Number of Creditors and the Real Effects of Credit Supply Disruptions

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Motivation

- Do negative shocks to the banking sector impact the real side of the economy?
- For which types of firms is the impact stronger?
- Does bank-firm relationship play any roles in strengthening or weakening the impact?
- Specifically, does the impact of credit disruptions differ across firms with different numbers of creditors?

Research Design

- Our identification strategy exploits a plausibly exogenous shock to credit availability to Iranian public firms as a result of an embezzlement scandal in 2011.
- Iranian firms are highly dependent on the banking system as their source of credit.
- The validity of our identification strategy hinges on the implicit assumption that the borrower-lender relationship is sticky.
- Following the scandal, there was a significant drop in credit supply by **Saderat Bank**, the primary bank involved in the scandal (Equation (1)).
- Moreover, neither the intensive nor the extensive margin of borrowing from other banks increases for the impacted firms relative to their peers.

Data

- Financial data for 260 Iranian public firms are obtained from Rahavard for 2008 to 2015 period.
- Employment and loan data (lender-borrower matrix) are hand-collected from financial statements footnotes available on CODAL.
- Financial statement data of Iranian private and public banks are obtained from the Iran Banking Institute database.

Empirical Model: Diff-in-Diff

(1) Identification of the Credit Dry-up

(Emb_b: Indicator for the troubled bank)

$$Credit_{bt} = \beta_0 + \beta_1 Post_t + \beta_2 Emb_b + \beta_3 Post_t \times Emb_b + \beta_4 Controls_{bt} + \epsilon_{bt}$$

(2) The Real Impact of Credit Dry-up on Employment and Investment

(LTB_i: Indicator for Linked to the troubled bank)

$$\Delta\%Emp_{it} = \beta_0 + \beta_1 Post_t + \beta_2 LTB_i + \beta_3 Post_t \times LTB_i + \beta_4 Controls_{it} + \delta_I + \epsilon_{it}$$

Results

	Bank Share of Total Credit		Bank Share of Credit to Private Sector	
	(1)	(2)	(3)	(4)
Post	-0.0099*	-0.0078*	-0.0100*	-0.0079**
	(-1.80)	(-1.84)	(-1.73)	(-2.15)
Emb	0.086***	0.025*	0.078***	0.020*
	(8.11)	(1.93)	(7.67)	(1.76)
Post×Emb	-0.028***	-0.028***	-0.027***	-0.028***
	(-5.02)	(-6.29)	(-4.70)	(-7.34)
Controls (bank-level)	No	Yes	No	Yes
R^2	0.119	0.758	0.114	0.780
Observations	279	240	279	240

Table 1. Impact of Embezzlement on Bank Credit Supply.

Dependent Variable: Employment Growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
LTB	0.004	0.004	0.001	0.00002		0.001	
	(0.22)	(0.24)	(0.05)	(0.00)		(0.03)	
Post	0.055*	0.057*	0.053*	0.050*	0.059*		
	(1.87)	(1.87)	(1.89)	(1.75)	(1.87)		
Post×LTB	-0.077**	-0.080**	-0.086**	-0.083**	-0.086**	-0.086**	-0.086**
	(-2.34)	(-2.33)	(-2.63)	(-2.52)	(-2.52)	(-2.62)	(-2.52)
Controls (firm-level)	No	No	Yes	Yes	Yes	Yes	Yes
R^2	0.0191	0.0724	0.0985	0.1254	0.2058	0.1267	0.2370
Observations	700	687	676	676	676	676	676
Year FE						Yes	Yes
Firm FE					Yes		Yes
Industry FE		Yes		Yes			

Table 2. Overall Impact of Credit Supply Shock on Employment.

Contact

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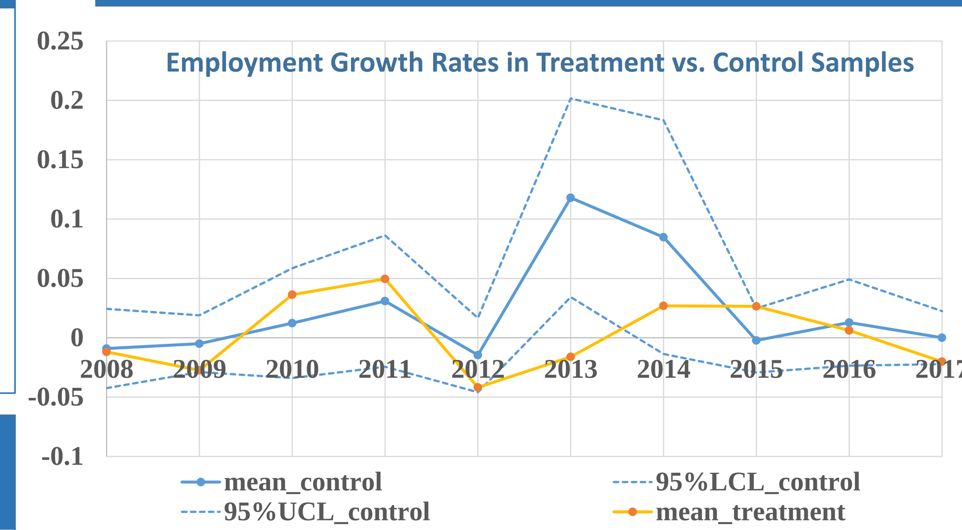
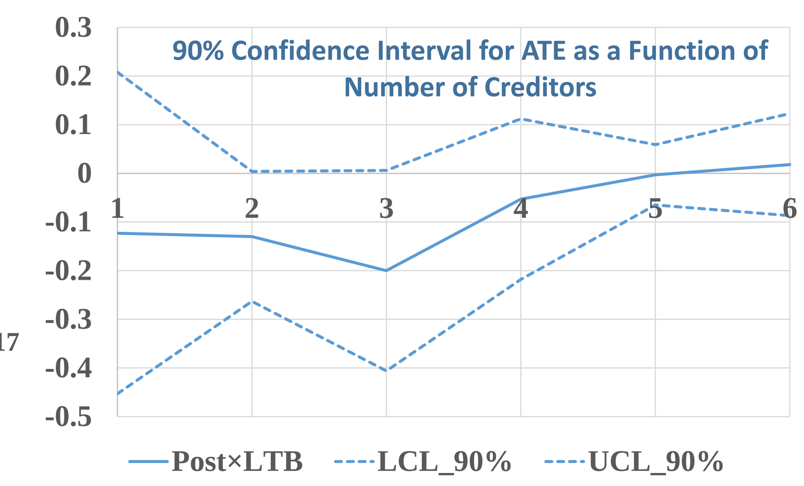
Results





