Determinants of bank profitability in emerging markets

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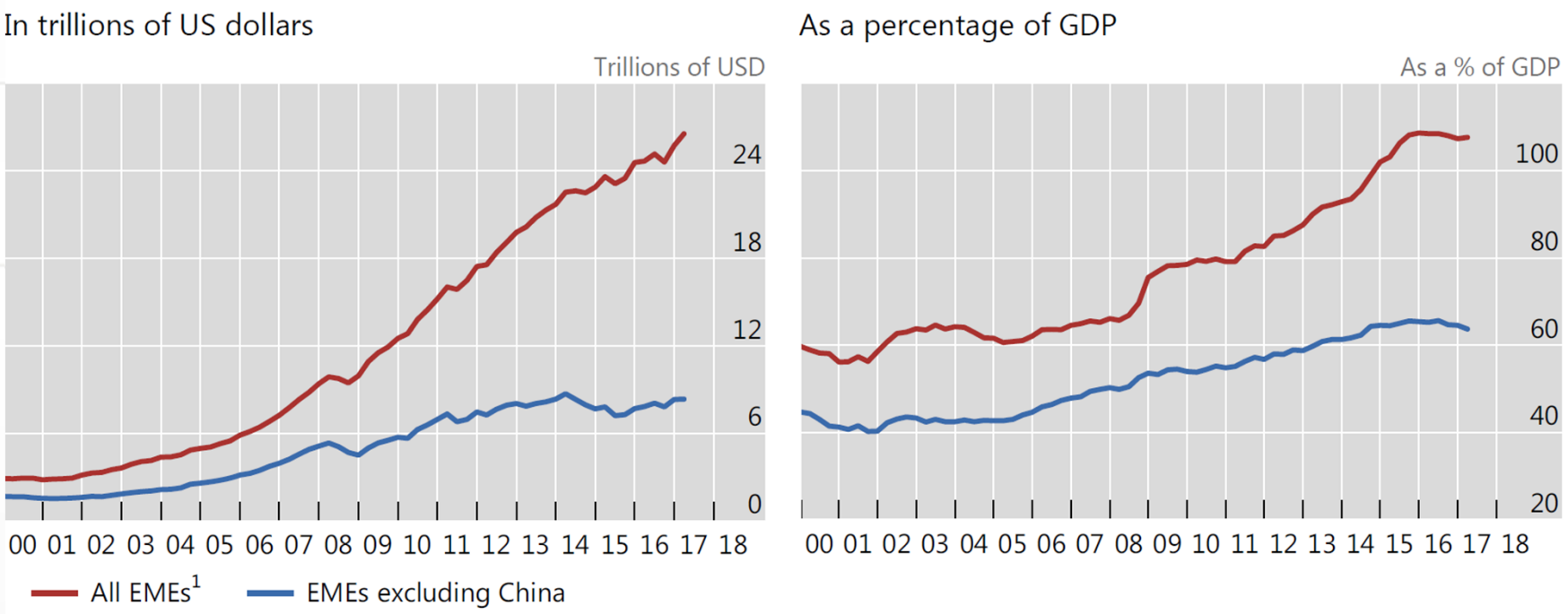
The total bank credit to the private sector in the EMEs expanded ninefold since 2000 and tripled since the end of 2007 .

