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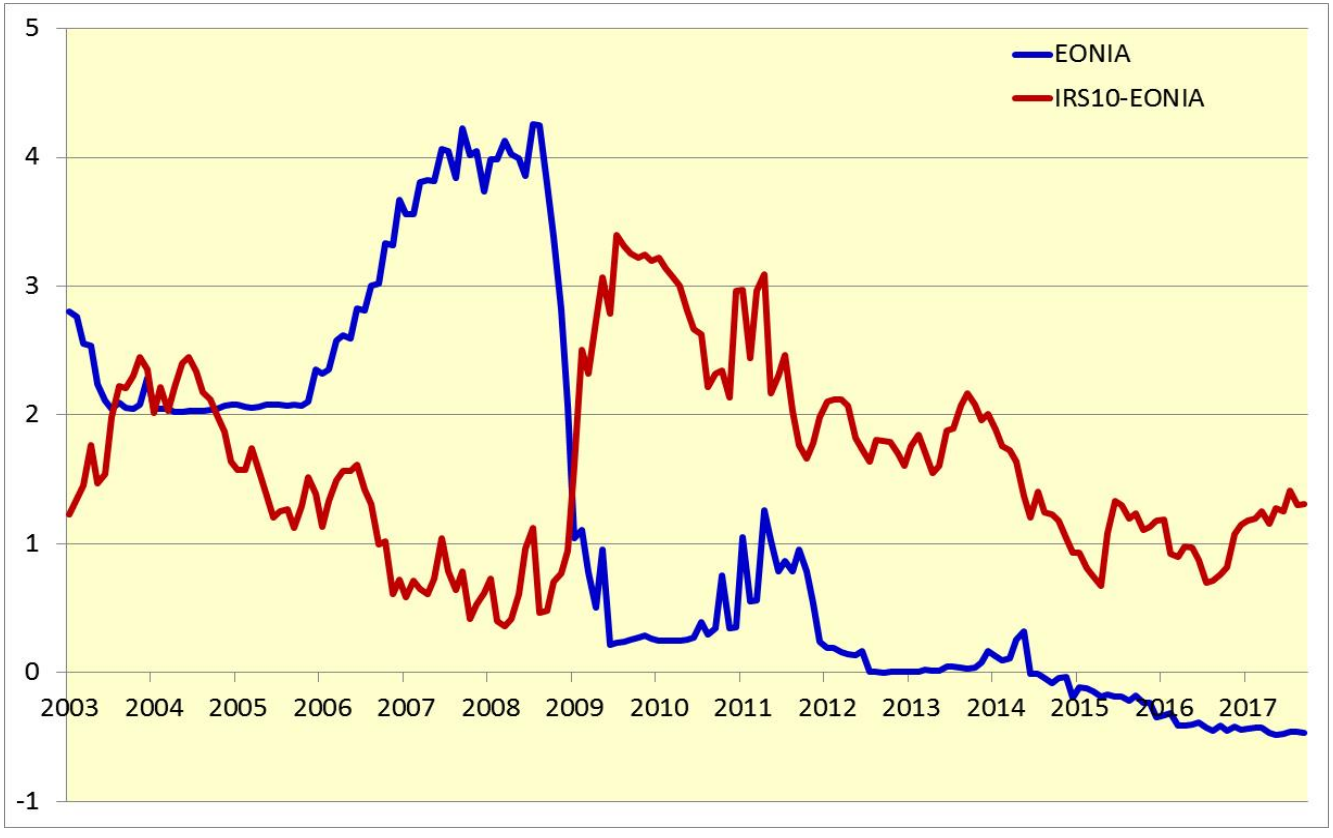
Credit Risk Taking and Maturity Mismatch: the Role of the Yield Curve

Giuseppe Ferrero, Andrea Nobili and Gabriele Sene

Banca d'Italia
Economic Outlook and Monetary Policy Department

Stylized facts on the yield curve

- **Short-term interest rates** and **slope of the yield curve**
  - 2003-2011: correlation is high and negative
  - 2011-2017 (Low Interest Rate Environment, LIRE): correlation small and/or positive



Motivation

- Wide debate on **financial stability** on current **LIRE**, related to
  - banks' **profitability**
  - **risk-taking** in banks' portfolio **(loans & securities)**

- The objective is to
  - investigate the **determinants** of banks' **credit risk taking**
  - assess the **implication** of a LIRE on banks' **credit risk taking**
  - derive some **implications** of UMPs on banks' **credit risk taking**

- In particular we address the following two questions:
  - Does banks' **risk taking** depend on **short term-interest rates** and/or on the **slope the yield curve**?
  - What role for the **banks' business model (in terms of maturity mismatch) & capital?**

Empirical literature on banks' risk-taking

Role of the term structure

Lower short-term interest rates

- Higher lending to riskier borrowers (Jimenez et al., 2014; Ioannidu et al., 2015; Dell'Ariccia et al., 2017; Bonfim and Soares, 2018)
- Lower interest rates to riskier firms (Poligorova and Santos, 2017)
- Softer lending standards (Maddaloni and Peydrò, 2011)
- Larger portfolio risk (Altunbas et al., 2010; Delis and Kouretas, 2011)
- Substitution between loans and securities (Peydrò, Polo and Sette, 2018).

