

Expectations and Bank Lending

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Motivation

- Beliefs of lenders often thought to be central in macro-finance
 - ▶ One of the most promising explanations of credit cycles
 - ▶ **Limited data** on lenders' beliefs and connections to real outcomes
- Previous expectations data mostly about beliefs of central tendencies
 - ▶ But beliefs about tails are also central, esp for lending (Simsek 13)
 - ▶ Default states are payoff relevant to lenders

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 - ▶ Default states are payoff relevant to lenders

This paper: granular data on beliefs of largest lenders in US (FR Y-14A)

- **Baseline + Tail** (severely adverse)
- For each **MSA by year**: house price index growth, unemployment rate
- Link to **US "credit registry"**: loans & firm outcomes (FR Y-14H1)

Main Findings

- 1 Banks more pessimistic about economic conditions of an MSA
⇒ Less credit to firms in that MSA
 - ▶ Firms see lower loan growth
 - ▶ Also higher rates, especially pronounced for riskier firms
 - ▶ Can use firm-year FE to tease out credit demand;
bank-year FE to tease out bank conditions
- 2 Firms w/ more pessimistic banks: also lower total borrowing & CAPX
 - ▶ Real effects from imperfect substitution
- 3 Beliefs about tails are key.
Beliefs about central tendencies have little impact in our data.

Literature

Lending and Credit Cycles

- Lender expectations conjectured as important for credit availability
- Minsky 77, Kindleberger 78, Fahlenbrach-Stulz 11, Simsek 13, Greenwood-Hanson 13, Cheng-Raina-Xiong 14, Ma 15, Baron-Xiong 17, Fahlenbrach-Prilmeier-Stulz 18, Baron-Verner-Xiong 18, Gennaioli-Shleifer 18, Richter-Zimmermann 19

Impact of Expectations

- Firms: Gennaioli-Ma-Shleifer 15, Barrero 20, Ma et al 20, Bordalo et al 19
- Capital markets: Greenwood-Shleifer 14, Bordalo-Gennaioli-Shleifer 18, Bordalo et al 20, Brooks-Lustig-Katz 19, Giglio et al 20

This paper: granular data on banks' expectations; baseline + tail

Road Map

1 Overview

2 Data

3 Expectations and Bank Lending

Data Sources

FR Y-14A: projections of **house price index (HPI)**, **unemployment rate**

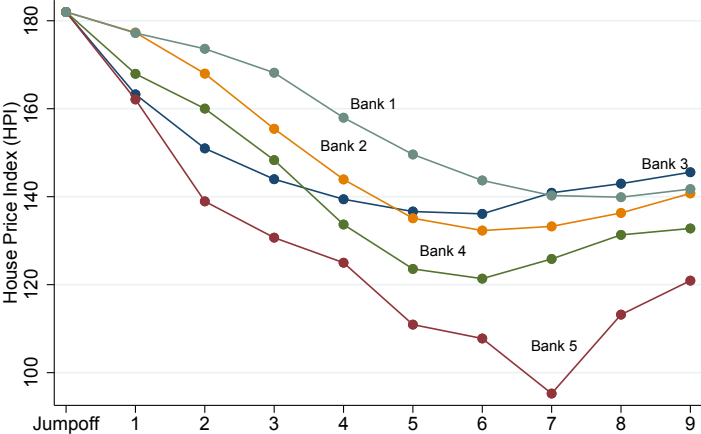
- **By 392 MSAs**, each year: 2014—2019
- For both **severely adverse scenario** and **baseline scenario**
 - ▶ Severely adverse: describes hypothetical adverse economic conditions
 - ▶ Baseline: similar macro condition to average Blue Chip projections
 - ▶ Over nine quarter horizon

FR Y-14H1: loan-level data à la “credit registry”

- Both outstanding loan amount and new loan issuance
- We focus on C&I lending:
 - ▶ In this period, relatively limited risky lending in residential mortgages

Illustration: Bank Projections

Hypothetical HPI projections
within MSA and across banks



Summary Statistics: Bank Projections

	# MSAs	# Banks	N	mean	p50	sd	25th	75th
SA HPI Drop	392	11	17,423	19.43	19.64	9.36	13.68	25.12
Baseline HPI Drop	392	8	12,794	-0.62	-0.67	1.35	-1.14	-0.15
SA Unempl Incr	392	8	9,467	4.80	4.80	2.12	3.55	5.97

- SA: severely adverse. HPI: house price index.
- HPI drop: $(\min \text{HPI} - \text{jumpoff HPI}) / \text{jumpoff HPI}$
- Unempl incr: $(\max \text{unemployment rate} - \text{jumpoff unempl rate})$
- All units in percentages. Larger value means worse outcome.

