Supplemental Appendix for "The Transmission of Monetary Policy to Corporate Investment: the Role of Loan Renegotiation"

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A Data construction

A.1 Construction of loan data from loan agreements

This section outlines the methodology used to construct the loan dataset for the analysis with a focus on generating comprehensive loan paths and capturing major changes in loan terms. The construction process involves four key stages: (1) identifying relevant credit agreements from SEC filings, (2) extracting and validating key dates, (3) classifying document types and changes, and (4) capturing specific loan terms and modifications. After manually reviewing over 2,000 credit agreements, I develop a targeted strategy and keyword lists to extract critical information from these agreements.

The process begins by obtaining all filings submitted to the SEC's EDGAR system, using a comprehensive list of all filings available within the system without restricting the search to specific form types such as 8-K, 10-K, or 10-Q, as credit agreements can also appear in other filings. Since not all filings contain credit agreements, the next step involves identifying the relevant documents. A custom text-search algorithm is designed to detect terms such as "credit agreement," "loan agreement" or "credit facilities" (including variations like "credit and guarantee agreement") within the first 900 characters of each document. Upon locating one of these terms, the first 400 characters are further examined to exclude irrelevant references (e.g., "pledge and security agreement", "restated security agreement" or "amended security agreement"). Additionally, the identification process is refined by screening for unrelated terms in the SEC header descriptions (e.g., "warrant supplement," "stock," "trust") and by filtering out documents containing phrases such as "this warrant," "this guarantee," or "press release" in the introductory paragraph. These filters are designed to maximize the capture of original credit agreements and major amendments while excluding irrelevant filings. A deliberately conservative approach is adopted to minimize the risk of omitting relevant agreements. Any remaining false positives were addressed through manual corrections, ensuring a robust dataset for analysis.[1]

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[1]The full list of keywords includes: words for detecting credit agreement ['credit agreement', 'loan agreement', 'credit facility', 'credit facilities', 'loan and security agreement', 'credit and security agreement', 'credit and guaranty agreement', 'credit and guarantee agreement'], words for excluding irrelevant references ['pledge and security agreement', 'restated security agreement',

With relevant documents identified, the next crucial step is to precisely determine the timing of loan origination, renegotiation, maturity and early termination. The process begins by capturing all dates mentioned in the documents, along with 20 preceding and 10 following words to provide contextual information. The surrounding text is then analyzed using a predefined list of keywords (e.g., "prior loan," "amended," "effective date," "expiration date") to identify the specific event associated with each date. The methodology accommodates the diverse ways dates are referenced across agreements by incorporating standard formats and common variations (e.g., "the first day of the next month"). To enhance accuracy, a manual review process is applied to cases where extracted dates seem implausible —such as excessively old dates (e.g., before 1950), far-future dates (e.g., after 2030), or incomplete formats (e.g., "January 2007" without a specific day). For these cases, the first 1,500 words of the document are closely examined to verify and correct the extracted information. For instance, if a document dated 2015 references "the Original Credit Agreement dated January 2007," the algorithm flags this incomplete date format for manual review, which involves examining the original 2007 filing to confirm the specific day of origination. This meticulous approach ensures the reliable identification of key event-related dates while effectively addressing the inconsistencies and variability in the formatting of credit agreements.

The event type —primarily origination, renegotiation, or termination —is initially identified by searching for keywords such as "amend," "restated" or "termination" and their variations within the document description or the first 20 words of the text. This baseline approach captures most cases, as credit agreements often explicitly indicate modifications or terminations in the opening lines (e.g., "FIRST AMENDMENT TO CREDIT AGREEMENT," "FOURTH AMENDMENT TO CREDIT AGREEMENT" or "THIS TERMINATION AGREEMENT is made and entered into this 31st day of October 2013") (See Excerpts 1 to 3). Some documents, however, reference the original loan agreement only after a substantial amount of text (see Excerpt 4). In such cases, relying solely on the first 20 words may misclassify the event as origination. To address this limitation, the retained words before and after all identified dates are analyzed for additional keywords such as "original loan agreement," "certain credit facility" and other variations. This supplemental step ensures that the event type is accurately classified by incorporating a broader contextual analysis. By combining the baseline keyword search with this extended contextual examination, the methodology enhances accuracy in distinguishing between origination, renegotiation, and termination events, effectively accommodating variations in document structure.

To examine loan terms, the study employs three complementary approaches. First, it analyzes summary passages discussing major contract changes by identifying key phrases such as "have agreed," "desire to amend," and their variations. For each identified phrase, the analysis extracts 10 preceding and 70 following words to capture contextual information. Within these passages, the study searches for loan-term keywords (e.g., "margin," "commitment," "covenant," "maturity"), directional words (e.g., "increase," "reduce"), and associated numerical values. Second, it specifically targets tables within contracts that document quantita-

