Monetary Policy and Investment Plans

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Abstract

We explore how monetary policy affects corporate investment decisions, and why there are long and variable lags in transmission. To do so, we hand-collect a firm-level dataset of U.S. investment plans and link it to managers' cash-flow expectations. Plans strongly predict realized investment, and allow us to observe decision changes separately from implementation. Using high-frequency monetary policy surprises, we show that firms revise investment plans within the quarter of the shock. The response varies by horizon: long-horizon plans are far more sensitive to policy than near-term plans. Plans for new projects respond more to monetary policy than plans related to ongoing projects. These results are consistent with capital production frictions and can help to explain the long and variable lags in monetary policy transmission. Regarding transmission mechanisms, we document evidence of a cost of capital channel. Earnings expectations respond to policy but explain at most a small fraction of investment-plan adjustments, and financial constraints actually dampen the transmission of monetary policy to investment.

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How does monetary policy affect corporate investment decisions, and why does it do so with long and variable lags [Friedman, 1968]? Classic explanations for lags include production frictions, such as time to build, investment irreversibility, and investment adjustment costs [Kydland and Prescott, 1982, Abel and Eberly, 1994], financial frictions [Bernanke and Gertler, 1995], or information frictions that delay firms' acquisition and analysis of news [Lucas, 1973, Mankiw and Reis, 2002, Coibion et al., 2018]. However, evidence to disentangle these narratives is limited. Without directly observing corporate expectations and decision making, the business investment response to monetary policy remains a black box.

In this paper, we construct a novel dataset of hand-collected quarterly forward-looking firm-level investment plans and managerial earnings expectations for the largest U.S. non-financial corporations to directly observe how firms adjust their expectations and investment decisions in response to monetary policy shocks. The data provides a unique perspective into the decision-making of corporate managers in real time. Unlike data on realizations, plans data separate the decision from the potentially slow and noisy process of implementation. To establish that these plans are economically meaningful, we first document that plans predict actual investment, even up to five years in the future.

Using this new dataset and high-frequency monetary policy surprises around FOMC announcements, we establish three new facts about how monetary policy affects firms' investment decisions. First, firms revise investment plans within the same fiscal quarter as the policy shock, and we find little additional updating to older shocks. This pattern is difficult to reconcile with slow information updating as the primary driver of long and variable lags. Second, investment plans exhibit a pronounced term structure of responsiveness: plans for investment several years ahead respond much more than plans for the near term. In other words, monetary policy primarily reshapes the future investment path by affecting long-horizon investment rather than immediately cutting next-year capital expenditure. Third, we provide provide novel evidence of the irreversibility of investment once underway: plans for new projects are most responsive to monetary policy, but plans for ongoing projects are comparatively inert - even for distant-horizon spending. Overall, we interpret these results as novel evidence of adjustment costs that dampen and delay the transmission of monetary policy to real activity.

With our new data on plans and expectations, we can more precisely map decision changes to various shocks to study monetary policy transmission. We document three findings supportive of a cost of capital channel: first, firms adjust their investment plans in response to changes in both the risk-free rate and risk premia around monetary policy events, both of which directly affect their cost of capital. Second, firms with

longer maturity assets and longer duration investments are more responsive, and third, long horizon plans are more responsive to changes in long-run risk-free rates than they are to short-run risk-free rates. We also find suggestive evidence of a cash flow expectations channel, though this appears to be smaller in magnitude. We find that financial constraints weaken the transmission of monetary policy to investment, consistent with Ottonello and Winberry [2020].

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. 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 2008. 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, roughly half 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. Importantly, investment plans predict actual investment with a predictability coefficient of around 0.8, confirming that plans are informative about a firm's intentions.

We use the plans data to understand firms' investment decisions in response to monetary policy. To investigate this, we use standard monetary policy shocks constructed using high-frequency changes in interest rate futures around FOMC announcements. We begin by providing a new estimate of the responsiveness of investment to monetary policy, and use this to back out a new estimate of the elasticity of investment with respect to the user cost of capital. Given our data, we are able to provide precise estimates both for the near-term and longer-term response of investment. We find estimates for the responsiveness of investment over the next year that are in line with prior estimates (around 2). When turning to the response over longer horizons, our estimates (4–10) are considerably larger than those previously found in the literature.

Next, we turn to investigating the reasons behind the previously documented lagged response of realized investment to monetary policy. We investigate two potential explanations: information stickiness, and

frictions in the production of capital. We show that firms update their planned investment within a quarter of the shock taking place, and do not continue to update their plans in future quarters following the shock. This suggests that slow updating and information processing do not completely explain the long lags of monetary policy transmission to investment.

We then investigate production frictions. First, we formally document 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. We interpret this as evidence of a long average time-to-build of multiple years. Next, we show that plans regarding new investment projects are more responsive to monetary policy; plans regarding ongoing investment projects are less responsive. This is the case even when holding fixed the horizon of the plan. This provides novel evidence of the partial irreversibility of investment [Arrow, 1968, Bernanke, 1983, Abel and Eberly, 1994], which poses a friction for monetary policy transmission to investment. We also find significant variation in responsiveness across types of investment: in response to contractionary monetary policy shocks, firms are most likely to reduce plans for investment that are potentially more flexible in their timing, such as investment related to expansion, environmental projects, and maintenance spending, and are less likely to adjust plans for investment related to R&D, acquisitions, and infrastructure.

Finally, we directly test mechanisms of monetary policy transmission, and how they vary across firms. Firms may adjust their investment plans downward in response to a contractionary monetary policy shock for many reasons, including a higher cost of capital, tighter financial constraints, or reduced cash flow expectations. We first investigate the financial constraints channel. We find that firms that are closer to their financial constraints are actually less responsive to monetary policy, suggesting that financial constraints actually dampen the transmission of monetary policy for our firms.

Next, we investigate the cost of capital channel, where monetary policy may affect investment by changing the cost of capital that firms use to discount expected future cash flows of projects by. Firms respond both to changes in the risk-free rate and risk premia component of the cost of capital. Sensitivity to risk-free rate changes induced by monetary policy is stronger among firms with greater investment duration and longer asset maturity. The evidence also points to duration matching along the term structure: long-term investment plans exhibit greater responsiveness to shocks to long-term yields than do short-term plans. Similarly, longer-horizon plans react more strongly to movements at the long end of the yield curve than to changes at the short end. The cost of capital channel may also result in firms readjusting their financing

accordingly. Consistent with this, we find that firms adjust their net issuance in response to monetary policy.

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. Firms reduce their expectations of net income in response to contractionary monetary policy, and that there is a positive correlation between reductions in net income expectations and reductions in investment expectations. However, the channel appears to be quantitatively small for firms in our sample.

The question of how monetary policy affects firms has been studied extensively [Keynes, 1937, Friedman, 1968, Cochrane, 1998, Bernanke et al., 1999]. In neoclassical theory (Jorgenson and Stephenson [1967], Jorgenson [1963]), changes in the cost of capital should elicit immediate and large investment responses. This is generally not true in the data: firms' realized investment responses to monetary policy shocks are typically estimated to be quantitatively small on average, and moreover occur with significant delays [Bernanke and Gertler, 1995, Christiano et al., 2005]. With data on planned investment, we can better pinpoint the economic decision around a monetary policy event, yielding a more precise estimate of investment decisions that is economically larger than when using realized investment. Our work also contributes to the literature on measuring the elasticity of investment with respect to the user cost of capital [Schaller, 2006, Gilchrist and Zakrajšek, 2007, House and Shapiro, 2008, Zwick and Mahon, 2017].

Our results help explain the well-documented pattern that realized business investment lags monetary policy shocks [Bernanke and Gertler, 1995, Christiano et al., 2005], contrary to predictions of immediate responses in neoclassical models. Explanations include nominal rigidities [Christiano et al., 2005], financial accelerator models [Bernanke and Gertler, 1995, Bernanke et al., 1996], information rigidities [Lucas, 1973, Mankiw and Reis, 2002, Coibion et al., 2018], and production frictions such as time to build and partial irreversibility [Kydland and Prescott, 1982, Abel and Eberly, 1994]. For the firms in our sample, stories of information rigidities would be hard to reconcile with the immediate response in plans we observe. Instead, we show that production frictions are the primary channel that leads to lagged responsiveness.[1] Production frictions include partial irreversibility of investment [Abel and Eberly, 1994, Dixit and Pindyck, 1994], where low resale value of capital makes investment costly to reverse and creates an option value of waiting. Our findings that new investment plans are more responsive to ongoing plans is consistent with these models.

[1] In a similar vein, Siani and Zhang [2025] show that institutional frictions in state budgeting processes create long lags in spending responses to aggregate shocks.

While this paper focuses on the transmission of monetary shocks, similar frictions likely characterize firms' responses to tax changes, regulatory shifts, and other demand or supply shocks.

Our paper takes a step towards opening the "black box of monetary policy transmission" via firms [Bernanke and Gertler, 1995]. In doing so, we build 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], Kaplan and Zingales [1997], Gennaioli et al. [2016]). Modern macro models predict a high investment responses to interest rates. Empirical results thus far are mixed.[2] Our data allows us to trace with more detail the effects of monetary policy, attributing changes in different horizons to shocks in different asset prices, 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.

Finally, our paper adds to a 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 [Lamont et al., 2000, Guiso and Parigi, 1999, Gennaioli et al., 2016, Coibion et al., 2020, Barry et al., 2022, Graham, 2022]. More recent work by Gormsen and Huber [2022] and Gormsen and Huber [2024] use public disclosures to study firm decisions, which can be more informative than surveys if decision-makers are held accountable for their plans and expectations. [3]We contribute to this literature by being the first to collect and use disclosed planned investment data to map out economic responses to monetary policy.

The remainder of the paper is organized as follows. We first discuss the new data on investment plans in Section 1. We then investigate the responsiveness of investment with respect to monetary policy, and investigate heterogeneity in this relationship across different types of investment in Section 2. Section 3

[2]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 [Gertler and Karadi, 2015, Nakamura and Steinsson, 2018, Bauer and Swanson, 2023]. 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, which are used in firms' investment decisions (Graham [2022], Gormsen and Huber [2022]).

[3]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]. 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 surveys). We build on this literature by constructing and analyzing the most comprehensive micro-data on investment plans and cash flow expectations to date. While the focus in this paper is on monetary policy, our data open up a host of new opportunities for understanding corporate behavior by directly observing management decisions. We explore these questions further in our companion paper Selgrad and Siani [2025].

explores the transmission mechanisms through which monetary policy can affect investment. Section 4 discusses implications and Section 5 concludes.

1 Measurement of 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.

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 E.3 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

[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`.

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 collection and cleaning process in Appendix A.

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 **??** 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 **??** 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 E.4 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 E.5. The plan horizon varies significantly by industry, as summarized in Figure 2; 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 E.7 shows the modal number of revisions to a given investment plan is three. Further, Figure E.8 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. Regulation S-K Item 303 requires SEC-filing companies to disclose material cash requirements, including capital expenditure commitments. Accordingly, once a project is reasonably likely to require material cash outlays, it should be disclosed.[6] Managers are strongly incentivized to provide guidance honestly and avoid "cheap talk". The

[6]See `https://www.ecfr.gov/current/title-17/chapter-II/part-229/subpart-229.300/section-229.303`.

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.

In Appendix C, we analyze our sample, discuss firm disclosure behavior (including the frequency and horizon of investment plans), and address potential selection bias. In summary, firms that report plans are larger and have more tangible assets and higher investment rates than those that do not disclose plans. Collectively, our firms make up an average X% of fixed business investment between 2010-2024 in the U.S. economy. We view our results as representative of the investment response of large firms, which are key for understanding the response of aggregate investment.

Mapping our micro investment plans to aggregate investment requires distinguishing between creation and reallocation of capital. Under U.S. GAAP, capital expenditures incorporate outlays that add to property, plant, and equipment (PP&E) through purchases, construction, and improvements, while excluding acquisitions of business entities.[7] For example, purchases of used machinery are recorded as capex, and while these transactions can improve productivity [Schoar, 2002], they do not contribute to aggregate capital formation. In our sample, the reallocation margin is limited: the share of PP&E that is sold by the firms in our sample each year is under 0.4%, lower than but broadly in line with Eisfeldt and Rampini [2006].[8] This is likely an upper bound of used capital purchases for the firms in our sample, since young/small firms are more likely to acquire used capital [Ma et al., 2022], and our sample is skewed larger. Property acquisitions, which also do not contribute to aggregate capital formation, do appear in plans but are infrequent; explicit references to land occur in under 1% of plan descriptions. We therefore interpret the capex plans we study as primarily reflecting new capital formation.

[7] In our data, companies will sometimes describe planned capital expenditure in conjunction with acquisition activities, but our planned amounts do not reflect the value of the acquisitions themselves.

[8] We follow Eisfeldt and Rampini [2006] and compute the PP&E turnover as the average Sales of PP&E across firms divided by the lagged average PP&E.

1.1 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 3a and 3b, we show the total planned 1-year (3-year) forward capital expenditure change, normalized by lagged assets, relative to the actual capital expenditure changes 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 stay roughly constant as a share of assets in 2020 based on 1-year plans made in 2019; but instead dropped significantly, likely due to the COVID-19 pandemic.

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:

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

We plot the estimated coefficients across all horizons $h \in [1,5]$ in Figure 4. 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 September 2011, but not the one announced in October 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 E.7, and find that medium and longer horizon plans (greater than two years) are generally slightly less predictive.[9]

1.2 Other Data

Regarding cash flow expectations, we obtain firms' projections for net income 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

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

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 23,735 cases. There are 1,800 unique firms that provide projected net income alongside an investment plan. LSEG Guidance Reports provides projections for cash flow variables made between 2004-2021.

We use high-frequency changes in interest rate futures around FOMC announcements constructed by Bauer and Swanson [2023] as the main monetary policy shocks. For the front-end of the yield curve (short-term, or "ST Shock"), we use the first principal component of the changes in the current-quarter Eurodollar (ED) futures contract, next-quarter ED futures contract, and the two- and three-quarter-ahead ED futures contracts from 10 minutes before the announcement until 20 minutes after the announcement, scaled so that the impact on the latter contract is one. To measure changes to the longer-end in the yield curve, we use changes in the prices of the 2-year, 5-year, and 10-year Treasury bond futures, also in the 30-minute announcement window.

We further use 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. We obtain a measure of asset specificity from Kermani and Ma [2023].

2 The Relationship between Firm Investment Decisions and Monetary Policy

In this section, we investigate the relationship between monetary policy and corporate investment decisions. The baseline hypothesis from neoclassical economic theory is that contractionary (expansionary) monetary policy shocks should reduce (increase) planned investment. We test this directly using standard monetary policy measures from the literature, and exploit our data on plans to estimate elasticities of planned investment over different horizons to interest rates. Next, we investigate why there is a long lag in the realized investment response to policy, as has been documented in the literature. Two theoretical frameworks can rationalize delayed reactions in realized investment: (1) information stickiness and (2) frictions in the production of

capital; we test predictions of both.

2.1 The Responsiveness of Investment with Respect to Monetary Policy

We first investigate the average responsiveness of investment plans to monetary policy, pooling across all firms and types of investment. A distinctive feature of our data is that we observe investment plans at various horizons and can track how planned investment at each horizon adjusts in response to monetary policy. Exploiting this feature, we estimate the following specification separately for each horizon $h = 1, 2, 3, 4, 5$:

$$\text{Planned Investment}_{i,t,h} = \beta_h \ \widehat{\Delta y}_t + X_{i,t-1} + \alpha_i + \varepsilon_{i,t,h}, \tag{2}$$

where $\text{Planned Investment}_{i,t,h}$ is defined as $\frac{F_{i,t}[I_{i,t+h}] - I_{i,t-1}}{A_{i,t-1}}$: planned investment for horizon h relative to prior actual investment and normalized by prior period assets; t the quarter in which the plan was made, and the projection horizon h refers to the number of years between the plan announcement and the end of the projection period. 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 in detail in Appendix B.

On the right hand side, we instrument for the quarterly change in each U.S. Treasury yield Δy_t with the sum of 30-minute high frequency shocks of the duration-matched U.S. Treasury future during all monetary policy events that occurred during quarter t. Firm controls include pre-shock cash-to-assets, leverage, log assets, return on assets, tangibility and Tobin's Q. Macro controls include the lagged quarter change and level of the CFNAI index, the lagged 2-year U.S. Treasury yield and 2-10 year Treasury yield curve, and four lags of GDP growth, inflation rate, and unemployment rate. We include all plans ending at least nine months after announcement, and cluster standard errors by firm and calendar quarter.

Figure 5 shows the effects on planned investment for different horizons, for monetary policy shocks to different points of the curve. Table 2 shows our baseline estimates using the five-year yield, which are stable across different controls. Table E.9 shows the estimates for changes to other points of the yield curve. Short-horizon investment plans for the upcoming year seem relatively unresponsive to monetary policy shocks. However, long-horizon investment plans for several years into the future are more responsive. For example, Panel B suggests that a one percentage point increase to the five-year yield leads to no reduction today in

short-term planned investment ($h = 1$). However, it leads to a 1.0%, 0.6%, 1.2% and 0.8% reduction today in planned investment that is to occur in two, three, four, and five years respectively, relative to prior realized investment, scaled by prior period assets. In general, it appears that the response of planned investment to risk-free interest rate shocks is increasing in the horizon of the plan.

For robustness, we also run a version of the specification where we have $\text{Revision}_{i,t,h} = \frac{F_{i,t}[I_{i,t+h}] - F_{i,t-1}[I_{i,t+h}]}{K_{i,t-1}}$ on the left-hand side instead. The results are shown in Figure E.11. While the confidence intervals are wider as we lose observations where there are not consecutive updates to plans within a year, the coefficient estimates are similar in magnitude to our baseline in Figure 5.

