

# Financial Deepening, Terms of Trade Shocks and Growth Volatility

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INTERNATIONAL MONETARY FUND



*International Conference “What responses to terms of trade shocks in poor and vulnerable countries?”  
(Paris, January 24, 2017)*



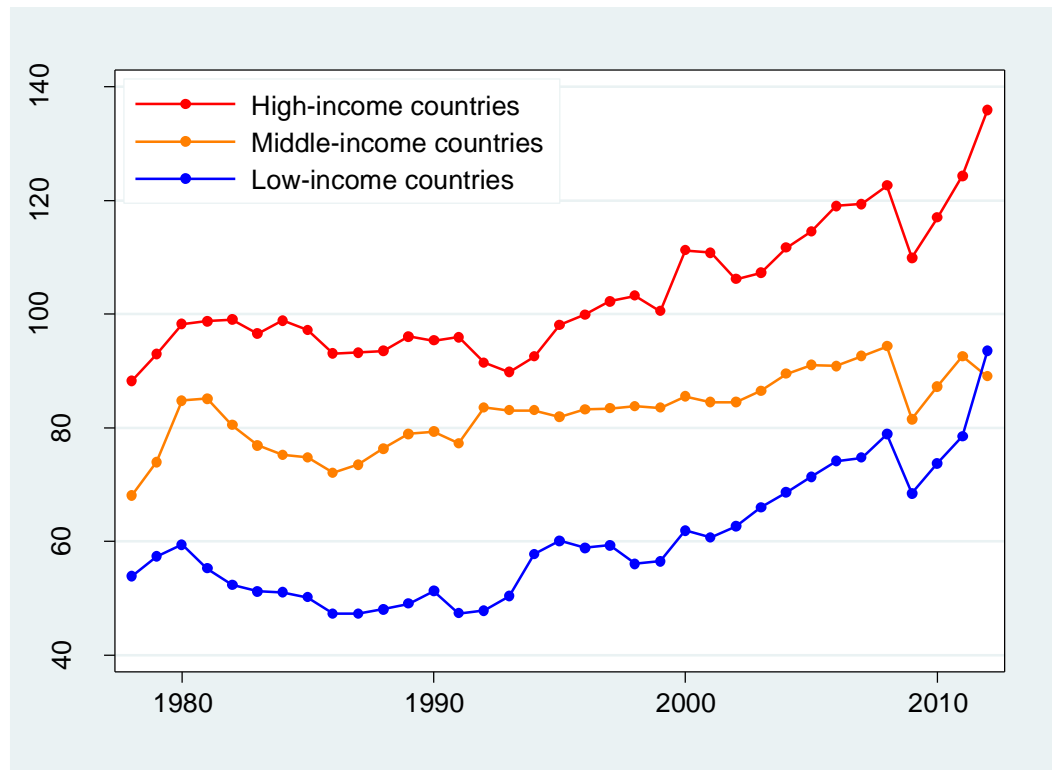
# *Outline*

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- 1. Motivation**
- 2. Financial deepening: a shock absorber or an amplifier?**
- 3. Model, data and estimation strategy**
- 4. Main results**
- 5. Conclusion and policy implications**

