GLOBAL BANKING, GLOBAL CRISES?

THE ROLE OF THE BANK BALANCE-SHEET CHANNEL FOR THE TRANSMISSION OF FINANCIAL CRISES

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BETTER POLICIES FOR BETTER LIVES

Motivation & Research question

- Main question: Do shocks to leveraged creditors with cross border holdings have an incidence on debtor countries' risk of suffering financial turmoil?

  1. Impact of international bank integration,
  2. External bank debt maturity,
  3. Domestic banking sector vulnerabilities / regulation.

Motivation & Research question

- Large theoretical literature on spillovers of country specific shocks: Krugman (2008), Devereux & Yetman (2010).
- Some tests of the transmission of specific liquidity shocks, notably during the global financial crisis: Khwaja & Mian (2008), Cetorelli & Goldberg (2010), Hale (2011), De Haas and Van Lelyveld (2013), Bussiere et al., (2014)...
- **BUT** lack of empirical evidence that international banks systematically transmit shocks to their debtor countries:
  - domestic shocks,
  - shocks to third-party borrowers.

Contributions and main findings

Contributions:

- New proxy measures of bank balance-sheet (BBS) shocks,
- DiD strategy on a large sample of countries and over time, 1983-2009.

Main findings:

1. Bank balance-sheet shocks matters for the occurrence of systemic banking crises and bank flows.
2. Bank balance-sheet shocks particularly affect countries:
    - With a higher degree of financial (banking) integration,
    - With higher short-term funding vulnerabilities,
    - During period of liquidity shortages.

Outline of the talk

1. Financial integration and transmission of financial turmoil through the banking system, data and descriptive evidence:
   - Identify a new proxy for bank-balance-sheet shocks.
   - Measure the effects of countries' exposure to those shocks.
2. Econometric analysis (≈150 countries, 1983-2009)
   - Measure the effect of bank balance-sheet shocks on the likelihood of systemic banking crises.
   - And on bilateral bank flows.
3. What factors/policies can mitigate bank balance-sheet shocks?
   - Bank leverage, capital adequacy ratios, liquidity in the banking system, overall liquidity, capital controls?

I. Identifying bank balance-sheet shocks

For each country, create liability-weighted bank shocks :

- Direct vulnerabilities: shocks to creditor banks.
- Indirect vulnerabilities: shocks to third-party country transmitted by common-creditor banks.

Two main sources of data:

1. Bilateral (locational) bank positions from the BIS.
2. Changes of country credit ratings
   - Survey of Institutional investors in September each year. Large sample of countries over 1983-2009.
   - Alternative using bank equity prices for a smaller sample of countries and a shorter time-period.

I.A. Bank balance-sheet shocks

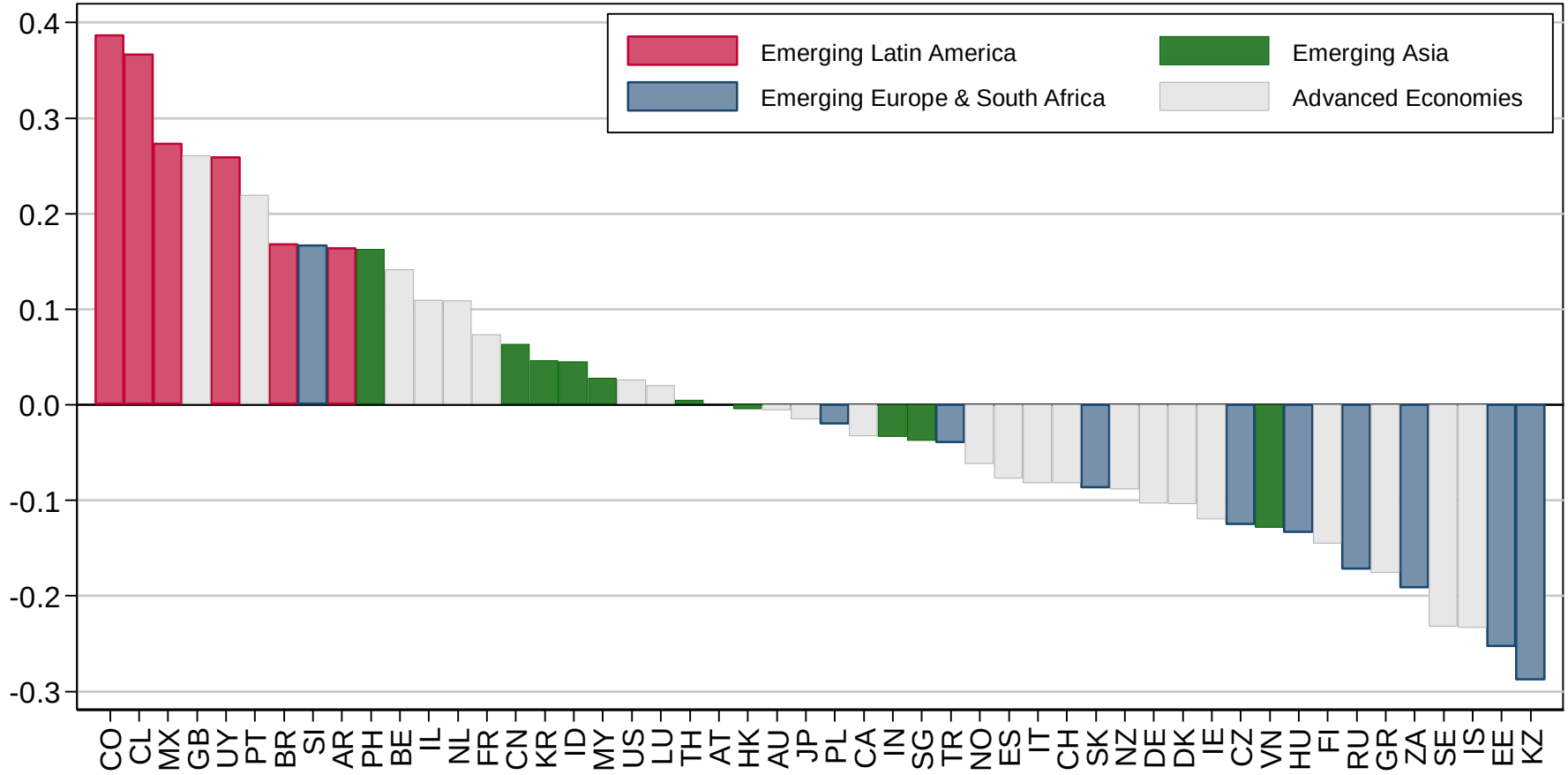
- External balance-sheet shocks for country *d* (debtor) are measured by the direct shocks to its creditors:

