

# Business Inflation Exposure and Bank Lending

Ricardo Correa, Teodora Paligorova, and Andrei Zlate  
Federal Reserve Board

EEA-ESEM Congress  
Rotterdam, August 26-28, 2024

The views stated herein are those of the authors and are not necessarily those of the Federal Reserve Board or the Federal Reserve System.

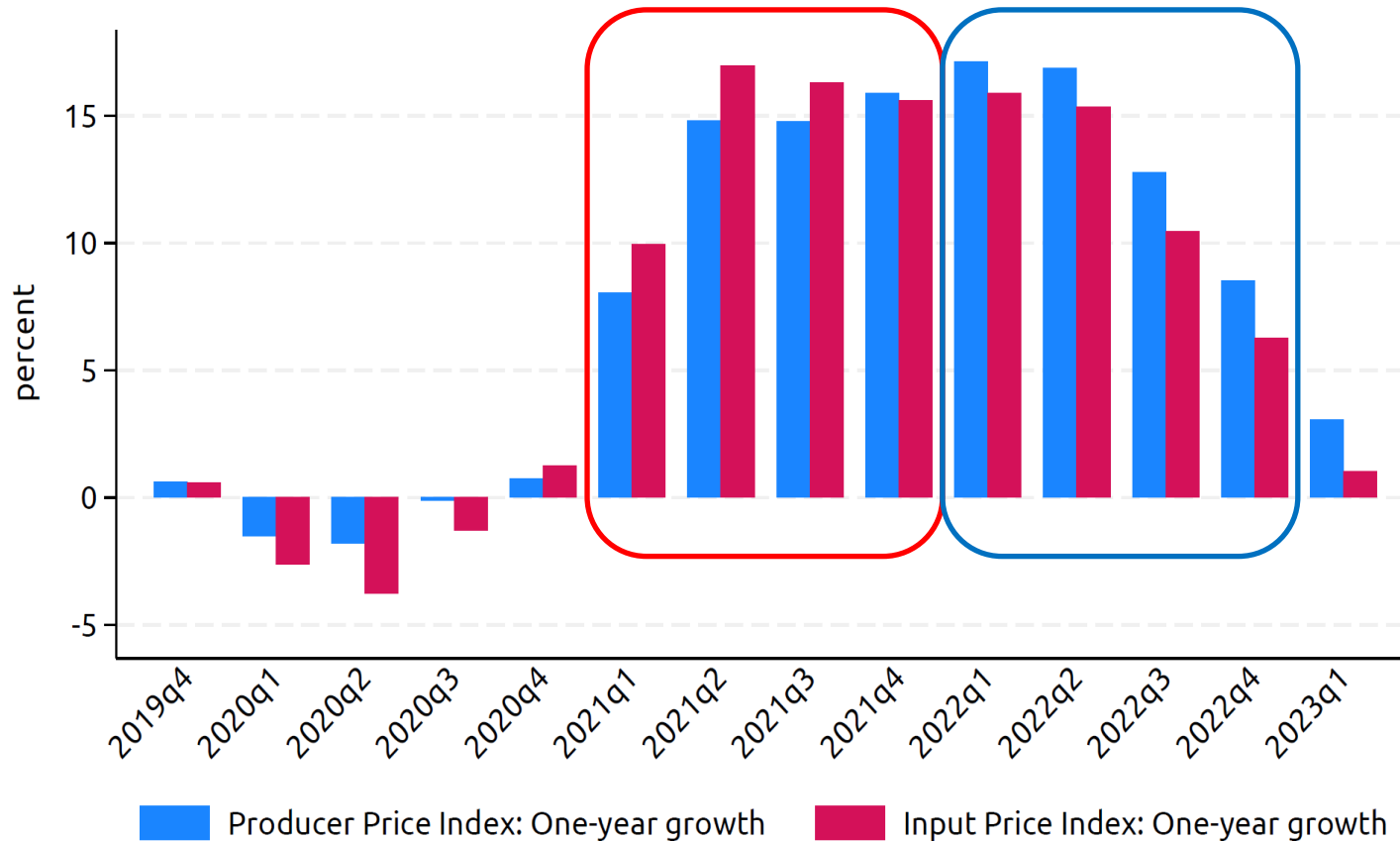
# Motivation

- Inflation surged in 2021, affected firms and banks differently.
- Firms differed in their ability to pass-through input price inflation to output prices:
  - Lower pass-through firms suffered lower profitability, ability to service debt, access to bank credit.
- Banks differed in their exposures to inflation, depending on the distribution of their loan portfolios across low vs. high pass-through firms.
  - Banks with higher exposures to low pass-through borrowers may have suffered a deterioration in asset quality, and therefore cut lending.

# Motivation

- On average, the pass-through of input price inflation to output prices was incomplete, varied over time.

