

# The Bank Lending Channel of Conventional and Unconventional Monetary Policy

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# Monetary policy transmission and credit supply

Long-dated interest in the BLC, resurged since the crisis

- Bernanke and Blinder (1988), Kashyap and Stein (1995, 2000), Romer and Romer (1990)
- Jimenez *et al.* (2012, 2014); Gambacorta and Mistrulli (2014)

Main prediction: transmission stronger for banks more exposed to asymmetric information problems (Stein, 1998)

- less capitalized, w/ less liquid balance-sheets, smaller

In addition, transmission amplified by dynamic impact on future capital via net interest income

- *bank capital channel* (van den Heuvel, 2002)

All these works focus on **conventional** MP (i.e. changes in short-term policy rate)...



# Unconventional monetary policy transmission and credit supply

...but no evidence on **unconventional** MP (UMP) so far

UMP typically undertaken in particular conditions:

- severe market stress
- traditional transmission channels impaired
- lending supply is often one explicit objective

Thus, the BLC of UMP may work differently:

- economic and regulatory constraints may affect banks' ability/willingness to expand loan supply (capital, liquidity)
  - UMP likely to *negatively* affect net interest income
  - alternative balance-sheet dimensions may matter (sovereign exposure, asset quality)
- Obvious policy interest in understanding if/how these measures worked



# This paper

We study the **transmission** of both conventional and unconventional MP **via shifts in bank lending supply**

Three main questions:

1. Was a bank-lending channel (BLC) operational during the crisis?
2. What are the main bank-specific factors affecting the BLC?
3. Is the BLC different for conventional and unconventional measures?

We use a monthly panel of bank-level loan rates for 200-some euro area banks (MFIs), for the period 2007-15

# Preview of main results

1. For conventional MP, results in line with standard BLC literature: asymmetric information
2. For unconventional MP:
  1. accommodation transmitted more by banks with stronger capital and funding positions: regulatory and economic constraints
  2. transmission attenuated by their negative effect on future bank's capital position via the net interest income (*reverse bank capital channel*).
3. Large sovereign exposures muted the response to conventional policy, but amplified transmission of unconventional measures

# Related literature

## Bank lending channel

- Pre-crisis: Kashyap and Stein (1995, 2000); Stein (1998); Kishan and Opiela (2000); Jimenez et al. (2012, 2014)
- Bank capital: Bernanke and Lown (1991); van den Heuvel (2002)
- Post-crisis: Gambacorta and Marques-Ibanez (2011);

## Pass-through of MP on lending rates in the euro area

- Macro data: Kok Sorenses (2006); Illes and Lombardi (2013); Von Borstel, Eickmeier and Krippner (2015)
- Same dataset: Holton and Rodriguez d'Acri (2016); Altavilla, Canova, Ciccarelli (2016); Boexkx et al. (2016)

## Types and effectiveness of UMP

- Borio and Disyatat (2010); Cecioni et al. (2011); Pattipeilohy et al., 2013
- Chung *et al.* (2012); Lenza *et al.* (2010); Gambacorta *et al.* (2014).
- Brunnermeier and Koby (2016)

# Rest of the talk

1. Data
2. Empirical strategy
3. Regression results
4. Conclusions

# Data – bank-level variables

## 1) Interest rate: new loans to NFC

- Monthly data for 160-200 MFIs from July-07 to Dec-15

## 2) Balance-sheet characteristics

- MFI-level, monthly, unconsolidated
  - **Deposit ratio** = HH+NFC deposits / Total main liabilities
  - **Sovereign exposure** = domestic Gov't bonds / Total main assets
- Group-level, yearly, consolidated (Bankscope, Bureau van Dijk<sup>©</sup>)
  - **Tier1 ratio** = Tier1 capital / RWAs
  - **NPL ratio** = non-performing loans / total loans
  - **Liquidity ratio** = (cash+short-term assets) / total assets
  - **Net Interest Income/total assets**: indicator of traditional intermediation activity