'amended security agreement'], words for excluding document description ['warrant supplement', 'prospectus', 'stock', 'intellectual', 'patent', 'property', 'reaffirmation', 'trust', 'release', 'guaranty', 'guarantor', 'guarauntee', 'guarantee extention agreement', 'consent', 'indenture', 'forebearance', 'cash collateral', 'subordination', 'only security agreement']

tive details. Syndicated loans, for example, typically use tables to document changes in lender commitments. Similarly, amendments to agreements often include tables that signify modifications in loan terms, such as revised pricing or amounts. These tables are extracted and analyzed to capture precise identification of relevant data. Third, it employs a specialized text-search algorithm to locate patterns involving amounts or pricing, including numerical values with commas, word representations of numbers (e.g., "billion," "million"), currency symbols, and related variations. When such keywords are identified, the associated numerical values and surrounding sentences are screened for keywords related to loan terms. This approach can be illustrated through a typical amendment: Consider a filing that states "The parties hereby agree to amend Section 2.1 to increase the Revolving Credit Commitment from $200,000,000 to $300,000,000." First, the summary passage approach captures this change through the phrase "agree to amend". The surrounding context identifies "increase" and "commitment" and extract the numerical change from "from" and "to" in both the numeric and currency formats, identifying the previous loan amount ($200,000,000) and the revised loan amount ($300,000,000). Second, the table extraction approach identifies the corresponding commitment schedule showing individual lender allocations totaling $300,000,000. Third, the specialized text-search algorithm searches the numerical values, identifying $200,000,000 and $300,000,000, and then examines the surrounding text to determine which loan terms the values are associated with. This approach extends beyond the summary passage to all pages containing numerical values, ensuring more accurate capture of changes, even when no values appear in the summary.

The study employs a hybrid methodology that integrates textual analysis of SEC filings with structured data from DealScan. This approach ensures comprehensive understanding of loan adjustments while leveraging the strengths of both unstructured and structured data sources. Appendix A.2 details this approach.

Excerpt 1.

"FIRST AMENDMENT TO CREDIT AGREEMENT This First Amendment (this "Amendment") is made as of November 14, 2012, effective as of June 27, 2012, by and among CHASE CORPORATION, a Massachusetts corporation (a "Borrower", or the "Chase Borrower"), NEPTCO INCORPORATED, a Rhode Island corporation (a "Borrower", or the "NEPTCO Borrower", and together with the Chase Borrower, the "Borrowers"), the Lenders (as defined in the Credit Agreement), and BANK OF AMERICA, N.A., as Administrative Agent, Swingline Lender and L/C Issuer. RECITALS A. The Borrowers, the Guarantors, the Administrative Agent and the Lenders entered into a Credit Agreement dated as of June 27, 2012 (the "Loan Agreement"),..."

Excerpt 2.

"UNIFIED GROCERS, INC. FOURTH AMENDMENT TO CREDIT AGREEMENT This FOUR TH AMENDMENT TO CREDIT AGREEMENT (this "Amendment") is dated as of March 27, 2013 (the "Effective Date") and entered into by and among Unified Grocers, Inc., a California corporation ("Borrower"), the financial institutions listed on the signature pages hereof ("Lenders") and Wells Fargo Bank, National Association, as administrative agent for Lenders ("Administrative Agent"), and is made with ref-

erence to that certain Credit Agreement dated as of October 8, 2010, as amended by the First Amendment to Credit Agreement dated as of November 12, 2010, the Second Amendment to Credit Agreement dated as of June 19, 2012 and the Third Amendment to Credit Agreement dated as of December 29, 2012 (as so amended, the "Credit Agreement"), by and among Borrower, Lenders, Union Bank, N.A., as..."

Excerpt 3.

"THIS TERMINATION AGREEMENT is made and entered into this 31st day of October, 2013, by and between Social Reality, Inc., a Delaware corporation with its principal place of business at 456 Seaton Street, Los Angeles, CA 90013 (the "Borrower"), TCA Global Credit Master Fund, LP, a Cayman Islands partnership with its principal place of business at 1404 Rodman Street, Hollywood, FL 33020 (the "Lender") and Pearlman Schneider LLP (the "Escrow Agent"). W I T N E S S E T H: WHEREAS, the Borrower and Lender are parties to that certain Credit Agreement dated as of December 31, 2012 made effective as of February 22, 2013 (the "Original Agreement"), as amended pursuant to the First Amendment to Credit Agreement effective June 11, 2013 (the "Amended Agreement") (collectively, the "Credit Agreement") pursuant to which the Lender extended a revolving credit facility to the..."

Excerpt 4.

"Exhibit 10.1 EXECUTION COPY $1,000,000,000 Five-Year Revolving Credit Agreement dated as of December 16, 2013, among...(page 1) .....

....

... (page 3)... 'Original Credit Agreement' means that certain Three-Year Revolving Credit Agreement as of October 9 2012, among..."

A.2 Integration of Parsed SEC Filings with Compustat and DealScan Data

This section outlines the process of merging parsed observations from SEC filings with data from Compustat for balance sheet information and DealScan for detailed loan terms.

Step 1: Identification of Firm ID and Compustat Matching

Every SEC filing header contains essential details, including current and former names, addresses, the central index key (CIK), the IRS tax identification number, and the reporting date. These details are employed to establish a linkage between historical records of Compustat and SEC filings for each company. This mapping begins by connecting the firm ID (GVKEY) in Compustat to the firm ID (CIK) in SEC filings. For unmatched CIKs, firms are linked based on historical IRS numbers. In some instances, certain SEC filers, such as many private companies, may not have a corresponding link to Compustat. Subsequently, for the remaining legal entities, name and address matches are established. To standardize firm names and

addresses, I employ standard cleaning techniques such as removing punctuation, abbreviations, and excess spacing, correcting common misspellings and removing parenthetical information.[2]