$$Contagion_{dt} = -\sum_{r \in R, r \neq d} wbl_{drt} \cdot \frac{\Delta rating_{rt}}{rating_{r,t-1}}$$

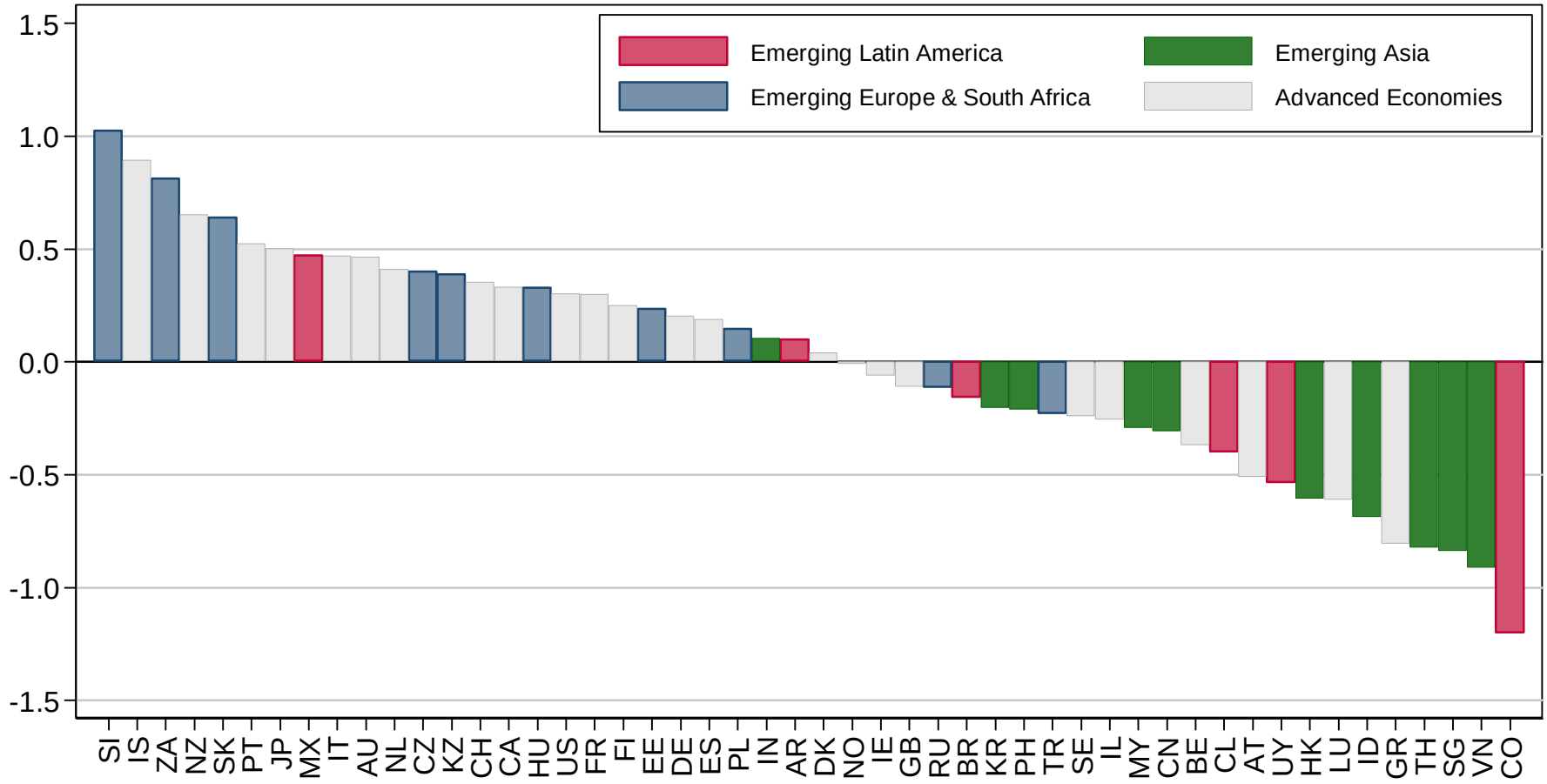
where:

- *R* the set of lending (reporting) countries,
- $rating_{r,t}$ is the rating of country *r* according to "*Institutional Investor*"
- wbl_{drt} is the share of *d*'s bank liabilities towards creditor country r in its overall bank liabilities.

Balance-sheet shocks in 1995: Mexican crisis



Balance-sheet shocks in 2009: financial crisis



I.B. Common creditor shocks

- Indirect shocks work through other debtor countries, i.e. via Common Creditors :

$$CCC_{dt} = -\sum_{r \in R} (wbl_{drt} \sum_{v \in V, v \neq d} wel_{rvt} \cdot \frac{\Delta rating_{vt}}{rating_{v,t-1}})$$

  - wbl_{drt} is the share of d's bank liabilities towards creditor country *r* in its overall bank liabilities.
  - wel_{rvt} is the share of *r*'s bank assets allocated in country *v*.
- These shocks occur through third party debtor countries, *v*, sharing the same creditor, *r*.

