Online Appendix[†]

OA.1 Specification

Consider the following simplified version of (2):

$$y_{jt} = \beta_0 + \beta_1 T_j + \beta_2 \mathbb{I}_{DU,LTRO} + \beta_3 T_j \times \mathbb{I}_{DU,LTRO} + \beta_4 \mathbb{I}_{LTRO} + \beta_5 T_j \times \mathbb{I}_{LTRO} + \epsilon_{jt} \quad \text{(OA.1)}$$

where j is a bank and t is a date. T_j is a treatment dummy. There are three periods. The dummy $\mathbb{I}_{DU,LTRO}$ is equal to one in the second and third period. The dummy $\mathbb{I}_{LTRO}$ is equal to one in the last period.

Claim. The coefficient β_3 (β_5) captures the difference in y_{jt} for the treated group during the second (third) period relative to control group during the first (second) period.

$$\begin{aligned}
\beta_3 =& E(y_{jt}|\mathbb{I}_{DU,LTRO}=1,\mathbb{I}_{LTRO}=0,T_j=1) - E(y_{jt}|\mathbb{I}_{DU,LTRO}=0,\mathbb{I}_{LTRO}=0,T_j=1) \\
&- \big(E(y_{jt}|\mathbb{I}_{DU,LTRO}=1,\mathbb{I}_{LTRO}=0,T_j=0) - E(y_{jt}|\mathbb{I}_{DU,LTRO}=0,\mathbb{I}_{LTRO}=0,T_j=0)\big) \\
\beta_5 =& E(y_{jt}|\mathbb{I}_{DU,LTRO}=1,\mathbb{I}_{LTRO}=1,T_j=1) - E(y_{jt}|\mathbb{I}_{DU,LTRO}=1,\mathbb{I}_{LTRO}=0,T_j=1) \\
&- \big(E(y_{jt}|\mathbb{I}_{DU,LTRO}=1,\mathbb{I}_{LTRO}=1,T_j=0) - E(y_{jt}|\mathbb{I}_{DU,LTRO}=1,\mathbb{I}_{LTRO}=0,T_j=0)\big)
\end{aligned}$$

Proof. Using (OA.1), we can compute the following conditional expectations:

$$\begin{aligned}
&E(y_{jt}|\mathbb{I}_{DU,LTRO}=0,\mathbb{I}_{LTRO}=0,T_j=0) = \beta_0 \\
&E(y_{jt}|\mathbb{I}_{DU,LTRO}=0,\mathbb{I}_{LTRO}=0,T_j=1) = \beta_0 + \beta_1 \\
&E(y_{jt}|\mathbb{I}_{DU,LTRO}=1,\mathbb{I}_{LTRO}=0,T_j=0) = \beta_0 + \beta_2 \\
&E(y_{jt}|\mathbb{I}_{DU,LTRO}=1,\mathbb{I}_{LTRO}=0,T_j=1) = \beta_0 + \beta_1 + \beta_2 + \beta_3 \\
&E(y_{jt}|\mathbb{I}_{DU,LTRO}=1,\mathbb{I}_{LTRO}=1,T_j=0) = \beta_0 + \beta_2 + \beta_4 \\
&E(y_{jt}|\mathbb{I}_{DU,LTRO}=1,\mathbb{I}_{LTRO}=1,T_j=1) = \beta_0 + \beta_1 + \beta_2 + \beta_3 + \beta_4 + \beta_5 \\
&\Rightarrow (y_{jt}|\mathbb{I}_{DU,LTRO}=1,\mathbb{I}_{LTRO}=0,T_j=1) - E(y_{jt}|\mathbb{I}_{DU,LTRO}=0,\mathbb{I}_{LTRO}=0,T_j=1) \\
&- \big(E(y_{jt}|\mathbb{I}_{DU,LTRO}=1,\mathbb{I}_{LTRO}=0,T_j=0) - E(y_{jt}|\mathbb{I}_{DU,LTRO}=0,\mathbb{I}_{LTRO}=0,T_j=0)\big) = \beta_3 \\
&\Rightarrow E(y_{jt}|\mathbb{I}_{DU,LTRO}=1,\mathbb{I}_{LTRO}=1,T_j=1) - E(y_{jt}|\mathbb{I}_{DU,LTRO}=1,\mathbb{I}_{LTRO}=0,T_j=1) \\
&- \big(E(y_{jt}|\mathbb{I}_{DU,LTRO}=1,\mathbb{I}_{LTRO}=1,T_j=0) - E(y_{jt}|\mathbb{I}_{DU,LTRO}=1,\mathbb{I}_{LTRO}=0,T_j=0)\big) = \beta_5
\end{aligned}$$