Role of bank capital

Lower short-term interest rates

- *more capitalized* banks take *more risk* (Dell'Ariccia et al., 2017)
- *less capitalized* banks take *more risk (*Jimenez et al.,2014)

Larger amount of CB reserves

- *more capitalized* banks take *more risk* (Peydrò, Polo and Sette, 2018)

Theoretical literature on banks' risk-taking

Banks' **maturity mismatch** and expected effect of yield curve on risk taking

	Risk taking channel of monetary policy			
Duration Gap	>0	<0		
Slope	+	+		

Risk taking channel of monetary policy

Risk-taking depends **positively** on the **slope of the yield curve:**

- *Adrian and Shin (2011)*: **profitability** of financial firms with DG>0 **benefits** from steeper yield curve. They ***reach-for-yield*** to increase leverage.

- *Rajan (2005)*: **profitability** of financial firms with DG<0 **suffers** from steeper yield curve. They ***search-for-yield*** to sustain their profitability.

Theoretical literature on banks' risk-taking

Banks' **maturity mismatch** and expected effect of yield curve on risk taking

	Risk taking channel of monetary policy		Monitoring Moral hazard	
Duration Gap	>0	<0	>0	<0
Slope	+	+	-	+

Banking literature on moral hazard and monitoring:

For financial firms with **DG>0** (DG<0) risk-taking depends **positively** (negatively) on the **slope of the yield curve**

- *Allen et al. (2011)* and *Dell'Ariccia et al. (2014)*: monitoring incentives depend **positively** on the spread between loan and deposit rates (i.e. negatively on profitability)

Theoretical literature on banks' risk-taking

Banks' maturity mismatch, **capital** and expected effect of yield curve on risk taking

	Risk taking channel of monetary policy		Monitoring Moral hazard	
Duration Gap	>0	<0	>0	<0
Slope	+	+	-	+
Slope*Capital	+	+		

Risk taking channel of monetary policy

- **Role bank capital**: Measure of banks' ability to expand credit supply
- For **both type** of banks, the **higher** the capital, the **larger** the **increase** in **risk-taking** in response to a **steepening** of the **yield curve.**

Theoretical literature on banks' risk-taking

Banks' maturity mismatch, **capital** and expected effect of yield curve on risk taking

	Risk taking channel of monetary policy		Monitoring Moral hazard	
Duration Gap	>0	<0	>0	<0
Slope	+	+	-	+
Slope*Capital	+	+	+	-

Banking literature on moral hazard and monitoring

- **Role bank capital**: Inverse measure of banks' exposure to asymmetric information problems
- For banks with **DG>0,** the **lower** the capital, the **larger** the **increase** in **risk-taking** in response to a **flattening** of the **yield curve**.
- For banks with **DG<0,** the **lower** the capital, the **larger** the **increase** in **risk-taking** in response to a **steepening** of the **yield curve**.

Theoretical literature on banks' risk-taking

Banks' maturity mismatch, **capital** and expected effect of yield curve on risk taking

	Risk taking channel of monetary policy		Monitoring Moral hazard	
Duration Gap	>0	<0	>0	<0
Slope	+	+	-	+
Slope*Capital	+	+	+	-

