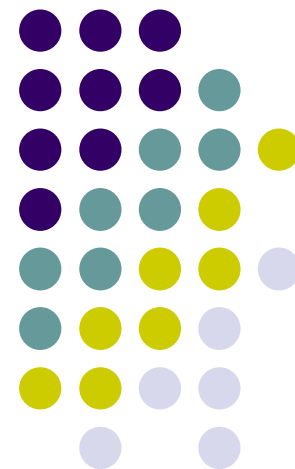


Is There a Competition-Stability Trade-Off in European Banking?

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5th NBRM Annual Research Conference

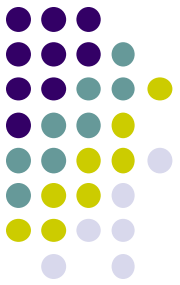
National Bank of the Republic of Macedonia , 7-8 April 2016



Presentation Outline

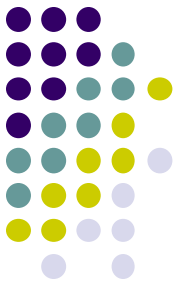
- 1) Introduction and motivation
- 2) Literature review
- 3) Data
- 4) Methodology and results
- 5) Robustness checks
- 6) Conclusion and policy implications

Introduction & motivation

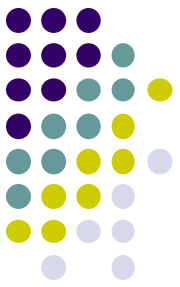


- The **vital role of banks** makes the issue of banking competition extremely important
- This issue is at the center of an **active academic and policy debate**
 - how measuring banking competition?
 - are pro-competitive policies relevant?
 - does banking competition matter for credit availability, investment and economic growth?
 - does banking competition matter for monetary policy transmission? (see, e.g., Leroy and Lucotte, 2015a, 2015b)
 - what are its impacts on the banking sector? Efficiency? Innovation?

Introduction & motivation



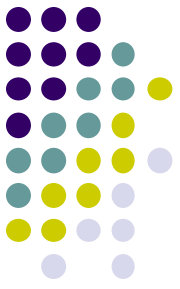
- In particular, the recent financial crisis demonstrates the urgent need to address the effect of bank competition on the **risk-taking behavior** of financial institutions, and then on **financial stability**
- Indeed, recent studies showed that the deregulation process and excessive competition have led to financial sector meltdowns in the US and the UK
- A large **theoretical and empirical literature** investigated the impact of bank competition on financial soundness: **bank competition-stability trade-off?**
 - No consensus...
 - “competition-fragility” vs. “competition-stability” view



Introduction & motivation

- Our study empirically re-investigates at the bank-level the relationship between bank competition and bank risk for a sample of 54 listed European banks from 2004 to 2013
- Contrary to the existing literature, two dimensions of risk are considered: **bank-individual risk** and **systemic risk**
- Only **Anginer et al. (2014)** previously investigated this issue by considering different proxies for risk co-dependence
- **Main result of our study:** competition increases individual bank fragility, **BUT** decreases systemic risk

Literature review



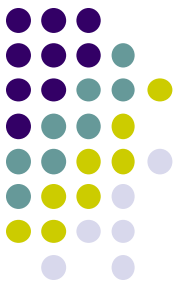
- **No consensus in the theoretical literature:** “competition-fragility” view vs. “competition-stability” view

- **“Competition-stability” hypothesis** → more competitive and/or less concentrated banking systems are more stable:
 - 1) Mishkin (1999): in a concentrated market, large banks are more likely to receive public guarantees and subsidies, which may generate a moral hazard (“Too-big-to-fail”), encouraging risk-taking behavior
 - 2) Caminal & Matutes (2002): less competition can result in less credit rationing and larger loans, ultimately increasing the probability of bank failures
 - 3) Boyd & De Nicolo (2005): a concentrated banking system allow banks to charge higher loan rates, which may encourages borrowers to shift to riskier projects

Literature review



- **“Competition-fragility” hypothesis** → more competitive and/or less concentrated banking systems are more fragile:
 - 1) Marcus (1984): decline in franchise value due to competition drives banks to undertake risk-taking strategies – opportunity cost of bankruptcy decreases
 - 2) Boot & Greenbaum (1993): in a more competitive environment, banks extract less informational rent from borrowers, which reduces their incentives to properly screen borrowers
 - 3) Allen & Gale (2000): a concentrated banking market is more stable because it is easier for the supervisor to monitor banks
 - 4) Boyd et al. (2004): higher profits in more concentrated banking systems, providing higher “capital buffers”, and then reducing financial fragility