- Unemployment projections have less coverage
 - ▶ One fewer year. Not as many banks.

Summary Statistics: Firms and Loans

Firm Level	mean	p50	sd	p25	p75
Log (assets)	16.79	16.44	2.18	15.38	17.85
Sales Growth	14.79	8.74	24.90	0.85	21.29
Return on Assets (ROA)	15.76	10.95	17.39	5.07	20.21
Book Leverage	33.52	30.04	27.03	8.21	54.33
Loan Share in Total Debt	0.64	0.83	0.39	0.24	1.00
Avg # of Banks	1.5	1	1.1	1	3
Loan Growth	0.11	-0.43	32.68	-6.364	2.156

Loan Level	mean	p50	sd	p25	p75
Log (loan size in \$B)	-5.31	-5.63	1.38	-6.41	-4.42
Loan Rates	3.55	3.48	1.48	2.50	4.38
Real Estate Purpose (1/0)	0.14				
Secured by Real Estate (1/0)	0.14				
Unsecured (1/0)	0.22				

$$\text{Loan growth}_{it} = (\text{Loan}_{it} - \text{Loan}_{it-1}) / (0.5\text{Loan}_{it} + 0.5\text{Loan}_{it-1})$$

Median firm assets: \$14M. Median loan size: \$4M.

Relationships among Different Projections

	SA HPI Drop					
	(1)	(2)	(3)	(4)	(5)	(6)
SA Unemp Incr	0.693*** (0.038)	0.238*** (0.049)	0.861*** (0.039)	0.163*** (0.059)	0.393*** (0.04)	0.531*** (0.047)
R^2	0.292	0.203	0.425	0.181	0.595	0.807
Fixed effects	Bank	MSA	Bank*Year	MSA*Year	MSA*Bank	B*Y, M*Y, M*B

	SA HPI Drop					
	(1)	(2)	(3)	(4)	(5)	(6)
Base HPI Drop	0.489*** (0.055)	0.488*** (0.054)	0.265*** (0.05)	0.267*** (0.058)	0.994*** (0.047)	0.722*** (0.035)
R^2	0.218	0.256	0.418	0.247	0.578	0.837
Fixed effects	Bank	MSA	Bank*Year	MSA*Year	MSA*Bank	B*Y, M*Y, M*B

What Explains the Projections?

	SA HPI Drop		Baseline HPI Drop		SA Unempl Incr	
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged projection	0.654*** (0.069)	0.437*** (0.068)	0.323*** (0.098)	0.250** (0.098)	-0.286 (0.405)	-1.831** (0.821)
L.MSA HPI Growth	0.322*** (0.118)	-0.056 (0.136)	-0.035** (0.014)	-0.016 (0.013)		
L.MSA Unempl Rate					0.064 (0.153)	-0.319* (0.161)
L.Bank ROA	-0.816** (0.310)	0.344 (0.351)	0.107*** (0.027)	0.148* (0.075)	-0.376 (0.250)	-0.418** (0.181)
L.Bank Tier 1	0.011 (0.419)	-2.050*** (0.632)	0.138** (0.062)	-0.006 (0.185)	0.154 (0.116)	0.430 (0.347)
L.Log (Bank Assets)	-1.231 (2.406)	-39.674 (23.804)	-6.112 (4.059)	-13.764** (5.080)	0.128 (0.291)	-11.229 (6.897)
Fixed Effects	None	B/M/Y	None	B/M/Y	None	B/M/Y
Observations	9,154	9,154	7,997	7,997	6,578	6,578
R ²	0.517	0.643	0.180	0.223	0.0210	0.499
R ² (within)	.	0.265		0.161		0.280

Road Map

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Bank Expectations and Firm Level Loan Growth

	Firm Level Loan Growth				
	(1)	(2)	(3)	(4)	(5)
SA HPI Drop	-0.272*** (0.037)		-0.293*** (0.049)		-0.186** (0.090)
Baseline HPI Drop		0.187 (0.293)	-0.032 (0.324)		
SA Unempl Incr				-1.873*** (0.335)	-1.722*** (0.392)
L.Log (Bank Assets)	-15.039*** (2.704)	-21.894*** (2.767)	-25.025*** (3.908)	-21.959*** (3.835)	-21.327*** (3.384)
L.Bank ROA	0.082*** (0.013)	0.048*** (0.018)	0.104*** (0.021)	-0.226*** (0.026)	-0.179*** (0.039)
L.Bank Tier 1	-0.159 (0.155)	-1.243*** (0.274)	-0.592** (0.269)	-0.252 (0.350)	-0.217 (0.389)
Firm Controls			Yes		
Fixed Effects			Firm, MSA*Year, Industry*Year		
Observations	333,714	241,162	239,558	209,524	182,853
R ²	0.188	0.209	0.210	0.240	0.281