□

[†]Date: February 2021. This is the online appendix to the paper "The design and transmission of central bank liquidity provisions" by Luisa Carpinelli and Matteo Crosignani. The opinions expressed are those of the author and do not necessarily reflect the views of the Bank of Italy, the European Central Bank, the New York Fed, or anyone associated with these institutions. All results have been reviewed to ensure that no confidential information is disclosed. All errors are our own. Emails: luisa.carpinelli@bancaditalia.it and matteo.crosignani@ny.frb.org.

OA.2 Additional Figures

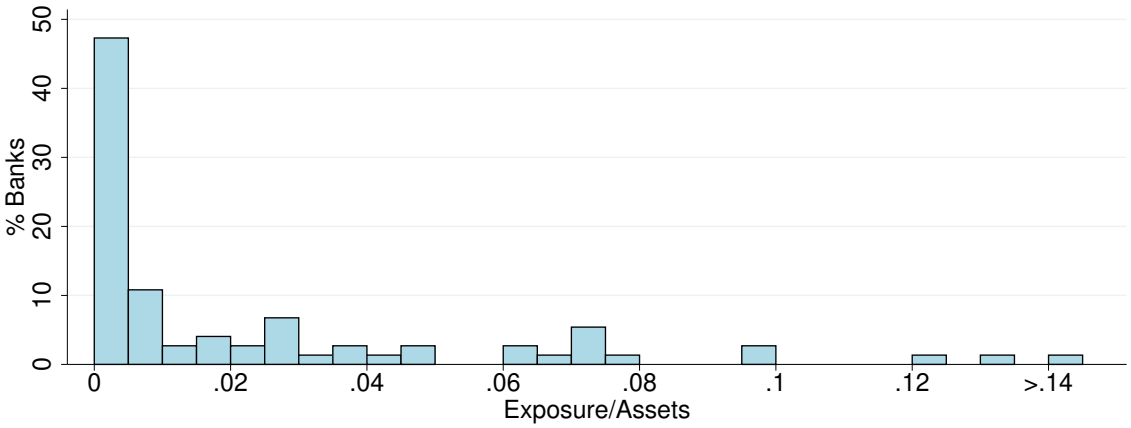

Figure OA.1: Bank Exposure to the Wholesale Funding Dry-Up. This histogram shows bank level exposure to the foreign wholesale funding market defined in (1). The y-axis is the share of sample banks. Source: Bank of Italy.

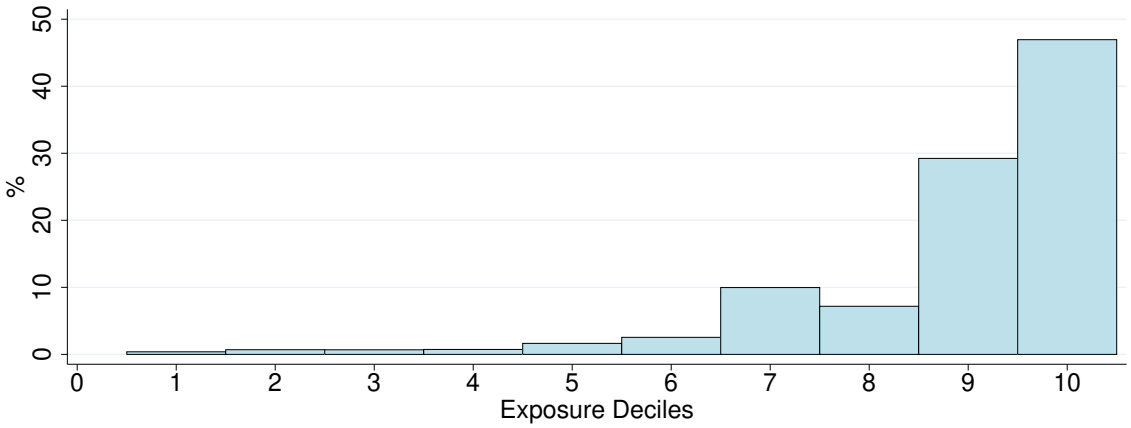

Figure OA.2: Bank Dry-Up Exposure and Loans to Firms. This bar chart shows the correlation between banks' total loans to firms and banks' exposure to the foreign wholesale market. The x-axis groups banks in ten deciles according to their exposure to the foreign wholesale market in June 2011. Each bar measures the share of total credit to firms funded by banks in each decile. Exposure deciles are delimited by p(10)=0.00%, p(20)=0.03%, p(30)=0.11%, p(40)=0.21%, p(50)=0.75%, p(60)=1.48%, p(70)=2.74%, p(80)=4.56%, and p(90)=7.57%. Source: Bank of Italy.

