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Italian Sovereign Spreads: Their Determinants and Pass-through to Bank Funding Costs and Lending Conditions

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Italian Sovereign Spreads: Their Determinants and Pass-through to Bank Funding Costs and Lending Conditions[1]

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Abstract

Volatility in Italian sovereign spreads has increased since mid-2011. This paper finds that news on the euro area debt crisis and country specific events were important drivers of sovereign spreads. Movements in sovereign spreads affect CDS spreads and bond yields of Italian banks, and are transmitted rapidly to firm lending rates. Banks with lower capital ratios and higher nonperforming loans were found to be more sensitive to swings in sovereign spreads. Credit supply constraints due to bank funding shortages from the sovereign debt crisis were a major factor behind the lending slowdown in late 2011, while in 2012 weak demand appears to have been driving changes in credit more than supply.

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[1] The paper has benefited from useful comments from Kenneth Kang, Vincenzo Guzzo and other colleagues at the International Monetary Fund. All remaining errors are author's responsibility.

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I. INTRODUCTION

Since the summer of 2011, the Italian sovereign bond market has been hit by a number of shocks. After remaining below 200 basis points (bps) until June 2011, 10-year bond spreads started climbing, peaking at over 500 bps at end-2011. Sovereign spreads tightened for a short period in spring 2012 after the 3-year Long Term Refinancing Operations (LTRO), but then widened again reaching more than 500 bps in July 2012. Spreads have come down steadily since the announcement of the details of the Outright Monetary Transactions (OMT) program last September.
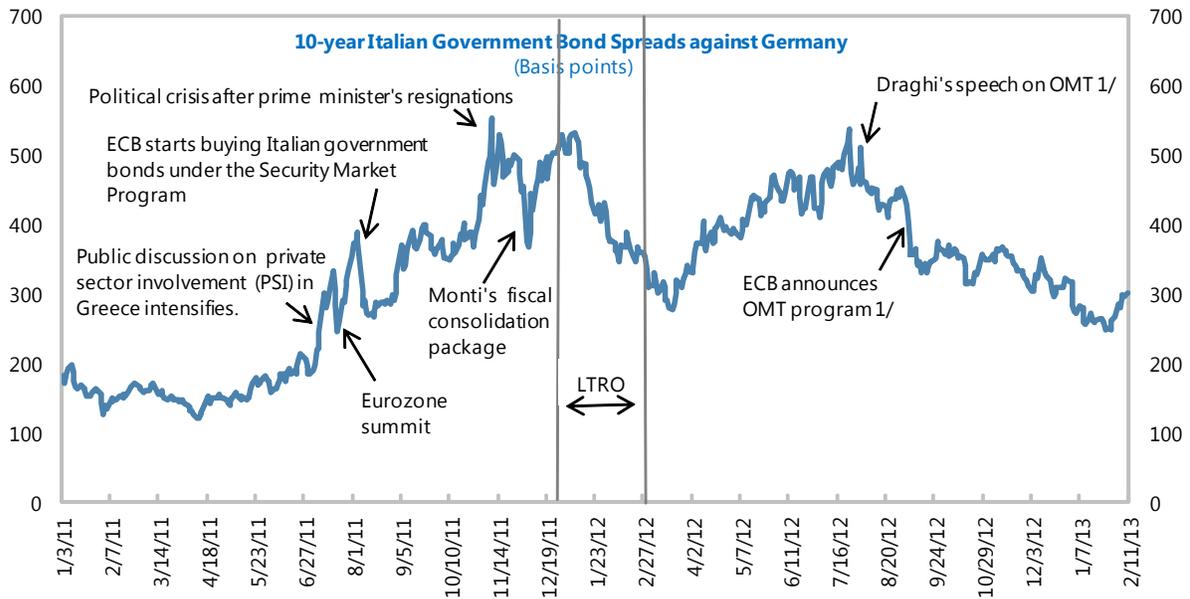
Source: Bloomberg.
1/ Outright Monetary Transactions.

Spillovers from the European sovereign debt crisis have also affected Italian banks' funding costs and lending conditions. Indeed, banks' CDS spreads and bond yields exceeded those of other European peers in the summer of 2011, when pressure on Italian government bonds intensified. Lending rates rose sharply in the second part of 2011, especially for firms, and 12-month credit growth to the non-financial private sector dropped from 3.5 percent in November 2011 to -0.9 percent in December 2012.

Against this background, this paper explores two issues. The first is the determinants of Italian sovereign spreads movements, in particular the role of investor risk appetite, fiscal developments, and news related to international as well as Italian specific events. The second is the pass-through of sovereign spreads on Italian banks' CDS, bond yields, lending rates and credit growth.

The results of the empirical analysis indicate that news related to the euro area debt crisis as well as Italy specific news have been important drivers of Italian sovereign spreads. The findings also suggest that Italy's high debt levels as well as the rise in the share of non-resident

holdings of government debt since the 1990s amplify the impact of investor risk appetite shocks on spreads. This underscores the need to reduce both country-specific and euro area vulnerabilities to contain sovereign risks.
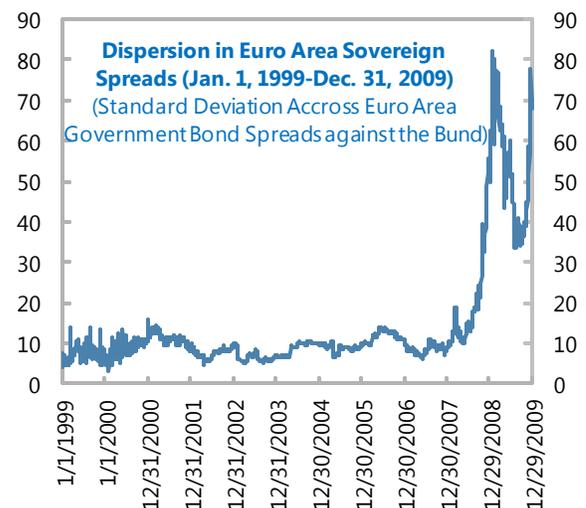
The paper also finds that Italian sovereign risk premiums have a significant impact on domestic banks' funding costs and on lending conditions. The empirical analysis indicates that changes in sovereign spreads affect the CDS spreads as well as bond yields differential of the five largest Italian banks. This effect tends to be larger for institutions with relatively lower capital ratios and higher non-performing loans ratios.

The results also show that movements in country risk premiums rapidly affect corporate borrowing costs. About 30-40 percent of the increase in sovereign spreads is transmitted to firm borrowing rates within three months, and 50-60 percent within six months. Credit supply constraints from bank funding pressures are found to have been the main driver of the lending slowdown at the end of last year.

The paper is organized as follows. Section II analyses the drivers of Italian sovereign spreads. Sections III and IV discuss the impact of sovereign spreads on Italian banks' CDS spreads and bond yields, respectively. Section V assesses the implications of Italian sovereign spreads movements on lending conditions, and Section VI concludes.

II.   FACTORS DRIVING ITALIAN SOVEREIGN SPREADS

In the period preceding the global financial crisis, Italian government bonds spreads moved in line with those of other euro area government bonds. During 1999–2007, sovereign risk premia were compressed as financial markets were not pricing in higher default risk for governments running higher deficits.[2] The empirical literature has generally found that, at least up to 2008, euro area sovereign spreads were mostly driven by a common factor, related to international risk appetite (Codogno and others, 2003; Geyer and others 2004; Sgherri and Zoli, 2009; Caceres and other, 2010; Favero and others, 2010). However, since the Lehman bankruptcy, financial markets have become more discriminating among government issuers (Sgherri and Zoli, 2009; Caceres and other, 2010).

Dispersion in Euro Area Sovereign Spreads (Jan. 1, 1999-Dec. 31, 2009) (Standard Deviation Accross Euro Area Government Bond Spreads against the Bund)

Sources: Bloomberg; and IMF staff calculations.

[2] See Garzarelli and Vaknin (2005) and Debrun and others (2008).