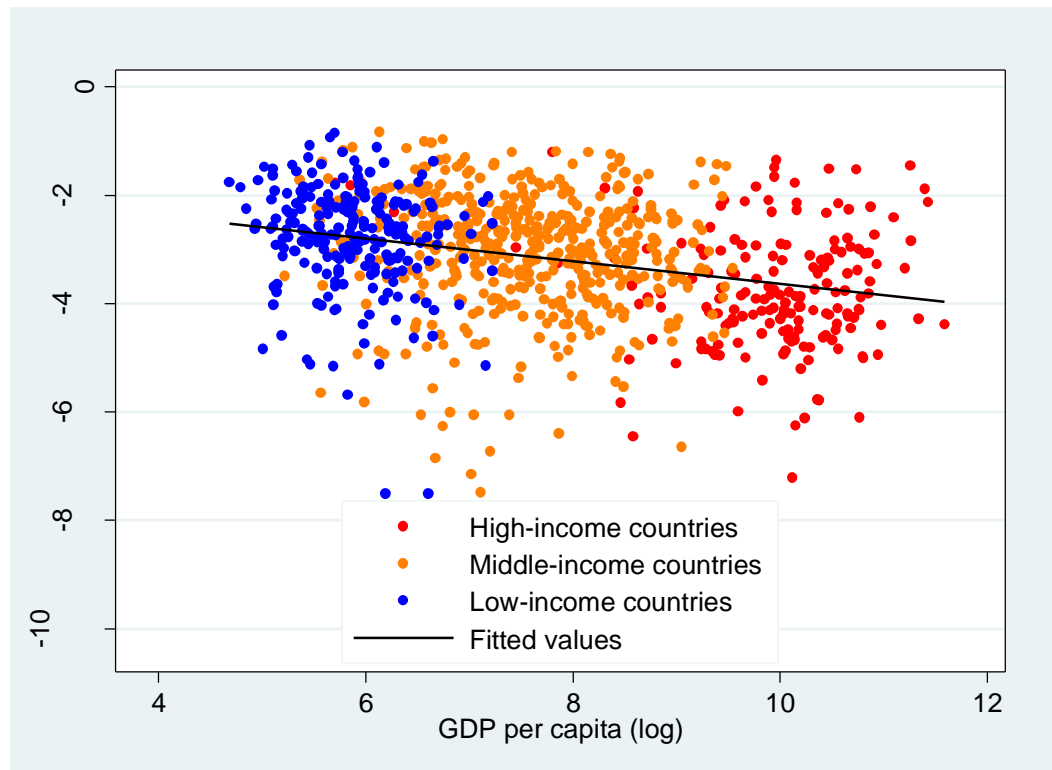
# 1. *Motivation*

- **Low-income countries (LICs) have been increasingly integrated to the world economy...**