OA.3 Additional Tables

Panel A	Wholesale Funding Dry-Up					
$Exposure_{Jun11}$	-0.439***	-0.425***	-0.403***	-0.400***	-0.411***	-0.398***
	(0.116)	(0.117)	(0.121)	(0.122)	(0.120)	(0.131)
LEV_{Jun11}		-96.646	-67.940	-91.247	-92.037	-92.377
		(101.381)	(108.422)	(117.933)	(115.804)	(116.629)
ROA_{Jun11}			-0.011	-0.014	-0.025	-0.024
			(0.014)	(0.016)	(0.016)	(0.017)
$T1R_{Jun11}$				-0.018	-0.043	-0.042
				(0.034)	(0.036)	(0.036)
NPL_{Jun11}					-0.147*	-0.143*
					(0.078)	(0.080)
$Large_{Jun11}$						-0.009
						(0.037)
Observations	73	73	73	73	73	73
R-squared	0.168	0.178	0.185	0.188	0.229	0.230

Panel B	Foreign Funding Wholesale Dry-Up					
$Exposure_{Jun11}$	-0.283***	-0.291***	-0.278***	-0.277***	-0.277***	-0.239***
	(0.062)	(0.063)	(0.065)	(0.065)	(0.066)	(0.071)
LEV_{Jun11}		54.923	71.597	62.167	62.121	61.119
		(54.217)	(57.939)	(63.075)	(63.525)	(63.114)
ROA_{Jun11}			-0.006	-0.008	-0.008	-0.007
			(0.008)	(0.008)	(0.009)	(0.009)
$T1R_{Jun11}$				-0.007	-0.009	-0.007
				(0.018)	(0.020)	(0.020)
NPL_{Jun11}					-0.009	0.003
					(0.043)	(0.044)
$Large_{Jun11}$						-0.027
						(0.020)
Observations	73	73	73	73	73	73
R-squared	0.226	0.237	0.245	0.247	0.247	0.268

Table OA.1: Wholesale Market Exposure and Dry-Up. These two panels present the results from two cross-sectional regressions. In the top panel, the dependent variable is the change in wholesale market funding between June 2011 and December 2011 (normalized by total assets in June 2011). In the bottom top panel, the dependent variable is the change in foreign wholesale market funding between June 2011 and December 2011 (normalized by total assets in June 2011). In both panels, the independent variables are the exposure to the foreign wholesale market defined in (1). LEV is leverage, ROA is return on assets, $T1R$ is the Tier 1 Ratio, NPL is nonperforming loans ratio, and $Large$ is a variable equal to bank total assets if the bank is one of the five largest banks and zero otherwise. All independent variables are measured in June 2011. *** p<0.01, ** p<0.05, * p<0.1. Source: Bank of Italy.

