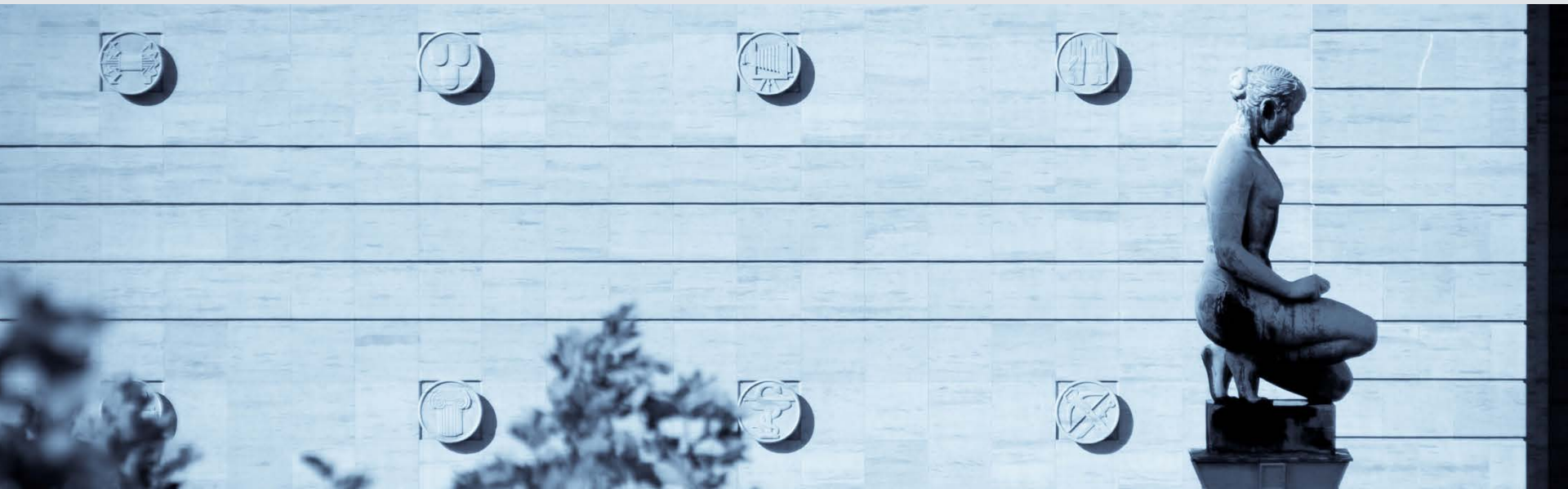# The Transmission Mechanism of Credit Support Policies in the Euro Area

ECB workshop on "Monetary policy in non-standard times"
Frankfurt, 12 September 2016

J. Boeckx (NBB)
M. De Sola Perea (NBB)
G. Peersman (UGent)

BanqueNationaleBank
DE BELGIQUE   VAN BELGIË
Eurosystem

DS.17.01.024

Motivation

▶ Since the GFC, the Eurosystem has not only used its policy rates as an active policy instrument but also its balance sheet. Prior to the APP, these were mainly measures to support the flow of credit to the private sector

- E.g. fixed interest rate with full allotment, extending maturity of LTRO's, enlarged pool of collateral, purchases of covered bonds and ABS, TLTROs, …

1. Have these "credit support policies" been effective at stimulating credit flows to the private sector?

2. If so, what are the exact transmission mechanisms of these policies? What bank characteristics (size, liquidity, retail deposit reliance, capitalisation) determine the transmission?

▶ Use monthly dataset of 131 individual euro area banks by merging different sources of data over sample period 2007M7–2015M10

Literature

► Vast strand of literature using individual bank lending data

  ● Kashyap and Stein (2000), Kishan and Opiela (2000)…

  ● For the euro area: Kashyap and Stein (1997), Gambacorta and Marqués-Ibáñez (2011), De Santis and Surico (2013), Holton and Rodriguez d'Acri (2015), Altavilla, Canova and Ciccarelli (2016)…

► Analysis of ECB's liquidity provision measures during the crisis

  ● De Haan, Vermeulen and van den End (2016), Andrade, Cahn, Fraisse and Mésonnier (2015),…

► Role of capital for monetary policy transmission

  ● Van den Heuvel (2002), Disyatat (2010), Bernanke and Lown (1991), Gambacorta and Mistrulli (2004)…