Bank Expectations and Firm Level Loan Growth

Investment Grade (IG) versus Non-IG

	Firm Level Loan Growth					
	(1)	Non-IG (2)	(3)	(4)	IG (5)	(6)
SA HPI Drop	-0.280*** (0.058)		-0.289*** (0.103)	-0.309*** (0.088)		-0.055 (0.222)
SA Unempl Incr		-2.637*** (0.824)	-2.400*** (0.777)		-2.639*** (1.367)	-3.962*** (1.376)
L.Log (Bank Assets)	-17.609*** (3.838)	-23.071*** (3.650)	-25.401*** (3.915)	-18.241*** (5.801)	-26.009 (19.663)	-19.583 (15.198)
L.Bank ROA	0.315 (0.208)	-0.186*** (0.051)	-1.206*** (0.291)	-0.965 (0.649)	-0.651*** (0.191)	-0.746 (0.475)
L.Bank Tier 1	0.068*** (0.015)	-1.461*** (0.306)	-0.138* (0.073)	0.048* (0.027)	0.458 (0.733)	-0.297* (0.152)
Firm Controls			Yes			
Fixed effects			Firm, MSA*Year, Industry*Year			
Observations	245,136	142,052	141,482	82,941	38,676	38,615
R ²	0.207	0.290	0.290	0.214	0.323	0.323

Further Results at Loan Level

Loan Level: Outstanding Loans

	Loan Growth					
	(1)	(2)	(3)	(4)	(5)	(6)
SA HPI Drop	-0.306*** (0.071)			-0.078* (0.045)		
Baseline HPI Drop		-0.175 (0.167)			0.614** (0.243)	
SA Unempl Incr			-1.333*** (0.198)			0.315 (0.381)
L.Log (Bank Assets)	-11.923*** (1.582)	6.198 (3.859)	-11.577*** (1.643)			
L.Bank ROA	3.926*** (0.640)	5.020*** (0.957)	1.300 (2.717)			
L.Bank Tier 1	-0.133 (0.134)	-0.192 (0.186)	0.315 (0.267)			
Fixed Effects	Firm*Year, Bank*MSA			Firm*Year, Bank*MSA, Bank*Year		
Observations	552,633	390,217	279,530	552,633	389,228	279,530
R ²	0.481	0.534	0.574	0.484	0.537	0.574

Loan Level: Outstanding Loans

IG versus Non-IG

	Loan Growth			
	Non-IG (1)	IG (2)	Non-IG (3)	IG (4)
SA HPI Drop	-0.296*** (0.074)	-0.312*** (0.076)	-0.099* (0.059)	-0.035 (0.038)
L.Log (Bank Assets)	-9.027*** (0.724)	-17.945*** (3.058)		
L.Bank ROA	4.144*** (0.662)	5.472*** (1.168)		
L.Bank Tier 1	0.208 (0.185)	-0.634* (0.360)		
Fixed Effects	Firm*Year, Bank*MSA		Firm*Year, Bank*MSA, Bank*Year	
Observations	335,156	198,265	335,156	198,265
R ²	0.541	0.454	0.544	0.459

Loan Level: New Loans

	Δ New Loans/L.Outstanding					
	All (1)	Non-IG (2)	IG (3)	All (4)	Non-IG (5)	IG (6)
SA HPI Drop	-0.169*** (0.027)	-0.209*** (0.052)	-0.155*** (0.029)	-0.054* (0.032)	-0.092 (0.060)	-0.026 (0.044)
L.Log (Bank Assets)	-9.023* (5.390)	5.408 (13.029)	-11.734** (4.622)			
L.Bank ROA	-7.518*** (1.661)	-7.414*** (1.933)	-6.559*** (2.139)			
L.Bank Tier 1	0.433 (0.435)	1.178** (0.564)	0.440 (0.635)			
Fixed Effects	Firm*Year, Bank*MSA			Firm*Year, Bank*MSA, Bank*Year		
Observations	521,947	317,839	186,102	521,947	317,839	186,102
R^2	0.077	0.070	0.082	0.082	0.073	0.088