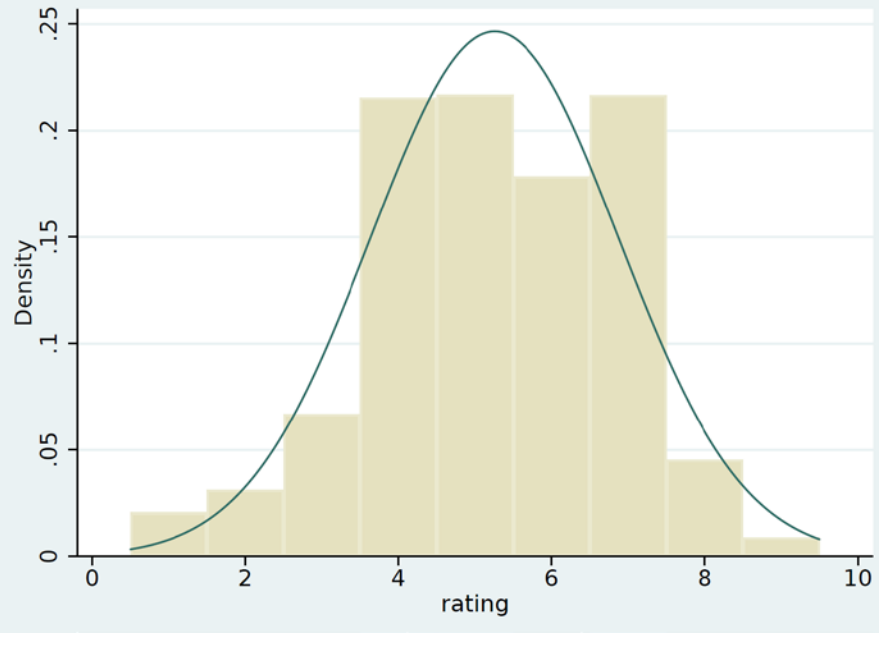
The dataset

- **Bank-firm panel data for Italy, sample period 2005-2016**
  - *Cerved*: firm rating (1-9) as measure of *ex-ante* credit risk and info about location and sector of economic activity (annual data)
  - *Italian Credit Register (TAXIA)*: bank-firm data about new loans conditions (quarterly data, 200 Italian banks + 10 branches and subsidiaries of foreign banks), which include size of granted loan, cost and maturity of the loan, repricing date of the loan.
  - *Supervisory Reports*: banks' balance sheet indicators, which include consolidated (Duration Gap, Tier1 capital) and unconsolidated (deposit ratio, NPL ratio, liquidity ratio) data
  - *Macroeconomic variables*: short-term (EONIA) and long-term (IRS 10Y) interest rates, 10Y spread Italian government bond and German Bund, inflation and GDP Italy and euro area, others.

Ex-ante credit risk: why CERVED?

- In 2008, Cerved obtained recognition of external agency for evaluation of creditworthiness from the Bank of Italy
- Some tradition in research analysis at the Bank of Italy:
  - Heterogeneity of credit supply conditions across firms: Albareto and Finaldi Russo (2012); Bonaccorsi and Finaldi Russo (2016);
  - Testing "Zombie-lending" following a credit supply shock: Albertazzi and Marchetti (2008); Schivardi, Sette and Tabellini (2017)

Empirical distribution of firm rating



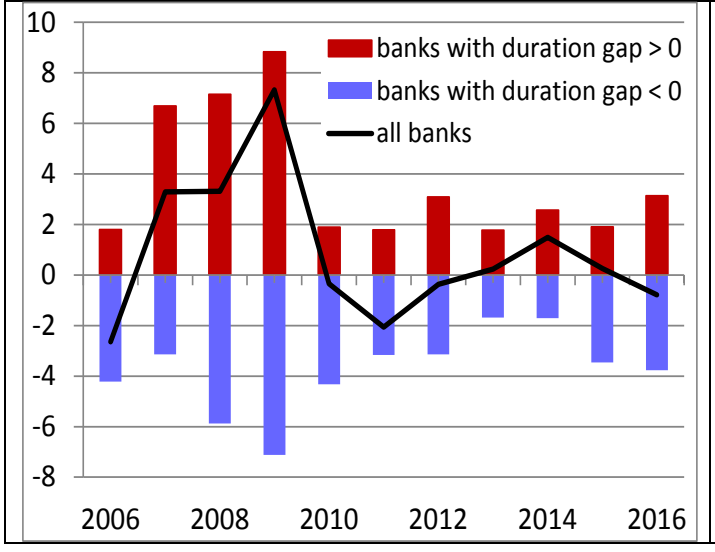
Banks' business model: The duration gap

Duration gap in the banking book as a measure of maturity mismatch between assets and liabilities (and interest rate risk)

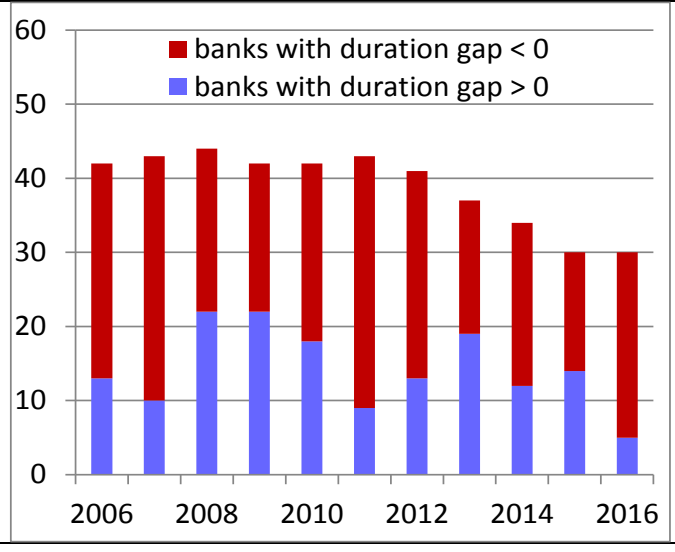
- Consider both on-balance and off-balance sheet items
- Consider both maturity and repricing date of assets & liabilities
- Simplified methodology vs. internal models could be an issue

FIGURE 2. Developments in banks' duration gap
(half-yearly observations)