LHS=$\Delta CreditGranted$	(1)	(2)	(3)	(4)	(5)	(6)
$Exposure_{Jun11} \times \mathbb{I}_{DU,LTRO}$	-0.132***	-0.130***	-0.136***	-0.160***	-0.119***	-0.104***
	(0.040)	(0.044)	(0.033)	(0.031)	(0.032)	(0.032)
$Exposure_{Jun11} \times \mathbb{I}_{LTRO}$	0.172***	0.170***	0.175***	0.150***	0.119**	0.141***
	(0.043)	(0.044)	(0.051)	(0.046)	(0.049)	(0.052)
$Share$	-0.026***	-0.026***	-0.026***	-0.026***	-0.026***	-0.026***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$Overdraft$	0.251***	0.251***	0.249***	0.250***	0.250***	0.250***
	(0.027)	(0.027)	(0.027)	(0.027)	(0.026)	(0.026)
$Drawn/Granted$	0.252	0.252	0.248	0.251	0.250	0.250
	(0.223)	(0.223)	(0.219)	(0.221)	(0.219)	(0.219)
$LEV_{Jun11} \times \mathbb{I}_{DU,LTRO}$		-0.044	-0.116	0.045	0.166	0.144
		(0.067)	(0.075)	(0.138)	(0.172)	(0.183)
$LEV_{Jun11} \times \mathbb{I}_{LTRO}$		0.054	0.131	0.287*	0.225	0.210
		(0.122)	(0.118)	(0.145)	(0.135)	(0.138)
$ROA_{Jun11} \times \mathbb{I}_{DU,LTRO}$			-0.058***	-0.070***	-0.051**	-0.031
			(0.021)	(0.017)	(0.021)	(0.024)
$ROA_{Jun11} \times \mathbb{I}_{LTRO}$			0.065***	0.051***	0.040**	0.072
			(0.020)	(0.018)	(0.017)	(0.055)
$T1R_{Jun11} \times \mathbb{I}_{DU,LTRO}$				0.363**	0.380**	0.386**
				(0.171)	(0.167)	(0.158)
$T1R_{Jun11} \times \mathbb{I}_{LTRO}$				0.370***	0.380***	0.409***
				(0.138)	(0.139)	(0.140)
$NPL_{Jun11} \times \mathbb{I}_{DU,LTRO}$					-0.348**	-0.285
					(0.153)	(0.196)
$NPL_{Jun11} \times \mathbb{I}_{LTRO}$					0.245**	0.335**
					(0.111)	(0.164)
$Large \times \mathbb{I}_{DU,LTRO}$						-0.013
						(0.013)
$Large \times \mathbb{I}_{LTRO}$						-0.019
						(0.025)
Firm-Time FE	✓	✓	✓	✓	✓	✓
Bank-Firm FE	✓	✓	✓	✓	✓	✓
Sample	Multiple Lenders	Multiple Lenders	Multiple Lenders	Multiple Lenders	Multiple Lenders	Multiple Lenders
Observations	2,171,749	2,171,749	2,171,749	2,171,749	2,171,749	2,171,749
R-squared	0.700	0.700	0.701	0.701	0.701	0.701

Table OA.2: Bank Credit Supply During the Dry-Up and the Intervention Periods, Robustness. This table presents the results from specification (2), where we saturate the baseline specification adding one bank balance sheet control at the time. The dependent variable is the difference in log (stock of) credit granted. $Exposure_{Jun11}$ is the exposure to the foreign wholesale market, divided by assets, in June 2011. $\mathbb{I}_{DU,LTRO}$ is a dummy equal to one in the dry-up and intervention periods. $\mathbb{I}_{LTRO}$ is a dummy equal to one in the intervention period. The normal period runs from December 2010 to June 2011. The dry-up period runs from June 2011 to December 2011. The intervention period runs from December 2011 to June 2012. *Share* is the share of total firm i credit obtained from bank j, *Drawn/Granted* is the ratio of drawn credit over committed credit between bank j and firm i, *Overdraft* is the share of overdraft credit between firm i and bank j, *LEV* is leverage, *ROA* is return on assets, *T1R* is the Tier 1 Ratio, *NPL* is nonperforming loans ratio, and *Large* is a variable equal to bank total assets if the bank is one of the five largest banks and zero otherwise. Standard errors double clustered at the bank and firm level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: Bank of Italy.

Panel A Exposed Banks		Jun10	Dec10	Jun11	Dec11	Jun12	Dec12
Total Assets	€billions	10.2	10.5	11.0	11.4	12.9	12.9
Leverage	Units	13.5	14.2	13.2	13.4	14.0	13.9
Tier 1 Ratio	Units	8.9	8.7	9.1	9.4	10.4	10.8
Risk-Weighted Assets	%Assets	71.7	70.6	71.2	69.3	64.3	60.8
Non-performing Loans	%Liabilities	8.1	8.0	8.6	8.9	10.8	11.7
Private Credit	%Assets	64.7	66.8	68.9	69.1	69.4	69.4
- Credit to Households	%Assets	15.9	16.6	17.1	17.7	17.5	18.0
- Credit to Firms	%Assets	40.5	42.3	43.7	44.7	44.1	42.8
Securities	%Assets	13.9	13.6	14.2	14.9	20.0	18.5
- Government Bonds	%Assets	3.3	5.1	7.1	7.7	12.3	15.0
Cash Reserves	%Assets	0.4	0.4	0.4	0.4	0.4	0.5
ROA	Profits/Assets	0.2	0.3	0.2	0.2	0.2	0.1
Central Bank Borrowing	%Assets	0.4	3.1	1.8	7.2	11.0	10.8
Household Deposits	%Assets	27.4	26.6	24.7	25.5	24.5	25.0
Wholesale Funding	%Assets	11.0	10.9	12.2	11.5	11.7	10.9
Bond Financing	%Assets	19.3	20.6	22.8	19.3	16.9	16.5

