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Simon Gilchrist (Boston University and NBER)

Benoit Mojon (Banque de France and Ecole Polytechnique)

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Résumé: Nous construisons des indicateurs de risque de crédit pour les banques et pour les sociétés non financières de la zone euro. Ces indicateurs sont les écarts de prime moyens entre le rendement des obligations émises par le secteur privé et le rendement de même maturité émis par l'État fédéral allemand. Les indicateurs sont construits par pays pour l'Allemagne, la France, l' Italie et l'Espagne ainsi que pour la zone euro. Ils révèlent que la crise financière de 2008 a considérablement augmenté le coût du financement de marché pour les banques et les entreprises non financières. En revanche, le ralentissement de 2001 n'a eu d'impact que sur le coût du crédit des entreprises non financières, alors que celui des banques est resté stable.
La crise financière de 2008 a également conduit à une divergence systématique des écarts de crédit pour les entreprises financières entre les pays. Cette divergence a encore augmenté lors que la crise de la dette européenne de 2010 à 2013. Les primes de crédit pour les banques et les entreprises non financières reflètent alors de plus en plus un facteur national plutôt que les conditions financières de la zone euro.
Nos indicateurs de risque de crédit fournissent du contenu prédictif important pour l'activité réelle et les volumes de crédit de la zone euro dans son ensemble et pour chaque pays. Une analyse VAR implique que les perturbations des marchés de crédit conduisent à des contractions importantes de la production, augmente le chômage et diminue l'inflation dans la zone euro.

Keywords : cycle du crédit, zone euro, crise financière

Code JEL: E32, E43, E44

Abstract: We construct credit risk indicators for euro area banks and non-financial corporations. These are the average spreads on the yield of euro area private sector bonds relative to the yield on German federal government securities of matched maturities. The indicators are also constructed at the country level for Germany, France, Italy and Spain. These indicators reveal that the financial crisis of 2008 has dramatically increased the cost of market funding for both banks and non-financial firms. In contrast, the prior recession following the 2000 U.S. dot-com bust led to widening credit spreads of non-financial firms but had no effect on the credit spreads of financial firms. The 2008 financial crisis also led to a systematic divergence in credit spreads for financial firms across national boundaries. This divergence in cross-country credit risk increased further as the European debt crisis has unfolded since 2010. Since that time, credit spreads for both non-financial and financial firms increasingly reflect national rather than euro area financial conditions. Consistent with this view, credit spreads provide substantial predictive content for a variety of real activity and lending measures for the euro area as a whole and for individual countries. VAR analysis implies that disruptions in corporate credit markets lead to sizeable contractions in output, increases in unemployment, and declines in inflation across the euro area.

Keywords: credit cycle, euro area, financial crisis

Code JEL: E32, E43, E44

Non-technical summary

Gauging the extent of financial distress for countries within the euro area remains a considerable challenge. Market interest rates arguably provide good indicators of credit risk as they reflect, in real time, the beliefs of many investors. Although market-based indices of an average of corporate bond yields are commercially available, these are frequently constructed from arbitrary samples of firms whose characteristics evolve over time in a non-transparent manner. Furthermore, the lack of information regarding the underlying structure of the portfolio leads to a maturity mismatch when constructing credit spreads as the difference in yields between corporate bonds and sovereign bonds. This maturity mismatch confounds measurement by not properly distinguishing between credit risk and term premia.

This paper introduces new indices of credit risk in the euro area. These indices aggregate the information obtained from thousands of corporate bonds and hundreds of thousands of monthly observations on the yield to maturity of such bonds since the launch of the euro in January 1999. Following Gilchrist et al. (2009) and Gilchrist and Zakrajsek (2012b), we construct a credit risk spread at the bond level as the difference between the corporate bond yield and the yield of a German Bund zero coupon bond of the same maturity. By constructing credit spreads at the bond-issuance level we thus avoid confounding credit risk premiums with term premiums. We then aggregate these bond-level credit spreads to obtain indices of credit risk for two sectors, banks and non-financial corporations (NFC thereafter) for the four largest euro area countries: Germany, France, Italy and Spain. By aggregating this information across countries, we are also able to construct credit spreads for the euro area as a whole.

Our credit spreads reveal that the financial crisis of 2008 dramatically increased the cost of market funding for both financial and non-financial firms in the euro area. Furthermore, since the summer of 2010, there is a strong divergence in corporate credit spreads across countries similar to the one observed for sovereign spreads. The credit spreads of both financial and non-financial corporations in Italy and Spain widened dramatically during this time period. Although not as pronounced, we further document a deterioration in the credit spreads of financial institutions in France and Germany during the post 2010 period. In contrast, the credit spreads of non-financial firms in France and Germany remain below their 2009 peak.

In addition to documenting the evolution of credit spreads across countries within the euro area, we also analyze the information content of these credit spreads by examining their ability to predict commonly used indicators of economic activity, inflation and bank lending. These results imply that both financial and non-financial credit spread indices are highly robust leading indicators for economic activity and the growth in bank lending. In terms of aggregate spending components, we find that both bank and NFC credit spreads are particularly informative about the future growth in non-residential investment both in the euro area and at the country level. In contrast, only bank credit spreads appear to be robust predictors of the future growth in consumption spending.

In order to characterize the response of economic activity to disruptions in credit markets we also estimate a Factor-Augmented Vector Autoregression (FAVAR) and study the impulse response of euro area and country-specific measures of economic activity to shocks to credit spreads that are orthogonal to information contained in both real activity series and other asset prices. Consistent with the findings that credit spreads predict future economic activity, the FAVAR results imply that disruptions in credit markets lead to a sharp reduction in stock returns, significant declines in output and inflation, and increases in unemployment across the euro area and within each of the four countries.