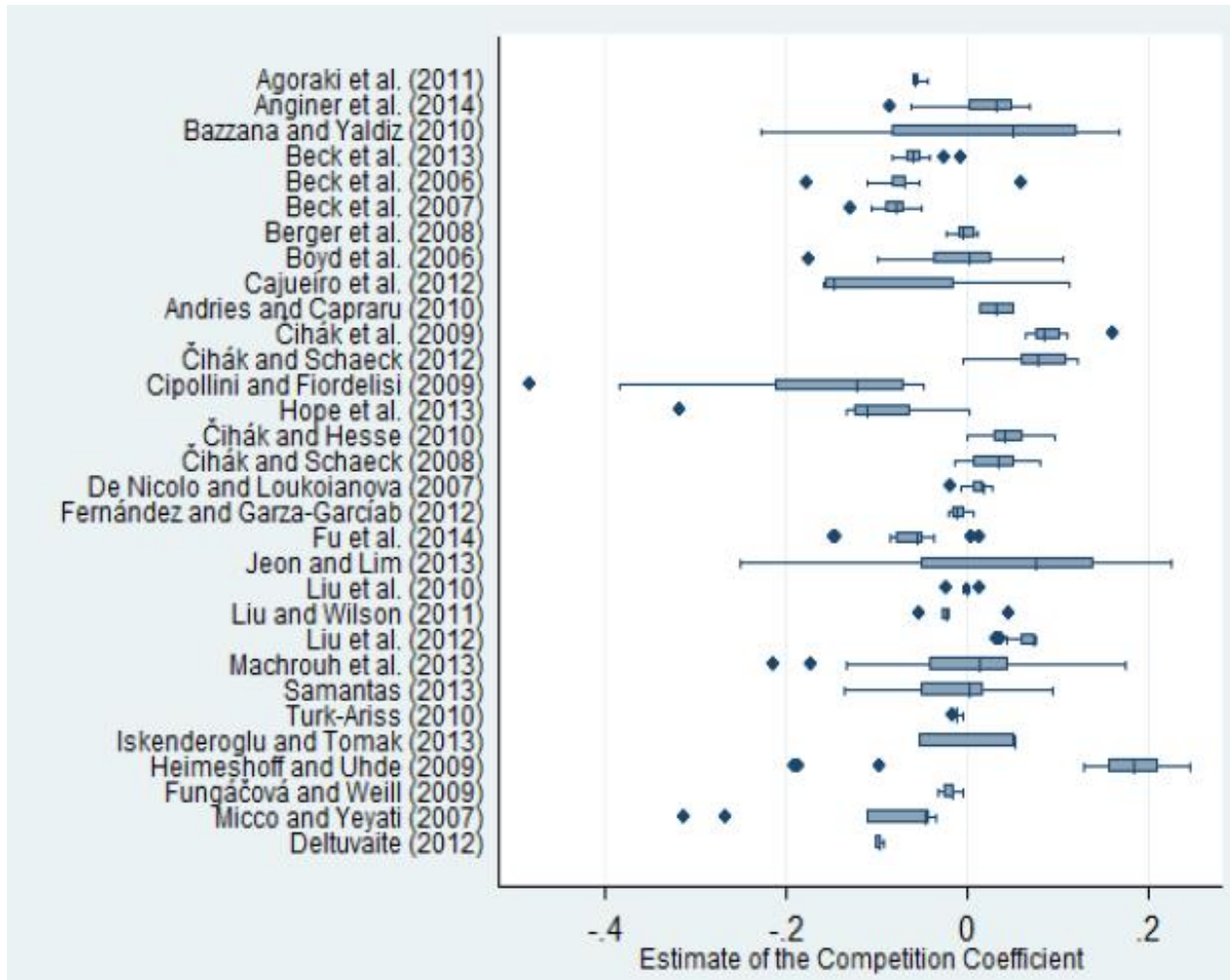
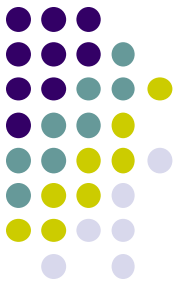
Literature review

- The existing **empirical literature** is not helpful to solve this controversial issue
→ see, e.g., the meta-analysis recently conducted by Zigrainova & Havranek (2015)



Source: Zigrainova & Havranek (2015)

Literature review



Source: Zigrainova & Havranek (2015)

Data

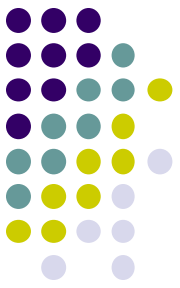


- 54 listed European banks over the period 2004-2013: largest banks in the EU, and most of them are identified as Systemically Important Financial Institution (SIFI) by the Basel Committee