Bank credit to the private non-financial sector in EMEs

Figure 1



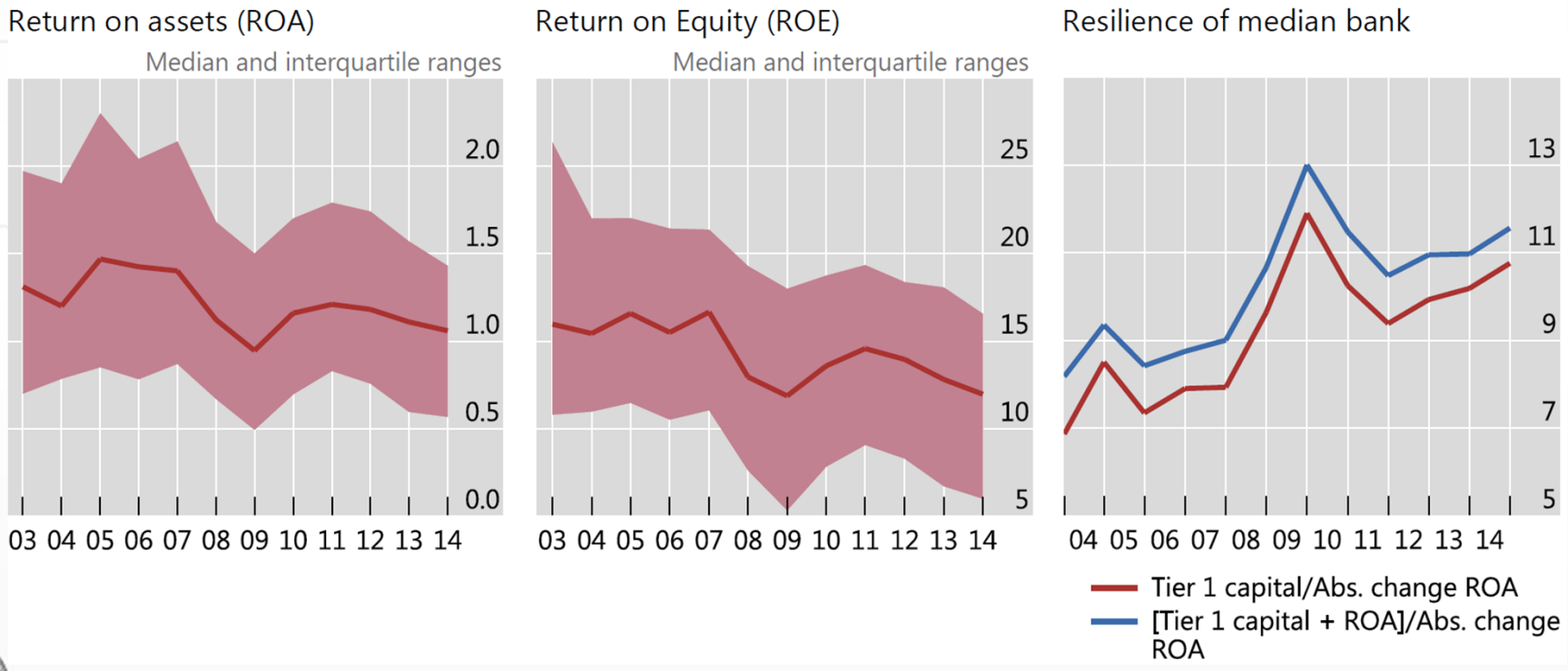
1 Brazil, Chile, China, Colombia, the Czech Republic, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Poland, Russia, South Africa, Thailand and Turkey.

After recovering from the 2008 crisis, bank profitability has tended to decrease in the EMEs during recent years ...

