

Why Does Structural Change Accelerate in Recessions? The Credit Reallocation Channel

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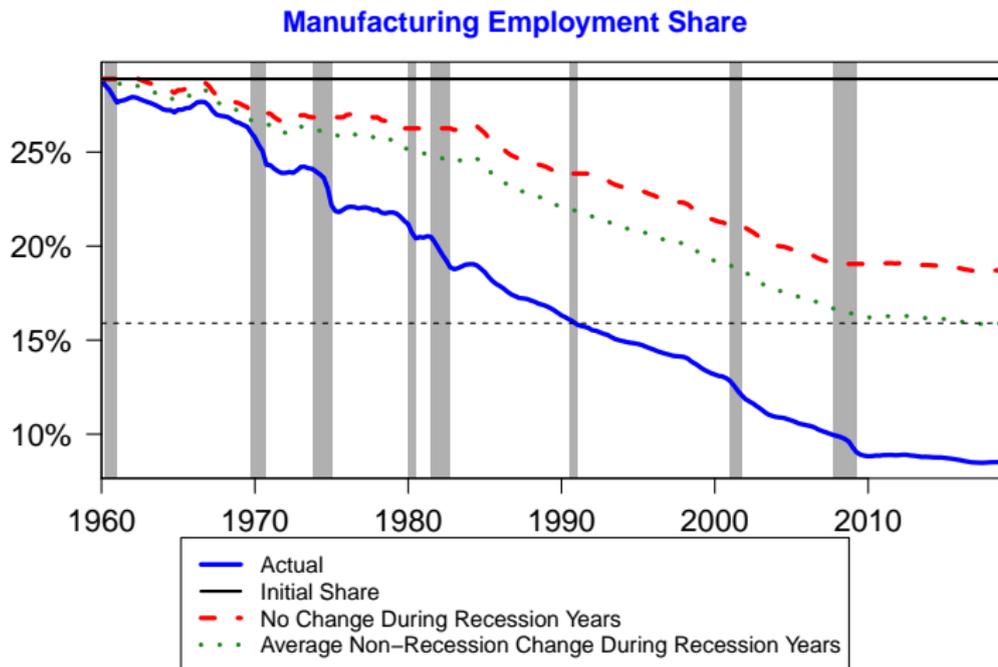
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Big Picture Research Question

How do recessions affect the reallocation of resources across sectors?