I.B. Isolating lending country shocks

- Credit rating of creditor country may take into account:
  1. Shocks specific to country *c*,
  2. Shocks to its debtor countries *d*.
- We define specific lending country spillovers:
  - Residuals of creditor country shocks once controlled for shocks to the external assets of its banks:

$$\Delta portfolio\_rating_{ct} = \sum_{v \in V} wea_{cvt} \cdot \frac{\Delta rating_{vt}}{rating_{v,t-1}}$$

1. External shocks

$$\Delta rating_{ct} = \alpha + \beta \, \Delta portfolio\_rating_{ct} + \varepsilon_{ct}$$

2. Residual shocks

$$LCS\,Shocks_{dt} = -\sum_{r \in R} wbl_{drt} \cdot \hat{\varepsilon}_{rt}$$

3. LCS shocks

I.B. Direct and indirect balance-sheet shocks

Mexican crisis **Asian crisis**

	1995		1998	
Ranking by shock size[(1)]	Lending-Country Spillovers	Common-Creditor Shocks	Lending-Country Spillovers	Common-Creditor Shocks
1	Colombia	Brazil	Hong Kong SAR	Singapore
2	Chile	United Kingdom	Singapore	Hong Kong SAR
3	Mexico	Estonia	Thailand	Thailand
4	United Kingdom	Germany	Korea	Malaysia
5	Slovenia	Russia	Malaysia	Australia
6	Uruguay	Portugal	Australia	Korea
7	Brazil	Ireland	China	United States
8	Philippines	Uruguay	India	China
9	Argentina	Japan	Indonesia	United Kingdom
10	Korea	Belgium	Colombia	Mexico

Banking system more regionally integrated

II. Econometric issues

Impact of the BBS shocks on the likelihood of financial crises?

- Other common shocks (e.g. global macroeconomic shocks, industry specific shocks) can affect countries at the same time and be correlated with BBS shocks.
- Reverse causality: situation in country *d* also affects banks in country *c*…
- The structure of the banking network may be endogenous.

⇒ Impact of the shocks should vary with exposure, isolate a banking channel.

⇒ Mostly an issue for direct shocks (shocks to debtor *d* are excluded from CCS) + lagged shocks and domestic controls.

⇒ Use lagged structure of the network.

II. Difference-in-differences strategy

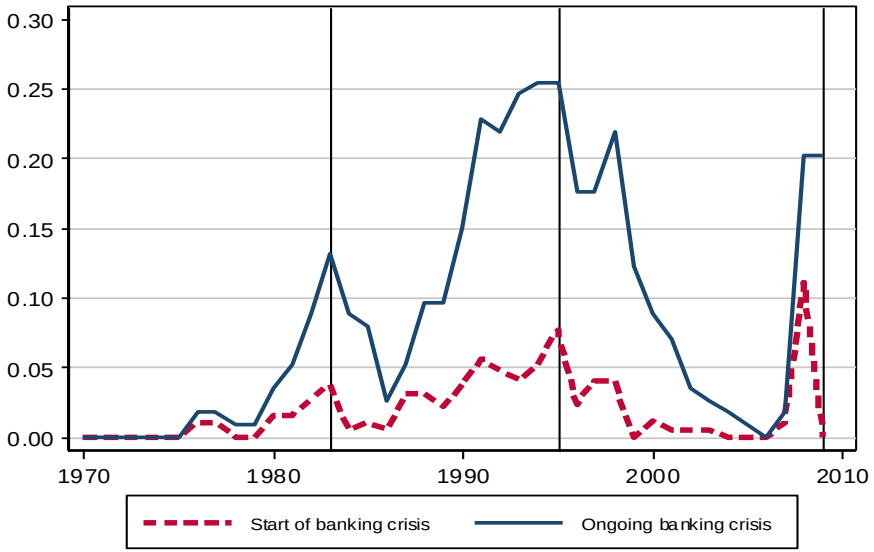
- Use exogenous balance-sheet shocks that are determined by the ex-ante structure of cross-border liabilities to banks (BIS bilateral locational statistics).
- Use various ex-ante measures of exposure or vulnerabilities to these shocks:
  1. Financial integration (banking)

     Proxied by consolidated external bank debt/GDP
  2. External funding risk

     Proxied by external short-term bank debt/GDP
- Use multiplicative term of exogenous balance-sheet shocks and exposure variable (refer to this term as multiplier).

II. Sample & Data

- Systemic banking crises:
  - Laeven & Valencia (2013)
  - Panel of 167 developed and emerging countries from 1970 to 2011.
  - Much more relevant for EMEs until recently.



- Bilateral consolidated bank flows.
- Main control variables:
  - Lane & Milesi-Ferreti (2010) for financial account.
  - completed by World-Bank data, IMF-IFS, IMF-WEO.

II. Econometric specification

- First-difference linear probability model with lagged explanatory variables. Conditional on the absence of crisis at t-1:

$$c_{it} = \alpha Shocks_{it-1} + \beta Exp_{it-1} + \gamma Exp_{it-1} \times Shocks_{it-1} + X_{it-1}\theta + \lambda_i + \delta_t + \varepsilon_{it}$$

- c_{it}: takes value 1 at the onset of a banking crisis, 0 otherwise.
- $Shocks_{it-1}$: bank balance-sheet shocks
- Exp_{it-1}:Exposure to shocks (external bank debt / GDP)
- λ_i, δ_t: country and year fixed effects.

II. Econometric specification

$$c_{it} = \alpha Shocks_{it-1} + \beta Exp_{it-1} + \gamma Exp_{it-1} \times Shocks_{it-1} + X_{it-1}\theta + \lambda_i + \delta_t + \varepsilon_{it}$$

- X_{it-1}: Other explanatory variables, including:
  - Usual (lagged) controls: domestic credit growth and credit level, GDP per capita and population,
  - Financial account size: External Assets/GDP, External liabilities/GDP, Reserves/GDP and their squares,
  - Trade openness , export prospects and export reliance.
  - controls for duration and state dependence.

