In Their Own Words: The Credit and Demand Channels of Monetary Policy Transmission

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Research Question

- How is monetary policy transmitted to the real economy?
- An important question that is still not well-understood
- The media and policymakers often wonder if the policy stance is affecting the real economy

WSJ Article March 17, 2024

- WSJ article on March 2024: "Resilient economy weakens argument that monetary policy is too tight"
- Federal Funds Rate at 5.5 since July 2023. GDP growth 2.5% in 2023 and 2.8% in 2024.

Methodology

- To answer this question, prior literature, among other methods, has used a high-frequency event-study methodology:

$$R_{i,t} = \alpha_i + \beta_{MPS}\text{MPS}_t + \beta_{MPSX}\text{MPS}_t \times X_{i,t} + \beta_X X_{i,t} + \varepsilon_{it},$$

- Regress daily firm-level equity returns, $R_{i,t}$, on monetary policy surprises, MPS_t, and allow for the effect to be different across firm-characteristics, $X_{i,t}$. Only use FOMC days.

- Methodology mitigates endogeneity (dual causality and reverse causality).

Our Contribution

- Prior literature mainly evaluates how physical and financial firm characteristics affect the firm's response to monetary policy surprises

- In this paper we evaluate whether top management narratives help us better understand the impact monetary policy decisions have on their firm and therefore the economy

- To do so we develop two novel text-based sentiment indexes using the earnings calls of over 4,000 firms:
  - credit conditions (financial constraints)
  - negative demand (low demand for products)

Why these two concepts?

- Bernanke and Gertler (1995), among others, describe the two prominent monetary policy transmission channel theories as: the credit channel and the demand channel theory
  - credit channel: interest rate changes affect firms that depend on external funds because credit is more expensive
  - demand channel: interest rates affect household who depend on credit, these households will consume less
- Our paper is a joint-hypothesis test: these theories are true and our sentiment indexes capture the relevant concepts.

Why is a text-based measure worth considering?

- Narratives can be useful in estimating hard-to-measure economic concepts such as business credit constraints and demand conditions
- Narratives often convey forward-looking information that help predict future firm and aggregate investment decisions, while accounting variables are backward-looking

Summary of Findings

- Both sentiment indexes help predict individual firm's stock price reaction to monetary policy surprises, firm's investment decisions, and aggregate investment
- Our credit sentiment index is one of the best predictors, out of a battery of variables, including:
  - negative demand sentiment index and
  - prior literature firm-level financial constraint indexes (e.g., KZ-index, Whited-Wu index)
- We find that the negative demand index has less explanatory power than the credit sentiment index

Summary of Findings (continued)

- Economic theory does not provide guidance on whether the cost of credit or access to credit have a bigger impact on business decisions

- We decompose our credit sentiment index into two sub-components: a cost of credit sentiment and an access to credit sentiment.
  - Empirically, we find that the the cost of credit sub-index has a bigger impact on businesses' decisions
  - Potential explanation: our sample of firms are public firms whose access to credit is pretty good (but our result also holds for firms whose debt is not rated)

Data

- Monetary policy surprises: high-frequency yield changes
- Firm-level stock returns: CRSP
- Accounting and financial data: Compustat
- Textual data: Earnings calls
  - Conference calls in which senior management discusses the firm's financial results with investors, analysts, and journalists
  - The Q&A section may be particularly informative

Data

- Sample period: January 2008 - December 2023
  - Earnings calls for over 4,000 firms
  - 132 FOMC meetings

Textual Analysis Techniques

- Two methods chosen to be extremes:
  - Bag-of-words (dictionary) method
    - low-tech, highly reproducible, misses context
  - Open-source LLM, Google's Gemini 3 model
    - high-tech, reproducible (perhaps not exactly, detailed prompt ensures reproducibility), captures context
  - WORK IN PROGRESS. I will show you the results for the bag-of-words method only.