Dependent Variable: Employment Growth

	Number of Creditors		Number of Creditors		Number of Creditors		Number of Creditors	
	Below Median (<=3)	Above Median (>3)	Below Median (<=3)	Above Median (>3)	Below Median (<=3)	Above Median (>3)	Below Median (<=3)	Above Median (>3)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LTB	0.045*	-0.002	0.034	0.002				
	(1.89)	(-0.08)	(1.44)	(0.07)				
Post	0.067	0.041	0.051	0.047				
	(1.51)	(1.09)	(1.25)	(1.14)				
Post×LTB	-0.112**	-0.052	-0.117**	-0.047	-0.107*	-0.049	-0.121**	-0.055
	(-2.19)	(-1.24)	(-2.55)	(-1.09)	(-2.00)	(-1.17)	(-2.66)	(-1.29)
Controls	No	No	Yes	Yes	No	No	Yes	Yes
R^2	0.0975	0.0925	0.1558	0.1492	0.1738	0.2590	0.2400	0.2791
Observations	339	348	333	343	343	357	333	343
Year FE					Yes	Yes	Yes	Yes
Firm FE					Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes				

Table 3. Impact of Credit Supply Shock on Employment in Subsamples Sorted by the Number of Creditors

Dependent Variable: Investment/Assets

	Number of Creditors		Firm Size		Firm Age	
	Below Median	Above Median	Large	Small	Old	Young
	(1)	(2)	(3)	(4)	(5)	(6)
LTB	-0.018	-0.015	-0.015	0.011	-0.024	-0.017*
	(-0.84)	(-0.85)	(-0.88)	(0.82)	(-1.10)	(-1.73)
Post	0.032	-0.017	-0.014	0.020*	-0.032	0.030**
	(1.34)	(-0.57)	(-0.62)	(1.72)	(-0.95)	(2.06)
Post×LTB	-0.041*	0.035	0.011	-0.032**	0.018	-0.036*
	(-1.78)	(1.08)	(0.47)	(-2.25)	(0.53)	(-2.01)
Controls (firm-level)	Yes	Yes	Yes	Yes	Yes	Yes
Observations	327	332	417	348	290	270
R^2	0.1287	0.222	0.2172	0.1272	0.2381	0.2063

Table 4. Impact of Credit Supply Shock on Investment in Subsamples.

Conclusions

- We document a nearly 8 percentage point drop in annual employment growth rate for firms connected to the troubled bank following the credit dry-up caused by the scandal.
- The magnitude of the effect on employment and investment is amplified by **bank-firm relationship** at least as much as by the **financial constraint status** found in previous studies.
- The minimum number of creditors that shields a company against the adverse effect of credit dry-up is **four**.
- The impact is larger for **smaller, younger and more financially constrained** firms.
- Among the firms that are smaller and younger and have limited access to creditors, the credit dry-up not only lowers investment in **human capital**, but also in **physical capital**.
- The adverse effect of credit dry-up on employment is more severe among **more profitable** and **high growth firms**, both in terms of sales and investment.
- The results highlight the role of bank-firm relationships and the importance of **access to multiple creditors** in alleviating the consequences of credit supply disruptions.

References

1. Bernanke, B. S. (2010). Addressing the Financial Needs of Small Businesses. In Federal Reserve Meeting Series, July(Vol. 12), July 12. Available at http://www.federalreserve.gov/newsevents/speech/bernanke20100712a.htm.
2. Chodorow-Reich, G. (2013). The employment effects of credit market disruptions: Firm-level evidence from the 2008–9 financial crisis. The Quarterly Journal of Economics, 129(1), 1-59.
3. Khwaja, A. I., & Mian, A. (2008). Tracing the impact of bank liquidity shocks: Evidence from an emerging market. American Economic Review, 98(4), 1413-42.
4. Peek, J., & Rosengren, E. S. (1997). The international transmission of financial shocks: The case of Japan. The American Economic Review, 495-505.
5. Ivashina, V., & Scharfstein, D. (2010). Bank lending during the financial crisis of 2008. Journal of Financial economics, 97(3), 319-338.