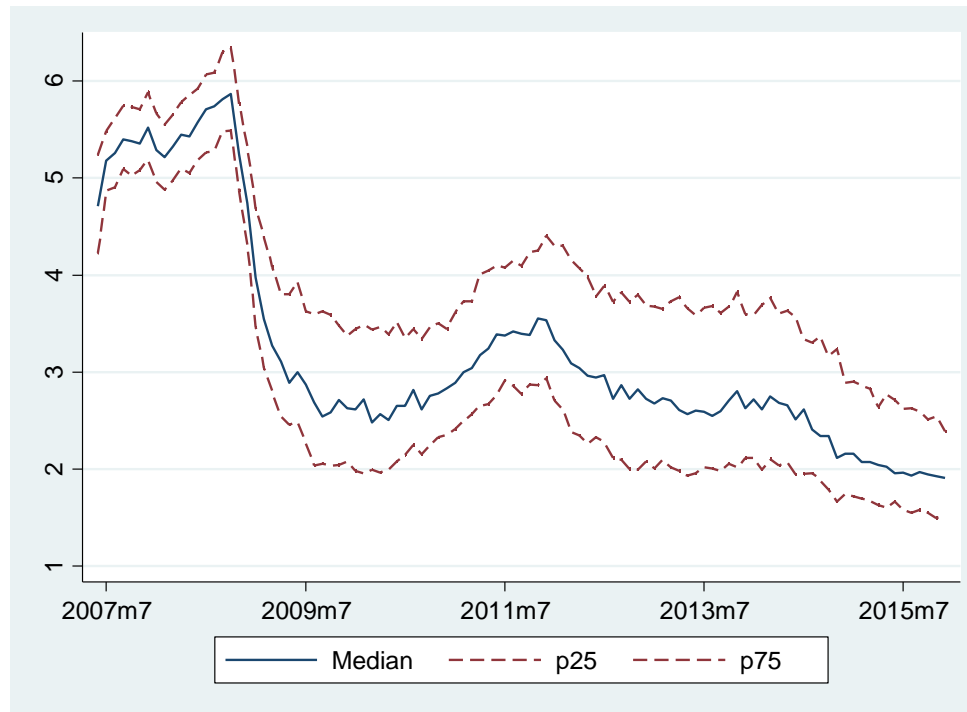
→ Descriptive statistics



# Data: bank-level variables

Dependent variable: bank-level average rate on new loans to NFC

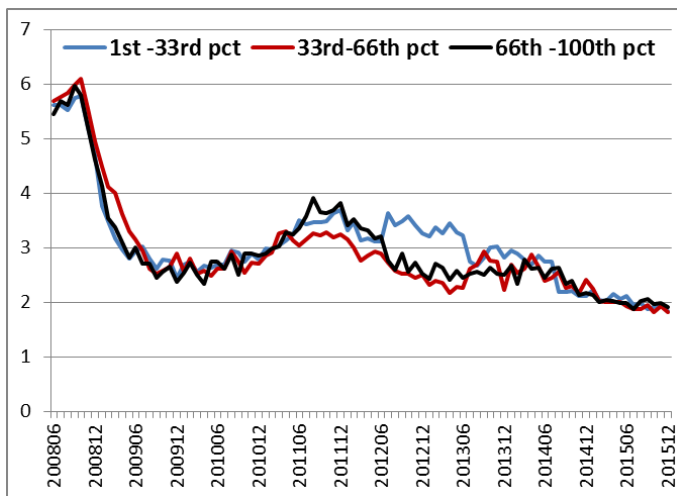
Monthly information for 160-200 banks, from July-07 to Dec-15. Unconsolidated



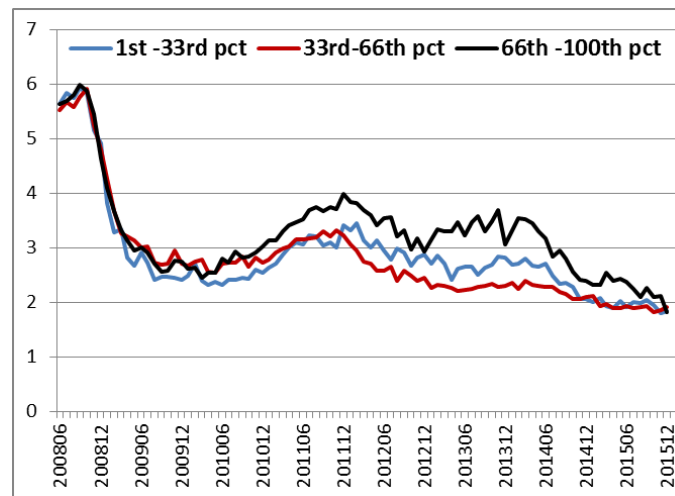
- Dispersion increases significantly since the summer of 2011