Step 2. Matching with DealScan

Leveraging the Compustat-SEC match from step 1 and the DealScan-Compustat link by Chava and Roberts (2008), firms in SEC filings are matched with DealScan data. Individual loan observations are then matched between SEC filings and DealScan using loan characteristics including origination date, effective date, loan type, and amount. A key consideration is that DealScan often records renegotiations as new independent loans. To enhance the accuracy of this matching process, manual matching is employed. This involves cross-referencing borrower names, loan dates, and other relevant details to ensure precise alignment between the datasets. DealScan provides standardized and comprehensive loan details that guide the manual verification process. Any discrepancies identified during this process are addressed through manual corrections.[3]

This matching process combines the strengths of both data sources. For recording loan terms, DealScan's structured data is prioritized when an observation appears in both sources or exclusively in DealScan. When amended contracts appear only in SEC filings, the parsed SEC data determines the loan terms. To ensure data consistency, loans originating exclusively in SEC filings without corresponding DealScan records are excluded from the analysis. This systematic approach integrates the complementary advantages of both structured DealScan data and unstructured SEC filings.

[2]I manually reviewed each matching combination with a similarity score ranging from 0.8 to 1, determined through a name-matching algorithm. The score scale spans from 0 (no match) to 1 (perfect match).

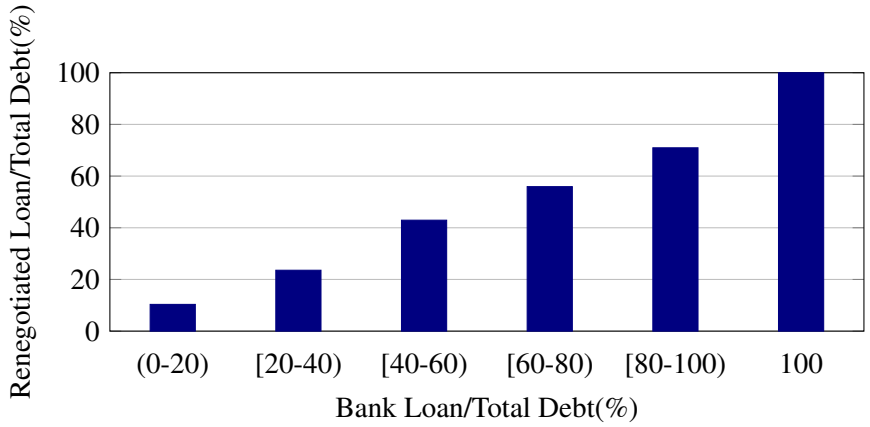
[3]The discrepancy between amendment observations in DealScan versus SEC filings is documented in the Appendix of Roberts (2015). For a detailed discussion of unmatched observations between DealScan and SEC filings, see the Appendix of Nini, Smith and Sufi (2009).

B Additional Data Description and Robustness Analysis

B.1 Additional Data Description

Figure B.1.1 illustrates the relationship between bank loans and renegotiated bank loans as a percentage of a firm's total debt, supporting the claim that renegotiation constitutes a significant portion of total corporate debt, particularly for firms with high reliance on bank financing.

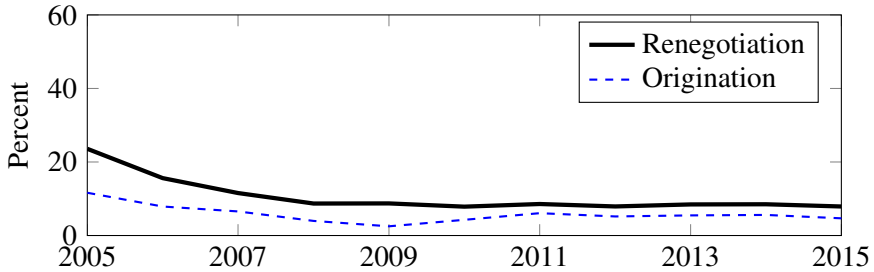
Figure B.1.1: The relation between renegotiated bank loans and all bank loan



Notes: This figure shows the relation between bank loans and renegotiated bank loans as a percentage of a firm's total debt. On the horizontal axis, the firm-year observations are grouped by the bank debt as a percentage of total debt. The vertical axis reports the corresponding renegotiated bank debt as a percentage of total debt.

Figure B.1.2 provides the evolution of the relative frequency of loan renegotiations and originations over time, illustrating that renegotiations consistently outnumber originations throughout the sample period, corroborating the finding in Table 1 that renegotiation is more prevalent.[4]

Figure B.1.2: Share loan renegotiations and originations

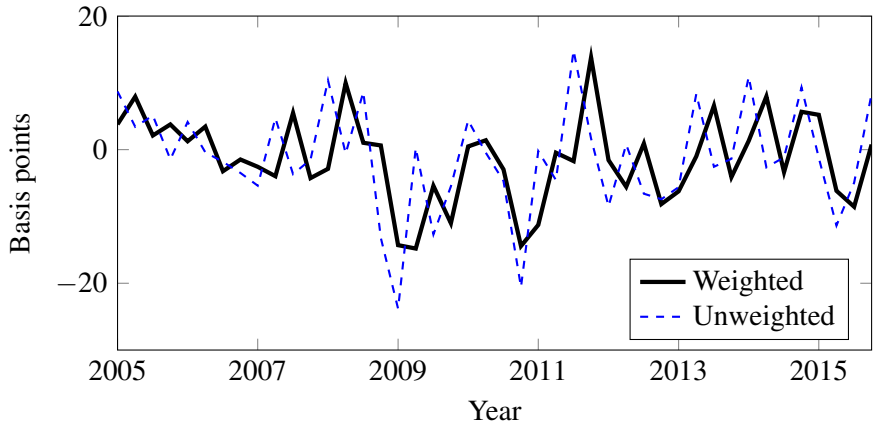


Notes: This figure shows the yearly share of loan adjustments (renegotiations and originations) as a percentage of the total number of valid loans in each period. The data is derived from corporate loan agreements filed with the US Securities and Exchange Commission.