(a) Ratio of banks' exposure to interest rate risk over tier1 capital



(b) Number of banks with positive vs. negative duration gap



Banks' business model: The duration gap

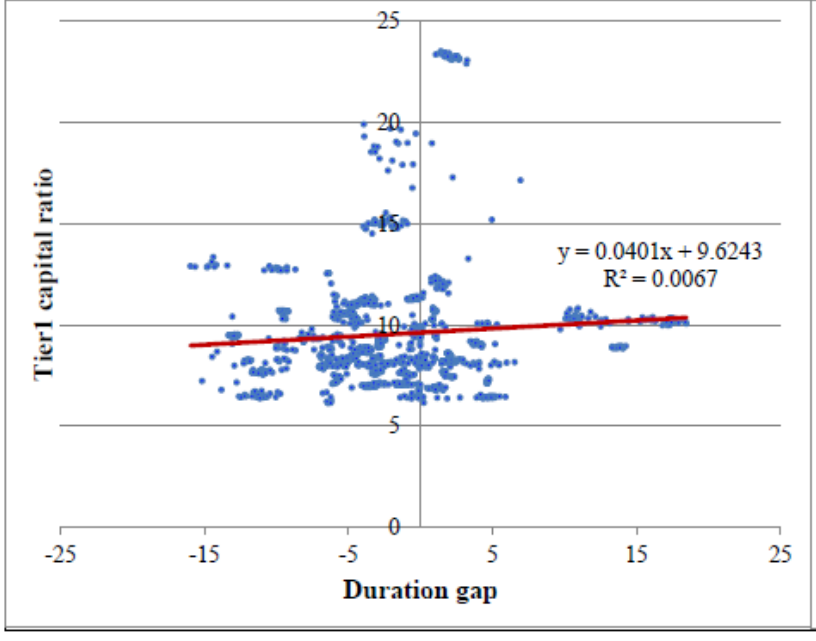
Correlation between duration gap and other banks' characteristics (Tier1 capital, deposit ratio, NPL ratio, liquidity ratio) is very low,

- thus suggesting that the bank duration gap has independent information content with respect to the other banks' features

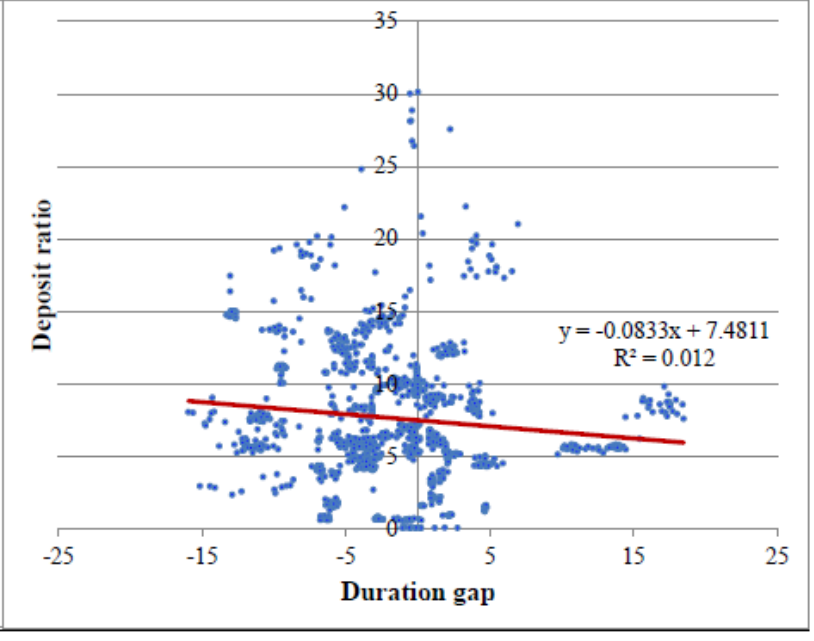
FIGURE 3. Cross-section correlation

(half-yearly observations)

(a) Duration gap vs Tier1 capital ratio



(b) Duration gap vs deposit ratio



Methodology

We run **two different regressions** (not directly comparable) providing **complementary information** about banks' risk-taking:

1. Effects on **new loan rating class** (Dell'Ariccia et al., 2017):

$$\boldsymbol{risk}_{\mathbf{i(j)}t} = \omega_{ij} + \beta\, X_{jt} + \gamma\, Z_t + \rho\, Y_{ijt} + \boldsymbol{\alpha_1 Eonia_t} + \boldsymbol{\alpha_2 10yIRS_t} + \varepsilon_{ijt} \quad (1)$$

2. Effects on **the (log) amount of new lending lending** (Jimenez et al., 2014):

$$\mathbf{ln(new\_lending)}_{\mathbf{ijt}} = \omega_{ij} + T_t + \beta\, X_{jt} + \rho\, Y_{ijt} +$$
$$\boldsymbol{\alpha_0 risk}_{i(j)t} + \boldsymbol{\alpha_1}(\boldsymbol{Eonia_t} * \boldsymbol{risk}_{i(j)t}) + \boldsymbol{\alpha_2}(\boldsymbol{10yIRS_t} * \boldsymbol{risk}_{i((j)t}) + \varepsilon_{ijt} \quad (2)$$

$\boldsymbol{risk}_{\mathbf{i(j)}t}$: rating of firm *i* in bank-firm relationship (*i*,*j*) at time *t*

Empirical test:

- $\boldsymbol{\alpha_1 < 0}$ is evidence of risk-taking when the **short-term** rate is **low**
- $\boldsymbol{\alpha_2 < 0}$ is evidence of risk-taking when **long-term rate** is **low**

