Specialization in Banking

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Motivation

- Banks traditionally tasked with:
  1. **Loan selection** – i.e. the avoidance of adverse selection (Leland and Pyle (1977))
  2. **Loan monitoring** – the mitigation of moral hazard (Gorton and Pennacchi (1995); Holmstrom and Tirole (1997)).
- This requires the acquisition of information, which is costly ...
- ... so economies of scale may be realized through **"specializing"**
  - On single firms – i.e. relationship lending (Bernanke (1983), Berger and Udell (1995), Degreyse and Ongena (2005), etc.)
  - On types of collateral (Gopal (2019))
  - On industries/countries (Paravisini et al. (2020), Giometti and Pietrosanti (2021))

This paper

1. Do large US banks specialize in certain industries?
   - **Yes**, even large banks have a preferred industry

2. If so, what drives specialization?
   - **Informational advantages**
   a. Better screening - banks can offer better loan terms
   b. Better monitoring - improved loan and bank performance

3. Why does specialization matter?
   - **Aggregate Effects**
   a. Bank stability
   b. Credit distribution

Specialization and Bank Information

- Banks provide different services to their customers
  1. **Risk sharing** – reduce idiosyncratic risks for depositors⇒ *diversification*
  2. **Information production** – loan monitoring and screening ⇒ *specialization*

The more banks know about a borrower, the more likely they are to lend (less uncertainty + lower winner's curse).

Hypothesis 1. If banks are unconstrained, they will specialize in industries in which they have an informational advantage.

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  Hypothesis 1. If banks are unconstrained, they will specialize in industries in which they have an informational advantage.

  Informational advantages translate into better screening and monitoring

  Hypothesis 2. Informational advantages lead to better loan performance in an industry in which a bank specializes.

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Measuring specialization

- **Relative specialization:** relative degree of over-investment in a sector.

$$\frac{\frac{LoanAmount_{b,s,t}}{\sum_s LoanAmount_{b,s,t}}}{\frac{LoanAmount_{s,t}}{\sum_s LoanAmount_{s,t}}}$$

- **Excess specialization:** deviation from the aggregate loan portfolio.

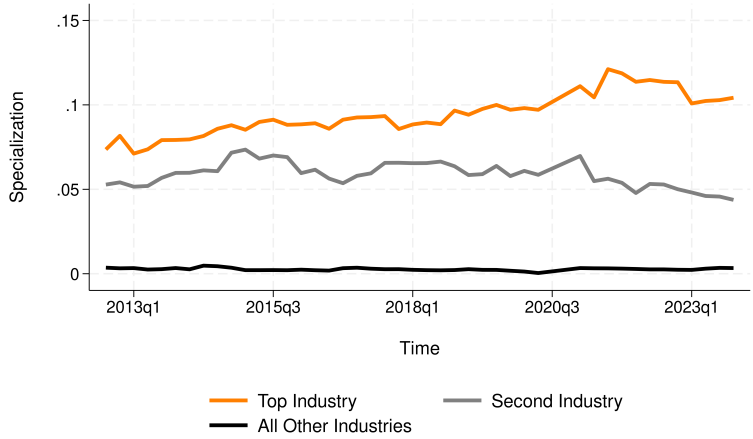
$$\frac{LoanAmount_{b,s,t}}{\sum_s LoanAmount_{b,s,t}} - \frac{LoanAmount_{s,t}}{\sum_s LoanAmount_{s,t}}$$

- Other measures of specialization: loan count, log loan amount, binary for 'top' industry, etc.

