Information sharing, credit booms, and financial stability

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Outline

Introduction : Motivation

This paper motivated by several strands of literatures related to the vulnerability of financial systems

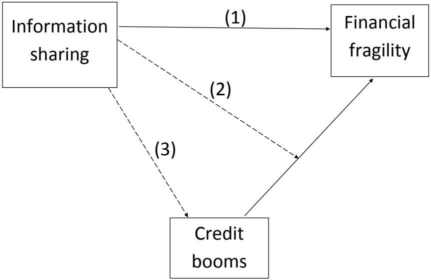
1. Credit boom and financial fragility
   - Credit boom is a main driver of financial crisis episodes
   - Some questions remain
     - How can we limit the occurrence of credit booms ?
     - How can we alleviate their detrimental impact ?

2. Recent development of information sharing
   - Development of IS around the World IS in the world
   - IS have been created to favor credit access
   - But they could affect financial fragility

3. Few papers on financial fragility in developing countries
   - Episodes of financial fragility are less frequent in low-income countries
   - But they may induce profound consequences

Introduction : Conceptual framework

- Existing literature focuses on the direct impact of information sharing (IS)
  1. Theory :
     - IS $\searrow$ fragility : Moral hazard, adverse selection, over-borrowing
     - IS $\nearrow$ fragility : Credit composition
  2. Empirical papers
     - IS tend to strength financial stability (micro and macro evidence)
     - But how ?
- We study its indirect effect trough credit booms



Introduction : An overview

- We combine data from 159 countries over the period 2008-2014 divided in two groups
  1. 80 "advanced" economies (High-income and upper-middle income countries)
  2. 79 "developing" economies (Low-income and lower-middle income countries)
- What we do ?
  1. Net effect of IS on financial fragility
  2. Transmission channels
     1. Attenuation effect of the detrimental effect of credit boom
     2. Impact on the occurrence of credit booms
- Main results
  1. IS reduces financial fragility ; no distinction between developing and other countries
  2. Depth of IS limits the occurrence of credit booms (but coverage does not matter)
  3. IS alleviates the detrimental effect of credit booms but only in advanced economies

Data and variables

- Datasets
  - Bankscope (financial fragility)
  - Doing Business (information sharing)
  - WDI and IFS (other variables)
- Sample - 159 countries including :
  - 79 developing countries (GNI per capita $<$ US$ 4,125)
  - 80 emerging and developed countries (GNI pc $\geq$ US$ 4,125)
- Period : 2008-2014

Data and variables

Dependent variable : Financial fragility

- Measurement

$$\Delta(\frac{NPLs}{Loans}) \geq 3points$$

  - Ratio of NPLs to loans is computed at the national level (weighted average)
  - Authors' calculation using Bankscope database

- Advantages
  - Available for a large number of countries, including low income countries
  - Identify episodes that were not transformed into financial crises
  - Why do not we use financial crises dataset ?
    - Limited number of financial crises since 2005 in low-income countries (data before 2005 cannot be exploited due to the lack of data on information sharing mechanisms)

Data and variables

Independent variables

- Credit boom (CB)
  - 2 criteria are used to define a credit boom
    1. An increase of the ratio of credit to GDP during at least three consecutive years
    2. The average of increases is 5 percentage points by year
  - Data are extracted from WDI

- Information sharing (IS)
  - Two alternative measures
    1. Depth of credit information
    2. Coverage of credit registries and credit bureaus
  - Authors' calculation using Doing Business data

- Control variables (X)
  1. Macroeconomic factors
     - GDP per capita, growth, inflation, Exchange rate vol
  2. Financial factors
     - PC/GDP, capital inflows, market concentration

Empirical model

1^{st} step : Baseline model (net effect of IS)

$$Pr(BSD_{it}) = \alpha + \beta IS_{it} + \Gamma X_{it} + \varepsilon_{it}$$

- Where
  - BSD_{it} : dummy equals to 1 if a country i experienced an episode of financial fragilityin year t
  - IS_{it} : Indicator of credit information sharing (depth and coverage)
  - X_{it} : Control variables (including time dummies)
- Method
  - Econometric method : Random-effect probit
  - Binary nature of dependent variable
  - Random effect : Control for unobserved heterogeneity
- Expected result : CIS reduces financial fragility ($\beta < 0$)

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Empirical model

2^{nd} step : Transmission channels

1. Inclusion of credit booms (CB)

$$Pr(BSD_{it}) = \alpha + \beta IS_{it} + \delta CB_{it} + \Gamma X_{it} + \varepsilon_{it}$$

   - Expected results : $\beta < 0$ and $\delta > 0$

2. Interaction between IS and CB

$$Pr(BSD_{it}) = \alpha + \beta IS_{it} + \delta CB_{it} + \gamma IS_{it} * CB_{it} + \Gamma X_{it} + \varepsilon_{it}$$