[4]Consistent with the findings of Roberts (2015), both activities exhibit a downward trend from 2005 to 2009, after which they stabilize at lower levels. These trends are controlled for in the main regression analyses using time fixed effects.

Figure B.1.3 depicts the quarterly monetary policy shock series for the sample period, using the data from Bu, Rogers and Wu (2021). The series shows both expansionary (negative) and contractionary (positive) shocks throughout the period. For ease of interpretation, the sign of the shock is reversed later in the regression, so that expansionary shocks are positive. The weighted series assigns weights based on the number of days in the quarter following the shock, while the unweighted series aggregates all shocks within each quarter.

Figure B.1.3: Quarterly monetary policy shocks



Notes: This figure uses the monetary policy shock series provided by Bu, Rogers and Wu (2021) for the period 1/1/2005 to 12/31/2015. The weighted quarterly shock is constructed by assigning weights based on the number of days in the quarter following the occurrence of the shock. The unweighted quarterly shock is obtained by simply aggregating all shocks within each quarter.

B.2 Robustness Analysis

Tables B.2.1 to B.2.3 show that the results of Table **??** are robust to using various alternative specifications. Table B.2.1 presents the results of the regression analysis, similar to Table **??**, but controlling for bank-specific capital ratio. The results demonstrate that the positive association between expansionary monetary policy shocks and both loan originations and renegotiations remains robust after controlling for this additional bank characteristic. Table B.2.2 presents the results of the regression analysis using an alternative definition of the origination indicator, where zeros are assigned to all potential bank-firm combinations that have been matched at least once during the sample period, regardless of whether a loan is currently active. This alternative construction reveals that the impact of monetary policy shocks on originations is delayed, with no significant immediate effect but increasing effects in subsequent quarters. Table B.2.3 presents the results of the regression analysis using central bank information shocks from Jarociński and Karadi (2020). As observed with information shocks in the literature, the results show that these shocks have an opposite impact on the propensity to originate and renegotiate loans compared to the effects observed with pure policy shocks.

Table B.2.1: Extensive margin - Immediate effect of monetary policy shocks on credit adjustment controlling for bank specific capital ratio

	Origination$_t$				Renegotiaton$_t$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Benchmark				Benchmark	
MP shock$_t$	0.277	0.535	0.934**	1.404***	1.828***	2.036***	1.980***	2.262***
	(0.418)	(0.416)	(0.409)	(0.424)	(0.440)	(0.461)	(0.468)	(0.440)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	-	No	Yes	Yes	-
Bank FE	No	No	Yes	-	No	No	Yes	-
Firm*Bank FE	No	No	No	Yes	No	No	No	Yes
Observations	84,710	84,710	84,710	84,401	84,710	84,710	84,710	84,401
R^2	0.007	0.045	0.055	0.115	0.025	0.113	0.119	0.183

Notes: The table presents the probability of origination/renegotiation after a 25bps expansionary monetary policy shock. The coefficient β_h is estimated for quarter h using equation $P_{bj,t+h} = \alpha_b + \alpha_j + \beta_h \cdot \varepsilon_t + \gamma_h \cdot X_{bj,t-1} + \nu_{bj,t+h}$, where $h = 0$, all specifications are equivalent to Table 3 except that bank specific capital ratio is added to $X_{bj,t-1}$. The table includes fixed effects, which are indicated as "yes" (included), "no" (not included), or "-" (comprised in the wider set of fixed effects). The robust standard errors in parentheses are two-way clustered by firm and bank. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.2.2: Extensive margin - Impact of monetary policy shocks on the likelihood of origination using an alternative definition of the origination indicator

	$t+0$				$t+1$	$t+2$	$t+3$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Benchmark				
MP shock$_t$	0.000	0.104	0.102	0.078	0.402*	0.747**	1.137***
	(0.159)	(0.164)	(0.164)	(0.167)	(0.242)	(0.298)	(0.339)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	-	Yes	Yes	Yes
Bank FE	No	No	Yes	-	Yes	Yes	Yes
Firm*Bank FE	No	No	No	Yes	No	No	No
Observations	272,783	272,783	272,783	272,551	272,783	272,783	272,783
R^2	0.001	0.010	0.012	0.022	0.022	0.032	0.041

Notes: The table presents the probability of origination/renegotiation after a 25bps expansionary monetary policy shock. The coefficient β_h is estimated for quarter h using equation $P_{bj,t+h} = \alpha_b + \alpha_j + \beta_h \cdot \varepsilon_t + \gamma_h \cdot X_{bj,t-1} + \nu_{bj,t+h}$, where $h = 0$ and $P_{bj,t+h}$ is zero for all bank-firm-quarter combinations and is replaced with one when at least one origination takes place between t to $t+h$. A bank-firm combination refers to the pair at least once matched during the sample periods but it is not necessarily active at t. The table includes fixed effects, which are indicated as "yes" (included), "no" (not included), or "-" (comprised in the wider set of fixed effects). The robust standard errors in parentheses are two-way clustered by firm and bank.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