# Dispersion of interest rates across a number of dimensions

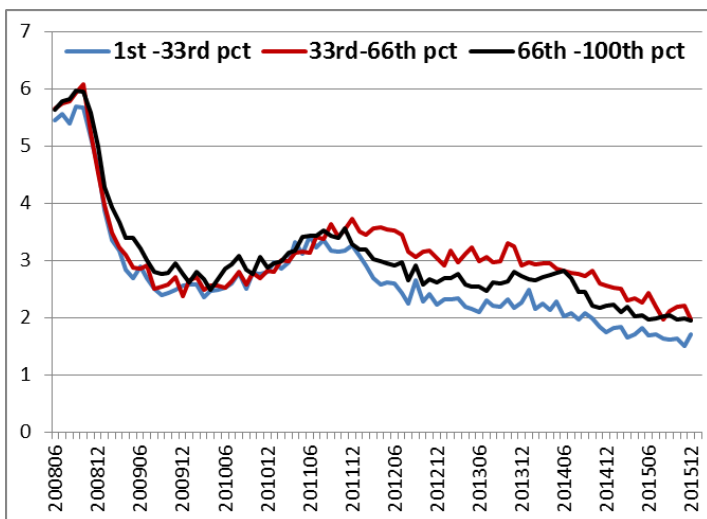
## By Tier1 ratio



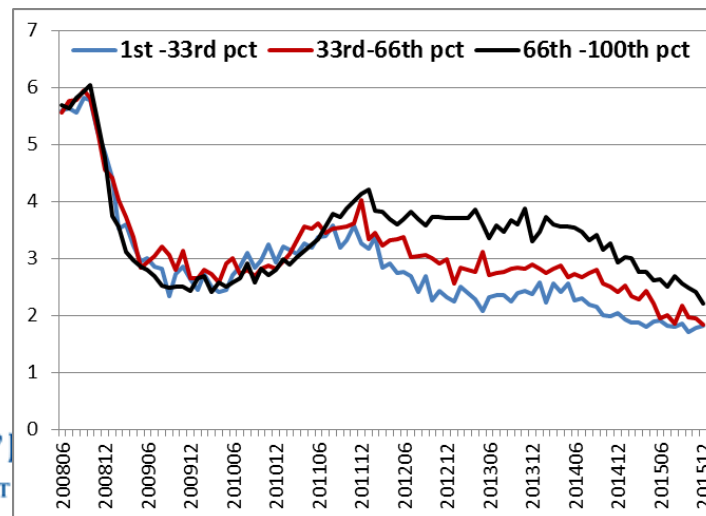
## By sovereign exposure



## By deposit ratio



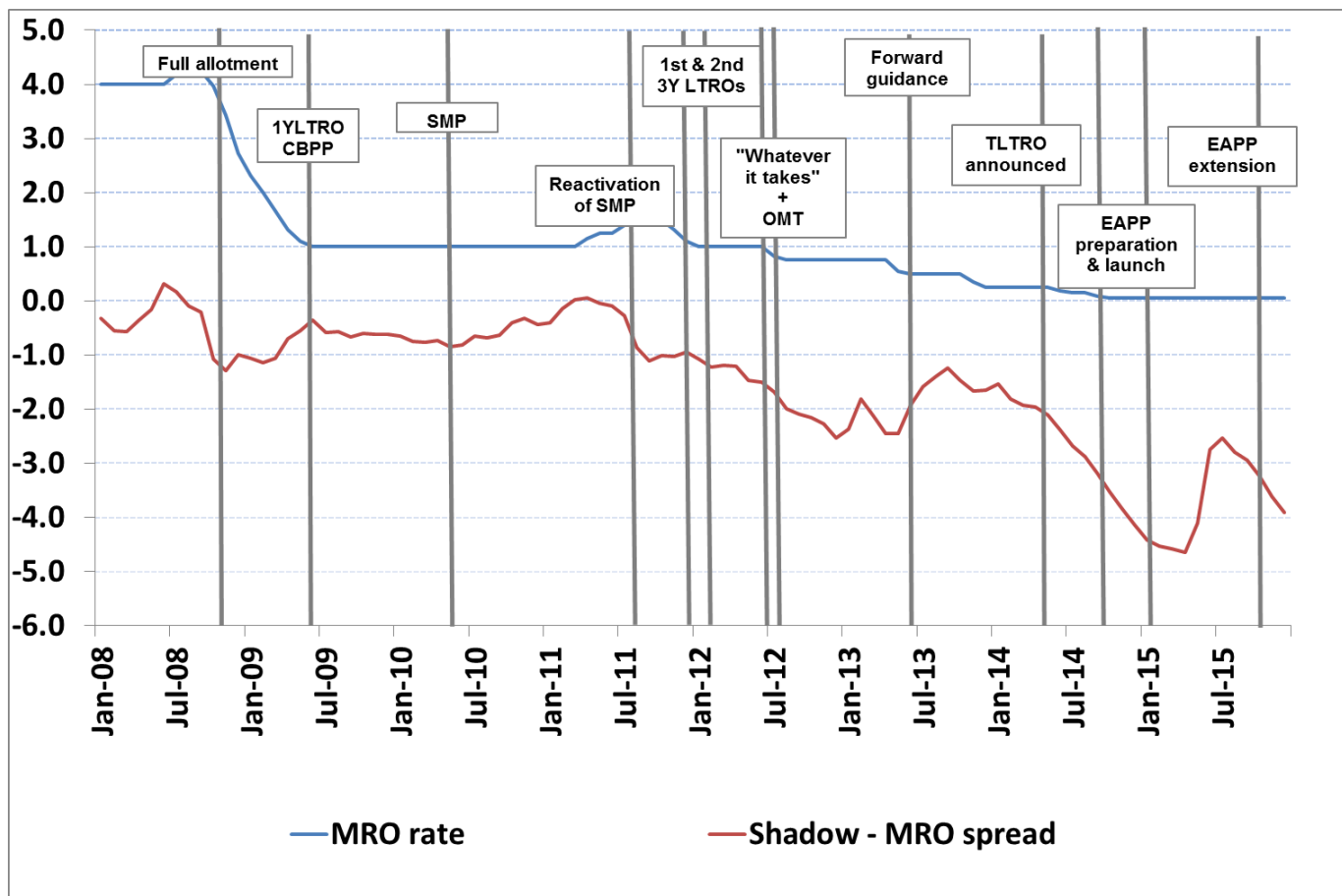
## By NPL ratio



# Monetary policy indicators

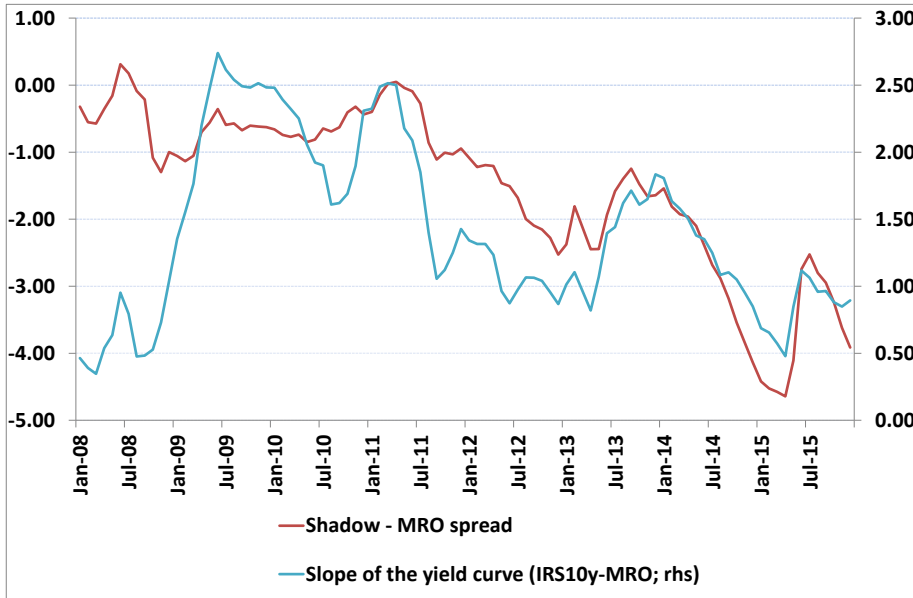
**Conventional MP:** MRO rate

**Unconventional MP:** Shadow rate (Krippner, 2014) (in diff. from the MRO)

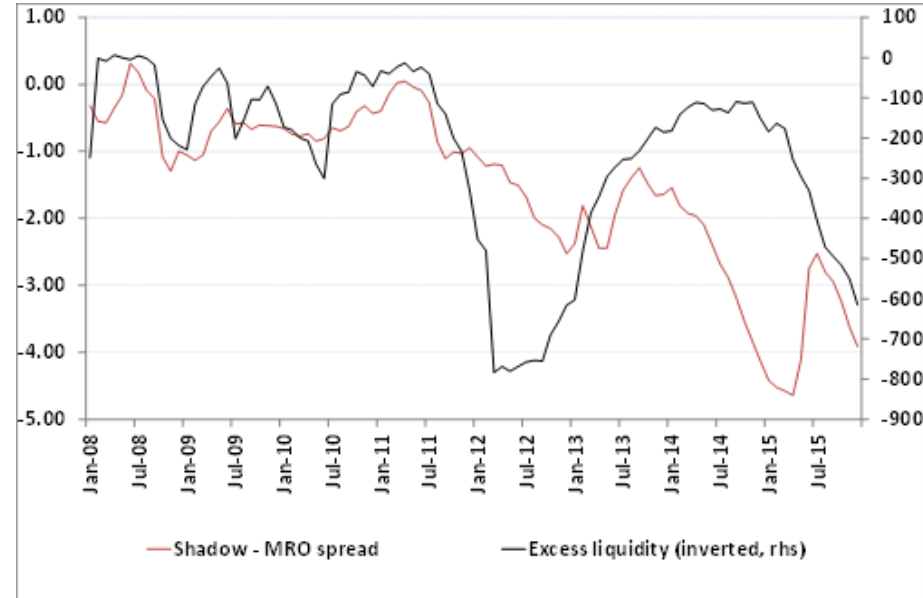


# Unconventional MP measure: Shadow rate-MRO vs...

...the slope of the yield curve



...excess liquidity (ECB b-sheet)



- Shadow-MRO spread tracks closely movements in the slope of the yield curve...
- ...and is also correlated with excess liquidity, though the correlation is milder
  - excess liquidity does not capture announcement effects or policies not affecting amount of liquidity (e.g., fwd guidance, OMT)

# Empirical strategy

We estimate a dynamic pass-through equation:

$$r_{it}^C = \omega_i + \tau_{Ct} + \alpha r_{it-1}^C + \beta X_{it-1} + \rho MP_{t-1} \cdot X_{it-1} + \varepsilon_{it}^C$$

- $r_{it}^C$ : loan rate charged by bank  $i$  (of country  $C$ ) at month  $t$
  - $\omega_i$ : bank fixed-effects
  - $\tau_{Ct}$ : country-month fixed effects → key identification hypothesis: control for loan demand conditions and borrowers' riskiness at the country-level
  - $X_{it-1}$ : bank-specific variables
  - $MP_{t-1}$ : indicators of the monetary policy stance (conv & unconventional)
  - $MP_{t-1} * X_{it-1}$ : interaction terms between MP and bank-specific variables
- Sample period: July 2007-Dec 2015
- → «Large T» case ( $T \sim 120$ ). So, we are fairly safe in estimating via OLS  
However, all results robust to using Arellano-Bover (1995)

# Summing up: hypotheses to be tested

## 1. Information asymmetry

- pass-through *stronger* for weaker banks

## 2. Economic and regulatory constraints:

- pass-through *stronger* for more capitalized banks (and/or stronger funding structure)

## 3. Bank capital channel

- Conventional policy: PT *stronger* for banks more relying on net interest income
- Unconventional MP: PT *weaker* for banks more relying on net interest income
- Reinforces the effects related to Tier1

# Expected signs

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## Conventional monetary policy

<i>MRO rate*</i>	Asymmetric information
Tier1 Ratio	-
Deposit ratio	-
Liquidity ratio	-
NPL ratio	+
Sov. Exposure ratio	+/-