Bag-of-words method: How we choose words

- We pick credit and demand related words based on prior literature, our own manual reading of earnings calls, and machine learning word embedding techniques
- We use an iterative process that maximizes true positives while minimizing false positives and false negatives Grimmer et al. (2022)
- For credit related words we do not pair words with a positive/negative modifier, but for demand related words we do. I will illustrate with an example
- Google's LLM will sign both credit and demand related words because we warn Google of potential biases

Credit Constraint Dictionary I

- Cost of credit keywords:
  - "interest expense*," "interest rate*," "lending fee*," "collateral," "credit" + "cost"
- Access to credit keywords:
  - "line" +"credit," "access" + "credit," "use" + "credit," "availability" + "credit," "borrow*," "bond" + "issue or issuance," "commercial paper" + "issue or issuance," "loan*," "lien," "covenant"
- Credit Sentiment= Access to credit + cost of credit
- Simple mention of words related to credit suggest that the firm is credit constraint Chen and Yang (2020)

Credit Constraint Dictionary II

Example: Sears 2014 Q1 Call (Sears declares bankruptcy October 15, 2018)

- Rob Schriesheim, the Chief Financial Officer of Sears, explains that their "ability to use the entire credit facility was limited."
- He then says that "we have immediate availability of $1.75 billion on our credit facilities... our short-term borrowings increased by $650 million over last year"

If we use positive modifiers such as "availability" and "increase" together with negative modifiers such as "limited" would make this particular earnings call have a positive credit sentiment.

Negative Demand Dictionary

We follow a similar procedure to develop a demand-related topic keyword dictionary, but this time we pair topic key-words with modifiers.

- Topic keywords:
  - "demand," "consumer," "client," "customer,"
- Close to modifier keywords:
  - "weak*," "decrease*," "low*"
- Consistent with Tetlock et al. (2007) we find that negative words are more informative than taking the difference between positive and negative words because managers tend to put a positive spin.

Google's Gemma 3 model prompt

Prompt has 5 key components:

1. Reader
2. Warning: potential biases
3. Output format
4. Output variables
5. Checks on output, provide reasoning

Reader (1) and potential bias (2)

Prompt: *Your role is a financial analyst assessing provided transcripts of earnings calls. Remember that company executives tend to present information in favorable light and your job is to be objective in your assessments.*

Output format (3) and variables (4)

Prompt: *Answer in JSON format with the company as the identifier and provide the following information: How much of discussion in percent of call sentences (other than by operator or transitional) is devoted to financing constraints, i.e. ability of the company to access lines of credit, borrow and finance its operations? Provide three values for these percentages: total, company executives presentation, and in q/a session with analysts. Also provide overall sentiment score on how constrained the company's access to external financing is on a scale of -5 to 5 with -5: access is very limited and the company is strained possibly approaching bankruptcy and 5: company has no difficulty accessing external funding. If no discussion of external financing takes place set the rating to NA.*

Provide reasoning/check (5)

Prompt: *In a separate field in no more than 70 words explain reasoning for your sentiment rating. Repeat this analysis to evaluate demand for company products or services, i.e. provide similar fields for amount of discussion devoted to demand and provide sentiment score about demand trend with corresponding justification. Remember that structure has to follow JSON format. Please examine the transcript as it appears below:*

Gemma Output Example (1)

	Financing		Demand	
Company (Date)	**Coverage**	**Sentiment**	**Coverage**	**Sentiment**
Nordstrom (Feb 2009)	11.0%	3	25.0%	−2

- **Financing:** Healthy balance sheet, credit ratings well into investment grade territory, and access to significant liquidity. Refinancing short-term debt with manageable maturity schedule.

- **Demand:** 9% decrease in same-store sales, anticipating continued negative trends in 2009 (−10% to −15%). Adjusting merchandise mix and increased promotional activity indicate weakening demand.