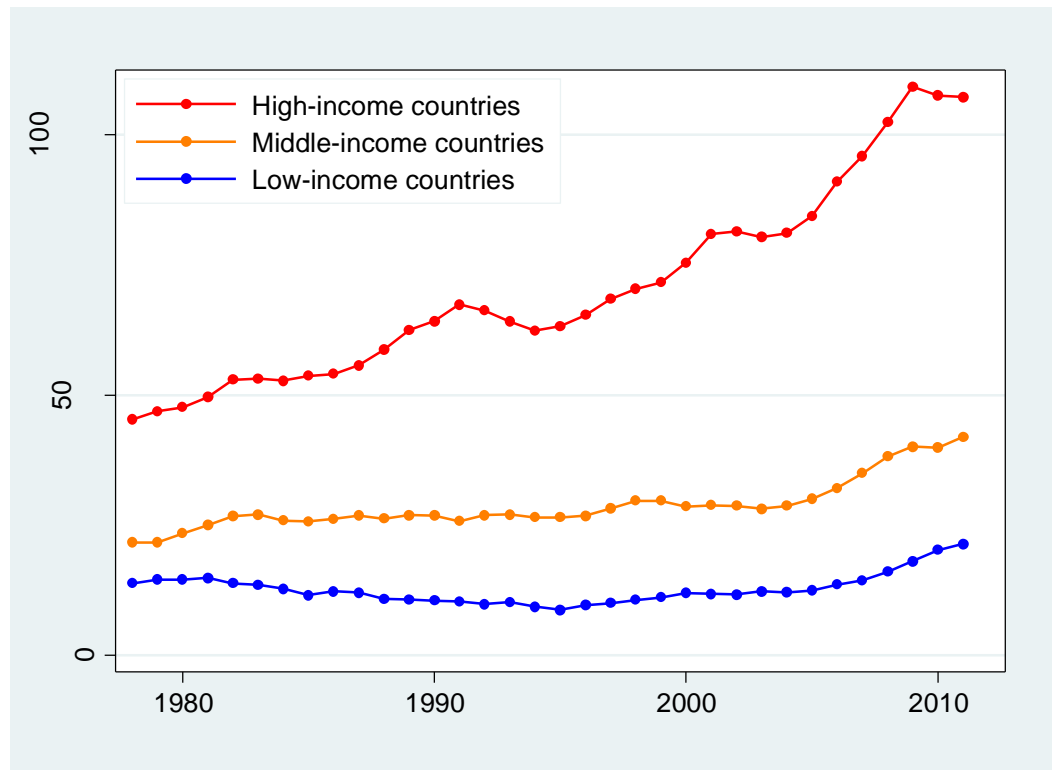
# 1. *Motivation*

- ... however, they have become more exposed to terms of trade shocks.



# 1. *Motivation*

- Yet, financial deepening remains shallow in LICs and has stagnated over time



# 1. *Motivation*

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- **This paper is related to three main strands of the literature:**
  - **Finance-growth nexus** (Levine, 1997; Levine, Loayza, and Beck, 2000; Andersen and Tarp, 2003; Guillaumont and Kpodar, 2006; Arcand, Berkes and Panizza, 2012; and Panizza, 2014)
  - **Financial deepening and macroeconomic volatility** (Easterly, Islam, and Stiglitz, 2000; Dabla-Norris and Srivisal, 2013; Beck, Lundberg, and Majnoni, 2006; )
  - **Financial structure and growth** (Beck and Levine, 2002)

# 1. *Motivation*

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- **The objective of this paper is to shed light on the benefits and/or risks financial deepening can bring to LICs:**
  - How does banking sector development affect growth volatility?
  - Does it help smooth or magnify the transmission of terms of trade shocks to growth volatility?
  - What about stock market development?

## ***2. Financial deepening: a shock absorber or an amplifier?***

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- **The theory provides grounds to believe that countries with deeper financial systems are more likely to better withstand shocks:**
  - In the presence of credit market imperfections, shocks to the net worth of borrowers amplify macroeconomic fluctuations (Bernanke and Gertler, 1990; Greenwald and Stiglitz, 1991).
  - Financial deepening provides opportunities to diversify risks, manage volatility and insure against unexpected events.
  - More developed financial systems make monetary policy more effective and ease constraints on counter-cyclical policies.



## *2. Financial deepening: a shock absorber or an amplifier?*

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- **Nevertheless, some views point to the role of finance in propagating macroeconomic fluctuations:**
  - The Asian financial crisis, and more recently the global financial crisis, have highlighted how finance can itself be a source of macroeconomic volatility
  - Larger financial systems may also indicate higher leverage on the part of economic agents, which implies more risk and lower stability
  - Negative commodity price shocks can adversely affect the health of the financial system, which then leads to macroeconomic volatility

## ***2. Financial deepening: a shock absorber or an amplifier?***

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- **Two empirical studies have looked at this issue, specifically with regards to terms of trade shocks...**
  - Beck, Lundberg, and Majnoni (2006): weak evidence for a dampening effect of financial development on the impact of terms of trade volatility on growth volatility, but financial intermediaries amplify monetary shocks.
  - Dabla-Norris and Srivisal, 2013 : financial deepening is found to mitigate the adverse impact of real external shocks on macroeconomic volatility, but the relationship reverses beyond a threshold.
- **However, these studies do not focus on LICs and tend to overlook the role of financial structure**

### 3. *Model, data and estimation strategy*

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$$Vgrowth_{i,t} = \lambda_0 + \lambda_1 y_{i,t} + \lambda_2 Vtot_{i,t} + \lambda_3 Findev_{i,t} + \lambda_4 Vtot_{i,t} * Findev_{i,t} + AX_{i,t} + u_i + e_{i,t}$$

Where:

