Central bank design and banking supervision

Anca Maria Podpiera and Martin Melecky
World Bank

14 April 2016, SUERF and BAFFI Carefin Center Conference -
"Central Banking and Monetary Policy: Which Will Be the New Normal?"

Structure of the presentation

- Historical perspective of banking supervision vis-a-vis the mandate of central banks, including the recent changes.
- Drivers of changes in the institutional structures of financial sector supervision.
- Analysis of whether placing microprudential supervision of banks in the central bank has the potential to improve financial stability.

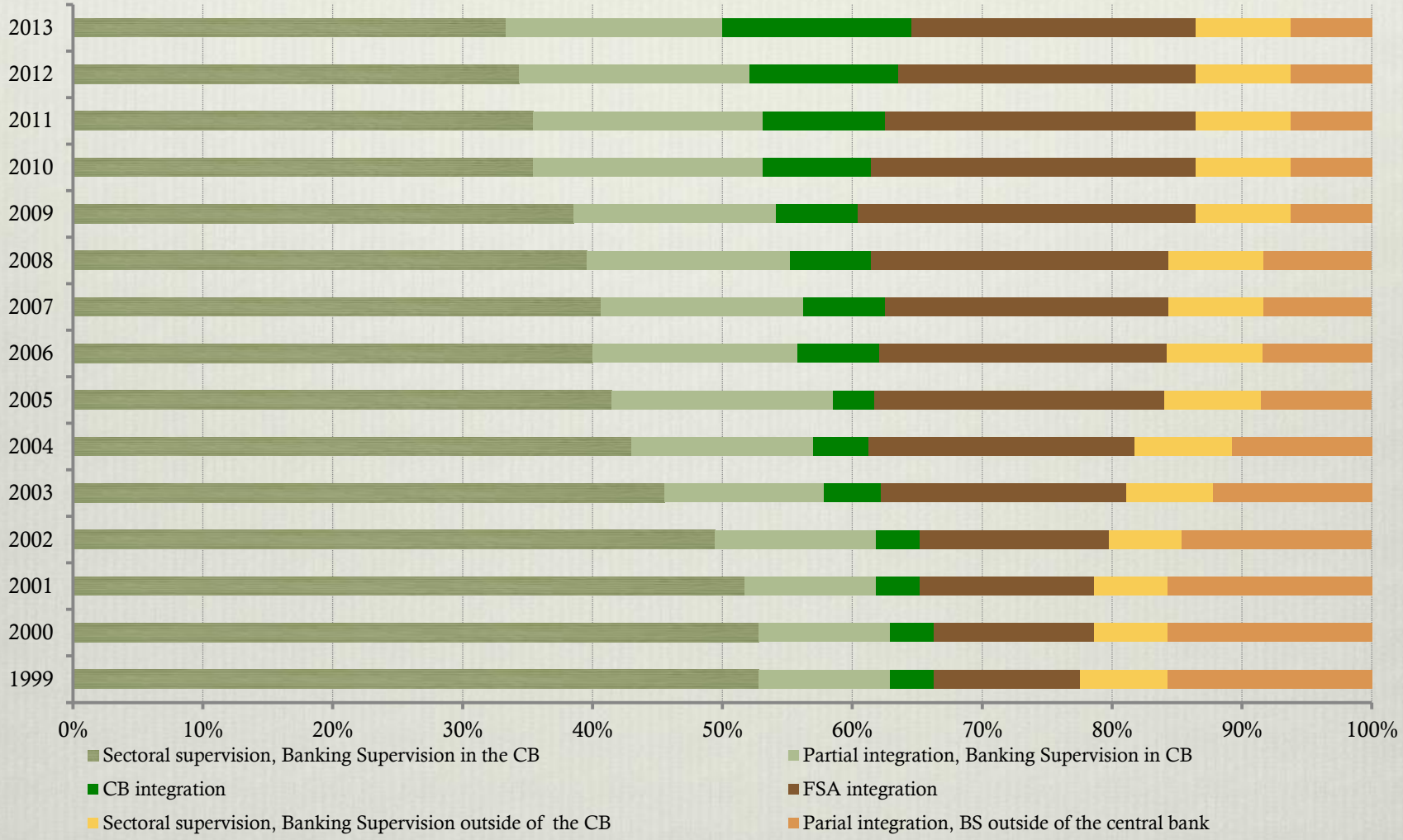
Historical perspective

- Besides the historical role in monetary policy and financial stability, some central banks were the authorities for banking supervision.
- Changes in the structure of prudential supervision, and especially the banking supervision, are among the transformations that affected the central banks, especially in the last 15 years.
- Most important changes were related to: (i) the consolidation of prudential supervision and (ii) **the involvement of the central bank in bank supervision and this consolidation.**
- A historical changes in the architecture of prudential supervision: the establishment of the UK's Financial Services Authority (FSA) in 1998. The FSA got the mandate for supervising all sub-sectors of financial sector.

Historical perspective

- Similar changes followed, mainly during 2002-2007.
- FSA: for instance, Germany and Malta (2002), Belgium (2004), Colombia (2005), Poland (2006).
- Unified supervisory responsibilities to the central bank: for instance, Ireland and Kazakhnstan (2003) and the Czech Republic and Slovak Republic (2006)
- Partial integration: where two financial sectors are supervised by the same institution, either the central bank or an agency outside of the central bank (Croatia, Portugal, Trinidad and Tabago).
- Changes in the supervision of business conduct: increased attention to business conduct supervision and its complementary function to prudential supervision (for instance, the Czech Republic).
- Another wave of changes skewed toward integration in the central banks took place after the global financial crisis.

Historical perspective



Historical perspective

- Until 2010, the unification scene was dominated by consolidations in FSA: 14 new unifications of prudential supervision in a FSA and five unifications in a central bank since 1999.

- During 2011-2013: consolidations in CB have predominated, with 8 new supervisory integration in CB

- The prevalence of central banks in the prudential banking supervision has (slightly) diminished during 2003-9, proportionally more in high financial depth economies. It was reversed after 2010.