Comparing Text to Data

Textual Information

	Financing		Demand	
Company (Date)	**Coverage**	**Sentiment**	**Coverage**	**Sentiment**
Nordstrom (Feb 2009)	11.0%	3	25.0%	−2

Hard Information

Probability of Default	Credit Rating	Sales Growth
0.61	A-	-6 %

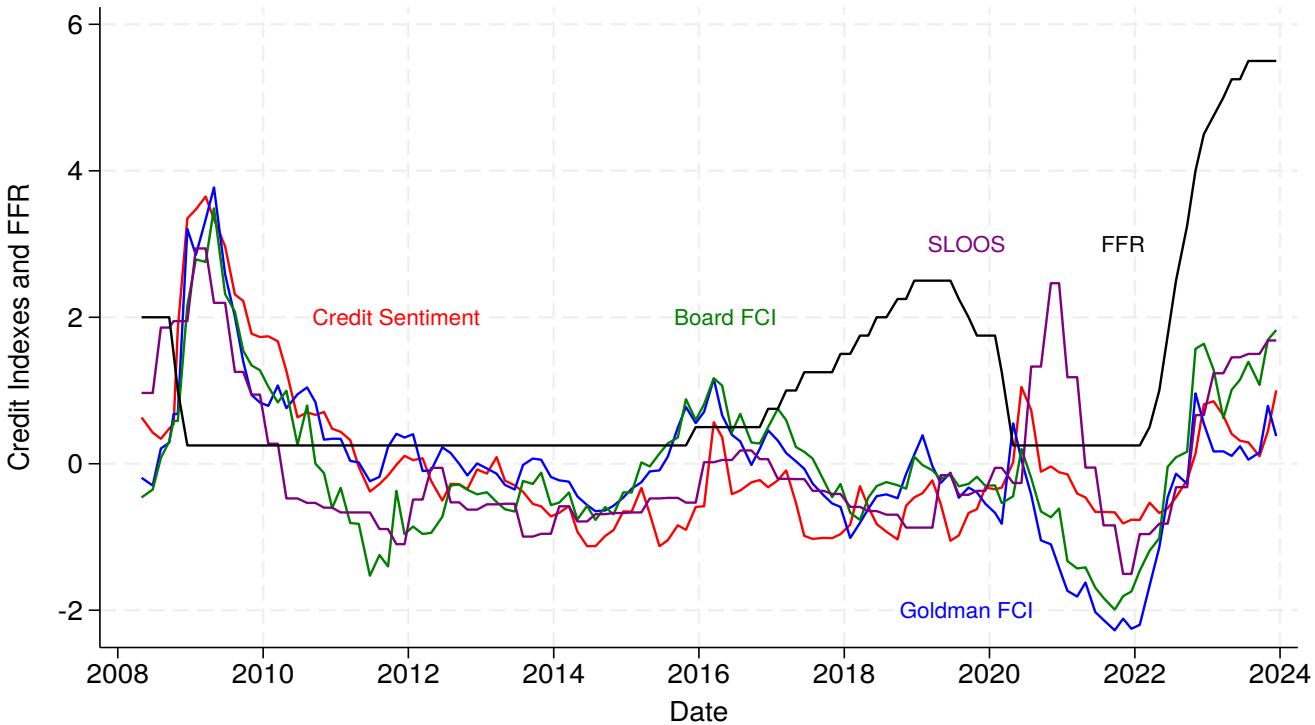
- The advantage of textual information in this example is that it is a good "summary measure" for credit conditions.

Validation of sentiment variables

- How do the measures correlate with other aggregate and firm-level measures? We show time-series graphs and a simple correlation matrix.
- Does credit sentiment measure financial constraints? We use Farre-Mensa and Ljungqvist (2016) financial constraint validation test to answer this question.
- Does negative demand sentiment predict firm's sale growth? We use one-quarter ahead forecast regression