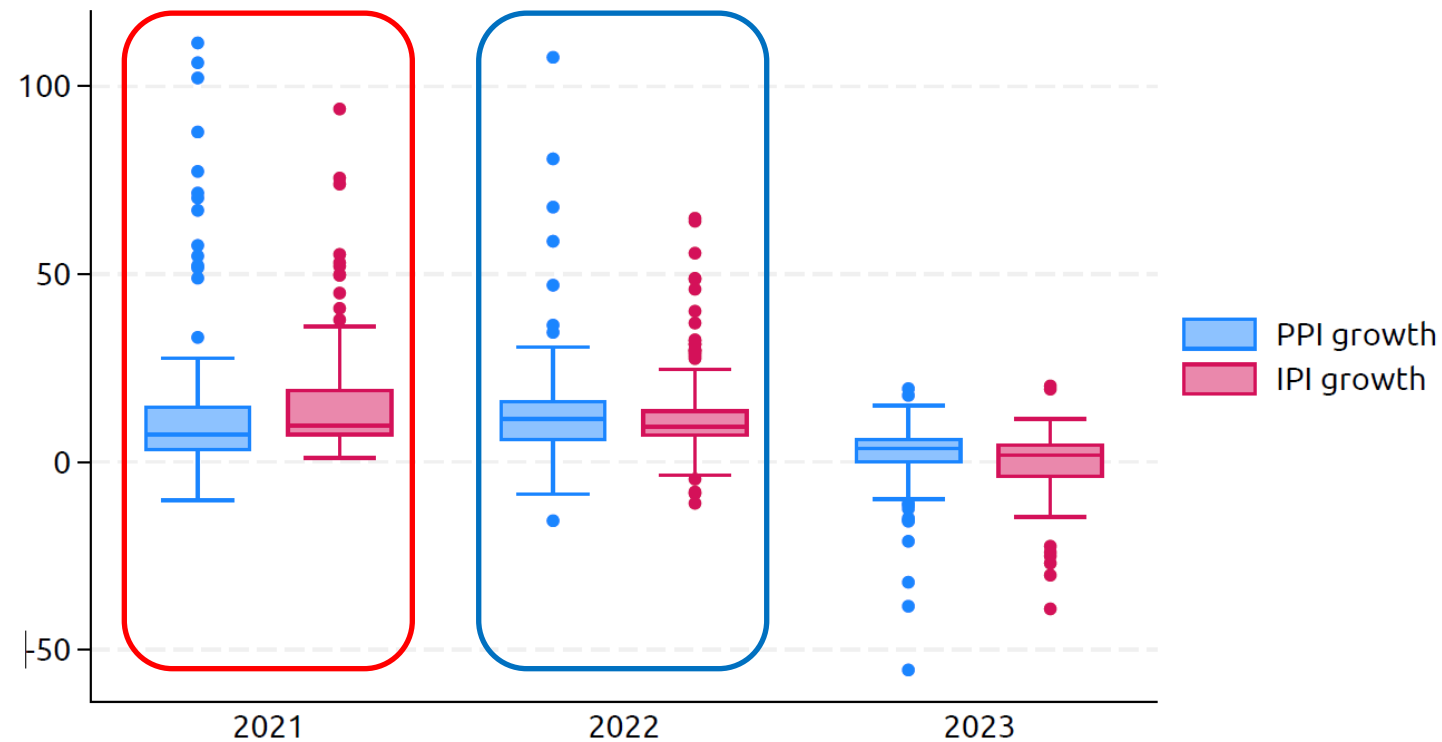
Input and output price inflation, yoy, average across industries



# Motivation

- Pass-through of input price inflation to output prices varied over 3-digit NAICS industries.

Input and output price inflation, yoy, dispersion across industries



Source: Bureau of Labour Statistics  
PPI is producer price index and IPI is input price index at 3-digit NAICS

# Research questions

1. Was there a link between firms' inflation pass-through and their profitability, credit worthiness, and access to bank credit?
2. Did banks' exposure to inflation (i.e., through low pass-through borrowers) affect their lending post-2021?
3. Were there real effects on borrowers that lost access to bank credit?

# Findings

1. Firms in low pass-through industries become financially weaker post-2021 (i.e., lower profit margins, higher probability of default).
  2. Banks more exposed to inflation cut lending and increased spreads by more post-2021, especially for firms in low-pass through industries.
  3. There were real effects for firms in low pass-through industries that borrowed from banks exposed to inflation:
    - Post-2021, these firms had lower interest coverage ratios, weaker credit ratings, lower return on assets, and lower investment.
- Overall, banks exposed to corporate inflation rebalanced their portfolios away from low pass-through firms.

# Literature

- Impact of inflation on bank intermediation.

## [Agarwal and Baron \(JFE 2023\)](#):

- During the unexpected rise in U.S. inflation in the 1970s, banks exposed to inflation reduced lending more, through lower bank net worth, loan misallocation, and deposit outflows.

## [Boyd, Levine, Smith \(JME 2001\)](#):

- At low-to-moderate rates of inflation, there is a strong negative association between inflation and lending by the financial sector to the private sector.

## [Jain and Converse \(2023\)](#)

- Bank stock prices outperform the broader stock market on higher-than-expected consumer price inflation prints.
- Channel: higher-than-expected inflation causes interest rates to rise, and consequently, bank profits to rise due to incomplete passthrough of higher rates into bank deposit rates.

# Literature

- Impact of inflation on firms' balance sheets.

## [Brunnermeier et al. \(2023\):](#)

- The German hyper-inflation of 1919-1923 reduced the real debt burdens and incidence of bankruptcy for levered firms, increased equity values and employment (the debt-inflation channel)

## [Coiboin, Gorodnichenko, Ropele \(QJE 2020\):](#)

- Firm with higher inflation expectations increase prices, increase demand for credit, reduce employment and capital.

→ We focus on the impact of inflation on bank credit while controlling for the monetary policy response;

→ Exploit the heterogeneous impact of inflation across industries.