Data

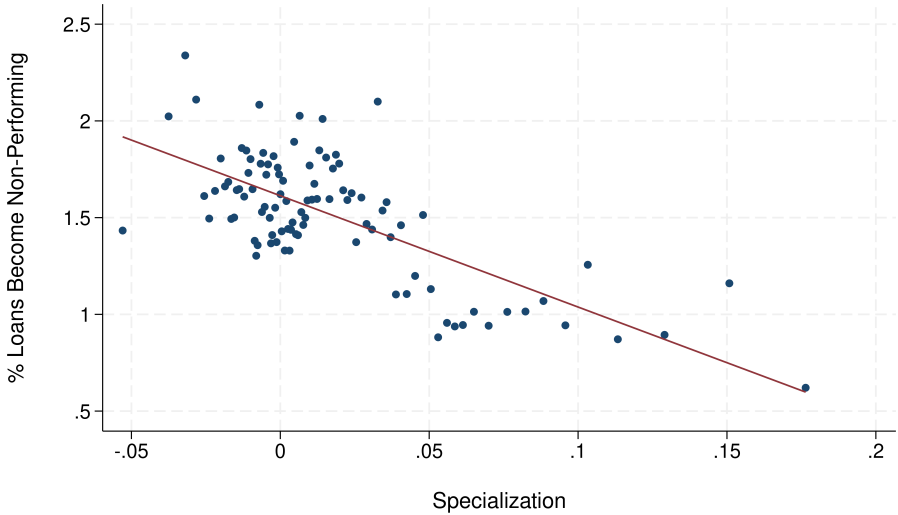
- Our primary data set is the Y14Q database
  - Covers all stress-tested banks (2012-2020; 40 banks)
  - Tracks every C&I loan over 1 mil. USD (over 3.5 million loan observations)
  - Amount, rate, collateral, maturity, internal rating, performance, etc.
  - Data on each loan reported quarterly – observe re-negotiations and new originations
  - Results below focus on **Term Loans**
- We merge in FFIEC-002 (Call Data & Y-9C)
  - Publicly available data on bank balance sheets
  - Quarterly data at entity-level
- SNC for additional tests

Y14 Data: Excess Specialization



- Many banks focused on a "favorite" top industry - consistent across time
- Heterogeneity in the degree of excess specialization in top industry

Specialization and Loan Performance



Regression analysis

$$
\begin{aligned}
Y_{l,i,b,s,t} =& \beta_0 + \beta_1 Specialization_{b,s,t} + \beta_2 X_{l,b} \\
&+ \beta_3 Relationship_{i,b} + \beta_4 Geography_{b,t} + \beta_5 MktShare_{b,s,t} \\
&+ \xi_{b,t} + \sigma_{s,t} + \phi_{loanriskrating} + \omega_{loanpurpose} + \epsilon_{l,i,b,s,t}
\end{aligned}
$$

- Outcome Y measures ex-post loan performance (and loan terms in later analyses)
- Coefficient of interest: Specialization
- Controls: relationship, geographic specialization, industry capture
- Regressions account for bank, industry, loan type, loan purpose, and risk fixed effects

Shortcomings and challenges

1. Do not measure loan demand – only ex-post outcomes

2. Cannot identify exogenous variation in specialization

→ Regressions not interpreted as causal

→ We identify patterns, trends, and correlations of interest to academics and policymakers

Specialization is associated with improved loan performance

	(1)	(2)	(3)	(4)
	Loan ever becomes non-performing			
Excess Specialization	-0.139***	-0.121***	-0.091***	-0.098***
	[0.014]	[0.014]	[0.013]	[0.013]
Interest rate		0.014***	0.007***	0.007***
		[0.000]	[0.000]	[0.000]
Log loan amount		0.000	0.001***	0.001**
		[0.000]	[0.000]	[0.000]
Share of Portfolio in ZIP				-0.013*
				[0.007]
Interactions (relationship)				-0.001***
				[0.000]
General Fixed Effects	Industry*Time, Bank*Time, Purpose			
Loan Rating Fixed Effects	No	No	Yes	Yes
Collateral Fixed Effects	No	No	No	Yes
Mean of dependent variable	0.04	0.04	0.04	0.04
N	298,043	298,043	296,951	296,951

Industry specialization vs. other dimensions of specializations

	(1)	(2)	(3)	(4)	(5)	(6)
	Loan ever becomes non-performing					
Excess Specialization	-0.097***				-0.096***	-0.007***
	[0.013]				[0.026]	[0.002]
Share of Portfolio in industry		-0.089***			-0.020	-0.002
		[0.012]			[0.017]	[0.004]
Share of Portfolio in ZIP			-0.015**		-0.012	-0.001
			[0.007]		[0.007]	[0.00]
Borrower Relationship				-0.001***	-0.001***	-0.003***
				[0.000]	[0.000]	[0.001]
Fixed Effects	Bank*Time, Loan Purpose, Loan Rating					
Industry Time FE	Yes	Yes	Yes	Yes	No	No
Controls	Loan Rate, Size, Maturity, Bank Industry Capture, Collateral					
Standardized Coefficients	No	No	No	No	No	Yes
Mean of dependent variable	0.05	0.04	0.04	0.04	0.04	0.04
R^2	0.16	0.16	0.16	0.16	0.17	0.17
N	296,951	296,951	296,951	296,951	296,951	296,951