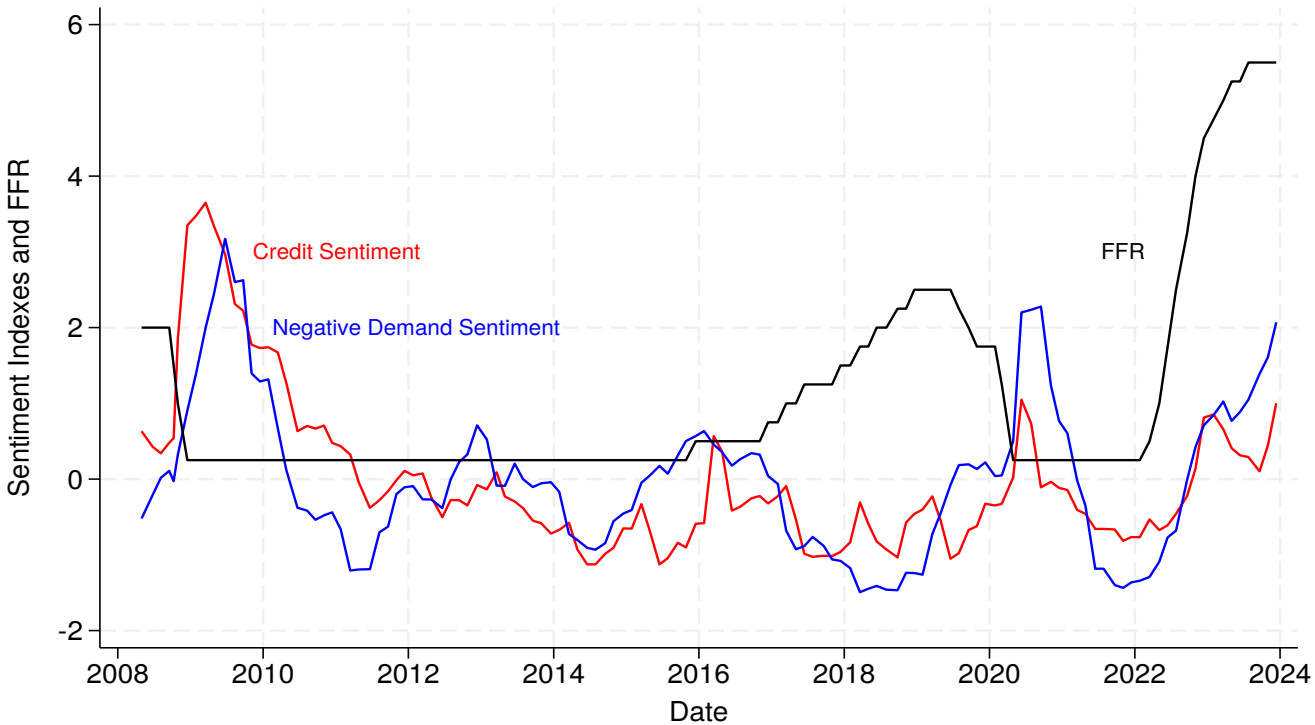
Credit Sentiment Index

- Sentiment index is sum of topic keywords divided by number of total words in the earnings call



(a) Credit Sentiment Index, Financial and Financing Conditions Indexes

Credit and Demand Sentiment Index



(a) Credit and Negative Demand Sentiment Index

Correlation

	Credit Sentiment	SLOOS Financing Conditions	Board FCI	Goldman Sachs FCI	Negative Demand Sentiment	GDP Growth	Consumption Growth
SLOOS Financing Cond.	0.62***	1					
Board FCI	0.69***	0.62***	1				
Goldman Sach FCI	0.71***	0.44***	0.84***	1			
Negative Demand Sent.	0.70***	0.78***	0.74***	0.54***	1		
GDP Growth	-0.59***	-0.57***	-0.45***	-0.55***	-0.60***	1	
Consumption Growth	-0.48***	-0.51***	-0.41***	-0.53***	-0.48***	0.94***	1

Farre-Mensa and Ljungqvist (2016) Test

$$\begin{aligned}\Delta Payout_{i,t} = \; & \beta_{FC}\Delta\text{Equity Issue}_{i,t} \times \text{Constrained}_{i,t} \\ & + \beta_{NFC}\Delta\text{Equity Issue}_{i,t} \times \text{Unconstrained}_{i,t} \\ & + \delta\Delta\text{Other Sources of Funds}_{i,t} + \gamma\Delta\text{Size}_{i,t} + \alpha_{j,t} + \varepsilon_{i,t},\end{aligned}$$

- $\Delta Payout_{i,t}$ is sum of the firm's dividend and share repurchases for firm i on year t
- $\text{Equity Issue}_{i,t}$ is firm-initiated equity issuance proceeds
- $\text{Constrained}_{i,t}$ and $\text{Unconstrained}_{i,t}$ are dummy variables equal to 1 or 0 depending on whether the firm is financially constrained according to different measures.