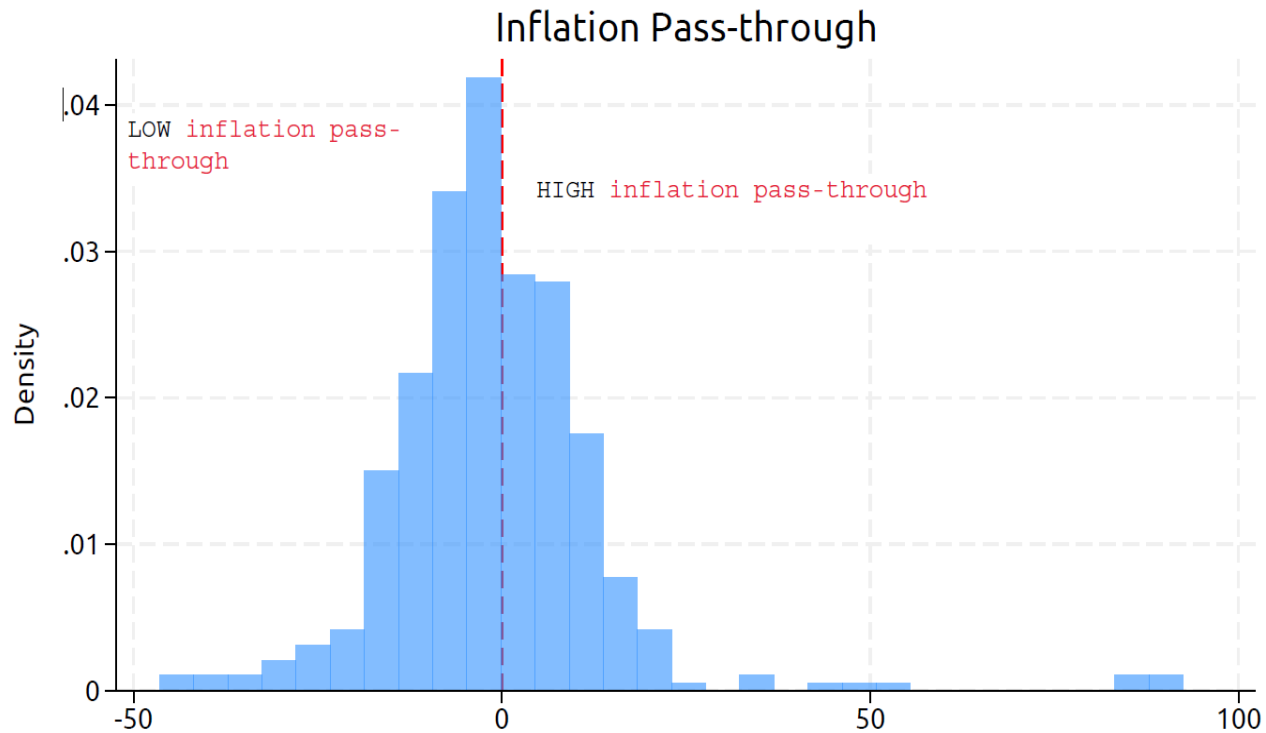
# Measurement

# Data sources

- **Bureau of Labor Statistics:** Input Price and Producer Price Index (IPI, PPI) at 3-digit NAICS
  - IPI captures the cost of domestic and imported inputs; excludes the cost of capital and labor.
  - We do not take a stance on why firms/industries suffer higher input price inflation (shortages, energy prices, wages)...
  - ... or why they differ in ability to pass input price inflation to output prices (competition, regulation, etc.)
- **Y-14Q H1:** bank loan level data from credit registry, 2018Q1-2023Q2
  - Loan amount and loan spreads
  - Borrower information: name, industry, firm characteristics, location
  - We match Y-14Q with the BLS data at the 3-digit NAICS level
- **Y-9C:** quarterly bank level data

# Firm and industry exposure to inflation

- Low inflation pass-through:  $\text{PPI inflation} - \text{IPI inflation} < 0$
- High inflation pass-through:  $\text{PPI inflation} - \text{IPI inflation} > 0$



Note: Inflation Pass-Through is:  
3-digit NAICS percentage difference between one-year PPI growth and Input Price Index growth post 2021

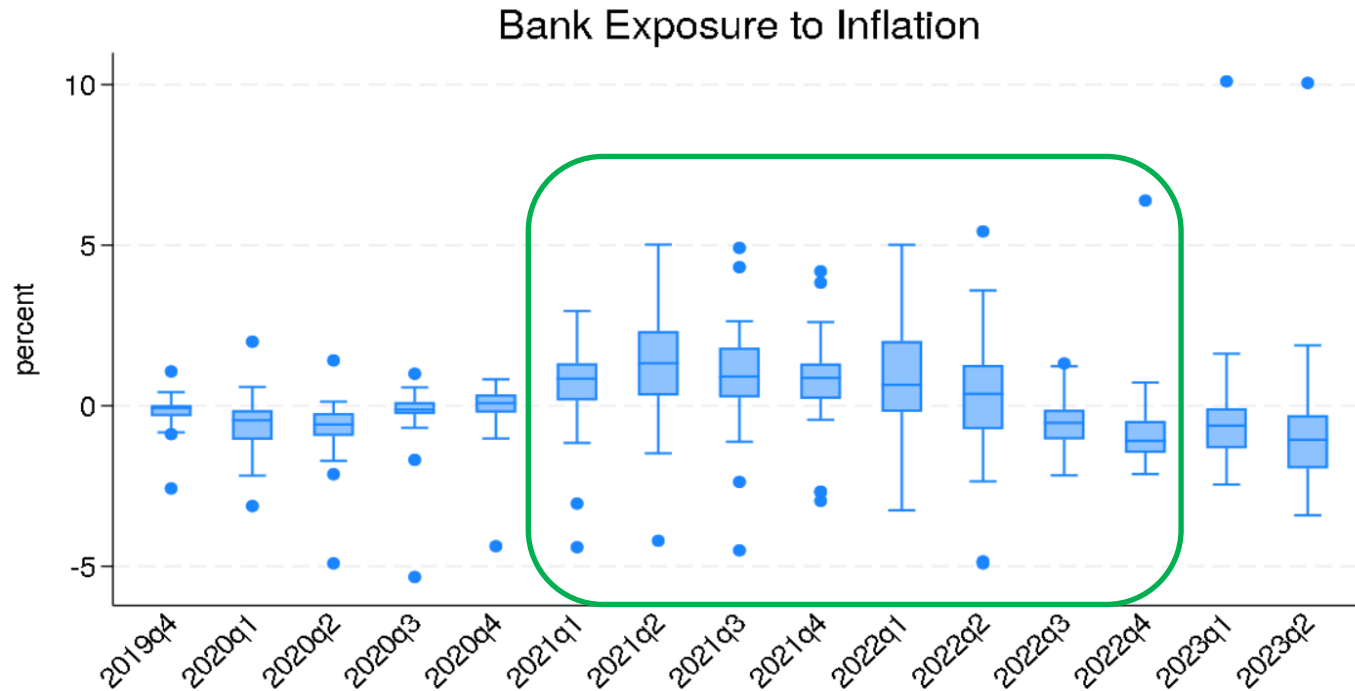
	Total Outstanding Loans (\$billion)				number of industries
	2023Q2	2023Q1	2021Q1	2019Q1	
High pass-through firm	842	851	783	703	21
Low pass-through firm	867	873	814	753	19
<b>Total</b>	<b>1709</b>	<b>1724</b>	<b>1597</b>	<b>1456</b>	<b>40</b>

# List of industries by inflation pass-through

NAICS3 Low Pass-through	NAICS3 High Pass-through
213 support activities for mining	211 oil and gas extraction
221 utilities	212 mining (except oil and gas)
311 food manufacturing	313 textile mills
312 beverage and tobacco product	316 leather and allied product manufacturing
314 textile product mills	321 wood product manufacturing
315 apparel manufacturing	322 paper manufacturing
325 chemical manufacturing	323 printing and related support activities,
327 nonmetallic mineral product	324 petroleum and coal products
333 machinery manufacturing	326 plastics and rubber products
334 computer and electronic product manufacturing	331 primary metal manufacturing
336 transportation equipment manufacturing	332 fabricated metal product manufacturing
339 miscellaneous manufacturing	335 electrical equipment, appliance, and component
481 air transportation	337 furniture and related product manufacturing
482 rail transportation	423 merchant wholesalers, durable goods
484 truck transportation	424 merchant wholesalers, nondurable goods
491 postal service	441 motor vehicle and parts dealers
492 couriers and messengers	444 building material and garden equipment and supplies dealers
517 telecommunications	445 food and beverage stores
622 hospitals	483 water transportation
	493 warehousing and storage
	721 accommodation, including hotels and motels