   - Expected results : $\beta < 0$, $\delta > 0$ and $gamma < 0$

3. Determinants of CB

$$Pr(CB_{it}) = \alpha' + \beta' IS_{it} + \Gamma' X_{it} + \varepsilon_{it}$$

   - Expected result : Sign of β' can be positive or negative

Empirical model

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Baseline results

TABLE: Baseline model

	All countries		GNI pc $<$ US$4,125		GNI pc $\geq$ US$4,125	
	(1)	(2)	(3)	(4)	(5)	(6)
Depth	-0.0149***		-0.0094**		-0.0255**	
	(-2.75)		(-2.07)		(-2.43)	
Coverage		-0.0011***		-0.0006**		-0.0020**
		(-2.70)		(-2.07)		(-2.04)
Control	Yes	Yes	Yes	Yes	Yes	Yes
# Obs.	977	977	499	499	478	478
# Countries	159	159	80	80	79	79

- IS reduces financial fragility ($\beta < 0$)
  - No distinction between depth and coverage
  - No distinction between developing and advanced economies
- Results are robust to
  - Econometric method
  - Sample
  - Change of dependent variable
  - Endogeneity of IS

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Transmission channels : 1/Inclusion of Credit boom

TABLE: Inclusion of Credit boom

	All countries		GNI pc < US$4,125		GNI pc ≥ US$4,125	
	(1)	(2)	(3)	(4)	(5)	(6)
Depth	-0.0132***		-0.0096*		-0.0197**	
	(-2.47)		(-1.95)		(-2.19)	
Coverage		-0.0009***		-0.0005*		-0.0018**
		(-2.29)		(-1.83)		(-1.88)
CB	0.1073***	0.1054***	0.0468**	0.0442**	0.1721***	0.1719***
	(4.16)	(4.08)	(2.49)	(2.37)	(3.04)	(3.12)
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- CB increases financial fragility ($\delta > 0$)
  - Effect of CB is particularly high in developing countries

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Transmission channels : 2/Interactions btw CB and IS

TABLE: Interactions between CB and IS

	All countries		GNI pc < US$4,125		GNI pc ≥ US$4,125	
	(1)	(2)	(3)	(4)	(5)	(6)
Depth	-0.0114*		-0.0149		-0.0183**	
	(-1.86)		(-1.42)		(-2.40)	
Depth*IS	-0.0374*		-0.0528*		-0.0111	
	(-1.64)		(-1.52)		(-0.35)	
Coverage		-0.0006*		-0.0067		-0.0013*
		(-1.76)		(-1.52)		(-1.95)
Coverage*IS		-0.0034***		-0.0035***		-0.0036
		(-2.79)		(-2.58)		(-1.06)
CB	0.307***	0.310***	0.345**	0.307**	0.249*	0.305***
	(3.30)	(4.37)	(2.90)	(3.45)	(1.82)	(2.30)
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- All countries :
  - IS reduces financial fragility ($\beta < 0$)
  - CB increases financial fragility ($\delta > 0$)
  - IS mitigates the detrimental impact of CB ($\gamma < 0$)

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- Advanced countries :
  - IS reduces financial fragility trough its effect on CB ($\beta = 0$ and $\gamma < 0$)
- Developing countries :
  - Direct effect of IS ($\beta < 0$ and $\gamma = 0$)

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- Advanced countries :
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- Developing countries :
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Transmission channels : 3/Determinants of CB

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	All countries		GNI pc $<$ US$4,125		GNI pc $\geq$ US$4,125	
	(1)	(2)	(3)	(4)	(5)	(6)
Depth	-0.0051*		-0.0146***		-0.0019*	
	(-1.88)		(-2.61)		(-1.75)	
Coverage		-0.0002		-0.0005		0.0000
		(-1.09)		(-1.40)		(0.22)
Control	Yes	Yes	Yes	Yes	Yes	Yes
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- Depth of IS limits the occurrence of credit booms ($\beta' < 0$)
- Coverage does not affect credit booms ($\beta' = 0$)

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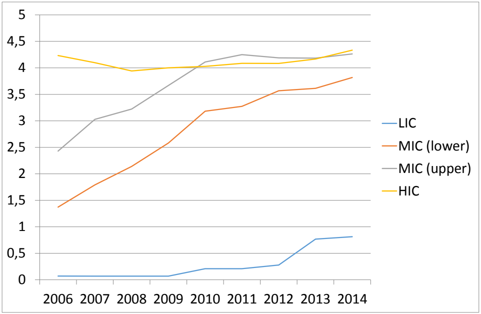
Conclusion

- Summary of the results
  1. IS reduces financial fragility
  2. Direct effect of IS (controlling for CB)
  3. IS (depth) has an impact on the occurrence of credit booms
  4. IS mitigates the negative effect of CB but only for emerging and developing countries
  5. CB is a strong determinants of financial fragility for both developing and developed countries

- Research perspective
  - Understanding the precise effect of IS on credit booms
    - Why depth matter and coverage do not ?
  - Alternative channels through which IS affect stability ?

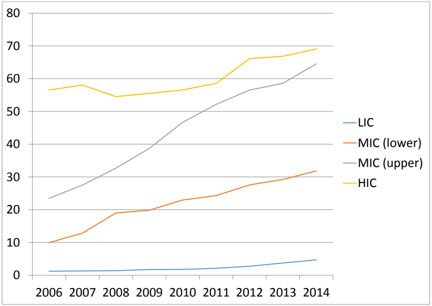
Introduction : Motivation

FIGURE: Quality of PCR and PCB, by group of countries



Introduction : Motivation

FIGURE: Coverage of PCR and PCB, by group of countries



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