What would we have learned looking only at realized investment? We estimate the following analogous specification for realized investment, for horizons $h = 1, 2, 3, 4, 5$:

$$\text{Realized Investment}_{i,t,h} = \beta_h \ \widehat{\Delta y}_t + X_{i,t-1} + \alpha_i + \varepsilon_{i,t,h}, \tag{3}$$

where $\text{Realized Investment}_{i,t,h}$ is defined as $\frac{I_{i,t+h} - I_{i,t-1}}{A_{i,t-1}}$. Figure E.10 compares estimates for this specification using realized investment to the specification using planned investment. The coefficients estimated using realized investment are relatively similar in magnitude to those estimated using planned investment, but are far noisier and statistically indistinguishable from zero.

This comparison highlights the signal-to-noise ratio issue when using data on realized investment: these noisily estimated coefficients could reflect measurement error or weak policy transmission. This problem is exacerbated when zooming out to longer horizons following a shock, when additional events may further affect firm investment decisions. Analyzing our data on actual plans instead of relying solely on data on realizations allows us to see that the policy is indeed effective at adjusting economic agents' decisions.

2.1.1 Comparing to Prior Estimates

We compare our estimates of investment plan response to monetary policy driven interest rate changes to investment elasticities in the literature. Figure E.9 displays prior recent estimates of the responsiveness of capital expenditure to monetary policy shocks. There are several deviations in methods we employ due to the nature of our data. On the left hand side, while most estimates are cumulative over longer horizon, i.e., they capture the total investment response over a given horizon, while our estimates capture annual investment responses as reported in the plans. In addition, existing estimates are typically using net investment, our

estimates are using gross investment, as most firms do not project out depreciation. Finally, most estimates use capital stock in the denominator, while our baseline uses assets, so our denominator is larger.

To make our estimates comparable, we cumulate our estimates using the short-term shock, adjust for an annual depreciation rate of 10%, and multiply by the average ratio of A/K in our sample.[10] Our comparable estimate of the investment response to a one percentage point shock is ≈ 0 over one year, -1.85 over two years, -4.44 over three years, -8.61 over four years, and -10.1 over five years. Our estimates of the responsiveness of the investment to monetary policy shocks are on the higher end of the previous literature for horizons spanning one to years, and considerably higher than those found in the previous literature for longer horizons.

Our estimates imply a short-term elasticity of investment with respect to the user cost of capital of 2.5, an intermediate elasticity of 4.3, and a long-term elasticity of 10.2.[11] Our short-term elasticity is similar to that of Zwick and Mahon [2017] for the largest decile of firms in their sample (which include typical Compustat firms). Our long-horizon investment plans data allows us to also estimate the longer-term responsiveness of investment over several years, which is considerably larger. This indicates that the noise of existing measures may obscure the full extent to which firms respond to monetary policy.

2.2 Monetary Policy Affects Investment Plans Immediately

Having established that firms adjust plans in response to monetary policy, we now turn to the question of why there are long lags. One set of models explaining delayed realized investment responses incorporates information rigidity or inattention [Lucas, 1973, Reis, 2006, Mankiw and Reis, 2002, 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 realized investment responds slowly to monetary policy shocks, as firms take time to revise their expectations and investment plans over several periods following a shock. These models yield a clear prediction: we should see firms update both investment plans and earnings expectations with a lag to monetary policy shocks, if at all. On the other hand, if firms do not face information rigidities and instead update their expectations immediately, then investment plans should only respond to monetary policy shocks in the current quarter, if at all, and they should not respond further to monetary policy shocks that occurred

[10] The average ratio of A/K in our sample is 4.62. For example, the cumulative effect on log capital at $t+3$ is obtained by depreciating prior investment responses and adding the $t+3$ response: $(0.9^2 \times 0 + 0.9 \times (-0.4) + (-0.6)) \times 4.62 = -4.44\%$.

[11] We outline the assumptions used to convert our estimates of the response of investment with respect to the risk-free rate into an elasticity with respect to the user cost of capital in Section D.

in previous quarters.

We test this directly using the plans data. For each plan horizon $h \in 1, 2, 3, 4, 5$ years, we estimate the following IV local projection for $s = 0, 1, 2, 3$ quarters after the policy shock driven change in yields:

$$\text{Planned Investment}_{i,t+s}^{(h)} = \beta_s^{(h)} \widehat{\Delta y}_t + \boldsymbol{\gamma}' \mathbf{X}_{i,t-1} + \alpha_i + \varepsilon_{i,t+s}^{(h)} \tag{4}$$

where Planned Investment$i, t + s^{(h)}$ is the change in planned real capital expenditures normalized by lagged assets for firm i observed s quarters after the monetary policy event, with plan horizon h; $\widehat{\Delta y}_t$ is the quarterly change in the 5-year Treasury yield, instrumented by sum of the contemporaneous quarter's 5-year Bauer–Swanson monetary policy surprises; $\mathbf{X}_{i,t-1}$ includes lagged firm-level and macroeconomic controls; and α_i are firm fixed effects. We condition on investment plans for time periods ending at least nine months after the announcement. 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. The coefficient $\beta_s^{(h)}$ traces out the impulse response of planned investment at horizon h to a policy-induced yield change s quarters prior.

Figure 6 reports the coefficient on the instrumented interest rate change $\beta_s^{(h)}$ for each value of s, along with 90% confidence intervals. Monetary policy shocks that occur within the quarter when the investment plan is determined immediately impact investment plans, while plans in the following periods do not appear to be affected. Taken together, these results show that firms incorporate new information from monetary policy into investment plans within one quarter.

2.3 Long Horizon Investment Plans are More Responsive to Monetary Policy

Next, we formally test the statistical significance of the result that long-horizon plans appear to respond more so than short-horizon plans. We again include all plans ending at least nine months after announcement. We estimate the following specification:

$$\text{Planned Investment}_{i,t,h} = \beta_1 \widehat{\Delta y}_t + \beta_2 \widehat{\Delta y}_t \times \mathbb{1}\{\text{LT Plan}_{i,t,h} = 1\} + \beta_3 \mathbb{1}\{\text{LT Plan}_{i,t,h} = 1\} + \alpha_i + X_{i,t-1} + \varepsilon_{i,t,h} \tag{5}$$

where $\widehat{\Delta y}_t$ is the change in yields over the quarter, instrumented 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] that occurred during the fiscal quarter t in which the investment plan was made. We define an investment plan as long-term ($\mathbb{1}\{\text{LT Plan}_{i,t,h} = 1\}$) if the plan is for a year that ends more than 24 months after the announcement of the plan. We include the same set of controls as before.

The results for this estimation are in Table 3. The omitted category is short-term (up to 24 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 contractionary shock lowers short-term planned capital expenditure (as a share of assets) by 0.016 percentage points while reducing long-term planned capital expenditures by around 0.25 percentage points (the sum of the base and the interaction coefficients). 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.

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 E.10 reports the results, which are qualitatively very similar to our baseline results in Table 3, providing us confidence in our results despite the small magnitude of the measured MPS from Bauer and Swanson [2023]. [12] 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 long-term investment plans, confirming our prior of the direction of the bias.

Overall, 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". This helps explain why monetary policy takes time to impact realized investment: it impacts long-horizon plans the most, which are still often years away from realization.

These results help to shed light on the potential frictions associated with the production of capital. First, these results suggest that costs firms face when adjusting their level of capital are not convex. Under convex adjustment costs, it would be optimal for the firm to spread any investment induced by monetary policy evenly across multiple periods, which would predict an equal response of investment plans to monetary policy shocks across all horizons, which we do not observe. The time-to-build literature [Kydland and Prescott, 1982] introduces the friction that multiple periods are required to build capital goods, and only

[12] Table E.11 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.

finished capital goods are part of the productive capital stock. Casares [2006] shows that in the case of a one period time-to-build, the peak effect of a monetary policy shock on realized investment will occur immediately in the period that the shock occurs. In the case of a multiple period time-to-build, the peak effect of a monetary policy shock on realized investment is delayed and occurs several periods later. Thus, a multiple year time-to-build can help to explain the term structure of investment plan responsiveness that we see.

2.4 Plans for New Projects are More Responsive to Monetary Policy

Another friction firms may face in the production of capital is laid out in Abel and Eberly [1994], where a wedge between the purchase price and resale price of capital makes investment costly to reverse. This wedge can create an option value of waiting before starting a project McDonald and Siegel [1986], Dixit and Pindyck [1994]. These models of partial irreversibility imply that new projects could be more sensitive to interest rates than ongoing projects: interest rates affect the option value of starting a new project, whereas for ongoing projects that option has already been exercised and so this channel no longer applies.

We test whether plans for new projects are more responsive than those for ongoing projects by using the qualitative information firms provide about their investment plans. First, we categorize whether a firm's investment plan describes a new or ongoing project based on the words it uses to describe the project. We observe a qualitative discussion of the kind of investment planned for roughly one-half of observations. We classify investment plans as referring to new projects when the firm signals the initiation of projects. For example, if the text about an investment plan includes the word "new" in combination with an asset, or references openings, the plan is categorized as referring to a new project. We classify investment plans as referring to ongoing projects when firms indicate the continuation or status of an existing project using words such as continue, ongoing, existing, or complete. The complete classifications are provided in Table E.8.

We then estimate the following specification for plans that are categorized as being exclusively about new or about ongoing projects:

$$\begin{aligned}\text{Planned Investment}_{i,t,h} = &\sum_j \sum_k \beta_{j,k} \widehat{\Delta y}_t \times \mathbb{1}\{LTPlan_{i,t,h} = j\} \times \mathbb{1}\{NewPlan_{i,t,h} = k\} \\ &+ \sum_j \sum_k \gamma_{j,k} \mathbb{1}\{LTPlan_{i,t,h} = j\} \times \mathbb{1}\{NewPlan_{i,t,h} = k\} \\ &+ X_{i,t-1} + \alpha_i + \alpha_h + \varepsilon_{i,t,h} \qquad (6)\end{aligned}$$

$\mathbb{1}\{NewPlan_{i,t,h} = 1\}$ if the investment plan is categorized as being exclusively about new projects, and $\mathbb{1}\{NewPlan_{i,t,h} = 0\}$ if the investment plan is categorized as being exclusively about ongoing projects. As before, $\mathbb{1}\{LTPlan_{i,t,h} = 1\}$ if the plan is for year that ends more than 24 months after the announcement date of the plan. In this way, we compare differences between new and existing plans within a planning horizon, in order to separate out the differences in sensitivity of new and ongoing projects from the differences in sensitivity of plans of short and long horizons.

The results are shown in Figure 7. Long-term plans for new projects are significantly more responsive to monetary policy shocks than long-term plans for existing projects. This suggests that for new investment projects, firms have considerably more flexibility in adjusting the scale of the project. For ongoing investment projects, firms have less flexibility in terms of adjusting it in response to monetary policy, i.e., investment appear irreversible once underway. Interestingly, the coefficient on ongoing projects are close to zero, suggesting a high degree of irreversibility once investment has begun.

2.5 What Types of Investment are Most Responsive?

We established in the previous section that new plans are more responsive to monetary policy than existing plans. In this section, we further exploit the textual data to investigate which types of investment decisions are particularly sensitive to monetary policy shocks, to try to identify more directly an extensive margin effect. We classify investments into the following, non-mutually exclusive categories: maintenance, acquisitions, physical infrastructure, environmental, expansion, and research and development. Table E.8 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 contractionary monetary policy, we run the following regression on plans for projection horizons that end at least 9 months after announcement:

$$\mathbb{1}\{\text{Investment Type}\}_{i,t} = \beta \Delta \widehat{y_t} + X_{i,t-1} + \alpha_i + \varepsilon_{i,t}, \tag{7}$$

where the outcome variable is a dummy variable that equals one if the qualitative description of the investment plan mentions words in a given category of investment and zero otherwise. Note that one investment plan can mention multiple types of investment. Figure 8 shows the estimated coefficients with 90 percent confidence intervals, using three different tenors of yield changes on the right-hand-side: short-term, two-year, and five-year, which yield similar findings. The most robust finding is that environment-related investment plans are significantly responsive to monetary policy: a one percentage point increase in yields (driven by monetary policy) will reduce the likelihood of mentioning an investment plan about the environment by about one percentage point. Further, increases in the 2- and 5-year yields driven by monetary policy reduce the likelihood of maintenance capex. Finally, increases in the 5-year yield reduce the likelihood of mentioning investment plans about expansionary projects: a one percentage point increase in yields reduces the likelihood of an expansionary plan by two percentage points. Physical infrastructure related investments respond negatively to positive (contractionary) yield shocks, but this is statistically insignificant.

These results underscore the heterogeneity of investment responses to monetary policy. Monetary policy appears to primarily affect investment categories where firms can adjust timing without immediate consequences - environmental projects that are often voluntary or anticipatory, expansionary plans that can wait for better conditions, and maintenance that can be temporarily deferred. By contrast, investments involving deeper strategic or institutional commitments - such as R&D programs tied to specialized teams and long-term research agendas, acquisitions driven by time-sensitive opportunities, and infrastructure governed by contractual obligations - appear less unresponsive.

3 Transmission Channels of Monetary Policy to Investment

Next, we explore the transmission channels of monetary policy to firm investment decisions. Monetary policy may affect firms' investment decisions via many channels, including through changes in financial constraints,

the cost of capital or cash flow expectations[13]. The key advantage of our approach is that by using investment plans and cash flow expectations data, we observe firms' decisions different types and horizons of investment in real time. This allows us to tie discrete adjustments in plans directly to contemporaneous changes in firms' expectations about cash flows and drivers of firms' discount rates and costs of capital and avoid the timing mismatches and noise inherent in realized data to better pinpoint the transmission mechanisms.

We discuss our methods and results below. In summary, our evidence is consistent with a dominant cost of capital channel acting as the primary transmission channel for monetary policy, as well as a driver of the term structure of investment plans that we document. While cash flow expectations do adjust in response to monetary policy, they play a quantitatively minor role in the overall transmission. Financial constraints actually dampen the transmission, consistent with Ottonello and Winberry [2020].

3.1 Financial Constraints

Tighter monetary policy may dampen investment decisions by tightening firms' financial constraints. We investigate whether this channel can explain the responsiveness of the firms we observe to monetary policy.

To do so, we investigate heterogeneity in the responsiveness of firms to yield changes. We estimate the following specification:

$$\text{Investment Plans}_{i,t,h} = \beta \cdot \widehat{\Delta y_t} + \theta \cdot \widehat{\Delta y_t} \times \mathbf{1}\{X_{i,t} \in \text{Top } 25\%\} + \gamma' \mathbf{Z}_{i,t} + \alpha_i + \delta_h + \varepsilon_{i,t} \tag{8}$$

where $\widehat{\Delta y_t}$ is the quarterly change in the Treasury yield, instrumented by the corresponding high-frequency monetary policy surprise as measured by the 30 minute window around monetary policy announcements. The outcome variable $\text{Investment Plans}_{i,t,h}$ denotes the change in firm i's planned capital expenditures at time t, scaled by lagged assets; MPS_t is the high-frequency monetary policy shock measured around FOMC announcements; $X_{i,t}$ represents a firm characteristic; $\mathbf{Z}_{i,t}$ includes the same firm-level and macroeconomic controls as described above; α_i denotes firm fixed effects; and δ_h captures projection horizon fixed effects. Standard errors are clustered by firm and calendar quarter. The coefficient of interest

[13]For example, shortly after liftoff from the ZLB, Williams and Williams Partners in January 2016 justify their reduced capital expenditure plans through lower expected net income and higher cost of capital: "Reduced growth in production areas, combined with lower commodity margins and a higher cost of capital, will drive both lower capital and lower ongoing expenses that we expect to be significant." Following further rate hikes in late 2018, Uniti Group, in its earnings call in early 2019, stated that the higher cost of capital lowered its planned capital expenditure: "With the cost of capital in the public markets being elevated right now, we've chosen to kind of go slow on larger transactions." Consol Energy, in its 10-K for 2009, describes how easy monetary policy raised its cash flow expectations: "Due to the relaxed monetary policy in the United States, a modest recovery appears likely to continue in the U.S. ... This should lead to an increase in demand for energy products."

is θ captures the differential response of firms in the top quartile of characteristic X relative to other firms. Figure 9 plots the coefficient estimates.

We examine heterogeneity along various dimensions. In this section, we discuss the results relating to heterogeneity in how far from financial constraints a firm is likely to be, as measured by firm size, leverage, interest expense expense relative to total debt, profitability, cash-to-assets, and distance to default as implied by the Merton model. In the next section, we discuss the results relating to heterogeneity in the duration of investments, in order to investigate the discount rate channel. We measure this heterogeneity using asset maturity (following De Fraisse [2023]) and investment duration (dollar-weighted average horizon of investment plans). We also investigate asset specificity (following Kermani and Ma [2023]) in order to investigate the effect of the irreversibility of investment on sensitivity to monetary policy.

Regarding financial constraints, we find that firms in the top quartile for interest expense to debt ratios are less responsive to risk-free rate changes (as shown by the positive coefficient on the interaction term, which dampens the baseline negative effect). We also find that firms in the top quartile for distance to default, and cash-to-assets are more responsive. Together, this suggests that firms that are less likely to face financial constraints are more responsive to changes in interest rates. This aligns with the findings of Ottonello and Winberry [2020], and suggests that monetary policy does not transmit through the tightening of financial constraints for the firms in our sample. Instead, firms with more financial slack are more responsive to monetary policy. We find that being in the top quartile for other more traditional measures of financial constraints, namely size, leverage, and profitability, do not significantly change the responsiveness of investment to interest rates.