► Our contribution: relying on EA individual bank data, we analyse the impact of ECB credit support policies on bank lending volumes and rates, and their channels of transmission.
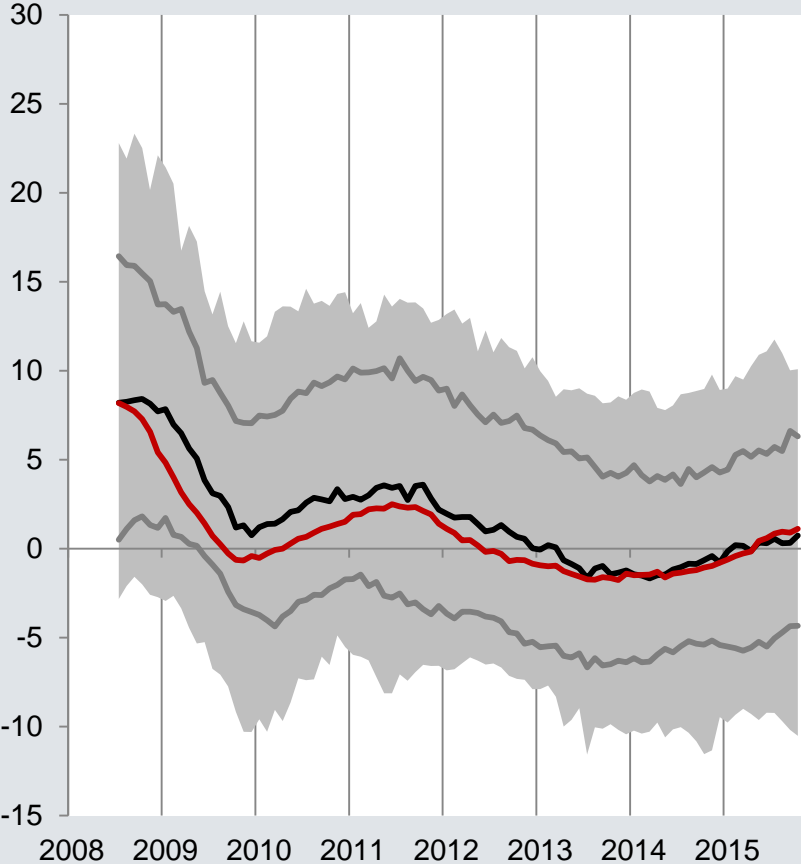
Individual bank data

► Two monthly databases compiled by the ECB and NCBs and a proprietary one

- Individual balance sheet items (e.g. volume of lending) of 281 banks and interest rates of 223 banks

- SNL Financial is the source for extra balance sheet indicators (capitalisation, …)

► After transformations and cleaning of dataset, 131 banks of 19 euro area countries can be used for the estimations

- Represent 37% of total assets of banking sector and 43% of total lending, while correlation of monthly changes with EA aggregates is 0.73 and 0.88
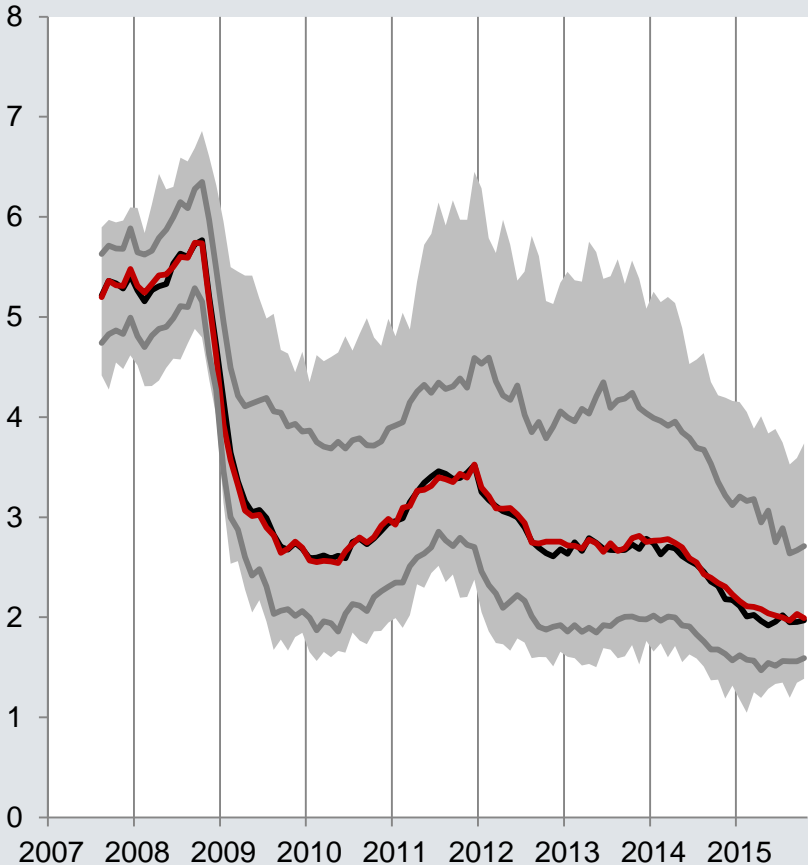
Representativeness of bank level data

Annual growth rate of bank lending to firms and households

Composite bank lending rate to firms and households

5th and 95th percentiles
16th and 84th percentiles

median of individual banks
euro area aggregate

Methodology and choice of "credit support shock"

► Jordà's (2005) local projection method for estimating impulse response at horizon h

$$Z_{i,t+h} = \alpha_{i,h} + \delta_{i,h}(L)Z_{i,t-1} + \rho_{i,h}(L)X_{t-1} + \theta_h MPshock_t + \varepsilon_{i,t+h}$$

**Impact of shock
at horizon h**

- Z_i : lending rates and volume of lending to firms and households by bank i

- X : set of control variables (macroeconomic, financial and monetary policy variables)

- $MPshock$: exogenous ECB balance sheet shocks (+ growth rate of total assets of ECB balance sheet as a robustness check in the paper)

Why do we use the local projection method?

