# The "Greatest" Carry Trade Ever? Understanding Eurozone Bank Risks

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## **Motivation**

- The European banking system is highly interconnected with the health of the sovereigns through the holdings of their debt
  - Domestic as well as cross-country holdings of sovereign debt.
- Since mid-2008, government bond yield spreads between pairs of European countries have widened considerably, mirroring the economic divergence between these countries.
  - Banks have experienced significant losses and market-value declines.
- Have banks been affected due to purely passive exposures to the troubled periphery sovereigns? Or did banks actively seek risky sovereign bonds? Which banks actively sought risky sovereign bonds? Can this behavior be understood using market data?
- Understanding bank risks can help understand how to "fix" banks

## Figure 1.B. Pairwise Comparison of Government Bond Yield Spreads: Spain versus Germany

This graphic shows the time series of 10-year government bond yields comparing Spanish and German 10-year government bond yields since January 2005 (Source: Bloomberg).



## "Carry Trades" in Peripheral Sovereign Bonds

- (Our results suggest that) Bank risk in this period can be understood as reflecting a "carry trade" behavior
  - Financing leg: short-term wholesale market
  - Investment leg: long-term GIPSI government bonds
- Carry trade reflects a bet on the economic convergence of the Eurozone and a convergence of the spread between the two legs
  - Banks gain on the *upside* when yields of GIPSI countries decrease (and market prices increase), i.e. banks can pocket the "carry"
  - Bank lose on the *downside* when spreads between both legs diverge further
    - Leading to losses of banks on sovereign bond portfolio
    - Questioning solvency and/or liquidity of banks in funding markets
- Why would banks engage (or sustain) such an economic exposure?

# **Main Hypothesis**

- European banks search for yield through investments in high yielding risky sovereign debt financed with short-term funding.
- Under-capitalized banks have an incentive to shift into riskier assets holding risk weights constant ("risk shifting").
  - Caballero, Hoshi and Kashyap, 2008; Giannetti and Simonov, 2013
- Current regulatory capital requirements in fact incentivize such behavior by treating most sovereign bonds as safe and ignoring short-term funding.
  - Basel II assigns zero risk weights for holding sovereign debt increasing incentives for under-capitalized banks to hold these assets ("regulatory arbitrage").
- European banks can use securities to obtain funding from the ECB.
- Phenomenon should pervade European banks, not just a "home bias"

# Dexia S.A. – A Carry Trade Gone Bad

"And of course, the deterioration of the Euro zone situation and particularly the sovereign crisis in the peripheral economies hit very badly the group. And that's of course not a surprise for a group that still had very important short-term funding needs that was mainly present in strong exposures in peripheral countries. [...] Before 2008, it was the group's high rating granting easy access to wholesale funding that led to the situation of October 2008 with short-term funding need of €260 billion outstanding in October 2008, i.e. 43% of total balance sheet. [...] with very significant acceleration and buildup of the bond portfolio was amounting at €203 billion at the end of 2008. Mostly carry-trades with marginal improvement of customer access [...] that led to a very significant gearing ratio because the portfolio size was, at that time, 25 times the group equity."

(Pierre Mariani, Chairman-Management Board & CEO, Dexia SA, Earnings Call, February 23rd, 2012)

# **Two Examples – Dexia S.A. and Bank of Cyprus**

- Dexia had invested about 5-6 time its 2008 book equity in GIPSI sovereign debt
  - Dexia lost about EUR 80 billion short-term funding and deposits between March and October 2011 (US MMF, institutional investors, retail investors)
  - Plus had to post about EUR 15 billion in cash collateral as margin for hedges -> Dexia was long fixed interest rates hedged with interest rate swaps
- Bank of Cyprus (BOC) quadrupled its investment in Greek government bonds in 2010 to EUR 2.4 billion
  - Greek sovereign debt among highest yielding bonds
  - Non-performing loan portfolio eroded profitability of BOC
  - "Absolute value" strategy to increase net interest income, "relative value" strategy to opportunistically sell bonds to generate gains around reporting dates ("window dressing")

## In this Paper

- We show that this behavior was pervasive among European banks
  - Long peripheral sovereign bonds financed in short-term wholesale markets
- Our results are supportive of moral hazard in the form of risk-taking by undercapitalized banks to exploit low risk weights
  - Regulatory capital arbitrage, risk shifting
- > We discuss alternative hypothesis
  - Inertia, Home bias, cross-border exposure to real sector of the periphery
- We show that riskier banks not only hold more GIPSI sovereign debt but have also *increased* their portfolio holdings from March 2010 to December 2010, until the stress tests "shocked" sovereign bond holdings.
- > The 'home bias' of peripheral banks has increased over time, esp. post-LTRO