Bank	Country	Total assets	Bank	Country	Total assets
Deutsche Bank AG	DEU	2012329	Banco Popular Espanol SA	ESP	157618
BNP Paribas	FRA	1907290	Bank of Ireland	IRL	148146
Crédit Agricole S.A.	FRA	1842361	Raiffeisen Bank International AG	AUT	136116
Barclays Bank Plc	UK	1782921	Unione di Banche Italiane Sepa	ITA	132434
Banco Santander SA	ESP	1269628	Banco Popolare	ITA	131921
Société Générale	FRA	1250696	Allied Irish Banks Plc	IRL	122516
Lloyds TSB Bank Plc	UK	1127574	National Bank of Greece SA	GRC	104799
HSBC Bank plc	UK	975309	Banco Comercial Português	PRT	89744
UniCredit SpA	ITA	926828	Banco Espirito Santo SA	PRT	83691
ING Bank NV	NLD	836068	Mediobanca SpA	ITA	78679
Intesa Sanpaolo	ITA	673472	Piraeus Bank SA	GRC	70406
Bank of Scotland Plc	UK	671469	Eurobank Ergasias SA	GRC	67653
Banco Bilbao Vizcaya Argentaria SA	ESP	637785	Banca popolare dell'Emilia Romagna	ITA	61638
Commerzbank AG	DEU	635878	Alpha Bank AE	GRC	58357
Natixis	FRA	528370	Bankinter SA	ESP	58166
Standard Chartered Bank	UK	482090	Banca Popolare di Milano SCaRL	ITA	51931
Danske Bank A/S	DNK	466756	Banca Carige SpA	ITA	49326
Dexia	BEL	357210	Aareal Bank AG	DEU	45734
Skandinaviska Enskilda Banken AB	SWE	285875	Pohjola Bank Plc-Pohjola Pankki Oyj	FIN	44623
Svenska Handelsbanken	SWE	277776	Banco BPI SA	PRT	44565
Crédit Industriel et Commercial - CIC	FRA	235732	Permanent TSB Plc	IRL	40919
KBC Bank NV	BEL	224824	Jyske Bank A/S (Group)	DNK	34586
Banca Monte dei Paschi di Siena SpA	ITA	218882	Banca Popolare di Sondrio	ITA	32349
Swedbank AB	SWE	215195	Credito Emiliano SpA-CREDEM	ITA	30749
Erste Group Bank AG	AUT	213824	Credito Valtellinese Soc Coop	ITA	29896
Deutsche Postbank AG	DEU	193822	Sydbank A/S	DNK	20452
Banco de Sabadell SA	ESP	161547	Oberbank AG	AUT	17675

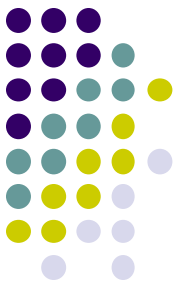
Source: Bankscope

Data



- Competition measure: **Lerner index** (Lerner, 1934)
→ inverse proxy for competition: measure the market power of banks
→ a low index indicates a high (low) degree of competition (market power), and conversely
- Measure used by a large number of papers in the banking literature: better proxy for competition than concentration indexes (see, e.g., Claessens & Laeven, 2004; Lapteacru, 2014)
- Formally, the Lerner index corresponds to the difference between price and marginal cost, as a % of price (price is equal to the ratio of total revenue – interest & non-interest revenue – to total assets):

$$Lerner_{it} = \frac{p_{it} - mc_{it}}{p_{it}}$$



Data

- Marginal cost obtained by estimating a **translog cost function** with three inputs and one output:

$$\begin{aligned} \ln TC_{it} = & \beta_0 + \beta_1 \ln TA_{it} + \frac{\beta_2}{2} \ln^2 TA_{it} + \sum_{k=1}^3 \gamma_k \ln W_{k,it} + \sum_{k=1}^3 \phi_k \ln TA_{it} \ln W_{k,it} \\ & + \sum_{k=1}^3 \sum_{j=1}^3 \rho_{kj} \ln W_{k,it} \ln W_{j,it} + \delta_1 T + \frac{\delta_2}{2} T^2 + \delta_3 T \ln TA_{it} + \sum_{k=4}^6 \delta_k T \ln W_{k,it} + \varepsilon_{it} \end{aligned}$$

- TC: total costs (sum of interest expenses, commissions and fee expenses, trading expenses, personnel and admin expenses, and other operating expenses)
- TA: quantity of output (total assets)
- W1, W2 and W3: prices of inputs (interest expenses, personnel expenses, and other operating expenses to total assets)
- T: time trend