Evolution of profitability in EMEs

Median and interquartile ranges

Figure 2

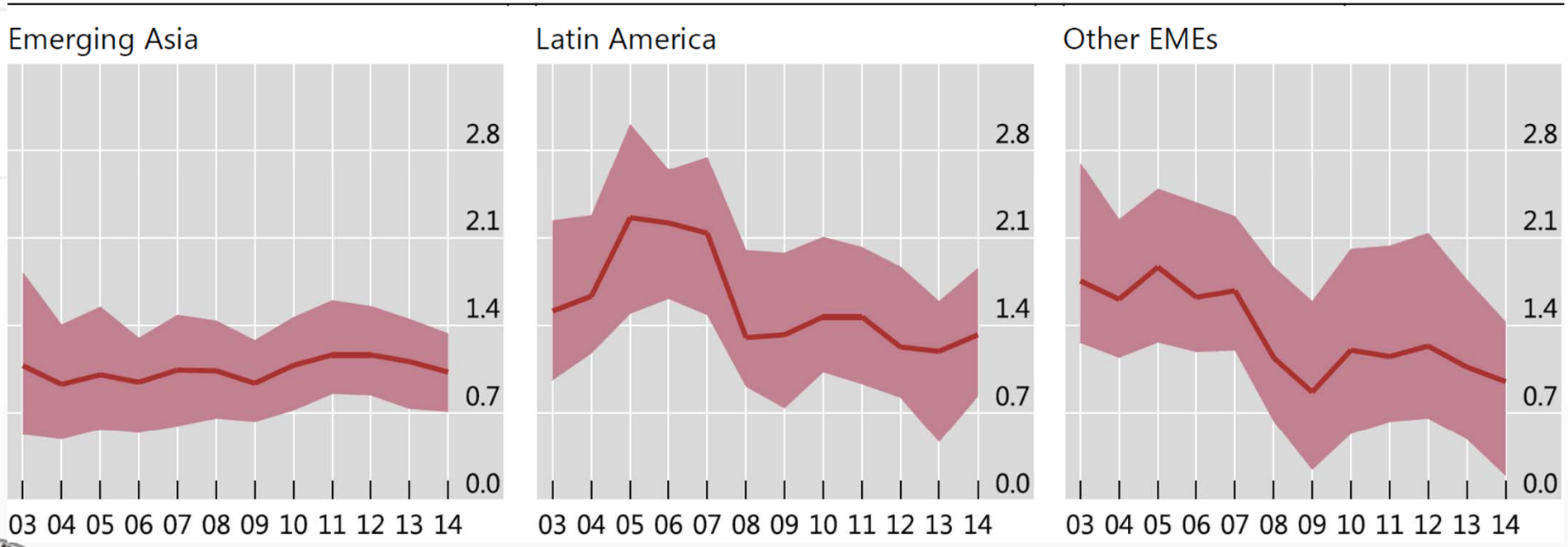


The reduction in bank profitability was greater in non-Asian banks.

Evolution of ROA by regions

Median and interquartile ranges

Figure 3



Questions

- How a possible moderation in the rate of credit expansion in EMEs could affect bank profitability and its components?

- Given the prospect of monetary policy normalization in major economies, how would changing interest rates, yield curves and risk premia impact future profitability?

- How is profitability affected by bank size, liquidity ratios, funding and other bank specific variables?

Main Results

- Bank profitability depends **positively** on the bank specific credit growth and the long-term interest rate and **negatively** on the short-term interest rate.
- **In normal times**, bank profitability responds little to variations in economic growth. **The financial cycle predicts bank profitability better than the business cycle.**
- **Increases in sovereign risk premia reduce bank profits** in a significant way, underscoring the role of credible fiscal frameworks in supporting the overall financial stability

