

**Bank Risk-Taking, Securitization, Supervision,
and Low Interest Rates:
Evidence from Lending Standards**

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- The 2007-2009 (?) **financial crisis** has had a dramatic impact on the banking and financial sector of several countries. It also triggered a very significant economic crisis...

➔ **There are several “causes” of the crisis, but what we concentrate on are the *fundamental* causes**

Timothy Geithner

(US Secretary of the Treasury & former NY Fed Chairman)

- *“One (error) was that monetary policy around the world was too loose too long. And that created this just huge boom in asset prices, money chasing risk. People trying to get a higher return. That was just overwhelmingly powerful... We all bear a responsibility for that ...*

The supervisory system was just way behind the curve. You had huge pockets of risk built up outside the regulatory framework and not enough effort to try to contain that. But even in the core of the system, banks got to be too big and overleveraged. Now again, here’s an important contrast. Banks in the United States, even with investment banks now banks, bank assets are about one times GDP of the United States. In many other mature countries - in Europe, for example – they’re a multiple of that. So again, around the world, banks got to just be too big, took on too much risk relative to the size of their economies.”

Timothy Geithner, *Charlie Rose’s PBS*, May 2009

Three key “root” causes of the crisis:

1. **Low levels of short- and long-term interest rates**
2. **High securitization activity**
3. **Weak banking supervision standards**

(See e.g. Allen (2009), Besley and Hennessy (2009), Blanchard (2008), Brunnemeier (2009), Calomiris (2008), Diamond and Rajan (2009), Taylor (2007 and 2008), Engel (2009), Rajan (2009) and numerous articles in *Financial Times*, *The Wall Street Journal*, and *The Economist*)

- These root causes may have been interrelated and **mutually amplifying** in affecting the risk-taking of financial institutions (Rajan, 2005)

Why these three? Some theoretical mechanisms

- Overnight rates are a key driver of liquidity and affect banks' leverage (Adrian and Shin, 2009; Shin, 2009; Brunnermeier et al., 2009)
- Low monetary policy rates amplify moral hazard problems in the banking industry thus inducing higher loan risk-taking (e.g. Allen and Gale, 2007)
- Low rates may induce a search for yield from financial intermediaries. Securitization of loans offers attractive returns, but it induces lower screening and monitoring of securitized loans or easier standards for new loans because of improved bank liquidity position (Rajan, 2005)
- Strong banking supervision standards, by limiting agency problems, should reduce the impact of low interest rates

The specific questions we address

1. Do low short- and long-term interest rates soften bank lending standards?
2. Are lending standards softer when securitization activity is high and when banking supervision is weak?
3. Does the softening imply more risk-taking?

Identification challenges

1. Endogeneity:

- Monetary policy rates are endogenous to local economic conditions
- Securitization depends on monetary policy as this affects loan growth
- Banking supervision is endogenous to monetary policy, in particular when the central bank is responsible for both

2. Data:

- Difficult to obtain data on the *pool of potential borrowers* approaching a bank and *to know whether, why and how* banks change the lending standards to their customers

Identification strategy relies on:

1. Geographical focus: Euro Area

- Monetary policy rates are identical. But there are cross-country differences in GDP growth and inflation → significant exogenous cross-sectional variation of monetary policy conditions, as measured for example by Taylor-rule implied rates (Taylor, 2008)
- Significant cross-country differences in securitization activity partly related to differences in the regulation of the market for securitization
- Banking supervision is responsibility of the national supervisory authority while monetary policy is decided by the Governing Council of the ECB

2. Data: Confidential Bank Lending Survey of the ECB/ EuroSystem:

- National central banks request quarterly information on the lending standards banks apply to customers → *we know whether, why and how banks change their lending standards* to business and households

Outline

- **Data**
 - Bank Lending Survey data
 - Interest rates, securitization, & banking supervision
 - Empirical strategy
- **Results**
 - Short-term rates
 - Short- and long-term rates
 - Securitization
 - Banking supervision
- **Conclusions**

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- **Data**
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Data: the Euro Area Bank Lending Survey (BLS)

- National central banks request quarterly information on the lending standards banks apply
- There are 18 regular questions about *supply* and *demand* of banks' loans
- Questions about *whether*, *why*, and *how* banks change lending standards
- Data are collected for 12 countries and 90 banks over the period 2002:Q4 to 2009:Q1
- 5 possible answers: from eased considerably to tightened considerably

Main BLS question: *whether and how much* banks change their standards

- “Over the past three months, how have your bank’s credit standards as applied to the approval of loans
 - or credit lines to enterprises changed?”
(overall, to SMEs, to large enterprises, short-term, long-term)
 - to households for house purchase?”
 - to households for consumer credit?”