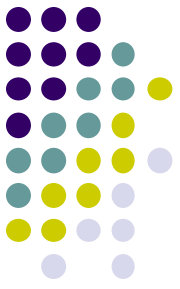
Data



- Translog cost function estimated on a large sample of listed and non-listed European banks (501 banks) using pooled OLS and by including country fixed effects to control potential differences in technology between countries
- The coefficient estimates from the translog cost function are then used to calculate the marginal cost for each bank:

$$mc_{it} = \frac{TC_{it}}{TA_{it}} [\beta_1 + \beta_2 TA_{it} + \sum_{k=1}^3 \phi_k \ln W_{k,it} + \delta_3 T]$$

Data



- **Measures of bank-risk:**

- 1) Bank-individual risk: Z-score and distance-to-default

- **Z-score**: accounting-based risk measure

- measures the distance from insolvency (inverse proxy for risk)

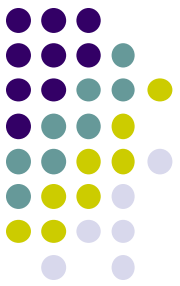
- **Distance-to-default**: market-based measure based on the Merton (1974) model

- an increase of the distance-to-default means that bankruptcy becomes less likely (inverse proxy for risk)

- Complementary measures of individual risk: since the distance-to-default also requires market data, it can be viewed as a forward-looking measure of bank default risk, which reflects market perception of a bank's expected soundness in the future

- 2) Systemic risk: **SRISK** (Acharya et al., 2012; Brownless & Engle, 2015) – market-based measure of systemic risk

- corresponds to the expected capital shortfall of a given financial institution, conditional on a crisis affecting the whole financial system



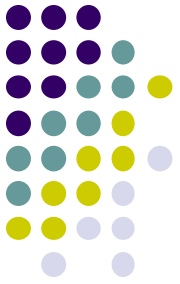
Methodology and results

- Based on the existing literature, the following regression specification is considered:

$$risk_{it} = \alpha + \beta_1 Lerner_{it-1} + \sum_{k=2}^n \beta_k X_{it-1} + \mu_i + \gamma_t + \varepsilon_{it}$$

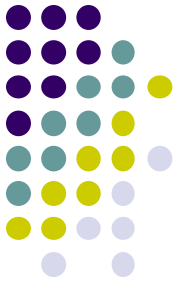
- Control variables (**bank-specific factors**): bank size (log of total assets), ratio of non-interest income on total income, ratio of fixed assets to total assets, share of loans in total assets, liquidity ratio.
- Endogeneity issue**: level of bank-risk taking could affect the competitiveness of banks, and then the measure of market power
 - “gamble for resurrection”: when banks face a high probability of default, they could be more inclined to change the price of their products to attract new consumers and access to financial resources
 - 2SLS: 3 instrumental variables (lag of Lerner, loan growth, net interest margin)

Methodology and results



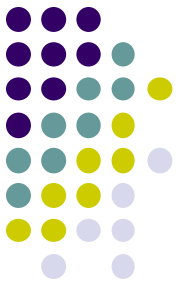
Dependent variable	Z-score	Z-score	Z-score	Z-score	Z-score	Z-score
	FE	FE	FE	RE	IV	IV
Lerner	3.981*** (0.938)	2.478*** (0.915)	3.122*** (0.822)	3.193*** (0.766)	8.687*** (1.931)	6.368*** (1.643)
Size		-0.398 (0.324)	-0.243 (0.539)	-0.158** (0.066)		-0.177 (0.345)
Non-interest income / Total income		-0.823* (0.490)	-0.244 (0.514)	-0.162 (0.441)		0.323 (0.425)
Fixed assets / Total assets		55.396*** (13.882)	51.331*** (13.586)	44.819*** (8.969)		42.367*** (16.012)
Liquidity		-0.000 (0.006)	0.004 (0.006)	0.002 (0.003)		0.002 (0.004)
Loans / Total assets		-0.003 (0.004)	-0.004** (0.002)	-0.004*** (0.001)		-0.005** (0.002)
GDP Growth		0.053* (0.031)	0.227*** (0.035)	0.220*** (0.034)		0.225*** (0.036)
Inflation		-0.161** (0.064)	0.043 (0.066)	0.036 (0.066)		-0.007 (0.084)
Constant	2.828*** (0.272)	7.824** (3.864)	4.705 (6.213)	3.507*** (0.867)		
Year fixed effects	Yes	No	Yes	Yes	Yes	Yes
Country fixed effects	No	No	No	Yes	No	No
Observations	439	439	439	439	435	435
R-squared	0.22	0.2	0.35	0.42	0.18	0.35
Number of banks	54	54	54	54	54	54
Hansen test (p-value)	-	-	-	-	0.08	0.42