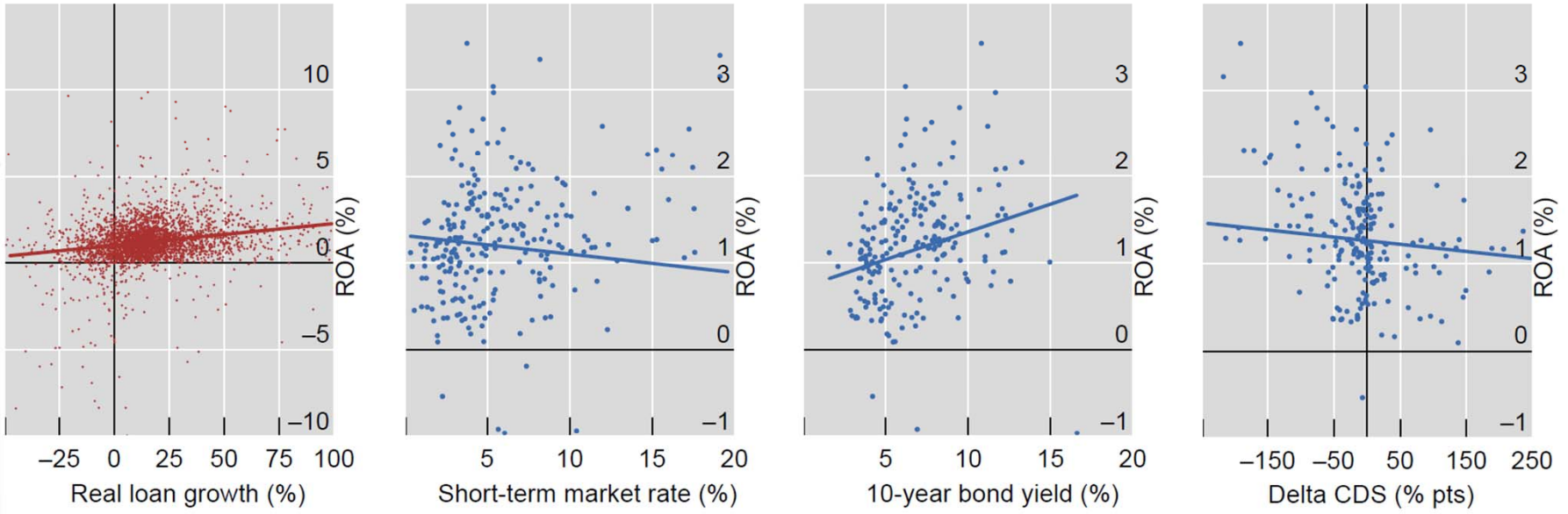
Literature

- Our study is related to the **broader financial stability literature**, as bank profitability is an important predictor of financial crises(see eg Demirguc-Kuntand Detragiache(1999)).
- Most of the literature has focused **on advanced economies** (eg English (2002), Albertazzi and Gambacorta (2009), Bolt et al (2012), Alessandri and Nelson (2015), Borio, Gambacorta and Hofmann (2015))
- Results suggest that **banks in EMEs are relatively similar to their advanced economies counterparts**.
- But little is known about the relative importance of credit cycle vs business cycles explaining banking profitability.
- CDS relevance points to the **importance of keeping coherent macroeconomic frameworks in place**, particularly with respect to fiscal accounts.

While there is a positive correlation of bank profitability with long-term interest rates (through maturity transformation activity), the correlation with short-term interest rates is negative (through higher funding costs).

Correlates of bank profitability[1]

Figure 4



[1] Scales adjusted to show most data points. [2] Data correspond to average ROA of all banks in the sample per country and year. Therefore, each data point represents a country in a specific year.

To evaluate the effects of different variables on overall bank profitability, we estimate an equation containing the main factors that may affect profits. We look at both aggregate and idiosyncratic factors:

$$
\begin{aligned}
y_{i,j,t} = {} & \alpha + \rho_1 y_{i,j,t-1} + \alpha_1 LG_{i,j,t} + \alpha_2 size_{i,j,t} + \alpha_3 cap_{i,j,t} + \alpha_4 liq_{i,j,t} + \\
& + \alpha_5 nocore_{i,j,t} + \alpha_6 efficiency_{i,j,t} + \beta_1 GDPg_{i,t} + \beta_2 SR_{i,t} + \\
& + \beta_3 LR_{i,t} + \beta_4 CDS_{i,t} + \beta_5 \pi_{i,t} + \eta_j + \tau_t + \varepsilon_{i,j,t}
\end{aligned}
$$

The information used is contained in the balance sheets of 534 banks of 19 EMEs between 2000 and 2014. To correct potential problems of endogeneity in the regressors, the generalized method of moments is used. Lags of explanatory variables are used as instruments.