Panel B Non-Exposed Banks		Jun10	Dec10	Jun11	Dec11	Jun12	Dec12
Total Assets	€billions	1.2	1.1	1.3	1.1	1.4	1.6
Leverage	Units	10.8	10.9	10.8	10.4	11.4	11.6
Tier 1 Ratio	Units	12.5	11.7	11.4	12.3	12.8	12.5
Risk-Weighted Assets	%Assets	68.4	70.1	68.0	69.8	65.7	64.3
Non-performing Loans	%Liabilities	8.3	8.5	8.7	9.2	10.9	11.9
Private Credit	%Assets	64.1	67.5	70.1	71.1	71.5	76.1
- Credit to Households	%Assets	18.8	19.3	20.0	19.7	19.6	20.2
- Credit to Firms	%Assets	42.4	45.0	47.0	49.1	48.8	51.2
Securities	%Assets	15.4	14.5	14.0	16.1	23.4	20.6
- Government Bonds	%Assets	4.7	5.6	6.2	7.9	15.8	15.5
Cash Reserves	%Assets	0.5	0.6	0.5	0.6	0.5	0.6
ROA	Profits/Assets	0.1	0.2	0.1	0.2	0.1	0.2
Central Bank Borrowing	%Assets	0.0	0.0	0.0	2.1	12.2	12.5
Household Deposits	%Assets	38.1	35.7	34.9	33.8	33.8	34.6
Wholesale Funding	%Assets	1.6	1.6	1.6	1.6	1.7	1.5
Bond Financing	%Assets	20.5	20.1	20.2	17.0	14.4	13.9

Table OA.3: Exposed and Non-Exposed Banks: Time-Series Evolution. This table shows cross-sectional medians of selected balance sheet items during the period from June 2010 to December 2012. The top panel (bottom panel) shows medians for the subsample of exposed (non-exposed) banks. Exposed (Non-exposed) banks have a June 2011 exposure to the foreign wholesale market above (below) median. This table extends Table 2 to capture the time-series dimension. Source: Bank of Italy.

	Private Credit	Government Bonds	Private Credit	Government Bonds
$Uptake \times \mathbb{I}_{LTRO}$	0.452*	0.102*	0.907***	-0.028
	(0.238)	(0.051)	(0.092)	(0.108)
$LEV_{Jun11} \times \mathbb{I}_{LTRO}$	0.118	-0.117	-0.546***	0.509
	(0.330)	(0.144)	(0.134)	(0.320)
$ROA_{Jun11} \times \mathbb{I}_{LTRO}$	26.069***	-1.235	-0.506	-0.563
	(6.816)	(1.674)	(1.957)	(2.481)
$T1R_{Jun11} \times \mathbb{I}_{LTRO}$	-0.189	0.055	-0.068**	0.082*
	(0.366)	(0.100)	(0.031)	(0.042)
$NPL_{Jun11} \times \mathbb{I}_{LTRO}$	62.246*	-23.346*	-24.472***	-11.178
	(34.082)	(13.028)	(5.128)	(11.101)
$Size_{Jun11} \times \mathbb{I}_{LTRO}$	-0.023***	0.000	-0.011***	-0.010
	(0.006)	(0.002)	(0.004)	(0.009)
Time FE	✓	✓	✓	✓
Bank FE	✓	✓	✓	✓
Sample	Exposed Banks	Exposed Banks	Non-Exposed Banks	Non-Exposed Banks
Observations	481	468	468	468
R-squared	0.891	0.994	0.940	0.955

Table OA.4: Transmission of LTRO Liquidity by Exposed and Non-Exposed Banks. This table shows the results from a difference-in-differences regression during the period from June 2011 to June 2012. The unit of observation is at the bank-month level. $\mathbb{I}_{LTRO}$ is a dummy equal to one in the intervention period from January 2012 to June 2012. The independent variable in columns (1) and (3) is the total private credit normalized by total assets in June 2011. The independent variable in columns (2) and (4) is the holdings of government bonds normalized by total assets in June 2011. In columns (1) and (2) the sample includes banks with an exposure to the dry-up above median. In columns (3) and (4) the sample includes banks with an exposure to the dry-up below median. *Uptake* is the total LTRO uptake divided by assets in June 2011, LEV is leverage, ROA is return on assets, $T1R$ is the Tier 1 Ratio, NPL is nonperforming loans ratio, and $Size$ is log(assets). Standard errors clustered at the bank level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Source: Bank of Italy.