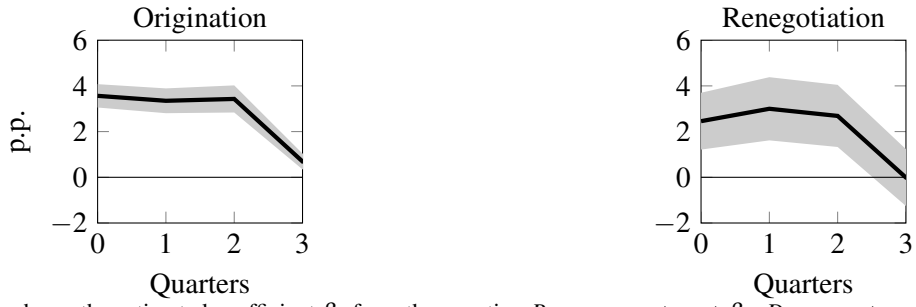
Table B.2.3: Extensive margin - Immediate effect of monetary policy shocks on credit adjustment using central bank information shock

	Origination$_t$				Renegotiation$_t$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Benchmark				Benchmark	
MP shock$_t$	-2.895***	-1.721*	-2.358**	-4.030***	-7.444***	-4.927***	-4.667***	-4.335***
	(0.943)	(1.015)	(0.997)	(1.003)	(1.043)	(1.236)	(1.238)	(1.243)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	-	No	Yes	Yes	-
Bank FE	No	No	Yes	-	No	No	Yes	-
Firm*Bank FE	No	No	No	Yes	No	No	No	Yes
Observations	110,752	110,752	110,752	110,386	110,752	110,752	110,752	110,386
R^2	0.008	0.042	0.058	0.113	0.027	0.112	0.122	0.184

Notes: The table presents the probability of origination/renegotiation, the coefficient β_h over quarter h from equation after a 25bps expansionary central bank information shocks from Jarociński and Karadi (2020): $P_{bj,t+h} = \alpha_b + \alpha_j + \beta_h \cdot \varepsilon_t + \gamma_h \cdot X_{bj,t-1} + \nu_{bj,t+h}$, where $h = 0$, all specifications are equivalent to those presented in Table 3. The table includes fixed effects, which are indicated as "yes" (included), "no" (not included), or "-" (comprised in the wider set of fixed effects). The robust standard errors in parentheses are two-way clustered by firm and bank. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

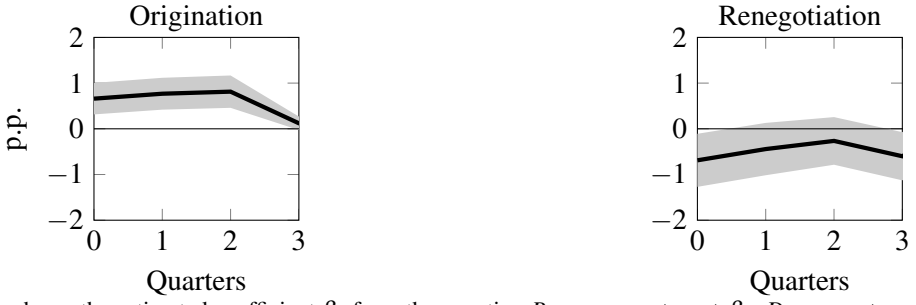
Figures B.2.1 and B.2.2 present the dynamic effects of monetary policy shocks on the probability of loan origination and renegotiation for firms with different ex-ante characteristics: highly leveraged and bank-dependent firms and firms with high lagged investment, respectively. The results confirm the findings in Table **??**, showing that 1) bank-dependent firms with high leverage implying financially constrained exhibit a higher likelihood of originating new loans or renegotiating existing loans following expansionary monetary policy shocks and 2) firms with higher lagged investment are significantly more likely to originate new loans after expansionary shocks, while no such relationship is observed for renegotiation.

Figure B.2.1: Extensive margin - Dynamic effect of monetary policy shocks on credit adjustment by ex-ante firm characteristics (i.e. highly leveraged bank-dependent firm)



Notes: The figure shows the estimated coefficient β_h from the equation $P_{bj,t+h} = \alpha_b + \alpha_j + \beta_h \cdot D_{j,t-1} \cdot \varepsilon_t + \gamma_h \cdot X_{bj,t-1} + \nu_{bj,t+h}$, where $D_{j,t-1}$ is an indicator variable for being highly leveraged and bank-dependent. The indicator variable takes the value of one if a firm's leverage is above the median of distribution and if the firm has no outstanding public bonds or has not issued public bonds for the last three years. The shaded regions represents 90% confidence intervals.