Determinants of ROA - ROE

	I	II	III	IV
Time effects	Yes	Yes	Yes	Yes
Number of banks	534	534	534	534
Number of observations	2,747	2,747	2,747	2,747
Number of instruments	390	498	508	493
Wald chi-squared	897.5	814.03	836.47	871.56
AB test for AR(2)	0.596	0.657	0.653	0.615
Hansen test Prob>chi-sq	0.262	0.629	0.654	0.742

Determinants of return on bank assets (ROA) Table 1

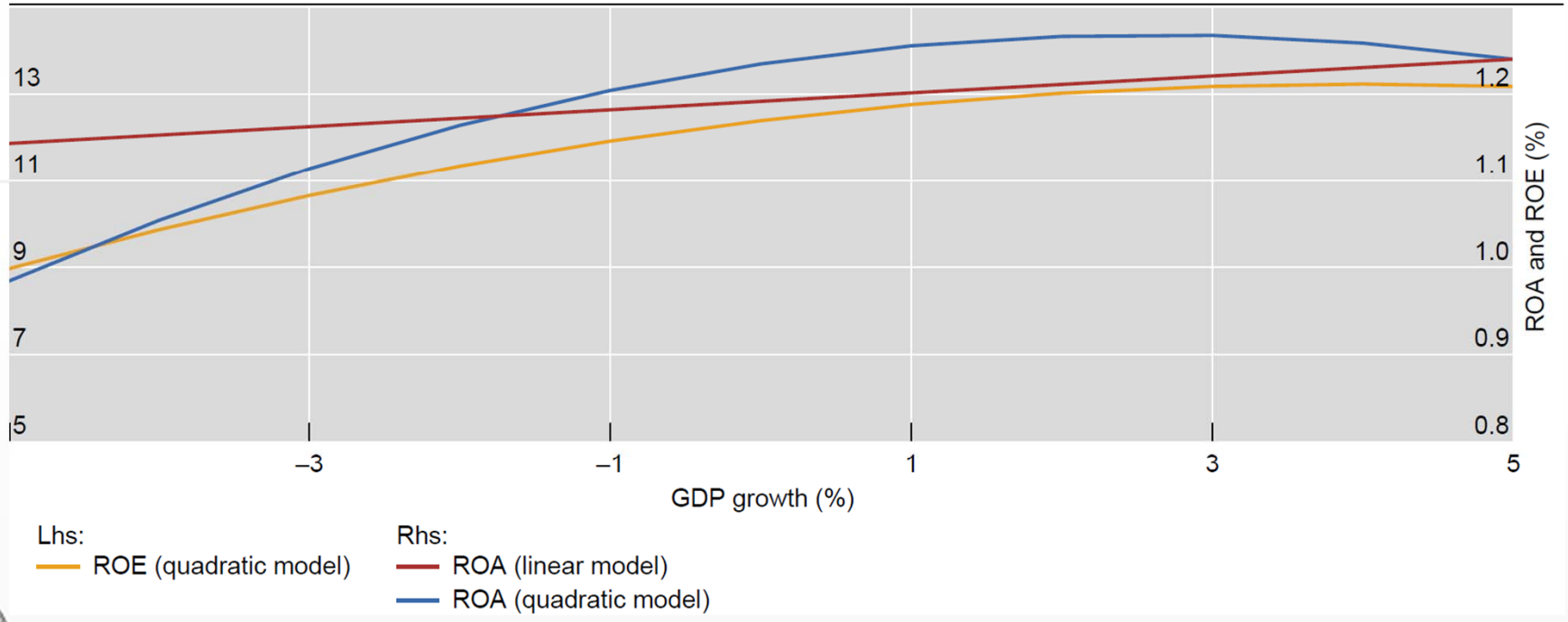
	I	II	III	IV
$ROA_{i,t-1}$	0.3005***	0.2487***	0.2514***	0.2493***
	(0.1115)	(0.0821)	(0.0817)	(0.0711)
Real loan growth		0.0065***	0.0066***	0.0082***
		(0.0024)	(0.0024)	(0.0026)
GDP growth	0.0049		−0.0097	0.0256
	(0.0121)		(0.0118)	(0.0170)
GDP growth squared				−0.0049**
				(0.0019)
Short-term market rate	−0.0574**	−0.0473*	−0.0529**	−0.0308
	(0.0234)	(0.0263)	(0.0258)	(0.0258)
10-year bond yield	0.1388***	0.1535***	0.1552***	0.1153***
	(0.0507)	(0.0515)	(0.0501)	(0.0400)
CDS	−0.0026***	−0.0024**	−0.0027***	−0.0024***
	(0.0009)	(0.0009)	(0.0010)	(0.0009)
CPI inflation	−0.0073	−0.0248	−0.0199	−0.0145
	(0.0174)	(0.0182)	(0.0185)	(0.0166)
Log assets	−0.2256**	−0.1824**	−0.2015**	−0.2096**
	(0.0914)	(0.0886)	(0.0883)	(0.0908)
Equity/total assets	0.0760***	0.0754***	0.0730***	0.0730***
	(0.0207)	(0.0227)	(0.0221)	(0.0212)
Liquidity	0.0098**	0.0049	0.0079*	0.0069
	(0.0045)	(0.0048)	(0.0046)	(0.0045)
Non-core funding ratio	−0.2566	−0.4524	−0.5430*	−0.4210
	(0.3154)	(0.3133)	(0.3130)	(0.3263)
1/Efficiency	−0.0290***	−0.0304***	−0.0304***	−0.0287***
	(0.0097)	(0.0086)	(0.0084)	(0.0090)
Constant	3.2553**	2.9274**	3.1467***	3.1868**
	(1.2997)	(1.1997)	(1.2282)	(1.3141)