- In 2013, **65 percent of countries have banking supervision with the central bank.** (66 percent in 1999)

- Inertia: Countries that have originally sectoral or partial integration with the banking supervision outside of the central bank typically have tended to either maintain their prudential supervisory structure or integrate it in a FSA. Countries in which the central bank supervised the banking sector showed a higher probability to integrate under the central bank than under a FSA. After 2011, there were several radical changes, from FSA integration to CB integration.

- In 15 out of the 33 countries that adopted or integrated the business conduct supervision during 1999-2010, the changes were introduced by an integration either in a FSA or CB.

Determinants of integration

- **Country's level of development and good governance** positively influences the probability of integrating supervision.
- **Small open economies** are more likely to integrate their prudential supervision.
- Integration of prudential supervision was a less preferred outcome from the point of view of an independent central bank.
- **Financial deepening is an important determinant**. The size of the banking sector influences positively the integration but development of the other financial subsectors affects negatively the tendency to integrate prudential supervision.
- Past high **aggregate liquidity exposures** increase the likelihood that a county will integrate prudential supervision.
- Finally, **the number of past financial crises** strongly increases the probability that a county will opt for integration of both prudential.
- **The positive effect of the number of past crises and the negative effect of the stock market capitalization appear to influence only the preference toward the central bank unification.**

The role of central bank in the supervision and eventual unification: literature

- **Proximity of micropurdential supervision to financial stability, typically entrusted to the central bank, could make crisis management more effective** due to of better coordination, possible synergies in systemic risk management, crisis preparedness, and crisis resolution (De Grauwe 2007; Cecchetti 2008; Claessens et al. 2010; Brunnermeier et al. 2009).

- **Information gains making monetary policy more effective** (Goodhart and Schoenmaker 1995; Bernanke 2007; Herrings and Carmassi 2008);
  - The global financial crisis showed that there are close links links between the the monetary policy and the financial stability monetary policy plays role to play in in the prevention of financial crisis.

- **An additional argument is related to the central bank capacity in attracting more skilled staff** (Abrams and Taylor 2002; Quintyn and Taylor 2007).