▶ It makes it possible to investigate the timing and dynamic impact of monetary policy shocks at the bank level

▶ It is more robust to misspecification (compared to VARs) — but erratic response patterns

▶ It makes it possible to make impulse responses dependent on bank characteristics:

- All characteristics can be included simultaneously (better than sample splits because they are correlated)

- State of the bank at time of shock matters, not the average over the sample

- Interaction between bank characteristics can be examined

Balance sheet innovations borrowed from Boeckx, Dossche and Peersman (IJCB, 2017)

Output	Prices	CB Total Assets	CISS indicator	EONIA-MRO spread	MRO-rate
0	0	≥ 0	≤ 0	≤ 0	0

► Lagged impact of balance sheet shocks on output and prices: to disentangle from innovations to output and prices (akin to most monetary SVAR studies)

► Balance sheet shocks do not increase CISS indicator: to disentangle from endogenous response (by ECB and banks through demand for liquidity) of balance sheet to financial stress

► Balance sheet shocks do not increase EONIA-MRO spread: to disentangle from (non-policy-induced) liquidity demand shocks

► Balance sheet shocks are orthogonal to shifts in policy rate

► (Weak) sign restrictions imposed on impact and first month after shock: announcement effects are possible

Series of exogenous monetary policy shocks
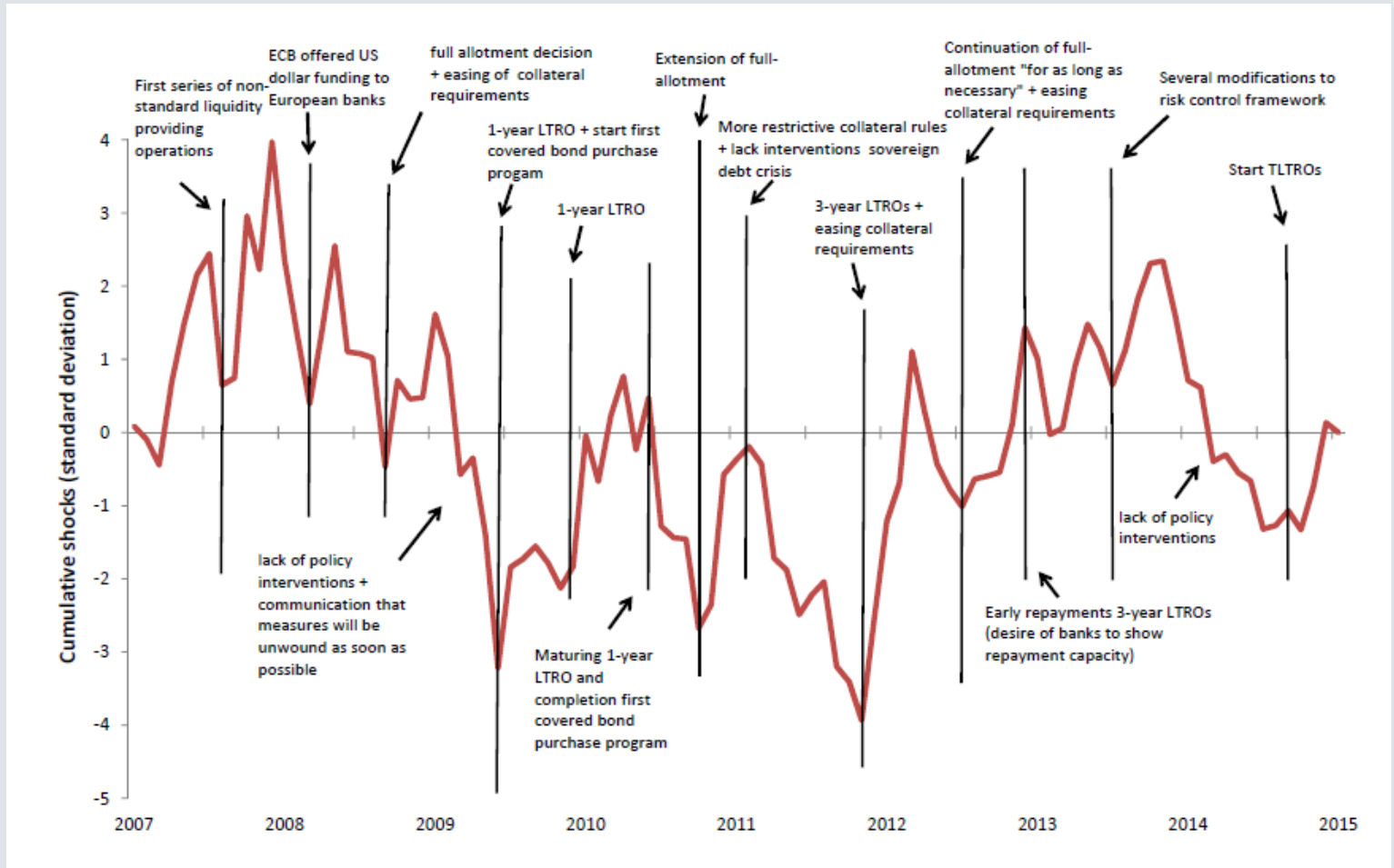
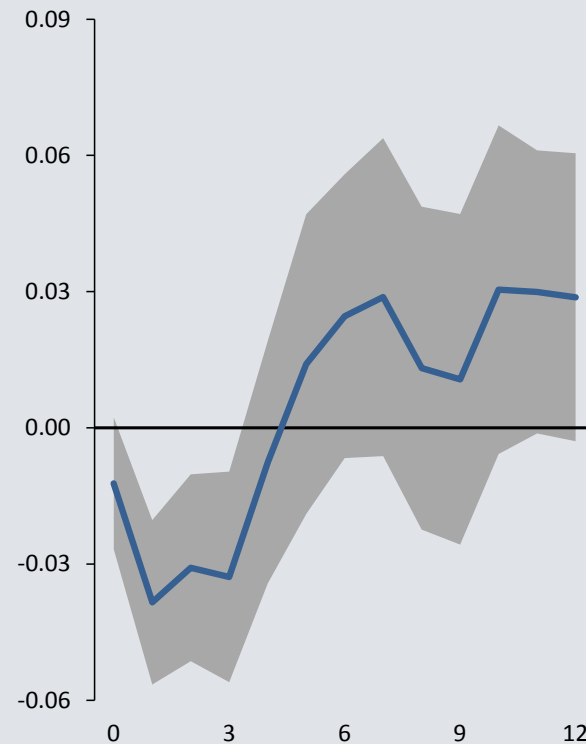# Panel results: a 1.5% balance sheet increase raises credit supply (volumes up, rates down)