# Data

> We start with all publicly listed banks that participated in the EBA stress tests

- Overall, 56 banks included in our analysis
- We collect market information from Bloomberg for all EBA public banks
  - Stock prices, sovereign bond yields, bank CDS spreads
- The European Banking Authority (EBA) disclosed information about banks' bond portfolio after the 5 stress tests
  - March 2010, December 2010, September 2011, December 2011, June 2012
- Financial information of banks from SNL Financial and annual and quarterly reports from banks (ECB funding, repo transactions)
  - Further data sources: S&P, ECB, BIS
- ➢ US Money Market Fund data from SEC (Rule 2a-7) filings starting Nov'10

# Table 2. Summary Statistics of Factor Loadings and Bond Holdings (cont'd)

Panel D. Sovereign bond holdings (in million euros)

	Greece	Italy	Portugal	Spain	Ireland
No GIPSI banks					
March 2010	34,814	115,472	14,776	29,190	18,677
December 2010	28,208	132,803	14,636	41,923	5,017
September 2011	21,832	103,137	13,975	30,039	3,845
December 2011	17,355	69,243	10,390	22,311	3,528
June 2012	1,672	69,344	10,169	20,615	2,961
GIPSI banks					
March 2010	56,148	144,856	5,176	143,869	5,322
December 2010	54,447	164,011	10,351	154,793	12,466
September 2011	NA	156,043	10,972	143,629	12,455
December 2011	NA	147,746	8,180	111,774	12,109
June 2012	NA	184,171	10,657	124,385	13,848

- GIPSI and non-GIPSI banks increased their exposure to Italy and Spain between March 2010 and December 2010.
- GIPSI banks increase holdings of Italian and Spanish government debt after LTROs.

## Table 3A. Increasing Sovereign Exposure: Bank Level Evidence

By Country (Changes	s in holdings in million eur	ros)		
	$\Delta$ Italy March 2010-	$\Delta$ Italy Dec 2011 -		
Italian Bank	Dec 2010	June 2012	% Change (2010)	% Change (2012)
No	21,358	-589	19.26%	-0.86%
Yes	19,155	36,424	13.22%	24.65%
	$\Delta$ Spain March 2010-	$\Delta$ Spain Dec 2011 -		
Spanish Bank	Dec 2010	June 2012	% Change (2010)	% Change (2012)
No	16,762	-1,758	66.34%	-7.69%
Yes	5,335	12,611	3.71%	11.28%

- Banks were not passively caught by the sovereign debt crisis as suggested by the inertia hypothesis but actively increased their sovereign debt positions.
- It was not domestic banks that increased their exposures as suggested by the home bias hypothesis but non-peripheral banks.

#### Table 3B. Increasing Sovereign Exposure: Bank Level Evidence

By Bank Risk (Holdings scaled by Total Assets)			
	$\Delta$ Italy March 2010-Dec 2010		
High Tier 1	0.022		
Low Tier 1	0.491		
High RWA/Assets	0.696		
Low RWA/Assets	0.004		
High Loans/Assets	0.387		
Low Loans/Assets	-0.022		
	$\Delta$ Spain March 2010-Dec 2010		
High Tier 1	-0.015		
Low Tier 1	0.679		
High RWA/Assets	0.543		
High RWA/Assets Low RWA/Assets	0.543 0.072		
High RWA/Assets Low RWA/Assets High Loans/Assets	0.543 0.072 0.505		

For example, banks with a Tier-1 ratio below 9.03% (the 25% quartile) increase their Italian bond holdings, on average, by 0.49% of total assets between March and December 2010.

Banks with low Tier 1 ratios, high RWA / Assets and high Loans / Assets increase their exposure to Italian and Spanish sovereign debt.

# **Figure 3 US MMF Withdrawals**



This figure depicts the investments of US MMF in European banks since October 2010.

Sale of commercial paper and repurchase agreements of European banks during the January to December 2011 period.

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BNP

SAN

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EXB

KBC KBC

SKIR ABC US MMF: % Sell-Off (Jan - Dec 2011)

SWEDA HSBA SEBA

SHBA

NDA

LLOY BARC

EBS

BK SNB

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#### US MMF Withdrawals (Low vs High Tier 1 Banks)



US MMF withdrew liquidity from weakly capitalized banks. Funds return in 2012 / 2013 to well capitalized banks. Solvency and liquidity problems interact.