# Bank exposure to inflation

$$Bank\ Inflation\ Exposure_b = - \sum_j \underbrace{\frac{Commitment_{bj}}{Commitment_b}}_{\text{Pre-inflation period 2018-19}} \underbrace{(PPI\ inflation_j - IPI\ inflation_j)}_{\text{Inflation period 2021-onward}}$$



Source: Bureau of Labour Statistics  
 PPI is producer price index and IPI is input price index at 3-digit NAICS

High values indicate that banks are exposed to inflation through their borrowers (i.e., they lend to low pass-through firms)

# Main Results

# Regression Specification # 1

- How lending and loan spreads relate to banks' inflation exposure?

$$\begin{aligned}
 Y_{fbt} = & \beta_1 \text{Bank Inflation Exposure}_{bi} \times \text{Post 2021}_t + \\
 & + \beta_2 \text{Bank Inflation Exposure}_{bi} + \\
 & + \beta_3 \text{Bank controls}_{bt} + \beta_4 \text{Bank controls}_{bt} \times \text{Post 2021}_t + \delta_{ft} + \gamma_b + \theta_{bf} + \epsilon_{fbt},
 \end{aligned}$$

$Y_{fbt}$  Firm-bank loan growth/ loan spread

$\delta_{ft}$  Firm\*time fixed effects

$\gamma_b$  Bank fixed effects

$\theta_{bf}$  Bank-firm fixed effects

$$\text{Bank Inflation Exposure}_{bi} = - \sum_{j \neq i} \underbrace{\frac{\text{Commitment}_{bj}}{\text{Commitment}_b}}_{\text{Pre-inflation period 2018-19}} \underbrace{(\text{PPI inflation}_j - \text{IPI inflation}_j)}_{\text{Inflation period 2021-onward}},$$

## Regression Specification # 2

- How does bank exposure to inflation affect loan growth and spread for low inflation vs high inflation pass-through firms?

$$\begin{aligned} Y_{fbt} = & \beta_1 \text{Bank Inflation Exposure}_{bi} \times \text{Post 2021}_t + \\ & + \beta_2 \text{Bank Inflation Exposure}_{bi} \times \text{Post 2021}_t \times \text{Low pass through}_f + \\ & + \beta_3 \text{Low pass through}_f \times \text{Post 2021}_t + \beta_4 \text{Low pass through}_f \times \text{Bank Inflation Exposure}_{bi} + \\ & + \beta_5 \text{Bank Inflation Exposure}_{bi} + \beta_6 \text{Low pass through}_f + \\ & + \beta_7 \text{Bank controls}_{bt} + \beta_8 \text{Bank controls}_{bt} \times \text{Post 2021}_t + \delta_{ft} + \gamma_b + \theta_{bf} + \epsilon_{fbt}, \end{aligned}$$



# Results

Dependent variable:	(1) log(Commitments)	(2)	(3) Cumulative Growth of Commitments	(4)	(5) Loan spreads	(6)
Bank Inflation Exposure × Post 2021	-0.019*** (0.004)	0.001 (0.005)	-0.034*** (0.008)	-0.003 (0.013)	0.054*** (0.007)	0.031*** (0.009)
Bank Inflation Exposure × Post 2021 × Low Pass-through Firm		-0.036*** (0.007)		-0.060*** (0.017)		0.033*** (0.013)
Observations	342,629	318,584	339,847	315,959	256,602	238,556
R-squared	0.95	0.96	0.81	0.81	0.92	0.91
Lower-level interactions and controls	Yes	Yes	Yes	Yes	Yes	Yes
FE bank	Yes	Yes	Yes	Yes	Yes	Yes
FE bank × firm	Yes	Yes	Yes	Yes	Yes	Yes
FE firm × time	Yes	Yes	Yes	Yes	Yes	Yes

- Impact: One st dev increase in bank inflation exposure (1.15%) translates into 4.1% decrease in committed amounts post-2021 for low pass-through firms.

Mechanisms:

Borrower credit quality and bank capital

# Mechanism: the role of borrowers' credit quality

Dependent variable:	(1) <b>PD</b>	(2) <b>Rating</b>
Bank Inflation Exposure × Post 2021 × Low Pass-through Firm	0.002** (0.001)	0.018* (0.010)
Bank Inflation Exposure × Post 2021	-0.001 (0.001)	0.027*** (0.008)
Observations	276,847	317,509
R-squared	0.82	0.92
R-squared across	0.731	0.879
R-squared within	0.000574	0.00594
Lower-level interactions and controls	Yes	Yes
Bank controls, in levels and interacted w/ Post 2021	Yes	Yes
FE bank	Yes	Yes
FE bank-firm	Yes	Yes
FE firm-time	Yes	Yes
FE firm		
FE time		
Firm controls, in levels and interacted w/ Post 2021		

- Banks with high exposure to inflation are associated with weaker low pass-through firms post-2021.

# Mechanism: the role of bank capital

Dependent variable:	(1) log(Commitments)	(2) Cumulative Growth of Commitments	(3) Loan spreads
Bank Inflation Exposure $\times$ Post 2021	0.085** (0.038)	-0.077 (0.092)	-0.650*** (0.080)
Bank Inflation Exposure $\times$ Post 2021 $\times$ Low Pass-through Firm	-0.237*** (0.065)	-0.297** (0.139)	-0.261** (0.102)
Bank Inflation Exposure $\times$ Post 2021 $\times$ Low Pass-through Firm $\times$ Low Capital	-0.015*** (0.005)	-0.019* (0.010)	-0.022*** (0.008)
Observations	318,584	315,967	238,556
R-squared	0.96	0.81	0.91
Lower-level interactions and controls	Yes	Yes	Yes
Bank controls, in levels and interacted w/ Post 2021	Yes	Yes	Yes
FE bank	Yes	Yes	Yes
FE bank $\times$ firm	Yes	Yes	Yes
FE firm $\times$ time	Yes	Yes	Yes

- Given credit quality concerns, banks with low capital restricted credit more.