Starting in July 2011, pressure on Italian government bonds intensified considerably, with 10-year bond spreads rising from 186 bps at end June 2011 to 527 bps at end December 2011. The volatility of spreads also increased substantially, with the monthly standard deviation peaking in December 2011–January 2012. The largest daily changes in spreads have taken place at the time of international and Italian related announcements and events. Since the OMT announcement in September 2012, sovereign spreads have steadily declined.

To shed light on the factors driving Italian sovereign spreads, equations for daily changes in Italian 10-year government bond spreads are estimated over January 1, 2008–October 22, 2012. The explanatory variables include an indicator of investor risk appetite, news related to international and Italian specific events, the projected public debt to GDP ratio, and the share of public debt securities held by non-residents.[3] Consistent with the literature, the implied volatility of the S&P stock price index options (VIX index) is used as a proxy for general risk appetite. Indeed, Italian

Sources: Bloomberg; and IMF staff calculations.

government bond spreads have moved in line with the VIX, and changes in the VIX are found to have a statistically significant impact on sovereign spreads (Appendix 1).[4] Also, according to the regression results, changes in the VIX index interacted with the projected debt to GDP ratio push up spreads, suggesting that the high level of debt amplifies the impact of investor risk appetite shocks.[5] Furthermore, the interaction between the VIX index and the share of public debt held by non residents is found to have a significant impact on Italian sovereign

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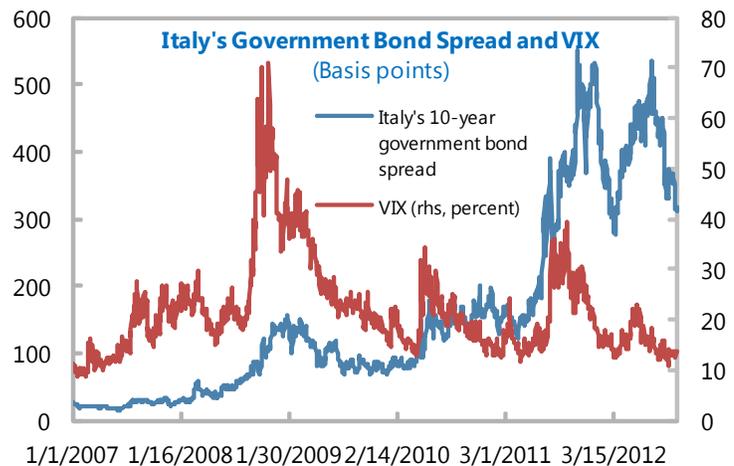
[3] Projected debt to GDP ratio from the Economist Intelligence Unit is used instead of actual debt since the former is in the investor information set when portfolio allocation decisions are made. During the sample period, monthly projections have changed quite dramatically over time, and at times, were very different from the actual outcome. For example, in January 2009, the projected debt to GDP ratio for that year was 107 percent, while actual ratio turned out to be 116 percent.

[4] Since Italy is a systemically important county, movements in the VIX may not be completely exogenous to changes in Italy's spreads. However, Granger causality tests indicate that changes in the VIX affect Italian sovereign spreads, but not the other way around. To help address possible endogeneity, equations are estimated using instrumental variables (Appendix 1). The use of instrumental variables and the inclusion of event dummies should help mitigate the risk that the spreads and the VIX may be both reacting to a third common factor rather than expressing a causal relationship.

[5] For example, at the debt to GDP ratio projected for 2012, a one standard deviation shock in the VIX index sustained for 5 days (a 10 percentage point increase) would increase spreads by almost 24 bps.

spreads, indicating that larger non-resident holdings of debt make spreads more sensitive to shocks in risk appetite (Appendix 1).

Both international and Italian-specific news are also found to have a sizable impact on daily movements in Italian 10-year spreads. Dummies capturing bad and good news related to important international events on the global and European sovereign crisis (e.g., the start of the Irish or Greek programs), as well as positive and negative news related to Italy specific events (e.g., approval of consolidation or reform measures) have a statistically significant and large impact on daily changes in spreads (Appendix 1).[6]

Impact of International and Italian Specific Events on Daily Changes in Italian Government Spreads 1/
(Basis Points)

| International bad news | International good news | Italy specific bad news | Italy specific good news |

Sources: Bloomberg and IMF Staff calculations.
1/ Impact is based on a regressions for daily changes in 10-year government bond spreads estimated over the period January 1, 2008-October 22, 2012. The control variables are changes in the lagged dependent variable and the VIX (Equation [1] in Appendix 1).

Overall, the empirical analysis reveals that news related to the euro area debt crisis as well as Italy specific news have contributed to enhanced sovereign spreads volatility since 2011. The findings also suggest that Italy's high debt levels and the large share of non-resident holdings of government debt may amplify the impact of investor risk appetite shocks on spreads.
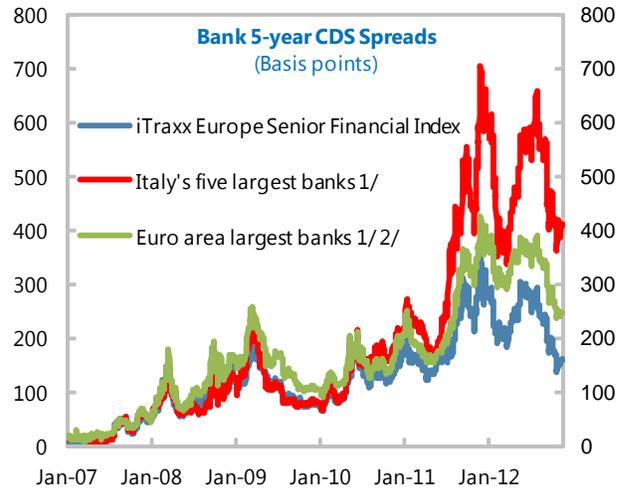
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[6] Appendix 2 provides the list of events captured by the dummies.

III. IMPACT OF SOVEREIGN SPREADS ON BANKS' CDS SPREADS

Throughout the global financial crisis the average CDS spreads of the five largest Italian banks closely tracked the iTraxx Europe senior financial index spreads and the average CDS spreads of the largest euro area banks. However, Italian banks' CDS spreads exceeded those of European peers in the summer of 2011, when pressure on Italian government bonds intensified, suggesting a spillover of sovereign risks to banks.
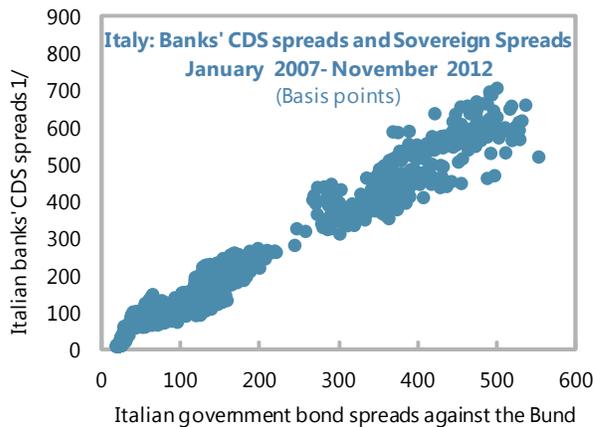
Italian banks' CDS spreads have moved closely with Italy's sovereign spreads since the beginning of the global financial crisis. Indeed, the correlation between changes in banks' CDS spreads and changes in the spread of the 10-year Italian government bond over the Bund has increased from less than 0.1 during the period January 2006–June 2007 to 0.6 during July 2001-October 2012. Co-movements among banks' CDS and sovereign spreads have been significant

Bank 5-year CDS Spreads
(Basis points)
— iTraxx Europe Senior Financial Index
— Italy's five largest banks 1/
— Euro area largest banks 1/2/

Sources: Bloomberg; Bank of Italy; and IMF staff calculations.
1/ Simple average of individual banks CDS spreads.
2/ The selected sample of euro area banks includes Erste, Raiffeisen, KBC, BNP Paribas, Credit Agricole, Societe Generale, Deutsche Bank, Commerzbank, Rabobank, ING Group., Santander and BBVA.

also for other euro area countries (e.g., France) over the same period. Throughout the European debt crisis, peaks in banks' CDS and sovereign spreads have coincided, in concomitance with major international events, such as the Lehman Brothers' bankruptcy, and the announcement of the Greek program.