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## Unconventional monetary policy

<i>Shadow-MRO spread*</i>	Asymmetric information
Tier1 Ratio	-
Deposit ratio	-
Liquidity ratio	-
NPL ratio	+
Sov. Exposure ratio	+/-

# Expected signs

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## Conventional monetary policy

	Asymmetric information	Economic and regulatory constraints
<b><i>MRO rate*</i></b>		
Tier1 Ratio	-	+
Deposit ratio	-	+
Liquidity ratio	-	
NPL ratio	+	
Sov. Exposure ratio	+/-	

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## Unconventional monetary policy

	Asymmetric information	Economic and regulatory constraints
<b><i>Shadow-MRO spread*</i></b>		
Tier1 Ratio	-	+
Deposit ratio	-	+
Liquidity ratio	-	
NPL ratio	+	
Sov. Exposure ratio	+/-	



# Expected signs

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## Conventional monetary policy

	Asymmetric information	Economic and regulatory constraints	Bank capital channel
<b><i>MRO rate*</i></b>			
Tier1 Ratio	-	+	
Deposit ratio	-	+	
Liquidity ratio	-		
NPL ratio	+		
Sov. Exposure ratio	+/-		
Net interest income			+

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## Unconventional monetary policy

	Asymmetric information	Economic and regulatory constraints	Bank capital channel
<b><i>Shadow-MRO spread*</i></b>			
Tier1 Ratio	-	+	
Deposit ratio	-	+	
Liquidity ratio	-		
NPL ratio	+		
Sov. Exposure ratio	+/-		
Net interest income			-

# Expected signs

## Conventional monetary policy

	Asymmetric information	Economic and regulatory constraints	Bank capital channel
<b><i>MRO rate*</i></b>			
Tier1 Ratio	-	+	
Deposit ratio	-	+	
Liquidity ratio	-		
NPL ratio	+		
Sov. Exposure ratio	+/-		
Net interest income			+
Net interest income * Tier1 Ratio			same sign as Tier1 Ratio

## Unconventional monetary policy

	Asymmetric information	Economic and regulatory constraints	Bank capital channel
<b><i>Shadow-MRO spread*</i></b>			
Tier1 Ratio	-	+	
Deposit ratio	-	+	
Liquidity ratio	-		
NPL ratio	+		
Sov. Exposure ratio	+/-		
Net interest income			-
Net interest income * Tier1 Ratio			opposite sign as Tier1 Ratio

# Empirical results

# Main results

Only BLC

(a)

## Conventional monetary policy

MRO \*

Tier1 ratio	<b>-0.011</b> **
Deposit ratio	<b>-0.128</b> ***
Sovereign exposure	<b>-0.467</b> **

## Unconventional monetary policy

SHADOW-MRO \*

Tier1 ratio	<b>0.011</b> ***
Deposit ratio	<b>0.073</b> *
Sovereign exposure	<b>0.577</b> ***

Interactions of MP with NPL and Liq ratio Y, Not Sign.