Main results: short-term rate vs. slope

	(1)	(2)	(3)	(4)	(5)
Dependent variable: rating class of new loan					
Eonia rate	**-0.1204*** **	**-0.1243*** **	**-0.0632*** **	**-0.0298*** **	**-0.0196*** **
10-year Eurirs rate		**0.0157**	**0.0458*** **	**0.0649*** **	**0.0564*** **
Bank fixed effects	yes	yes	yes	yes	no
Firm zip-code*sector fixed effects	no	no	yes	no	no
Firm fixed effects	no	no	no	yes	no
Firm*Bank fixed effects	no	no	no	no	yes
Observations	2,498,790	2,498,790	2,446,268	2,375,238	2,131,448
Number of banks	144	144	144	144	143
Number of firms	359,111	359,111	313,917	235,559	205,307
Adjusted R-squared	0.096	0.096	0.524	0.723	0.764

	(1)	(2)	(3)	(4)	(5)
Dependent variable: (log) amount new lending for different rating classes					
Firm rating	-0.0542***	-0.1166***	-0.0639***	-0.0431***	-0.0316***
Eonia rate * Firm rating	**-0.0101*** **	**-0.0126*** **	**-0.0044*** **	**-0.0013**	**-0.0012**
10-year Eurirs rate * Firm rating		**0.0109*** **	**0.0086*** **	**0.0084*** **	**0.0081*** **
(Year:quarter) fixed effects	yes	yes	yes	yes	yes
Bank fixed effects	yes	yes	yes	yes	no
Firm zip-code*sector fixed effects	no	no	yes	no	no
Firm fixed effects	no	no	no	yes	no
Firm*Bank fixed effects	no	no	no	no	yes
Observations	2,498,790	2,498,790	2,446,268	2,375,238	2,131,448
Number of banks	144	144	144	144	143
Number of firms	359,111	359,111	313,917	235,559	205,307
Adjusted R-squared	0.192	0.192	0.547	0.672	0.754

Banks' business model: Positive vs. negative duration gap

	Dependent variable: rating class of new loan				Dependent variable: (log) amount new lending for different rating classes			
	duration gap > 0		duration gap < 0		duration gap > 0		duration gap < 0	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Eonia rate	**-0.0261*** **	**-0.0182** **	**-0.0291*** **	**-0.0089**				
10-year Eurirs rate	**0.0665*** **	**0.0612*** **	**0.0675*** **	**0.0531*** **				
Firm rating					-0.0444***	-0.0429***	-0.0469**	-0.0356
Eonia rate * Firm rating					**0.0021**	**0.0032**	**-0.0034***	**-0.0039***
10-year Eurirs rate * Firm rating					**0.0100*** **	**0.0090*** **	**0.0069** **	**0.0070** **
Bank fixed effects	yes	-	yes	-	yes	-	yes	-
Firm fixed effects	yes	-	yes	-	yes	-	yes	-
Firm*Bank fixed effects	-	yes	-	yes	-	yes	-	yes
(Year:quarter) fixed effects	-	-	-	-	yes	yes	yes	yes
Other macro variables	yes	yes	yes	yes	-	-	-	-
[(Other macro variables) * (Firm rating)]	-	-	-	-	yes	yes	yes	yes
Bank controls	yes	yes	yes	yes	yes	yes	yes	yes
Loan-level controls	yes	yes	yes	yes	yes	yes	yes	yes
Number of banks	121	119	140	139	121	121	140	140
Number of firms	144 192	122 660	163 087	138 260	144 192	144 192	163 088	163 088
Observations	1 049 169	910 423	1 224 020	1 060 542	1 049 169	910 423	1 224 020	1 060 542
Adjusted R-squared	0.746	0.793	0.730	0.789	0.684	0.760	0.676	0.757

Banks' business model: From Empirics to the Theory

	Search-for-yield Reach-for-yield		Monitoring Moral hazard	
Business model	DG>0	DG<0	DG>0	DG<0
Slope	+	+	-	+

- Reach-for-yield story for DUR_GAP>0
- What about DUR_GAP<0? …
- … Let's look at another source of banks' heterogeneity: **capital**

Banks' business model and capitalization

Effects on **new loan rating class** (Dell'Ariccia et al., 2017):

$$\boldsymbol{risk_{i(j)t}} = \cdots + \boldsymbol{\alpha_1(Eonia_t * Tier1\_ratio)} + \boldsymbol{\alpha_2(10yIRS_t * Tier1\_ratio)} + \varepsilon_{ijt}$$

Effects on **the (log) amount of new lending lending** (Jimenez et al., 2014):

$$\mathbf{ln(new\_lending)_{ijt}} = \cdots + \boldsymbol{\alpha_1(Eonia_t * Tier1\_ratio * risk_{it})} + \boldsymbol{\alpha_2(10yIRS_t * Tier1\_ratio * risk_{it})} + \varepsilon_{ijt}$$

Empirical test:

- $\boldsymbol{\alpha_1 < 0}$ is evidence of higher risk-taking when the **short-term** rate is **low for banks with more capitalization**
- $\boldsymbol{\alpha_2 < 0}$ is evidence of higher risk-taking when **long-term rate** is **low** (**slope** of the yield curve is **flat**) **for banks with more capitalization**

Banks' business model and capitalization (1)