Italy: Banks' CDS spreads and Sovereign Spreads January 2007- November 2012
(Basis points)

Italian banks' CDS spreads 1/
Italian government bond spreads against the Bund

Sources: Bloomberg and IMF staff calculations.
1/ Simple average of Italy's five largest banks' CDS spreads.

Selected Euro Area Banks' CDS and Sovereign Spreads
(Basis points)
---- French banks
— Italian banks
— Italy's sovereign spreads 1/
— France's sovereign spreads 1/
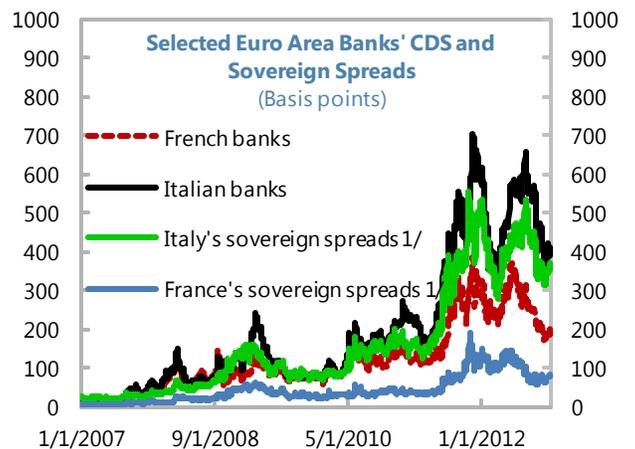
Source: Bloomberg.
1/ 10-year government bond spreads over the Bund.

The correlation between banks' CDS and sovereign spreads movements could be due to different reasons. Following the start of the global crisis, weakness in the financial sector may have become a factor in driving sovereign spreads, especially for governments that committed large public resources to support financial institutions (Mody, 2009; Sgherri and Zoli, 2009).[7] On the other hand, shocks to sovereign bond yields and spreads could have an impact on banks' risk profile through different channels. Rating agencies cap bank ratings on the basis of the sovereign rating, thus creating a link between the two. Government bond yields are benchmark rates affecting banks' funding costs and, hence, their profitability and risk profile. Declines in government bond prices associated with rising yields reduce the value of government securities in banks' portfolios. Furthermore, a sovereign with a heightened risk profile may have limited room to support the banking system, if needed.

A third possible explanation for the correlation between banks' CDS and sovereign spread movements is that risk repricing may have contributed to the widening of both bank and sovereign risk premium at the same time. The literature on contagion has indeed shown how risk repricing due to changes in investor risk appetite can transmit shocks across financial instruments during periods of financial stress (e.g., the 1997 Asian crisis, the Russian and Long-term Capital Management crisis in 1998).[8]

A principal component analysis indicates that movements in euro area banks' CDS and sovereign spreads are largely driven by a common factor. Indeed, almost 70 percent of the variance in the euro area banks' CDS and sovereign spreads series is explained by the first principal component.[9] The loadings, representing the contribution of the individual series to the first principal component, are all positive and similar in size, suggesting that the latent factor might be capturing a common risk indicator.

Given the common movements among euro banks' CDS spreads, it would be appropiate to focus on the differential between Italian banks' CDS spreads and those of other euro area banks, rather than on changes in Italian banks' CDS spreads *per se*, to understand the change in
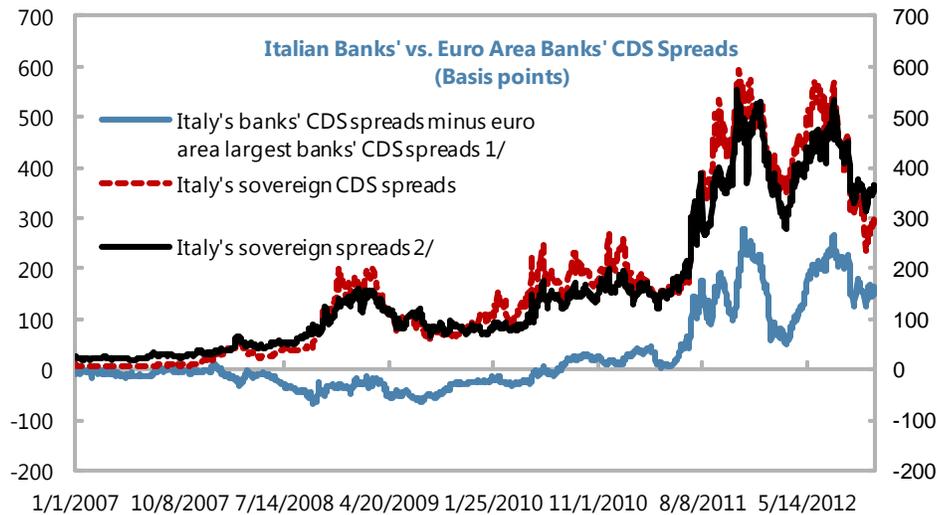
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[7] In Ireland, for example, sovereign spreads started to climb after the government extended a guarantee to the banking system in 2008. Mody (2009) finds that while exposure to the financial sector was not an important determinant of sovereign spreads prior to the collapse of Bear Sterns in March 2008, it became increasingly more significant as the financial crisis progressed. Sgherri and Zoli (2009) show that rising expected default frequencies (EDFs) in the financial sector translated into increases in government spreads in a number of euro area countries in late 2008-early 2009.

[8] Studies on the role of risk appetite as a transmission channel of financial crises include for example Kumar and Persaud (2002), and Dungey, Fry, González-Hermosillo and Martin (2003). Papers examining how financial crises transmit across geographical borders and different asset classes comprise, among others, Dornbusch, Park, and Claessens (2000), Pericoli and Sbracia (2003), and Dungey et al. (2003, 2005, 2006, 2007, 2011).

[9] The series included in the principal component analysis comprise the spreads of 10-year government bonds over the Bunds of Austria, Belgium, Finland, France, Italy, Netherlands, Spain, and the 5-year CDS spreads of twelve euro area banks and five Italian banks (see Appendix 3 for details). All series were standardized before computing the principal component.

perception of Italian banks' risk profile over time. Before and throughout the global financial crisis, the CDS spreads of the five largest Italian banks remained very close and below those of a selected group of large euro area banks.[10] However, starting at the end of April 2010, with the escalation of the European sovereign debt crisis, the differential between Italian and euro area banks' CDS spreads became positive and widened especially after the summer of 2011. Movements in this differential mirror movements in Italian sovereign spreads.

Italian Banks' vs. Euro Area Banks' CDS Spreads (Basis points)

Legend:
- Italy's banks' CDS spreads minus euro area largest banks' CDS spreads 1/
- Italy's sovereign CDS spreads
- Italy's sovereign spreads 2/

X-axis: 1/1/2007 10/8/2007 7/14/2008 4/20/2009 1/25/2010 11/1/2010 8/8/2011 5/14/2012

Sources: Bloomberg and IMF staff calculations.
1/ Simple average of the five largest Italian CDS spreads minus simple average of the CDS spreads of a group of euro area banks. Euro area banks in the sample are Erste, Raiffesein, KBC, BNP Paribas, Credit Agricole, Societe Generale, Deutsche Bank, Commerzbank, Rabobank, ING Group, Santander, and BBVA.
2/ 10-year government bond spreads over the Bund.

Against this background, an econometric model is estimated to explain changes in the CDS spreads of Italian banks relative to those of other euro area banks. The sample consists of daily observations covering the period January 1, 2007- July 31, 2012. The dependent variable is the change in the differential between 5-year CDS spreads of each of the five largest Italian banks and the average CDS spreads of a group of euro area banks. The explanatory variables include the lagged dependent variable and the 5-year Italian sovereign CDS spreads or the 10-year government bond spreads over the Bund (lagged).[11] The bid-ask spreads of each bank's CDS premium are also introduced among the regressors, as an indicator of CDS liquidity. The wider is the bid-ask spread, the higher is the liquidity risk. The VIX index is used as a proxy for

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[10] See Appendix 3 for a list of the euro banks included in the comparison group.

