What Hinders Investment in the Aftermath of Financial Crises: Balance-Sheet Mismatches or Access to Finance?

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Why are financial crises contractionary?

- Theory: A currency crisis must be expansionary since it leads to a large depreciation, increasing competitiveness.
- Empirical literature: mixed evidence depending on:
  - ⋆ the severity of the crisis: currency crisis might be accompanied by a banking crisis
  - ⋆ heavy reliance on foreign debt and importance of the tradable sector
- If we focus on emerging markets, financial crises seem to be mostly contractionary.
- Important to focus on emerging markets since there is a lot to be learned from their experience for the current crisis!

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Growth of GDP and Investment: Aftermath of the Crisis

	Argentina		Colombia	Mexico	
	BC	ER	BC	BC	ER
year	2001	2002	1998	1994	1995
	Growth of GDP, %				
One year after	-11	8	-4	-6	5
	Growth of GFKF, %				
One year after	-36	38	-38	-29	16

ER:depreciation of real ex. rate $> 25\%$
BC:Reinhart and Rogoff (2008) definition

What does the theory propose?

Financial crises can lead to declines in investment and output due to existence of financial constraints

1. **Credit crunch (supply side):** Domestic banks cannot extend credit; foreign capital leaves
   - Firms cannot re-finance short-term debt, import intermediate inputs or undertake new investment.
   - Aghion et al. (2001); Chang and Velasco (2001); Caballero and Krishnamurty (2001); Mendoza and Smith (2006).
2. **Balance-Sheet Mismatch (demand side):** Foreign currency denominated debt inflates, firms net-worth declines
   - Firms cannot borrow.
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How does the evidence match up?

The empirical literature is divided in two lines of research due to lack of detailed data:

- **Access to Finance:** Foreign firms outperform domestic firms during depreciations (Desai, Foley and Forbes (2008); Blalock, Gertler and Levine (2007)).
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Our Approach

The literature suffers from an omitted variables problem

- Firms who do not have a weak balance-sheet can be foreign owned firms and therefore have better access to credit and/or
- Foreign firms with access to credit are also the ones that better match the currency denomination of their assets and liabilities.

We investigate the effect of financial crises on firm performance, **disentangling for both channels of financial frictions**

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A new database

- New database with annual accounting information for over 2100 non-financial listed companies from Argentina, Brazil, Chile, Colombia, Mexico and Peru; 1991 to 2004.
  - ⋆ Sales, Investment: change in stock of physical capital (property, plant, and equipment)
  - ⋆ Currency composition of assets and liabilities: from firms' balance sheets in stock market statements
  - ⋆ Exports: Income statements and custom office records
  - ⋆ Foreign Ownership: Foreign if at least 50% of the equity share of the firm is foreign owned.
- Final sample: 1203 firms (sales), 632 (investment)

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Differences-in-Differences

- We want to identify how a crisis affects firm performance...
- By focusing on the channels through which crises aggravate credit constraints
- The key idea to test each channel:
  - ⋆ Depreciation increases investment opportunities in the exporting sector
  - ⋆ Exporters might be constrained if they hold dollar debt...
  - ⋆ Or they might be constrained if they have limited access to finance

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Do exporters perform better?

$$y_{i,c,j,t} = \beta_1(Exports_{i,c,j,t-1} \times Post_{c,t}) + \beta_2 Exports_{i,c,j,t-1} + \phi_{j,t} + \varphi_{c,t} + \tau_t + \alpha_i + \xi_{i,c,j,t} \quad (1)$$

- $y_{i,c,j,t}$ is the outcome of firm i, in country c, in sector j at time t (Sales and Investment)
- *Exports*: whether or not the firm is an exporter/volume
- *Post*: a dummy for the year of depreciation and the year after
- $\phi_{j,t}$ sector-year fixed effects
- $\varphi_{c,t}$ country-year fixed effects; accounts for banking crisis
- τ_t are year dummies
- α_i are firm-specific effects: identification is from time changes
- Controls: firm size (assets), total debt

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	Sales Growth (1)	Investment (2)
Exporter $\times$ *Post*	0.134*	-0.013
	(0.07)	(0.01)
Exporter	-0.012	0.010**
	(0.03)	(0.00)
DollarDebt		
Observations	8786	5119
Firms	1203	632
Firm Fixed-Effects	yes	yes
country*year	yes	yes
sector*year	yes	yes
year	yes	yes