Firm Characteristics		**Dec10**	**Dec11**	**Dec12**
Q1				
Risky	Dummy	0	0	0
Firm Profitability	EBITDA	2.2	1.8	0.9
Leverage	%	37.9	38.5	35.4
Total Assets	€billions	652.0	665.0	650.0
Median				
Risky	Dummy	1	1	1
Firm Profitability	EBITDA	6.2	5.9	5.3
Leverage	%	67.8	68.6	66.8
Total Assets	€billions	1,533.0	1,553.0	1,523.0
Q3				
Risky	Dummy	1	1	1
Firm Profitability	EBITDA	11.4	11.1	10.4
Leverage	%	87.3	87.9	87.5
Total Assets	€billions	4,058.0	4,099.0	4,025.0
Mean				
Risky	Dummy	0.491	0.487	0.486
Firm Profitability	EBITDA	6.8	5.1	3.0
Leverage	%	61.0	62.1	61.8
Total Assets	€billions	9,226.4	9,299.0	9,311.5

Table OA.5: Summary Statistics, Firms. This table shows firm summary statistics at December 2010, December 2011, and December 2012. The four panels show the first quartile, the median, the third quartile, and the mean, respectively. Firm characteristics include a risk dummy equal to one if the firm has a Z-score greater or equal than 5 (range 1-9), profitability (EBITDA), leverage, and total assets. Source: Cebi-Cerved Database.

OA.4 Institutional Details

This section documents, in great detail, the institutional setting. In Appendix OA.4.1, we present the ECB collateral framework. In Appendix OA.4.2, we present (i) the legislative framework behind government guaranteed bonds and (ii) present anecdotal evidence confirming that the program was designed to allow banks to expand their eligible collateral in order to access LTRO2.

OA.4.1 ECB Collateral Framework

In this Appendix, we discuss the ECB collateral framework and describe the evolution of holdings of available (non-pledged) collateral securities during the period June 2011–November 2011.

Every bank has access to ECB liquidity and, in particular, to the 3-Year LTRO. To be able to borrow at ECB, banks are required to post eligible collateral. The list of eligible collateral securities is posted and constantly updated on ECB website. There, intermediaries can check which securities are pledgeable and what is the haircut that the central bank applies to each asset. The haircut depends mainly on the asset class, rating, coupon structure, and residual maturity. Table OA.6 and Table OA.7 provide examples of valuation haircuts, taken on a specific day, from the ECB website.

Haircuts are applied at the market value of the security. If the market value drops before the ECB loan matures, banks might receive a margin call from ECB asking to post additional collateral. Haircuts are not changed often and, crucially, are unchanged around the allotment of the 3-Year LTRO.

OA.4.2 Government Guaranteed Bank Bonds (GGBBs)

After the 2008 financial crisis, the European Commission temporarily relaxes the standard restrictions on financial sector government support. As the sovereign crisis deteriorates even further in the summer of 2011, the European Commission extends the temporary framework to allow peripheral eurozone governments to back their weak domestic banking sectors (see European Commission (2011)). On 6 December, the Italian government implements the European Commission guideline (see Italian Government (2011)) allocating a government budget of million €200 to bank liabilities guarantees for the 2012-2016 period. Under these scheme Italian banks can apply, not later than June 30, 2012, to receive a government guarantee on specific debt instruments (principal and interests).