► Fixed effects, heterogeneous slopes X-variables, 90% confidence bands

$$Z_{i,t+h} = \alpha_{i,h} + \delta_{i,h}(L)Z_{i,t-1} + \rho_{i,h}(L)X_{t-1} + \theta_h MPshock_t + \varepsilon_{i,t+h}$$

Volume of lending
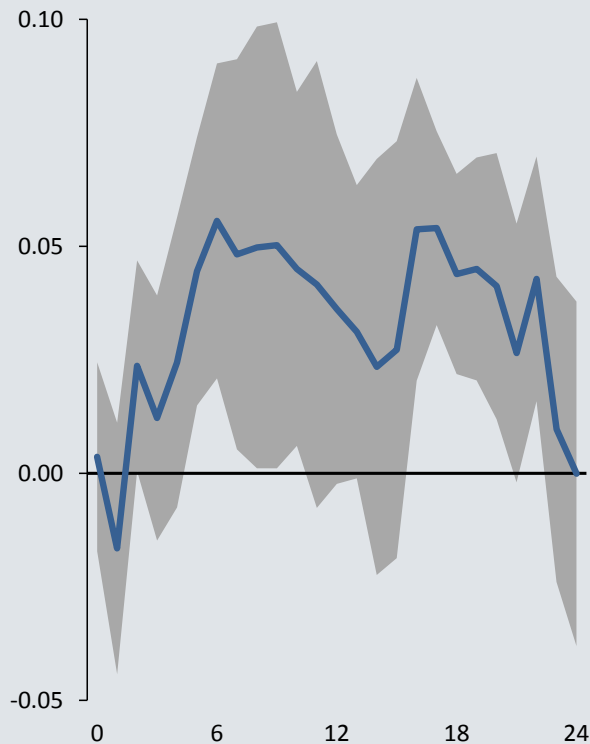
Lending rates

Transmission mechanism of credit easing policies

► Extend baseline local projections to include individual bank characteristics

$$Z_{i,t+h} = \alpha_{i,h} + \delta_{i,h}(L)Z_{i,t-1} + \rho_{i,h}(L)X_{t-1} + \theta_{i,h}MPshock_t + \varepsilon_{i,t+h}$$

$$\theta_{i,h} = \gamma_{0,h} + \sum_j \gamma_{j,h}\,DUMC_j + \sum_k \gamma_{k,h}\big(characteristic(k)_{i,t-1}\big)$$

► Are there important differences in the way banks with varying characteristics respond to credit easing policies?

- *characteristic(k)* captures a specific channel

- *$DUMC_j$* is a country dummy to take account of country-specific effects on the impact of credit support policies

Bank lending view of monetary transmission

► When financial markets are impaired, the supply of bank loans will be more constrained for banks with difficulties to raise unsecured external funds for their lending activities:

1. Smaller banks (asymmetric information or not benefitting from "too big to fail")

   ■ 100*log(total assets) from iBSI

2. Banks with a smaller deposit base

   ■ Retail deposits/retail lending from iBSI

3. Banks with less liquid balance sheets

   ■ Liquid assets/total assets from SNL (yearly, not available for all banks)

4. Banks with weaker balance sheets, i.e. low-capitalized banks

   ■ Equity/total assets from SNL (yearly)

► Policies that facilitate access to central bank liquidity and relax the conditions to get it, should also primarily shift loan supply of these banks