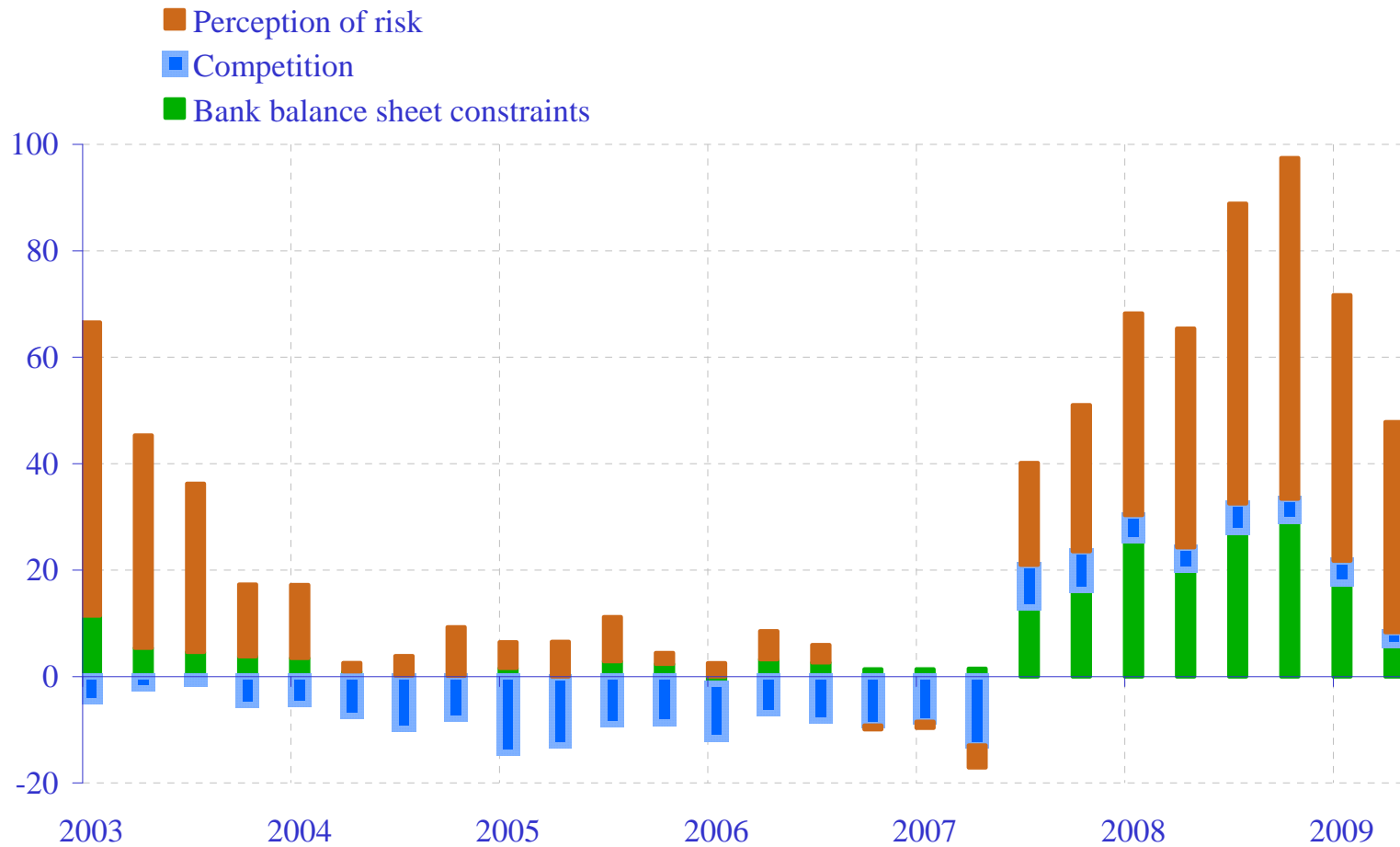
Changes of lending standards across types of loans

Why and how banks change their standards

For each type of loan (business, mortgage and consumer):

- **Factors affecting credit standards (WHY):**
 - **bank balance sheet constraints:** bank liquidity, bank capital, and access to market finance
 - **pressure from competition:** from banks, from non-banks and from the market
 - **borrower's risk:** general economic situation, industry/firm outlook, risk of collateral, housing markets prospects, and creditworthiness of consumers
- **Changes in loan conditions and terms (HOW):**
 - margins for average and riskier borrowers, loan size, maturity, collateral, covenants, loan to value ratio, and non interest rate charges