- *Vgrowth* represents growth volatility
- *y* is the level of GDP per capita
- *Vtot* is the volatility of terms of trade
- *X* is a set of control variables including trade openness, financial volatility, political stability and share of agricultural value added in GDP.
- *u* is the country-specific effect and *e* is the error term

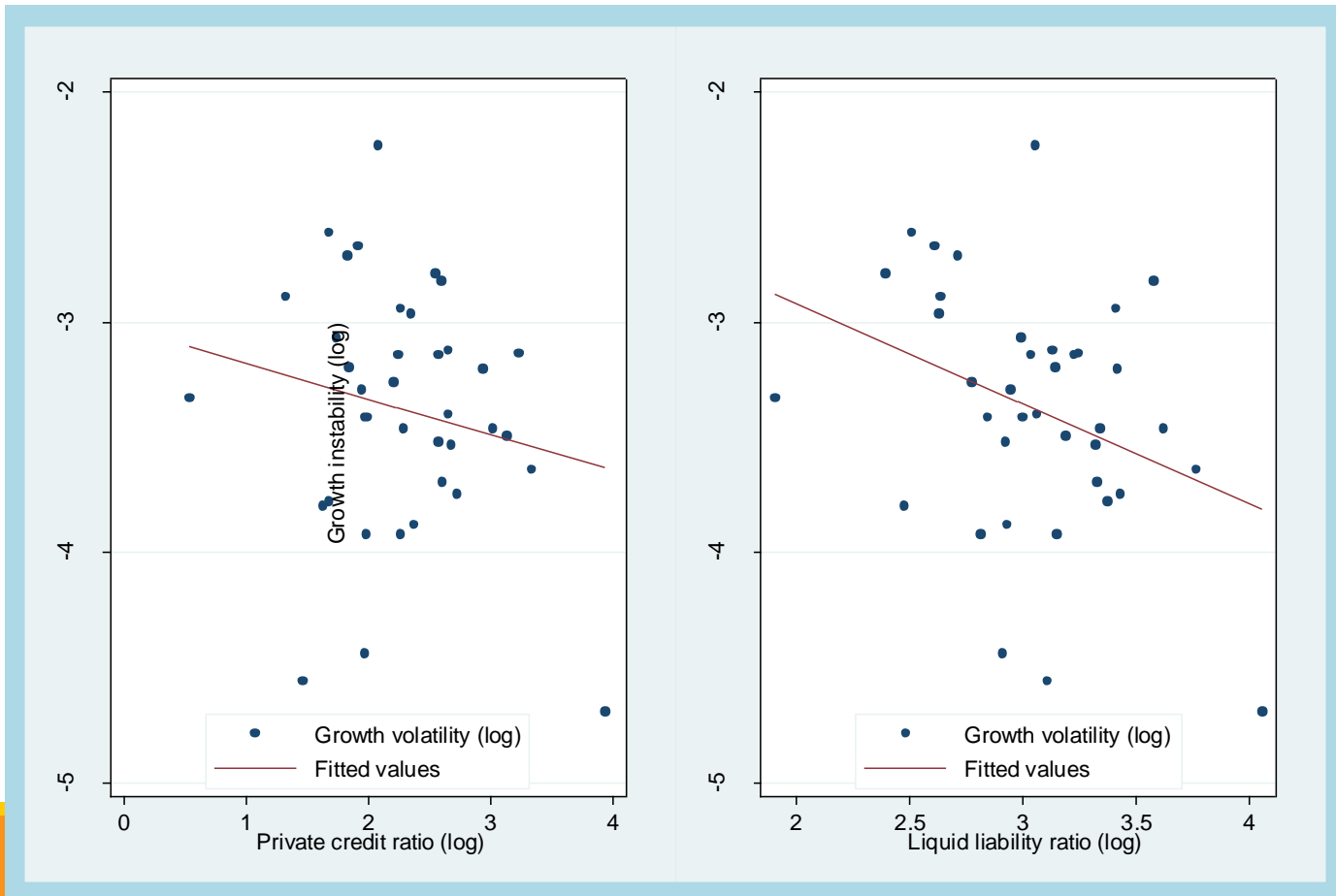
### ***3. Model, data and estimation strategy***