3.2 Cost of Capital

[Graham, 2022] find that NPV is the most popular methodology among large firms when making decisions about investment projects, followed by IRR using hurdle rates. Gormsen and Huber [2024] find that firms' perceived costs of capital typically differ from their hurdle rates, and that firms' perceived costs of capital update relatively quickly in response to changes in their financial cost of capital, while hurdle rates move slowly. Therefore, even in the presence of sticky hurdle rates, if firms' perceived cost of capital updates in response to monetary policy, this can translate to changes in investment decisions if firms use the latter to discount cash flows in their NPV calculations. Tighter monetary policy may thus dampen investment plans by raising firms' cost of capital. This can occur both through raising risk-free rates, and through raising risk

premia. We investigate each component below.

3.2.1 Risk-Free Rate Component

When valuing investment projects, the discount rate used should match the riskiness and duration of the project when evaluating whether to invest. Because long-term projects should be discounted using long-term yields, and short-term projects should be discounted using short-term yields, one testable prediction of the cost of capital mechanism is if long-term projects are more responsive to shocks to long-term risk-free rates than short-term projects.

We test this directly by estimating the following specification, where we compare how planned investment for different horizons responds to shocks in different parts of the yield curve. As before, we instrument each U.S. Treasury yield change with the sum of high-frequency shocks for the maturity-matched Treasury future as per Bauer and Swanson [2023].

$$\text{Planned Investment}_{i,t,h} = \beta_1 \widehat{\Delta y}_t + \sum_{x=2}^{5} \beta_h \widehat{\Delta y}_t \times \mathbb{1}\{h = x\} + \alpha_i + \alpha_h + X_{i,t-1} + \varepsilon_{i,t,h} \tag{9}$$

Table 4 reports the results. Importantly for the cost of capital channel, the responsiveness of investment plans appears aligned with the maturity of the interest rate shocks: 10-year yield shocks affect the longest-horizon five year plans the most, while shorter maturity shocks do not seem to significantly affect these plans. De Fraisse [2023] documents that secular changes in the slope of the yield curve impact the duration of corporate investment; 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. This is suggestive evidence that at the decision-making stage, firms use long term yields when evaluating longer duration projects.

Cross-firm variation in responsiveness is also informative about the cost of capital channel. If monetary policy operates through this channel, then we should see that firms with greater duration investment projects are more responsive. Figure 9 shows that firms with greater asset maturity and investment duration are more responsive to risk-free rate changes. This provides further evidence supporting the cost of capital channel.

3.2.2 Risk Premium Component

Monetary policy can also change firms' cost of capital by changing the equity or credit risk premium. In this section we investigate the latter. We estimate the following specification:

$$\text{Planned Investment}_{i,t,h} = \beta_h \ \widehat{\Delta\text{Risk Premium}}_t + X_{i,t-1} + \alpha_i + \varepsilon_{i,t,h} \tag{10}$$

where we instrument for quarterly changes in the excess bond premium of Gilchrist and Zakrajšek [2012] with changes in the excess bond premium in the two day window around monetary policy events. This captures variation in the pricing of default risk due to monetary policy events, given the reasonable assumption that little other news that could affect the EBP is occurring in the two day window [Hanson and Stein, 2015]. Given that credit risk premia feed directly into firms' cost of debt and thus their financial cost of capital, we would expect increases in credit risk premia to dampen investment if monetary policy operates through a cost of capital channel. Furthermore, given that changes in risk premia lead to a relatively level shift in the cost of capital across maturities, we would expect the effect on investment to be more uniform across horizons.

The results are displayed in Figure 10. We see that planned investment declines in response to increases in the excess bond premium caused by monetary policy events. This effect is uniform across investment plans of all horizons. The magnitudes are rather large, with a one percentage point change in the excess bond premium induced by monetary policy leading to an approximately 0.5 percentage point in planned investment scaled by lagged assets each year. The results suggest that monetary policy also affects investment through the cost of capital channel through changes in risk premia.

3.2.3 Do Firms Change their Borrowing in Response to Monetary Policy?

If firms reduce planned investment in response to higher cost of capital, we may expect this to be reflected in their borrowing behavior. We next test whether firms adjust their borrowing in response to monetary policy shocks. We estimate how a one-period policy shock alters firms' debt-issuing behavior over multiple horizons. Concretely, for each month horizon $h = 0, 1, \ldots, 24$, we run regressions of the form:

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

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 11 shows the average results across all firms, using different monetary policy shocks. There is a statistically significant decline in net issuance in response

to contractionary monetary policy shocks, and this is consistent across different kinds of shocks, though it is slightly more pronounced for shocks to the 2-year 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. The effect is not as strong for shocks in the 10-year yield, shown in Panel (c).

The coefficient plots in Figure 11 indicate notably shorter response lags for borrowing compared to realized 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. Thus, bond market borrowing responds quickly to monetary policy shocks.

Collectively, these results indicate that firms adjust their debt issuance behavior significantly in response to monetary policy-induced shifts in borrowing costs. The joint response of investment plans and borrowing behavior suggests that monetary policy operates through the cost of capital channel in a manner consistent with firms both re-evaluating the attractiveness of investment projects and adjusting their financing accordingly.

3.3 Cash Flow Expectations Channel

Another potential mechanism through which monetary policy affects planned investment is via changes in cash flow expectations. Gennaioli et al. [2016] use CFO survey data to document that higher earnings expectations in the next twelve months corresponds to increased planned investment over the same period. Changes in firms' cash flow expectations can affect planned investment in various ways. First, in the presence of capital market frictions that make internal funds less costly than external funds, a decrease in a firm's cash flows will result in an decrease in that firm's investment (Fazzari et al. [1988]). Second, in the presence of cash-flow based lending (Lian and Ma [2021]), a decrease in a firm's cash flows may cause financial constraints to become more binding, which may lead to a decrease in that firm's investment. Third, a decrease in firm's cash flow expectations due to lower anticipated aggregate demand may decrease the expected future payoff of investment projects, which may also lead to a decrease in investment. It follows that

if an increase in interest rates dampens a firm's expectations of future cash flows, via an aggregate demand channel, then the firm may reduce its planned investment.

While we do not directly observe firms' cash-flow expectations, we do observe their net income expectations. We treat net income expectations as a reasonable proxy for cash flow expectations. First, we study the relationship between a firm's expected future net income and monetary policy. We estimate the following specification:

$$\text{E[Net Income]}_{i,t,h} = \beta \widehat{\Delta y}_t + X_{i,t-1} + \alpha_i + \alpha_h + \varepsilon_{i,t,h}. \tag{11}$$

where β represents the effect of a change in the yield induced by monetary policy events on earnings projections. The sum of β_1 and β_2 represent the effect of an expansionary monetary policy shock on earnings projections. Controls $X_{i,t-1}$ are as above, and α_i and α_h are firm and projection horizon fixed effects. Standard errors are clustered at the firm and quarter level.

The results of these estimations are shown in Table 5, for net income expectations for the next year ($h = 1$) in columns (1) - (3), and for expectations for longer horizons ($h > 1$) in columns (4) - (6). The results suggest that short-term net income expectations respond to monetary policy, with a negative significant coefficient on the instrumented yield change. In terms of magnitudes, a one percentage point increase in the 5-year yield induced by monetary policy leads to a 0.8 percentage point decline in net income expectations, expressed as a percentage of lagged assets. From Table 1, this translates to a 0.12 standard deviation change in net income expectations for a one percentage point increase in the 5-year yield. Longer-term net income expectations do not seem responsive, although we observe far fewer observations for long-term earnings expectations.

Next, to study the relationship between a firm's investment plans and projected cash flows, we estimate the following specification:

$$\text{Planned Investment}_{i,t,h} = \beta E\left[\text{Net Income}_{i,t,1}\right] + X_{i,t-1} + \alpha_i + \alpha_t + \varepsilon_{i,t,h}, \tag{12}$$

where $\text{E[Net Income]}_{i,t,t+1}$ is firm i's projected real net income for the next year ($h = 1$), projected in quarter t, compared to actual net income in quarter $t-1$, scaled by the firms' assets as of quarter $t-1$. $\text{Planned Investment}_{i,t,h}$ is the analogous term for projected investment for a future year $t+h$. 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.

To examine the relationship between investment plans and cash flow expectations, Table 6 regresses planned investment on expected net income with two different timing structures. Columns (1) - (4) investigate the relationship between one-year-ahead investment plans and one-year-ahead net income expectations, made contemporaneously. Columns (5) - (8) investigate whether near-term earnings expectations predict longer-horizon investment plans, and displays the relationship between longer-term investment plans more than one year ahead on one-year-ahead net income expectations, made contemporaneously.

The first four columns show that the coefficient on expected net income change is positive and highly significant across all specifications, ranging from 0.013 to 0.020. This implies that a 1 percentage point increase in expected net income (as a share of assets) is associated with approximately a 0.02 percentage point increase in planned investment (as a share of assets). The coefficient is robust to the inclusion of firm controls, macro controls, and firm and time fixed effects. The next four columns show that longer-horizon investment plans for two to five years into the future are not statistically significantly related to contemporaneous first-year cash flow expectations. These results suggest that changes in near-term earnings expectations do not strongly translate into changes in investment plans for our firms.

Overall, while present, the cash flow expectations channel appears to be quantitatively very small for the firms in our sample. This could be explained by our firms being far from their financial constraints (Table 1 shows the typical firm in our sample has a distance to default of about 7 standard deviations), given that one way in which cash flow expectations may affect investment is through changing financial constraints. This suggests that for our firms, the cost of capital channel dominates in the transmission of monetary policy to investment.

4 Discussion

We document that investment plans respond within a quarter following a monetary policy shock. This suggests that the long and variable lags documented in the transmission of monetary policy to realized investment are not entirely explained by 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 plans quickly in response to monetary policy shocks, implying that firms' information sets update quickly.

We find evidence consistent with theories of capital production frictions. The term structure of investment plan responsiveness illustrates that capital outlays planned for the near future are harder to adjust. This is in line with time-to-build models (such as Kydland and Prescott [1982]), which would suggest that investment plans for long-term horizons respond more than investment plans for short-term horizons in response to monetary policy shocks in the presence of a long time-to-build. This result also suggests limited support for convex adjustment costs, as in such a world one would expect firms to adjust their investment plans across all horizons evenly.

We document new evidence of the irreversibility of investment, and how this can dampen the transmission of monetary policy. Once a project is initiated, firms behave as though the investment decision is largely committed, with further changes in monetary policy having limited effects. Plans regarding new projects are more responsive to monetary policy shocks than plans regarding ongoing projects. These findings align with frameworks where firms treat investment decisions as exercising real options (Dixit and Pindyck [1994], Abel and Eberly [1994]). Specifically, investment plans for new projects not yet underway, for which the option value of waiting still exists, display greater flexibility in adjusting to policy shocks.

5 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 that investment responses differ by horizon: short-term plans react less strongly overall compared to long-term plans, consistent with production frictions such as time-to-build and adjustment costs. Relatedly, the stage of the project matters – new investments are more responsive to contractionary monetary policy shocks, whereas ongoing projects are largely insulated – further evidence of the variation in flexibility across investment projects within a firm's portfolio. Our results are broadly consistent with a view of investment implementation with partial irreversibility and real options [Abel and Eberly, 1994, Dixit and Pindyck, 1994].

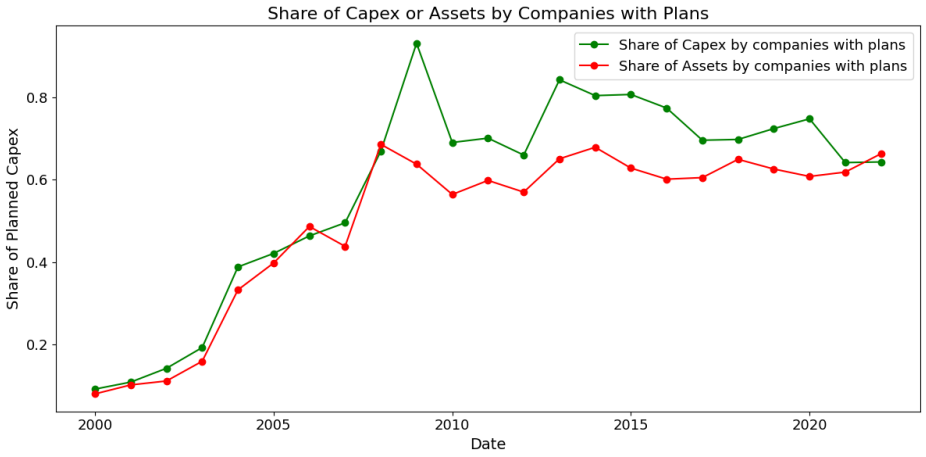
Our results provide new evidence explaining the well-documented empirical lag between monetary policy changes and realized output. We find that information frictions are unlikely to be significant drivers of the long lags in policy response for large, U.S. non-financial firms. Instead, we find that monetary policy immediately impacts the formation of new investment plans, with actual investment spending adjustments materializing only when projects begin execution with lags, given time to build and partial irreversibility of

existing projects.

We also find new evidence on the transmission mechanisms through which monetary policy affects investment. The cost of capital channel appears to be the dominant mechanism, with the cash flow expectations channel also playing a role albeit more quantitatively muted. Financial constraints dampen the transmission of monetary policy.

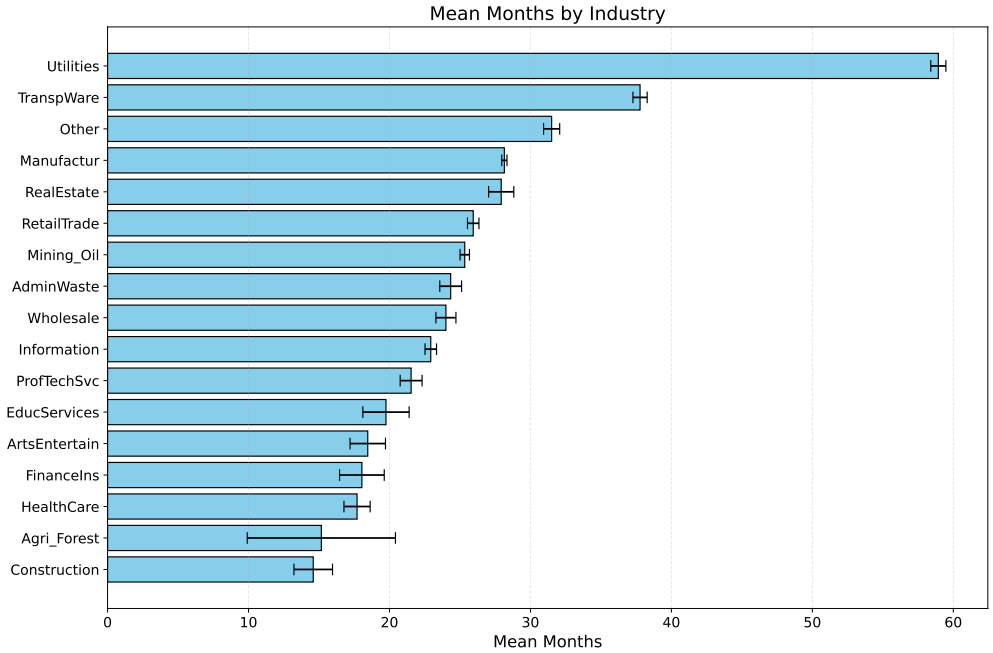
Overall, our evidence shows that analyzing corporate decision making is crucial for understanding the transmission of policy to the aggregate economy. Our findings imply that the composition of planned investment projects can affect how quickly and flexibly the corporate sector can respond to monetary policy through actual investment spending. While the focus of our paper is on monetary policy, our results provide important insights into firm responses to shocks and policies in general, and our new data provides many opportunities to better understand corporate decision-making.

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



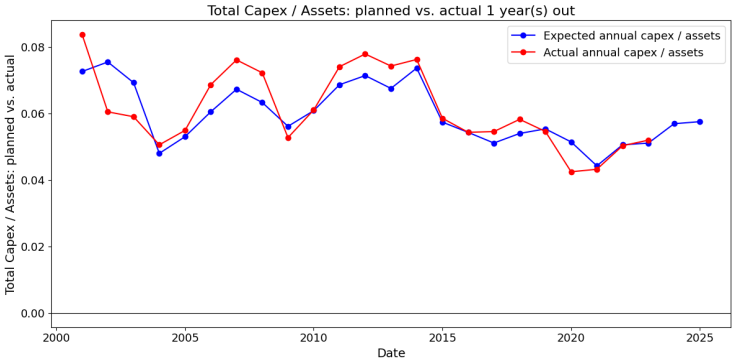
Notes: This figure plots the share of total assets (total capex) across all U.S. Compustat non-financial companies in red (green) that are covered by firms with investment plans in our sample.

Figure 2: Industry-level mean months to end of plan

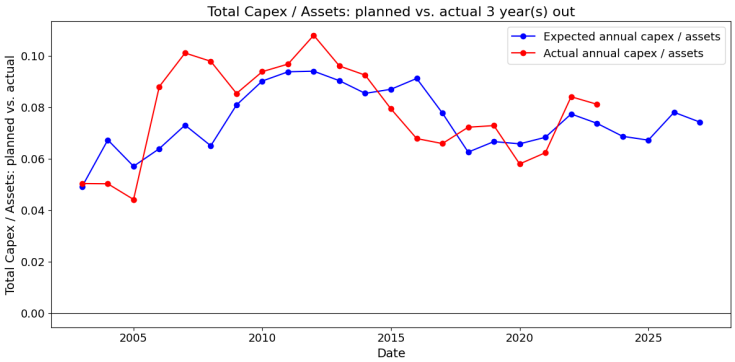


Notes: This figure summarizes the average projection period by industry across all firm quarters, conditional on the firm-quarter having an investment projection. Standard error bars are reported in black.