Competing explanation:  
The role of monetary policy

# Control for monetary policy tightening

- Exposure through security losses

- Banks with larger fixed-rate security losses may cut lending more.
- Results may not hold if bank inflation exposure is correlated with security losses.

- Exposure through fixed-rate loans

- Banks more exposed to fixed-rate loans may cut lending more.
- Problem if bank inflation exposure is correlated with fixed-rate loans exposures.

# Competing explanations: control for monetary policy

- Exposure to higher interest rates: security valuation losses & fixed rate loans

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	log(Commitments)			Cumulative Growth of Commitments			Loan spreads		
Bank Inflation Exposure × Post 2021	0.000 (0.005)	0.002 (0.005)	0.000 (0.005)	-0.005 (0.014)	-0.002 (0.013)	-0.005 (0.014)	0.031*** (0.009)	0.046*** (0.009)	0.049*** (0.010)
Bank Inflation Exposure × Post 2021 × Low Pass-through Firm	-0.042*** (0.007)	-0.036*** (0.007)	-0.041*** (0.007)	-0.071*** (0.018)	-0.058*** (0.017)	-0.069*** (0.018)	0.031** (0.013)	0.040*** (0.013)	0.038*** (0.013)
Security Loss Exposure × Post 2021	-0.007 (0.005)		0.092*** (0.019)	-0.016 (0.010)		0.258*** (0.047)	-0.003 (0.006)		-0.037* (0.021)
Security Loss Exposure × Post 2021 × Low Pass-through Firm	0.064*** (0.018)		-0.006 (0.005)	0.178*** (0.044)		-0.013 (0.010)	-0.042** (0.020)		0.015** (0.006)
Fixed Rate Loan Exposure × Post 2021		-0.000 (0.001)	-0.001 (0.001)		-0.001 (0.002)	-0.003 (0.002)		-0.008*** (0.002)	-0.009*** (0.002)
Fixed Rate Loan Exposure × Post 2021 × Low Pass-through Firm		0.002** (0.001)	0.001* (0.001)		0.003* (0.002)	0.003* (0.002)		0.027*** (0.002)	0.028*** (0.002)
Observations	318,584	318,584	318,584	315,967	315,967	315,967	238,556	238,556	238,556
R-squared	0.96	0.96	0.96	0.81	0.81	0.81	0.91	0.91	0.91
Lower-level interactions and controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank controls, in levels and interacted w/ Post 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE bank	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE bank × firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE firm × time	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

# Real Effects



# Real Effects: collapse Y-14Q data at the firm level

Dependent variable:	(1) log(Utilization)	(2) ICR	(3) Rating	(4) ROA	(5) Cash	(6) Leverage	(7) Capex
Avrg. Bank Inflation Exposure × Post 2021 × Low Pass-through Firm	0.004*** (0.001)	-0.077* (0.041)	0.011* (0.006)	-0.008** (0.003)	-0.000 (0.000)	0.001 (0.001)	-0.065* (0.036)
Low Pass-through Firm × Post 2021	0.035*** (0.006)	-1.416*** (0.165)	0.109*** (0.019)	-0.085*** (0.010)	-0.008*** (0.002)	0.019*** (0.002)	0.020 (0.122)
Avrg. Bank Inflation Exposure × Post 2021	-0.005*** (0.001)	0.019 (0.042)	-0.005 (0.006)	0.006* (0.003)	0.000 (0.000)	0.000 (0.001)	-0.023 (0.027)
Avrg. Bank Inflation Exposure × Low Pass-through Firm	-0.006*** (0.001)	0.046* (0.027)	-0.009** (0.005)	0.005** (0.002)	0.000 (0.000)	-0.002*** (0.001)	0.003 (0.030)
Avrg. Bank Inflation Exposure	0.005*** (0.001)	0.019 (0.028)	0.006 (0.005)	-0.002 (0.002)	-0.000 (0.000)	-0.001 (0.001)	-0.037 (0.030)
Low Pass-through Firm (dummy)	-0.031*** (0.006)	0.633*** (0.132)	-0.043*** (0.017)	0.040*** (0.008)	0.003* (0.002)	-0.012*** (0.003)	-0.113 (0.140)
Observations	75,941	67,362	82,691	82,708	82,708	78,840	33,931
R-squared	0.71	0.68	0.76	0.66	0.75	0.78	0.66
Firm controls, in levels and interacted w/ Post 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Avrg. bank controls, in levels and interacted w/ Post 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE time	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: ICR (interest coverage ratio) = EBITDA/Interest expense; Rating = higher is worse; Capex = capital expenditure/assets.

# Conclusion

- Inflation impacted firms and industries differently.
  - Banks with high exposure to inflation cut credit to low pass-through firms.
- Low pass-through firms became financially weaker.
  - Banks with lower capital cut lending more.
- Results are robust to controlling for monetary policy tightening.
- The reduction in credit had real effects.
  - Firms with low pass-through experienced worse interest coverage ratios, credit ratings, ROA, and investment.

Thank you!

# Appendix

# Research questions

## Questions:

1. Was there a link between low inflation pass-through and firms' creditworthiness, access to bank credit?
2. Did banks' exposure to inflation (i.e., through low pass-through borrowers) affect their lending post-2021?
3. Were there real effects on borrowers that lost access to credit?

## Hypotheses:

1. Firms in low pass-through industries experienced a deterioration in credit quality.
2. Banks exposed to inflation through *low* pass-through firms cut lending and increased spreads by more post-2021.
3. Affected firms decreased investment.