#### Methodology for capturing this behavior in market data

- We use the sensitivity of banks' stock returns to sovereign bond returns as a measure of banks' exposure to sovereign debt.
  - similar to the procedure employed by Agarwal and Naik (2004) to characterize the exposures of hedge funds.

 $R_{i,t} = \beta_{0,i} + \beta_{GIPSI,i} R_{GIPSI,t} + \beta_{Germany,i} R_{Germany,t} + \beta_m R_{m,t} + \varepsilon_{i,t}$ (1)

- >  $R_{i,t}$  is bank *i*'s daily stock return
- $\succ$   $R_{GIPSI,t}$  is the daily return on ten-year government bonds from GIPSI countries
- $\succ$   $R_{Germany,t}$  is the daily return on ten-year German government bonds
- $\succ$   $R_{m,t}$  is the daily return of the equity market index in country *m*.

# Table 4A. Summary Statistics of Factor Loadings and Bond Holdings

2007 -2012						
	Obs	Mean	Std-Dev	Min	P50	Max
Factor loadings		$\frown$				
$\hat{\beta}$ Italy	833	1.84	2.00	-3.17	1.40	16.42
<sup>β</sup> Spain	833	1.42	2.13	-9.45	0.95	18.64
<sup>ĝ</sup> Germany	833	-2.76	2.13	-20.81	-2.44	5.97
No GIPSI banks						
<sup>β</sup> Italy	765	1.85	2.05	-3.17	1.39	16.42
<sup>ĝ</sup> Spain	731	1.47	2.24	-9.45	0.97	18.64
<sup>ĝ</sup> Germany	459	-2.86	2.14	-16.86	-2.54	2.14
GIPSI banks						
<sup>Â</sup> ltaly	68	1.75	1.14	-0.11	1.52	4.98
<sup>Â</sup> Spain	102	1.02	0.84	-0.90	0.81	3.56
<sup>Â</sup> Germany	374	-2.63	2.12	-20.81	-2.40	5.97

We find a positive correlation between banks' stock returns and GIPSI bond returns and a negative correlation with German bund returns.

These correlations are significantly larger during the 2007 – 2012 period as compared to the pre-2007 period.

#### Table 4B. Banks' Carry Trade Behavior Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>R<sub>Greece</sub></i>	R <sub>Italy</sub>	R <sub>Spain</sub>	R <sub>Portugal</sub>	<i>R<sub>Ireland</sub></i>	R <sub>CIPSI</sub>
$\hat{\beta}_{Greece}$	0.095***					0.048***
	(5.73)					(2.73)
$\hat{\beta}$ Italy		0.432***				0.261***
5		(5.12)				(2.93)
$\hat{\beta}$ Portugal			0.130***			0.007
0			(3.05)			(0.57)
$\hat{\beta}$ Spain				0.427***		0.077
				(8.78)		(1.46)
$\hat{\beta}$ Ireland					0.267***	0.132**
in claria					(5.32)	(2.49)
$\hat{\beta}_{Germany}$	-2.460***	-2.563***	-2.500***	-2.611***	-2.517***	-2.558***
,	(-19.09)	(-23.64)	(-19.40)	(-23.07)	(-19.78)	(-22.70)
β̂m	1.359***	1.363***	1.373***	1.367***	1.371***	1.354***
	(14.98)	(15.17)	(15.02)	(15.27)	(15.30)	(15.25)
$\hat{eta}_0$	-0.001**	-0.001***	-0.001***	-0.001***	-0.001**	-0.001***
	(-2.56)	(-2.94)	(-2.75)	(-2.64)	(-2.58)	(-2.73)
Ν	55,206	55,206	55,206	55,206	55,206	55,206
$R^2$	45.66%	45.88%	45.54%	45.86%	45.78%	46.22%

 $R_{i,t} = \beta_0 + \beta_{GIPSI}R_{GIPSI,t} + \beta_{Germany}R_{Germany,t} + \beta_m R_{m,t} + \varepsilon_{i,t}$ 