Bank characteristics	Yes
Bank fixed effects	Yes
Country-time fixed effects	Country*YY:M
Clustering (two-way)	Year*Bank, Year:m
N° of observations	8600

# Main results

	Only BLC	Bank lending channel & bank capital channel
	(a)	(b)
<b>Conventional monetary policy</b>		
MRO *		
Tier1 ratio	<b>-0.011 **</b>	<b>-0.011 **</b>
Deposit ratio	<b>-0.128 ***</b>	<b>-0.130 ***</b>
Sovereign exposure	<b>-0.467 **</b>	<b>-0.470 **</b>
Net interest margin		-0.005
<b>Unconventional monetary policy</b>		
SHADOW-MRO *		
Tier1 ratio	<b>0.011 ***</b>	<b>0.011 ***</b>
Deposit ratio	<b>0.073 *</b>	<b>0.087 **</b>
Sovereign exposure	<b>0.577 ***</b>	<b>0.534 ***</b>
Net interest margin		<b>-0.047 **</b>
Interactions of MP with NPL and Liq ratio	Y, Not Sign.	Y, Not Sign.
Bank characteristics	Yes	Yes
Bank fixed effects	Yes	Yes
Country-time fixed effects	Country*YY:M	Country*YY:M
Clustering (two-way)	Year*Bank, Year:mm	Year*Bank, Year:mm
N° of observations	8600	8570

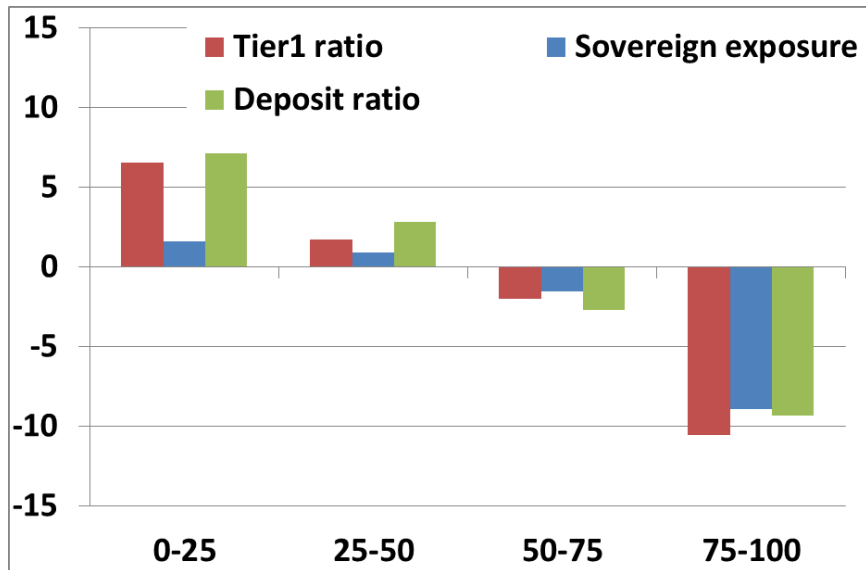
# Main results

	Only BLC	Bank lending channel & bank capital channel	
	(a)	(b)	(c)
<b>Conventional monetary policy</b>			
MRO *			
Tier1 ratio	<b>-0.011 **</b>	<b>-0.011 **</b>	<b>-0.022 **</b>
Deposit ratio	<b>-0.128 ***</b>	<b>-0.130 ***</b>	<b>-0.138 ***</b>
Sovereign exposure	<b>-0.467 **</b>	<b>-0.470 **</b>	<b>-0.440 **</b>
Net interest margin		-0.005	-0.084
Net interest margin * Tier1 ratio			0.008
<b>Unconventional monetary policy</b>			
SHADOW-MRO *			
Tier1 ratio	<b>0.011 ***</b>	<b>0.011 ***</b>	<b>0.023 ***</b>
Deposit ratio	<b>0.073 *</b>	<b>0.087 **</b>	<b>0.101 **</b>
Sovereign exposure	<b>0.577 ***</b>	<b>0.534 ***</b>	<b>0.508 ***</b>
Net interest margin		<b>-0.047 **</b>	0.061
Net interest margin * Tier1 ratio			<b>-0.009 **</b>
Interactions of MP with NPL and Liq ratio	Y, Not Sign.	Y, Not Sign.	Y, Not Sign.
Bank characteristics	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes
Country-time fixed effects	Country*YY:M	Country*YY:M	Country*YY:M
Clustering (two-way)	Year*Bank, Year:mm	Year*Bank, Year:mm	Year*Bank, Year:mm
N° of observations	8600	8570	8570

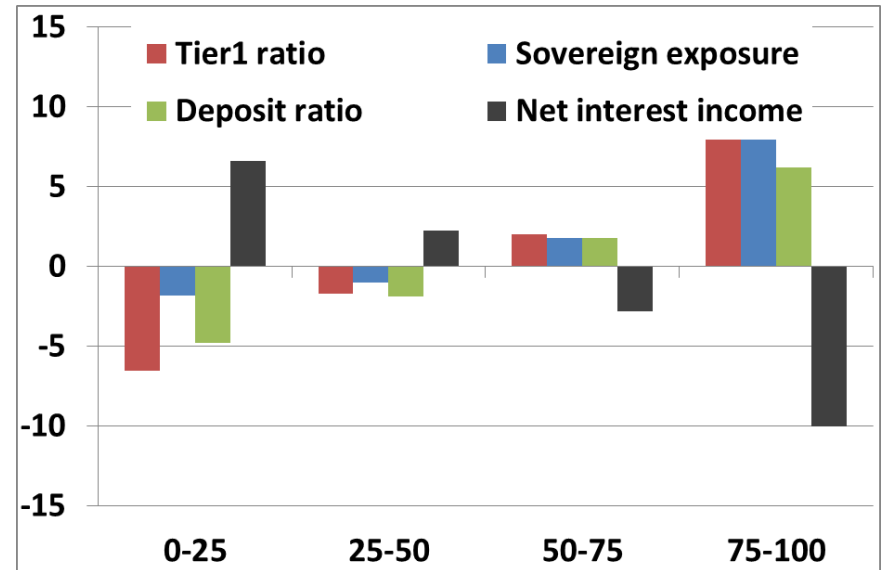
# Pass-through of 100 bp change in MP

Difference in long-run pass-through on lending rates,  
w.r.t. median bank  
(basis points, by quartiles of bank characteristics)

Conventional MP  
(MRO rate)



Unconventional MP  
(Shadow r.-MRO spread)



Note: each bar reports the PT for a bank with the mean value of the characteristic in each bucket.