Results for volume of lending (top) and lending rates (bottom)
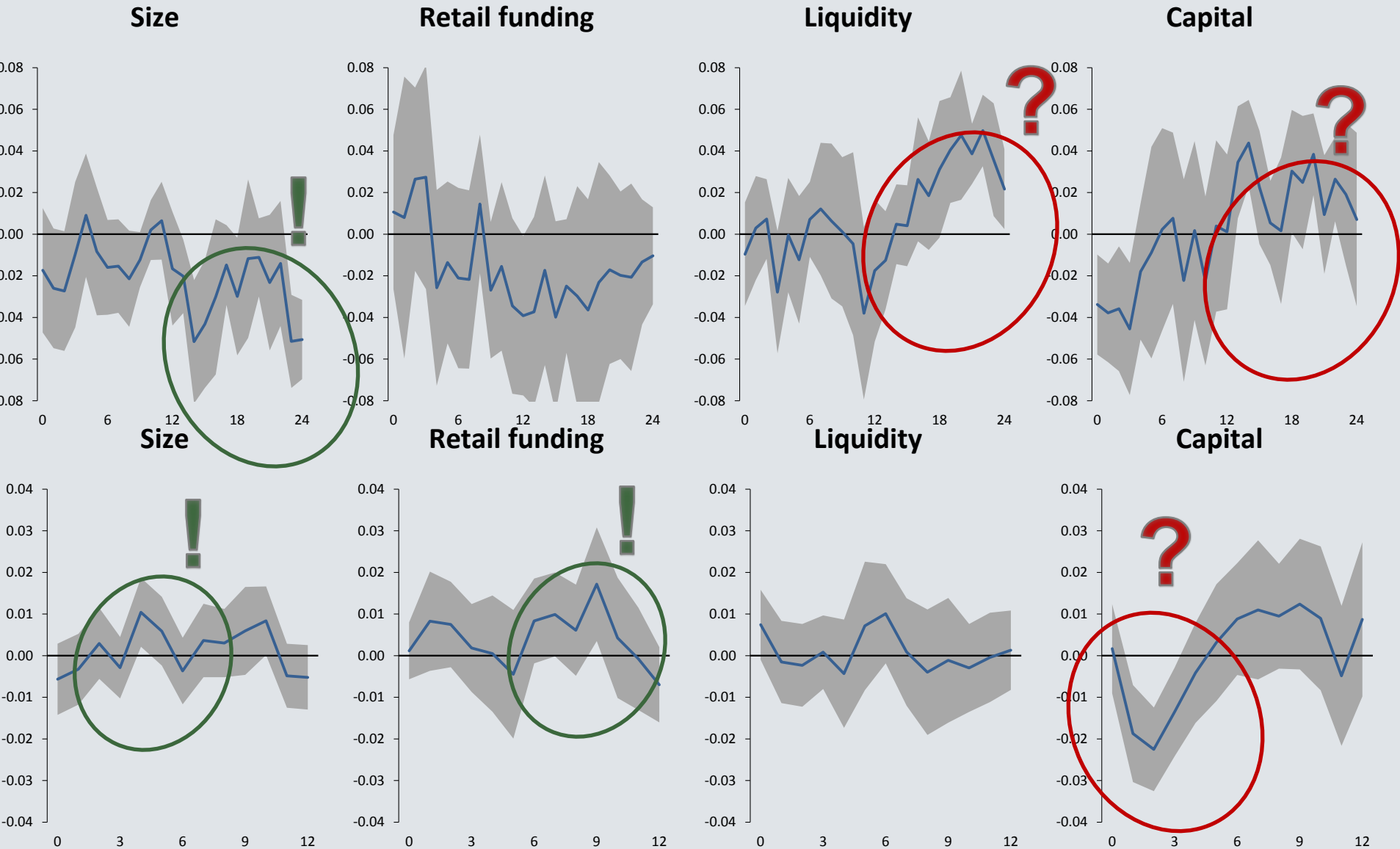
Figures show extra effects if bank characteristic deviates 1 standard deviation from sample mean: magnitudes are economically meaningful!

The role of (low) capital

► Low-capitalized banks are expected to benefit more of credit support policies because they have difficulties raising unsecured external funds…

► … but low levels of capital could also encompass a drag on the ability to increase loan supply (Van den Heuvel, Bernanke & Lown, …)

- Banks could extend loans up to a certain multiple of their capital, determined by regulatory capital requirements or by market discipline: some fundamental or ultimate constraint

► Analyze the role of capital using two methods:

- Include dummy variable for banks with capital ratio in the lowest quartile of the sample: does closeness to regulatory threshold limits ability to increase lending?