The role of central bank in the supervision and eventual unification: literature

- **Moral hazard risks:** banks can become less risk averse if the lender of last resort is also the supervisor (Goodhart and Schoenmaker 1995; Llewellyn 2005; Herrings and Carmassi 2008).

- **Potential conflicts of interest between the monetary policy and bank supervision** (Goodhart and Schoenmaker 1995; Padoa Schioppa 2003);

- **The reputational risk**: poor supervisory performance could damage the credibility of monetary policy makers (Goodhart 2000)

- The potential that the **bureaucratic powers** of the central bank could become too big (Padoa Schioppa 2003; Masciandaro 2006).

Placing Bank Supervision in the Central Bank: *Implications for Financial Stability Based on Evidence from the Global Crisis*

- This work examines whether placing the microprudential supervision of banks in the central bank can improve the management of systemic risk in the financial sector.

- Specifically, the work analyzes whether placing bank supervision in the central bank mitigated the likelihood of banking crises that started in 2007.

- We aim to contribute to the literature on optimal institutional arrangements for financial sector oversight to foster financial stability and to early-warning models of banking crises.

Data and model

- We try to analyze whether placement of bank supervision in the central bank could have lowered the probability of a banking crisis using a cross-sectional regression model that employs data from 124 countries.

- For dependent variable, we construct a binary variable that takes the value of 1 if a country experienced a systemic banking crisis after 2007 and 0 otherwise using banking crisis classification of Laeven and Valencia's (2013) database and we cross-check our results against the crisis classification by Reinhart and Rogoff (2011).

- Placement of microprudential supervision of banks prior to 2007: binary variable based on Melecky and Podpiera (2013) and the 2003, 2007, and 2012 Bank Regulation and Supervision Surveys of the World Bank.

Data and model

- The conditioning set of variables in our model of banking crises : Demirgüç-Kunt and Detraghiache (1998, 2005), Kaminsky and Reinhart (1999), Berkmen et al. (2009), Lane and Milesi-Ferretti (2011), Gourinchas and Obstfeld (2012), and Frankel and Saravelos (2012), among others.

- We control for macroeconomic conditions (real output gap, inflation, real interest rate, and change in the real exchange rate), financial conditions--the real private credit gap, a liquidity indicator, financial openness, financial depth indicator (the private credit–to-GDP ratio and the ratio of deposits to GDP, respectively), and institutional development (quality of microprudential supervision; quality of macroprudential supervision); number of previous banking crisis.

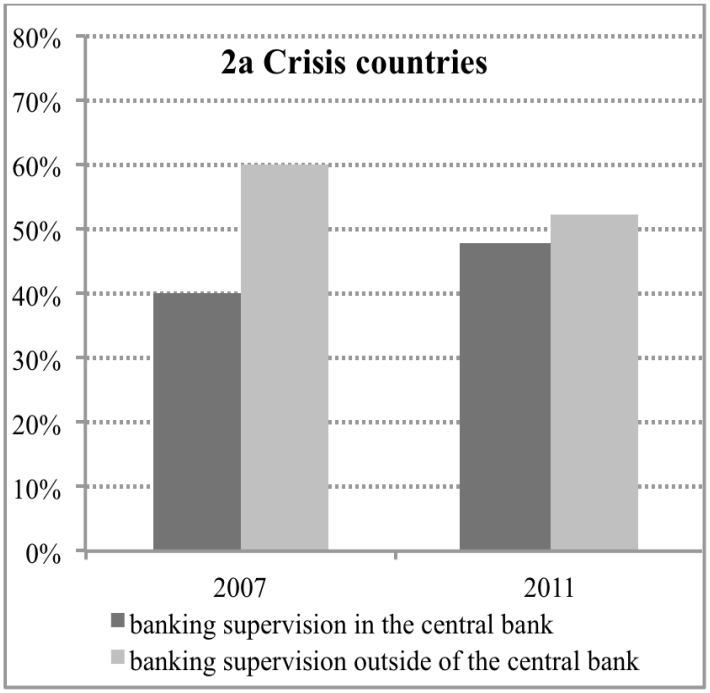
$$y_i = \alpha + \sum_j \beta_j z_{ji} + \sum_p \delta_p x_{pi} + \varepsilon_i ,$$