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# **Falsification Tests**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	8
	EBA Banks	EBA LIK Banks	US Banks	HFRX Macro	MSCI GIPSI	MSCI Germany	MSCI Non GIPSI	MSCI UK
$\hat{\beta}_{Greece}$	0.005 (0.62)	-0.004 (-0.58)	-0.005 (-1.29)	0.000 (0.05)	-0.009 (-1.10)	-0.012** (-1.99)	0.002 (0.40)	0.004 (0.88)
$\hat{\beta}$ Italy	0.234***	0.179	-0.005	-0.056***	-0.211**	0.095	0.029	0.170**
	(3.39)	(1.62)	(-0.06)	(-2.83)	(-2.19)	(0.97)	(0.61)	(2.43)
<sup>β</sup> Portugal	0.013	0.011	0.028	0.003	0.017	-0.037	-0.023	-0.036
	(0.74)	(0.42)	(1.40)	(0.54)	(0.71)	(-1.46)	(-1.62)	(-0.95)
<sup>β</sup> Spain	0.091	-0.160	-0.041	0.021	0.162*	-0.055	0.048	-0.112
	(1.26)	(-1.48)	(-0.49)	(0.94)	(1.79)	(-0.57)	(1.03)	(-1.48)
$\hat{\beta}$ Ireland	0.124**	0.144	-0.047	0.034**	0.086*	-0.001	0.019	-0.021
	(2.23)	(1.64)	(-0.84)	(2.19)	(1.79)	(-0.03)	(0.68)	(-0.40)
<sup>β</sup> Germany	-2.499***	-2.039***	-1.971***	0.128***	-0.052	-0.094	-0.044	0.069
	(-30.30)	(-16.09)	(-18.46)	(4.27)	(-0.67)	(-0.69)	(-0.73)	(0.72)

Return exposures consistent with carry trade behavior is specific to Euro area banks and not to hedge funds, industrial firms or other banks of Western economies.
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## **Figure 4. Factor Loadings and Bank Portfolio Holdings**



- We estimate the factor loadings for each bank in the time period 60 days before and 60 days after each reporting date.
- Here: Sept.'11, Dec'11 and June'12 for exposure to Italy and Spain.
- The scatterplot shows a positive relationship between factor loadings and portfolio holdings.

## **Figure 5. Cross-Sectional Differences**



- > This graphic plots  $\hat{\beta}_{Germany,i}$ measured quarterly during the Jan 2011 – Dec 2011 period against US MMF withdrawals in 2011 scaled by total assets.
- > The correlation between  $\hat{\beta}_{Germany,i}$  and the MMF changes is 0.71 suggesting that US MMF exposure is an important determinant of banks' liquidity problems.

#### **Results from Seemingly Unrelated Regressions**

- We assess the importance of portfolio holdings of sovereign debt as well as money market fund exposure in explaining our factor loadings in a one-step framework using Zellner's (1968) seemingly unrelated regression (SUR) technique.
  - This approach has also been used, for example, in French et al. (1983) to estimate the effects of nominal contracting on stock returns

$$R_{i,t} = \beta_0 + \alpha_0 R_{GIPSI,t} + \alpha_1 \frac{Holdings_{i,t-1}}{Assets_{i,t-1}} R_{GIPSI,t} + \alpha_2 R_{Germany,t} + \alpha_3 \frac{\Delta MMF_{i,t}}{Assets_{i,t-1}} R_{Germany,t} + \cdots$$

 $\hat{\beta}_{GIPSI} \text{ is taking the form } \alpha_0 + \alpha_1 \frac{Holdings_{GIPSI,i,t-1}}{Assets_{i,t-1}}$ 

 $\hat{\beta}_{GIPSI}$  should be larger if banks have larger bond holdings ( $\alpha_1 > 0$ )

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 $\hat{\beta}_{Germany}$  is taking the form  $\alpha_2 + \alpha_3 \frac{\Delta MMF_{i,t}}{Assets_{i,t-1}}$ 

#### Table 7. Results from Seemingly Unrelated Regressions (cont'd)

			$\frown$		$\frown$	
GIPSI	Т	$\hat{\alpha}_0$	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\alpha}_3$	Prob > chi2
Italy	161	0.296***	11.203***	-2.210***	-8.091***	<0.001
		(7.2)	(10.53)	(-25.47)	(2.58)	
Spain	161	0.399*** (8.29)	4.736*** (8.9)	-2.32*** (-32.48)	-10.389*** (3.45)	<0.001
			$\overline{\mathbf{\nabla}}$		$\mathbf{\nabla}$	

- >  $\hat{\alpha}_0$ ,  $\hat{\alpha}_1$ ,  $\hat{\alpha}_2$  and  $\hat{\alpha}_3$  are point estimates under the constraints they are constant across all banks.
- We thus can interpret these coefficients as average factor loadings of our sample banks.