Farre-Mensa and Ljungqvist (2016) Test Results

- Dependent variable: Change in Payout to Investors

	(1) Constrained: High Credit Sentiment	(2) Normal: Mid Credit Sentiment	(3) Unconstrained: Low Credit Sentiment
Δ Equity Issue	0.006	0.010***	0.018***
	(0.005)	(0.002)	(0.001)
R^2	0.088	0.068	0.051
Wald test:			
Equal coefficients		8.90***	
No of observations	6,900	18,176	8,935

Can sentiment predict firm's sales growth?

- Dependent variable: Sales Growth

	(1)	(2)
Past Sales Growth	0.4967***	0.4967***
	(0.0011)	(0.0011)
Negative Demand Sentiment	-0.0128***	-0.0127***
	(0.0010)	(0.0010)
Credit Sentiment		-0.0021*
		(0.0013)
Tobin's Q	0.0081***	0.0081***
	(0.0007)	(0.0007)
Cash Flow to Capital Ratio	0.0260***	0.0261***
	(0.0043)	(0.0043)
Firm Size	0.0166***	0.0166***
	(0.0020)	(0.0020)
Cash and Short-Term Investments	0.0018*	0.0017
	(0.0011)	(0.0011)
Observations	97,877	97,877
Adjusted R^2	0.689	0.689
Firm Fixed Effects	Yes	Yes
Industry X Quarter Fixed Effects	Yes	Yes

How is monetary policy transmitted to the real economy?

- High-frequency event-study methodology:

$$R_{i,t} = \alpha_i + \beta_{MPS}\text{MPS}_t + \beta_{MPSX}\text{MPS}_t \times X_{i,t} + \beta_X X_{i,t} + \varepsilon_{it},$$

- $R_{i,t}$ is the firm's i daily equity return on day t
- MPS_t is the monetary policy surprise on day t, 10-year yield change (we use other surprises in the robustness section)
- $X_{i,t}$ are different firm characteristics prior to the release of the FOMC statement, firm's size, credit sentiment etc.
- Advantage: mitigate endogeneity (reverse causality and omitted variable biases)

Make our measure compete against other measures

- We are not the first to compute a firm-level financing constraint index
- Important to compare our credit sentiment to prior literature firm-level financing constraint indexes
- Most indexes use accounting and financial variables from Compustat (e.g., KZ index and WW index)
- Hoberg and Maksimovic (2015) use textual analysis of 10-K filings
- Linn and Weagley (2024) use a combination of textual analysis and accounting and financial variables

Firm's stock return response, I

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Panel A: Degree of Financial Constraints						
	Firm Size	Credit Sentiment	KZ Index	Credit Rating	LW Debt Focused	LW Equity Focused	WW Index
MPS	-45.53***	-40.79***	-41.69***	-71.39***	-46.79***	-46.59***	-57.88***
	(6.11)	(6.07)	(6.23)	(11.70)	(6.45)	(6.32)	(11.17)
MPS $\times$ $X_{i,t}$		-6.68***	-0.82	0.86	-1.08	-0.67	3.63
		(1.40)	(1.45)	(0.90)	(1.22)	(1.54)	(3.31)
MPS $\times$ $Size_{i,t}$	2.70***	2.32***	3.29***	4.13**	2.92***	2.91***	4.42***
	(0.80)	(0.80)	(0.80)	(1.87)	(0.84)	(0.83)	(1.60)
$X_{i,t}$		13.17***	2.44*	3.71**	-0.65	4.46**	2.79
		(1.43)	(1.44)	(1.87)	(1.49)	(1.83)	(2.48)
$Size_{i,t}$	-19.91***	-17.78***	-17.69***	-32.63***	-18.93***	-18.59***	-19.43***
	(1.84)	(1.87)	(1.83)	(3.07)	(1.92)	(1.93)	(2.02)
Observations	228,727	228,727	212,363	96,537	213,627	213,627	219,666
R^2	0.04	0.04	0.03	0.03	0.04	0.04	0.04
Adjusted R^2	0.03	0.03	0.01	0.02	0.03	0.03	0.03
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

- One standard deviation shock to credit sentiment **increases** the response of the firm's equity return to a monetary policy surprise by 6 basis points
- The only variable that is statistically significant

Firm's stock return response, II

- Do changes in the cost of credit or changes in access to credit explain better the equity response to monetary policy surprises?