[11] While the possible reverse causality between banks' CDS and sovereign spreads is not fully solved by entering the sovereign spread as a regressor with a lag, the problem is probably not too serious in the case of Italian banks, as they have received little government financial support during the financial crisis. Also, Granger causality tests suggest that changes in sovereign spreads drive changes in individual banks' CDS spreads relative to other euro area banks, and not the other way around.

general risk aversion. The euro 3-month Libor-OIS spread[12] is also added among the explanatory variables as a measure of counterparty risk in the interbank market. All variables are differenced, with the exception of the bid-ask spread, which is stationary. Estimates are carried out using the seemingly unrelated regression method, which accounts for error term correlation among the five Italian banks.

As a variation to the basic estimation model, lagged changes in sovereign spreads are also interacted with a measure of individual bank capital, to assess whether sovereign risks have a bigger impact on institutions with lower capital levels. Specifically, the measure of bank capital is the ratio between the average tier-1 of the euro area banks comparison group and the tier-1 of the individual Italian banks. Also, an alternative model includes as a regressor an interaction term between lagged changes in sovereign spreads and an indicator of the size of non-performing loans. The indicator here is the non-performing loans ratio of the individual Italian bank relative to the average non-performing loans ratio of the euro area banks comparison group.

Estimates indicate that changes in sovereign spreads have had a significant impact on the CDS spreads differential of the five largest Italian banks with respect to a group of euro area banks.[13] The interaction term between sovereign spreads and bank capital has a positive and significant coefficient, suggesting that the impact of sovereign risk on bank risk is larger for institutions with relatively lower capital levels. The interaction term between sovereign spreads and the relative non-performing loan ratio has also a positive and significant coefficient, indicating that sovereign spreads shocks have a greater impact on CDS spreads of banks with higher non-performing loans (Table 1).

The VIX index is found to have a statistically significant effect on the dynamics of four banks' CDS, suggesting that investors demand higher credit risk premiums on some Italian banks more than other European banks when risk appetite declines. On the other hand, tensions in the interbank market, as measured by the Libor-OIS spreads do not appear to have increased Italian banks' CDS spreads relative to other euro area banks.

Overall, the analysis indicates that changes in country risk premiums and in investor risk appetite affect the CDS spreads of the five largest Italian banks. The impact of sovereign spreads shocks on banks' CDS spreads tends to be larger for institutions with relatively lower capital ratios and higher non-performing loans ratios.

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[12] Libor stands for London interbank offered rates, and the OIS for overnight index swap rates. The spreads between these two interest rates is considered a measure of distress in the interbank market.

[13] Similar results are obtained regardless of whether sovereign CDS spreads or 10-year government bond spreads to the Bund are used as regressors.

Table 1. Determinants of Daily Changes in Italian Banks' CDS Spreads Relative to Euro Area's Banks' CDS Spreads 1/

|	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5
Constant	0.03	0.02	**0.25**	0.22	-0.33	-0.06	-0.08	0.05	-0.18	-0.01	0.02	0.03	0.20	0.12	-0.33
P-value	*0.88*	*0.94*	*0.02*	*0.58*	*0.47*	*0.74*	*0.80*	*0.80*	*0.71*	*0.10*	*0.92*	*0.88*	*0.50*	*0.78*	*0.48*
Bid-ask spread	0.06	0.01	0.07	0.00	0.03	0.01	0.01	0.01	0.00	0.02	0.01	0.00	0.00	0.00	0.03
P-value	*0.80*	*0.62*	*0.70*	*0.95*	*0.32*	*0.77*	*0.73*	*0.80*	*0.94*	*0.60*	*0.01*	*0.99*	*0.96*	*0.96*	*0.30*
D(VIX)	**0.54**	**0.58**	**0.68**	**0.60**	0.51	**0.19**	**0.25**	**0.17**	0.21	0.20	**0.49**	**0.52**	**0.61**	**0.54**	0.50
P-value	*0.00*	*0.00*	*0.00*	*0.00*	*0.23*	*0.00*	*0.00*	*0.03*	*0.15*	*0.14*	*0.00*	*0.00*	*0.00*	*0.00*	*0.20*
D(Sovereign spread(-1))	**0.09**	**0.17**	**0.12**	**0.22**	0.04	**0.03**	**0.11**	**0.04**	**0.14**	**0.09**	0.02	**0.13**	**0.06**	**0.17**	**0.07**
P-value	*0.00*	*0.00*	*0.00*	*0.00*	*0.10*	*0.06*	*0.00*	*0.02*	*0.00*	*0.00*	*0.44*	*0.00*	*0.02*	*0.00*	*0.06*
D(Libor-OIS spread(-1))	0.03	0.01	0.07	0.02	-0.04	-0.03	-0.04	-0.05	-0.02	-0.02	-0.01	**0.01**	0.00	0.02	-0.11
P-value	*0.50*	*0.80*	*0.30*	*0.75*	*0.60*	*0.22*	*0.26*	*0.38*	*0.83*	*0.72*	*0.65*	*0.69*	*0.98*	*0.73*	*0.24*
D(Dep. variable(-1))	-0.02	**-0.05**	**-0.05**	-0.04	0.03	**-0.06**	**-0.05**	**-0.07**	-0.04	**0.01**	**-0.06**	**-0.06**	**-0.10**	-0.04	-0.03
P-value	*0.23*	*0.00*	*0.00*	*0.08*	*0.29*	*0.05*	*0.02*	*0.00*	*0.14*	*0.71*	*0.00*	*0.00*	*0.00*	*0.12*	*0.24*
D(Sovereign spread(-1)) *relative capital	-	-	-	-	-	**0.22**	**0.20**	**0.29**	**0.26**	**0.20**	-	-	-	-	-
P-value						*0.00*	*0.00*	*0.00*	*0.00*	*0.00*					
D(Sovereign spread(-1)) *relative NPL ratio	-	-	-	-	-	-	-	-	-	-	**0.05**	**0.13**	**0.03**	**0.02**	**0.03**
P-value											*0.00*	*0.00*	*0.04*	*0.21*	*0.23*
Adj. R^2	0.1	0.1	0.1	0.1	0.02	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
N. Observations	1450	1450	1450	1450	1176	1433	1433	1433	1433	981	1627	1693	1563	1305	1160

Source: IMF staff estimates.
1/ Bolded coefficients are those statistically significant at the 5 or 1 percent level.

IV. IMPACT OF SOVEREIGN SPREADS ON BANKS' BOND YIELDS

The previous section discussed the impact of sovereign spreads on banks CDS spreads, which are indicators of bank riskiness, as perceived by the market. This section focuses on the impact of sovereign spreads on bank bond yields—a more direct measure of funding costs.
Yields on bonds issued by the five largest Italian banks have been higher than the average on bonds issued by other euro area banks starting in July 2011, peaking in November 2011 when Italian sovereign spreads were at the apex.[14] Movements in Italian bank securities' yields have been more correlated with those of sovereign spreads than with changes in the 3-month euribor—an indicator of monetary conditions.