II.A. Main results

Dependent variable:	**Start of a banking crisis**					
Estimator:	**Pooled OLS**	**Fixed effects**		**First differences**		**GMM-2S**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Debt to foreign banks / GDP	0.006	0.020	0.008	0.034	0.032	0.401**
	(0.007)	(0.027)	(0.024)	(0.042)	(0.042)	(0.167)
Bank balance-sheet shocks	-0.306	0.077	0.010	0.189	0.182	0.132
	(0.454)	(0.505)	(0.501)	(0.311)	(0.309)	(0.340)
Bank balance-sheet shocks x Debt to foreign banks / GDP	**0.195** **(0.372)**	**0.432** **(0.296)**	**0.532**** **(0.269)**	**0.960***** **(0.124)**	**0.951***** **(0.122)**	**0.917***** **(0.118)**
Country fixed effects	No	Yes	Yes	Yes	Yes	Yes
Controls for duration[1]	No	No	Yes	No	Yes	Yes
Instruments[2]	No	No	No	No	No	Yes
Hansen (P-val)						0.24 (0.88)
Kleibergen-Paap (P-val)						7.17 (0.07)
Observations	2,419	2,419	2,419	2,204	2,204	2,055
Countries	146	146	146	146	146	146

IVs: Past levels of bank debt / GDP in t-3, t-4
+ interactions with BBS keeping network constant

II.A. Direct and indirect shocks

Dependent variable:	**Start of a banking crisis**					
Estimator:	**First differences linear probability model**					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Debt to foreign banks / GDP	0.044	0.032	0.047	0.040	0.035	0.043
	(0.037)	(0.038)	(0.037)	(0.039)	(0.038)	(0.040)
Lending-country spillovers	0.132		0.135	-0.034		-0.011
	(0.110)		(0.111)	(0.108)		(0.112)
Lending-country spillovers	**0.908*** **		**0.735*** **	**0.502*** **		**0.319***
x Debt to foreign banks / GDP	**(0.163)**		**(0.183)**	**(0.141)**		**(0.170)**
Common-creditor contagion shocks		2.211*	2.344*		2.338*	2.634*
		(1.180)	(1.325)		(1.293)	(1.382)
Common-creditor contagion shocks		**1.306*** **	**0.904*** **		**0.983*** **	**0.889** **
x Debt to foreign banks / GDP		**(0.196)**	**(0.235)**		**(0.187)**	**(0.387)**
Continent x year dummy variables	No	No	No	Yes	Yes	Yes
Observations	2,148	2,204	2,204	2,148	2,148	2,148
Countries	146	146	146	146	146	146

Baseline estimate (se): 0.951*** (0.122)

II.B. BBS shocks or regional shocks?

- Despite the large number of controls, the bank-balance-sheet channel could be confounded by regional shocks.

- Four main placebo tests are constructed.
  - We consider that each country external debt portfolio of assets is proportional to:
    1. the inverse of distance,
    2. the inverse of distance squared,
    3. Trade volume (share of exports).
  - We control for continent x year dummies.

II.B. BBS shocks or regional shocks?

Dependent variable:	**Start of a banking crisis**					
Estimator:	**First differences linear probability model**					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Debt to foreign banks / GDP	0.032	0.029	0.034	0.037	0.046	0.034
	(0.042)	(0.045)	(0.043)	(0.044)	(0.043)	(0.040)
Bank balance-sheet shocks	0.182	0.040	0.078	0.060	0.095	0.030
	(0.309)	(0.321)	(0.322)	(0.330)	(0.330)	(0.321)
Bank balance-sheet shocks x Debt to foreign banks / GDP	**0.951*** (0.122)**	**1.436*** (0.222)**	**1.027*** (0.145)**	**0.892*** (0.326)**	**0.663* (0.347)**	**0.646*** (0.163)**
Placebo (distance)	No	Yes	No	No	Yes	No
Placebo (distance squared)	No	No	Yes	No	Yes	No
Placebo (trade)	No	No	No	Yes	Yes	No
Continent * year dummies	No	No	No	No	No	Yes
Observations	2,204	2,148	2,148	2,139	2,139	2,204
Countries	146	146	146	145	145	146

II.C. Balance-sheet shocks and short-term funding

- Exposure or vulnerabilities to balance-sheet shocks does not only increase with total external funding,
- Short-term debt may also lead to increased vulnerabilities due to higher roll-over risk of external funding positions.
- Concern: maturity structure may be endogenous:
  - Distressed borrowers may not be able to use LT debt.
  - Instrument by 4 year lags and maturing long-term debt.

II.C. Balance-sheet shocks and short-term funding

Dependent variable:	**Start of a banking crisis**					
Estimator:	**First differences**			**First differences**		
	OLS	**GMM-2S**	**GMM-2S**	**OLS**	**GMM-2S**	**GMM-2S**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Short-term debt to foreign banks / GDP	0.036	-0.036	0.418	0.036	0.063	-0.066
	(0.038)	(0.165)	(0.660)	(0.031)	(0.380)	(0.128)
Long-term debt to foreign banks / GDP				0.052	0.185	0.169
				(0.128)	(0.136)	(0.118)
Bank balance-sheet shocks	0.210	0.319	0.313	0.237	0.316	0.602
	(0.311)	(0.324)	(0.459)	(0.323)	(0.333)	(0.404)
Bank balance-sheet shocks	**1.810*** **	**1.558*** **	**1.763*** **	**1.527**	**1.645** **	**1.056***
x Short-term debt to ext. banks / GDP	**(0.363)**	**(0.253)**	**(0.534)**	**(1.156)**	**(0.765)**	**(0.552)**
Bank balance-sheet shocks				**0.050**	**0.059**	**0.149**
x Long-term debt to ext. banks / GDP				**(0.174)**	**(0.231)**	**(0.242)**
Instruments[1]	No	**Yes IV1**	**Yes IV2**	Yes	**Yes IV1**	**Yes IV2**
Hansen (P-val)		2.04 (0.36)	0.05 (0.98)		3.49 (0.32)	3.63 (0.82)
Kleibergen-Paap (P-val)		3.90 (0.27)	2.02 (0.57)		5.49 (0.24)	11.49 (0.18)
Observations	2,172	2,018	1,617	2,172	1,926	1,611
Countries	146	146	141	146	146	142