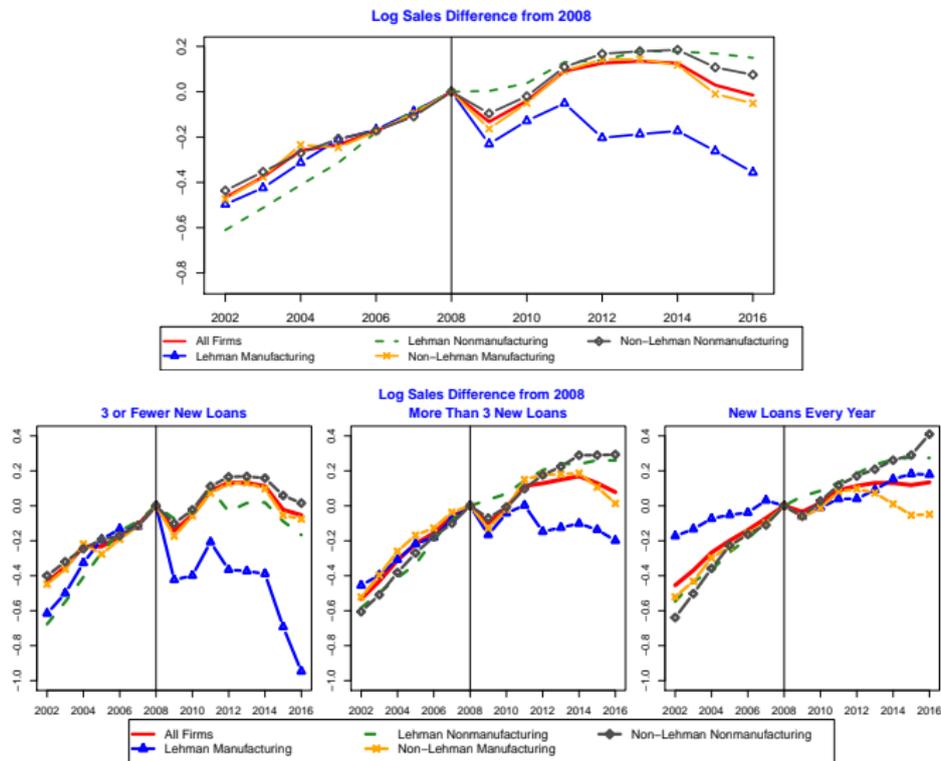


*"[A crisis is the] process by which economic life adapts itself to the new economic conditions." -Joseph Schumpeter, *The Theory of Economic Development* (1934)*

Credit reallocation accelerated the US manufacturing decline

- 1 Credit destruction disproportionately hurt manufacturers**
 - ▶ When Lehman Brothers collapsed, its manufacturing clients had a harder time obtaining new credit and experienced worse real outcomes
- 2 New credit disproportionately benefited nonmanufacturers**
 - ▶ Interstate banking deregulation in the 1980s led to increases in employment for nonmanufacturers but had no effect for manufacturers
- 3 Model with costs of establishing lending relationships and technology-driven structural change matches these patterns**
 - ▶ Preventing reallocation is costly; misallocation costs of US auto bailout in 2008-09 were five times larger than losses from nonrepayment

Identification Strategy: Collapse of Lehman Brothers



Lehman's failure disproportionately hurt manufacturing firms

Regression: Lehman Exposure

How did post-crisis outcomes change for firms that experienced a credit supply shock?

$$Y_{i,t} = \alpha_i + \sigma_t + \mathbb{1}_{\{Mfg\}} \times \chi_t + \gamma X_{i,t-1} + \rho \times \mathbb{1}_{\{Year \geq 2009\}} \times Lehman_i + \Omega \times \mathbb{1}_{\{Year \geq 2009\}} \times Lehman_i \times \mathbb{1}_{\{Mfg\}} + \epsilon_{i,t} \quad (1)$$

- α_i is firm fixed effect, σ_t and χ_t are sector-by-year fixed effects, X_{t-1} is a vector of lagged firm-level sales, assets, employment, and leverage
- $Lehman_i$ represents the total number of revolving credit facilities held by firm i involving Lehman starting <2008 and ending ≥ 2009
- Ω represents the additional effect of Lehman exposure post-2009 for manufacturing firms relative to nonmanufacturing firms

Lehman Exposure Hit Manufacturers Harder

	(1)	(2)	(3)	(4)
New Loan Probability				
$\mathbb{1}_{\{\text{Year} \geq 2009\}} \times \text{Lehman}_i$	0.0850*** (0.0272)	0.0688*** (0.0243)	0.0905*** (0.0298)	0.0890*** (0.0300)
$\mathbb{1}_{\{\text{Year} \geq 2009\}} \times \text{Lehman}_i \times \mathbb{1}_{\{\text{Mfg}\}}$	-0.0541** (0.0217)	-0.0470** (0.0213)	-0.0611*** (0.0208)	-0.0589*** (0.0170)
Sales				
$\mathbb{1}_{\{\text{Year} \geq 2009\}} \times \text{Lehman}_i$	0.00636 (0.00613)	0.00438 (0.00542)	0.0186 (0.0162)	0.00438 (0.00758)
$\mathbb{1}_{\{\text{Year} \geq 2009\}} \times \text{Lehman}_i \times \mathbb{1}_{\{\text{Mfg}\}}$	-0.0635*** (0.0123)	-0.0551*** (0.0116)	-0.0129 (0.0366)	-0.0786*** (0.0104)
Employment				
$\mathbb{1}_{\{\text{Year} \geq 2009\}} \times \text{Lehman}_i$	0.0145 (0.0106)	0.0100 (0.0105)	0.0437** (0.0210)	-0.00295 (0.0103)
$\mathbb{1}_{\{\text{Year} \geq 2009\}} \times \text{Lehman}_i \times \mathbb{1}_{\{\text{Mfg}\}}$	-0.0599*** (0.0140)	-0.0590*** (0.0155)	-0.109*** (0.0320)	-0.0514*** (0.0163)
Controls	Y	Y	N	Y
Loans > 0	N	Y	N	N
2016 Survivors	N	N	N	Y
<i>N</i>	69940	44422	84061	37486