Why and how banks change their standards



Source: ECB

The variable BLS

is defined as the *net percentage of banks reporting a tightening of standards* = the difference between the banks reporting a tightening and the banks reporting a softening of lending standards (in percentage)

- we use only responses aggregated by country, since the dataset with individual bank answers is available (to us 😊) only until 2007q3



Interest rate variables

- Overnight rate (EONIA)
- Rate on 10-year national government bonds
- Taylor rate differences = Euribor 3m – Taylor-rule implied rates
 - Taylor (2009): “*within Europe the deviations from the Taylor rule vary in size because inflation and output data vary from country to country*” (see also Ahrend, Cournede and Price, 2008)

Securitization data

- The securitization activity is the volume of ABS and MBS deals divided by the outstanding amounts of loans (or gross new business flows) in each country
- Possible endogeneity problems: we construct an indicator (**instrument**) of the regulation for securitization in the Euro Area countries
 - the instrument is a measure of the legal environment for securitization in each country
 - from country information contained in the *EFMLG (2007) Report*



Banking supervision standards

- Capital stringency index is an index of regulatory oversight of bank capital (Barth, Caprio and Levine, 2006; and Laeven and Levine, 2009)

Summary statistics (Table 1)

Table 1, Panel A: summary statistics of macroeconomic and financial variables

Variable	Mean	Std. Dev.	Min	Max
Overnight rate	2.87	0.81	2.02	4.25
10-year rate	4.05	0.46	2.94	5.22
Taylor-rate difference	-1.23	1.62	-6.55	2.67
GDP growth	2.42	2.09	-7.98	8.42
Inflation	2.51	0.99	-0.17	5.58
Securitization	1.82	1.66	0	9.87
Capital stringency	5.26	1.20	3	7
Securitization regulation	8.08	3.81	1.5	14

Estimation

- The empirical strategy relies on a series of panel regressions of the following form:

$$BLS_{t,i} = \alpha_i + \beta \times STrate_{t,i} + \gamma \times LTrate_{t,i} + \delta \times CONTROLS_{t,i} + \varepsilon_{t,i}$$

Estimation

- *LHS variable*: lending standards (net percentage tightening)
- *RHS variables*: overnight and long-term rates, Taylor-rate differences, securitization, capital stringency, and controls for GDPG and inflation
- GLS panel regression with country fixed effects and standard errors corrected for heteroskedasticity, correlation between countries and autocorrelation (T=26, N=12, and overnight rates are constant across countries)
- Robustness:
 - other controls: credit growth, property prices, and expected GDPG and inflation
 - country (and time) fixed effects and errors clustered by country
 - dynamic panel

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Low short-term interest rates imply more bank risk-taking

- Low overnight interest rates soften lending standards for all type of loans. Low short-term rates have a stronger impact than low long-term rates
- Lending standards are softened because of the improvement of borrowers' creditworthiness, but also because of less binding balance sheet constraints and increased competition (from banks and non-banks)
- The analysis suggest that banks do not adjust the terms and conditions of the loans for the additional risk taken

Low overnight (monetary policy) rates induce high risk-taking

Low interest rates imply more bank risk-taking

- Introducing cross-sectional variation of monetary policy stance by using Taylor-rule differences confirms the results
- The persistence of low rates (*rates too low for too long*) amplify the effect even further

Distance from Taylor-rule rates (Table 2)

Table 2, Panel B: the impact of differences in monetary policy stance

	loans to non-financial firms	loans to households for house purchase	consumption
	total credit standards		
	1	2	3
Taylor-rate difference t-1	5.046 [3.53]***	8.22 [6.19]***	4.757 [5.67]***
# of expansive periods t-1			
country fixed effects	yes	yes	yes
time fixed effects	no	no	no
# of observations	312	312	312
# of countries	12	12	12
Wald Chi ²	24.7**	101.55***	86.41***

Distance from Taylor-rule rates (Table 2)

Table 2, Panel B: the impact of differences in monetary policy stance

	loans to non-financial firms				loans to households for house purchase consumption				
	credit standards due to bank balance sheet constraints								
	4	5	6	7	8	9	10	11	12
Taylor-rate difference t-1	4.508 [7.58]***	4.652 [7.92]***	2.596 [3.34]***	2.41 [4.88]***	2.895 [5.71]***	0.333 [0.41]	1.281 [4.87]***	1.653 [4.42]***	-0.516 [0.85]
# of expansive periods t-1		-0.174 [2.09]**	-0.157 [1.53]		-0.336 [7.53]***	-0.444 [5.62]***		-0.267 [7.60]***	-0.378 [6.27]***
country fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
time fixed effects	no	no	yes	no	no	yes	no	no	yes
# of observations	312	312	312	312	312	312	312	312	312
# of countries	12	12	12	12	12	12	12	12	12
Wald Chi ²	70.28***	78.73***	17458***	42.25***	82.85***	16343***	39.95***	83.76***	32256***