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[14] Portfolios of debt securities issued by Italian and other euro area banks were constructed using bonds broadly comparable in terms of maturity and seniority.
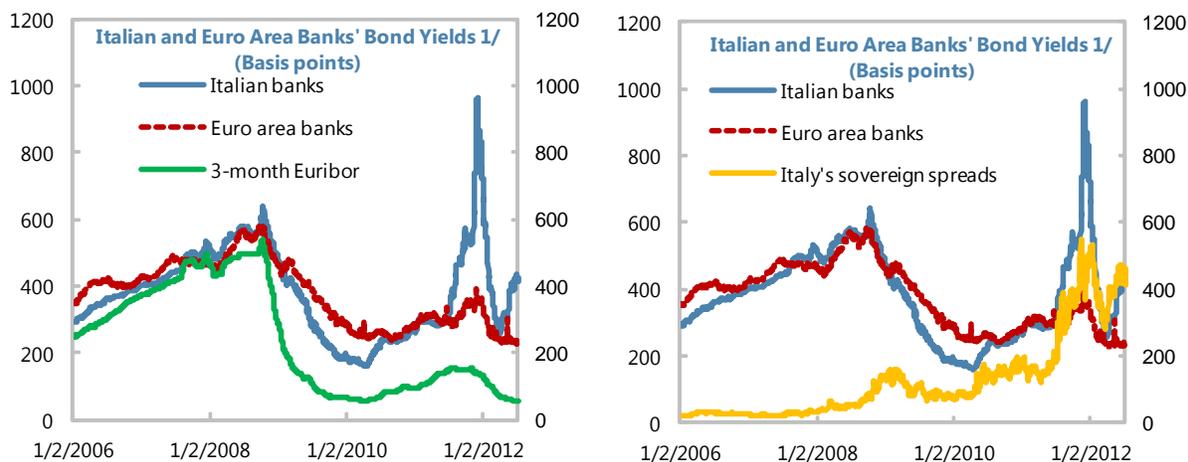
Sources: Bloomberg, Datastream; and IMF staff calculations.
1/ Unweighted average yields of bonds issued by the five largest Italian banks, and unweighted average yields of bonds issued by a group of euro area banks. Euro area banks in the sample are Erste, Raiffesein, Dexia, Fortis, KBC, BNP Paribas, Credit Agricole, Societe Generale, Deutsche Bank, Commerzbank, ABN Amro, Rabobank, ING Group.

Against this background, we estimate an econometric model over the period January 1, 2007- July 31, 2012 to assess the impact of sovereign spreads movements on Italian banks' bond yields.[15] The dependent variable is the change in the differential between the yields on bonds issued by Italian banks and the average yields on bonds issued by a group of euro area banks.[16] The explanatory variables include the lagged dependent variable, changes in the 5-year Italian sovereign CDS spreads or the 10-year government bond spreads over the Bund (lagged), and changes in the VIX index and in the euro 3-month Libor-OIS spread. Again, lagged changes in sovereign spreads are also interacted with the measure of relative bank capital and the relative non-performing loans ratio of Italian banks with respect to euro area peers. Estimates are carried out using the seemingly unrelated regression method.

The econometric results suggest that changes in sovereign spreads have had a significant impact on the bond yield differential of the five largest Italian banks vis-à-vis a group of euro area banks. The interaction term between sovereign spreads and bank capital has a positive and significant coefficient for four of the Italian banks in the sample. The interaction term between sovereign spreads and the relative non-performing loan ratio also has a positive and significant coefficient. In other words, banks with lower relative capital ratios and higher nonperforming loans were more sensitive to changes in sovereign spreads. The estimated effect is that a 100 bps widening in Italian sovereign spreads would result in an average 15-20 bps increase in

[15] In a similar vein, to gauge the impact of sovereign risks on bank funding costs, Albertazzi et al. (2012) estimate the impact of Italian sovereign spreads on bank deposit rates. They find that a 100 bps increase in the spread, lasting for a quarter, is associated, within the same quarter, with a 34 and 21 bps rise in the interest rate on households' deposits with agreed maturity and repurchase agreements, respectively. The impact has been greater during the sovereign debt crisis, reaching around 40 bps for both instruments. The effect is larger for the interest paid on newly issued bonds (79 bps), especially during the sovereign debt crisis (100 bps).

[16] See Appendix 3 for the list of banks included in the group.

Italian banks' bond yields compared to other euro area banks. The coefficient on the VIX index has the expected positive sign and is statistically significant consistently only for two banks. The evidence is mixed on whether Libor-OIS spreads have significantly affected Italian banks' bond yields relative to other euro area banks.

Table 3. Determinants of Changes in Italian Banks' Bond Yields Relative to Euro Area's Banks' Bond Yields

|	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5
Constant	0.12	0.06	**0.20**	0.07	0.15	0.10	-0.08	0.18	-0.16	0.17	0.10	0.00	0.20	0.01	0.10
P-value	*0.71*	*0.87*	*0.38*	*0.90*	*0.68*	*0.79*	*0.85*	*0.41*	*0.84*	*0.70*	*0.76*	*0.99*	*0.40*	*0.99*	*0.80*
D(VIX)	**0.37**	**0.77**	0.02	**0.57**	0.11	**0.36**	**0.63**	-0.18	0.19	0.25	**0.38**	**0.57**	-0.18	0.27	0.17
P-value	*0.05*	*0.00*	*0.83*	*0.05*	*0.56*	*0.06*	*0.00*	*0.13*	*0.64*	*0.29*	*0.00*	*0.00*	*0.13*	*0.39*	*0.42*
D(Sovereign spread(-1))	**0.08**	**0.30**	**0.15**	**0.11**	**0.20**	**0.08**	**0.28**	**0.13**	0.08	**0.17**	**0.08**	**0.27**	**0.13**	0.08	**0.17**
P-value	*0.05*	*0.00*	*0.00*	*0.07*	*0.00*	*0.04*	*0.00*	*0.00*	*0.30*	*0.00*	*0.06*	*0.00*	*0.02*	*0.25*	*0.00*
D(Libor-OIS spread(-1))	0.00	0.01	**0.18**	**0.46**	**0.37**	0.15	**0.22**	0.05	0.11	0.14	0.14	**0.20**	0.05	0.08	0.13
P-value	*0.98*	*9.92*	*0.02*	*0.02*	*0.00*	*0.11*	*0.05*	*0.32*	*0.65*	*0.20*	*0.11*	*0.02*	*0.30*	*0.55*	*0.15*
D(Dep. variable(-1))	**-0.27**	**-0.28**	**-0.11**	**-0.34**	-0.10	**-0.27**	**-0.29**	**-0.11**	-0.34	**-0.10**	**-0.28**	**-0.29**	**-0.12**	**-0.34**	**-0.10**
P-value	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
D(Sovereign spread(-1)) *relative capital	-	-	-	-	-	0.01	**0.12**	**0.11**	**0.16**	**0.15**	-	-	-	-	-
P-value						*0.96*	*0.00*	*0.00*	*0.00*	*0.00*					
D(Sovereign spread(-1)) *relative NPL ratio	-	-	-	-	-	-	-	-	-	-	0.01	**0.07**	**0.06**	**0.09**	**0.16**
P-value											*0.79*	*0.00*	*0.00*	*0.00*	*0.00*
Adj. R^2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
N. Observations	1439	1439	1439	1412	1439	1433	1175	1404	954	1234	1367	1433	1363	1278	1433

Source: IMF staff estimates.

1/ Bolded coefficients are those statistically significant at the 10 or 5 or 1 percent level.

V. IMPACT OF MOVEMENTS IN SOVEREIGN SPREADS ON LENDING CONDITIONS

Credit conditions in Italy tightened as higher volatility in the Italian sovereign debt market since the summer 2011 pushed up funding costs and limited banks' access to the international wholesale markets. Rates on new firm loans increased by 100 bps in the second part of 2011, and those on new mortgages rose by 80 bps. In January, however, rates on firm loans started to decline, as sovereign spreads fell (Figure 1). Indeed, Italian sovereign spreads and lending rates have moved together especially since 2009.

To evaluate the impact of sovereign spreads on firm lending rates, a VAR is estimated at monthly

Sovereign Spreads and Firm Lending Rates (Percent)
— Average firm lending rates on new loans
--- Government bond spreads versus Bunds
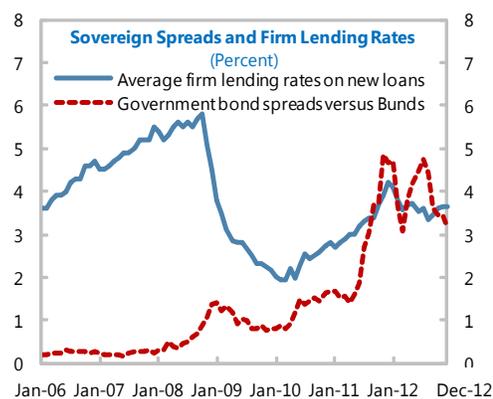
Source: Bank of Italy.

frequency over January 2006-September 2012.[17] The endogenous variables in the VAR are the lending rate, the 10-year government bond spread over the Bund and the average CDS spreads of the five largest Italian banks (all in first differences). Changes in the 3-months euribor are also included as an exogenous variable. The model focuses on the impact of sovereign spreads, instead of yields, as the former measure the country risk premium affecting banks' CDS spreads and their funding costs, as discussed in sections C and D, whereas the euribor is a proxy for the underlying interest rate.