Driscoll-Kraay standard errors in parentheses

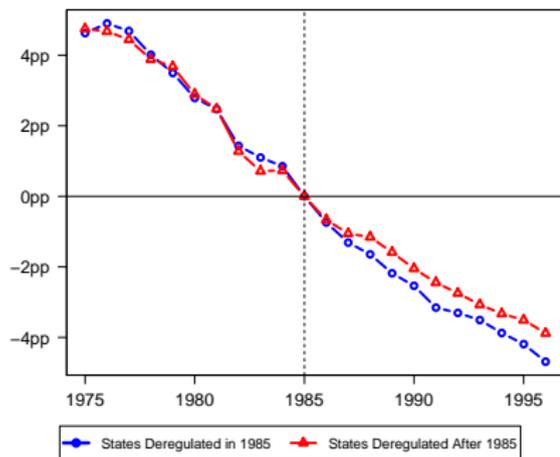
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Banking Deregulation Benefited Nonmanufacturers

- Interstate banking deregulation in 1980s expanded credit access
- Estimate effect of post-deregulation dummy on outcome Y in state s

$$Y_t^s = \alpha^s + \delta_t + \gamma \text{Controls}_t^s + \beta \text{dereg}_t^s + \epsilon_t^s \quad (2)$$

Change in Manufacturing Employment Share Relative to 1985



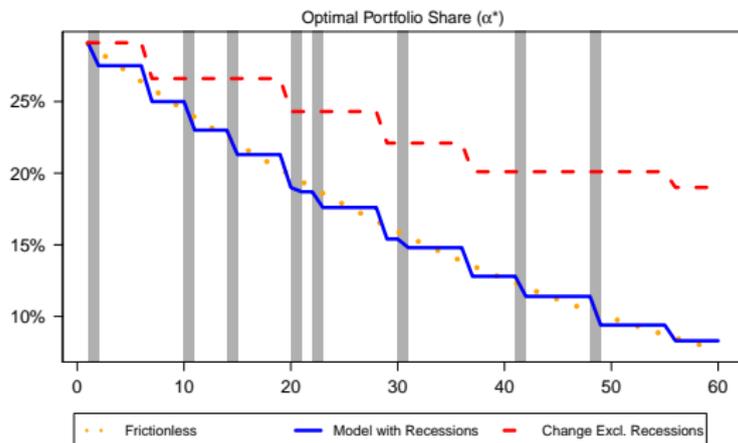
	(1)	(2)	(3)
Mfg. emp. share	-0.0025*** (0.00065)	-0.0024*** (0.00064)	-0.0021*** (0.00065)
Log mfg. emp.	0.0013 (0.0048)	0.0012 (0.0029)	0.0057 (0.0050)
Log nonmfg. emp.	0.018*** (0.0047)	0.016*** (0.0050)	0.020*** (0.0054)
Controls	N	Y	N
State time trends	N	N	Y
N	1,029	1,029	1,029

Standard errors clustered at the state level in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Quantitative Model

- Manufacturing declines over time as technology changes
- Credit changes are lumpy due to fixed costs of new firm-bank matches
- Recessions break matches and reduce opportunity cost of reallocation
- Model is able to closely match dynamics of manufacturing share



US auto bailout registered accounting losses of \$12bn from default, but model suggests misallocation costs were much larger at \$63bn