Other measures of industry specialization

		(1)	(2)	(3)
		Loan ever becomes non-performing		
"Excess" Specialization	2-Digit Industry	-0.121***	-0.091***	-0.098***
		[0.014]	[0.013]	[0.013]
	4-Digit Industry	-0.098***	-0.049**	-0.065***
		[0.026]	[0.025]	[0.024]
"Relative" Specialization	2-Digit Industry	-0.005***	-0.004***	-0.005***
		[0.001]	[0.001]	[0.001]
	4-Digit Industry	-0.001**	-0.001*	-0.000*
		[0.000]	[0.000]	[0.000]
Portfolio Share	2-Digit Industry	-0.106***	-0.076***	-0.081***
		[0.012]	[0.012]	[0.012]
	4-Digit Industry	-0.070***	-0.038***	-0.046***
		[0.013]	[0.013]	[0.013]
Top Industry Dummy		-0.009***	-0.006***	-0.007***
		[0.002]	[0.001]	[0.001]
Loan Rating at First Obs.		**No**	**No**	**Yes**
Interest Rate and Collateral Controls		**No**	**Yes**	**Yes**
N		298,043	296,951	296,951

+ Bank*Time, Ind.*Time, Purpose, loan purpose, and loan type FE and loan and bank controls

Performance is consistent with superior information

1. **Performance and Syndication** – Non-syndicated loans perform (a little) better in specialized industry – banks use knowledge for themselves
2. **Information vs. constraints** – Larger banks (less likely to be constrained) have better performance in the industry of specialization
3. **SME Lending** – Lending to SMEs more likely if bank is specialized

Specialized banks offer "better" loan terms (1/2)

	(1)	(2)	(3)	(4)
	Interest rate	Log loan amount	Maturity remaining	Unsecured
Excess Specialization	-0.569***	1.242***	3.803*	-0.044
	[0.134]	[0.114]	[2.008]	[0.043]
Fixed Effects	Bank*Time, Industry*Time, Loan Purpose, Loan Rating			
Controls	Loan Rate, Size, Maturity, Bank Industry Capture, Collateral			
Mean of dependent variable	3.6	8.2	22	0.14
R^2	0.36	0.25	0.28	0.38
N	296,951	296,951	296,951	296,951

Specialized banks offer "better" loan terms (2/2)

- Specialization associated with more favorable terms for borrowers
- This holds for both newly originated loans (see above) and re-negotiations
- Loan more likely to be secured by fixed assets and other collateral, for which specialized knowledge may be necessary
- Effect not driven by firm-bank interactions, geography...
- ... or industry capture, which is associated with monopolistic behavior

Aggregate results: Why does bank specialization matter?

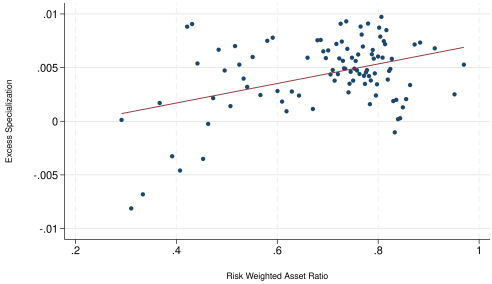
1. Specialization is associated with better performance at the industry level even in times of industry downturn
2. Reductions in Tier-1 ratio associated with rising specialization
3. Banks focus on their preferred industry following a shock to deposits
   - Improvements in firm performance

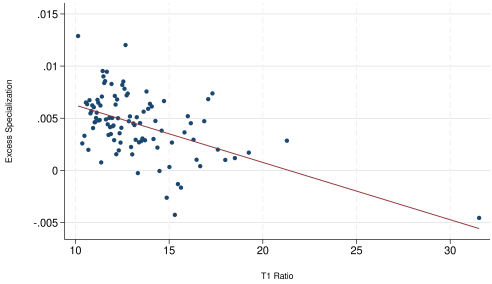
- BUT: Specialization associated with lower returns

Specialized banks can "buck" industry/bank trends

	(1)	(2)	(3)	(4)
	Non performing loan			
Avg. Defaults in Industry	0.236***	0.266***		0.256***
	[0.065]	[0.067]		[0.066]
Specialization * Ind. Default Rate		-2.275*		-2.187*
		[1.218]		[1.221]
Excess Specialization		0.003	0.022*	0.046***
		[0.016]	[0.012]	[0.018]
Avg. Default in Bank			0.588***	0.581***
			[0.061]	[0.061]
Specialization * Bank Default Rate			-1.915***	-1.847***
			[0.464]	[0.461]
Fixed Effects	Purpose, Rating, Bank, Time, Industry			
Controls	Loan size, Rate, Collateral, Industry capture			
R^2	0.29	0.3	0.3	0.3
N	296,951	296,951	296,951	296,951