In normal times the **correlation between the GDP and bank profitability** is low, although **it tends to be high in times of significant economic contractions.**

EME bank returns and real annual output growth

Estimation results

Figure 5



Bank profitability can be disaggregated into its components and in this way identify how different bank's activities are affected:

- Net interest margin
- Non-interest income (trading book +fees)
- Loan loss provisions

	Dependent variable		
	Net interest margin	Non-interest income	Loan loss provisions
Time effects	Yes	Yes	Yes
Number of banks	494	519	514
Number of observations	2225	2514	2413
Number of instruments	367	493	355
Wald chi-squared	1694.93	100.47	2533.8
AB test for AR(2)	0.8560	0.3810	0.1570
Hansen test Prob>chi-squared	0.3700	0.2230	0.1540

Determinants of main components of bank profitability Table 2

	Dependent variable		
	Net interest margin	Non-interest income	Loan loss provisions
Dependent variable$_{i,t-1}$	0.7148***	0.1298	0.8522***
	(0.0931)	(0.1091)	(0.0375)
Real loan growth	0.0071***	−0.0045	0.0018
	(0.0027)	(0.0097)	(0.0069)
GDP growth	−0.0491***	−0.3019***	−0.0920***
	(0.0128)	(0.0954)	(0.0264)
Short-term market rate	−0.0621***	0.0359	0.1040***
	(0.0178)	(0.059)	(0.0369)
10-year bond yield	0.0905**	−0.5010**	−0.1939***
	(0.0452)	(0.2099)	(0.0687)
CDS	−0.0002	0.0024	0.0027
	(0.0007)	(0.0021)	(0.0017)
CPI inflation	−0.0489**	0.5424**	0.0991**
	(0.023)	(0.2206)	(0.0442)
Market capitalisation	0.0015*	0.0034	0.0004
	(0.0008)	(0.0037)	(0.0019)
Log assets	−0.2064***	−1.471**	0.0786
	(0.0721)	(0.5704)	(0.1524)
Equity/total assets	0.0357*	−0.0397	−0.0485*
	(0.0212)	(0.0724)	(0.0262)
Liquidity	−0.0216**	0.0002	−0.0126
	(0.0098)	(0.0185)	(0.0095)
Non-core funding ratio	−0.0151	2.5840*	0.7195
	(0.4087)	(1.5126)	(0.6088)
1/Efficiency	−0.0103*	0.0116	0.0165*
	(0.0061)	(0.0089)	(0.0086)
Constant	3.3844***	15.6336***	−1.1323
	(1.1119)	(5.9078)	(1.9976)