Figure 3: Comparing Planned vs. Actual Investment



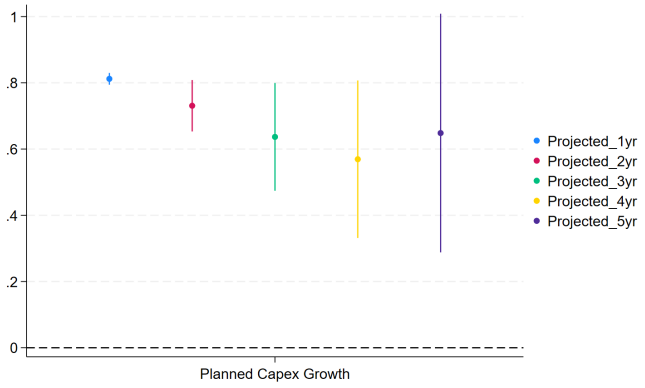
(a) Planned vs. Actual Capex / Assets: 1 Year Out



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

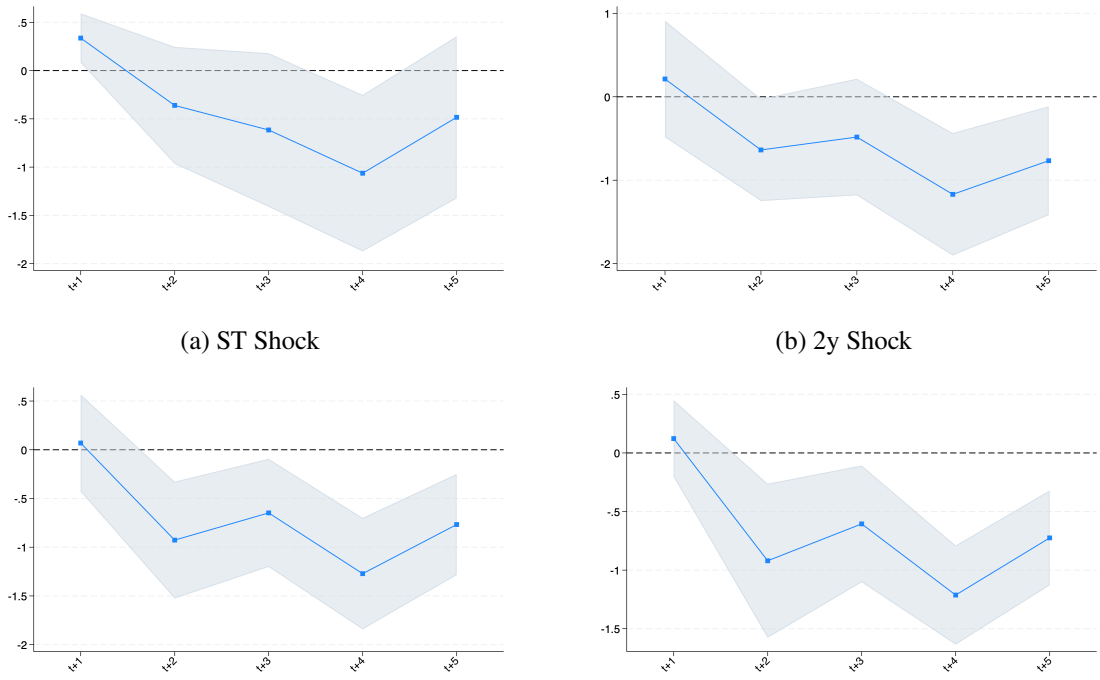
Notes: This figure compares total realized and planned capex as a share of lagged total assets. In Panel (a), the blue line shows the change in aggregate planned capex relative to one year earlier, while the red line shows the realized capex change over the same period. In Panel (b), the blue line plots planned capex / assets relative to three years prior, and the red line plots capex / assets relative to three years prior.

Figure 4: Predictiveness of Investment Plans at Different Projection Horizons



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

Figure 5: Impact of Monetary Policy on Investment Across Horizons



(a) ST Shock

(b) 2y Shock

(c) 5y Shock

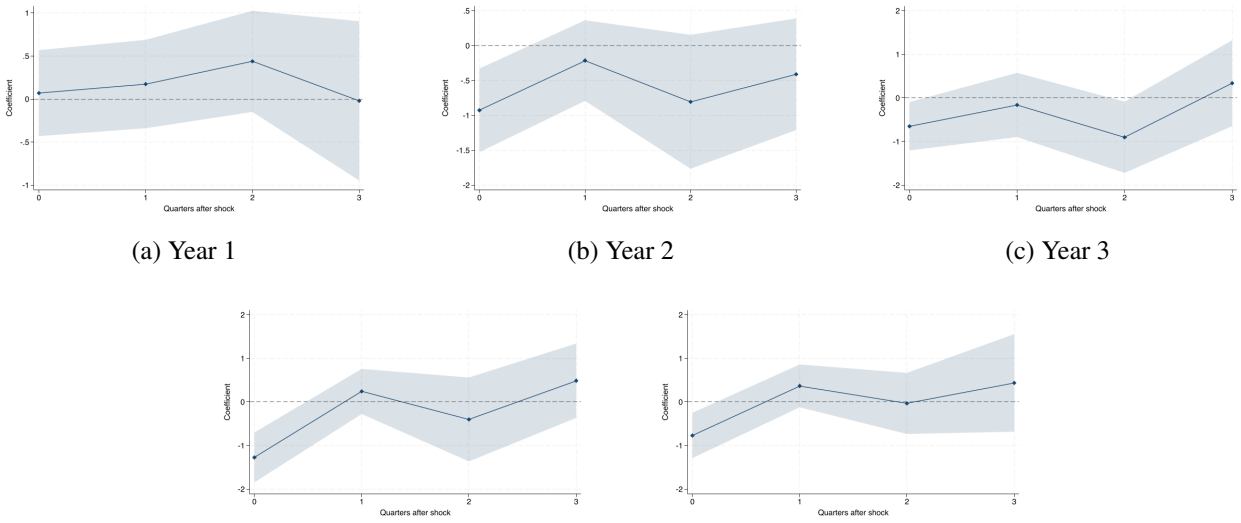
(d) 10y Shock

Notes: This figure depicts β_h and 90% confidence intervals for the following specification, for $h = 1, 2, 3, 4, 5$:

$$\text{Planned Investment}_{i,t,h} = \beta_h \widehat{\Delta y_t} + X_{i,t-1} + \alpha_i + \varepsilon_{i,t,h}$$

$\text{Planned Investment}_{i,t,h}$ is planned real investment for firm i in future year $t+h$ 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. 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 9-12 months, $h = 2$ if the difference is between 13-24 months, $h = 3$ if the difference is between 25-36 months, $h = 4$ if the difference is between 37-48 months, and $h = 5$ if the difference is between 49-60 months. $\widehat{\Delta y_t}$ is the three month change in the Treasury yield, instrumented using the maturity-matched monetary policy shock that occur during quarter t, during which the investment plan is made and at the end of which the plan is announced. Panel (a) instruments the 1-year UST yield with the Bauer and Swanson [2023] unorthogonalized shock, Panel (b) instruments the 2-year UST yield with the high frequency change in the 2-year UST yield, Panel (c) instruments the 5-year UST yield with the high frequency change in the 5-year UST yield, and Panel (d) instruments the 10-year UST yield with 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. The outcome variable is trimmed at the 2nd and 98th percentiles. Firm fixed effects are included, and standard errors are clustered at the firm and quarter level.

Figure 6: Contemporaneous vs. Lagged Shocks Effect on Investment Plans

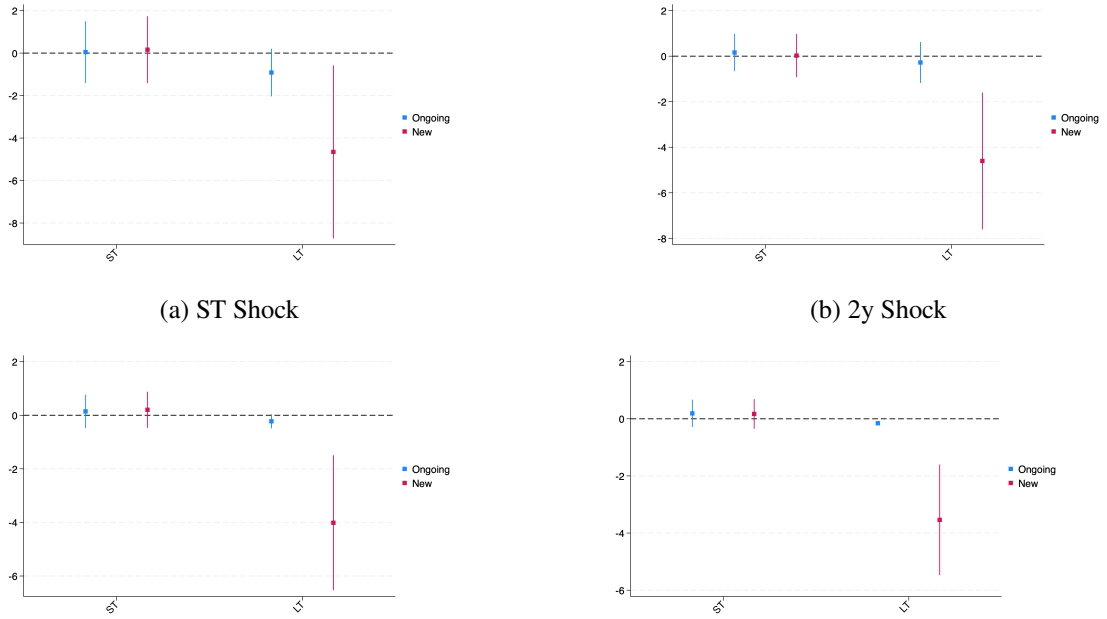


(a) Year 1 (b) Year 2 (c) Year 3

(d) Year 4 (e) Year 5

Notes: Each panel plots the local projection IV impulse response of planned investment at horizon h to a change in the 5-year U.S. Treasury yield, instrumented using the high-frequency 5-year Treasury monetary policy shock. The x-axis denotes quarters after the shock ($s = 0, 1, 2, 3$). The specification is in Equation 4. Panels (a)–(e) correspond to plan horizons $h = 1, \ldots, 5$. The regressions control for firm-level characteristics and macroeconomic variables. Firm fixed effects are included, and standard errors are clustered at the firm and quarter level. The shaded area represents 90% confidence intervals.

Figure 7: Effect of Monetary Policy on New versus Ongoing Investment Projects



(a) ST Shock

(b) 2y Shock

(c) 5y Shock

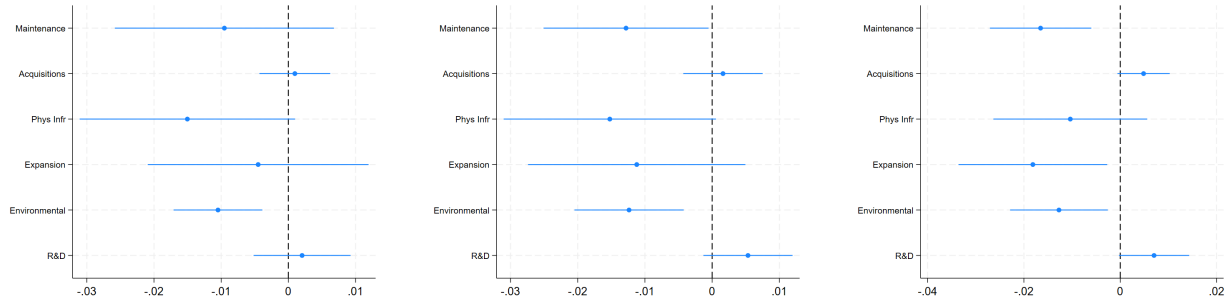
(d) 10y Shock

Notes: This figure depicts $\beta_{j,k}$, for $j = 0, 1$ and $k = 0, 1$, and 90% confidence intervals for the following specification:

$$\begin{aligned}\text{Planned Investment}_{i,t,h} = &\sum_j \sum_k \beta_{j,k} \widehat{\Delta y}_t \times \mathbb{1}\{LTPlan_{i,t,h} = j\} \times \mathbb{1}\{NewPlan_{i,t,h} = k\} \\ &+ \sum_j \sum_k \gamma_{j,k} \mathbb{1}\{LTPlan_{i,t,h} = j\} \times \mathbb{1}\{NewPlan_{i,t,h} = k\} \\ &+ X_{i,t-1} + \alpha_i + \alpha_h + \varepsilon_{i,t,h}\end{aligned}$$

Planned Investment$_{i,t,h}$ is planned real investment for firm i in future year $t+h$ 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. $\mathbb{1}\{NewPlan_{i,t}\} = 1$ if the investment plan exclusively concerns a new project, and = 0 if the investment plan exclusively concerns an ongoing project. $\mathbb{1}\{LTPlan_{i,t}\} = 0$ if the difference between the projection date and the end of the projection year is between 9-24 months, and equals one otherwise. The regression controls $X_{i,t-1}$ include firm-level characteristics except the one used to construct the tercile (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. The outcome variable is trimmed at the 2nd and 98th percentiles. Firm fixed effects are included, and standard errors are clustered at the firm and quarter level.

Figure 8: Heterogeneity in Responsiveness to Monetary Policy Across Investment Types



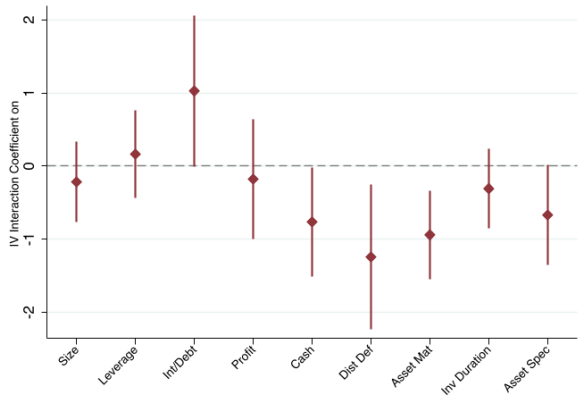
(a) ST Shock (b) 2y Shock (c) 5y Shock

Notes: These figures report the estimated coefficients and 90% confidence intervals from the IV regression:

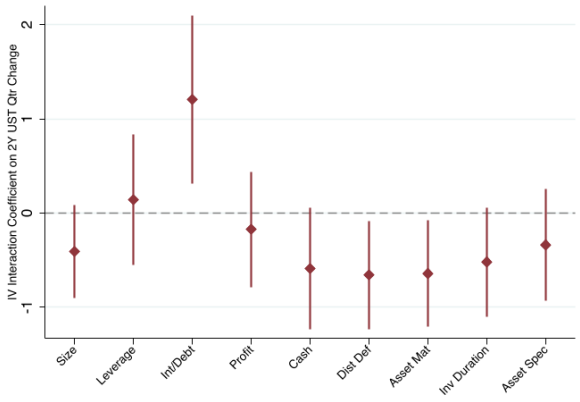
$$\mathbb{1}\{\text{Investment Type}\}_{i,t} = \beta \Delta \widehat{y_t} + X_{i,t-1} + \alpha_i + \varepsilon_{i,t}$$

where Δy_t is the quarterly change in the 1-year (panel a), 2-year (panel b), or 5-year (panel c) U.S. Treasury yield, instrumented using the maturity-matched high-frequency monetary policy shock. $\mathbb{1}\{\text{Investment Type}\}_{i,t}$ equals 1 if an investment plan discusses a project of the type considered, and 0 otherwise. The sample is restricted to plans with projection horizons ending at least 9 months after announcement. The regressions 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 lagged 2-year U.S. Treasury yield, the 2-10 year Treasury yield curve slope, the lagged quarter change and level of the CFNAI index, 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.

Figure 9: Heterogeneity in Responsiveness to Monetary Policy Across Firms



(a) ST Shock



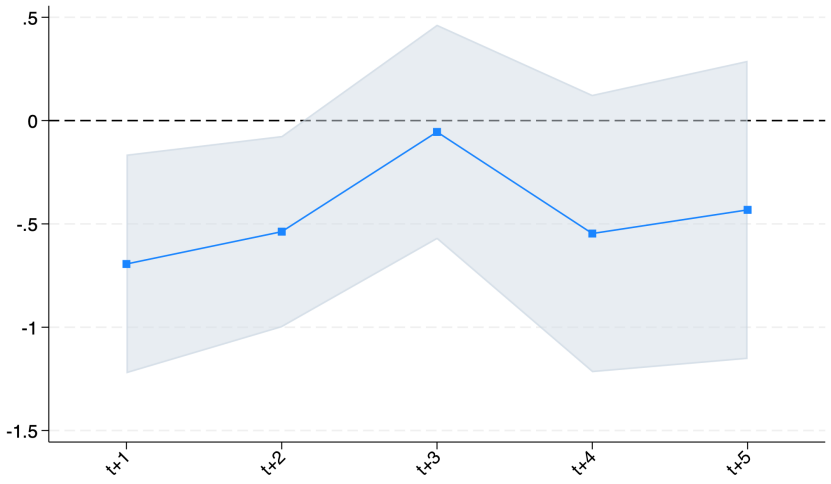
(b) 2y Shock

Notes: These figures report the estimated interaction coefficients θ and 90% confidence intervals from the IV regression:

$$\text{Investment Plans}_{i,t,h} = \beta \cdot \widehat{\Delta y_t} + \theta \cdot \widehat{\Delta y_t} \times \mathbf{1}\{X_{i,t} \in \text{Top } 25\%\} + \gamma' \mathbf{Z}_{i,t} + \alpha_i + \delta_h + \varepsilon_{i,t}$$

where $\widehat{\Delta y_t}$ is the quarterly change in the 1-year (panel a) or 2-year (panel b) U.S. Treasury yield, instrumented using the maturity-matched high-frequency monetary policy shock. $\mathbf{1}\{X_{i,t} \in \text{Top } 25\%\}$ is an indicator for whether firm i is in the top quartile of characteristic X in quarter t. Each coefficient represents the differential response θ for top-quartile firms relative to other firms. The characteristics examined are size, leverage, interest expense to debt, profitability, cash-to-assets, distance to default, asset maturity, investment duration, and asset specificity. The sample is restricted to plans with projection horizons ending at least 9 months after announcement. The regressions 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 lagged 2-year U.S. Treasury yield, the 2-10 year Treasury yield curve slope, the lagged quarter change and level of the CFNAI index, four lags of GDP growth, the inflation rate, and the unemployment rate. Firm and projection horizon fixed effects are included, and standard errors are clustered at the firm and quarter level.