Methodology and results



Dependent variable	DD	DD	DD	DD	DD	DD
	FE	FE	FE	RE	IV	IV
Lerner	3.657*** (1.179)	3.472*** (1.033)	3.736*** (0.882)	4.055*** (0.782)	8.632*** (2.100)	6.614*** (1.941)
Size		-1.199*** (0.306)	-0.979** (0.399)	-0.417*** (0.130)		-0.976*** (0.332)
Non-interest income / Total income		-1.232*** (0.413)	-1.062*** (0.362)	-1.111*** (0.371)		-0.104 (0.568)
Fixed assets / Total assets		28.703 (17.428)	27.987* (15.462)	32.474** (15.280)		15.176 (15.806)
Liquidity		0.012** (0.005)	0.016*** (0.005)	0.009*** (0.003)		0.011* (0.006)
Loans / Total assets		-0.002* (0.001)	-0.002*** (0.000)	-0.003*** (0.001)		-0.002** (0.001)
GDP growth		0.093*** (0.027)	0.158*** (0.035)	0.157*** (0.039)		0.130*** (0.031)
Inflation		-0.052 (0.046)	0.245*** (0.053)	0.241*** (0.054)		0.186** (0.075)
Constant	1.001* (0.501)	14.581*** (3.678)	10.870** (4.510)	5.051*** (1.823)		
Year fixed effects	Yes	No	Yes	Yes	Yes	Yes
Country fixed effects	No	No	No	Yes	No	No
Observations	500	500	500	500	446	446
R-squared	0.25	0.26	0.36	0.47	0.25	0.33
Number of banks	54	54	54	54	54	54
Hansen test (p-value)	-	-	-	-	0.06	0.85

Methodology and results



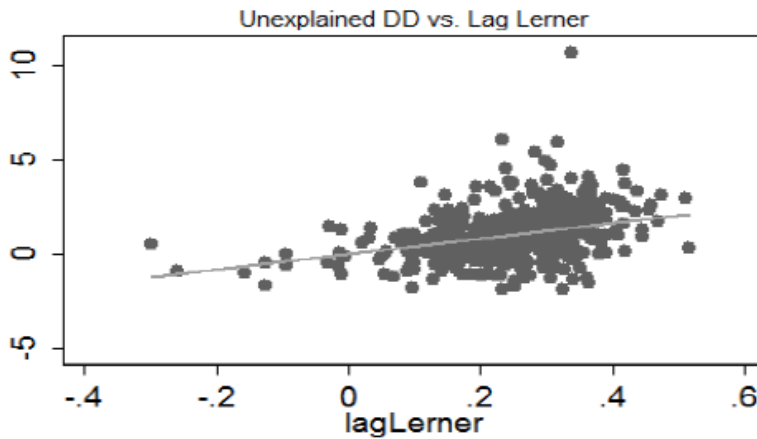
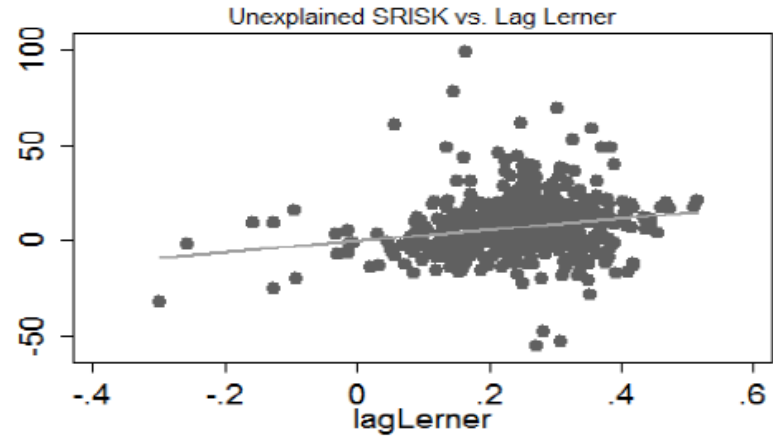
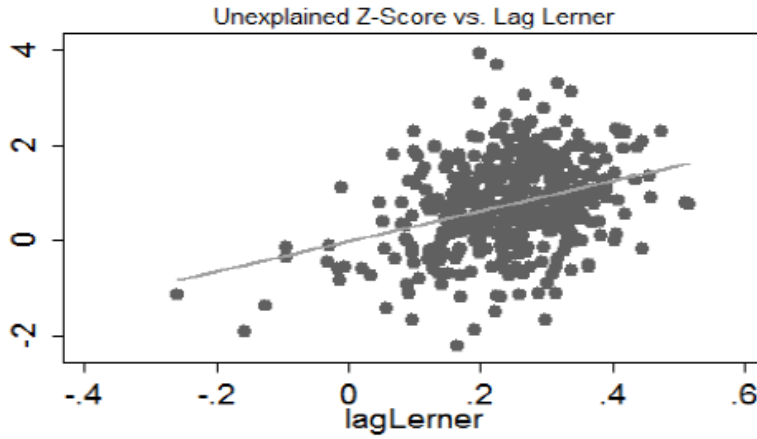
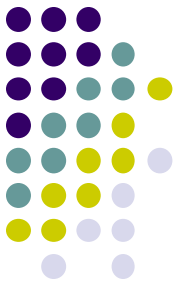
Dependent variable	SRISK	SRISK	SRISK	SRISK	SRISK	SRISK
	FE	FE	FE	RE	IV	IV
Lerner	25.996** (10.176)	29.445** (11.546)	30.306** (11.974)	30.431*** (11.784)	40.565*** (15.801)	61.837*** (17.448)
Size		22.948*** (4.629)	17.916*** (5.206)	11.167*** (2.138)		22.864*** (4.944)
Non-interest income / Total income		-9.490 (5.704)	-7.795 (5.379)	-8.188 (5.659)		-12.178** (5.925)
Fixed assets / Total assets		52.648 (340.432)	58.686 (323.767)	6.699 (289.775)		7.968 (206.545)
Liquidity		0.062 (0.099)	0.102 (0.115)	0.136 (0.090)		0.094 (0.086)
Loans / Total assets		-0.015** (0.007)	-0.010* (0.005)	-0.007 (0.007)		0.002 (0.010)
GDP growth		-0.799** (0.351)	0.310 (0.439)	0.246 (0.442)		0.375 (0.309)
Inflation		2.268*** (0.740)	1.328* (0.785)	1.414* (0.795)		1.360* (0.772)
Constant	-8.937* (4.589)	-272.405*** (56.198)	-218.419*** (61.177)	-143.154*** (26.039)		
Year fixed effects	Yes	No	Yes	Yes	Yes	Yes
Country fixed effects	No	No	No	Yes	No	No
Observations	500	500	500	500	446	446
R-squared	0.36	0.36	0.42	0.6	0.35	0.4
Number of banks	54	54	54	54	54	54
Hansen test (p-value)	-	-	-	-	0.44	0.82