IV1: Past levels of short-term debt t-3/t-4

IV2: Maturing long-term debt from t-2/t-3

II.E. Bank flows and BBS shocks

- Use bilateral (consolidated) data on the liabilities of BIS reporting countries

- Estimate a bilateral equation controlling for all debtor country shocks to isolate the effects of creditor country's shocks.

- Change (in eoy) liabilities of *d* towards *c*:

$$\Delta \ln(L_{cd,t}) = \alpha + Shocks_{cd,t-1}\beta + \gamma_{d,t} + \delta_{cd} + \varepsilon_{cd,t}$$

$$Shocks_{cd,t} = \sum_{v,v\neq d} wbl_{cdv,t} \frac{-\Delta rating_{v,t}}{rating_{v,t-1}}$$

II.E. Bank flows and BBS shocks

Dependent variable:	**Yearly change in (log) creditor's assets in country d**					
Estimator:	**Debtor-year fixed-effects model**					
	(1)	(2)	(3)	(4)	(5)	(6)
Common-creditor Contagion shock	**-2.714*** (0.969)**	**-3.709*** (0.949)**	**-3.418*** (0.936)**	**-3.472*** (0.933)**	**-2.482** (0.996)**	**-2.492** (1.000)**
Creditor fixed effects	No	Yes	No	No	No	No
Creditor x debtor fixed effects	No	No	Yes	Yes	Yes	Yes
Creditor linear time trend	No	No	No	Yes	Yes	Yes
Creditor quadratic time trend	No	No	No	No	Yes	Yes
Creditor domestic GDP growth	No	No	No	No	No	Yes
# observations	41,303	41,303	41,303	41,303	41,303	41,303
# creditor*year	431	431	431	431	431	431
# debtor countries	211	211	211	211	211	211

III. Factors mitigating BBS shocks

- External factors: Overall level of liquidity.
  - Different measures: US interest rates, world interest rates, aggregate money supply.
  - Control for risk-aversion in each year.

- Domestic factors (small sample):
  - (domestic) bank deposits / credit
  - Bank leverage (RW assets / capital)
  - Bank liquidity reserves / assets.

} WB data

III.A. Overall liquidity and BBS shocks

Dependent variable:	**Start of a banking crisis**					
Estimator:	**First differences linear probability model**					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Debt to foreign banks / GDP	0.057	0.047	0.036	0.073*	0.069*	0.038
	(0.036)	(0.038)	(0.035)	(0.042)	(0.041)	(0.036)
Bank balance-sheet shocks	-0.005	-0.035	-0.041	-0.099	-0.128	0.000
	(0.311)	(0.316)	(0.303)	(0.351)	(0.351)	(0.342)
Bank balance-sheet shocks	**2.268*** **	2.073***	0.832**	2.023***	1.952***	0.825**
x Debt to foreign banks / GDP	**(0.416)**	(0.458)	(0.368)	(0.427)	(0.487)	(0.383)
x --- x US real interest rate	**0.647*** **			0.612***		
	(0.135)			(0.159)		
x --- x World real interest rate		0.676***			0.750***	
		(0.233)			(0.241)	
x --- x Global liquidity			-0.883**			-0.854**
			(0.375)			(0.383)
Controls for Risk aversion (VXO)[1]	No	No	No	Yes	Yes	Yes
Observations	2,204	2,204	2,079	2,025	2,025	1,900
Countries	146	146	146	146	146	146

Each “liquidity” variable is introduced in deviation from its 1983-2009 average.

III.B. Domestic factors mitigating BBS shocks

Dependent variable:	**Start of a banking crisis**					
Estimator:	**First differences linear probability model**					
	OLS	**OLS**	**OLS**	**OLS**	**OLS**	**OLS**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Debt to foreign banks / GDP	0.035	0.124	-0.071	0.192	-0.066	0.073
	(0.041)	(0.135)	(0.064)	(0.138)	(0.066)	(0.125)
Bank balance-sheet shocks	0.098	1.108**	0.681*	0.939*	0.617	1.825***
	(0.312)	(0.476)	(0.372)	(0.473)	(0.378)	(0.635)
Bank balance-sheet shocks	1.751***	-2.354*	1.208***	-1.336	1.497**	-1.708
x Debt to foreign banks / GDP	(0.351)	(1.267)	(0.201)	(0.857)	(0.754)	(1.489)
x --- x Bank deposits / credit	-0.337***			-0.907***	-0.107	
	(0.125)			(0.237)	(0.232)	
x --- x Bank Leverage		0.170***		0.242***		0.146**
(bank assets / capital)		(0.060)		(0.055)		(0.070)
x --- x Bank liquidity reserves /			-7.893**		-7.656**	-4.971
assets			(3.803)		(3.777)	(8.105)
Observations	2,195	504	601	504	601	367
Countries	146	90	97	90	97	70

Conclusion (1/2)

- We have constructed new measures of direct and indirect external funding shocks to debtor countries.
- Empirical evidence that bank integration, as well as maturity-driven external funding risk propagate both direct and indirect contagion shocks.
- Robust to a number of specifications.
- Importantly for policy, liquidity seems to mitigate the effect of BBS shocks and implies the need for international policy coordination.