	A) Dependent variable: change in the rating class of the new marginal loan			
	duration gap > 0		duration gap < 0	
	(1)	(2)	(3)	(4)
Eonia rate * Tier1 ratio	**-0.0010**	**0.0045**	**0.0030**	**0.0040****
10-year Eurirs rate * Tier1 ratio	**0.0022**	**0.0022**	**-0.0017**	**-0.0065****
Eonia rate * |Duration gap|		**-0.0001**		**-0.0014*****
10-year Eurirs rate * |Duration gap|		**0.0020****		**0.0032****
Eonia rate * NPL ratio		0.0036		0.0001
10-year Eurirs rate * NPL ratio		-0.0007		0.0015
Eonia rate * Deposit ratio		-0.0005		-0.0001
10-year Eurirs rate * Deposit ratio		0.0019		0.0007
Eonia rate * Liquidity ratio		0.0002		0.0001
10-year Eurirs rate * Liquidity ratio		-0.0002		-0.0004
Eonia rate * Size		-0.0017		0.0008
10-year Eurirs rate * Size		-0.100**		-0.0011
(Year:quarter) fixed effects	yes	yes	yes	yes
Firm*Bank fixed effects	yes	yes	yes	yes
Bank controls	yes	yes	yes	yes
Loan-level controls	yes	yes	yes	yes
Observations	910,423	910,423	1,060,542	1,060,542
Adjusted R-squared	0.793	0.761	0.790	0.790

Banks' business model and capitalization (2)

	B) Dependent variable: change in new lending for different rating					
	duration gap > 0			duration gap < 0		
	(5)	(6)	(7)	(8)	(9)	(10)
Eonia rate * Firm rating * Tier1 ratio	**-0.0015**	**0.0054**	**0.0023**	**0.0009**	**0.0002**	**-0.0003**
10-year Eurirs rate * Firm rating * Tier1 ratio	**0.0040*** **	**-0.0059** **	**0.0011**	**0.0015**	**-0.0027**	**-0.0051** **
Eonia rate * Firm rating * |Duration gap|			**-0.0006*** **			**0.0012*** **
10-year Eurirs rate * Firm rating * |Duration gap|			**0.0015*** **			**0.0016***
Eonia rate * Firm rating * NPL ratio			-0.0004			-0.0015
10-year Eurirs rate * Firm rating * NPL ratio			-0.0008			-0.0009
Eonia rate * Firm rating * Deposit ratio			0.0013			0.0015*
10-year Eurirs rate * Firm rating * Deposit ratio			0.0007			-0.0010
Eonia rate * Firm rating * Liquidity ratio			0.0004			-0.0001
10-year Eurirs rate * Firm rating * Liquidity ratio			0.0003			0.0001
Eonia rate * Firm rating * Size			-0.0017			-0.0013
10-year Eurirs rate * Firm rating * Size			0.0020			0.0019
Firm*(Year:quarter) fixed effects	no	yes	yes	no	yes	yes
(Year:quarter) fixed effects	yes	yes	yes	yes	yes	yes
Firm*Bank fixed effects	yes	yes	yes	yes	yes	yes
Bank controls	yes	yes	yes	yes	yes	yes
Loan-level controls	yes	yes	yes	yes	yes	yes
[Other macro vars]*[Tier1 ratio]*[Firm rating]	yes	yes	yes	yes	yes	yes
[Other macro vars]*[Other bank controls]*[Firm rating]	no	no	yes	no	no	yes
Observations	323,188	323,188	323,188	1,060,542	381,677	381,677
Adjusted R-squared	0.676	0.677	0.679	0.757	0.688	0.688

Banks' credit risk-taking: From Empirics to the Theory

	Search-for-yield Reach-for-yield		Monitoring Moral hazard	
Business model	DG>0	DG<0	DG>0	DG<0
Slope	+	+	-	+
Slope*Capital	+	+	+	-

- Reach-for-yield story for DUR_GAP>0
- What about DUR_GAP<0? …
- … **Monitoring and moral hazard story for DUR_GAP<0**

Conclusions (1/2)

- Both **level and slope of the yield curve are relevant** drivers of banks' credit risk-taking
  - Controlling for firms fixed-effects magnifies the role of the slope and reduces the one of the level
  - Results are consistent across different measures of risk-taking and model specifications

- Controlling for the **bank business model is important to validate theory**. Low level and steep slope leads financial institutions
  - with **positive duration gap** to increase **"reach-for-yield"** (Adrian and Shin, 2011)
  - with **negative duration gap** to reduce monitoring for moral hazard considerations (Dell'Ariccia et al., 2014)

Conclusions (2/2)

- Financial stability implications:
  - Reassuring answers to concerns for financial stability (in terms of banks' credit risk-taking) stemming from a LIRE characterized by low short and long-term interest rates and a relatively flat yield curve.