Banks gravitate towards specialization in response to T1/RWA shifts





- Banks gravitate towards preferred industry in times of stress

Inflows correlated with increases in specialization in preferred industry

- Banks increased lending to preferred industries after exogenous deposit inflow
- COVID: unsolicited increase in deposits
  - increased specialization in a bank's preferred industry
  - Reshuffling of deposits in the banking sector can change the distribution of credit and have firm-level effects

Conclusion

1. Large banks specialize by concentrating on single "favorite" industries

2. Specialization is consistent with banks' having informational advantages
   - Better loan performance
   - Banks to offer generous terms to valuable clients (especially if competition is high)

3. Bank specialization has aggregate implications
   - Specialized banks are more stable
   - Banks allocate credit disproportionately to their preferred industry after positive deposit shocks

- Broader agenda on bank specialization and the importance of bank business models
  - Information-based pricing in Specialized Lending (Blickle, He, Huang, and Parlatore (2023))
  - Specialized Lending When Big Data Hardens Soft Information (He, Huang, and Parlatore (2024))
  - Small bank focus on mortgages shifts prices after deposit shock (Blickle (2022))

1. Specialization makes sell-off unlikely

	(1) Loan sold (in part)	(2) Loan sold entirely	(3) Loan sold (in part)	(4) Loan sold entirely
Specialization	-0.014**	-0.004**	-0.075***	-0.006
	[0.006]	[0.002]	[0.024]	[0.006]
Fixed Effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Sample	All loans		Syndicated as Agent	
Mean of dep. var.	0.8	0.011	0.72	0.0073
R^2	0.55	0.16	0.098	0.11
N	833,920	833,920	39,453	39,453

- If specialization is associated with additional information, asymmetric information problems may exist
- Market unlikely to offer 'fair' price for loans from specialized banks – only pooling price

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2. SNC Data: Loan Performance Split by Bank Size

	(1)	(2)	(3)	(4)	
	Indicator: Loan ever becomes non-performing				
"Excess" Specialization	0.100***	0.017***	0.070***	0.026***	0.062*
	[0.002]	[0.002]	[0.002]	[0.003]	[0.035]
Medium Small Bank × "Excess" Specialization			0.003	0.039***	-0.002
			[0.006]	[0.006]	[0.055]
Medium Bank× "Excess" Specialization			-0.169***	-0.088***	0.018
			[0.008]	[0.009]	[0.061]
Medium Large Bank × "Excess" Specialization			-0.229***	-0.133***	-0.295***
			[0.010]	[0.010]	[0.066]
Large Bank ×"Excess" Specialization			-0.224***	-0.164***	-0.207***
			[0.013]	[0.013]	[0.056]
Industry*Time FE, loan controls	Yes	Yes	Yes	Yes	Yes
Bank*Time FE	No	Yes	No	Yes	Yes
Sample			All		Arranger
R^2	0.2	0.23	0.2	0.23	0.14
N	2,131,559	2,126,159	2,131,559	2,126,159	103,798

- Only larger lenders benefit from specialization, small banks are constrained

3. Specialization and SME lending

- Long documented trend: SMEs find it difficult to borrow from large banks
- Opacity of small and young firms makes information acquisition difficult
- However, specialization associated with improved information acquisition
- ...and greater SME lending by specialized banks

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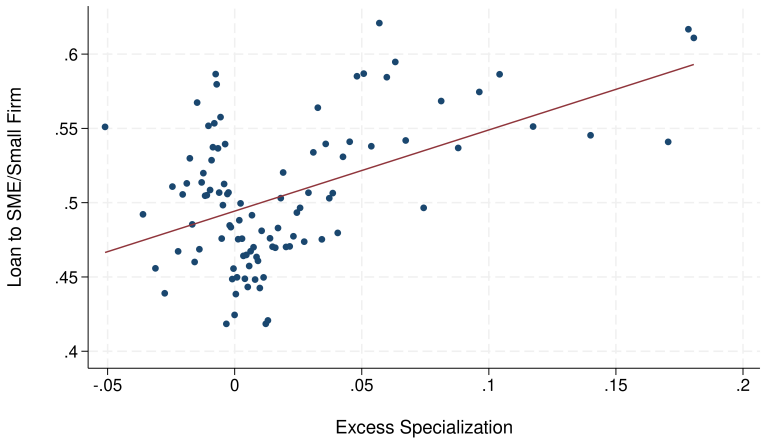
3. SME lending is more likely if the bank is specialized



- Banks have more small loans, $< 2m$, the more specialized they are.

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