1 Introduction

The euro area has become the epicenter of world financial stress since the post-Lehman recession escalated into a sovereign debt crisis that began in 2010. The fear of a sovereign default and the possible break up of the euro has resulted in diverging financial conditions for debt issuers across countries within the euro area. This divergence of financial conditions within the Eurosystem has been among the main motivations for a series of non-conventional monetary policy measures taken by the ECB since May 2010. In particular, the launch of the OMT in the late summer of 2012 was motivated by the need to "restore" the transmission mechanism, i.e. the uniqueness of financial conditions within the euro area.

Although policy makers remain concerned about the fragmentation of the European financial system, gauging the extent of financial distress for countries within the euro area remains a considerable challenge. There are very few reliable indicators of credit risk in the euro area and across euro area countries. Most statistics on euro area interest rates are either sovereign interest rates or bank retail interest rates. In principle, the latter reflect the effective cost of external finance for a large proportion of the population of euro area firms and for households. In practice, retail bank interest rates are based on surveys rather than market-based indicators. In addition, bank retail interest rates reflect compositional changes among borrowers as well as the varying degree of competition between banks.

Market interest rates arguably provide better indicators of credit risk as they reflect, in real time, the beliefs of many investors. Although market-based indices of an average of corporate bond yields are commercially available, these are frequently constructed from arbitrary samples of firms whose characteristics evolve over time in a non-transparent manner. Furthermore, the lack of information regarding the underlying structure of the portfolio leads to a maturity mismatch when constructing credit spreads as the difference in yields between corporate bonds and sovereign bonds. This maturity mismatch confounds measurement by not properly distinguishing between credit risk and term premia.

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ing credit spreads at the bond-issuance level we thus avoid confounding credit risk premia with term premia. We then aggregate these bond-level credit spreads to obtain indices of credit risk for two sectors, banks and non-financial corporations (NFC thereafter) for the four largest euro area countries: Germany, France, Italy and Spain. By aggregating this information across countries, we are also able to construct credit spreads for the euro area as a whole.

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In addition to documenting the evolution of credit spreads across countries within the euro area, we also analyze the information content of these credit spreads by examining their ability to predict commonly used indicators of economic activity, inflation and bank lending. These results imply that both financial and non-financial credit spread indices are highly robust leading indicators for economic activity and the growth in bank lending. In terms of aggregate spending components, we find that both bank and NFC credit spreads are particularly informative about the future growth in non-residential investment both in the euro area and at the country level. In contrast, only bank credit spreads appear to be robust predictors of the future growth in consumption spending.

In order to characterize the response of economic activity to disruptions in credit markets we also estimate a Factor-Augmented Vector Autoregression (FAVAR) and study the impulse response of euro area and country-specific measures of economic activity to shocks to credit spreads that are orthogonal to information contained in both real activity series and other asset prices. Consistent with the findings that credit spreads predict future economic activity, the FAVAR results imply that disruptions in credit markets lead to a sharp reduction in stock returns, significant declines in output and inflation, and increases in unemployment across the euro area and within each of the four countries.

There is a long tradition of building credit risk indicators from bond prices and assessing their predictive content for economic indicators over the business cycle.[1] Our approach replicates the one developed in Gilchrist and Zakrajsek (2012b) for U.S. data. Bleaney et al. (2012) have implemented a similar approach for corporate bonds from Austria, Belgium, France, Germany, Italy, the Netherlands, Spain and the UK, yet they focus exclusively on NFC credit spreads, while we also focus here on corporate credit risk for banks.

The role of banks in the transmission of monetary policy has been analyzed in a number of research papers, including nine euro area country case studies that consistently analyzed individual balance sheet data in the context of the Eurosystem Monetary Transmission Network. Angeloni et al (2003) and Ehrmann et al. (2003) provide an overview of these results. More recently many papers have focused on the spillover of the euro area sovereign debt crisis to credit markets, including Albertazzi et al (2012), Del Giovane, Nobili and Signoretti (2013), Neri and Ropele (2013) and references therein.[2]

Several papers have also gathered evidence on the importance of banks for the euro area business cycle. Among these, de Bondt et al (2010), Ciccarelli, Madaloni and Peydro (2010), Del Giovane et al; (2011), Lacroix and Montornès (2009) and Hempell and Kok Sorensen (2010) show in particular that the diffusion indices constructed from the ECB Bank Lending Survey contain predictive power for economic indicators in the euro area.

In addition to providing an analysis of the evolution of euro area and country-specific corporate credit spreads, an important goal of this research project is to construct credit risk indicators in a uniform and hence comparable manner for the euro area and within the four largest euro area countries. Importantly, our data collection methods, which rely on publicly available information, allow us to provide consistent monthly updates to all aggregate credit indices. The updated series can be downloaded from the appendix of the Banque de France working paper version of this paper. In addition, the micro data used to build these indices are available upon request from the authors.

The rest of the paper is organized as follows. Section 2 describes the data used to construct credit indices at the country level for both banks and non-financial firms and documents the evolution of these indices over the available sample period, 1999-2013. Section

[1]See in particular Friedman and Kuttner (1992, 1993), Estrella and Hardouvelis (1997), Estrella and Mishkin (1998) and Gertler and Lown (1999).

[2]See also Panetta and Signoretti (2010) for an earlier study of the effects of financial stress on banks' activity.