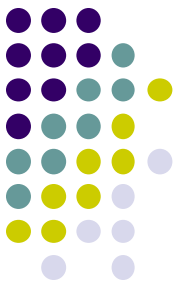
Methodology and results



- How explain that competition (market power) decreases (increases) systemic risk?
- If we refer to the franchise value paradigm, which assumes that market power encourages banks to take less risks, two arguments can be advanced:
 - 1) The risk aversion of banks and their willingness to reduce their exposure of bankruptcy can lead them to take correlated risks, making the financial system more vulnerable to shocks
→ Acharya & Yorulmazer (2007): “Too-many-to-fail” theory
 - 2) The willingness of banks to reduce portfolio risks can lead them to diversify their portfolio by holding the market portfolio (Wagner, 2010)
→ this strategy increases the vulnerability of banks to financial stress, and then the systemic risk
- Results consistent with Anginer et al. (2014): market power and risk co-dependence

Methodology and results





Robustness checks

- 1) **Alternative measures of the Lerner index:**
 - Koetter et al. (2012): controlling for inefficiency
 - translog cost function estimated using a Stochastic Frontier Analysis
 - Maudos and Fernandez de Guevara (2007): two-input cost function
 - cost funding excluded because it could partially reflect market power
 - Berger et al. (2009) & Beck et al. (2013): translog cost function estimated separately for each country
 - take into account technology heterogeneity in the European banking industry more accurately than country fixed-effects
- 2) **Bank-specific Lerner index replaced by a country-specific Lerner index:** beyond their own conditions, banks may be also sensitive to the overall condition of their market
 - median and weighted mean (by market shares) of individual Lerner indexes

Robustness checks



Table 5: Competition and bank risks: results obtained with efficiency-adjusted Lerner