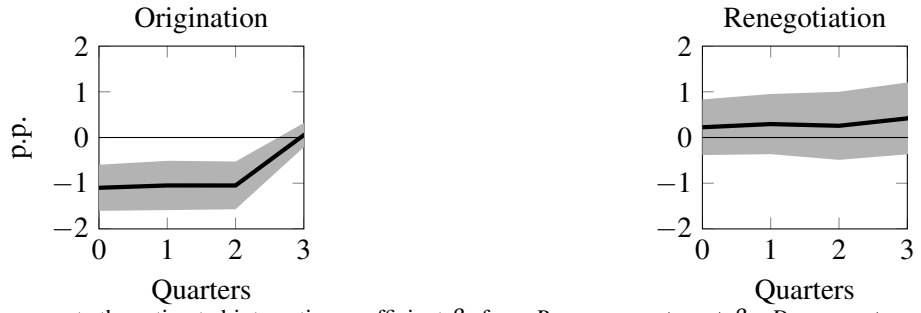
Figure B.2.2: Extensive margin - Dynamic effect of monetary policy shocks on credit adjustments by ex-ante firm characteristics (i.e. lagged investment)



Notes: The figure shows the estimated coefficient β_h from the equation $P_{bj,t+h} = \alpha_b + \alpha_j + \beta_h \cdot D_{j,t-1} \cdot \varepsilon_t + \gamma_h \cdot X_{bj,t-1} + \nu_{bj,t+h}$, where $D_{j,t-1}$ is lagged investment to asset ratio which is measured as a within-firm demeaned ratio of investment to assets and is standardized. The shaded regions are 90% error bands.

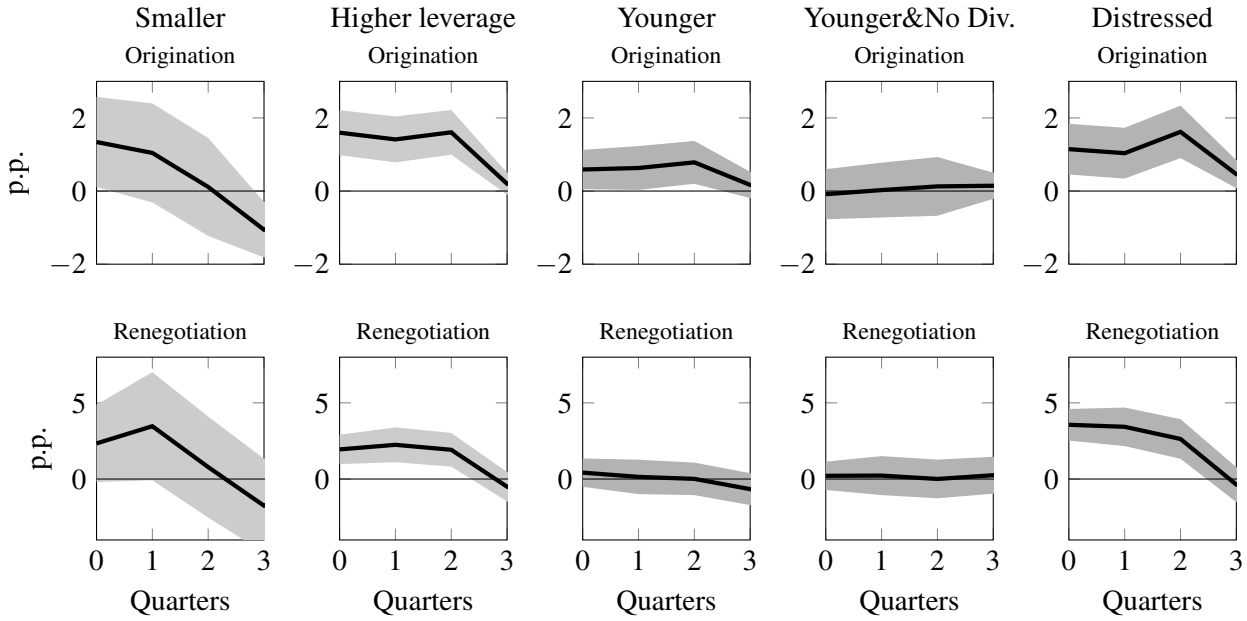
Figures B.2.3 and B.2.4 present the dynamic effects of monetary policy shocks on loan origination and renegotiation for various firm characteristics, including distance to default (Figure B.2.3) and alternative measures of financial constraints, such as firm size, leverage, age, dividend payments, and distress (Figure B.2.4). The results consistently demonstrate that financially constrained firms are more likely to originate new loans or renegotiate existing loans after expansionary monetary policy shocks, while firms with lower financial constraints and access to alternative financing channels may exhibit different response patterns.

Figure B.2.3: Extensive margin - Dynamic effect of monetary policy shocks on extensive margins of credit adjustment by firm's ex-ante distance to default



Notes: This figure reports the estimated interaction coefficient β_h from $P_{bj,t+h} = \alpha_b + \alpha_j + \beta_h \cdot D_{j,t-1} \cdot \varepsilon_t + \gamma_h \cdot X_{bj,t-1} + \nu_{bj,t+h}$, where $h \geq 0$ and D represents the distance to default within firm deviation, as measured in Ottonello and Winberry (2020). A higher distance to default indicates a greater level of distance from default. The shaded regions are 90% error bands.