The results suggest that changes in sovereign spreads quickly affect corporate borrowing costs. About 30-40 percent of the increase in sovereign spreads is transmitted to firm lending rates within three months, and 50-60 percent is transmitted within six months, with a somewhat higher pass-through for small loans.[18] Albertazzi et al. (2012) also find a rapid pass-through from Italian sovereign spreads to lending rates, especially during periods when spreads are high. According to their estimates, during the sovereign debt crisis, the response of firm loan rates to a temporary 100 bps increase in 10-year government bond spreads has been about

Response of Firm Lending Rates on New Loans to a 1 Percentage Point Increase in 10-year Government Bond Spreads
(Percentage points)

Sources: Bank of Italy; Bloomberg; and IMF staff

50 bps after a quarter, while permanent increases in sovereign spreads are fully transmitted after one year.
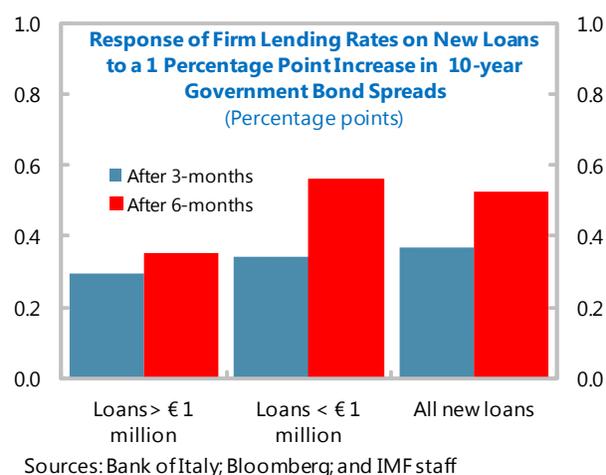
Turmoil in the Italian sovereign debt market has also been associated with a sharp credit slowdown, especially for small firms.[19] Sovereign spreads can affect loan volumes as banks' funding shortages limit their ability to extend credit. Indeed, 12-month credit growth to the non-financial private sector dropped from 3.5 percent in November 2011 to -0.9 percent in December 2012. The credit contraction was more severe for small firms, and more pronounced than in 2009 (Figure 1). Indeed, the 12-month growth in loans to small firms declined from 0.4 percent year-on-year in November 2011 to -5.9 per cent in November 2012. Bank and business surveys conducted toward the end of 2011 point to tight lending standards

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[17] The focus is mostly on firms rather than households since the former receive about 60 percent of private sector credit and have a large impact on investment and economic activity.

[18] The passthrough of sovereign spreads on lending rates may not be symmetric following increases or declines in spreads. The model, however, does not allow us to examine this issue.

[19] Albertazzi et al. (2012) find a significant and negative effect of Italian sovereign spreads on the growth of loans to both firms and households. A 100 bps increase in the sovereign spreads is estimated to reduce the annual growth rate on loans by 0.7 percentage points.

similar to those observed in the immediate period after the Lehman bankruptcy, owing to banks' high cost of capital and funding difficulties, while more recent surveys indicate some improvement in loan supply conditions and a significant decline in credit demand (Figure 1).

As in previous recession episodes, the slowdown in credit growth is partly driven by the decline in loan demand. Historically, the sharpest slowdowns in credit growth in Italy have been associated with the severe recessions of the 1970s, early 1990s, and 2008–09, with the lowest nominal annual credit growth (-0.1 percent) taking place during the 1992–93 recession. Interestingly, the most recent episode of lending slowdown has been somewhat milder than in the 1992–93 recession, despite the severe 2008–09 output contraction, probably thanks to lower interest rates supporting demand and the policies put in place to sustain credit to small and medium sized enterprises.[20] The 2009–10 credit slowdown was mainly driven by weak demand, even though supply constraints appear to have prevailed for a period in early 2009 (Albertazzi and Marchetti, 2010; Panetta and Signoretti, 2010; Del Giovane et al., 2010; Zoli, 2010).[21] So far the pace of the slowdown in private sector credit seems to be lower than that experienced in previous recession episodes, possibly because the pace of credit growth in the pre-recession period has been slower. Indeed, four quarters since the start of the recession, nominal annual credit growth to the private sector has declined by 5.4 percentage points, compared to declines of 13.2 and 11.0 percentage points respectively during corresponding periods in the early 1990s and 2008–09.
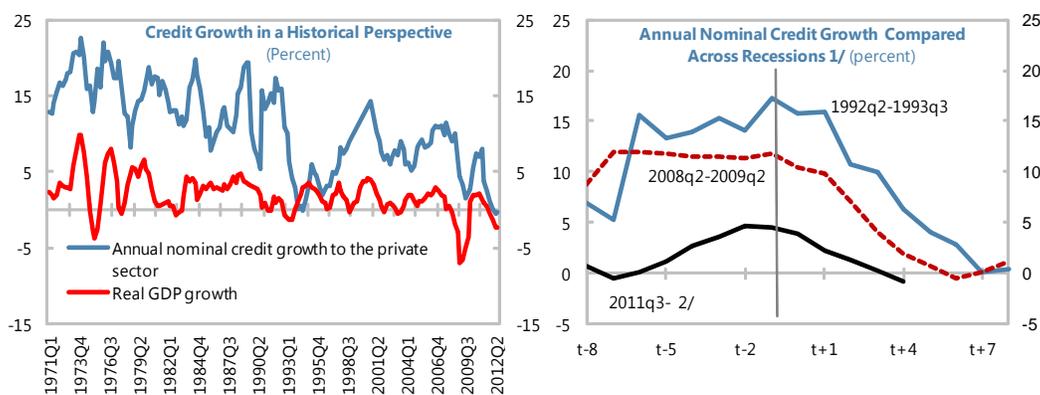
Sources: ISTAT, IMF; and IMF staff calculations.
1/ The legend shows the dates of recession episodes. t is the recession starting period.
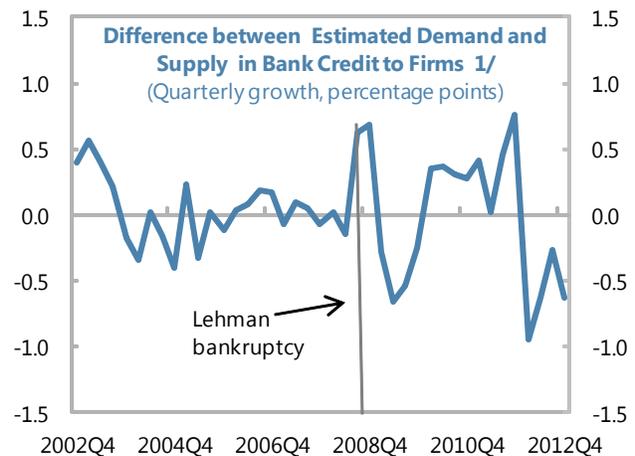2/ Data adjusted for the impact of securitization.

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[20] A comparison with the 1974-75 recession is rather difficult, due to the impact of high inflation rates on nominal and real credit growth at that time. Comparisons with more recent recession episodes could be misleading, as in those cases the output contraction was much milder.

[21] Albertazzi and Marchetti (2010) find that supply restrictions account for 1 percentage point of the 7 percentage points slowdown in credit growth in September 2008-March 2009. Panetta and Signoretti (2010) estimate that in 2009 the output contraction due to lending supply tightening was 1.2 percentage points.