3 assesses the ability of credit spreads to predict economic activity, inflation and lending aggregates. Section 4 uses a Factor-Augmented VAR framework to explore the distinct role of credit spreads in the business cycle. Section 5 concludes.

2 Credit Risk Indices for the Euro Area

Following the methodology of Gilchrist and Zakrajsek (2012b) we use individual security level data to construct security-specific credit spreads. We then average these credit spreads to obtain credit spread indices at the aggregate level. This methodology allows us to construct credit spread indices that reflect the two key characteristics of the European financial system: the importance of banks, and the extent of national fragmentation of financial markets within the euro area.

It is well known that the European financial system is dominated by banking institutions. That such financial firms account for a disproportionate share of the corporate bond market is perhaps less widely recognized. Bonds issued by euro-area banks account for over 5 trillions euros as of July 2012. This compares to 800 hundred billions euros issued by non-financial corporations and 6.2 trillions euros issued by sovereigns.[3] Thus to a large extent, the bond market overwhelmingly reflects a combination of debt issued by financial institutions and sovereigns with only a small fraction of issuance accounted for by non-financial corporations.[4].

The importance of individual countries in the European financial system reflects the national fragmentation of the euro-area financial market that has re-emerged since the Lehman bankruptcy. In this environment, credit conditions in sovereign debt markets may easily spill over into country-specific financial markets. In turn, a deterioration in balance sheets of the financial sector at the country level may lead to an increase in sovereign risk.

Given these concerns we build two indicators, one for banks and one for non-financial corporations, for each of the four largest euro area countries: France, Germany, Italy and Spain. These countries account for 80% of the euro area population, economic activity and financial markets. Although in principle it is possible to extend the analysis to countries

[3]The total debt of the euro area public sector exceeds 8 trillion euros, once bank loans, primarily granted to cities and regions, are included.

[4]The euro area corporate bond market is relatively liquid. Biais et al (2006) report for instance that each security is subject to approximately 3 trades per day, on average

beyond Spain, in practice, corporate debt market become too shallow and provide too narrow a cross-section of issuers to build reliable macroeconomic indicators for smaller countries.

2.1 Data sources and methods

Our indices are based on a comprehensive list of corporate debt securities issued by corporations in the euro area big 4 as reported in Bloomberg and Datastream. For each security, we use the Datastream month end "effective yield" and subtract from it the interest rate of a zero coupon German Federal bond of matched duration.[5] Our choice of the German Bund as the benchmark risk-free asset is motivated by the increased and more volatile sovereign spreads between Italian, Spanish and to a lesser extent French treasury yields with respect to the German Bund interest rate as the European debt crisis has unfolded. To match duration, we obtain an estimate of the zero-coupon German Bund yield at a specific maturity using standard yield-curve fitting techniques.

To construct credit indicators, we focus on fixed-coupon, euro-denominated, non-callable, non-guaranteed securities. We provide details of the sample selection including names of all issuers in the data appendix. The resulting database includes over 90000 monthly observations from nearly 2300 corporate bonds. Of these, about 50000 observations are effective yields on bonds issued by banks. The remaining 40000 observations are issued by non-financial corporations.

Table 1 provides descriptive statistics of the underlying bond market data by type of issuer and by country. The number of securities available varies significantly across countries and over time. The cross-country variation is in part due to the depth of the market as measured by country size in economic terms. It also reflects institutional characteristics specific to each country. In particular, German banks have a noticeably large number of securities outstanding in comparison to banks in the other three countries. The number of issuers is therefore a more informative statistic of data coverage. This varies from 66 banks and 112 non-financial companies in Germany to 26 banks and 22 non-financial companies in Spain. Table 1 also highlights considerable variation in data availability over time. Notably, data coverage is somewhat limited for the first years of the sample and grows over time as the

[5]For a subset of securities, we independently verified that the effective yield provided by Datastream matches the effective yield computed from the bond price and the sequence of coupons.

European bond market deepens.[6]

Table 1 also provides summary statistics on the characteristics of individual bonds, including size of issuance, maturity and duration. Banks tend to issue smaller amounts than non-financial companies, especially in Germany where the median issuance of banks amount to $121 million. The median issuance for non-financial companies ranges from $494 million in Spain to $753 million in Italy. The initial maturity of the securities is close to 10 years and the remaining maturity ranges from 3 to 5 years across portfolios.

For each security, the spread S_{it}, on corporate bond i, is constructed by subtracting from the effective yield R_{it} the German Bund zero coupon interest rate of a similar duration $ZCR_t^{DE}(Dur(i,t))$:

$$S_{it} = R_{it} - ZCR_t^{DE}(Dur(i,t))$$

As shown in Table 1, the mean and median credit spreads for the entire sample period appear to be relatively homogenous across sectors and countries. For banks, the median credit spread ranges from 0.9% for French banks to 2.1% for Spanish banks. Non-financial corporations have median spreads with respect to the German Bund that range from 1.0% in France to 1.6% in Italy.

Country-specific credit risk indicators S_t^k are constructed as a weighted average of credit spreads on individual securities:

$$S_t^k = \sum_i w_{it} S_{it}$$

where the weight

$$w_{i,t} = \frac{MVAI_{it}}{\sum_i MVAI_{i,t}}$$

is defined as the ratio of the market value at issue of the security relative to the total market value at issue of all bonds in the sample during a point in time. In addition to constructing country-specific credit spread indices, we also use the same methodology to construct a value-weighted credit spread index for the euro area as a whole.[7]

[6]The limited sample size in the earlier yields is partially due to limited availability of data on securities that have expired and for which our source does not maintain records.