	(1) Firm Size	(2) Credit Sentiment	(3) Access to Credit	(4) Cost of Credit
MPS	-48.55***	-50.59***	-50.37***	-49.30***
	(6.25)	(7.35)	(7.08)	(7.49)
MPS $\times$ $X_{i,t}$		-7.00***	-4.67	-5.50***
		(2.53)	(3.58)	(1.80)
MPS $\times$ $Size_{i,t}$	3.02***	3.50***	3.41***	3.37***
	(0.78)	(0.91)	(0.91)	(0.92)
$X_{i,t}$		13.12***	6.25***	8.35***
		(1.77)	(1.40)	(1.45)
$Size_{i,t}$	-16.93***	-17.07***	-17.90***	-16.64***
	(1.85)	(2.00)	(2.00)	(2.09)
Observations	347,458	315,755	315,755	315,755
R^2	0.02	0.03	0.03	0.03
Adjusted R^2	0.01	0.02	0.01	0.01
Firm Fixed Effects	Yes	Yes	Yes	Yes

- Changes to the cost of credit appear to be more important

Firm's stock return response, III

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Panel B: Floating Rate Debt Exposure and Leverage				**Panel C: Internal Funds**		
	Floating Rate Debt Exposure	Bank Debt Leverage	Floating Rate Debt Leverage	Book Leverage	Cash	Retained Earnings	Dividends per Share
MPS	-52.87***	-51.53***	-54.79***	-47.44***	-47.38***	-49.36***	-51.32***
	(7.64)	(7.54)	(7.80)	(7.00)	(6.73)	(6.81)	(7.83)
MPS $\times$ $X_{i,t}$	0.16	0.92	0.53	-2.73	3.79	-3.94	-3.35**
	(2.06)	(1.82)	(1.77)	(1.86)	(2.99)	(2.64)	(1.53)
MPS $\times$ $Size_{i,t}$	4.04***	3.64***	4.18***	3.08***	3.16***	3.44***	3.65***
	(0.98)	(0.97)	(1.01)	(0.90)	(0.88)	(0.90)	(1.03)
$X_{i,t}$	-2.52*	-0.99	-0.78	2.51	-2.12	2.21	-8.13***
	(1.36)	(1.60)	(1.60)	(2.28)	(2.16)	(5.20)	(1.49)
$Size_{i,t}$	-17.29***	-19.04***	-17.63***	-18.90***	-19.24***	-19.55***	-17.65***
	(1.96)	(2.05)	(1.95)	(1.96)	(1.96)	(1.94)	(2.05)
Observations	179,315	194,637	184,917	208,798	210,547	209,849	210,849
R^2	0.03	0.03	0.03	0.04	0.04	0.04	0.04
Adjusted R^2	0.01	0.01	0.01	0.03	0.03	0.03	0.03
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

- Firms that payout dividends are less affected by monetary policy surprises (3 basis points lower)