To assess the relative importance of demand and supply in affecting corporate lending, loan supply and demand functions are estimated. Disentangling demand and supply effects in credit markets is not straightforward, as suitable exogenous instruments for identification are difficult to find. The approach adopted here assumes that the responses from loan officers in the bank survey on lending standards and credit demand from firms (BLS) are good proxies for unobserved demand and supply.

Specifically, the dependent variable is the quarterly growth in seasonally adjusted credit to non-financial firms. In the loan supply equation, the regressors are the lagged dependent variable, the change in credit standards to enterprises over the past three months obtained from the BLS and the lending rate. In the credit demand equation, the regressors are the lagged dependent variable, credit demand from firms over the past three months from the BLS, the lending rate, and a consumer confidence indicator, as a proxy for expected economic activity. The model is estimated over 2003Q2-2012Q3, using instrumental variables. Indicators of supply and demand conditions from the BLS are found to have statistically significant coefficients, with the expected sign (Appendix 4). Evidence of a potential supply-driven credit crunch is then assessed by evaluating whether the difference between fitted demand and supply (excess demand) is positive and large.

According the results, at end-2011 supply constraints driven by bank funding difficulties at the peak of the Italian sovereign debt crisis seem to have prevailed over weak demand. The estimates of excess demand suggest that growth in loan demand exceeded that of credit supply by 0.5 percentage points in 2011Q4, similar to that observed in the aftermath of the Lehman bankruptcy. A supporting piece of evidence at the end of last year can be found in net corporate bond issuance, which returned positive in the fourth quarter of 2011, after having been negative for several months—a sign

Difference between Estimated Demand and Supply in Bank Credit to Firms 1/
(Quarterly growth, percentage points)

Lehman bankruptcy

Sources: Bank of Italy; and IMF staff calculations.
1/ Loan supply and demand are estimated as linear functions of the indicators of supply and demand conditions obtained from the bank lending survey, using equation [1] from Appendix 4.

that firms were possibly substituting bank borrowing with bond issuance.

In 2012, the situation appears to have reversed with weak demand driving changes in credit more than supply. After the LTROs and other actions taken by policy makers to support banks, estimated demand for credit fell well short of supply, as it happened in 2009, as the severe recession curbed loan demand. The decline in corporate borrowing rates observed in 2012 is also consistent with this conclusion.

VI. CONCLUSIONS

Volatility in the Italian sovereign debt market intensified since the summer of 2011, pushing up Italian banks' funding costs and tightening lending conditions. The empirical evidence presented in the paper suggests that shocks in investor risk appetite, and news related to the euro area debt crisis, as well as Italy specific news, have been important drivers of Italian sovereign spreads. Italy's high public debt and the large share of non-resident holdings of government debt have amplified the impact of investor risk appetite shocks on spreads. These findings highlight the importance of reducing country-specific vulnerabilities as well as the need to address fragilities in Euro area at large to contain Italy's sovereign risks.

Banks' funding costs have also been considerably affected by sovereign tensions. While euro area banks' CDS and sovereign spreads are partly driven by a common component, Italian banks' CDS spreads have exceeded those of their euro area peers since summer 2011. The empirical analysis shown in the paper indicates that the rise in sovereign spreads have been a significant determinant in widening the CDS spread differential of Italian banks with those of other euro area banks. There is also evidence that the impact of sovereign risks on perceived bank risk is larger for institutions with relatively lower capital and higher non-performing loans ratios.

Yields on Italian banks' securities have also risen more than those on other euro area banks since summer 2011. Again, the econometric analysis reveals that changes in sovereign spreads have contributed to these movements and Italian banks' relatively lower capital ratios and higher non-performing loans ratios tend to amplify the impact of sovereign risks on banks' borrowing costs.

Lending conditions have also been considerably affected by tensions in the sovereign markets. The analysis shows that increases in sovereign spreads drive up firm lending rates rapidly— with about 30-40 percent of the sovereign shock being transmitted to firm lending rates within a quarter. Credit growth to Italian firms has declined significantly, reflecting both weak demand and supply constraints. The latter appear to have prevailed at the end of 2011, as turmoil in Italy's sovereign market curtailed banks' access to funding. In 2012, weak demand appeared to be the main driver of the slowdown in credit.

Overall, the analysis reveals that Italian sovereign risks have a significant impact on domestic banks and private credit conditions. This may be due to Italian banks holding large amounts of government bonds, and also to banks' ratings (and therefore their perceived risk profile and funding costs) being linked to that of the Italian sovereign. Banks with lower relative capital ratios and higher non-performing loans are found to be more sensitive to changes in sovereign spreads. This would suggest broader benefits for the economy from continued efforts to strengthen banks' capital buffer and reduce impaired assets.

Figure 1. Italy: Lending Conditions
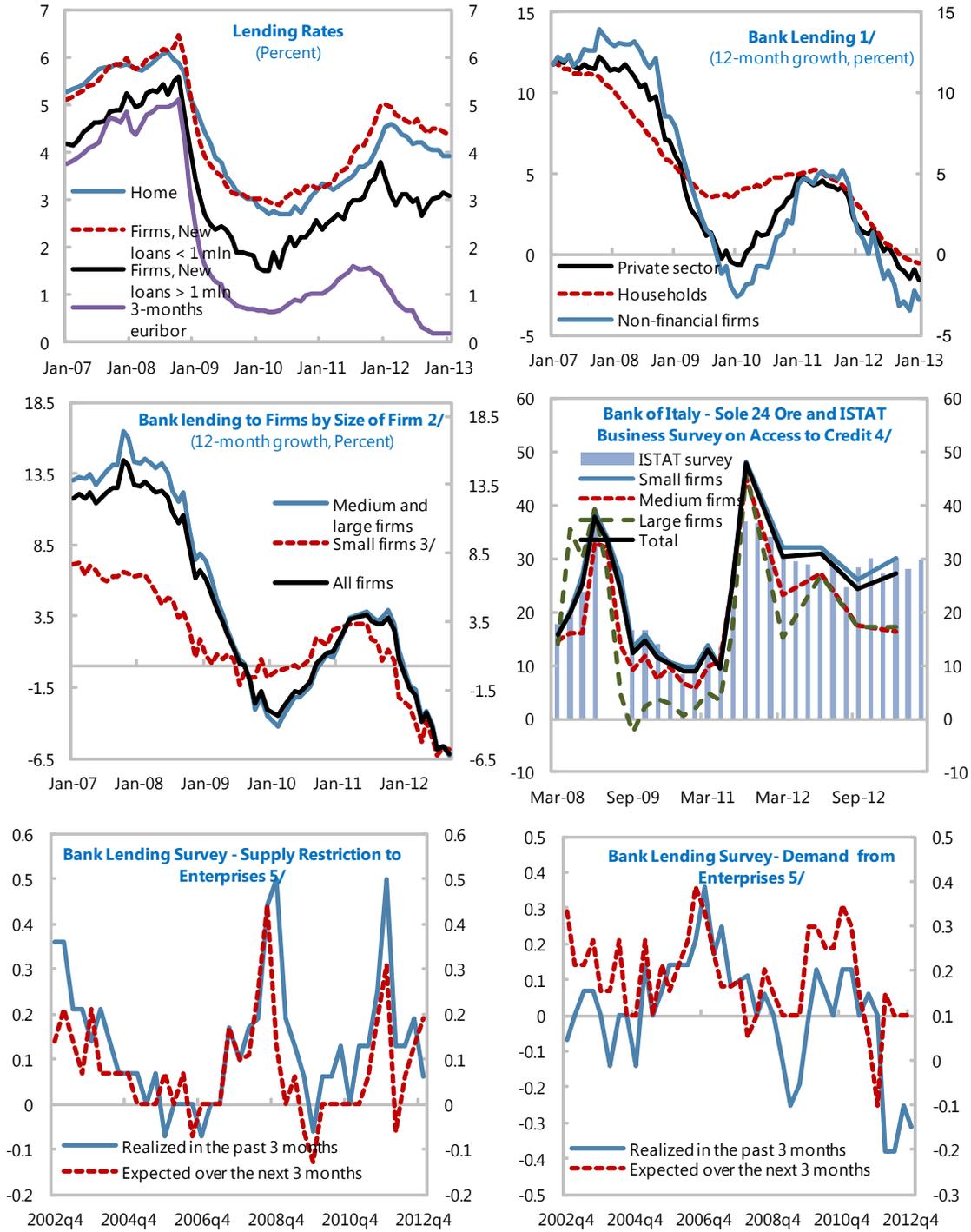
Sources: Bank of Italy; Bloomberg; and IMF staff calculations.
1/ Data adjusted for the accounting effect of securitizations.
2/ Data adjusted for the accounting effect of securitizations. Loans exclude repos, bad debts and some minor items.
3/ Limited partnerships, general partnerships, informal partnerships, de facto companies and sole proprietorships with up to 19 workers.
4/ Difference between the share of firms that declared to find access to credit more difficult compared to the previous quarter and the share of firms that declared to find access to credit less difficult compared to the previous quarter.
5/ Net percentage.