	Sales Growth (1)	Investment (2)	Investment (3)
Exporter $\times$ *Post*	0.134*	-0.013	-0.008
	(0.07)	(0.01)	(0.01)
Exporter	-0.012	0.010**	0.009**
	(0.03)	(0.00)	(0.00)
DollarDebt			-0.002
			(0.01)
Observations	8786	5119	4025
Firms	1203	632	575
Firm Fixed-Effects	yes	yes	yes
country*year	yes	yes	yes
sector*year	yes	yes	yes
year	yes	yes	yes

Is there any effect of holding dollar debt?

$$
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y_{i,c,j,t} = {} & \beta_1(DDebt_{i,c,j,t-1} \times Post_{c,t}) \\
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- *DDebt*: share of short-term dollar denominated liabilities.

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- *DDebt*: share of short-term dollar denominated liabilities.

	Sales Growth (1)	Investment (2)
Dollar Debt $\times$ *Post*	0.244**	-0.010
	(0.10)	(0.03)
Dollar Debt	-0.024	-0.001
	(0.04)	(0.01)
Exports		
Observations	7078	4025
Firms	1111	575
Firm Fixed-Effects	yes	yes
country*year	yes	yes
sector*year	yes	yes
year	yes	yes

	Sales Growth (1)	Investment (2)	Investment (3)
Dollar Debt $\times$ *Post*	0.244**	-0.010	-0.010
	(0.10)	(0.03)	(0.03)
Dollar Debt	-0.024	-0.001	-0.002
	(0.04)	(0.01)	(0.01)
Exports			0.002
			(0.00)
Observations	7078	4025	4025
Firms	1111	575	575
Firm Fixed-Effects	yes	yes	yes
country*year	yes	yes	yes
sector*year	yes	yes	yes
year	yes	yes	yes

Identification

- Triple difference-in-difference
- The depreciation should increase the financial constraints of all firms holding dollar debt. Unless firms:
  1. Match balance sheet with revenues/assets.
  2. Access to finance

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Mismatch or Access to Finance?

$$y_{i,c,j,t} = \beta_1(Exports_{i,c,j,t-1} \times DDebt_{i,c,j,t-1} \times Post_{c,t})$$
$$\beta_2(Exports_{i,c,j,t-1} \times Post_{c,t}) + \beta_3(DDebt_{i,c,j,t-1} \times Post_{c,t})$$
$$+\beta_4 Exports_{i,c,j,t-1} + \beta_5 DDebt_{i,c,j,t-1} + \phi_{j,t} + \varphi_{c,t} +$$
$$\tau_t + \alpha_i + \xi_{i,c,j,t} \tag{3}$$

Run for sub sample of foreign-owned and domestically-owned firms to separate the channels.

Dep. var.: Investment	Total (1)	Domestic (2)	Foreign (3)
$Exports \times DD \times Post$	0.005***	0.001	0.009**
	(0.00)	(0.00)	(0.00)
$Foreign \times DD \times Post$			
Observations	4025	2478	1122
Firms	525	394	171
Firm Fixed-Effects	yes	yes	yes
country*year	yes	yes	yes
sector*year	yes	yes	yes
year	yes	yes	yes

Dep. var.: Investment	Total (1)	Domestic (2)	Foreign (3)	NonExporter (4)	Exporter (5)
Exports $\times$ *DD* $\times$ *Post*	0.005***	0.001	0.009**		
	(0.00)	(0.00)	(0.00)		
Foreign $\times$ *DD* $\times$ *Post*				-0.048	0.059*
				(0.05)	(0.03)
Observations	4025	2478	1122	1699	1901
Firms	525	394	171	271	294
Firm Fixed-Effects	yes	yes	yes	yes	yes
country*year	yes	yes	yes	yes	yes
sector*year	yes	yes	yes	yes	yes
year	yes	yes	yes	yes	yes

Conclusion

- We study the impact of large depreciations on firms' performance accounting for two channels:
  - Balance Sheet Effects
  - Access to Finance
- We find that foreign firms outperform domestic firms even after controlling for balance-sheet effects.
- We attribute the better performance to easier access to finance
- **Big picture:** How financial constraints hinder investment is important to link financial crises to recessions.

Conclusion

- We study the impact of large depreciations on firms' performance accounting for two channels:
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  - Access to Finance
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