The guarantee has a maturity between three months and five years (or seven years in the case of covered bonds). The Bank of Italy is in charge of evaluating the capitalization of the applicant bank in order to ensure that the entity is not insolvent. The guarantee is irrevocable, cannot be conditioned on other obligations, and it might be granted only to banks with Italian legal residence. Banks can obtain government guarantees up to what is "necessary to reactivate their medium- and long-term financing capacity". However, individual bank's guarantees cannot exceed the regulatory capital. The Bank of Italy monitors that these limits are respected. After having determined that

Levels of valuation haircuts applied to eligible marketable assets										
		Liquidity categories								
Credit quality	*Residual maturity (years)*	Category I		Category II		Category III		Category IV		Category V
		fixed coupon	zero coupon	fixed coupon	zero coupon	fixed coupon	zero coupon	fixed coupon	zero coupon	
Steps 1 and 2 (AAA to A-)	0-1	0.5	0.5	1.0	1.0	1.5	1.5	6.5	6.5	
	1-3	1.5	1.5	2.5	2.5	3.0	3.0	8.5	9.0	
	3-5	2.5	3.0	3.5	4.0	5.0	5.5	11.0	11.5	
	5-7	3.0	3.5	4.5	5.0	6.5	7.5	12.5	13.5	16
	7-10	4.0	4.5	5.5	6.5	8.5	9.5	14.0	15.5	
	>10	5.5	8.5	7.5	12.0	11.0	16.5	17.0	22.5	
		Liquidity categories								
Credit quality	*Residual maturity (years)*	Category I		Category II		Category III		Category IV		Category V
		fixed coupon	zero coupon	fixed coupon	zero coupon	fixed coupon	zero coupon	fixed coupon	zero coupon	
Step 3 (BBB+ to BBB-)	0-1	5.5	5.5	6.0	6.0	8.0	8.0	15.0	15.0	
	1-3	6.5	6.5	10.5	11.5	18.0	19.5	27.5	29.5	
	3-5	7.5	8.0	15.5	17.0	25.5	28.0	36.5	39.5	
	5-7	8.0	8.5	18.0	20.5	28.0	31.5	38.5	43.0	Not eligible
	7-10	9.0	9.5	19.5	22.5	29.0	33.5	39.0	44.5	
	>10	10.5	13.5	20.0	29.0	29.5	38.0	39.5	46.0	

Table OA.6: ECB Collateral Schedule at LTRO (marketable assets). This table shows the haircuts applied by the European Central Bank for each eligible collateral type pledged during open market operations after 28 July 2010, including longer term LTROs. The liquidity categories are (i) government bonds and debt instrument issued by central banks; (ii) local and regional government debt instruments, Jumpo covered bonds, agency debt instruments, and supranational debt instruments; (iii) traditional and structured covered bank bonds and corporate debt instruments; (iv) uncovered credit institutions debt instruments; (v) ABSs. Standard floaters belong to maturity category 0-1 years and another (unreported) table is applied to inverse floaters. This table is publicly available and directly taken from the ECB website `www.ecb.europa.eu` and has been published on 28 July 2010. Source: ECB website.

the issuer eligible to receive the guarantee, the Bank of Italy communicates the positive response to the Italian Treasury. Within five days, the Treasury then confidentially communicates the approval of the guarantee to the bank.

Eligible financial debt instruments must be senior, euro denominated, plain vanilla, and issued after 22 December 2011. The also need to have fixed coupon and a unique principal payment at maturity. For each bank, the share of financial instruments with maturity greater than three years cannot exceed one third of the total nominal value of guaranteed instruments. The bank needs to pay a fee that is the sum of a fixed commission and a variable part based on the riskiness of the issuer. The cost of the guarantee is approximately one percent of the guaranteed amount.

OA.4.3 GGBBs and LTRO: Anecdotal Evidence

In this subsection, we document anecdotal evidence confirming that (i) self-issued government guaranteed bonds were entirely used to tap the second LTRO allotment and (ii) the cost of the guarantee was non negligible implying that only banks with scarce available collateral had the incentive to pay the government guarantee.

Levels of valuation haircuts applied to eligible non-marketable assets				
		Asset categories		
Credit quality	*Residual maturity (years)*	Credit claims		Non-marketable RMB debt
		Fixed interest payment and a valuation based on a theoretical price assigned by the NCB	Fixed interest payment and a valuation according to the outstanding amount assigned by the NCB	
Steps 1 and 2 (AAA to A-)	0-1	8.0	10.0	24
	1-3	11.5	17.5	
	3-5	15.0	24.0	
	5-7	17.0	29.0	
	7-10	18.5	34.5	
	>10	20.5	44.5	
Credit quality	*Residual maturity (years)*	Credit claims		Non-marketable RMB debt
		Fixed interest payment and a valuation based on a theoretical price assigned by the NCB	Fixed interest payment and a valuation according to the outstanding amount assigned by the NCB	
Step 3 (BBB+ to BBB-)	0-1	15.5	17.5	Not eligible
	1-3	28.0	34.0	
	3-5	37.0	46.0	
	5-7	39.0	51.0	
	7-10	39.5	55.5	
	>10	40.5	64.5	