- Include (size*capital), (liquidity*capital) and (retail*capital) as explanatory variables: is there a drag of bank capital on the other channels?
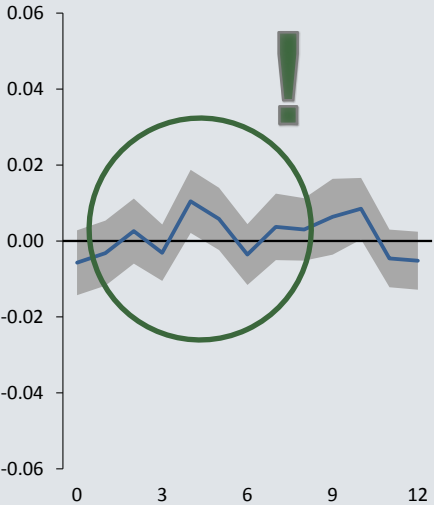
Results for volume of lending and low capital dummy
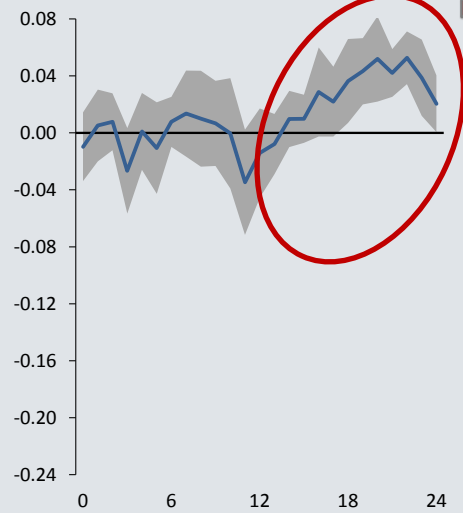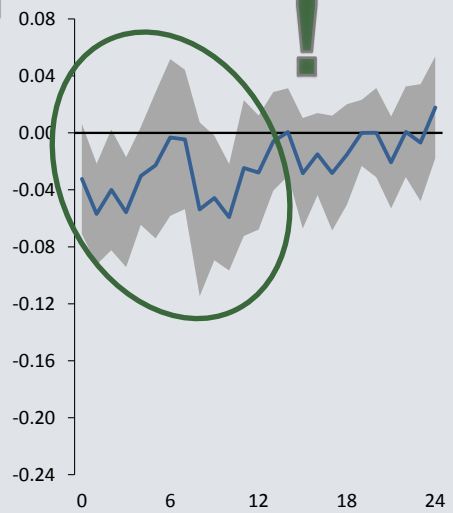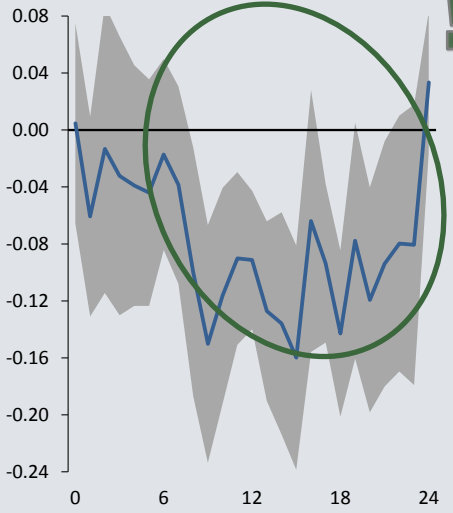
Results for lending rates and low capital dummy