Short-term versus long-term rates

- Low short-term rates imply more bank's appetite for risk, even when controlling for long-term rates
- The impact of short-term rates on bank's risk-taking is statistically and economically stronger than the effect induced by long-term rates

Short-term vs. long-term rates (Table 3)

Table 3, Panel A: the impact of short- and long-term interest rates on total credit standards

	loans to non-financial firms		loans to households for house purchase consumption			
	total credit standards					
	1	2	3	4	5	6
Overnight rate t-1		20.562 [7.61]***		7.998 [6.66]***		8.589 [5.06]***
10-year rate t-1	12.685 [3.34]***	4.913 [1.35]	14.774 [8.56]***	11.311 [6.12]***	3.666 [1.78]*	-1.243 [0.54]
GDP growth t-1	-3.026 [4.56]***	-3.22 [5.14]***	-4.599 [8.06]***	-4.616 [8.07]***	-1.901 [3.95]***	-1.843 [3.67]***
Inflation t-1	7.82 [4.69]***	5.283 [3.31]***	4.58 [4.39]***	3.78 [3.83]***	4.113 [3.56]***	2.788 [2.36]**
country fixed effects	yes	yes	yes	yes	yes	yes
# of observations	312	312	312	312	312	312
# of countries	12	12	12	12	12	12
Wald Chi ²	90.7***	210.51***	248.93***	362.71***	96.96***	122.59***

The impact of low short-term rates on risk taking is amplified by securitization

- The results highlight
 - the importance of competition from other banks and financial intermediaries (the “shadow banking system?”) in inducing easier lending standards
 - the importance of bank balance sheet strength
 - the effect of the transfer of collateral risk
- Results are largely robust to the use of an instrument for securitization
- The impact of securitization on conditions and terms is significant for riskier households but not for riskier firms

Securitization activity (Table 4)

	loans to non-financial firms		loans to households for			
			house purchase	consumption		
	total credit standards					
	1	2	3	4	5	6
Overnight rate t-1	13.29 [3.96]***		1.231 [0.67]		1.71 [0.92]	
10-year rate t-1	6.174 [1.32]	-13.467 [1.43]	12.516 [4.46]***	-0.314 [0.03]	-0.796 [0.30]	-9.156 [1.14]
Securitization t-1	-10.575 [2.44]**	-7.521 [1.78]*	-9.714 [1.68]*	-12.375 [1.67]*	-12.603 [2.64]***	-9.432 [1.73]*
Overnight rate*securitization t-1	4.246 [3.31]***	4.387 [3.96]***	4.85 [4.49]***	4.199 [3.06]***	4.282 [4.66]***	4.275 [4.27]***
10-year rate*securitization t-1	-0.942 [0.79]	-1.287 [1.14]	-1.756 [1.09]	-0.594 [0.29]	-0.505 [0.40]	-1.088 [0.78]
GDP growth t-1	-3.5 [3.53]***	-0.418 [0.56]	-4.448 [9.14]***	-2.621 [2.66]***	-2.195 [4.58]***	0.595 [0.92]
Inflation t-1	5.508 [3.56]***	1.373 [0.78]	4.489 [5.08]***	-0.348 [0.15]	3.779 [3.33]***	-0.47 [0.25]
country fixed effects	yes	yes	yes	yes	yes	yes
time fixed effects	no	yes	no	yes	no	yes
# of observations	312	312	312	312	312	312
# of countries	12	12	12	12	12	12
Wald Chi ²	296.09***	10765***	602.91***	7658***	166.52***	10230***

The impact of low short-term rates and weak banking supervision on lending standards

- The softening impact due to less binding balance sheet constraints is higher when supervision standards are weaker
- The results are not strong and depend to a certain extent from the empirical specification
- A better measure of *good regulation* and not only more stringent is needed

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Summary of main results and conclusions

- Low short-term interest rates soften lending standards and rates *too low for too long* amplify the impact
 - High securitization activity and (to a certain extent) weak banking supervision amplify the softening due to low short-term rates
 - The softening is over and above the improvement of borrowers' creditworthiness, suggesting more risk-taking
 - Low short-term rates have a stronger impact than low long-term rates, both directly and indirectly via securitization and banking supervision
- These results **help shed light on the origins of the current global crisis and have important policy implications** for monetary policy, banking regulation and supervision, and for financial stability