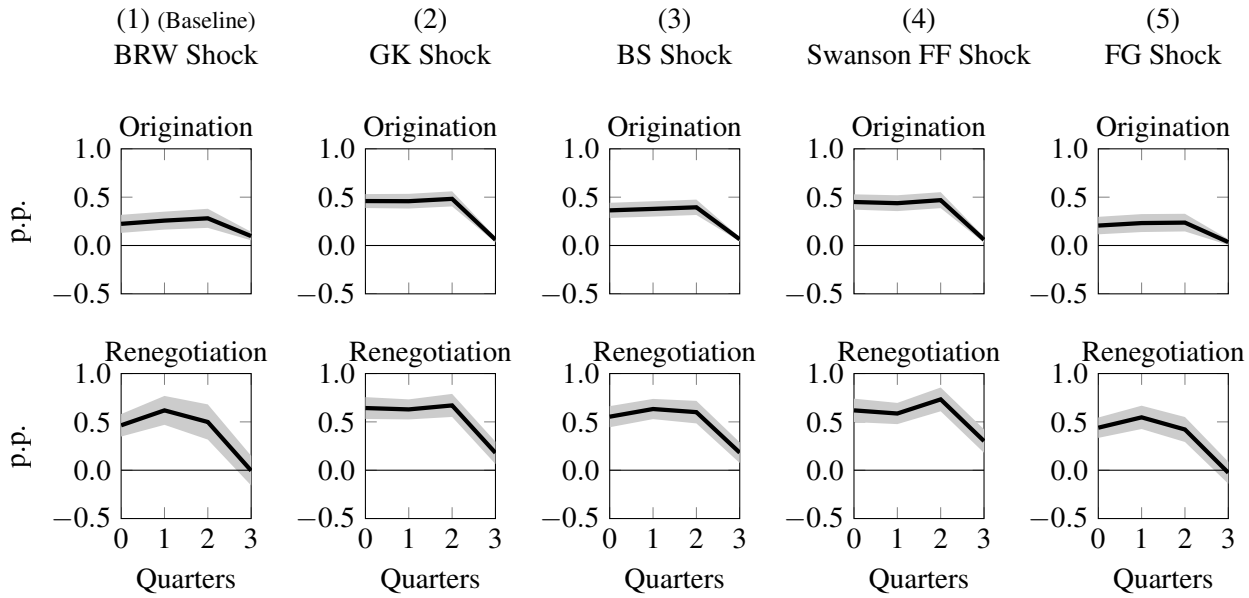
Figure B.2.4: Extensive margin - Dynamic effect of monetary policy shocks on credit adjustment by alternative firm characteristics



Notes: This figure reports the interaction coefficient β_h from the equation $P_{bj,t+h} = \alpha_b + \alpha_j + \beta_h \cdot D_{j,t-1} \cdot \varepsilon_t + \gamma_h \cdot X_{bj,t-1} + \nu_{bj,t+h}$, where $h \geq 0$ and D represents an indicator for each group. The groups are defined as follows: (1) Small firms with average sales over the past 10 years below the 30th percentile of the distribution (Gertler and Gilchrist, 1994). (2) Highly leveraged firms, where leverage is defined as the debt-to-asset ratio, with debt being the sum of short-term and long-term debt, and assets being the book value of assets. (3) Younger and non-dividend paying firms, defined as firms less than 15 years since incorporation and did not pay cash dividends during the previous year (Cloyne et al., 2023). (4) Distressed firms, identified as firms with Altman's Z-score below 1.1 (i.e., distress zone with a very high probability of bankruptcy within two years) (Altman, 1968). The shaded regions are 90% error bands.

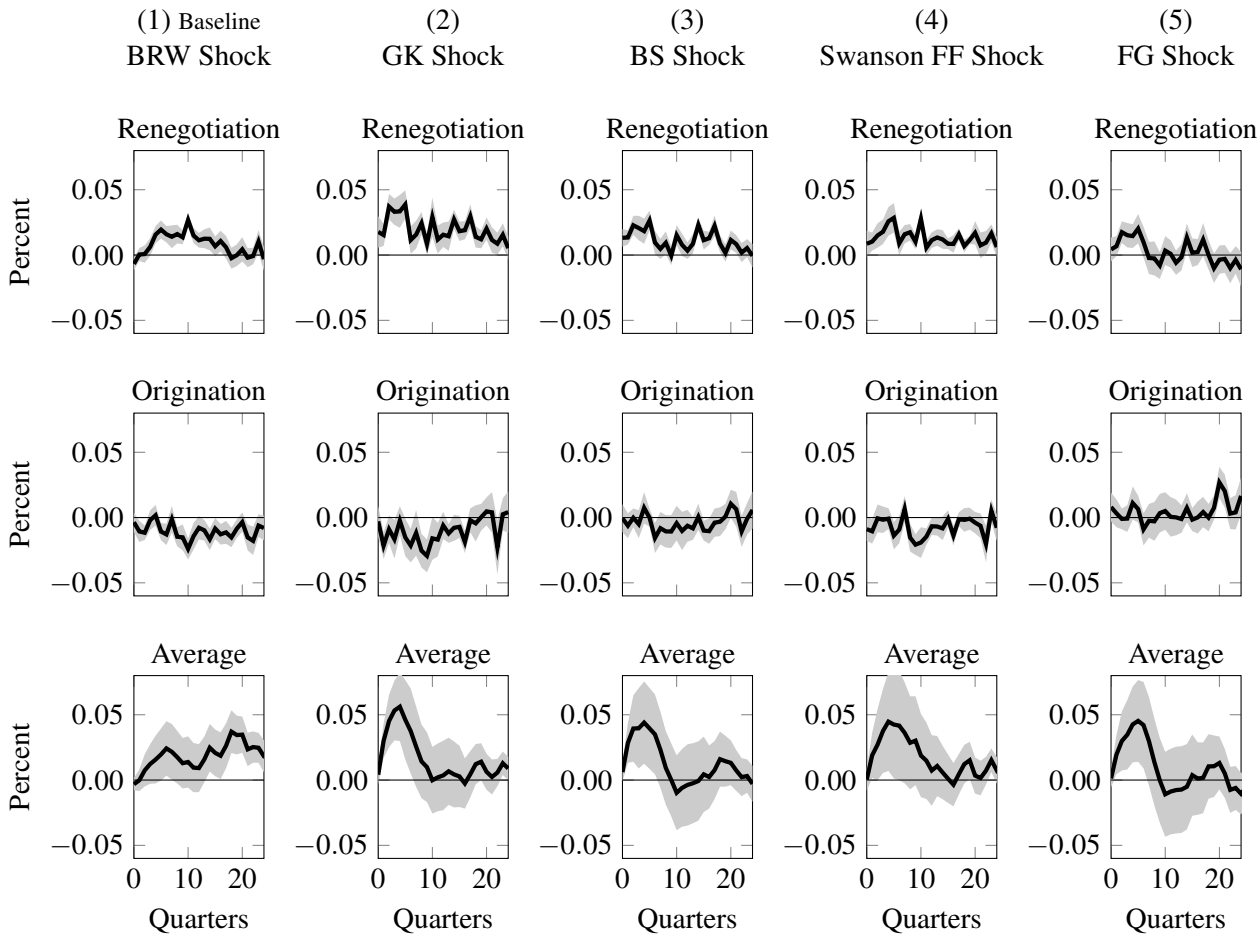
Figures B.2.5 and B.2.6 validate the robustness of the main findings across alternative monetary policy shock measures. Columns 2 and 3 provide consistent evidence that expansionary monetary policy shocks increase loan renegotiations and lead to higher investment responses among renegotiating firms when using shock measures from Gertler and Karadi (2015) and Bauer and Swanson (2023*b*). Additionally, using Swanson (2021)'s decomposition into conventional (federal funds rate) and unconventional (forward guidance) monetary policy shocks, the last two columns of the figures reveal that both types of shocks significantly affect corporate investment through the renegotiation channel.