Firm's stock return response, IV

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Panel D: Demand and Sales		**Panel E: Other Firm Characteristics**				
	Negative Demand Sentiment	Sales Growth	Market-to-Book Ratio	Short-term Debt-to-Assets Ratio	Profitability	Asset Maturity	Number of Analysts
MPS	-45.61***	-46.59***	-39.56***	-46.10***	-42.83***	-49.76***	-43.22***
	(6.10)	(5.98)	(7.34)	(6.75)	(6.78)	(6.15)	(9.60)
MPS $\times$ $X_{i,t}$	-2.60**	5.10**	7.09***	-1.52	5.39	-1.95	0.91
	(1.04)	(2.02)	(1.99)	(1.91)	(4.35)	(1.41)	(2.36)
MPS $\times$ $Size_{i,t}$	2.80***	2.96***	2.20**	2.92***	2.40**	3.61***	2.36*
	(0.80)	(0.80)	(0.94)	(0.87)	(0.95)	(0.79)	(1.34)
$X_{i,t}$	3.17***	-1.62	15.16***	3.20	-0.53	-8.47***	-3.32
	(1.18)	(1.24)	(1.95)	(2.11)	(2.51)	(2.39)	(2.65)
$Size_{i,t}$	-19.63***	-19.99***	-24.79***	-18.87***	-19.32***	-20.23***	-19.16***
	(1.85)	(1.84)	(2.23)	(1.91)	(2.04)	(1.92)	(2.03)
Observations	228,727	223,356	209,121	209,829	208,915	202,274	228,727
R^2	0.04	0.04	0.04	0.04	0.04	0.03	0.04
Adjusted R^2	0.03	0.03	0.03	0.03	0.03	0.02	0.03
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

- Firms that experience lower demand for their services, have low sales growth or low market-to-book ratios react more to monetary policy surprises

Firm's stock return response, V

	(1)	(2)	(3)	(4)
MPS	-37.10***	-39.86***	-42.14***	-44.90***
	(6.05)	(8.39)	(9.78)	(10.02)
MPS × Credit Sentiment	-5.99***	-5.27***	-3.95**	-4.68**
	(1.52)	(1.59)	(1.79)	(1.98)
MPS × Size	2.98***	2.54**	3.40***	3.75***
	(0.78)	(1.11)	(1.28)	(1.31)
MPS × KZ Index	0.51			
	(1.43)			
MPS × Floating Rate Debt Exposure			0.75	1.21
			(2.74)	(2.85)
MPS × Bank Debt Leverage			3.86	6.52
			(8.01)	(8.46)
MPS × Floating Rate Debt Levarage			-3.76	-6.05
			(7.85)	(8.30)
MPS × Book Leverage		-0.27	-1.83	-2.92
		(1.94)	(2.41)	(2.54)
MPS × Cash-to-Assets Ratio		-1.96	0.37	0.42
		(3.45)	(2.40)	(2.43)
MPS × Dividends per Share		-2.46	-5.05***	-5.09***
		(1.52)	(1.67)	(1.71)
MPS × Market-to-Book Ratio		5.52***	7.51***	7.77***
		(1.88)	(2.39)	(2.44)
MPS × Short-term Debt-to-Assets Ratio		-0.55	1.89	2.12
		(1.98)	(1.83)	(1.89)
MPS × Negative Demand Sentiment	-2.55**	-1.29	-2.03	-2.03
	(1.09)	(1.10)	(1.31)	(1.34)
Observations	212,363	207,341	173,107	173,107
R^2	0.03	0.04	0.03	0.03
Adjusted R^2	0.01	0.03	0.01	0.01
Firm Fixed Effects	Yes	Yes	Yes	Yes
Triple Interactions with Hedge	No	No	No	Yes

Firm's investment decisions, I

- Are credit and demand sentiment indexes able to predict future firm's investment?

$$ln(k_{i,t}) - ln(k_{i,t-1}) = \alpha_i + \alpha_{s,t} + \beta_k(ln(k_{i,t-1}) - ln(k_{i,t-2})) + \beta_{cs}\text{Credit Sentiment}_{i,t} + \beta_X X_{i,t} + \varepsilon_{it},$$

- α_i denotes a firm fixed effect, $\alpha_{s,t}$ denotes an industry sector-by-quarter fixed effect, $ln(k_{i,t-1}) - ln(k_{i,t-2})$ is the capital or investment growth rate for the previous quarter, $\text{Credit Sentiment}_{i,t}$ is our text-based firm-level credit sentiment, and $X_{i,t}$ are firm-level control variables: Tobin's q, cash flow-to-capital ratio, and our text-based firm-level negative demand sentiment.