Figure 10: Response of Investment Plans to Changes in Risk Premia due to Monetary Policy

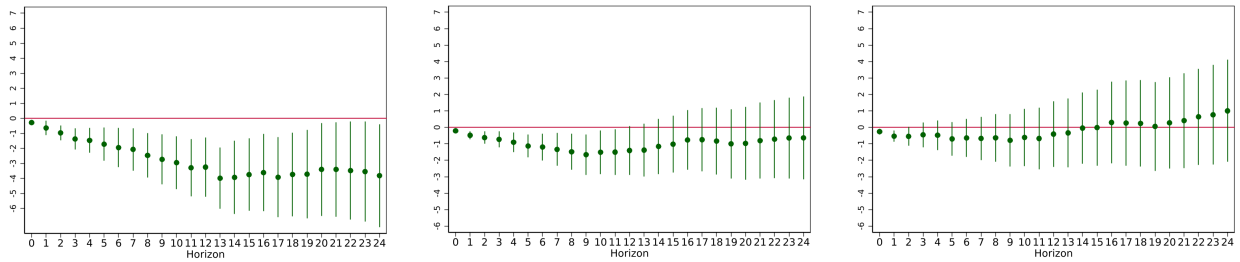


Notes: This figure depicts β_h and 90% confidence intervals for the following specification, for $h = 1, 2, 3, 4, 5$:

$$\text{Planned Investment}_{i,t,h} = \beta_h \ \widehat{\Delta RiskPremium}_t + X_{i,t-1} + \alpha_i + \varepsilon_{i,t,h}$$

$\text{Planned Investment}_{i,t,h}$ is planned real investment for firm i in future year $t+h$ 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. 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 9-12 months, $h = 2$ if the difference is between 13-24 months, $h = 3$ if the difference is between 25-36 months, $h = 4$ if the difference is between 37-48 months, and $h = 5$ if the difference is between 49-60 months. $\widehat{\Delta RiskPremium}_t$ is the three month change in the excess bond premium, instrumented using the two-day window changes in teh excess bond premium around monetary policy events that occur during quarter t, during which the investment plan is made and at the end of which the plan is announced. 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. The outcome variable is trimmed at the 2nd and 98th percentiles. Firm fixed effects are included, and standard errors are clustered at the firm and quarter level.

Figure 11: Cumulative Net Issuance Response to Monetary Policy



(a) ST shock (b) 2y Shock (c) 10y Shock

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

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

for $h = 0, 1, ..., 24$. Firm fixed effects are included, and standard errors are clustered at the firm and month level. Cumulative net issuance is 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.

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

	Plans Sample					Compustat				
	Mean	Std	25th	Median	75th	Mean	Std	25th	Median	75th
Number of Quarters	50.44	24.77	30.00	53.00	70.00	61.88	32.21	34.00	61.00	98.00
Assets ($M)	9,488	22,463	853	2,401	7,522	4,566	15,261	41	370	2,036
Return on Equity	0.03	0.10	0.01	0.03	0.05	-0.06	0.35	-0.03	0.02	0.04
Return on Assets	0.01	0.03	0.00	0.01	0.02	-0.22	1.24	-0.04	0.00	0.01
Log Tobin's Q	0.54	0.49	0.18	0.44	0.81	0.69	1.03	0.04	0.37	0.98
Investment Rate	-0.01	0.07	-0.02	-0.00	0.02	-0.05	0.25	-0.05	-0.01	0.01
Asset Tangibility	0.32	0.25	0.11	0.24	0.49	0.21	0.25	0.02	0.11	0.32
Leverage	0.29	0.21	0.13	0.28	0.41	0.54	1.92	0.03	0.20	0.41
Cash/Assets	0.12	0.14	0.02	0.07	0.17	0.20	0.26	0.03	0.08	0.28
Distance to Default	7.37	5.13	3.67	6.56	10.14					
Planned ΔCapex/Assets	0.18	3.02	-0.82	0.18	1.22					
Expected ΔNI/Assets	2.35	6.91	-0.35	0.74	2.77					

Notes: This table presents summary statistics comparing firms in our investment plans sample to the broader Compustat universe from 2000–2024. The plans sample includes all firms with at least one investment plan announcement. Assets are quarterly Compustat total assets in millions of dollars. Return on Equity is quarterly net income divided by book common equity. Return on Assets is quarterly net income divided by total assets. Log Tobin's Q is $\ln(1+(\text{ME}-\text{CE})/\text{AT})$, where ME is market equity (stock price × shares outstanding), CE is book common equity, and AT is total assets. Investment Rate is capex net of depreciation, normalized by lagged PP&E. Tangibility is net PP&E divided by total assets. Leverage is total debt (long-term plus current) divided by total assets. Cash/Assets is cash and short-term investments divided by total assets. All firm characteristics are winsorized at the 1st and 99th percentiles. The bottom panel reports plan-specific variables available only for the plans sample. Distance to Default is computed from the Merton model. Planned ΔCapEx/Assets is the real change in planned capital expenditures as a percentage of assets. Expected ΔNI/Assets is the real change in expected net income as a percentage of assets. ΔCapEx/Assets and ΔNI/Assets are trimmed at the 2nd and 98th percentiles.

Table 2: Response of Investment Plans to Monetary Policy

	Year 1			Year 2			Year 3			Year 4			Year 5		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Δy	0.422	0.015	0.069	-0.465	-0.850***	-0.927**	-0.281	-0.492	-0.648*	-0.602	-1.024***	-1.271***	-0.457	-0.651**	-0.767**
	(0.340)	(0.280)	(0.304)	(0.382)	(0.323)	(0.365)	(0.320)	(0.352)	(0.337)	(0.368)	(0.311)	(0.348)	(0.334)	(0.289)	(0.315)
Observations	21,347	21,339	19,614	7,563	7,545	6,799	2,669	2,665	2,209	1,346	1,342	1,200	977	973	868
Firm FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Macro controls		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Firm controls			✓			✓			✓			✓			✓
Treasury yield	5-Year	5-Year	5-Year	5-Year	5-Year	5-Year	5-Year	5-Year	5-Year	5-Year	5-Year	5-Year	5-Year	5-Year	5-Year

Note: This table reports the results for the following regression specification:

$$\text{Planned Investment}_{i,t,h} = \beta_h \widehat{\Delta y_t} + X_{i,t-1} + \alpha_i + \varepsilon_{i,t,h}$$

Planned Investment$_{i,t,h}$ is planned real investment for firm i in future year $t+h$ 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. 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 9-12 months, $h=2$ if the difference is between 13-24 months, $h=3$ if the difference is between 25-36 months, $h=4$ if the difference is between 37-48 months, and $h=5$ if the difference is between 49-60 months. $\widehat{\Delta y_t}$ is the three month change in the Treasury yield, instrumented using the maturity-matched monetary policy shock that occur during quarter t, during which the investment plan is made and at the end of which the plan is announced. The 5-year UST yield is instrumented with the high frequency change in the 5-year UST yield. The regression controls $X_{i,t-1}$ include firm controls (cash-to-assets, leverage, log assets, return on assets, tangibility, and Tobin's Q) and macro controls (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). The outcome variable is trimmed at the 2nd and 98th percentiles. Firm fixed effects are included, and standard errors are clustered at the firm and quarter level.

Table 3: Response of Long-Term vs Short-Term Investment Plans

	LHS: Normalized Planned Capex			
	(1) IV RHS: $\Delta UST2y$	(2) IV RHS: $\Delta UST5y$	(3) IV RHS: $\Delta UST10y$	(4) IV RHS: $\Delta UST2-10y$
Δ UST	-0.0511	-0.156	-0.0229	0.0266
	(0.298)	(0.249)	(0.207)	(0.560)
LT Plan = 1 $\times\Delta$ UST	-0.679*	-0.747**	-0.858***	0.390
	(0.380)	(0.360)	(0.319)	(1.490)
Firm Controls	Yes	Yes	Yes	Yes
Macro Controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Projection horizon FE	Yes	Yes	Yes	Yes
Observations	32490	32490	32490	32490
R-squared	0.0650	0.0642	0.0654	0.0653

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 more than 24 months ahead; the excluded category consists of plans for the subsequent fiscal year, conditional on the projected year ending at least 9 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 prior-quarter-end two-year yield level $2y_{t-1}$ and the prior-quarter-end yield curve slope $2-10y_{t-1}$, 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. The outcome variable is trimmed at the 2nd and 98th percentiles.

Table 4: Response of Different Horizon Investment Plans to Monetary Policy

	LHS: Normalized Planned Capex				
	(1) RHS: ST MPS	(2) RHS: 2y UST Shocks	(3) RHS: 5y UST Shocks	(4) RHS: 10y UST Shocks	(5) RHS: 2-10y UST Shocks
MPS	0.156	0.103	0.00209	0.111	0.117
	(0.525)	(0.302)	(0.253)	(0.193)	(0.536)
Projection horizon (yrs)=2×MPS	-0.389	-0.397	-0.545**	-0.602**	-0.614
	(0.346)	(0.336)	(0.256)	(0.297)	(0.869)
Projection horizon (yrs)=3×MPS	-0.597	-0.651	-0.725**	-0.785***	-0.0261
	(0.402)	(0.394)	(0.335)	(0.285)	(1.172)
Projection horizon (yrs)=4×MPS	-0.698	-1.041**	-1.116**	-1.196**	0.914
	(0.425)	(0.509)	(0.515)	(0.498)	(2.139)
Projection horizon (yrs)=5×MPS	-0.290	-0.584	-0.905*	-1.189**	-1.724
	(0.555)	(0.542)	(0.485)	(0.488)	(2.463)
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	33495	33495	33495	33495	33495
R-squared	0.0701	0.0693	0.0683	0.0695	0.0693

Note: This table reports the results of the following specification:

$$\text{Planned Investment}_{i,t,h} = \beta_1 \widehat{\Delta y}_t + \sum_{x=2}^{5} \beta_h \widehat{\Delta y}_t \times \mathbb{1}\{h = x\} + \alpha_i + \alpha_h + X_{i,t-1} + \varepsilon_{i,t,h}$$

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 9 months after the plan announcement. Planned Investment$_{i,t,h}$ is planned real investment for firm i in future year $t+h$ 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. 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 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 lagged quarter change and level of the CFNAI index, the lagged 2-year U.S. Treasury yield and 2-10 year Treasury yield curve, four lags of GDP growth, the inflation rate, and the unemployment rate. Firm fixed effects and projection horizon fixed effects are included, and standard errors are clustered at both the firm and fiscal quarter levels. The outcome variable is trimmed at the 2nd and 98th percentiles.

Table 5: Response of Net Income Expectations to Changes in Treasury Yields

	Expected NI (Y1)			Expected NI (Y2+)		
	(1)	(2)	(3)	(4)	(5)	(6)
Δy	0.353	-1.160**	-0.822*	-1.133	-0.264	0.596
	(0.354)	(0.512)	(0.491)	(1.799)	(1.395)	(1.966)
Observations	7,850	7,846	7,278	680	680	637
Firm FE	✓	✓	✓	✓	✓	✓
Macro controls		✓	✓		✓	✓
Firm controls			✓			✓
Horizon FE				✓	✓	✓
Treasury yield	5-Year	5-Year	5-Year	5-Year	5-Year	5-Year

Note: This table reports the results for the following regression specification:

$$\text{E[Net Income]}_{i,t,h} = \beta_h \widehat{\Delta y_t} + X_{i,t-1} + \alpha_i + \varepsilon_{i,t,h}$$

Expected $\text{NI}_{i,t,h}$ is expected net income for firm i in future year $t+h$ 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. h denotes the years from today that the plan is for. The first three columns show the results for $h = 1$, where the difference between the projection date and the end of the projection horizon is between 9-12 months. The next three columns show the results for horizons longer than one year, i.e. $h = 2+$ where the difference is more than 12 months. In the latter three columns we also include horizon fixed effects. $\widehat{\Delta y_t}$ is the three month change in the 5y Treasury yield, instrumented using the maturity-matched monetary policy shock that occur during quarter t, during which the investment plan is made and at the end of which the plan is announced. The regression controls $X_{i,t-1}$ include firm controls (cash-to-assets, leverage, log assets, return on assets, tangibility, and Tobin's Q) and macro controls (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). The outcome variable is trimmed at the 2nd and 98th percentiles. Firm fixed effects are included, and standard errors are clustered at the firm and quarter level.

Table 6: Relationship between Net Income Expectations and Investment Plans

	Normalized Planned Capex (Y1)				Normalized Planned Capex (Y2+)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Expected NI (Y1)	0.0178***	0.0132*	0.0184***	0.0176***				
	(0.00515)	(0.00687)	(0.00560)	(0.00557)				
Expected NI (Y1)					-0.0674	-0.0545	0.00805	0.00540
					(0.0418)	(0.0641)	(0.0366)	(0.0659)
Firm Controls			✓	✓			✓	✓
Macro Controls				✓				✓
Firm FE		✓	✓	✓		✓	✓	✓
Horizon FE						✓	✓	✓
Calendar quarter FE			✓	✓			✓	✓
Observations	8,317	7,950	7,704	7,698	1,587	1,453	1,430	1,430
R-squared	0.002	0.256	0.334	0.336	0.005	0.317	0.480	0.494

Notes: This table reports regressions of planned investment on expected net income with two timing structures. The dependent variable is planned capital expenditure change scaled by lagged assets. The first four columns show first-year investment plans regressed on contemporaneous first-year net income expectations. The next four columns show longer-horizon investment plans (projection horizon ending more than 24 months after announcement) regressed on first-year net income expectations from the same firm-quarter. Firm controls include 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 lagged 2-year U.S. Treasury yield, the 2-10 year Treasury yield curve slope, the lagged quarter change and level of the CFNAI index, four lags of GDP growth, the inflation rate, and the unemployment rate. All variables are scaled by lagged assets and winsorized. Standard errors are clustered by firm and calendar quarter. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

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.1 Is Lagged Investment 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 E.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.

A 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.

A.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.[14] 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.[15] 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.

[14] 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.

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

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.

B 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:

$$\Delta \ln K_{i,t+h} = \beta_h^R \text{MPS}_t + X_{i,t-1} + \nu_{i,t+h}^R \tag{13}$$

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:

$$\Delta \ln K_{i,t+h} = \beta_h^R \, \text{MPS}_t + X_{i,t-1} + \sum_{s=1}^{h} \psi_{h,s} \, u_{t+s} + \sum_{s=1}^{\tau_{i,t}} \phi_{h,s} v_{t-s} + \eta_{i,t+h}^R \tag{14}$$

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 $Cov\big(u_{t+s}, \text{MPS}_t\big) = 0 \; \forall s$, 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 $\tau_{i,t}$ 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:[16]

$$Revision_{i,t,h} = \frac{F_{i,t}[I_{i,t+h}] - F_{i,t-1}[I_{i,t+h}]}{K_{i,t-1}}. \tag{15}$$

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

[16]This normalized forecast difference, $\frac{\Delta F_{i,t}[I_{i,t+1}]}{K_{i,t-1}}$, 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]).

physically realized, they do not suffer from the mechanical attenuation caused by unknown construction lags.

Our baseline regression is therefore:

$$Revision_{i,t,h} = \beta_h^P \, \text{MPS}_t + X_{i,t-1} + \alpha_i + \varepsilon_{i,t}, \tag{16}$$

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 $I_{i,t-1}/K_{i,t-1}$. 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 E.1 shows a strong positive relationship between prior-period investment and prior-period planned investment. Table E.1 shows the results of more tests, which are discussed in Appendix .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 14 and **??** can be written, respectively:

$$\text{var}(\widehat{\beta}_h^R \mid X) = \frac{\sigma_R^2}{N_R V (1 - R^2)}, \qquad \text{var}(\widehat{\beta}_h^P \mid X) = \frac{\sigma_P^2}{N_P V (1 - R^2)}. \tag{17}$$

where $V = \text{var}(\text{MPS}_t), R^2 = R^2_{\text{MPS}|X}$, and $\sigma_R^2 \equiv \text{var}(\eta^R) = \sum_{s=1}^{h} \psi_{h,s}^2 \sigma_u^2 + \sigma_v^2$ 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 14 as $\text{Bias}_R = \mathbb{E}[\widehat{\beta}_h^R] - \beta_h^R$. Then we can define:

$$\text{MSE}_R = \text{B}ias_R^2 + \text{var}\big(\widehat{\beta}_h^R\big), \qquad \text{MSE}_P = \text{var}\big(\widehat{\beta}_h^P\big). \tag{18}$$

The plans-based estimator dominates if and only if:

$$\text{MSE}_P < \text{MSE}_R \quad \Longleftrightarrow \quad r > \frac{\sigma_P^2}{\sigma_R^2 + N_R V (1 - R^2) (\text{Bias}_R^2)}. \tag{19}$$

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 E.12 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 **??** to perform better than the realizations-based estimator in Equation 14. 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 **??**, and find no significant difference in investment opportunities (as measured by Tobin's Q) when firms disclose investment plans within firm. However, firms tend to be larger, have higher investment rates and tangibility, and more cash on hand when they disclose planned investment, suggesting they may be more likely to disclose when they are investing more. 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.

C Discussion of Potential Selection Bias

We explore the representativeness of the sample by conducting several tests. Not all firms disclose investment plans. Table E.2 documents the number of unique firms in our dataset, as well as the attrition process from the universe of Compustat data. Of the 45,360 firms in the Compustat universe, 14,263 (31%) are non-financial U.S. firms with data after 2000 and at least 2 quarters of data and non-missing characteristics. Of these, 23% disclose investment plans for projection periods ending at least three months from the announcement date and are thus included in our analysis. We further restrict our baseline analyses to the 3,051 firms that report plans that are at least 9 months forward.