# Inflation channels

- Banks that are exposed to inflation cut lending relatively more than other banks (Agarwal and Baron, 2023) (supply effect)
  - ✓ net wealth: reduction in equity values due to **lower NIMs and** long-term fixed rate loans leads to reduction in lending
  - ✓ loan misallocation: **shift away from long-term loans, toward inflation-protected assets.**
  - ✓ deposit outflows : **regulatory** ceilings on deposit rates, higher deposit outflows
- Debt-inflation channel through firms
  - large reduction in real debt burden for levered *firms* results in a large decline in bankruptcies (Brunnermeier et al. 2023)
  - **But high inflation could erode borrowers' profitability and ability to repay loans.**

# Sample characteristics

	mean	sd
<b>bank-firm level (like loan level)</b>		
loan size (million)	36	143
loan spread %	1.37	1.1
prob. of default %	1.9	7.7
investment grade (1/0)	0.43	0.49
<b>Bank level</b>		
Bank inflation exposure %	0.074	1.15
Tier 1 Capital %	13	2.08
ROA %	1.05	1.04
Uninsured Deposits/Total Deposits %	45	13
Assets (billion)	758	928
<b>BLS price indexes</b>		
PPI (Producer Price Index) %	5.71	12.9
Input Price Index (IPI) %	6.8	11.5

# Pre/post-2021 firm characteristics

- Low inflation pass-through firms' quality deteriorates during the post-2021 inflation period

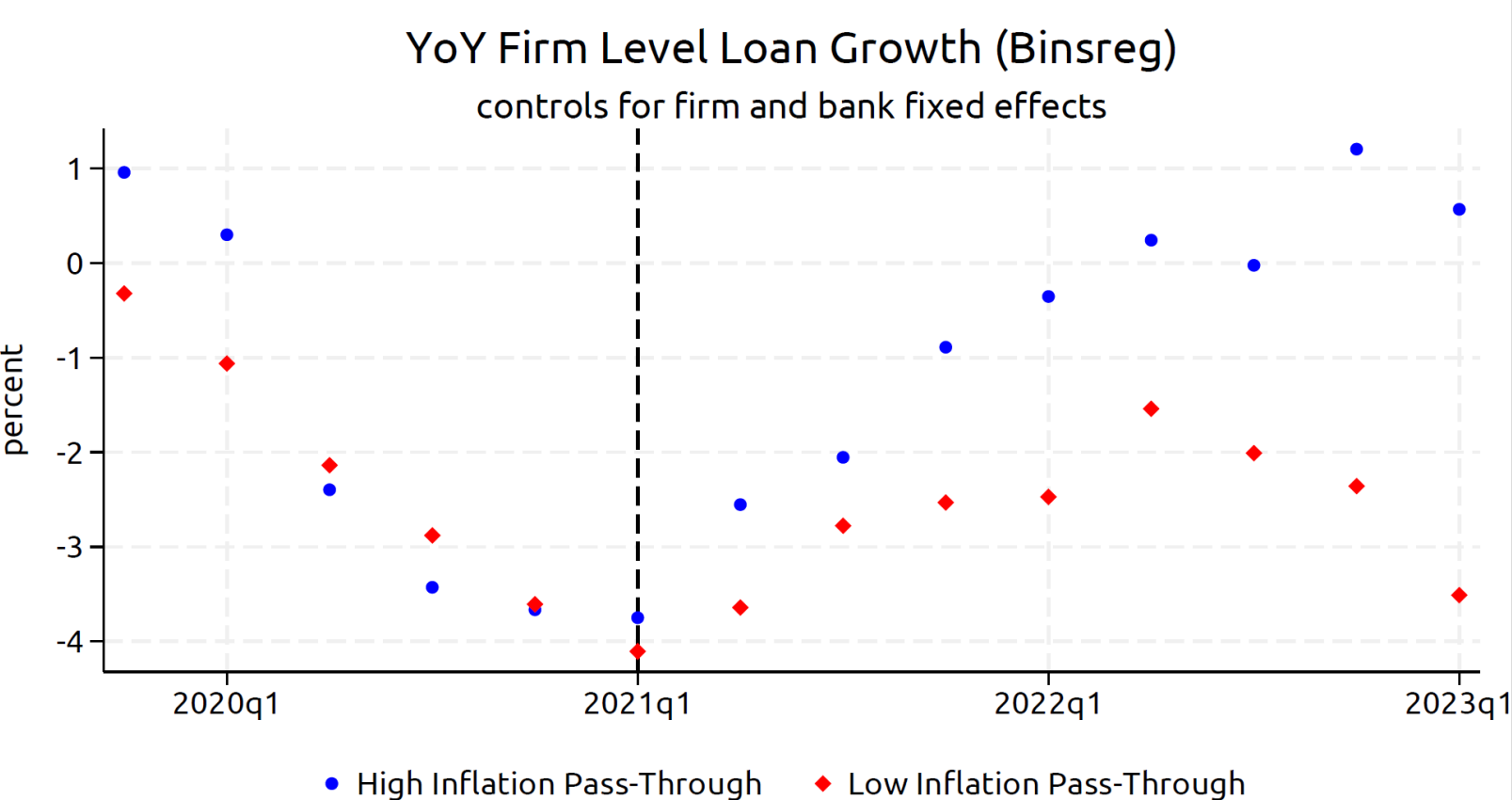
	Pre-2021				
	Prob of default %	Past due (1/0)	Spread %	ROA (%)	Sales growth %
Low-pass through firm	1.8	0.009	0.9	11	2.4
High-pass through firm	2.4	0.009	1.4	11	2.5
<i>Difference (low -high)</i>	-0.4***	0.0005	-0.5***	0	-0.1
	Post-2021				
Low-pass through firm	2.5	0.01	1.3	10	2.8
High-pass through firm	2.2	0.009	1.6	15	3.7
<i>Difference (low -high)</i>	0.03**	0.002**	-0.3***	-5.00***	-1.1**