Firm's investment decisions, II

	(1)	(2)	(3)	(4)	(5)
Past Change in Investment	0.503***	0.546***	0.509***	0.515***	0.525***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Tobin's Q	0.081***				0.081***
	(0.005)				(0.005)
Cash Flow to Capital Ratio		0.165***			0.164***
		(0.006)			(0.006)
Credit Sentiment			-0.049***		-0.046***
			(0.005)		(0.005)
Negative Demand Sentiment				-0.016***	-0.014***
				(0.003)	(0.003)
Observations	121,401	118,460	121,482	121,482	118,380
Adjusted R^2	0.142	0.151	0.141	0.141	0.154
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes
Industry $\times$ Quarter Fixed Effect	Yes	Yes	Yes	Yes	Yes

- a one-standard deviation increase in the firm's credit sentiment reduces firm's investment by 5 percent and a one-standard deviation increase in negative demand decreases firm's investment by 2 percent

Aggregate investment, I

- Are credit and demand sentiment indexes able to predict aggregate investment?

$$ln(k_t) - ln(k_{t-1}) = \alpha + \beta_k(ln(k_{t-1}) - ln(k_{t-2})) + \beta_{cs}\text{Credit Sentiment}_{i,t} + \beta_X X_t + \varepsilon_t,$$

- $ln(k_{t-1}) - ln(k_{t-2})$ is the capital or investment growth rate for the previous quarter, Credit Sentiment$_t$ is our aggregate text-based credit sentiment (equal weighted average of credit sentiment across all firms), and X_t are control variables: last quarter's real GDP growth, Baker et al. (2016)'s economic uncertainty index, Huber and Gormsen (`https://costofcapital.org/`) cost of capital, financial and financing conditions indexes (Board FCI, Goldman Sachs FCI, and SLOOS) and aggregate negative demand sentiment.

Aggregate investment, II

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Past Change	0.687***	0.263**	0.289**	0.329**	0.399***	0.362***	0.474***	0.486***	0.363*	-0.016
Investment	(0.152)	(0.117)	(0.132)	(0.125)	(0.129)	(0.126)	(0.114)	(0.120)	(0.184)	(0.256)
Past Change	-0.428*								-0.332	-0.066
GDP	(0.223)								(0.225)	(0.262)
Credit Sent.		-0.010***							-0.008**	-0.012***
		(0.003)							(0.004)	(0.004)
Negative			-0.008**						-0.005	-0.004
Demand Sent.			(0.003)						(0.004)	(0.004)
SLOOS FC				-0.007**					-0.003	-0.005
				(0.003)					(0.004)	(0.004)
Board FCI					-0.004				0.007	0.006
					(0.003)				(0.005)	(0.006)
Goldman FCI						-0.005*			-0.001	-0.009
						(0.003)			(0.006)	(0.007)
EPU							-0.001		-0.001	0.003
							(0.003)		(0.003)	(0.003)
Cost of								0.001		0.018***
Capital								(0.004)		(0.006)
Observations	64	64	64	64	64	64	64	56	64	56
Adjusted R^2	0.254	0.357	0.283	0.278	0.229	0.253	0.211	0.208	0.366	0.454
Sample	2008-2023	2008-2023	2008-2023	2008-2023	2008-2023	2008-2023	2008-2023	2008-2021	2008-2023	2008-2021

- a one-standard deviation increase in the aggregate credit sentiment index reduces aggregate investment by 10 percent. R-squared suggests it is one of the best predictors

Conclusion

- Narratives can be useful in estimating hard-to-measure economic concepts such as business credit and demand conditions
- Changes in the cost of credit appear to predict better the equity response to monetary policy surprises than changes in the access to credit
- Credit sentiment appears to predict better the equity response to monetary policy surprises than changes in the demand for the firm's product
  - Possible explanation: During our sample period household income and savings were relatively high
- Credit and demand sentiment are able to predict firm level investment decisions and aggregate investment

Future Work

- Investigate potential structural breaks (pre-COVID and post-COVID) and time-varying effects of monetary policy surprises. For example, Almeida et al. (2024) find that equity-focused financial constraints explain firm's response to monetary policy surprises. We do not.
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- Compare AI method (probably better, but less able to fully replicate) to our bag-of-words method (does not take context into account, but it is reproducible).

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