To understand what kinds of firms report planned investment, we regress an indicator variable for whether the firm disclosed at least one investment plan in our sample on firm-level characteristics. Larger firms with higher investment rates, higher Tobin's Q, more tangible assets, and lower profitability and cash balances are more likely to disclose investment plans, as reported in column 1 of Table E.3. We consider this a feature of the data, not a bug; collectively, our firms make up the majority of fixed business investment in the U.S. economy, as reported in Figure 1. Larger firms with higher investment rates and Tobin's Q, and less leverage, tangible assets, cash balances and profitability are more likely to report net income expectations, as reported in column 3 of Table E.3.

For our analysis, the ideal scenario would be that firms that disclose plans do so regularly and systematically, and that disclosure itself is not sensitive to monetary policy surprises. To test how systematically firms disclose plans, we compute the mode of the number of quarters between investment plan announcements for each firm. In Figure E.2, we show that nearly all firms have a modal interval between announcements of one quarter, indicating they follow a regular pattern of disclosure.

Importantly, we test whether disclosure is sensitive to monetary policy surprises by regressing indicator variables for whether the firm disclosed plans on monetary policy surprises, with the same controls and fixed effects as our baseline regressions. Table E.4 shows that the unconditional probability of disclosure of 3+ month (and 9+ month) investment plans is insensitive to a littany of monetary policy surprises. Further, Table E.5 show that disclosure of long-term plans (> 24 months) is not sensitive to monetary policy surprises conditional on the firm having a plan that quarter. In terms of magnitudes, a one standard deviation contractionary shock in the short rate reduces the unconditional probability of disclosing 9+ month capex

plans by at most 0.6 percentage points at the 90% confidence level. [17] In addition, conditional on having a plan, the probability of including long-term projections changes by at most 0.02 percentage points per one standard deviation shock.[18] This result reduces concerns that our findings of the differential response of long-term versus short-term plans to monetary policy are confounded by firms strategically timing their disclosures of long-term plans.

Finally, we test if firms deviate from their pattern of disclosure when their fundamentals change. To do this, we regress an investment plan disclosure dummy on changes in firm-level characteristics, including firm by fiscal quarter fixed effects to capture firm-specific patterns of disclosure. Table E.6 shows that across the full sample of firms, disclosure of investment plans does not load significantly on changes in any firm-level characteristics, including investment opportunities (as proxied by Tobin's Q) or leverage. Disclosure of long-term plans across all firms (columns 2) or firms that disclose plans in that quarter (column 3) are similarly insensitive to changes in firm-level characteristics. Earnings expectation announcements are also generally insensitive to changes in firm-level characteristics, except for a small positive effect of leverage and a negative effect of cash balances.

D Computing the Implied Elasticity of Investment to User Cost of Capital

In the neoclassical framework, risk-free rates can affect investment decision through two main channels: cash flow expectations and the user cost of capital. While our estimates suggest cash-flow expectations are responsive to changes in the risk-free rate, for firms in our sample, the relationship between cash flow expectations and investment plans is small in magnitude. The average firm in our sample does not seem to face binding financial constraints, which may explain this small pass-through. The results suggest that for the large firms we observe, changes to the risk-free rate pass through to investment decisions mainly through changes to the user cost of capital.

We use our baseline estimates of the responsiveness of investment with respect to risk-free rates to calculate an implied elasticity with respect to the user cost of capital, which we denote by c here. The average ratio of I/A in our sample is 0.0604, so to convert our estimates into a semi-elasticity of investment

[17] The point estimate on the short rate shock is 0.05 and the standard error is 0.07, see Table E.4, Column (6). This implies a 90% confidence interval of [-0.067, 0.167] percentage points. One standard deviation of the short rate shock is 0.08, so the bounds on one standard deviation of the short rate is [-0.067 * 0.08, 0.167 * 0.08] = [-0.0054, 0.0134] percentage points. Thus, the reduction in the probability of disclosure in response to a one standard deviation positive shock in the short rate is at most 0.5 percentage points, which is quite small economically, and is in any case statistically insignificant.

[18] The point estimate is 0.0000586 (standard error: 0.0113); see Table E.5, Column (1).

with respect to the risk-free rate, we first divide our coefficients by this number. We then cumulate as before.

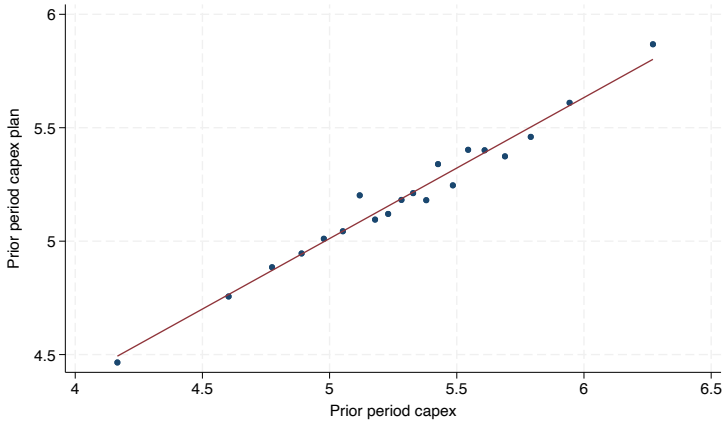
In the neoclassical framework, the user cost of capital is $c = \frac{1-\tau z}{1-\tau} \cdot (r+\delta) \cdot p$, where τ is the firm's tax rate, z is the present discounted value of depreciation deductions, r is the firm's cost of funds, δ is the economic depreciation rate, and p is the relative price of capital goods. The WACC r can be written as $r = \omega \times (1-\tau) \times r^{debt} + (1-\omega) \times r^{equity}$, where r^{debt} is the cost of debt, r^{equity} is the cost of equity and ω is the leverage ratio. Assuming that changes to the risk-free rate pass-through 1:1 to the cost of debt and the cost of equity, the semi-elasticity of the user cost of capital with respect to the risk-free rate is $dlog(c)/dr = \frac{1-\omega\tau}{r+\delta}$. In sample, the average leverage ratio is 30%. We assume an average cost of funds of 7%, corporate tax rate of 30%, and annual depreciation rate of 10%. To compute the elasticity of investment with respect to the user cost of capital, we next divide our cumulated coefficients by the implied $dlog(c)/dr$ from these assumptions.

Using our baseline estimates of the responsiveness of investment with respect to the five-year yield, we obtain a short-term elasticity of investment with respect to the user cost of capital of 2.5. This captures the investment response that occurs within two years, and is in line with the elasticity implied by Zwick and Mahon [2017].[19] Our medium-term elasticity of investment with respect to the user cost of capital is 4.3, and captures the investment response that occurs within three years. Our long-term elasticity of investment with respect to the user cost of capital is 10.2, and captures the investment response that occurs within five years.

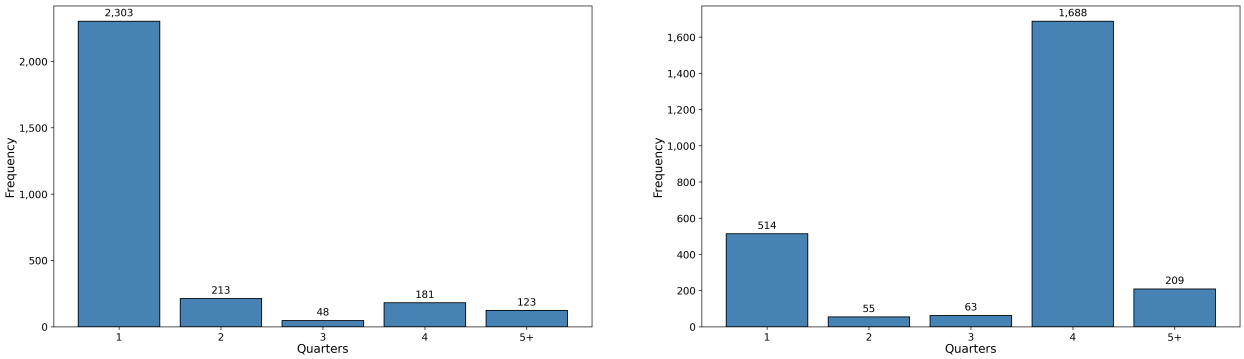
E Additional Tables and Figures

[19] In Table B.2, they find a coefficient of 1.34 for large firms, which implies an elasticity of 2.65.

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



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



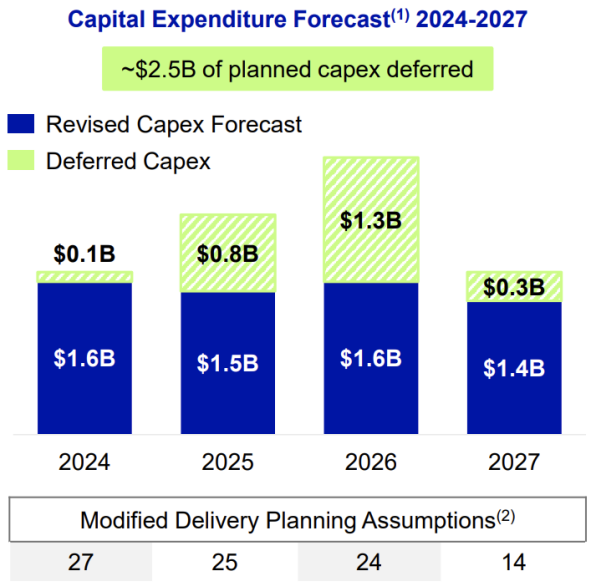
(a) Firm-level mode: 3+ month investment plans

(b) Firm-level mode: 9+ month investment plans

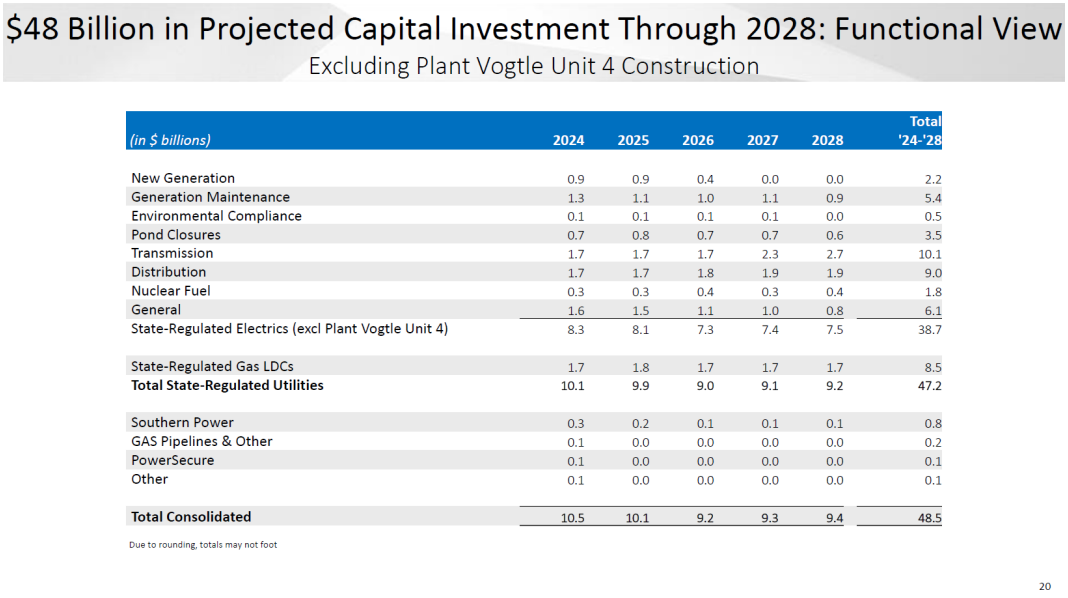
Figure E.2: Firm-Level Mode: Quarters Between Investment Plans Announcements

Notes: The left panel plots the distribution of the mode of quarters between investment plans announcements for each firm, where the projection period ends at least 3 months from the announcement date. The right panel plots the distribution of the mode of quarters between investment plans announcements for each firm, where the projection period ends at least 9 months from the announcement date.

Figure E.3: 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

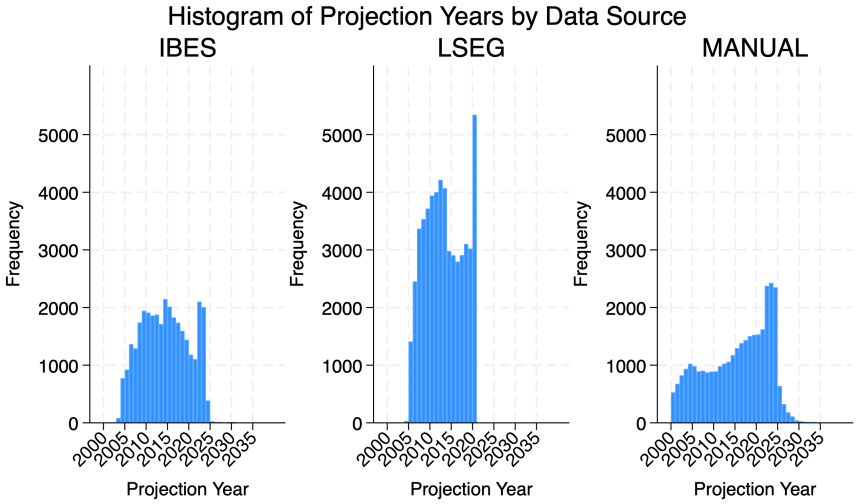
Due to rounding, totals may not foot

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(b) Southern Company's 2023Q4 Earnings Call

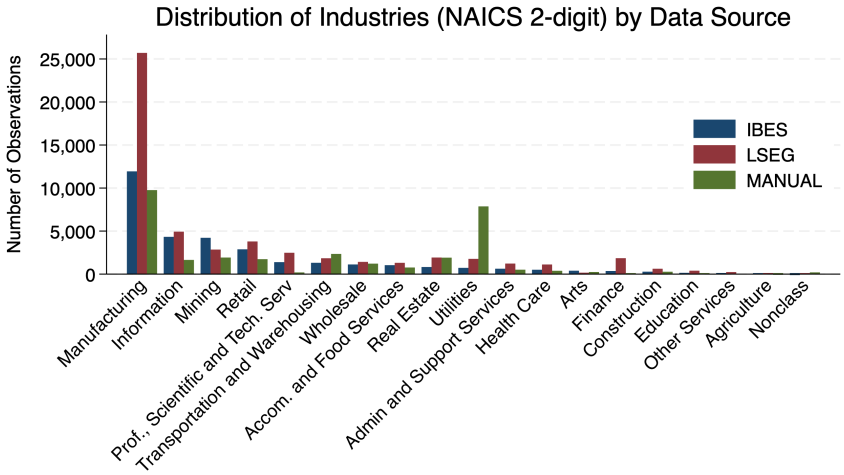
Source: The top image is from page 9 of the Jetblue 2013 Q4 Earnings presentation. The bottom image is from page 20 of Southern Company's 2023Q4 Earnings Call.

Figure E.4: Coverage of Projected Years Across Sources



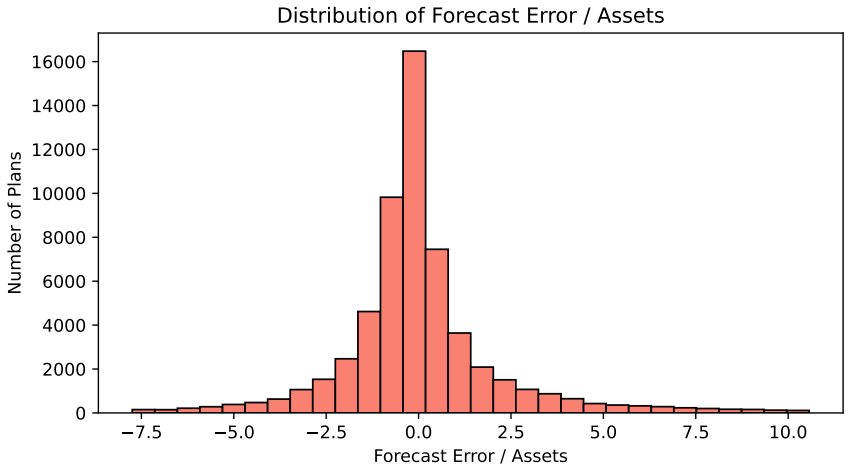
Notes: These three histograms each show the distribution of firm-announcement date observations for a given source.

Figure E.5: Coverage of Industries Across Sources



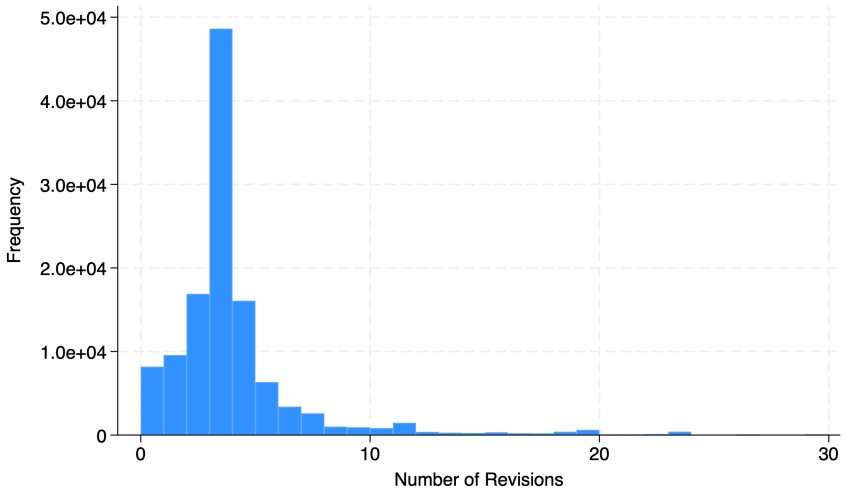
Notes: This histogram shows the distribution of investment plans (firm-announcement date-projection year observations) present for across industries in the dataset, indicating the source of the data.