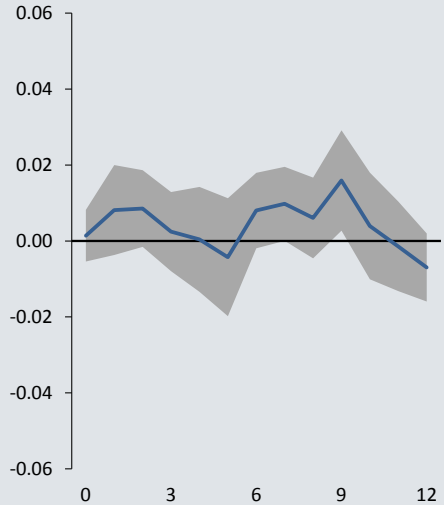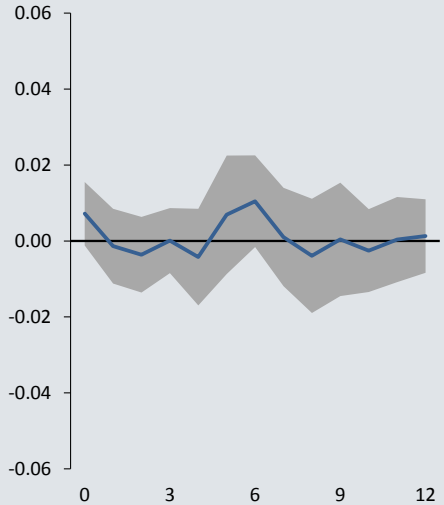
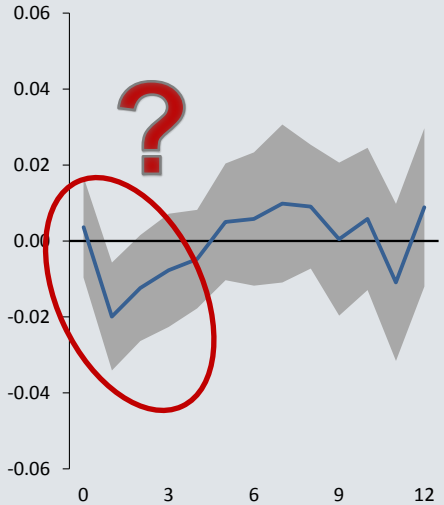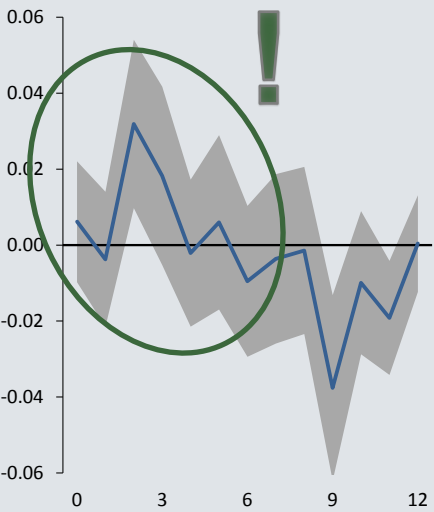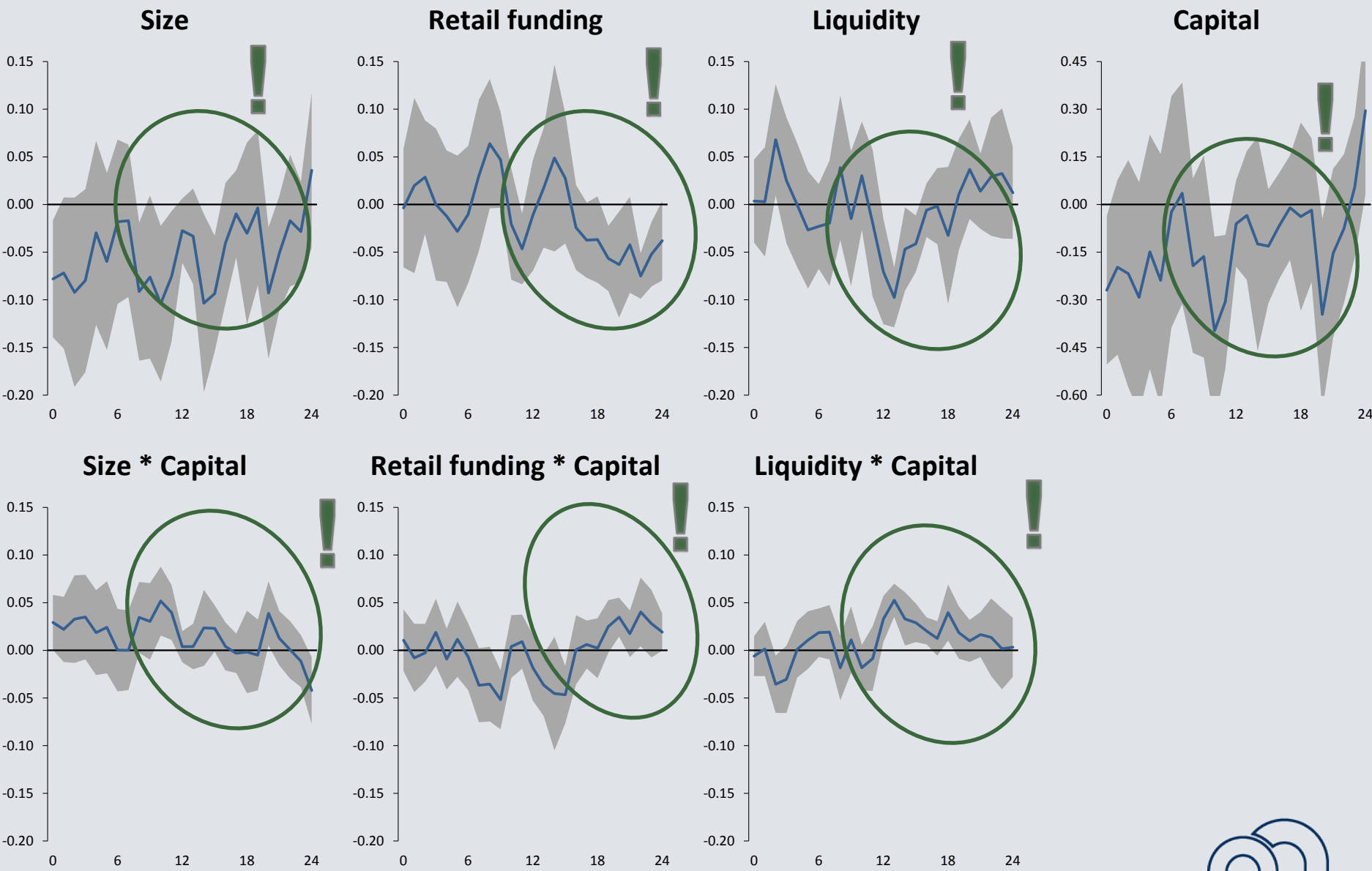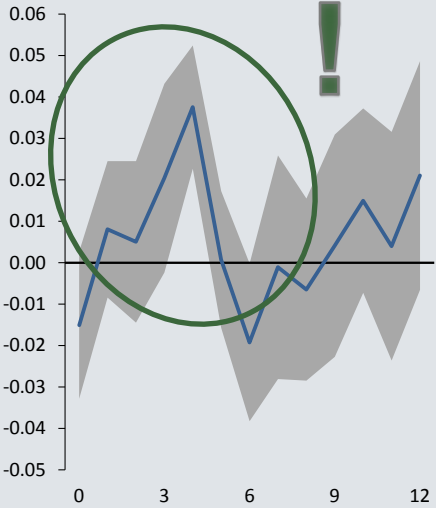# Results for volume of lending and interaction of capital
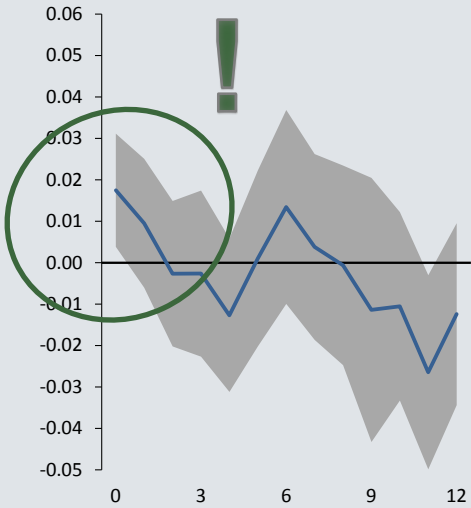
Results for lending rates and interaction of capital
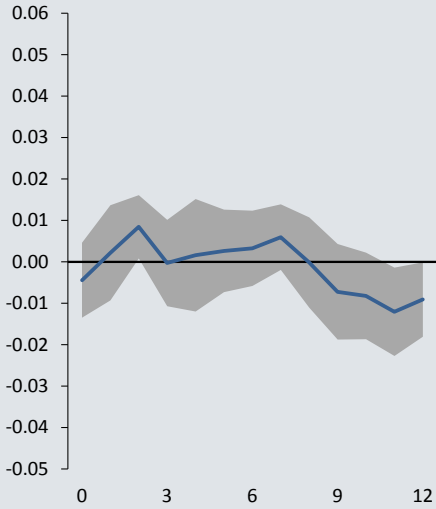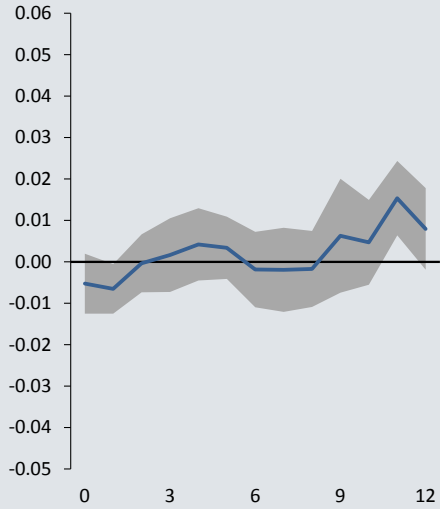
Conclusions