[7]We have compared these spreads to unweighted averages as well as to trimmed means that exclude the first and the ninety-ninth percentiles and the fifth and the ninety-fifth percentiles of the spread distributions. These comparisons, which are available upon request to the authors, reveal that these alternative approaches produce highly correlated indices. The only notable exception pertains to German bank spreads during the 2002-2003 slowdown. In this episode, the unweighted credit spread index is significantly higher than the

2.2 The time-series evolution of credit spreads

Figure 1 and Figure 2 display the time-series evolution of the credit risk indicators for banks and the NCFs for each country and for the euro area. The time series behavior of these credit spreads show a number of striking patterns that reflect financial developments in the euro area over the 1999-2013 sample period.

Prior to the global financial crisis that began in mid 2007, credit spreads for banks in Germany, France and Italy are both low and show a strong common comovement. In the 1999-2002 period these credit spreads are roughly on the order of 80 to 100 basis points. These credit spreads fell to roughly 50 basis points during the 2003-2007 period of strong growth in housing prices in the U.S., the UK, Spain and other European countries. This drop in credit spreads to historic lows is consistent with the low credit spreads and credit risk premiums observed in the U.S. financial markets as documented by Gilchrist and Zakrajsek (2012b). During this period, credit spreads for Spanish banks are somewhat elevated and do not exhibit strong comovement with other countries however.

Credit spreads of European non-financial corporations show much more variation over this time period. In particular, credit spreads for non-financial firms rose substantially during the slowdown in global economic activity that followed the bursting of the U.S. dot-com bubble. In contrast, bank credit spreads appear largely unaffected by the 2001-2002 global slowdown.

As can be seen in Figure 1, the financial crisis of 2008 dramatically increased the cost of market funding for banks. This is especially true in Germany, Italy and France where, prior to mid-2007, bank credit spreads were on the order of 50 basis points, but subsequently rose sharply in response to the deterioration in global financial conditions that occurred in late 2008 and throughout 2009. Credit spreads on Spanish banks, although already elevated relative to the spreads in other countries, also widened during this period.

Credit spreads for non-financial firms also rose sharply during the 2008 financial crisis. Strikingly, there is very little divergence in financial conditions for non-financial firms across European countries during this period. In contrast, one can see a distinct divergence in country-specific credit spreads for the banking sector during the 2008-2009 episode. In effect, the on-going national fragmentation of European financial markets was seeded in the

weighted index presented in this paper, implying that the cost of market funding for small German banks increased at that time.

2008 financial crisis.

The final distinct episode of interest is the post 2010 period during which the risk of sovereign default became a growing concern within European financial markets. Such concerns lead to a widening of credit spreads on Italian, Spanish and, to a lesser extent, French banks in the second quarter of 2010. Although credit spreads fell somewhat in early 2011 they again increased sharply in 2011Q4 when the average credit spread on Italian banks peaked at nine percent. During this episode, credit spreads on Spanish banks jumped three percentage points (from 2.5% to 5.5%). Credit spreads for German and French banks also increased sharply during this period. Although credit spreads on Italian banks fell relative to their 9% peak, credit spreads on Spanish banks continued to rise, reaching an all-time high of 8% in 2012Q2. Subsequent to this spike, bank credit risk fell continuously across all four countries and in the euro area as a whole, a fact that is likely attributable to the more activist stance of the ECB as of mid-2012.

In contrast to the 2008-2009 episode in which credit spreads of non-financial companies exhibited a very strong comovement, it appears that country-specific risks spilled over into the non-financial sector with the onset of the European debt crisis. Figure 2 clearly shows the same cross-country divergence in credit spreads of non-financial corporations that one sees in the credit spreads of financial companies from 2010 onwards. By this measure, country-specific sovereign-risk factors have caused a sharp rise in funding costs for banks and a coincident rise in funding costs for non-financial firms during the post-2010 period.

2.3 Comparison to alternative series

In Figures 3 and 4 we compare the Gilchrist-Mojon (GM thereafter) euro area credit spreads to alternative measures of credit risk. For banks, we compare the euro area credit spread to the 6 month EURIBOR-EONIA SWAP (BOR-OIS hereafter), a widely used measure of counterparty and credit risks on the interbank market. These spreads are shown in Figure 3. Both the GM and the EURIBOR-OIS spread show negligible credit/counterparty risk in August 2007 but rise sharply thereafter, indicating peak financial stress in late 2008, after Lehman filed for bankruptcy. These risk indicators clearly diverge in the post-2010 period however. This divergence may in part be due to compositional changes in the Euribor-OIS market whereby over time, riskier banks are excluded from transacting. Such compositional bias is much less likely to influence the GM euro area credit spread which is constructed from

longer term securities that include all financial institutions that have issued such securities, not just those that still transact in the Euribor-OIS market. These results suggest that credit spreads constructed from secondary bond prices may provide a more informative measure of overall financial distress than the BOR-OIS spread.

Figure 4 compares the GM euro area credit spread for non-financial firms to the credit spread obtained from retail interest rates on bank loans.[8] To construct a retail credit spread we subtract the 6 month EONIA SWAP rate from the retail interest rate. This is a reasonable benchmark because bank loans still overwhelmingly dominate the external financing of euro area NFCs and such loans are typically granted at a variable interest rate that is indexed to short-term money market interest rates. It is evident from Figure 4 that these two indicators of credit risk for NFCs tend to peak simultaneously in late 2008 and in late 2011. Despite such strong comovement during periods of acute financial distress, these two series diverge in important ways. Most notably, the retail bank credit spread remains persistently elevated relative to the GM bank credit spread in the aftermath of the 2008 financial crisis.