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- **The main sample consists of 38 LICs, but we also consider a larger sample of 124 developing economies**
- **Period of study: 1978-2012 divided in 7 subperiods of 5 years each**
- **Fixed effects and System GMM**
- **Volatility is measured by the residual of an AR(1) process with a trend**

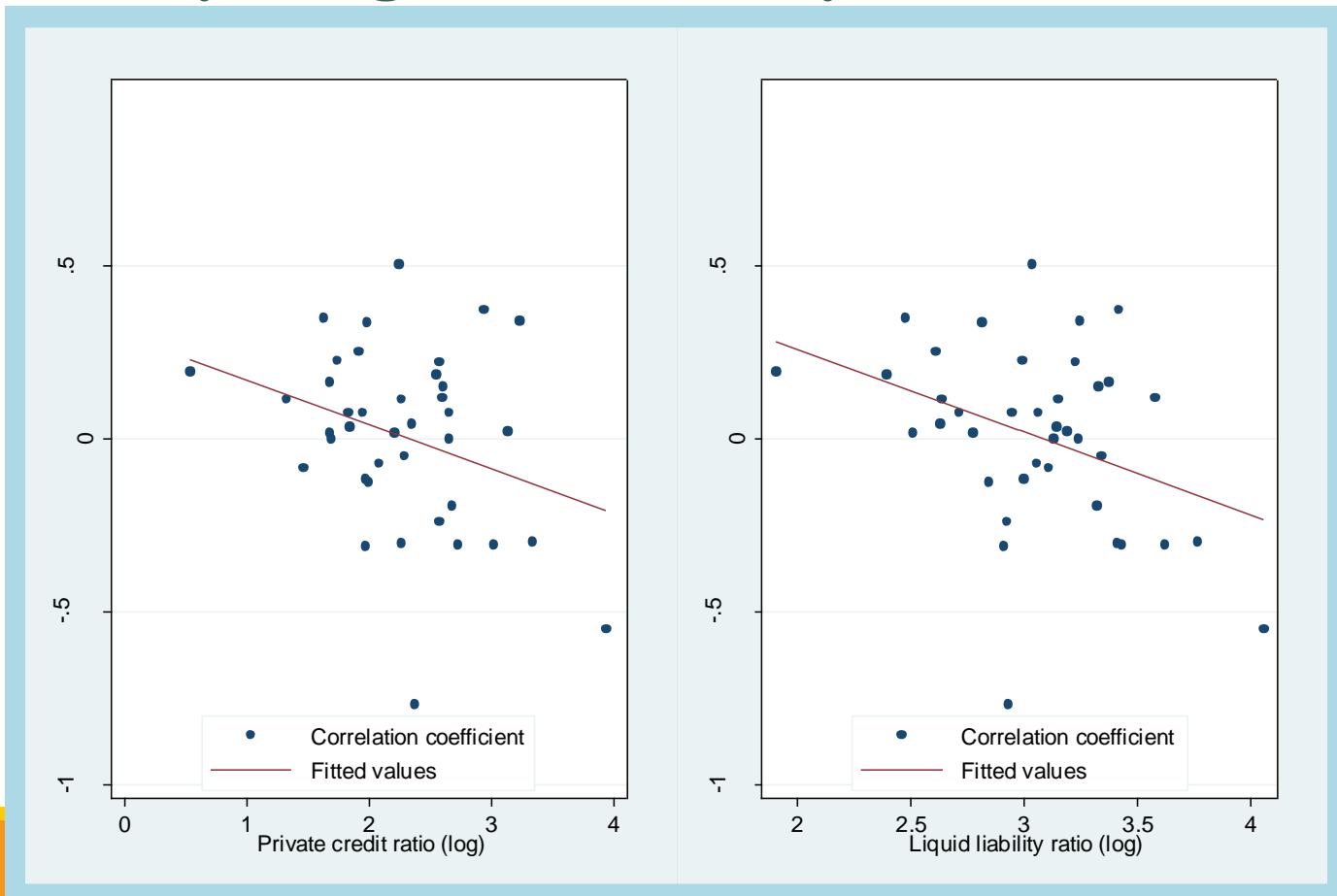
# 3. Model, data and estimation strategy

- Data suggests that financial deepening is negatively associated with growth volatility ...