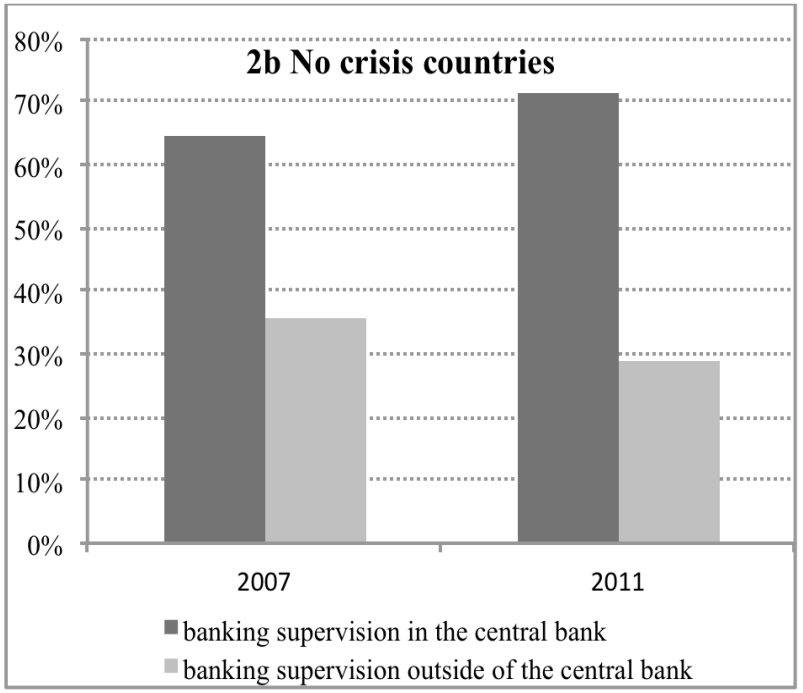
- **All explanatory variables are averaged over 2003–07.**

- We estimate the regression model explaining the probability of a banking crisis with a *binary choice logit* model using robust standard errors.

Summary statistics

Location of Bank Supervision by Crisis Experience.





Source: The proportions of countries are calculated based on Melecky and Podpiera (2013), World Bank's Bank Regulation and Supervision Surveys, and Laeven and Valencia (2013).

Summary statistics

- On average, the crisis countries in our sample are characterized by a higher level of development (GDP per capita), lower inflation, and a higher output (real GDP) gap than the countries that did not experience a crisis. In fact, the non-crisis countries showed, on average, a negative real GDP gap over 2003–07.

- Financial variables in the five-year period preceding the global financial crisis: the private credit–to-GDP ratio and the deposits-to GDP-ratio (financial depth variables), the degree of financial openness, and the exposure to aggregate liquidity risk were, on average, significantly higher in crisis countries than in noncrisis countries.

Results

- When conditioning on macroeconomic and financial variables, we find that placing bank supervision in the central bank is not statistically significant at common levels.
- Aware of numerous significant cross-correlations among macro-financial vbs we strive to derive a parsimonious estimation of the regression.
- We employ the Lasso (least absolute shrinkage and selection operator) penalized regression estimator of Tibshirani (1996), as a variable selection tool to reduce the set of indicators.
- Parsimonious model(s) include: the number of past crises, the GDP gap, the real interest rate, the ratio of private credit to deposits, the ratio of private credit to GDP, and the deposits-to-GDP ratio in the alternative regression.

Results

- Countries that experienced a **higher number of past crises** had a lower probability of experiencing another crisis after 2007, likely as a result of efforts to address macroeconomic, financial, and institutional vulnerabilities after the past crises.

- Countries with **greater deviations of real GDP from its potential** (greater output gap) showed a higher propensity to experience banking crises after 2007. This result agrees with results of other studies of banking crises, such as Kaminsky and Reinhart (1999), Gourinchas and Obstfeld (2012) and Frankel and Saravelos (2012).

- Our results also show a **negative impact of the real interest rate** on the probability of a banking crisis: low real interest rates support excessive borrowing that can ultimately generate banking crises. Frankel and Saravelos (2012) also associate higher saving rates with lower incidence of crises. In contrast, Demirgüç-Kunt and Detragiache (1998, 2005) find that exposure to high real interest rates, which could intensify credit risk as well as negatively affect bank profits, was a source of bank fragility during 1980–2002.