Finally, in Figures 5 and 6, we compare GM spreads and credit default swap rates, country by country. The latter are unweighted averages of CDS rates on banks or non-financial firms for each country. An important difference between GM spreads and CDS rates is that the latter are available for only a small number of issuers (typically only a handful of firms) relative to the cross section used to construct GM spreads. This compositional bias explains why, with the exceptions of French banks in 2011 and Italians NFCs in 2009, our credit spreads are typically higher than CDS rates during episodes of financial stress.

3 The Predictive Content of Credit Spreads

We now turn to analyzing the predictive content of credit spreads. We first consider the ability of credit spreads to forecast real activity variables such as GDP, unemployment and industrial production, as well as inflation indices as measured by both headline and core inflation. Because we are primarily interested in business cycle dynamics as opposed to near-term forecasting results we focus on forecasting the growth rate of a given variable at the one-year ahead horizon. In addition, this is the horizon over which credit spreads contain

[8]This retail bank interest rate for new business is published in bottom panel of Table 4.5 in the statistical appendix of the ECB monthly bulletin.

the largest gain in forecasting performance for U.S. data, as documented in Gilchrist and Zakrajsek (2012b). We first consider the ability of euro area credit spreads to predict euro area economic activity. Within this framework, we consider both monthly indicators such as industrial production and unemployment as well as quarterly series such as GDP and its individual spending components, consumption, residential and non-residential investment. We then turn to a country-specific analysis and address the question as to whether country-specific credit spreads help predict country-specific outcomes. We provide a similar analysis for inflation for the euro area and at the country-level. Finally, we extend this analysis to consider the predictive content of credit spreads for the aggregate growth in lending in the euro area as well as the growth rates in lending for each individual country.

3.1 Real Economic Activity and Inflation

3.1.1 Methodology

In this section we present empirical results that examine the ability of credit spreads to predict various measures of real economic activity and inflation. Let $\Delta^h \log Y_{t+h}$ measure the h quarter ahead percent change in a variable of interest.[9] We follow Gilchrist and Zakrajsek (2012b) and specify a forecasting equation of the form:

$$\Delta^h \log Y_{t+h} = \alpha_o + \alpha_1 r_t + \alpha_2 term_t + \gamma \Delta^h \log Y_t + \beta s_t + \varepsilon_t$$

where r_t measures the real interest rate, $term_t$ measures the term premium and s_t is the credit spread of interest. The real interest rate is measured as the EONIA rate minus the twelve-month euro area inflation rate. The term spread is measured as the difference in yields on ten-year AAA euro sovereign bonds minus the EONIA. For all forecasting regressions, we report separate results using bank credit spreads and credit spreads for non-financial firms as our measure of s_t. We first consider the ability of credit spreads to forecast the two most commonly used monthly indicators of economic activity – unemployment and industrial production. We then examine the ability of credit spreads to forecast quarterly GDP and its broad spending components. This section concludes with an analysis of the forecasting power of credit spreads for inflation.

[9] When forecasting unemployment we compute the h quarter ahead change in the unemployment rate rather than the log-difference.

3.1.2 Economic Activity Indicators

We begin by reporting forecasting results for the euro area as a whole. We then consider country-specific regressions. Table 2 presents the main estimation results on the predictive content of credit spreads for monthly economic activity as measured by the four-quarter ahead change in euro area unemployment and industrial production. We report regression results that include the real interest rate and the term-spread as a baseline. We then separately add the GM euro area bank credit spread and the NFC credit spread to these baseline regressions.

As shown in Table 2, both the bank credit spread and the non-financial credit spread are highly statistically significant predictors of the four-quarter ahead change in the euro area unemployment rate. These credit spreads are also highly statistically significant predictors of the four-quarter ahead change in euro area industrial production. The coefficient estimates imply an economically significant impact of credit spreads on future economic activity – a one percentage point rise in bank credit spreads predicts a 0.81 percent rise in the euro area unemployment rate and a 2 percent decline in euro area industrial production. As measured by the in-sample change in R-square the predictive content of credit spreads is large, especially for the euro area unemployment rate where the R-squared increases from 0.31 to 0.71 with the addition of either the bank or non-financial credit spread.

Table 3 presents forecasting results for euro area quarterly GDP and its spending components. The top panel presents estimation results for the full quarterly sample period 2000:Q1 to 2012:Q4. As in Table 2, the estimation again controls for the real interest rate and the term spread with all interest rates and credit spreads measured as of the final month prior to the start of the quarter. Consistent with the results reported in Table 2 for the monthly economic activity series, we find that both bank and NFC credit spreads are highly statistically significant predictors of four-quarter ahead growth in euro area real GDP. The coefficient estimates imply that a one percentage point increase in bank credit spreads predicts a 1.24 percent decline in euro area real GDP. Again, the in-sample gains in fit are substantial. The R-squared increases from 0.31 to 0.46 with the inclusion of the bank credit spread, and to 0.51 with the inclusion of the NFC credit spread.

The remaining columns of Table 3 report estimation results for the individual spending components, consumption, residential investment and non-residential investment. Both bank and NFC credit spreads are robust predictors of the four-quarter ahead growth in con-

sumption and non-residential investment. The improvement in in-sample fit is particularly impressive for non-residential investment where the R-squared increases from 0.26 to 0.53 with the inclusion of the bank credit spread and to 0.56 with the inclusion of the NFC credit spread. Notably, neither series helps predict residential investment over this period. The finding that credit spreads predict non-residential investment is consistent with the forecasting results documented in Gilchrist and Zakrajsek (2012b) for the U.S. The finding that credit spreads also add significant explanatory power for consumption growth is new and specific to European data however.