# 3. Model, data and estimation strategy

- ... But also to the correlation between terms of trade volatility and growth volatility in LICs



## 4. *Main results*

Fixed effects	(1)	(2)	(3)	(4)	(5)	(6)
	LICs	LICs	LICs	LICs	LICs	LICs
GDP per capita (log)	-0.423 [0.183]**	-0.328 [0.189]*	-0.375 [0.202]*	-0.520 [0.197]**	-0.379 [0.278]	-0.439 [0.329]
Trade openness	-0.003 [0.004]	-0.004 [0.004]	-0.003 [0.004]	-0.004 [0.004]	0.001 [0.005]	-0.004 [0.007]
Terms of trade volatility (log)	0.893 [0.160]***	0.838 [0.166]***	0.803 [0.132]***	0.926 [0.166]***	0.740 [0.152]***	0.599 [0.173]***
Private credit ratio (log)	-0.896 [0.207]***	-0.860 [0.206]***	-0.858 [0.195]***	-0.918 [0.214]***	-0.827 [0.224]***	-0.725 [0.236]***
Private credit ratio * Terms of trade volatility	-0.323 [0.069]***	-0.311 [0.068]***	-0.295 [0.056]***	-0.335 [0.068]***	-0.269 [0.058]***	-0.255 [0.062]***
Credit growth volatility		0.239 [0.080]***				0.208 [0.147]
Inflation volatility			0.078 [0.094]			0.011 [0.123]
Political stability					-0.505 [0.205]**	-0.645 [0.218]***
Agricultural value added share				-0.349 [0.352]		-0.534 [0.559]
Constant	1.333 [0.946]	1.145 [0.969]	1.100 [0.953]	3.268 [2.169]	0.081 [1.533]	2.424 [3.420]
Observations	180	177	171	175	129	118
Number of countries	38	38	38	37	38	37
R-squared	0.16	0.20	0.17	0.17	0.20	0.27

## 4. *Main results*

System GMM	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	LICs	LICs	LICs	LICs	LICs	LICs+LMICs	Developing
GDP per capita (log)	-0.517 [0.304]*	-0.413 [0.296]	-0.401 [0.268]	-0.393 [0.408]	-0.442 [0.348]	-0.200 [0.151]	-0.211 [0.168]
Trade openness	-0.006 [0.004]	-0.006 [0.004]	-0.008 [0.005]	-0.006 [0.005]	-0.007 [0.006]	-0.009 [0.005]**	-0.013 [0.004]***
Terms of trade volatility (log)	1.154 [0.422]***	0.933 [0.386]**	1.409 [0.487]***	0.983 [0.421]**	0.796 [0.381]**	0.773 [0.342]**	0.455 [0.244]*
Private credit ratio (log)	-0.889 [0.411]**	-0.698 [0.373]*	-1.244 [0.531]**	-0.982 [0.465]**	-0.776 [0.395]**	-0.409 [0.395]	-0.213 [0.279]
Private credit ratio * Terms of trade volatility	-0.331 [0.151]**	-0.270 [0.137]**	-0.434 [0.167]***	-0.327 [0.166]**	-0.274 [0.139]**	-0.248 [0.122]**	-0.169 [0.083]**
Credit growth volatility		0.203 [0.151]			0.482 [0.174]***	-0.116 [0.218]	0.125 [0.161]
Inflation volatility			-0.101 [0.152]		-0.102 [0.140]	0.320 [0.161]**	0.176 [0.111]
Agricultural value added share				0.168 [0.740]	-0.606 [0.495]	-0.145 [0.275]	-0.513 [0.251]**
Constant	2.751 [2.151]	1.839 [1.877]	2.698 [2.121]	1.193 [5.171]	4.207 [3.941]	0.800 [1.819]	1.488 [1.709]
Observations	180	177	171	175	163	373	542
Number of countries	38	38	38	37	37	83	121
Hansen test p-values	0.40	0.45	0.35	0.43	0.49	0.52	0.14
AR(2) test (p-values)	0.51	0.44	0.42	0.55	0.43	0.36	0.69