# Economic relevance of estimated effects

Compute long-run pass-through on lending rates on the basis of estimated coefficients

- Calculations based on (1<sup>st</sup>-25<sup>th</sup>) vs (75<sup>th</sup>-100<sup>th</sup>) buckets

## 1) MRO rate falls by 100bps

- Loan rate falls by **18bp more** for *lowly-capitalized* banks
- Loan rate falls by **16 bp more** for banks with **low deposit ratio**
- Loan rate falls by **11 bp more** for banks with **low sovereign risk**

## 2) Shadow - MRO spread falls by 100bps

- Loan rate falls by **18bp more** for *highly-capitalized* banks
- Loan rate falls by **11 bp more** for banks with **high deposit ratio**
- Loan rate falls by **12 bp more** for banks with **high sovereign risk**
- Loan rate falls by **17bp more** for banks with **low NII**



# By country group

	memo: Baseline regression	By country group	
		Not stressed countries	Stressed countries
<b>Conventional monetary policy</b>			
MRO *			
Tier1 ratio	<b>-0.011 **</b>		
Deposit ratio	<b>-0.130 ***</b>		
Sovereign exposure	<b>-0.470 **</b>		
Net interest margin	-0.005		
<b>Unconventional monetary policy</b>			
SHADOW-MRO *			
Tier1 ratio	<b>0.011 ***</b>		
Deposit ratio	<b>0.087 **</b>		
Sovereign exposure	<b>0.534 ***</b>		
Net interest margin	<b>-0.047 **</b>		
Interactions of MP with NPL and Liq ratio	Y, Not Sign.		
Bank characteristics	Yes		
Bank fixed effects	Yes		
Country-time fixed effects	Country*YY:M		
Clustering (two-way)	Year*Bank, Year:mm		
N° of observations	8570	--	---

# By country group

	memo: Baseline regression	By country group	
		Not stressed countries	Stressed countries
<b>Conventional monetary policy</b>			
MRO *			
Tier1 ratio	<b>-0.011 **</b>	<b>-0.014 **</b>	
Deposit ratio	<b>-0.130 ***</b>	<b>-0.111 *</b>	
Sovereign exposure	<b>-0.470 **</b>	<b>-0.943 **</b>	
Net interest margin	-0.005	0.015	
<b>Unconventional monetary policy</b>			
SHADOW-MRO *			
Tier1 ratio	<b>0.011 ***</b>	0.010	
Deposit ratio	<b>0.087 **</b>	0.059	
Sovereign exposure	<b>0.534 ***</b>	<b>0.736 **</b>	
Net interest margin	<b>-0.047 **</b>	-0.055	
Interactions of MP with NPL and Liq ratio	Y, Not Sign.	Y	
Bank characteristics	Yes	Yes	
Bank fixed effects	Yes	Yes	
Country-time fixed effects	Country*YY:M	Country*YY:M	
Clustering (two-way)	Year*Bank, Year:mm	Year*Bank, Year:mm	
N° of observations	8570	4897	

# By country group

	memo: Baseline regression	By country group	
		Not stressed countries	Stressed countries
<b>Conventional monetary policy</b>			
MRO *			
Tier1 ratio	<b>-0.011 **</b>	<b>-0.014 **</b>	-0.007
Deposit ratio	<b>-0.130 ***</b>	<b>-0.111 *</b>	-0.095
Sovereign exposure	<b>-0.470 **</b>	<b>-0.943 **</b>	-0.284
Net interest margin	-0.005	0.015	-0.026
<b>Unconventional monetary policy</b>			
SHADOW-MRO *			
Tier1 ratio	<b>0.011 ***</b>	0.010	<b>0.011 *</b>
Deposit ratio	<b>0.087 **</b>	0.059	0.105
Sovereign exposure	<b>0.534 ***</b>	<b>0.736 **</b>	<b>0.484 **</b>
Net interest margin	<b>-0.047 **</b>	-0.055	-0.003
Interactions of MP with NPL and Liq ratio	Y, Not Sign.	Y	Y
Bank characteristics	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes
Country-time fixed effects	Country*YY:M	Country*YY:M	Country*YY:M
Clustering (two-way)	Year*Bank, Year:mm	Year*Bank, Year:mm	Year*Bank, Year:mm
N° of observations	8570	4897	3673

# Robustness: additional regressions

memo: Baseline  
regression

## Conventional monetary policy

MRO \*

Tier1 ratio	<b>-0.011 **</b>
Deposit ratio	<b>-0.130 ***</b>
Sovereign exposure	<b>-0.470 **</b>
Net interest margin	-0.005

## Unconventional monetary policy

SHADOW-MRO \*

Tier1 ratio	<b>0.011 ***</b>
Deposit ratio	<b>0.087 **</b>
Sovereign exposure	<b>0.534 ***</b>
Net interest margin	<b>-0.047 **</b>

Interactions of MP with NPL and Liq ratio Y, Not Sign.