## **Cross-Border Real Sector Exposures**

- One could argue that our factor loadings reflect cross-border investments of internationally active banks rather than exposure to sovereign debt.
- We obtain detailed information about banks' cross-border real sector investments as of Dec 31<sup>st</sup>, 2010 from the EBA that has been disclosed in the context of the second stress test in July 2011.
- We construct a new variable Real<sub>GIPSI</sub>/Assets which is the sum of each bank's exposure to firms, the retail sector (including retail real estate) and commercial real estate scaled by total assets.
  - Real sector exposures to Spain is constructed accordingly.
- Table 7 reports the results of regressions of our factor loadings estimated 60 days before and after 31 Dec 2010 on real sector and sovereign exposure.

#### Table 8. Non-Sovereign Cross-Border Exposure of Banks

$$\hat{\beta}_{GIPSI,i,t} = \alpha_0 + \alpha_1 \frac{Real_{GIPSI,i,t}}{Assets_{i,t-1}} + \alpha_2 \frac{Holdings_{GIPSI,i,t}}{Assets_{i,t-1}} + \omega_{i,t}$$

		Ĺ	<sup>3</sup> Italy	
	All	All	All	Non-Italian
	(1)	(2)	(3)	(4)
$\hat{\alpha}_1$	1.148***		-0.602	4.990
	(4.09)		(-0.63)	(0.73)
$\hat{\alpha}_2$		8.565***	12.091	36.248***
		(2.95)	(1.52)	(2.81)
$\hat{lpha}_{0}$	0.845***	0.807***	0.799***	0.685***
	(6.84)	(6.38)	(6.20)	(5.14)
N	51	51	51	46
$R^2$	0.06	0.08	0.09	0.08

> Overall, these results indicate that  $\hat{\beta}_{GIPSI,i,t}$  reflects banks' exposure to GIPSI sovereign debt.

#### **Table 9. Carry Trade Behavior and Bank Risk**

(1) (2)	
$\hat{\beta}_{GIPSI}$ -1.567*** -0.576	
(-3.80) (-1.19)	
$\hat{\beta}_{GIPSIT}$ log-Assets 0.083*** 0.073***	k 🛛
(3.43) (3.05)	
$\hat{\beta}_{amax}$ ST U/C 0.828** 0.917**	*
(2.31) (2.84)	
$\hat{B}_{2222}$ (2007) (2007) (2007)	
PGIPSIx LOANS/ASSEIS (6 01)	
$\hat{\beta} = 0.052**$	*
$P_{GIPSIx}$ lier 1 -0.000 (3.47)	
(-5.47)	*
$P_{GIPSIx} RWA/Assets$ 0.720 (2.02)	
(3.02) Â	
$P_{Germany} -0.734 0.150 (0.00)$	
(-0.47) (0.09)	
$\beta_{Germany x} Log-Assets$ -0.091 -0.129*	
(-1.21) (-1.68)	
$\hat{\beta}_{Germany x} ST-LVG$ -1.257** -1.249**	e i
(-2.08) (-2.06)	
$\hat{\beta}_{Germany x}$ loans/Assets -0.507	
(-0.46)	
$\hat{\beta}_{commany r}$ Tier 1 -0.053	
(-1 10)	
$\hat{\beta}_{-}$ DMA (Appendix 0.528	
<sup>r</sup> Germany x RWA/ASSEIS -0.520	
$\hat{\beta}_{m}$ 1 322*** 1 321**	*
(16.04) (15.90)	
$\hat{B}_{0}$ 0.001 0.002	
$\sim_{\rm U}$ -0.001 -0.002 (-0.44) (-1.08)	
N 39 925 39 711	
$R^2$ 45.97% 46.08%	)

- We find that banks with higher Tier 1 capital ratios have lower exposure to Italian sovereign debt.
  - Tier 1 capital increases if banks have higher RWA or if they decide to hold more economic capital. For a given amount of RWA, the negative coefficient implies higher risk-shifting incentives
- Moreover, the positive coefficient on RWA / Assets (unlike the sign on Tier 1) suggests that there is a regulatory arbitrage motive.
  - Our results suggest that the discretionary part of Tier 1 capital is more strongly related to the risk-shifting motive. In other words, not controlling for RWA understates the risk-shifting effect.