Given the strong relationship between credit spreads and economic activity during the 2008 financial crisis and subsequent European sovereign debt crisis it is natural to ask whether there is a significant relationship between credit spreads and economic activity prior to these episodes. As a robustness exercise, in the lower panel of Table 3 we report estimation results based on the pre-crisis sample period that covers 2000:Q1 to 2007:Q4. According to the results in the lower panel of Table 3, NFC credit spreads remain statistically significant predictors of four-quarter ahead GDP growth during this time period although the gain in in-sample fit is relatively small. Bank credit spreads no longer forecast GDP growth in the period prior to 2008 however. These results are not surprising given that this relatively short sample contains only one business cycle in which, as discussed above, NFC credit spreads widened but bank credit spreads remained relatively stable. More interestingly, both bank credit spreads and NFC credit spreads continue to predict consumption growth over the pre-crisis sample period. Bank credit spreads also remain a robust predictor of non-residential investment spending during the pre-crisis sample. In contrast, NFC credit spreads lose their forecasting power for non-residential investment when we eliminate the post-crisis period. Overall, these findings imply that bank credit spreads are significant predictors of both consumption and non-residential investment over both the full sample period as well as the pre-crisis sample period.

We now consider the ability of country-specific credit spread indices to forecast country-specific measures of economic activity. We begin with the three measures of overall economic activity: real GDP, unemployment and industrial production. We then consider forecasting the individual spending components, consumption, residential and non-residential investment, at the country level. Table 4 reports the estimation results for forecasting the year-ahead growth in real GDP, unemployment and industrial production for Germany, France,

Italy and Spain over the full sample period 2000:Q1 to 2012:Q4 while Table 5 reports the estimation results for the individual spending components.

According to the top panel of Table 4, both bank and NFC credit spreads are statistically significant predictors of four-quarter ahead growth in real GDP for France, Italy and Spain. In each case, the gain in in-sample fit is roughly the same with the inclusion of either credit spread. The NFC credit spread is also a statistically significant predictor of four-quarter ahead real GDP growth in Germany, whereas the bank credit spread is only marginally significant (at the 10% but not 5% level). The coefficient estimates imply considerable heterogeneity in the predicted response of GDP growth to changes in credit spreads across countries. For Germany, a one percentage point increase in credit spreads forecasts a 2 percent decline in future real GDP, whereas for Spain, a one percentage point increase in credit spreads forecasts a decline in real GDP on the order of 0.61 to 0.87 percent.

Country-specific credit spreads also contain significant predictive content for the year-ahead change in unemployment as documented in the middle panel of Table 4. The NFC credit spread is a statistically significant predictor for unemployment in Germany, France and Italy, where a one percentage point increase in credit spreads is associated with a 0.4 to 0.6 percent rise in future unemployment depending on the country. Bank credit spreads contain the same amount of information as NFC credit spreads for unemployment in France and Italy but have no explanatory power for unemployment in Germany. Although the NFC credit spread helps predict unemployment in Spain, the coefficient is the opposite sign to what is expected however, a clearly anomalous result.

The lower panel of Table 4 reports results for the predictive content of credit spreads for the year-ahead change in industrial production. According to these estimates, both bank and NFC credit spreads are robust predictors of industrial production in Germany and France, while bank credit spreads add marginal explanatory power for industrial production in Italy and Spain. In contrast, NFC credit spreads do not add explanatory power in Italy or Spain. Moreover, although not statistically significant, a rise in Spanish NFC credit spreads again predicts an increase rather than a decrease in economic activity.

To understand the source of the predictive content of credit spreads for economic activity at the country level we again consider the breakdown of GDP into its spending components. These results are reported in Table 5. According to results in the top panel of Table 5, bank credit spreads are statistically significant predictors of consumption growth for France, Italy

and Spain. The coefficient estimates are remarkably uniform across these three countries – a one percentage point increase in bank credit spreads predicts a one percent decline in consumption growth in all three countries. In contrast, a 1 percentage point increase in bank credit spreads predicts a 0.4 percent decline in German consumption growth, moreover the coefficient estimate is not statistically significantly different from zero. In contrast to the coefficient estimates for bank credit spreads, the coefficient estimates of NFC credit spreads on consumption growth vary substantially across countries both in terms of statistical significance and in terms of economic magnitudes. The coefficient estimates range from 0.4 to 1.11 and are statistically significant at the 5% level for Italy, marginally significant for Germany and not significantly different from zero for France and Spain. These results imply that, with the notably exception of Germany, country-level bank credit spreads but not country-level NFC credit spreads are robust predictors of future consumption growth.

We obtain similar results when assessing the predictive content of country-specific credit spreads for non-residential investment. As documented in the lower panel of Table 5, the coefficient on bank credit spreads is statistically significantly different from zero for the year-ahead growth in non-residential investment in Germany, France and Spain, and marginally significant in the case of Italy. Again, the predictive content of NFC credit spreads is somewhat weaker and more heterogeneous across countries. NFC credit spreads are statistically significant for Germany and France, marginally significant for Italy, and have no predictive content for Spain. Finally, the middle panel of Table 5 documents that residential investment is not strongly related to country-specific credit spreads, a result that mirrors the findings for the euro area as a whole.