Conclusions and policy implications

- Both macro and micro factors affect bank profitability
- **Credit growth** appears to have been more important for bank profits than output growth.
  - **Credit cycles** could actually be more relevant for explaining bank profitability than business cycles.
- **The term structure of interest rates matters.**
  - **Higher levels of long-term interest rates** tend to increase bank profitability of banks by raising net interest margins. When long-term rates decrease, banks have to rely more heavily on other sources of income such as fees and commissions, as well as revenue derived from transactions on the bank's trading book.
  - **Short-term rates**, in turn, raise funding costs and tend to reduce bank profits

Conclusions and policy implications

- **Efficiency** increases bank profitability
- CDS on sovereign debt affect bank profitability
  - **Credible fiscal frameworks** are key for overall financial stability
- The use of **countercyclical policies** could reduce the likelihood of deterioration in bank profitability.

THANK YOU!!

Determinants of ROE

	I	II	III	IV
Time effects	Yes	Yes	Yes	Yes
Number of banks	534	534	534	534
Number of observations	2747	2747	2747	2747
Number of instruments	390	498	508	511
Wald chi-squared	552.75	464.36	417.36	331.94
AB test for AR(2)	0.3820	0.2310	0.2380	0.1710
Hansen test Prob>chi-squ	0.4740	0.7920	0.7580	0.8460