Dependent variable	Z-score	Z-score	Distance-to-default	Distance-to-default	SRISK	SRISK
	FE	IV	FE	IV	FE	IV
Lerner	1.192 (1.176)	3.273*** (0.765)	1.284* (1.160)	2.343*** (0.744)	18.377*** (5.670)	54.048*** (13.529)
Size	-0.433 (0.572)	-0.487 (0.359)	-1.063*** (0.397)	-1.251*** (0.309)	17.603*** (4.986)	19.288*** (4.783)
Non-interest income / Total income	0.180 (0.547)	0.578 (0.393)	-0.362 (0.333)	-0.002 (0.503)	-4.609 (6.743)	-8.453 (5.883)
Fixed assets / Total assets	55.399*** (12.564)	49.168*** (13.998)	34.242** (15.417)	24.883* (13.846)	96.983 (298.711)	35.931 (188.460)
Liquidity	0.002 (0.006)	-0.002 (0.005)	0.012** (0.005)	0.008 (0.006)	0.060 (0.113)	0.021 (0.088)
Loans / Total assets	-0.004* (0.002)	-0.005** (0.002)	-0.001** (0.001)	-0.001* (0.001)	-0.006 (0.005)	0.011 (0.011)
GDP growth	0.237*** (0.035)	0.196*** (0.042)	0.168*** (0.038)	0.108** (0.044)	0.285 (0.434)	-0.597 (0.446)
Inflation	0.039 (0.064)	-0.018 (0.068)	0.223*** (0.059)	0.186*** (0.072)	1.046 (0.836)	0.751 (0.916)
Constant	7.236 (6.577)		12.288*** (4.526)		-211.001*** (58.375)	
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	438	435	499	445	499	445
R-squared	0.33	0.38	0.34	0.35	0.42	0.37
Number of banks	54	54	54	54	54	54

Robustness checks



Table 6: Competition and bank risks: results obtained with funding-adjusted Lerner

Dependent variable	Z-score	Z-score	Distance-to-default	Distance-to-default	SRISK	SRISK
	FE	IV	FE	IV	FE	IV
Lerner	2.572** (0.982)	5.392*** (1.457)	3.296*** (0.939)	5.950*** (1.878)	21.929* (11.280)	50.138*** (16.667)
Size	-0.248 (0.544)	-0.294 (0.345)	-0.954** (0.413)	-1.090*** (0.321)	17.115*** (5.112)	20.680*** (4.951)
Non-interest income / Total income	-0.238 (0.561)	0.333 (0.413)	-1.134*** (0.391)	-0.089 (0.531)	-5.974 (5.529)	-8.088 (6.165)
Fixed assets / Total assets	52.153*** (13.273)	42.859*** (15.916)	30.217* (15.683)	18.377 (15.162)	83.826 (318.587)	51.400 (198.693)
Liquidity	0.003 (0.006)	0.001 (0.004)	0.015*** (0.006)	0.010* (0.006)	0.095 (0.117)	0.085 (0.088)
Loans / Total assets	-0.004** (0.002)	-0.005** (0.002)	-0.002*** (0.000)	-0.002** (0.001)	-0.008 (0.005)	0.001 (0.009)
GDP growth	0.231*** (0.035)	0.227*** (0.036)	0.163*** (0.036)	0.130*** (0.031)	0.378 (0.445)	0.394 (0.312)
Inflation	0.044 (0.066)	0.006 (0.083)	0.246*** (0.054)	0.199*** (0.075)	1.301 (0.799)	1.455* (0.786)
Constant	5.193 (6.270)		11.083** (4.692)		-205.578*** (59.936)	
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	438	434	500	445	500	445
R-squared	0.33	0.34	0.35	0.33	0.41	0.39
Number of banks	54	54	54	54	54	54
Hansen test (p-value)	-	0.30	-	0.92	-	0.80

Robustness checks



Table 7: Competition and bank risks: results obtained with country-specific Lerner