Notes: Spread is % above base rate



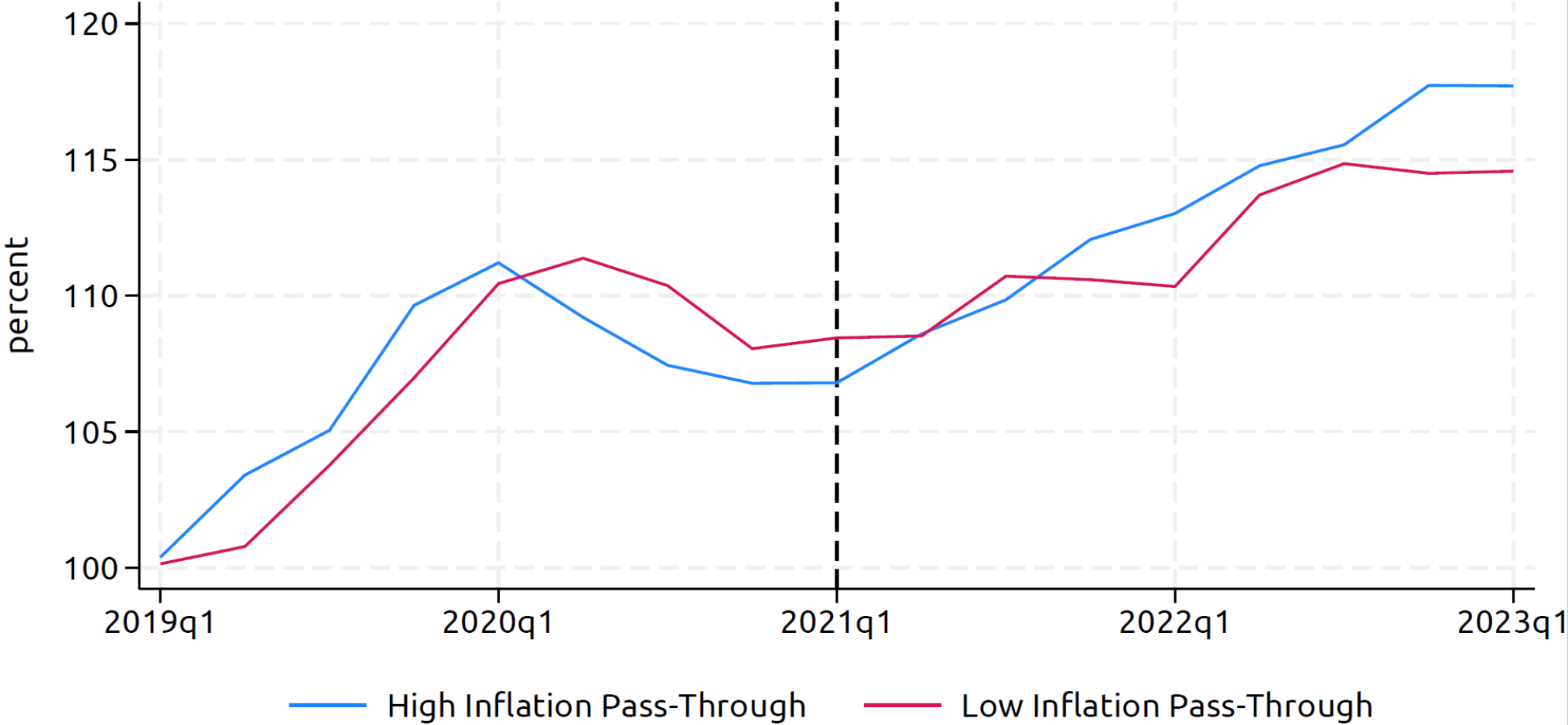
# Firm loan growth and inflation pass-through

- Firms in low inflation pass-through industries have weaker loan growth



Note: High/Low Inflation Pass-Through: 3-digit NAICS with positive/negative percentage difference between one-year PPI growth and Input Price Index growth for at least six quarters post-2021q1

# Total Loan Growth



Note: High/Low Inflation Pass-Through: 3-digit NAICS with positive/negative percentage difference between one-year PPI growth and Input Price Index growth for at least six quarters post-2021q1  
\*Average outstanding loan level in 2018 and 2019 is the base

# Bank inflation exposure varies by bank-industry

$$\text{Bank Inflation Exposure}_{bi} = - \sum_{j \neq i} \underbrace{\frac{\text{Commitment}_{bj}}{\text{Commitment}_b}}_{\text{Pre-inflation period 2018-19}} \underbrace{(\text{PPI inflation}_j - \text{IPI inflation}_j)}_{\text{Inflation period 2021-onward}},$$

# Results

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	log(Commitments)		Cumulative Growth of Commitments		Loan spreads	
Bank Inflation Exposure × Post 2021	-0.019*** (0.004)	0.001 (0.005)	-0.034*** (0.008)	-0.003 (0.013)	0.054*** (0.007)	0.031*** (0.009)
Bank Inflation Exposure × Post 2021 × Low Pass-through Firm		-0.036*** (0.007)		-0.060*** (0.017)		0.033*** (0.013)
Uninsured Deposits Ratio	-0.145*** (0.047)	-0.132*** (0.050)	-0.209** (0.101)	-0.184* (0.108)	-0.151** (0.076)	-0.167** (0.079)
Uninsured Deposits Ratio × Post 2021	0.007 (0.030)	-0.011 (0.033)	-0.009 (0.059)	-0.028 (0.064)	0.118** (0.055)	0.130** (0.059)
CET1 Ratio	0.004* (0.002)	0.003 (0.003)	0.004 (0.005)	0.000 (0.006)	-0.023*** (0.004)	-0.024*** (0.005)
CET1 Ratio × Post 2021	-0.011*** (0.002)	-0.010*** (0.002)	-0.026*** (0.004)	-0.025*** (0.005)	0.053*** (0.004)	0.052*** (0.005)
ROA	0.001 (0.003)	0.002 (0.003)	0.003 (0.006)	0.004 (0.006)	-0.003 (0.005)	-0.001 (0.006)
ROA × Post 2021	0.013** (0.005)	0.012** (0.005)	0.028*** (0.010)	0.032*** (0.010)	-0.010 (0.009)	-0.010 (0.010)
Log(Assets)	0.143*** (0.019)	0.143*** (0.020)	0.278*** (0.038)	0.272*** (0.040)	0.203*** (0.020)	0.189*** (0.021)
Log(Assets) × Post 2021	0.005* (0.003)	0.004 (0.003)	0.004 (0.006)	0.006 (0.006)	-0.034*** (0.006)	-0.029*** (0.006)
Observations	342,629	318,584	339,847	315,959	256,602	238,556
R-squared	0.95	0.96	0.81	0.81	0.92	0.91
Lower-level interactions and controls	Yes	Yes	Yes	Yes	Yes	Yes
FE bank	Yes	Yes	Yes	Yes	Yes	Yes
FE bank × firm	Yes	Yes	Yes	Yes	Yes	Yes
FE firm × time	Yes	Yes	Yes	Yes	Yes	Yes

- One st dev increase in bank inflation exposure (1.15%) translates into 4.1% decrease in committed amounts post-2021 for low pass-through firms.