Appendix 1. Determinants of Italian Sovereign Spreads

Dependent variable: Changes in the 10-year government bond spreads over the Bund 1/

		[1]	[2]	[3]
Lagged dep. variable		**0.05**	**0.05**	**0.07**
	P-value	0.04	0.00	0.00
International bad news 2/		**13.16**	**12.61**	**12.99**
	P-value	0.00	0.00	0.00
International good news 2/		**-14.73**	**-14.36**	**-12.5**
	P-value	0.00	0.00	0.00
Italy specific bad news 3/		**15.80**	**15.74**	**15.72**
	P-value	0.00	0.00	0.00
Italy specific good news 3/		**-38.37**	**-38.52**	**-38.3**
	P-value	0.00	0.00	0.00
D(VIX)		**1.96**		
	P-value	0.01		
Projected debt*D(VIX)			**0.02**	
	P-value		0.01	
Share of debt held by foreigners*D(VIX)				**0.04**
	P-value			0.01
Number of observations		1252	1252	1171
Adjusted R-squared		0.18	0.17	0.17

Sources: Bloomberg; EIU, NewPlus/Factiva; and IMF staff estimates.

1/ Equations were estimated at daily frequency over the period January 1, 2008-October 22, 2012, using instrumental variables. Instruments were lagged changes in the VIX and lagged interaction terms between changes in the VIX and projected debt or the share of public debt securities held by non residents. A constant was included among the regressors. Statistically significant coefficients are bolded.

2/ Dummies capturing good and bad news related to international events related to the global crisis and the European debt crisis (details are reported in Appendix 2).

3/ Dummies capturing good and bad news related to Italy specific events (details are reported in Appendix 2).

Appendix 2. List of Events Corresponding to Good and Bad News

International/EU related news
Bad

Bear Stearns bailout	March 14, 2008
Lehman bankruptcy	September 15, 2008
G-7 meeting fails to address Greek debt problem	February 7, 2010
EU-IMF program on Greece announced	April 11 2010
S&P downgrades Greece and Portugal	April 27, 2010
Moody's publishes report warning on contagion risks from Greece and ECB disappoints expectations that it will support sovereign	May 6, 2010
French and German governments agree to take steps that would make it possible to impose haircuts on government bonds	October 28, 2010
Ireland requests EU-IMF program	November 21 2010
EU-IMF Irish program is announced	November 28 2010
EU Commission issues a consultation paper on a draft directive that would give regulators sweeping powers to restructure debt of failing banks	January 6, 2011
Portugal's Minister of Finance says that the country will need international financial assistance	April 6, 2011
Moody's downgrades Portugal. S&P says that French proposal on Greek debt rollover would constitute selective default	July 11, 2011
Reports that Greek officials had failed to reach an agreement with representatives from the International Monetary Fund and the European Union on austerity measures to meet fiscal targets as part of the second bail-out package for Athens	September 5, 2011
Euro zone finance ministers rejected an offer of Greek private sector involvement.	January 23, 2012

Good

At the G-20 Finance Ministers meeting IMF funding is boosted	March 15, 2009
750 billion rescue package is announced	May 10, 2010
EBA stress test results are published	23 July 2010
Finance ministers make clear that burden sharing would apply only to bonds issued after 2013	November 12, 2010
ECB announces that it would continue to provide exeptional liquidity support	December 2, 2010
The European Commission says the size of the 440 billion European Financial Stability Facility must be reinforced and its application expanded	January 12, 2011
European finance ministers decide to provide 500 billion euros for a new crisis fund that will come into force in 2013	February 14, 2011
At the eurozone summit Germany and France are expected to reach an agreement on an aid strategy for Greece. Stress test results are published	July 21, 2011
IMF agrees to release disbursement for Greece	September 7, 2011
First LTRO	December 21, 2011
ECB debt swap removes obstacle to launch of PSI	February 17, 2012
Second LTRO	February 29, 2012
High participation in Greece's PSI deal is disclosed	March 9, 2012
IMF approves new Greece's program	March 15, 2012
European Union Summit	June 29, 2012
President Draghi's speech suggesting ECB willingness to buy sovereign bonds in secondary markets	July 26, 2012
ECB announces Outright Market Transactions program	September 6, 2012
German Consitutional Court ruling on ESM and Fiscal Pact	September 12, 2012

Appendix 2. List of Events Crorresponding to Good and Bad News (Cont.)

Italy related news
Bad

Prime Minister's position weakens as he loses support from party members	September 11, 2011
S&P's sovereign rating downgrade	September 19, 2011
Moody's sovereign rating downgrade	October 4, 2011
Fitch's sovereign rating downgrade	October 7, 2011
After Prime Minister's resignation, uncertainty during the consultations to form a new government	November 12, 2011
S&P's sovereign rating downgrade	January 14, 2012
Moody's sovereign rating downgrade	February 13, 2012

Good

The ECB start buying Italian government bonds under the SMP program	August 8, 2011
Italian government approves consolidation package (manovra d'Agosto)	August 12, 2011
Monti consolidation package is announced	December 5, 2011
Cabinet approves liberalization decree	January 20, 2012
Paliament approves liberalization decree	March 24, 2012
Parliament approves labor market reform	June 27, 2012

Appendix 3. List of Banks Included in the Sample for the Analysis in Section III.

Euro area banks:
Erste, Raiffesein, KBC, BNP Paribas, Credit Agricole, Societe Generale, Deutsche Bank, Commerzbank, Rabobank, ING group, Santander, Banco Bilbao Vizcaya Argenta.

Italian largest banks:
Unicredit, Intesa San Paolo, Monte dei Paschi, Banco Popolare, Unione Banche Italiane.

Appendix 4. Estimated Credit Demand and Supply

Estimated Credit Demand and Supply 1/
Dependent variable: Quarterly percent changes in seasonally adjusted credit to firms

	[1]		[2]		[3]	
	Supply	Demand	Supply	Demand	Supply	Demand
Lagged dep. Variable	**0.98**	**0.86**	**0.60**	**0.74**	**0.60**	**0.86**
P-value	0.00	0.00	0.01	0.00	0.01	0.00
Lending standards 2/	**-0.01**		**-0.01**		**-0.01**	
P-value	0.01		0.00		0.00	
Demand indicator 3/		**0.01**		**0.01**		**0.01**
P-value		0.00		0.00		0.00
Lending rate			**0.50**	0.14	**0.50**	
P-value			0.03	0.45	0.03	
D(Confidence indicator) 4/						-0.13
P-value						0.17
Number of observations	38		38		38	
Adjusted R-squared	0.86	0.91	0.87	0.90	0.00	0.87

Sources: Bank of Italy; and IMF staff estimates.

1/ Equations were estimated over the period 2003Q1-2012Q3, using instrumental variables.
Instruments were the lagged lending standards and demand indicators from the Bank Lending Surveys and lagged lending rates.
A constant was included among the regressors. Bolded coefficients are those statistically significant.
2/ Bank lending standards from bank lending survey responses.
3/ Demand for loans from bank lending survey responses.
4/ ISAE consumer confidence indicator, as a proxy for expected economic activity.

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