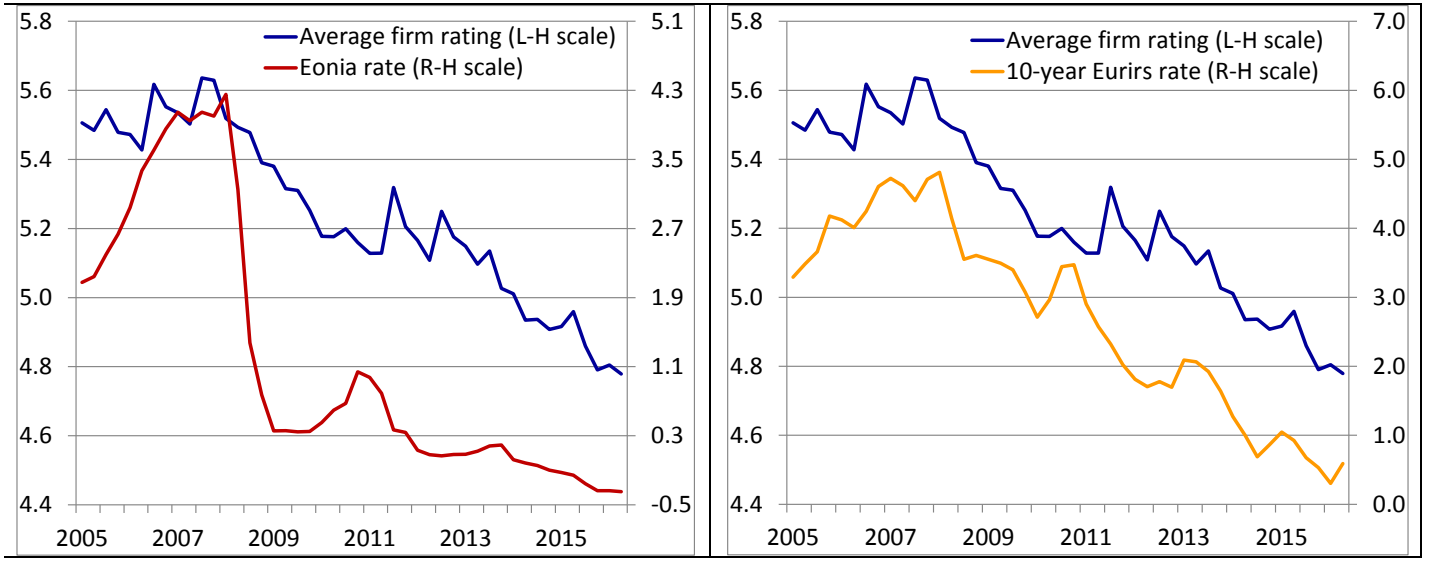
- Monetary policy implications:
  - The risk-taking channel may work differently for monetary policies that reduce the long-term part of the yield curve. In particular,
  - APP does not increase banks' credit risk-taking.

APPENDIX

Ex-ante credit risk: declining trend in average risk-taking

Average firm rating and interest rates

(quarterly data; simple average)



The data: descriptive statistics

	Frequency	Observations	Mean	Standard deviation	25th percentile	75th percentile
Firm-level variables						
Risk rating	Annual	1,031,505	5.2	1.7	4.0	7.0
Macroeconomic variables						
Eonia rate (%)	Quarterly	50	1.3	1.5	0.1	2.1
10-year Eurirs rate (%)	Quarterly	50	2.8	1.4	1.7	4.1
10-year BTP - 10-year Bund spread (%)	Quarterly	50	1.4	1.2	0.3	1.6
Itacoin	Quarterly	50	0.0	0.5	-0.2	0.3
Italian inflation rate (%)	Quarterly	50	1.6	1.2	0.5	2.4
Italian unemployment rate (%)	Quarterly	50	9.2	2.3	7.3	11.6
Eurocoin	Quarterly	50	0.3	0.5	0.0	0.6
Euro-area inflation rate (%)	Quarterly	50	1.6	1.1	0.6	2.3
Expected real GDP - Italy (%)	Quarterly	50	1.1	0.5	0.8	1.4
Expected real GDP - Euro area (%)	Quarterly	50	1.6	0.4	1.3	1.8
Expected inflation rate - Italy (%)	Quarterly	50	1.7	0.4	1.5	2.0
Expected inflation rate - Euro area (%)	Quarterly	50	1.6	0.3	1.4	1.8
Loan-level variables						
Loan size (logarithm)	Quarterly	2,515,614	11.9	1.5	10.9	12.9
Loan cost (%)	Quarterly	2,515,614	5.1	2.3	3.4	6.4
Long-term loans (0/1)	Quarterly	2,515,614	0.4	0.5	0.0	1.0
Fixed-rate loans (0/1)	Quarterly	2,515,614	0.1	0.3	0.0	0.0
Subsidized loan (0/1)	Quarterly	2,515,614	0.0	0.1	0.0	0.0
Bank-level variables						
Consolidated balance sheet items						
Duration gap (%)	Bi-annual	933	-0.3	39.1	-7.6	1.9
Tier 1 capital ratio (%)	Bi-annual	933	9.9	3.8	7.3	11.4
Unconsolidated balance sheet items						
Total assets (logarithm)	Quarterly	4,360	9.0	1.3	8.0	9.8
NPL ratio (%)	Quarterly	4,360	5.9	4.9	2.4	8.1
Deposit ratio (%)	Quarterly	4,360	42.0	19.2	34.5	54.7
Liquidity ratio (%)	Quarterly	4,360	5.5	6.7	0.9	8.1
Profitability (%)	Quarterly	4,360	0.4	1.0	0.1	0.8