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Bank characteristics	Yes
Bank fixed effects	Yes
Country-time fixed effects	Country*YY:M
Clustering (two-way)	Year*Bank, Year:mm
N° of observations	8570

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# Robustness: additional regressions

	memo: Baseline regression	Controlling for interactions with other macro variables
<b>Conventional monetary policy</b>		
MRO *		
Tier1 ratio	<b>-0.011 **</b>	-0.007
Deposit ratio	<b>-0.130 ***</b>	<b>-0.131 **</b>
Sovereign exposure	<b>-0.470 **</b>	<b>-0.712 **</b>
Net interest margin	-0.005	-0.027
<b>Unconventional monetary policy</b>		
SHADOW-MRO *		
Tier1 ratio	<b>0.011 ***</b>	<b>0.010 ***</b>
Deposit ratio	<b>0.087 **</b>	0.088 **
Sovereign exposure	<b>0.534 ***</b>	<b>0.456 **</b>
Net interest margin	<b>-0.047 **</b>	<b>-0.054 **</b>
<b>Other macroeconomic controls</b>		
Unemployment * Bank characteristics	NO	YES
CISS Indicator * Bank characteristics	NO	YES
Interactions of MP with NPL and Liq ratio	Y, Not Sign.	Y, Not Sign.
Bank characteristics	Yes	Yes
Bank fixed effects	Yes	Yes
Country-time fixed effects	Country*YY:M	Country*YY:M
Clustering (two-way)	Year*Bank, Year:mm	Year*Bank, Year:mm
N° of observations	8570	8570

# Robustness: additional regressions

	memo: Baseline regression	Controlling for interactions with other macro variables	Excluding branches and subsidiaries
<b>Conventional monetary policy</b>			
MRO *			
Tier1 ratio	<b>-0.011 **</b>	-0.007	<b>-0.009 **</b>
Deposit ratio	<b>-0.130 ***</b>	<b>-0.131 **</b>	<b>-0.117 ***</b>
Sovereign exposure	<b>-0.470 **</b>	<b>-0.712 **</b>	<b>-0.393 **</b>
Net interest margin	-0.005	-0.027	-0.009
<b>Unconventional monetary policy</b>			
SHADOW-MRO *			
Tier1 ratio	<b>0.011 ***</b>	<b>0.010 ***</b>	<b>0.009 ***</b>
Deposit ratio	<b>0.087 **</b>	0.088 **	<b>0.103 *</b>
Sovereign exposure	<b>0.534 ***</b>	<b>0.456 **</b>	<b>0.398 **</b>
Net interest margin	<b>-0.047 **</b>	<b>-0.054 **</b>	<b>-0.055 **</b>
<b>Other macroeconomic controls</b>			
Unemployment * Bank characteristics	NO	YES	NO
CISS Indicator * Bank characteristics	NO	YES	NO
Interactions of MP with NPL and Liq ratio	Y, Not Sign.	Y, Not Sign.	Y, Not Sign.
Bank characteristics	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes
Country-time fixed effects	Country*YY:M	Country*YY:M	Country*YY:M
Clustering (two-way)	Year*Bank, Year:mm	Year*Bank, Year:mm	Year*Bank, Year:mm
N° of observations	8570	8570	6958

# Robustness: alternative MP indicators

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	memo: Baseline regression
<b>Conventional monetary policy</b>	
MP Measure *	MRO *
Tier1 ratio	<b>-0.011 **</b>
Deposit ratio	<b>-0.130 ***</b>
Sovereign exposure	<b>-0.470 **</b>
Net interest margin	-0.005
<b>Unconventional monetary policy</b>	
MP Measure *	SHADOW- MRO *
Tier1 ratio	<b>0.011 ***</b>
Deposit ratio	<b>0.087 **</b>
Sovereign exposure	<b>0.534 ***</b>
Net interest margin	<b>-0.047 **</b>

Interactions of MP with NPL and Liq ratio Y, Not Sign.

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Bank characteristics	Yes
Bank fixed effects	Yes
Country-time fixed effects	Country*YY:M
Clustering (two-way)	Year*Bank, Year:mm
N° of observations	8570

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# Robustness: alternative MP indicators

	memo: Baseline regression	Using the EONIA rate and the shadow-EONIA spread	Including the EONIA-MRO spread
<b>Conventional monetary policy</b>			
MP Measure *	MRO *	EONIA *	MRO *
Tier1 ratio	<b>-0.011 **</b>	<b>-0.009 *</b>	<b>-0.009 *</b>
Deposit ratio	<b>-0.130 ***</b>	<b>-0.110 ***</b>	<b>-0.099 **</b>
Sovereign exposure	<b>-0.470 **</b>	<b>-0.444 **</b>	-0.351
Net interest margin	-0.005	-0.005	-0.017
<b>Unconventional monetary policy</b>			
MP Measure *	SHADOW- MRO *	SHADOW- EONIA *	SHADOW- MRO *
Tier1 ratio	<b>0.011 ***</b>	<b>0.009 ***</b>	<b>0.009 ***</b>
Deposit ratio	<b>0.087 **</b>	<b>0.071 **</b>	0.061
Sovereign exposure	<b>0.534 ***</b>	<b>0.491 **</b>	<b>0.410 *</b>
Net interest margin	<b>-0.047 **</b>	<b>-0.049 **</b>	<b>-0.039 *</b>
MP Measure *			EONIA- MRO *
Tier1 ratio			-0.023
Deposit ratio			-0.238
Sovereign exposure			<b>-1.420 *</b>
Net interest margin			0.104
Interactions of MP with NPL and Liq ratio	Y, Not Sign.	Y, Not Sign.	Y, Not Sign.
Bank characteristics	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes
Country-time fixed effects	Country*YY:M	Country*YY:M	Country*YY:M
Clustering (two-way)	Year*Bank, Year:mm	Year*Bank, Year:mm	Year*Bank, Year:mm
N° of observations	8570	8570	8570