## 4. *Main results*

System GMM	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	LICs	LICs	LICs	LICs	LICs	LICs+LMICs	Developing
GDP per capita (log)	-0.453 [0.311]	0.026 [0.302]	-0.074 [0.273]	-0.455 [0.414]	0.003 [0.534]	0.347 [0.385]	-0.121 [0.290]
Trade openness	-0.007 [0.005]	-0.006 [0.007]	-0.008 [0.006]	-0.008 [0.006]	-0.004 [0.007]	-0.008 [0.005]*	-0.008 [0.004]**
Terms of trade volatility (log)	1.711 [0.639]***	2.956 [1.191]**	2.634 [0.967]***	1.884 [0.752]**	3.065 [1.422]**	2.536 [0.928]***	1.296 [0.547]**
Liquid liability ratio (log)	-1.305 [0.608]**	-3.092 [1.349]**	-2.815 [1.071]***	-1.584 [0.735]**	-3.512 [1.341]***	-2.275 [1.097]**	-0.969 [0.564]*
Liquid liability ratio * Terms of trade volatility	-0.470 [0.193]**	-0.887 [0.380]**	-0.772 [0.294]***	-0.545 [0.240]**	-0.931 [0.452]**	-0.761 [0.307]**	-0.366 [0.159]**
Volatility of the liquid liability ratio		0.272 [0.287]			0.177 [0.284]	0.389 [0.284]	0.444 [0.195]**
Inflation volatility			-0.115 [0.174]		-0.082 [0.160]	0.151 [0.183]	0.155 [0.129]
Agricultural value added share				-0.066 [0.616]	-0.034 [1.031]	0.390 [0.707]	-0.781 [0.577]
Constant	4.052 [1.960]**	7.188 [3.828]*	6.065 [3.376]*	5.010 [4.360]	8.035 [7.658]	2.276 [4.049]	5.106 [3.954]
Observations	183	167	173	178	161	368	534
Number of countries	38	38	38	37	37	83	120
Hansen test p-values	0.42	0.52	0.27	0.42	0.45	0.60	0.19
AR(2) test (p-values)	0.38	0.34	0.41	0.37	0.43	1.00	0.69

## 4. *Main results*

System GMM	(1)	(2)	(3)	(4)	(5)	(6)
	LICs	LICs	LICs	LICs	Developing	Developing
GDP per capita (log)	-0.476 [0.300]	-0.583 [0.301]*	-0.440 [0.304]	-0.461 [0.278]*	-0.106 [0.129]	-0.086 [0.124]
Trade openness	-0.006 [0.004]	-0.006 [0.005]	-0.005 [0.004]	-0.005 [0.005]	-0.009 [0.004]**	-0.007 [0.003]**
Terms of trade volatility (log)	0.965 [0.372]***	1.113 [0.382]***	1.054 [0.379]***	1.187 [0.472]**	0.577 [0.297]*	0.562 [0.284]**
Private credit ratio (log)	-0.671 [0.335]**	-0.807 [0.360]**	-0.800 [0.308]***	-0.994 [0.484]**	-0.286 [0.312]	-0.331 [0.283]
Private credit ratio * Terms of trade volatility	-0.265 [0.131]**	-0.308 [0.132]**	-0.310 [0.140]**	-0.367 [0.197]*	-0.230 [0.102]**	-0.212 [0.090]**
Stock market capitalization ratio (log)	-0.135 [0.144]		-0.121 [0.258]		0.390 [0.197]**	
Stock market total value traded ratio (log)		0.040 [0.171]		0.616 [0.564]		0.624 [0.335]*
Stock market capitalization * Terms of trade volatility			0.009 [0.108]		0.167 [0.063]***	
Stock market total value traded * Terms of trade volatility				0.190 [0.217]		0.256 [0.103]**
Constant	1.946 [2.131]	2.937 [2.101]	1.927 [2.059]	2.446 [2.137]	-1.632 [1.174]	-1.748 [1.127]
Observations	180	180	180	180	580	580
Number of countries	38	38	38	38	124	124
Hansen test p-values	0.53	0.55	0.52	0.63	0.33	0.10
AR(2) test (p-values)	0.49	0.56	0.48	0.47	0.89	0.70