Loan Rates

	Loan Rates					
	All (1)	Non-IG (2)	IG (3)	All (4)	Non-IG (5)	IG (6)
SA HPI drop	0.001 (0.001)	0.003*** (0.001)	-0.005*** (0.001)	-0.001 (0.002)	0.003*** (0.001)	-0.006*** (0.001)
L.Log (Bank Assets)	0.419*** (0.053)	0.543*** (0.065)	0.358** (0.144)			
L.Bank ROA	0.109** (0.043)	0.067* (0.035)	0.084 (0.078)			
L.Bank Tier 1	-0.036*** (0.011)	-0.030*** (0.011)	-0.019** (0.009)			
Loan Controls				Yes		
Fixed Effects	Firm*Year, Bank*MSA			Firm*Year, Bank*MSA, Bank*Year		
Observations	677,087	435,114	227,402	677,096	435,114	227,402
R ²	0.785	0.820	0.721	0.786	0.820	0.721

Are HPI Projections Only about Real Estate Value?

Firm Level Loan Growth

	Real Estate Purpose			Non-Real Estate Purpose		
	All	Non-IG	IG	All	Non-IG	IG
SA HPI Drop	-0.977** (0.414)	-0.899* (0.462)	-0.221* (0.134)	-0.484** (0.236)	-0.481* (0.268)	-0.231*** (0.065)
Controls	Firm Variables, Bank Variables					
Fixed Effects	Firm, MSA*Year, Industry*Year					
Observations	63,864	49,741	14,123	285,977	207,023	73,916
R ²	0.746	0.792	0.350	0.329	0.361	0.268

	Secured by Real Estate			Not Secured by Real Estate		
	All	Non-IG	IG	All	Non-IG	IG
SA HPI Drop	-0.264* (0.141)	-0.349** (0.177)	-0.222 (0.159)	-0.468*** (0.149)	-0.448*** (0.132)	-0.303 (0.481)
Controls	Firm Variables, Bank Variables					
Fixed Effects	Firm, MSA*Year, Industry*Year					
Observations	275,589	198,733	72,048	66,403	52,240	14,163
R ²	0.227	0.245	0.256	0.411	0.431	0.421

Firm Real Effects

Firm Real Outcomes: Total Leverage & CAPX

	Total Leverage			CAPX		
	(1)	(2)	(3)	(4)	(5)	(6)
SA HPI Drop	-0.044*** (0.014)			-0.017*** (0.005)		
Baseline HPI Drop		0.099*** (0.034)			0.055 (0.057)	
SA Unempl Incr			-0.040 (0.058)			-0.002 (0.029)
L.Log (Bank Assets)	-0.775 (0.601)	-0.600 (0.915)	-1.501*** (0.564)	-0.232 (0.600)	-0.780 (0.856)	0.153 (0.339)
L.Bank ROA	0.187*** (0.059)	0.252*** (0.076)	0.031 (0.093)	-0.010 (0.044)	-0.145 (0.094)	0.043 (0.063)
L.Bank Tier 1	0.016 (0.017)	0.004 (0.016)	0.107*** (0.037)	-0.024*** (0.002)	-0.015* (0.009)	-0.000 (0.012)
Firm Controls			Yes			
Fixed Effects			Firm, MSA*Year, Industry*Year			
Observations	190,328	140,661	100,134	126,397	90,731	82,002
R ²	0.798	0.794	0.798	0.466	0.521	0.508

Real Outcomes: Total Leverage & CAPX

IG versus Non-IG

	Total Leverage		CAPX	
	Non-IG (1)	IG (2)	Non-IG (3)	IG (4)
SA HPI Drop	-0.037*** (0.012)	-0.026 (0.033)	-0.029** (0.012)	0.006 (0.011)
L.Log (Bank Assets)	-2.228*** (0.790)	-2.581*** (0.915)	0.384 (0.873)	0.812 (0.768)
L.Bank ROA	0.084 (0.071)	0.097 (0.123)	-0.027 (0.058)	0.004 (0.041)
L.Bank Tier 1	0.005 (0.014)	-0.017 (0.019)	-0.035*** (0.010)	-0.006 (0.007)
Firm Controls	Yes			
Fixed Effects	Firm, MSA*Year, Industry*Year			
Observations	142,688	45,097	66,986	30,161
R ²	0.830	0.905	0.428	0.510

Summary

- Collect granular data on banks' economic projections + Match with lending decisions
 - ▶ ⇒ Concrete evidence for a large literature
- Banks' expectations, esp about downside, are important
- Next steps:
 - ▶ Further quantify the impact
 - ▶ Will soon have some information about COVID-19 setting