Conclusion (2/2)

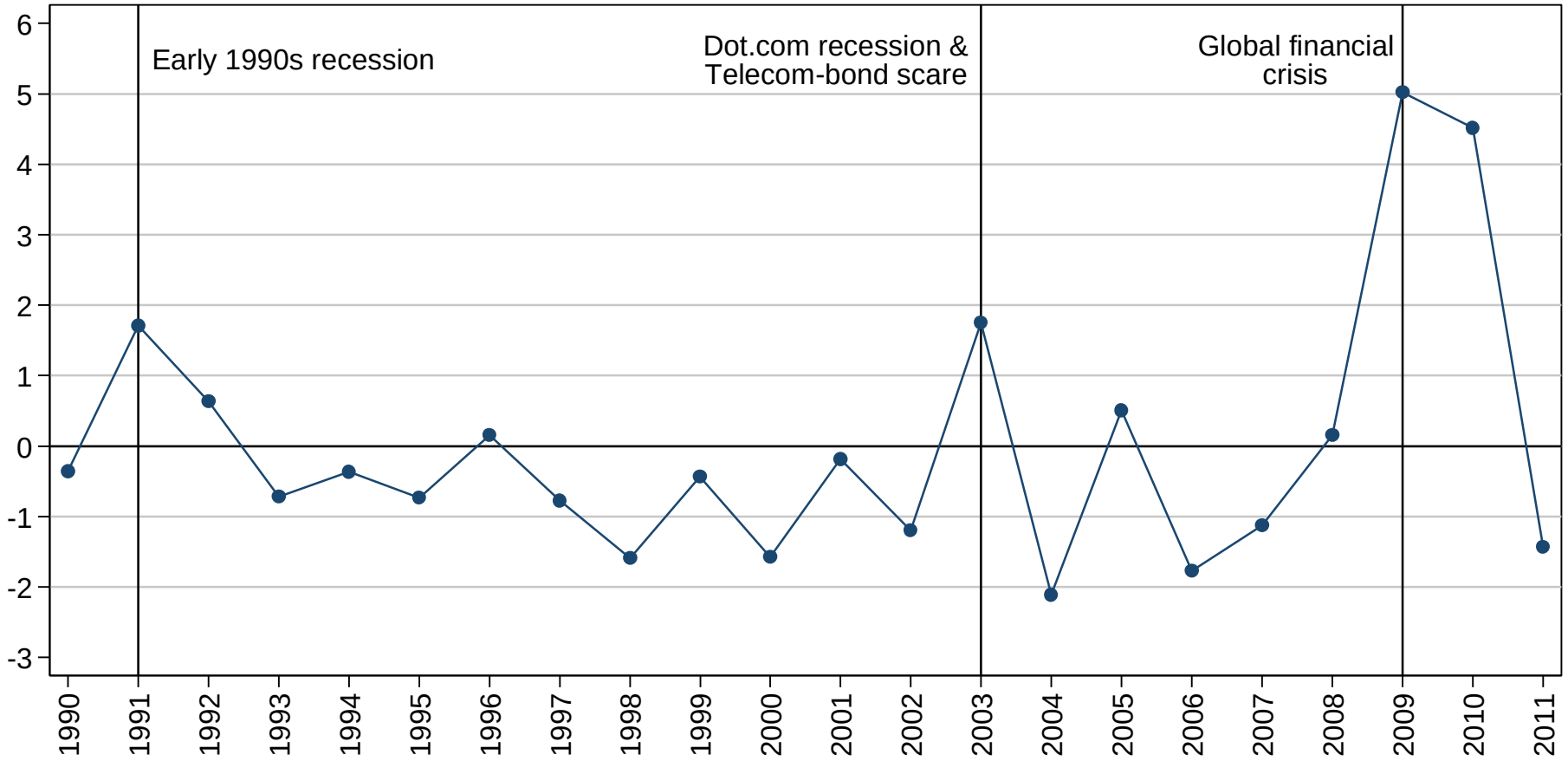
- Domestic banking vulnerabilities (and regulations) play also a role:
  1. Maturity of external lending,
  2. Domestic banking sector leverage.
- If certain policies are not in place: international financial integration may become “too much of a good thing”.
- In particular, international short term lending between banks contributes to spread financial turmoil and can turn out counterproductive.

Thank you!

Backup slides

1. Evolution over time of BBS shocks
2. Descriptive statistics on systemic banking crises
3. Impact on EMEs:
   - Likelihood of systemic banking crises,
   - Bilateral bank flows.
4. Alternative specification using bank equity indices