Risk-taking measure: rating class of the new loan

	(1)	(2)	(3)	(4)	(5)
Macroeconomic variables					
Eonia rate	**-0.1204*** **	**-0.1243*** **	**-0.0632*** **	**-0.0298*** **	**-0.0196*** **
10-year Eurirs rate		**0.0157**	**0.0458*** **	**0.0649*** **	**0.0564*** **
10-year BTP-BUND spread	-0.0884***	-0.0875***	-0.0609***	-0.0465***	-0.0446***
Italian Inflation rate	0.0120**	0.0111**	0.0048	0.0027	0.0000
Italian unemployment rate	-0.0568***	-0.0539***	-0.0059	0.0248***	0.0330***
Italian business cycle	0.0192**	0.0178**	-0.0233***	-0.0477***	-0.0516***
Bank controls					
Duration gap	-0.0002	-0.0003	-0.0002*	-0.0001***	-0.0001**
Size	-0.0543	-0.0546	-0.0273	-0.0025	0.0008
Tier1 capital ratio	-0.0212***	-0.0202***	-0.0096***	-0.0037**	-0.003
NPL ratio	-0.0214***	-0.0199***	-0.0116***	-0.0040**	-0.0045**
Deposit ratio	0.0017	0.0018	0.0006	-0.0007	-0.0016
Liquidity ratio	-0.0009	-0.0009	-0.001	-0.0004	0.0004
Profitability	0.0078	0.0081	0.0043	-0.0021	-0.0018
Loan-level controls					
Loan size	-0.0139*	-0.0140*	-0.0270***	-0.0171***	-0.0128***
Loan cost	0.1818***	0.1815***	0.1015***	0.0529***	0.0469***
Loan maturity	-0.0165	-0.0165	-0.0330*	-0.0268***	-0.0151*
Fixed-rate loans	-0.1603***	-0.1600***	-0.0922***	-0.0161**	-0.0184**
Subsidized loans	-0.1364**	-0.1362**	-0.1539***	-0.0091	0.0093
Bank fixed effects	yes	yes	yes	yes	no
Firm zip-code*sector fixed effects	no	no	yes	no	no
Firm fixed effects	no	no	no	yes	no
Firm*Bank fixed effects	no	no	no	no	yes
Observations	2,498,790	2,498,790	2,446,268	2,375,238	2,131,448
Number of banks	144	144	144	144	143
Number of firms	359,111	359,111	313,917	235,559	205,307
Adjusted R-squared	0.096	0.096	0.524	0.723	0.764

Risk-taking measure: : (log) amount of new lending for different rating classes

	(1)	(2)	(3)	(4)	(5)
Firm rating	-0.0542***	-0.1166***	-0.0639***	-0.0431***	-0.0316***
Interactions with macroeconomic variables					
Eonia rate * Firm rating	**-0.0101*** **	**-0.0126*** **	**-0.0044*** **	**-0.0013**	**-0.0012**
10-year Eurirs rate * Firm rating		**0.0109*** **	**0.0086*** **	**0.0084*** **	**0.0081*** **
10-year BTP-BUND spread * Firm rating	0.0011	0.0009	0.0021	0.0019	0.0023*
Italian inflation rate * Firm rating	0.0058***	0.0099***	0.0028**	0.0007	0.0001
Italian unemployment rate * Firm rating	-0.0004	-0.0018	-0.0026	-0.0030**	-0.0030***
Italian business cycle * Firm rating	-0.0002	-0.0006	0.0052**	0.0053***	0.0047***
Bank controls					
Duration gap	0.0008***	0.0008***	0.0003	0.0001	-0.0001
Size	0.0984	0.0981	0.0152	-0.0234	0.0048
Tier1 capital ratio	0.0297***	0.0296***	0.0226***	0.0157***	0.0081**
NPL ratio	0.0219**	0.0220**	0.0122**	0.0098*	0.0034
Deposit ratio	-0.0070*	-0.0070*	-0.0032	-0.0012	-0.0013
Liquidity ratio	-0.0087***	-0.0087***	-0.0046***	-0.0025*	0.0007
Profitability	0.0007	0.0006	-0.0008	0.0003	0.0011
Loan-level controls					
Loan cost	-0.2672***	-0.2672***	-0.1352***	-0.0718***	-0.0642***
Loan maturity	0.1751***	0.1750***	0.3743***	0.5235***	0.4965***
Fixed-rate loans	-0.2618***	-0.2621***	-0.2279***	-0.2075***	-0.2035***
Subsidized loans	-0.2958***	-0.2961***	-0.0901	-0.0311	-0.0515
(Year:quarter) fixed effects	yes	yes	yes	yes	yes
Bank fixed effects	yes	yes	yes	yes	no
Firm zip-code*sector fixed effects	no	no	yes	no	no
Firm fixed effects	no	no	no	yes	no
Firm*Bank fixed effects	no	no	no	no	yes
Observations	2,498,790	2,498,790	2,446,268	2,375,238	2,131,448
Number of banks	144	144	144	144	143
Number of firms	359,111	359,111	313,917	235,559	205,307
Adjusted R-squared	0.192	0.192	0.547	0.672	0.754