Figure B.2.5: Extensive margin - Dynamic effect of monetary policy shocks on credit adjustment using alternative monetary policy shocks



Notes: The figure displays the estimated coefficient β_h from the regression: $P_{bj,t+h} = \alpha_b + \alpha_j + \beta_h \cdot \varepsilon_t + \gamma_h \cdot X_{bj,t-1} + \nu_{bj,t+h}$, where $h \geq 0$, $P_{bj,t+h}$ is an indicator for loan origination/renegotiation between bank b and firm j, $X_{bj,t-1}$ represents a vector of controls and ε_t is a standardized monetary shock with a standard deviation of 1 for comparability across different shocks from: (1) Bu, Rogers and Wu (2021) (baseline) rescaled for standardization, (2) Gertler and Karadi (2015) using three-month-ahead federal funds futures contract (FF4), (3) Bauer and Swanson (2023*b*) using the first four quarterly Eurodollar futures contracts (ED1–ED4), (4) Swanson (2021) federal funds rate factor using FF4 and the current federal funds futures contracts (FF1), and (5) Swanson (2021) forward guidance factor using the second to fourth Eurodollar futures contracts (ED2-ED4). All alternative shocks are orthogonalized following Bauer and Swanson (2023*a*,*b*). All specifications include firm and bank fixed effects with standard errors clustered by firm and bank. Shaded regions indicate 90% confidence intervals.

Figure B.2.6: Investment responses to alternative monetary policy shocks: Interaction coefficients and average investment responses across all firms



Notes: The top two rows present the interaction coefficient β_h of a renegotiation/origination indicator $R_{i,t+k}$ and a standardized monetary policy shock ε_t. The base group is the firms that never renegotiate/originate a loan over the K(=3) period as specified by the equation $\Delta_h Y_{j,t+h} = \alpha_j + \alpha_{st} + \beta_h \cdot \mathbb{1}[\sum_{k=0}^{K} R_{j,t+k}] \cdot \varepsilon_t + \gamma_h \cdot X_{j,t-1} + \nu_{j,t+h}$, where $h \geq 0$, $\Delta_h Y_{j,t+h}$ is the difference in the investment rate over the horizon h for a firm j, $\mathbb{1}[\sum_{k=0}^{K} R_{j,t+k}]$ takes a value of 1 if a firm j renegotiates/originates at least once over the specified period, $X_{j,t-1}$ is a vector of controls. The bottom row displays the coefficient β_h from $\Delta_h Y_{j,t+h} = \alpha_j + \alpha_{st} + \beta_h \cdot \varepsilon_t + \gamma_h \cdot X_{j,t-1} + \nu_{j,t+h}$ as the benchmark average investment response to each monetary policy shock without including the origination/renegotiation indicator. Monetary policy shocks are from: (1) Bu, Rogers and Wu (2021), (2) Gertler and Karadi (2015), (3) Bauer and Swanson (2023*b*), (4) Swanson (2021) federal funds rate factor and (5) Swanson (2021) forward guidance factor. The analysis excludes Swanson (2021)'s QE factor due to theoretical inconsistencies in average investment responses even after orthogonalization. Results incorporating this factor are available upon request. All alternative shocks are orthogonalized following Bauer and Swanson (2023*a*,*b*). Firm and bank fixed effects are included, and standard errors are clustered by firm and bank. The shaded regions represent 90% confidence intervals.

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