Evolution over time of the average bank balance-sheet shocks

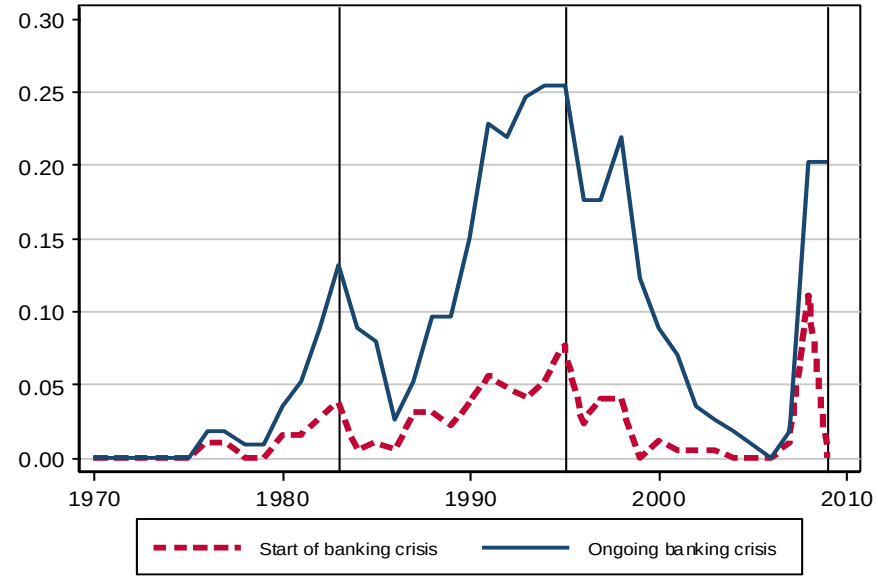


Simple cross-country average

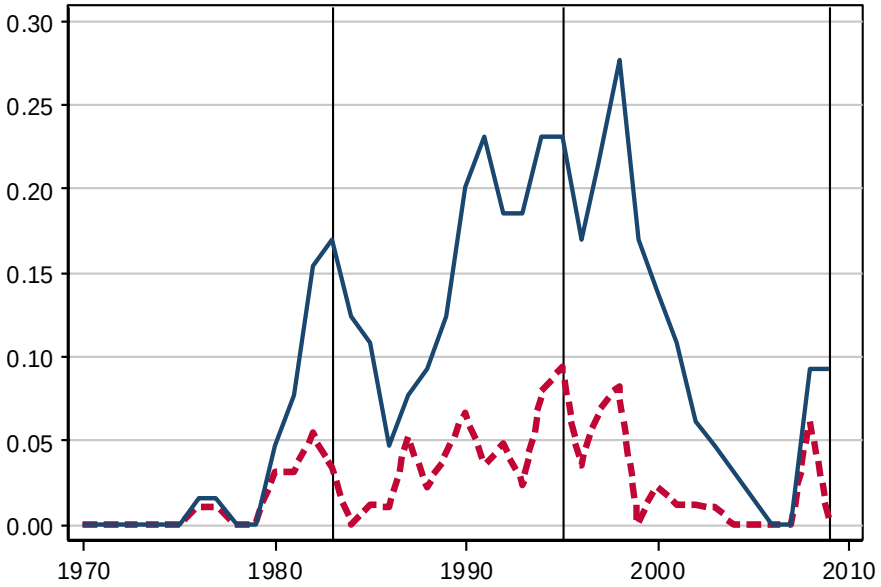
Descriptive statistics on systemic banking crises

	Whole sample	Emerging Economies	Advanced Economies
	(1)	(2)	(3)
A. Crises occurring over the 1983-2009 period			
# of crises	129	74	**20**
Starting year	1995.08	1994.28	2003.08
(s.d.)	(7.30)	(6.06)	(7.39)
Duration	2.74	2.72	2.74
(s.d.)	(1.51)	(1.49)	(1.51)
B. Crises occurring over the 1983-2009 period excluding ongoing crises in 2009			
# of crises	106	68	**5**
Starting year	1992.29	1993.07	1991.6
(s.d.)	(4.60)	(4.67)	(3.29)
Duration	2.87	2.78	3.8
(s.d.)	(1.63)	(1.54)	(1.79)
Output losses[1]	0.28	0.28	0.31
(s.d.)	(0.34)	(0.33)	(0.29)
# observations output losses[1]	88	57	5
# countries	194	98	22

Occurrence of banking crises EMEs



Whole sample



Restricted to 97 EMEs

Effects in EMEs (crises)

Dependent variable:	**Start of a banking crisis**					
Estimator:	**Pooled OLS**	**Fixed effects**		**First differences**		**GMM-2S**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Bank debt / GDP	0.006	0.025	0.006	0.043	0.045	0.225**
	(0.007)	(0.028)	(0.032)	(0.057)	(0.057)	(0.107)
Bank balance-sheet Shocks	-0.262	-0.074	-0.196	0.066	0.052	0.043
	(0.704)	(0.760)	(0.723)	(0.459)	(0.450)	(0.459)
Bank balance-sheet Shocks	0.799	0.999*	1.244**	1.019***	0.965***	0.795***
x Bank debt / GDP	(0.635)	(0.523)	(0.528)	(0.373)	(0.342)	(0.275)
Country fixed effects	No	Yes	Yes	Yes	Yes	Yes
Controls for duration(1)	No	No	Yes	No	Yes	Yes
Instruments(2)	No	No	No	No	No	Yes
Hansen (P-val)						0.36 (0.84)
Kleibergen-Paap (P-val)						5.65 (0.13)
Observations	1,509	1,509	1,509	1,375	1,375	1,287
Countries	85	85	85	85	85	85

Effects in EMEs (flows)