3.1.3 Inflation

We now turn to the predictive content of credit spreads for inflation. Table 6 reports forecasting results for the four-quarter ahead change in headline and core inflation in the euro area. The baseline regressions again include the real EONIA, the term spread and the lagged twelve-month inflation rate as explanatory variables. According to the estimation results, NFC credit spreads are statistically significant predictors of headline inflation. The effect is economically important – a one-percentage point rise in the euro area NFC credit spread predicts a 0.45 percent decline in euro area headline inflation. Although a rise in bank credit spreads also predicts a decline in inflation, the estimated coefficient is not statistically sig-

nificant. The second two columns of Table 6 report estimation results for predicting core inflation. Neither bank nor NFC credit spreads help predict year-ahead core inflation in the euro area as a whole. Moreover, the estimated coefficients imply a substantially reduced effect of credit spreads on core inflation relative to headline inflation – a one-percentage point rise in either NFC or bank credit spreads predicts a 0.16 percent decline in core inflation. Finally, it is worth noting that the gains in in-sample fit as measured by the change in R-square across specifications reported in Table 6 are in all cases relatively modest. In summary, there is little evidence to suggest that euro area credit spreads are robust predictors of euro area inflation, a result that is also consistent with previous findings for the U.S. as discussed in Gilchrist, Yankov and Zakrajsek (2009).

Table 7 documents the predictive content of country-specific credit spreads for inflation at the country level. At the country level, both bank and NFC credit spreads are strong predictors of headline inflation for Germany, France, and Spain. For these countries, a one-percentage point rise in either bank or NFC credit spreads predicts on the order of a 0.5 percent decline in year-ahead inflation. In contrast, year-ahead inflation in Italy is not systematically related to Italian credit spreads. With the exception of Spain, credit spreads do not add significant explanatory power in predicting year-ahead core inflation however, results that are entirely consistent with the findings for the euro area reported in Table 5. The one clear exception here is Spain where bank credit spreads are a statistically significant predictor of core inflation. In this case, a 1 percentage point increase in Spanish bank credit spreads predicts a 0.45 percent decline in Spanish core inflation. Moreover, the inclusion of the bank credit spread nearly doubles the in-sample fit as measured by the R-square in the Spanish inflation regression.

3.1.4 Summary

On balance these results imply that credit spreads overall, and in particular bank credit spreads, provide substantial predictive content for economic activity as measured by four-quarter changes in the unemployment rate, industrial production and real GDP growth. Some differences emerge across countries: monthly indicators of economic activity in Germany are better explained by non-financial credit spreads while economic activity in Spain is clearly more responsive to bank credit spreads. In terms of individual components of GDP, bank credit spreads do particularly well at forecasting consumption growth and the growth

in non-residential investment spending over both the full sample period and the 1999-2007 pre-crisis period. Finally, although bank credit spreads add significant explanatory power for predicting headline inflation at the country level, with the exception of Spain, these findings do not carry over to predicting core inflation.

3.2 Bank Lending Activity

Our analysis is motivated by the idea that credit spreads may forecast future economic activity because they provide a signal regarding the underlying fundamentals of the real economy and because they provide a measure of credit-supply conditions that directly influences spending behavior by households and the demand for inputs by firms. To the extent that credit spreads provide information about overall credit conditions as well as expected future economic activity, they should also provide information regarding future lending activity. In particular, as emphasized by Gertler and Gilchrist (1993) and Gilchrist and Zakrajsek (2012a), bank lending responds roughly contemporaneously with economic activity over the course of the business cycle.

To study the effect of credit spreads on lending activity we again consider a regression of the form:

$$\Delta^h \log L_{t+h} = \alpha_o + \alpha_1 r_t + \alpha_2 term_t + \gamma \Delta^h \log L_t + \beta s_t + \varepsilon_t$$

where $\Delta^h \log L_{t+h}$ measure the h quarter ahead change in lending volume, r_t measures the real interest rate, $term_t$ measures the term premium and s_t is the credit spread of interest – either bank or non-financial. We separate lending activity into three components – consumer loans, housing loans and loans to non-financial corporations. Table 8 reports the estimation results for each country and lending category.

According to the estimation results, bank credit spreads are statistically significant predictors of euro area loan growth for all three lending categories. A one-percentage point increase in bank credit spreads forecasts a 2.98% decline in consumer loans, a 1.29% decline in housing loans and a 4.55% decline in loans to non-financial corporations. NFC credit spreads also predict euro area consumer and NFC loan growth but do not forecast housing loan growth.

At the country-level, bank credit spreads and NFC credit spreads are significant predictors of the four-quarter ahead change in loan growth for all three loan categories in France and Italy. Credit spreads also provide significant explanatory power for NFC loans in Spain.

The response of loan growth in Germany is at odds with this overall picture however. The four-quarter ahead changes in housing and NFC loans in Germany are insensitive to changes in credit spreads, while in the case of consumer loans, rising credit spreads forecast an increase rather than a decline in future lending. Overall these results imply that credit spreads are robust predictors of loan growth in the euro area as a whole, and in France and Italy but do not uniformly predict loan growth in Spain and have no impact on lending volumes in Germany.

4 FAVAR Analysis

In this section we use the factor-augmented vector autoregression (FAVAR) methodology proposed by Bernanke, Boivin and Eliasz (2005) to identify credit shocks and examine their dynamic effect on a large set of macroeconomic variables. The estimation and identification procedure directly follows the methodology of Gilchrist, Yankov and Zakrajsek (2009).