Figure E.6: Histogram: 1-year Projection Period Investment Forecast Errors



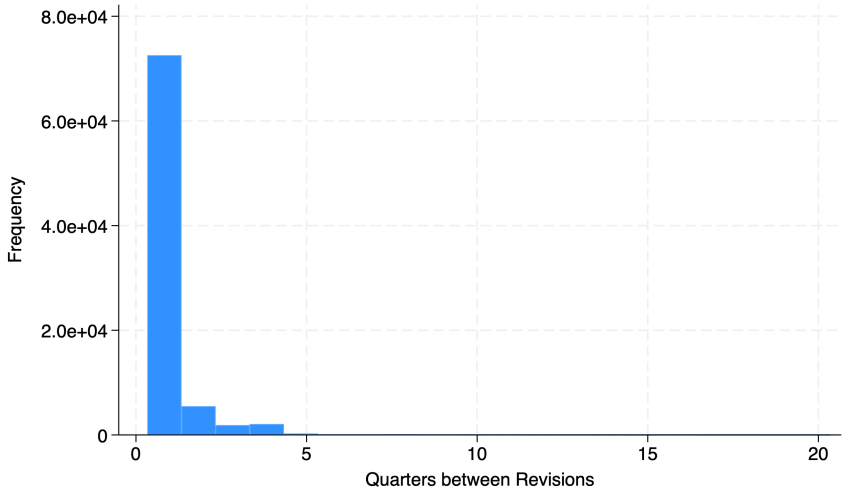
Notes: This figure plots the distribution of 1-year projection period capex forecast errors. Capex forecast errors in year t are computed as the difference between realized capex in fiscal year t and capex plans for year t announced within 3 to 12 months of the end of the year, normalized by lagged total assets. Forecast errors are trimmed at the 2nd and 98th percentiles.

Figure E.7: Number of Revisions to a Given Plan



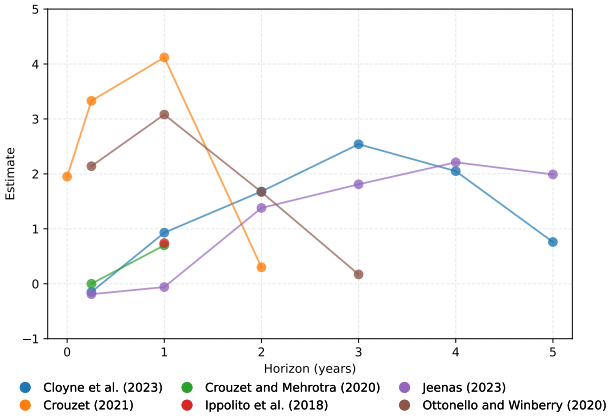
Notes: This histogram shows the distribution of the number of revisions to a given plan (for a given firm and projection period) in the dataset, including IBES, LSEG and the manually collected data.

Figure E.8: Quarters between Revisions to a Given Plan



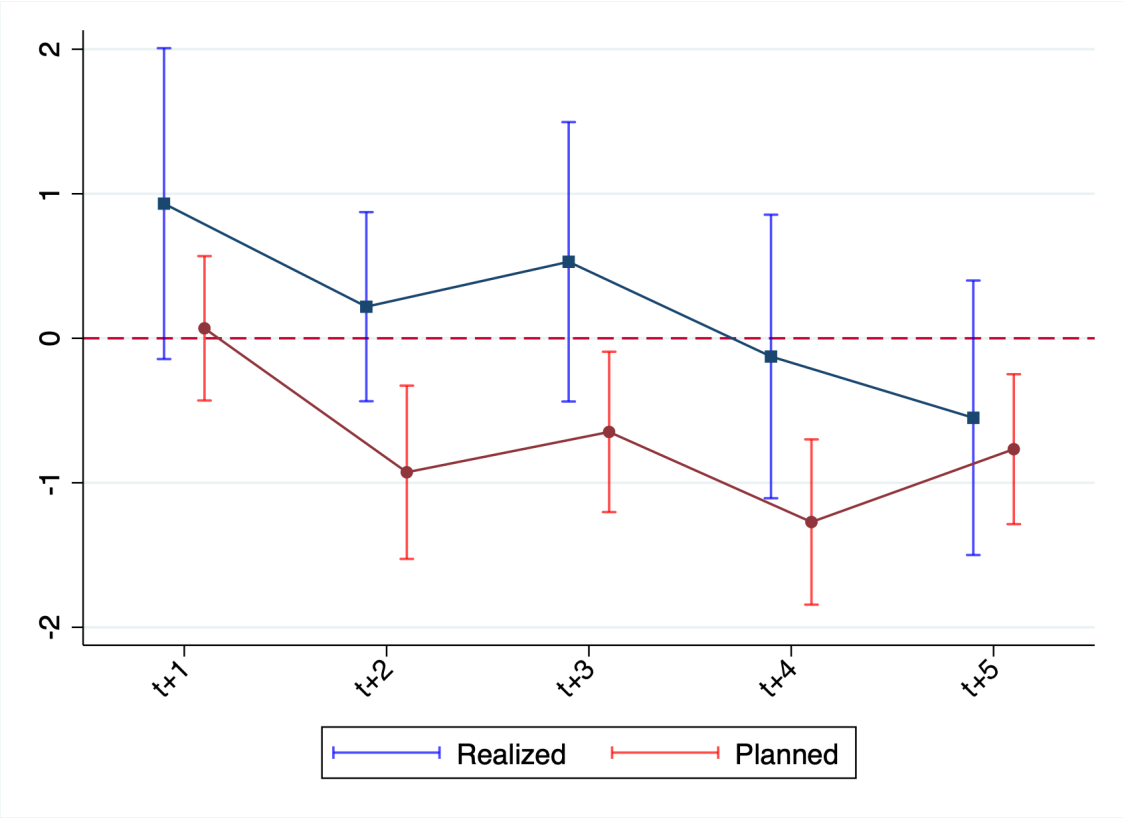
Notes: This histogram shows the distribution of the quarters between revisions to a plan (for a given firm and projection period) in the dataset, including IBES, LSEG and the manually collected data.

Figure E.9: 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 E.10: Comparing Estimates of Investment's Sensitivity to Monetary Policy using Realized vs Planned Investment

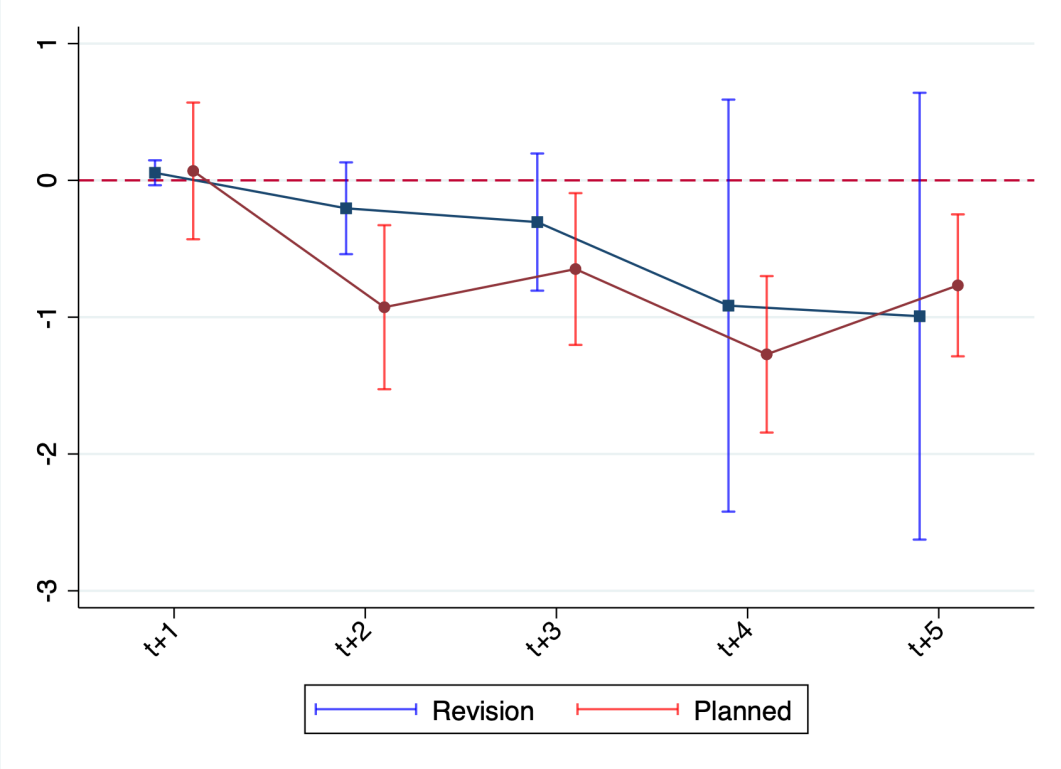


Notes: This figure depicts β_h and 90% confidence intervals for the following specification, for $h = 1, 2, 3, 4, 5$:

$$\text{Investment}_{i,t,h} = \beta_h \widehat{\Delta y_t} + X_{i,t-1} + \alpha_i + \varepsilon_{i,t,h}$$

The red lines represent results where the left-hand side variable is Planned $\text{Investment}_{i,t,h}$, which is planned real investment for firm i in future year $t+h$ 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. The blue lines represent results where the left-hand side variable is Realized $\text{Investment}_{i,t,h}$, which is actual real investment for firm i in future year $t+h$ 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. $\widehat{\Delta y_t}$ is the three month change in the five year Treasury yield, instrumented using the maturity-matched monetary policy shock that occur during quarter t, during which the investment plan is made and at the end of which the plan is announced. 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. The outcome variable is trimmed at the 2nd and 98th percentiles. Firm fixed effects are included, and standard errors are clustered at the firm and quarter level.

Figure E.11: Impact of Monetary Policy on Investment Across Horizons: Robustness with Revisions

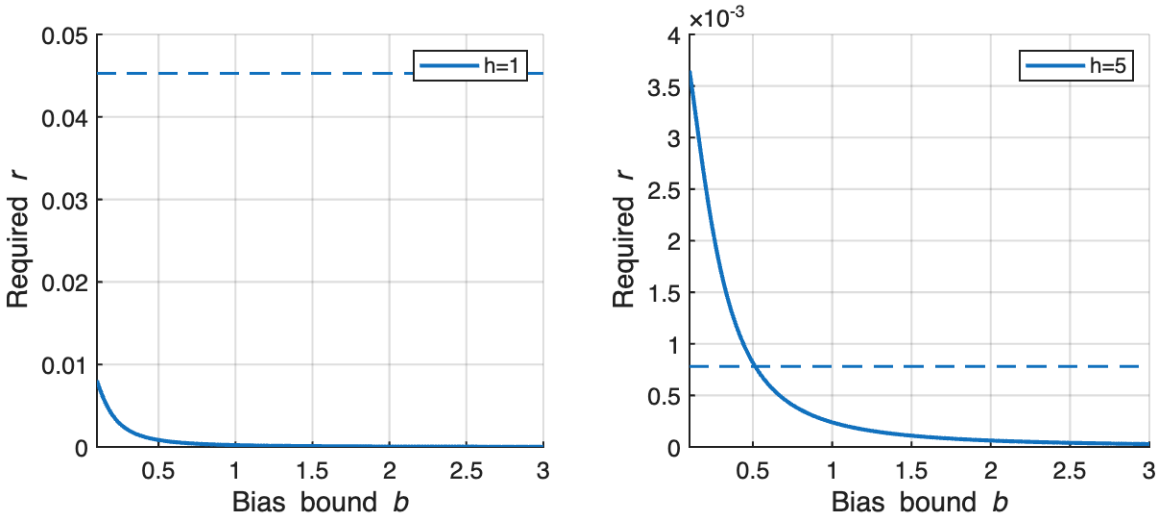


Notes: This figure depicts β_h and 90% confidence intervals for the following specification, for $h = 1, 2, 3, 4, 5$:

$$\text{Revision}_{i,t,h} = \beta_h \widehat{\Delta y_t} + X_{i,t-1} + \alpha_i + \varepsilon_{i,t,h}$$

$\text{Revision}_{i,t,h}$ is planned real investment for firm i in future year $t+h$ relative to the previous planned real investment for the same firm and future year, divided by time $t-1$ assets, where plans can be made up to one year apart. 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 9-12 months, $h = 2$ if the difference is between 13-24 months, $h = 3$ if the difference is between 25-36 months, $h = 4$ if the difference is between 37-48 months, and $h = 5$ if the difference is between 49-60 months. $\widehat{\Delta y_t}$ is the three month change in the 5 year Treasury yield, instrumented using the maturity-matched monetary policy shock that occur during quarter t, during which the investment plan is made and at the end of which the plan is announced. 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.

Figure E.12: Required r Across Bias Levels

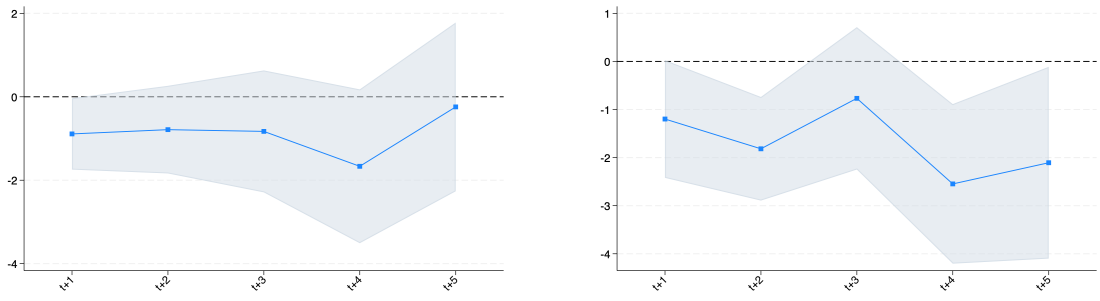


(a) Plan horizon: 1 Year

(b) Plan horizon: 5 Years

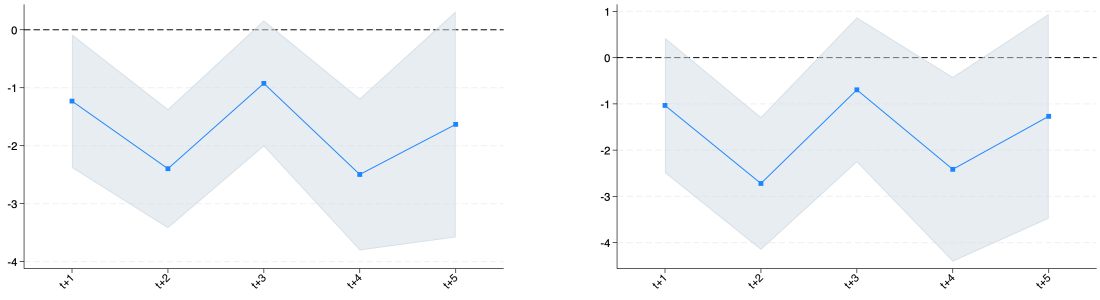
Notes: This figure plots the minimum $r = N_P/N_R$ required for plans data to have a lower MSE than realized investment data for each horizon h. The dotted line represents the actual ratio r in the data for that horizon.

Figure E.13: Impact of Monetary Policy Shocks on Investment - Other MPS



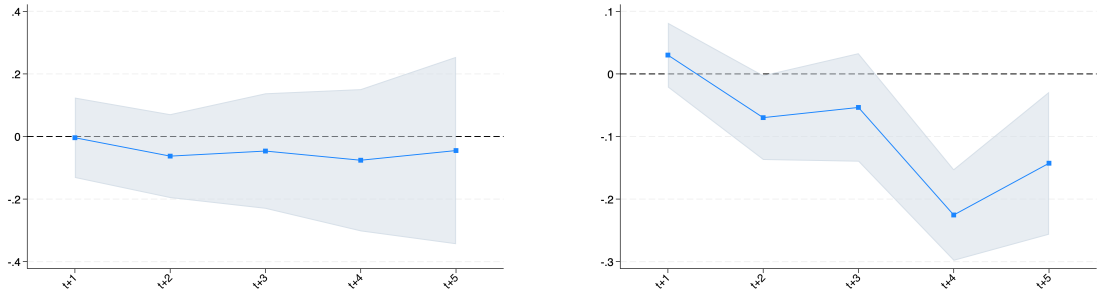
(a) BS Shock

(b) Residualized Shock 2y



(c) Residualized Shock 5y

(d) Residualized Shock 10y



(e) FFR Shock

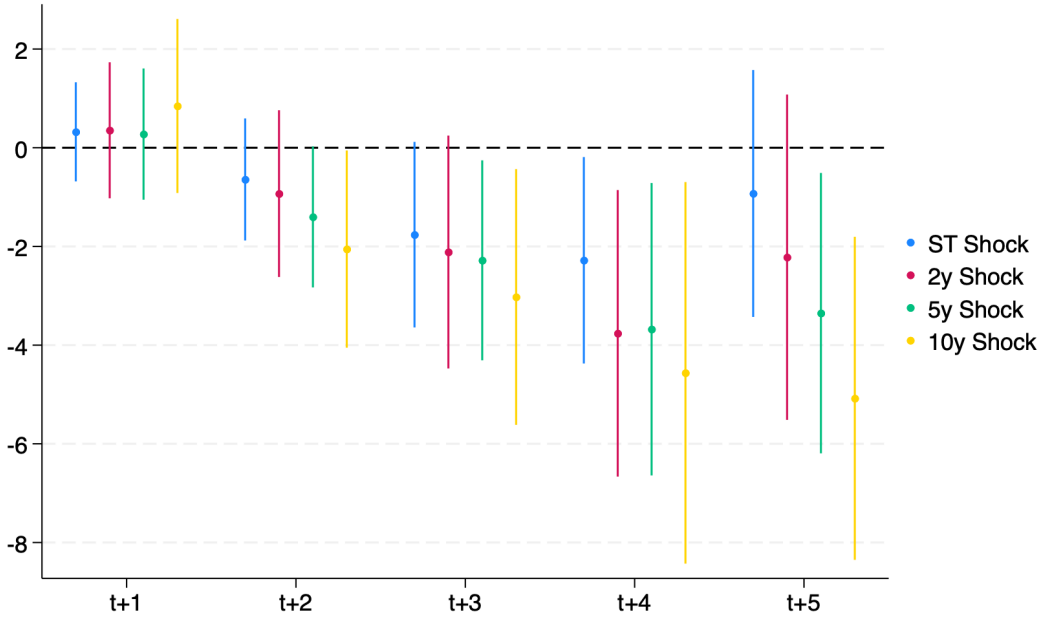
(f) Forward Guidance Shock

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

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

Planned Investment$_{i,t,h}$ is planned real investment for firm i in future year $t+h$ 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. 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 9-12 months, $h = 2$ if the difference is between 13-24 months, $h = 3$ if the difference is between 25-36 months, $h = 4$ if the difference is between 37-48 months, and $h = 5$ if the difference is between 49-60 months. Panel (a) uses the residualized ST shock from Bauer and Swanson [2023]. Panels (b)-(d) use shocks constructed from 30-minute high frequency changes in the 2-, 5-year, and 10-year UST yield futures, residualized with controls using the same method as in Bauer and Swanson [2023]. Panels (e) and (f) use the Fed Funds Rate shocks and Forward Guidance shocks extracted from using a principal components analysis from Swanson [2021]. 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 E.14: Planned Investment Response to Monetary Policy by Horizon



Note: This figure plots the coefficients and 95% confidence intervals from the OLS regressions reported in Table 4. The horizons are shown as $t+1$ to $t+5$ on the x-axis.