# Results

	log (committed)		Spread at the firm-bank level	
	(1)	(2)	(3)	(4)
Bank inflation exposure	-0.151*** (0.045)	-0.099*** (0.029)	-0.030 (0.023)	-0.024 (0.030)
Post 2021*Low pass-through firm*Bank inflation exposure		-0.039*** (0.007)		0.033*** (0.013)
Post 2021*Bank inflation exposure	-0.034*** (0.008)	0.001 (0.005)	0.054*** (0.007)	0.031*** (0.009)
Low pass-through firm		-0.040** (0.016)		0.015 (0.018)
Post 2021*Low pass-through firm		-0.003 (0.009)		-0.011 (0.012)
Low pass-through firm*Bank inflation exposure		0.023 (0.023)		-0.009 (0.025)
Bank Controls	Yes	Yes	Yes	Yes
Bank Controls*Post 2021	Yes	Yes	Yes	Yes
Observations	339,847	318,584	256,602	238,556
R-squared	0.81	0.96	0.92	0.91
Fixed Effects	bank, bank-firm, firm*year-quarter			

Decomposition of triple interaction	
column (2)	
	Post 2021
Low pass-through firm	<b>-0.154</b>
High pass-through firm	<b>-0.098</b>
Δ	-0.056
	Pre 2021
Low pass-through firm	<b>-0.116</b>
High pass-through firm	<b>-0.099</b>
Δ	-0.017
diff-in-diff	<b>-0.039</b>

- 1 st dev increase in bank inflation exposure (1.15%) translates into 4.4% decrease in committed amounts in the post vs pre 2021 for low vs high pass-through firms

# Competing explanations

- Exposure to higher interest rates: security losses & fixed rate loans

	Exposure through securities		Fixed-rate Loans exposures		Both	
	Log (committed)	Spread at the firm-bank level	Log (committed)	Spread at the firm-bank level	Log (committed)	Spread at the firm-bank level
Post 2021*Low pass-through firm*Bank inflation exposure	-0.042*** (0.007)	0.031** (0.013)	-0.036*** (0.007)	0.040*** (0.013)	-0.041*** (0.007)	0.038*** (0.013)
Full interaction terms with low pass-through and bank infl. exposure	yes	yes	yes	yes	yes	yes
Post 2021*Low pass-through firm*Interest Rate Exposure	0.064*** (0.018)	-0.042** (0.020)			-0.006 (0.005)	0.015** (0.006)
Post 2021* Interest Rate Exposure	-0.007 (0.005)	-0.003 (0.006)			0.092*** (0.019)	-0.037* (0.021)
Low pass-through firm*Interest Rate Exposure	-0.023*** (0.006)	-0.014* (0.008)			-0.006 (0.005)	0.015** (0.006)
Post 2021*Low pass-through firm*Fixed-Loan Exposure			0.002** (0.001)	0.027*** (0.002)	0.001* (0.001)	0.028*** (0.002)
Post 2021*Fixed-Loan Exposure			-0.000 (0.001)	-0.008*** (0.002)	-0.001 (0.001)	-0.009*** (0.002)
Low pass-through firm*Fixed-Loan Exposure			0.014*** (0.003)	0.010** (0.004)	0.017*** (0.003)	0.008* (0.004)
Bank controls	yes	yes	yes	yes	yes	yes
Bank controls* Post 2021	yes	yes	yes	yes	yes	yes
Observations	318,584	238,556	318,584	238,556	318,584	238,556
R-squared	0.96	0.91	0.96	0.91	0.96	0.91
FE	bank, bank-firm, firm*year-quarter					

Exposure through securities: (pre 2021: Fair value -Amortized Cost)/Amortized Cost; Fixed-Loan Exposure is the share of fixed rate c&l loans to committed loan pre 2021

# Mechanism: decline in credit quality

- Banks with high exposure to inflation experience weaker credit quality in connection with low pass-through firms in the post 2021 period.

Dependent variable:	(1) PD	(2) Rating
Bank Inflation Exposure $\times$ Post 2021 $\times$ Low Pass-through Firm	0.002** (0.001)	0.018* (0.010)
Bank Inflation Exposure $\times$ Post 2021	-0.001 (0.001)	0.027*** (0.008)
Observations	276,847	317,509
R-squared	0.82	0.92
R-squared across	0.731	0.879
R-squared within	0.000574	0.00594
Lower-level interactions and controls	Yes	Yes
Bank controls, in levels and interacted w/ Post 2021	Yes	Yes
FE bank	Yes	Yes
FE bank-firm	Yes	Yes
FE firm-time	Yes	Yes
FE firm		
FE time		
Firm controls, in levels and interacted w/ Post 2021		



# Real Effects

	Utilized Credit Lines %	Interest Coverage Ratio	Rating	ROA%	Capex%
Post 2021*Low infl passthrough firm*Average Bank inflation exposure	0.004*** (0.001)	-0.077* (0.041)	0.011* (0.006)	-0.008** (0.003)	-0.065* (0.036)
Low infl passthrough firm* Average Bank inflation exposure	-0.006*** (0.001)	0.046* (0.027)	-0.009** (0.005)	0.005** (0.002)	0.003 (0.030)
Average Bank inflation exposure	0.005*** (0.001)	0.019 (0.028)	0.006 (0.005)	-0.002 (0.002)	-0.037 (0.030)
Post 2021* Average Bank inflation exposure	-0.005*** (0.001)	0.019 (0.042)	-0.005 (0.006)	0.006* (0.003)	-0.023 (0.027)
Low pass-through firm	-0.031*** (0.006)	0.633*** (0.132)	-0.043*** (0.017)	0.040*** (0.008)	-0.113 (0.140)
Post 2021*Low pass-through firm	0.035*** (0.006)	-1.416*** (0.165)	0.109*** (0.019)	-0.085*** (0.010)	0.020 (0.122)
Firm conrols	Yes	Yes	Yes	Yes	Yes
Firm conrols*Post 2021	Yes	Yes	Yes	Yes	Yes
Average Bank Controls	Yes	Yes	Yes	Yes	Yes
Average Bank Controls*Post 2021	Yes	Yes	Yes	Yes	Yes
Observations	75,941	67,362	82,691	82,708	33,931
R-squared	0.71	0.68	0.76	0.66	0.66
Fixed Effects			firm, year-quarter		

Note: Interest Coverage Ratio: EBITDA/Interest Expense; Capex is capital expenditure/assets; Rating, higher values are worse