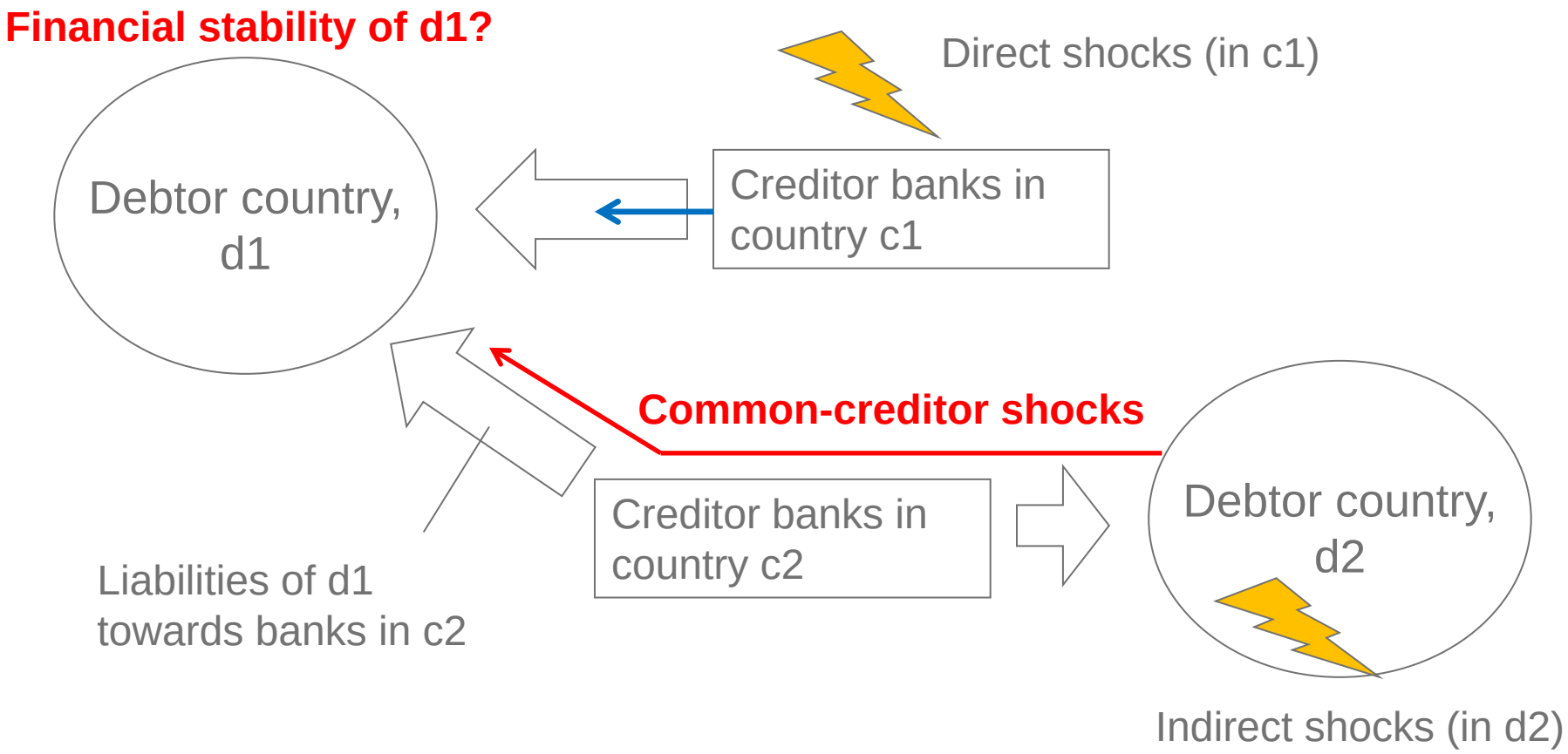
Dependent variable:	**Yearly change in (log) creditor's assets in country d**					
Estimator:	**Debtor-year fixed-effects model**					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Common-creditor Contagion shock	-3.046***	-4.195***	-4.140***	-4.209***	-3.106***	-3.108***
	(0.994)	(0.986)	(0.972)	(0.970)	(1.050)	(1.053)
Creditor fixed effects	No	Yes	No	No	No	No
Creditor*debtor fixed effects	No	No	Yes	Yes	Yes	Yes
Creditor linear time trend	No	No	No	Yes	Yes	Yes
Creditor quadratic time trend	No	No	No	No	Yes	Yes
Creditor domestic GDP growth	No	No	No	No	No	Yes
# observations	24,614	24,614	24,614	24,614	24,614	24,614
# creditor*year	416	416	416	416	416	416
# debtor countries	97	97	97	97	97	97

Bank equity indices and contagion

Dependent variable:	**Start of a banking crisis**					
Estimator:	**Pooled OLS**	**Fixed effects**		**First differences**		**GMM-2S**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Bank debt / GDP	0.003	-0.047	-0.043	0.013	0.008	0.256
	(0.019)	(0.036)	(0.031)	(0.028)	(0.028)	(0.359)
Bank Balance Sheet Shocks	-0.007	-0.018	0.010	-0.003	-0.002	-0.008
	(0.031)	(0.030)	(0.031)	(0.027)	(0.027)	(0.036)
Bank Balance Sheet Shocks	**0.093****	**0.143****	**0.144****	**0.116*****	**0.115*****	**0.068***
x Bank debt / GDP	**(0.042)**	**(0.063)**	**(0.063)**	**(0.037)**	**(0.036)**	**(0.040)**
Country fixed effects	No	Yes	Yes	Yes	Yes	Yes
Controls for duration(1)	No	No	Yes	No	Yes	Yes
Instruments(2)	No	No	No	No	No	Yes
Hansen (P-val)						5.15 (0.27)
Kleibergen-Paap (P-val)						5.16 (0.40)
Observations	1,643	1,643	1,643	1,460	1,460	1,415
Countries	147	147	147	147	147	147

- Sample is limited to 1995-2009
- Cannot compute common-creditor shocks

Identifying bank balance-sheet shocks



Bank shocks or other channels?

Dependent variable:	Start of a banking crisis					
Estimator:	First differences linear probability model					
	(1)	(2)	(3)	(4)	(5)	(6)
Debt to foreign banks / GDP	0.032	0.040	0.045	0.033	0.041	0.028
	(0.042)	(0.039)	(0.039)	(0.042)	(0.036)	(0.042)
Bank balance-sheet shocks	0.182	-0.118	-0.143	-0.159	-0.236	-0.152
	(0.309)	(0.314)	(0.315)	(0.314)	(0.360)	(0.310)
Bank balance-sheet shocks	**0.951*** **	**1.236*** **	**1.094*** **	**1.061*** **	**1.224*** **	**1.070*** **
x Debt to foreign banks / GDP	**(0.122)**	**(0.279)**	**(0.295)**	**(0.319)**	**(0.288)**	**(0.318)**
Bank balance-sheet shocks						
x Overall Debt / GDP		Yes			Yes	
x Overall Equity /GDP			Yes		Yes	
x Overall FDI /GDP				Yes	Yes	
x Locational bank liab./GDP						Yes
Observations	2,204	2,204	2,201	2,204	2,201	2,204
Countries	146	146	146	146	146	146

Balance-sheet shocks in 1998: Asian crisis