Table E.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 E.2: Sample Construction

Description	Number of unique gvkeys
Start with Compustat universe	45360
Drops missing industry codes	33670
Exclude financial firms (NAICS2 != 52)	27875
Keep observations with fiscal year beginning in 2000	19792
Keep firms with at least 2 quarters of data	19792
Keep firms incorporated in USA (fic = USA)	14263
Has non-missing characteristics	11102
Inclusion in plans	3336
Has at least 9 months of plans	3051

Notes: This table documents sample construction from the Compustat universe. We require non-financial U.S. firms with at least 2 quarters of data after 2000 and non-missing characteristics (size, investment rate, leverage, Tobin's Q, ROA, cash/assets, tangibility). The final sample includes 3,075 firms with investment plans at 9+ month horizons.

Table E.3: Which Firms Disclose Investment Plans?

	Has Capex Plans	Has LT Capex Plans	Has NI Expectations
	(1)	(2)	(3)
Log assets	0.105***	0.0192***	0.0670***
	(0.00147)	(0.00105)	(0.00151)
Net investment rate	0.0754***	-0.0159***	0.0745***
	(0.00967)	(0.00280)	(0.00700)
Leverage	0.000226	0.00128***	-0.00257***
	(0.00132)	(0.000359)	(0.000947)
Log Tobin's Q	0.0857***	0.0145***	0.0749***
	(0.00346)	(0.00133)	(0.00294)
Return on assets	-0.0351***	-0.00982***	-0.0206***
	(0.00214)	(0.000803)	(0.00167)
Tangibility	0.0676***	0.106***	-0.191***
	(0.0180)	(0.0103)	(0.0145)
Cash / assets	-0.264***	-0.0162***	-0.245***
	(0.0120)	(0.00387)	(0.00964)
Sample	Full Sample	Full Sample	Full Sample
Observations	11663	11663	11663
R^2	0.365	0.0960	0.230

Notes: This table reports cross-sectional regressions of firm-level disclosure indicators on average firm characteristics (2000–2024). The dependent variable is an indicator for whether a firm ever discloses: (1) investment plans at 9+ months horizon, (2) net income expectations, or (3) has bond yield data. "All" includes all non-financial U.S. firms in Compustat; "Large" restricts to firms ever in the top quartile by total assets. Standard errors are heteroskedasticity-robust.

Table E.4: Selection Bias Check: Disclosure Dummy on MPS

	Capex plans disclosed (3+ months)					Capex plans disclosed (9+ months)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ST Shock (Raw)	0.0187					0.0522				
	(0.0694)					(0.0734)				
MPS 2y		0.0626					0.0185			
		(0.0624)					(0.0629)			
MPS 5y			0.0852					-0.0193		
			(0.0763)					(0.0733)		
MPS 10y				0.131					0.0183	
				(0.103)					(0.0959)	
EBP change					0.00249					-0.0178
					(0.0304)					(0.0342)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	369875	369875	369875	369875	369875	369875	369875	369875	369875	369875
R-squared	0.403	0.403	0.403	0.403	0.403	0.231	0.231	0.231	0.231	0.231

Notes: This table reports linear probability models examining whether monetary policy surprises (MPS) predict disclosure of investment plans. The dependent variable is a binary indicator for whether a firm discloses plans in a given quarter. The independent variables include various MPS measures: high-frequency UST 2-year and 10-year surprises, and the San Francisco Fed policy news shock. All specifications include firm fixed effects, calendar quarter fixed effects, and lagged firm-level controls (size, Tobin's Q, leverage, cash/assets, ROA, tangibility). Standard errors are clustered by firm and quarter.

Table E.5: Selection Bias Check: Disclosure Dummy on MPS (Conditional on Having a Plan)

	Capex plans disclosed (long-term)				
	(1)	(2)	(3)	(4)	(5)
ST Shock (Raw)	0.0000586				
	(0.0113)				
MPS 2y		-0.00164			
		(0.0153)			
MPS 5y			-0.00963		
			(0.0163)		
MPS 10y				-0.00966	
				(0.0210)	
EBP change					-0.00596
					(0.00425)
Firm Controls	Yes	Yes	Yes	Yes	Yes
Macro Controls	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Observations	53884	53884	53884	53884	53884
R-squared	0.553	0.553	0.553	0.553	0.553

Notes: This table reports linear probability models examining whether MPS predict disclosure of long-term plans, conditional on the firm having any plan that quarter. The dependent variable is a binary indicator for whether a firm discloses long-term investment plans (horizon >24 months). The sample is restricted to firm-quarters where the firm discloses at least one plan ending 9+ months after announcement. All specifications include firm fixed effects, calendar quarter fixed effects, and lagged firm-level controls. Standard errors are clustered by firm and quarter.

Table E.6: When Do Firms Disclose Investment Plans?

	Investment plans disclosed	Has long-term plans		E[Net income] disclosed
	(1)	(2)	(3)	(4)
Δ Size	-0.000197	0.0000291	0.0135	0.000825
	(0.00182)	(0.000329)	(0.0103)	(0.00109)
Δ Investment rate	0.000818	0.000172	0.00195	-0.000292
	(0.000890)	(0.000113)	(0.0117)	(0.000617)
Δ Leverage	0.000199	0.0000133	-0.0201	0.000217*
	(0.000196)	(0.0000390)	(0.0219)	(0.000128)
Δ Log Tobin's Q	-0.00188	0.00000315	0.00638	0.000137
	(0.00185)	(0.000278)	(0.00807)	(0.00119)
Δ ROA	-0.0000498	-0.0000261	0.0170	0.0000300
	(0.000140)	(0.0000271)	(0.0221)	(0.000103)
Δ Tangibility	0.00673	-0.00190	-0.0141	0.000433
	(0.00536)	(0.00183)	(0.0558)	(0.00257)
Δ Cash/Assets	-0.00354	-0.000110	0.0174	-0.00465**
	(0.00280)	(0.000836)	(0.0285)	(0.00210)
Calendar Quarter FE	✓	✓	✓	✓
Firm x Fqtr FE	✓	✓	✓	✓
Sample	Full sample	Full sample	Curr. has plan = 1	Full sample
Observations	342653	342653	23810	342653
R-squared	0.521	0.443	0.731	0.448

Notes: This table reports linear probability models for when firms disclose plans. The dependent variable is a binary indicator for whether a firm discloses investment plans (col. 1), long-term investment plans (cols. 2–3), or net income expectations (col. 4) in quarter t. Independent variables are changes in firm characteristics: size, log Tobin's Q, investment rate, leverage, ROA, tangibility, and cash/assets. Columns 1, 2, and 4 use the full sample of non-financial U.S. firms in Compustat. Column 3 is restricted to firms that currently have a plan. All specifications include calendar quarter fixed effects and firm × fiscal quarter fixed effects. Standard errors are clustered by firm and quarter.

Table E.7: Predictiveness of Investment Plans

	Capex Growth Rate			Capex Growth/ Assets		Capex (log)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Planned Capex Growth	0.812***	0.783***	0.773***				
	(65.10)	(65.43)	(63.59)				
Over 1yr plan=1 × Planned Capex Growth			-0.125***				
			(-4.00)				
Over 1yr plan			15.55***		0.823***		
			(7.75)		(7.35)		
Planned Capex / Assets				0.804***	0.786***		
				(70.44)	(67.04)		
Over 1yr plan=1 × Planned Capex / Assets					-0.158***		
					(-4.91)		
Log(Planned Capex)						0.919***	0.488***
						(170.55)	(24.25)
Year FE		✓	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓		✓
Observations	18537	18533	24048	18786	24414	20551	19940
Rsquared	0.626	0.639	0.581	0.645	0.570	0.858	0.944

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 growth rate" report coefficients from regressions of realized capital expenditure growth on planned capital expenditure growth; columns labeled "Capex / Assets" report coefficients from regressions of realized capital expenditure growth on planned capital expenditure growth scaled by lagged total assets; columns labeled "Capex (log)" report coefficients from regressions of log actual capital expenditure on log planned capex. Regressions 1, 2, 4, 6, and 7 focus on the one-year projection horizon, while Regressions 3 and 5 include all plans. We winsorize realized growth at the 1st and 99th percentiles. We include firm and year fixed effects, and cluster standard errors at the firm and quarter level.

Table E.8: Classification of Investment Plan Types

Category	Words
Environmental	environmental, environment, clean, emissions, renewable, solar, wind, green, carbon, sustainability, sustainable
Research_Development	research, development, new product, innovation, innovative, exploration, ai, technology, artificial, machine learning, research and development
Expansion_Growth	expansion, expand, grow, growth, new stores, new, expanding
Acquisitions	acquisitions, redevelopment, acquisition
Physical_Infrastructure	property, equipment, manufacturing, nuclear, aircraft, ppe, infrastructure, operating assets, drilling, oil, coal, refining, mining
Maintenance	maintenance, maintain, repair, replacement, renovations, renovation, existing, upgrades, ongoing, reliability, cost reduction, modernize, operations, routine

Category	Words
New	establish, establishing, greenfield, open, new, expanding, openings, growth opportunities, brand-new, construct, acquisition of sites, expand, acquire, build, growth, buy, purchase, additional, addition, acquisition, buying
Ongoing	maintain, continue, upgrade, maintenance, renovation, remodel, redevelopment, improvement, renovate, existing, completion, continue to, redevelop, drilling & completion, improve, rehab, restructuring, continuing, complete, ongoing, capacity expansion, enhance, pipeline upgrades, increase, recurring, replace, modernize, improving

Note: These tables list the categories of investment plan types and the corresponding words within investment plans that map to each category. Categories are not mutually exclusive.

Table E.9: Response of Investment Plans to Changes in Yields due to Monetary Policy

	Year 1			Year 2			Year 3			Year 4			Year 5		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Δy	1.186***	-0.669	-0.183	0.118	-0.698	-0.361	-0.214	-0.914	-0.615	-0.392	-1.460*	-1.063**	-0.240	-0.743	-0.484
	(0.428)	(5.058)	(4.041)	(0.363)	(0.421)	(0.368)	(0.349)	(0.637)	(0.484)	(0.470)	(0.768)	(0.493)	(0.482)	(0.648)	(0.511)
Observations	21,347	21,339	19,614	7,563	7,545	6,799	2,669	2,665	2,209	1,346	1,342	1,200	977	973	868
Firm FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Macro controls		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Firm controls			✓			✓			✓			✓			✓
Treasury yield	1-Year	1-Year	1-Year	1-Year	1-Year	1-Year	1-Year	1-Year	1-Year	1-Year	1-Year	1-Year	1-Year	1-Year	1-Year

	Year 1			Year 2			Year 3			Year 4			Year 5		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Δy	0.711*	0.133	0.213	-0.206	-0.676*	-0.637*	-0.156	-0.323	-0.483	-0.530	-1.060**	-1.169**	-0.406	-0.792**	-0.766*
	(0.369)	(0.400)	(0.425)	(0.391)	(0.350)	(0.372)	(0.360)	(0.422)	(0.425)	(0.433)	(0.407)	(0.446)	(0.421)	(0.336)	(0.397)
Observations	21,347	21,339	19,614	7,563	7,545	6,799	2,669	2,665	2,209	1,346	1,342	1,200	977	973	868
Firm FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Macro controls		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Firm controls			✓			✓			✓			✓			✓
Treasury yield	2-Year	2-Year	2-Year	2-Year	2-Year	2-Year	2-Year	2-Year	2-Year	2-Year	2-Year	2-Year	2-Year	2-Year	2-Year

	Year 1			Year 2			Year 3			Year 4			Year 5		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Δy	0.490**	0.072	0.123	-0.339	-0.802**	-0.920**	-0.237	-0.486	-0.605**	-0.535	-0.969***	-1.213***	-0.423	-0.593**	-0.725***
	(0.232)	(0.180)	(0.199)	(0.467)	(0.349)	(0.400)	(0.349)	(0.342)	(0.303)	(0.330)	(0.237)	(0.257)	(0.276)	(0.251)	(0.246)
Observations	21,347	21,339	19,614	7,563	7,545	6,799	2,669	2,665	2,209	1,346	1,342	1,200	977	973	868
Firm FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Macro controls		✓	✓		✓	✓		✓	✓		✓	✓		✓	✓
Firm controls			✓			✓			✓			✓			✓
Treasury yield	10-Year	10-Year	10-Year	10-Year	10-Year	10-Year	10-Year	10-Year	10-Year	10-Year	10-Year	10-Year	10-Year	10-Year	10-Year

Note: This table reports the results for the following regression specification:

$$\text{Planned Investment}_{i,t,h} = \beta_h \widehat{\Delta y_t} + X_{i,t-1} + \alpha_i + \varepsilon_{i,t,h}$$

Planned Investment$_{i,t,h}$ is planned real investment for firm i in future year $t+h$ 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. 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 9-12 months, $h=2$ if the difference is between 13-24 months, $h=3$ if the difference is between 25-36 months, $h=4$ if the difference is between 37-48 months, and $h=5$ if the difference is between 49-60 months. $\widehat{\Delta y_t}$ is the three month change in the Treasury yield, instrumented using the maturity-matched monetary policy shock that occur during quarter t, during which the investment plan is made and at the end of which the plan is announced. The 1-year UST yield is instrumented with the Bauer and Swanson [2023] unorthogonalized shock. The 2-year UST yield is instrumented with the high frequency change in the 2-year UST yield. The 5-year UST yield is instrumented with the high frequency change in the 5-year UST yield. The 10-year UST yield is instrumented with the 10-year UST yield. The regression controls $X_{i,t-1}$ include firm controls (cash-to-assets, leverage, log assets, return on assets, tangibility, and Tobin's Q) and macro controls (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). The outcome variable is trimmed at the 2nd and 98th percentiles. Firm fixed effects are included, and standard errors are clustered at the firm and quarter level.

Table E.10: Naive OLS: Response of Investment Plans to Changes in Treasury Yields

	LHS: Normalized Planned Capex			
	(1) RHS:$\Delta UST2y$	(2) RHS:$\Delta UST5y$	(3) RHS:$\Delta UST10y$	(4) RHS:$\Delta UST2-10y$
Δ UST	0.212***	0.143*	0.0959	-0.150
	(0.0683)	(0.0743)	(0.0863)	(0.147)
Over 2yr plan×Δ UST	-0.363	-0.415**	-0.413**	-0.208
	(0.227)	(0.194)	(0.185)	(0.281)
Firm Controls	Yes	Yes	Yes	Yes
Macro Controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Projection horizon FE	Yes	Yes	Yes	Yes
Observations	32490	32490	32490	32490
R-squared	0.286	0.286	0.286	0.286

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 more than 24 months ahead; the excluded category consists of plans for the subsequent fiscal year, conditional on the projected year ending at least 9 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 prior-quarter-end two-year yield level $2y_{t-1}$ and the prior-quarter-end yield curve slope $2-10y_{t-1}$, 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. The outcome variable is trimmed at the 2nd and 98th percentiles.

Table E.11: First Stage: Changes in Treasury Yields on Monetary Policy Shocks

	(1) $\Delta UST2y$	(2) $\Delta UST5y$	(3) $\Delta UST10y$	(4) $\Delta UST10-2y$	(5) $\Delta UST2y$
Shock 2y	1.942***				
	(0.423)				
Shock 5y		1.600***			
		(0.436)			
Shock 10y			1.805***		
			(0.523)		
Shock 2-10y				1.804***	
				(0.421)	
ST Shock					1.784***
					(0.452)
Constant	0.291**	0.390**	0.383**	0.105	0.239*
	(0.136)	(0.163)	(0.158)	(0.0984)	(0.134)
Macro Controls	Yes	Yes	Yes	Yes	Yes
Observations	313	313	313	313	313
R-squared	0.246	0.168	0.170	0.282	0.234

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 prior-quarter-end two-year yield level $2y_{t-1}$ and the prior-quarter-end yield curve slope $2-10y_{t-1}$, both measured on the day of the announcement. Four lags of GDP growth, the inflation rate, and the unemployment rate are also included.