Table OA.7: ECB Collateral Schedule at LTRO (non-marketable assets). This table shows the haircuts applied by the European Central Bank for each eligible collateral type pledged during open market operations after 28 July 2010, including longer term LTROs. The liquidity categories are (i) government bonds and debt instrument issued by central banks; (ii) local and regional government debt instruments, Jumbo covered bonds, agency debt instruments, and supranational debt instruments; (iii) traditional and structured covered bank bonds and corporate debt instruments; (iv) uncovered credit institutions debt instruments; (v) ABSs. Standard floaters belong to maturity category 0-1 years and another (unreported) table is applied to inverse floaters. This table is publicly available and directly taken from the ECB website www.ecb.europa.eu and has been published on 28 July 2010. Source: ECB website.

Use of Government Guaranteed Bank Bonds UBI Banca, in the 2012 Annual Financial Financial statement documents that *"The increase in the assets [eligible at ECB] is the result of a series of actions undertaken in the first quarter of the year (+€13 billion) [...] The principal strategic initiatives implemented during 2012 were the issuance by UBI Banca, of bonds with a government guarantee for a total nominal amount of €6 billion (€5.8 billion net of haircuts) [...]"*. In its 2012 annual statement, Banco Popolare di Milano states that *"the following are the own bonds issued and repurchased as part of the refinancing operations with the European Central Bank [...] and provided as collateral for the advances received from central banks (OMO – Open Market Operations): (i)"BPM 23.03.2012-2017* 5.90%*" bonds guaranteed by the Government, for a nominal value of €0.5 billion; (ii) "BPM 23.03.2012-2015* 4.90%*" bonds guaranteed by the Government, for a nominal value of €1.0 billion."* In its 2012 annual financial statement, Banca Carige states that *"assets held to guarantee own liabilities include [...] own debt securities, irrevocably and unconditionally guaranteed by the Italian Government pursuant to Art. 8 of Law Decree 201/2011, amounting to €2,000 million, pledged as a guarantee to the European Central Bank for Long Term*

Refinancing Operations (LTRO)."

Rationale for the Italian Government GGBBs Law Fitch Ratings (2012) notes that *"The Italian government was quick to establish a government-guaranteed bond scheme to enable the banks to create collateral by issuing selfretained bonds. Fitch understands that the LTRO funds to date have been used primarily to replace short-term interbank and institutional funding or wholesale maturities, with very little invested in government debt so far. The Bank of Italy expects the banks to use LTRO funding to sustain loan availability to the real economy. Measures taken by the Italian government and the central bank have enabled the banking sector to increase available ECB-eligible collateral substantially. This additional collateral has eased pressure on funding, which had intensified during Q411. According to the Bank of Italy, at end-January 2012 the Italian banking sector had about €150 billion unencumbered eligible collateral. The recent decision to allow additional assets (rated loans) as collateral could increase available collateral by about €70–€90 billion. This puts the total of potential unutilised available collateral prior to February's LTRO at around €250 billion."* Similarly, Unicredit Credit Research (2014) illustrates that the government law was *"carried out in order to stabilize the Italian credit system and to provide Italian banks with state guarantees on their bonds, which could then be posted as ECB collateral for much needed liquidity: 3Y LTROs."*

Cost of the Government Guarantee Intesa Sanpaolo, in its 2012Q1 financial statement, reports that *"compared to the fourth quarter of 2011, net fee and commission income for the first quarter of 2012 fell slightly by* 1.6%*, entirely due to the impact of the cost for the government guarantee on the bank's bonds [...]."* Similarly. in its 2012 annual financial statement, Banco Popolare states that *"net fee and commission income was negative, corresponding to €-37.4 million, insofar as it includes the cost of bonds guaranteed by the government."* Monte dei Paschi Siena, in its 2012 annual report, states that *"net fees and commissions were impacted by the cost of the Government guarantee required to gain access to ECB LTROs, as against a slight growth in retail and corporate components [...] The downtrend as compared to 2011 was mainly accounted for by institutional funding charges (particularly commissions on the Government guarantee required to gain access to ECB LTROs)."*

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