## 4. *Main results*

System GMM	(1)	(2)	(3)	(4)	(5)	(6)
	LICs	LICs	LICs	LICs	Developing	Developing
GDP per capita (log)	-0.471 [0.303]	-0.578 [0.283]**	-0.322 [0.245]	-0.411 [0.261]	-0.074 [0.101]	-0.083 [0.128]
Trade openness	-0.006 [0.004]	-0.007 [0.004]	-0.007 [0.005]	-0.005 [0.004]	-0.008 [0.003]**	-0.008 [0.004]**
Terms of trade volatility (log)	1.040 [0.392]***	1.141 [0.389]***	0.906 [0.282]***	0.882 [0.352]**	0.621 [0.228]***	0.485 [0.255]*
Private credit ratio (log)	-0.876 [0.390]**	-0.919 [0.403]**	-0.751 [0.326]**	-0.728 [0.367]**	-0.500 [0.259]*	-0.307 [0.283]
Private credit ratio * Terms of trade volatility	-0.313 [0.145]**	-0.346 [0.145]**	-0.268 [0.109]**	-0.241 [0.140]*	-0.187 [0.075]**	-0.181 [0.082]**
Structure size	-0.140 [0.440]		-1.163 [0.831]		0.842 [0.578]	
Structure activity		0.577 [0.231]**		-3.377 [4.111]		6.036 [3.750]
Structure size * Terms of trade volatility			-0.349 [0.326]		0.377 [0.217]*	
Structure activity * Terms of trade volatility				-1.345 [1.483]		2.256 [1.266]*
Constant	2.252 [2.227]	3.054 [2.015]	1.038 [1.484]	1.519 [1.787]	-0.880 [0.879]	-1.748 [1.019]*
Observations	180	180	180	180	580	580
Number of countries	38	38	38	38	124	124
Hansen test p-values	0.43	0.48	0.59	0.57	0.17	0.16
AR(2) test (p-values)	0.46	0.43	0.45	0.47	0.80	0.50

# 5. *Conclusion and policy implications*

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## ➤ **Summary of results**

- Banking sector development not only reduces growth volatility in LICs, but also mitigate the impact of terms of trade shocks on growth volatility
- In LICs, stock market development appears not to have a meaningful impact on growth volatility, nor does it affect the transmission of terms of trade shocks to growth volatility.
- Nevertheless, as the economy develops, stock market development tends to heighten growth volatility in addition to amplifying the marginal impact of terms of trade shocks on growth volatility
- This suggests that financial structure does matter for growth volatility

# 5. *Conclusion and policy implications*

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## ➤ **Policy implications**

- As LICs' financial systems are dominated by banks, they stand to benefit from policies to deepen their financial sector.
- However, as their economies develop and the financial system becomes more market-based, the financial sector may amplify terms of trade shocks .
- Strong institutions, prudent macroeconomic policies and structural reforms will then play a much important role in strengthening resilience to shocks

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*Thank You*