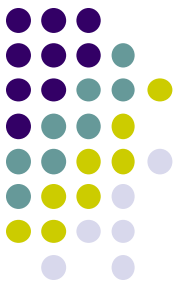
Dependent variable	Z-score	Z-score	Distance-to-default	Distance-to-default	SRISK	SRISK
	FE	IV	FE	IV	FE	IV
Lerner	2.825*** (0.921)	5.925*** (1.446)	3.227*** (0.834)	6.051*** (1.679)	24.137** (10.941)	51.275*** (14.863)
Size	-0.253 (0.548)	-0.242 (0.338)	-0.957** (0.408)	-1.036*** (0.317)	16.978*** (5.094)	21.121*** (4.835)
Non-interest income / Total income	-0.125 (0.534)	0.552 (0.425)	-0.967** (0.370)	0.114 (0.539)	-5.153 (5.349)	-6.161 (6.084)
Fixed assets / Total assets	52.478*** (13.431)	42.852*** (15.831)	30.059* (15.750)	16.037 (15.651)	70.306 (322.171)	18.556 (203.744)
Liquidity	0.004 (0.006)	0.003 (0.004)	0.016*** (0.005)	0.011** (0.006)	0.101 (0.118)	0.097 (0.087)
Loans / Total assets	-0.004** (0.002)	-0.005** (0.002)	-0.002*** (0.000)	-0.002** (0.001)	-0.008 (0.005)	0.002 (0.010)
Gdp growth	0.225*** (0.036)	0.223*** (0.036)	0.158*** (0.035)	0.126*** (0.031)	0.318 (0.454)	0.357 (0.311)
Inflation	0.053 (0.064)	0.030 (0.080)	0.255*** (0.054)	0.221*** (0.074)	1.388* (0.796)	1.670** (0.779)
Constant	4.859 (6.303)		10.711** (4.617)		-207.149*** (59.643)	
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	439	436	501	447	501	447
R-squared	0.34	0.34	0.35	0.33	0.41	0.40
Number of banks	54	54	54	54	54	54
Hansen test (p-value)	-	0.56	-	0.90	-	0.79

Robustness checks



Table 9: Competition and risk: results obtained with country-level measure of competition

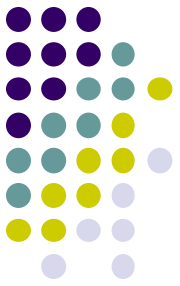
Dependent variable	Z-score FE	Distance-to-default FE	SRISK FE	Z-score FE	Distance-to-default FE	SRISK FE
Lerner median	3.001* (1.722)	3.961** (1.494)	58.340*** (21.609)			
Lerner mean				3.276** (1.436)	3.004 (2.106)	43.788*** (12.544)
Size	-0.294 (0.535)	-0.992** (0.424)	15.380*** (4.946)	-0.350 (0.541)	-0.933** (0.462)	16.266*** (5.005)
Non-interest income / Total income	-0.159 (0.547)	-0.830** (0.369)	-6.119 (5.047)	-0.181 (0.550)	-0.724* (0.404)	-4.533 (5.618)
Fixed assets / Total assets	58.713*** (12.662)	40.364** (16.547)	156.314 (293.666)	53.920*** (13.118)	36.955** (16.963)	106.676 (305.913)
Liquidity	0.002 (0.006)	0.012* (0.006)	0.067 (0.106)	0.002 (0.006)	0.011* (0.006)	0.061 (0.108)
Loans / Total assets	-0.003 (0.002)	-0.002*** (0.001)	-0.008 (0.007)	-0.003 (0.002)	-0.001*** (0.000)	-0.006 (0.006)
GDP growth	0.208*** (0.042)	0.153*** (0.036)	0.061 (0.530)	0.216*** (0.037)	0.168*** (0.031)	0.276 (0.456)
Inflation	0.016 (0.070)	0.232*** (0.055)	1.196* (0.713)	0.030 (0.066)	0.240*** (0.055)	1.318 (0.808)
Constant	5.367 (6.195)	10.976** (4.740)	-194.935*** (57.926)	5.974 (6.223)	10.474** (5.044)	-202.482*** (58.956)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	443	505	505	443	505	505
R-squared	0.31	0.33	0.42	0.32	0.33	0.42
Number of banks	54	54	54	54	54	54



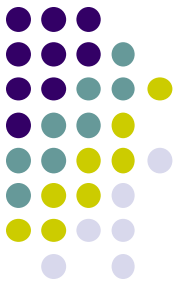
Conclusion and policy implications

- Our study aims to reconcile the conflicting empirical evidence regarding the relationship between bank competition and financial (in)stability
- Contrary to the existing literature, 2 dimensions of risk considered: bank-individual risk (Z-score and distance-to-default) and systemic risk (SRISK)
- Competition (market power) increases (decreases) the individual risk-taking of banks: Lerner index associated with lower Z-score and distance-to-default
- Competition (market power) decreases (increases) the banks' systemic risk contribution: Lerner index associated with higher SRISK

Conclusion and policy implications



- However, finding a **dual relationship** between the Lerner index and our two types of risk is not inconsistent
 - explained by the franchise value paradigm
 - confirms that individual bank risk and systemic bank risk have two different dimensions
- The fact that competition has a divergent effect on individual and systemic risk implies that **financial regulation and competition policy** should complete both a micro- and a macro-prudential exam when analyzing the repercussions of banking competition
- Pro-competitive policy may help to maintain macro-financial stability, and Basel III regulatory framework corrects incentives for individual risk-taking



**Thank you for your
attention**