Determinants of return on bank equity (ROE) Table 3

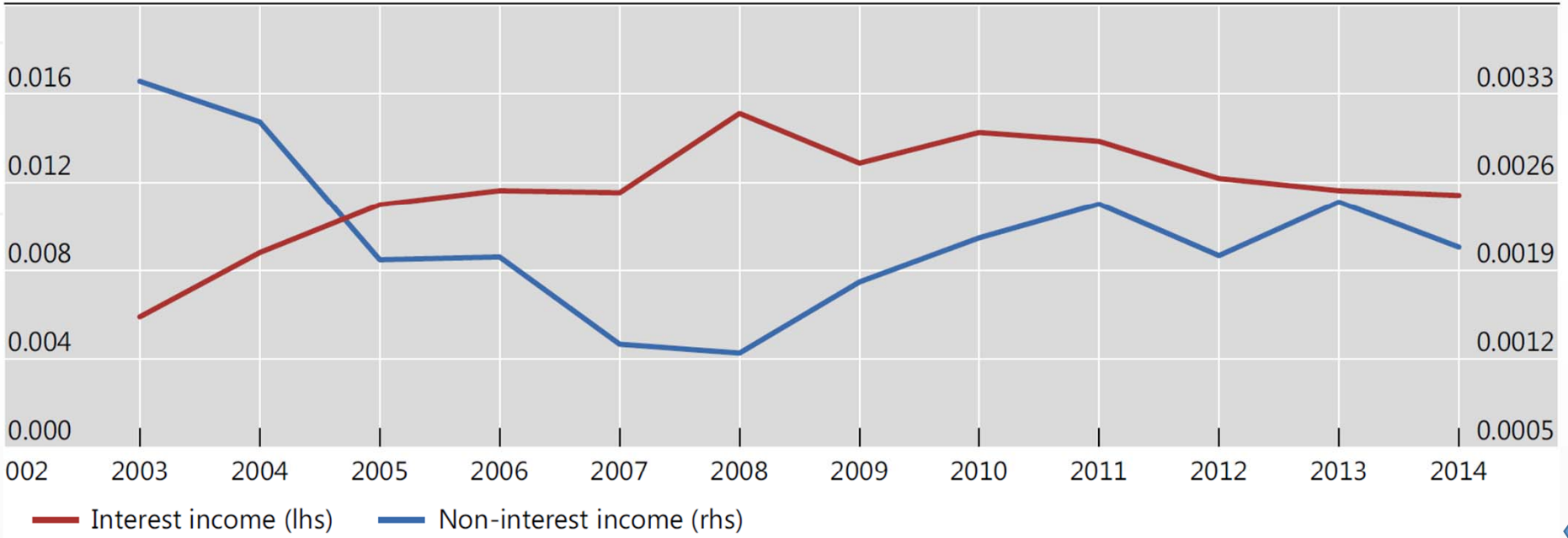
	I	II	III	IV
$ROE_{i,t-1}$	0.2562***	0.1860***	0.1892***	0.1709***
	(0.0649)	(0.0724)	(0.0720)	(0.0659)
Real loan growth		0.0717***	0.0707***	0.0833***
		(0.0191)	(0.0193)	(0.0202)
GDP growth	0.1559		0.0055	0.4205***
	(0.1019)		(0.0997)	(0.1543)
GDP growth squared				−0.0528***
				(0.0168)
Short-term market rate	−0.5607**	−0.4745**	−0.5108**	−0.3089
	(0.2192)	(0.238)	(0.2364)	(0.2384)
10-year bond yield	1.6731***	1.8323***	1.8874***	1.6013***
	(0.4566)	(0.4501)	(0.4454)	(0.4425)
CDS	−0.0305***	−0.0327***	−0.0334***	−0.0315***
	(0.0113)	(0.0113)	(0.0115)	(0.0115)
CPI inflation	0.0289	−0.0615	−0.0714	−0.0102
	(0.1941)	(0.1976)	(0.2066)	(0.2053)
Log assets	−1.7369***	−1.4362**	−1.5976**	−1.6514**
	(0.6214)	(0.6360)	(0.6356)	(0.7747)
Equity/total assets	−0.1536	−0.2829*	−0.2983*	−0.3567*
	(0.1770)	(0.1712)	(0.1723)	(0.2029)
Liquidity	0.0700	0.0503	0.0576	0.0007
	(0.0545)	(0.0512)	(0.0512)	(0.0585)
Non-core funding ratio	−5.9862*	−9.0122**	−9.5183***	−8.1295*
	(3.5544)	(3.5798)	(3.4576)	(4.1913)
1/Efficiency	−0.3263***	−0.3420***	−0.3412***	−0.3433***
	(0.0493)	(0.0483)	(0.0488)	(0.0741)
Constant	38.6319***	38.0585***	39.4448***	41.3807***
	(8.5874)	(8.0948)	(8.4613)	(11.0946)

Sources of income of banks

Sources of income

As a ratio of total assets

Figure A1



Sources: BankScope; authors' calculations.

Countries considered

Banks by country and by size Table A1

country	number of banks	sample period	bank sizes in 2013-2014 (total assets in million USD)		
			smallest	median	largest
Brazil	43	2006-2014	1495	6384	438375
Chile	16	2006-2014	1386	13316	51583
China	124	2005-2014	2475	23506	2736417
Colombia	15	2001-2014	1219	8168	68043
Czech Republic	19	2000-2014	1097	5411	48694
Hungary	7	2006-2014	2462	8574	48134
India	34	2005-2009	1633	7836	108418
Indonesia	28	2002-2014	1675	5278	44407
Israel	8	2007-2014	3620	31126	109485
South Korea	15	2000-2014	3028	54678	322807
Mexico	18	2000-2015	1289	14463	104912
Malaysia	25	2000-2014	2481	23550	98919
Peru	9	2006-2014	1352	10571	38744
Philippines	17	2004-2014	1762	9407	41770
Poland	22	2004-2014	1588	10958	52630
Russia	85	2002-2014	1271	3940	556393
South Africa	7	2000-2014	4367	72928	97674
Thailand	22	2000-2014	4532	25028	83727
Turkey	20	2009-2014	1565	16842	118818

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