# Robustness: alternative MP indicators

	memo: Baseline regression	Using the EONIA rate and the shadow-EONIA spread	Including the EONIA-MRO spread	Using the slope of the yield curve
<b>Conventional monetary policy</b>				
MP Measure *	MRO *	EONIA *	MRO *	MRO *
Tier1 ratio	<b>-0.011 **</b>	<b>-0.009 *</b>	<b>-0.009 *</b>	0.000
Deposit ratio	<b>-0.130 ***</b>	<b>-0.110 ***</b>	<b>-0.099 **</b>	-0.045
Sovereign exposure	<b>-0.470 **</b>	<b>-0.444 **</b>	-0.351	0.065
Net interest margin	-0.005	-0.005	-0.017	<b>-0.050 **</b>
<b>Unconventional monetary policy</b>				
MP Measure *	SHADOW-MRO *	SHADOW-EONIA *	SHADOW-MRO *	10YIRS - MRO
Tier1 ratio	<b>0.011 ***</b>	<b>0.009 ***</b>	<b>0.009 ***</b>	<b>0.015 **</b>
Deposit ratio	<b>0.087 **</b>	<b>0.071 **</b>	0.061	0.162 **
Sovereign exposure	<b>0.534 ***</b>	<b>0.491 **</b>	<b>0.410 *</b>	<b>0.894 ***</b>
Net interest margin	<b>-0.047 **</b>	<b>-0.049 **</b>	<b>-0.039 *</b>	<b>-0.079 **</b>
MP Measure *			EONIA-MRO *	
Tier1 ratio			-0.023	
Deposit ratio			-0.238	
Sovereign exposure			<b>-1.420 *</b>	
Net interest margin			0.104	
Interactions of MP with NPL and Liq ratio	Y, Not Sign.	Y, Not Sign.	Y, Not Sign.	Y, Not Sign.
Bank characteristics	Yes	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes	Yes
Country-time fixed effects	Country*YY:M	Country*YY:M	Country*YY:M	Country*YY:M
Clustering (two-way)	Year*Bank, Year:mm	Year*Bank, Year:mm	Year*Bank, Year:mm	Year*Bank, Year:mm
N° of observations	8570	8570	8570	8570

# Robustness: alternative MP indicators

	memo: Baseline regression	Using the EONIA rate and the shadow-EONIA spread	Including the EONIA-MRO spread	Using the slope of the yield curve	Including excess liquidity	Including dummy for OMT
<b>Conventional monetary policy</b>						
MP Measure *	MRO *	EONIA *	MRO *	MRO *	MRO *	MRO *
Tier1 ratio	<b>-0.011 **</b>	<b>-0.009 *</b>	<b>-0.009 *</b>	0.000	-0.008	<b>-0.011 **</b>
Deposit ratio	<b>-0.130 ***</b>	<b>-0.110 ***</b>	<b>-0.099 **</b>	-0.045	-0.094	<b>-0.128 ***</b>
Sovereign exposure	<b>-0.470 **</b>	<b>-0.444 **</b>	-0.351	0.065	-0.319	<b>-0.467 **</b>
Net interest margin	-0.005	-0.005	-0.017	<b>-0.050 **</b>	-0.008	-0.005
<b>Unconventional monetary policy</b>						
MP Measure *	SHADOW-MRO *	SHADOW-EONIA *	SHADOW-MRO *	10YIRS - MRO	SHADOW-MRO *	SHADOW-MRO *
Tier1 ratio	<b>0.011 ***</b>	<b>0.009 ***</b>	<b>0.009 ***</b>	<b>0.015 **</b>	<b>0.011 ***</b>	<b>0.011 ***</b>
Deposit ratio	<b>0.087 **</b>	<b>0.071 **</b>	0.061	0.162 **	<b>0.091 **</b>	<b>0.087 **</b>
Sovereign exposure	<b>0.534 ***</b>	<b>0.491 **</b>	<b>0.410 *</b>	<b>0.894 ***</b>	<b>0.548 **</b>	<b>0.536 **</b>
Net interest margin	<b>-0.047 **</b>	<b>-0.049 **</b>	<b>-0.039 *</b>	<b>-0.079 **</b>	<b>-0.050 **</b>	<b>-0.047 **</b>
MP Measure *			EONIA-MRO *			
Tier1 ratio			-0.023			
Deposit ratio			-0.238			
Sovereign exposure			<b>-1.420 *</b>			
Net interest margin			0.104			
<b>Including other MP measures</b>						
Excess liquidity * Bank characteristics	NO	NO	NO	NO	YES	NO
OMT dummy * Bank characteristics	NO	NO	NO	NO	NO	YES
Interactions of MP with NPL and Liq ratio	Y, Not Sign.	Y, Not Sign.	Y, Not Sign.	Y, Not Sign.	Y, Not Sign.	Y, Not Sign.
Bank characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-time fixed effects	Country*YY:M	Country*YY:M	Country*YY:M	Country*YY:M	Country*YY:M	Country*YY:M
Clustering (two-way)	Year*Bank, Year:mm	Year*Bank, Year:mm	Year*Bank, Year:mm	Year*Bank, Year:mm	Year*Bank, Year:mm	Year*Bank, Year:mm
N° of observations	8570	8570	8570	8570	8570	8570

# Conclusions and policy implications

Capital and economic constraints are key in the transmission of UMP

- Excessive regulatory and supervisory pressure on the level of bank capitalization may weaken the effectiveness of UMP => close coordination.

UMP effectiveness may be limited by negative impact on Interest Income

- Full evaluation of UMP however, requires taking into account effects on all dimensions of bank profitability: volume, LLPs, capital gains (Cœuré, 2016)

Sovereign exposure crucial driver of effectiveness of both conv&unconv policy

- ECB measures addressing mispricing in sovereign debt markets helped restoring transmission mechanism

Thank you



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# Descriptive statistics

<b>Variable</b>	<b>p25</b>	<b>p50</b>	<b>mean</b>	<b>p75</b>	<b>N</b>
<b>Loan rate (1)</b>	2.18	3.01	3.34	4.39	21,426
<b>Tier1 ratio</b>	8.63	10.62	11.12	12.50	11,582
<b>Liquidity ratio</b>	15.74	33.82	46.07	61.44	14,222
<b>Deposit ratio</b>	5.06	30.37	32.44	52.30	23,308
<b>Sovereign exposure</b>	0.10	1.85	4.12	5.83	23,171
<b>NPL ratio</b>	2.70	4.67	6.14	7.24	11,695
<b>Net interest income</b>	0.71	1.19	1.27	1.73	11,528

(1) Average rate on new loans to firms.

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