► Credit support policies of ECB have been effective at stimulating bank lending to the private sector in the aftermath of the financial crisis

► Policies transmitted via size, liquidity, retail funding and capital channel: in line with the "bank lending view" of monetary transmission

► Role of capital is ambiguous and nonlinear: lower capital implies a stronger capital channel, but mitigates size, retail and liquidity channel considerably

  ● On average, drag effect of capital even dominated during the sample period, in particular for banks with low capital ratios

  ● Increasing bank capitalization should enhance the effectiveness of credit support policies
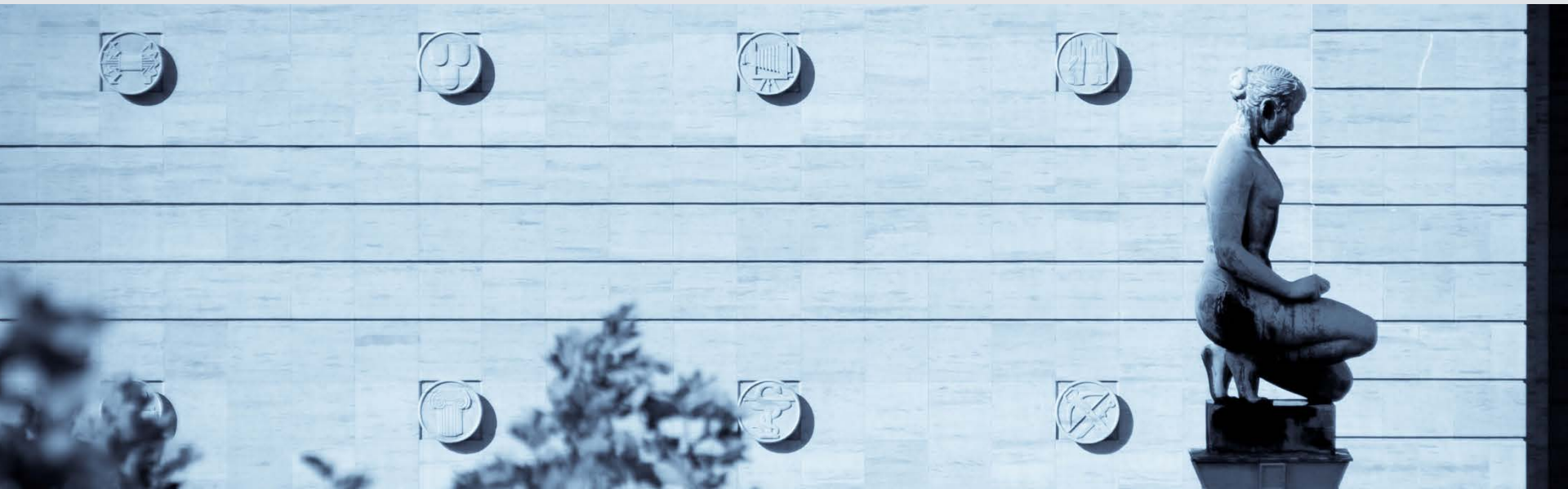
Bank characteristics — Descriptive statistics

Table 2 - Bank characteristics

	2008				2014				Overall			
	Obs	Average	Median	Stdev	Obs	Average	Median	Stdev	Obs	Average	Median	Stdev
Size (€ bn)	1398	92.6	34.9	138.6	1560	87.1	35.7	137.9	12445	91.1	36.0	140.0
Size (100*log)	1398	360.4	355.1	148.0	1560	355.6	357.4	140.7	12445	360.4	358.5	142.9
Equity over total assets	99	4.9	5.1	2.4	129	7.2	6.7	3.7	1006	5.9	5.8	3.2
Deposit to loan ratio	1398	72.7	69.0	47.9	1560	88.6	83.3	75.6	12445	81.8	75.1	72.7
Liquidity ratio	81	33.1	29.6	16.5	97	30.4	27.4	14.5	781	31.1	27.9	15.8

Correlations	Size	Equity over total assets	Deposit to loan ratio
Size (€ bn)	1		
Equity over total assets	-0.1863	1	
Deposit to loan ratio	-0.0263	0.3386	1
Liquidity ratio	0.3606	-0.2084	0.2106

Summary of results for volume of lending

| Additional effect of credit support policies on volume of lending (average impact = 0.05) | Taking into account interaction effects | |
	Interaction with low capital	Additional effect
Small banks	+0.05***	-0.05**	+0.10***
Low-liquidity banks	-0.05***	-0.05***	+0.10***
Wholesale funded banks	+0.03	-0.03**	+0.06***
Low-capital banks	-0.04***		+0.34**