#### Table 10. Sovereign Exposure and Bank Risk

		De	pendent Vari	able: Italy / A	ssets	
	(1)	(2)	(3)	(4)	(5)	(6)
$\hat{\beta}_{Tier1}$	-0.310***			-0.317***	-0.278***	-0.229***
-	(-4.42)			(-4.14)	(-3.37)	(-2.78)
$\hat{\beta}_{RWA/Assets}$		0.031***		0.005	-0.021	-0.006
,		(3.19)		(0.49)	(-1.30)	(-0.30)
$\hat{\beta}_{Loans} / Assets$			0.028***		0.034**	0.041**
,			(2.76)		(2.11)	(2.50)
$\hat{\beta}_{Log-Assets}$						0.003**
0						(2.30)
$\hat{\beta}_0$	0.049***	0.000	-0.006	0.049***	0.034***	-0.023
-	(5.06)	(0.10)	(-1.46)	(4.05)	(3.69)	(-0.90)
Ν	180	195	173	171	148	148
$R^2$	11.57%	3.13%	3.54%	13.10%	13.66%	15.53%

		Depe	endent Variab	ole: Spain / As	ssets	
	(1)	(2)	(3)	(4)	(5)	(6)
$\hat{\beta}_{Tier 1}$	-0.179***			-0.087**	-0.131***	-0.062
•	(-4.08)			(-2.26)	(-2.75)	(-1.10)
$\beta_{RWA/Assets}$		0.036***		0.034***	0.015	0.038**
		(3.87)		(3.19)	(1.24)	(2.08)
$\hat{\beta}_{Loans} / Assets$			0.032***		0.021**	0.031***
-			(3.59)		(2.09)	(2.75)
$\hat{\beta}_{Log-Assets}$						0.004**
-						(2.31)
$\hat{\beta}_0$	0.030***	-0.008***	-0.010**	0.004	0.006	-0.072**
	(4.47)	(-2.78)	(-2.57)	(0.62)	(0.98)	(-2.10)
N	180	195	173	171	148	148
$R^2$	5.22%	7.54%	4.82%	10.20%	10.66%	14%

- Regress reported sovereign bond holdings on risk factors.
- Increasing Tier 1 ratios from the 1<sup>st</sup> to the 3<sup>rd</sup> quartile decreases Italian sovereign bond holdings over total assets by 1%.
- Riskier and poorly capitalized banks have stronger incentives to invest in carry trades with Italian/Spanish sovereign debt.

# **Policy Implications**

- Under-capitalized banking sectors as the European countries had at the end of the financial crisis of 2007-08 can lead to subsequent problems through excess risk-taking comparable to the Japanese experience in 1990s.
- Simply restoring bank capitalizations up to regulatory risk weight based requirements does not suffice in environments where the regulatory risk weights have become out of sync with market's perception of risk of assets.
  - If risky sovereign debt is accounted for as liquid security under Basel III, this creates similar incentives to load up on these securities.
- ECB LTROs apparently have strengthened the financial sector and sovereign's nexus in the periphery, implying that a further deterioration of the sovereign health would lead to a significant peripheral crisis.
- Potential real-sector effects: crowding out of real-sector lending?
  - Schoenmaker (2013): it is under-capitalized European banks that are not lending

## Increase in Home Bias After ECB Dec'11 and Feb'12 LTROs

- The exposure of core European banks to Italian and Spanish sovereign debt decreased over the March 2010 to June 2012 period.
- The exposure of peripheral banks to their domestic sovereign debt increased over the same period.

Italian Bank	% Change (2010)	% Change (2012)
No	19.26% ←	-0.86%
Yes	13.22% —	→ 24.65%
Spanish Bank	% Change (2010)	% Change (2012)
No	66.34%	-7.69%

- Results indicate an increase in 'home bias' over time financed with Dec'11 and Feb'12 LTROs from the ECB
  - Suggesting that the ECB helps to contain risks within the periphery

# Table 3C. Home Bias and LTROs

	Italy		Spain	
	<= 3 years	> 3 years	<= 3 years	> 3 years
AT	-473	-4	-100	1
BE	-137	-232	-814	-189
CY	30	-27	0	-5
DE	-48	767	56	-588
DK	158	151	-31	8
ES	1,531	-2,450	6,032	6,579
FR	4,009	-881	345	231
GB	-1,468	-1,791	-956	528
HU	0	0	0	0
IE	1	15	-30	0
IT	28,643	7,782	-65	-271
MT	0	0	0	0
NL	230	-187	-319	142
NO	0	0	0	0
PT	-1	65	-19	27
SE	11	-6	-13	0

This table shows changes in Italian / Spanish sovereign bond holdings between Dec'11 and June'12 (in million euros).

Banks match the maturities of the securities they purchase with the maturity of ECB funds.

> Particularly domestic banks are net purchasers of Italian/Spanish bonds.