- Third, we confirm the results from earlier studies that countries with **greater financial deepening** (ratio of private credit to GDP) and **countries taking greater aggregate liquidity risk** (ratio of private credit to deposits) are significantly more prone to banking crises.

- We further interact the with the selected macrofinancial variables with the dummy for bank supervision in the central bank. **We find that placement of bank supervision in the central bank reduced the contribution of financial depth to the probability of banking crises.**

	Explanatory variables	Dependent variable: Binary crisis measures (0/1 dummy)							
		(1)	(2)	(3)	(4)	(5)	(6)	7)	8)
Supervisory Block	Number of previous crises	-0.97*	-1.206**	-1.531*	-1.002	-0.977	-1.144*	-1.076	-1.408**
		(0.56)	(0.560)	(0.895)	(0.644)	(0.638)	(0.62)	(0.661)	(0.593)
	CMiMa								
	Quality supervision								
	Length of FSR publication								
Macro-financial block	GDP per capita								
	GDP gap	1.15**	1.008**	1.09**	1.531	1.18**	1.25**	1.21**	1.102**
		(0.45)	(0.432)	(0.517)	(1.084)	(0.534)	(0.51)	(0.529)	(0.481)
	Inflation								
	Real interest rate	-0.3***	-0.26***	-0.25***	-0.24***	-0.200	-0.265***	-0.26***	-0.271***
		(0.09)	(0.088)	(0.0912)	(0.0935)	(0.26)	(0.098)	(0.0925)	(0.0976)
	Change in real exchange rate								
	Real private credit gap								
	Private credit–to-GDP ratio	**0.02*** (0.007)**		0.02*** (0.008)	0.022** *(0.008)	0.02*** (0.008)	**0.028*** (0.008)**	0.022*** (0.008)	
	Deposit-to-GDP ratio		**0.016** (0.005)**						**0.021*** (0.007)**
	Private credit–to-deposit ratio	0.022** (0.008)	0.04*** (0.009)	0.024** (0.01)	0.021** (0.01)	0.022** (0.009)	0.022** (0.007)	0.023** (0.01)	0.037*** (0.01)
Interactive terms	Financial openness								
	CMiMa*nr of prev crises			1.091					
				(1.035)					
	CMiMa*GDP gap				-0.483 (1.185)				
	CMiMa*real interest rate					-0.06 (0.289)			
	CMiMa*private credit to GDP						**-0.012* (0.007)**		
	CMiMa*deposits to GDP								**-0.013** (0.006)**
	CMiMa*private credit to deposits							-0.004 (0.006)	
	Observations	124	124	124	124	124	124	124	
	Pseudo R-squared	0.404	0.395	0.413	0.406	0.405	0.428	0.408	

Robustness tests

- We test the robustness of our results through additional estimations in which we alter the following consecutively: (1) the definition of the dependent variable; (2) the construction of our explanatory variable of interest; and (3) the estimation method.

- (1) We consider two alternative definitions of banking crises:
  - Reinhart and Rogoff (2011) and Reinhart (2010) (the 17 crisis countries-- a subset of those identified by Laeven and Valencia (2013)
  - a definition that distinguishes the class of borderline crises identified by Laeven and Valencia (2013).
- The results of the regressions, including interaction terms, are similar to our main results, column. In addition, when using the RR data, the positive effect of financial openness on the likelihood of crises is mitigated when bank supervision is housed in the central bank.

Conclusion

- This work examined whether the possible synergy effects from having bank supervision in the central bank can help countries avoid banking crises.
- Our results suggest that policy makers can benefit from having a good knowledge of the financial system's microstructure when safeguarding the stability of the financial system as a whole.
- This result holds regardless of whether rapid financial deepening occurs because of domestic credit policies influenced by the risk appetite of domestic policy makers or because of exogenous factors such as capital inflows after liberalization of external financial accounts.
- More work to be done for understanding whether placing banking supervision in the central bank is optimal and whether new institutional arrangements are needed for central banks.

Thank you!