The analysis combines the data on country-specific credit spread indices for banks and non-financial firms with data on euro area and country-specific measures of economic activity, inflation, interest rates and other asset prices. We estimate a FAVAR at the monthly frequency. Accordingly, we use both euro area and country-level growth rates of industrial production and changes in the unemployment rate as measures of real activity. Euro area and country-specific inflation is measured using both headline and core inflation. Thus, for the euro area as a whole and for each country (Germany, France, Italy and Spain) we have two real activity variables and two inflation variables. To this we add three euro area interest rates: the ECB policy rate as measured by the EONIA, the ten-year yield on German Bunds, and the three-month Euribor rate. We also include the five-year yield on sovereign bonds for each country, along with country-specific stock returns based on the overall market, and stock returns for that country's banking sector. These are computed as the log difference in the relevant country-specific stock index. Finally we also include a broad set of asset price information that capture conditions in both euro area and U.S. financial markets. These variables are the stock return on the U.S. S&P 500, the implied volatility from U.S. and European stock options (VIX-USA, VIX-Europe), the U.S. ten-year treasury rate, the log-difference in oil prices measured in U.S. dollars, the log-difference in the US-Euro exchange rate and the realized volatility in the US-Euro exchange rate measured as the standard

deviation of daily rates over the past 30 days.

In sum, these variables encompass euro area and country-specific measures of real activity and inflation, country-specific stock market indices that span financial and non-financial firms, along with both country-specific sovereign yields, euro area interest rates and global asset market indicators that capture exchange rate movements and stock market volatility in both the U.S. and Europe. The remaining eight variables assess conditions in European credit markets as measured by the country-level credit spreads for banks and non-financial firms.

We wish to evaluate the macroeconomic impact of disturbances to credit spreads that are uncorrelated with other real activity and asset price movements. We therefore separate the eight country-specific credit spread variables in $X_{2,t}$ $(N_2 \times 1)$ and all the rest of the variables in $X_{1,t}$ $(N_1 \times 1)$. We assume that the information content in $X = [X'_{1,t}\ X'_{2,t}]$ $(N \times T)$ can be summarized in a small set of unobservable factors F_t $(1 \times k)$. A subset of these factors $F_{2,t}$ $(1 \times k_2)$ are factors that are specific to the corporate bond market which we will refer to as credit factors. These credit factors do not contemporaneously influence variables in $X_{1,t}$ but they influence the corporate bond spreads. The rest of the factors $F_{1,t}$ $(1 \times k_1)$ span the information set contained in the entire dataset. The relationship between the observed variables and the unobserved factors is assumed to be linear and given by the observation equation:

$$\begin{bmatrix} X_{1,t} \\ X_{2,t} \end{bmatrix} = \begin{bmatrix} \Lambda_{1,1} & \Lambda_{1,2} \\ \Lambda_{2,1} & \Lambda_{2,2} \end{bmatrix} \begin{bmatrix} F'_{1,t} \\ F'_{2,t} \end{bmatrix} + \nu_t$$

where $\Lambda = \begin{bmatrix} \Lambda_{1,1} & \Lambda_{1,2} \\ \Lambda_{2,1} & \Lambda_{2,2} \end{bmatrix}$ $(N \times k)$ is the matrix of the factor loadings.

The dynamics of the factors are summarized in a vector-autoregression system:

$$\begin{bmatrix} F'_{1,t} \\ F'_{2,t} \end{bmatrix} = \Phi(L) \begin{bmatrix} F'_{1,t-1} \\ F'_{2,t-1} \end{bmatrix} + \epsilon_t$$

where $\Phi(L)$ is a lag-polynomial of finite order p. It is assumed that $E(\nu_{i,t}\epsilon_{j,t}) = 0$ for all $i = 1..N$ and $j = 1..k$ and $E(\epsilon_{i,t}\epsilon_{l,t}) = 0$ for all $i \neq l$. In this form the model is a static representation of a dynamic factor model (Stock and Watson, 2005).

To identify the set of credit factors F_{2t}, we impose the following restrictions on the system of equations. First, we assume that $\Lambda_{12} = 0$. This restriction on the factor loading implies that F_{1t} summarizes all information contained in the information set X_{1t}. To obtain F_{2t} we first regress X_{2t} on F_{1t} and then obtain the residuals from this regression. We then construct F_{2t} by estimating the factors from these residuals. Thus, by construction, F_{2t} summarizes the information contained in X_{2t} that is orthogonal to the first set of factors, i.e. it contains the information in credit spreads that is orthogonal to the factors that summarize real activity and inflation, interest rates, stock prices and other asset market variables.

We estimate the model using a Gaussian MLE method and Kalman filter to construct the likelihood function. However, when N is large and in the presence of identifying restrictions this method is computationally demanding. We therefore follow the four-step procedure outlined in GYZ as this is simple to implement while directly imposing the necessary identification restrictions.

We estimate a FAVAR model that allows for four factors in F_{1t} and two factors in F_{2t}. The relationship between factors and data can be deduced from their correlation between each data series and each factor. Table 9 reports the correlation between each factor and a subset of the euro area variables. The first factor is highly negatively correlated with euro area stock returns and positively correlated with implied volatility as measured by the euro area VIX. This factor is also negatively correlated with economic activity and positively correlated with both CPI and core inflation, and therefore appears to act like a "supply" shock. The second factor is highly positively correlated with yields on five-year French and German government bonds and negatively correlated with both bank and NFC credit spreads. The third factor is most strongly associated with core inflation while the fourth factor is most strongly associated with industrial production. Roughly speaking the four factors identified in F_{1t} appear to determine stock market activity, inflation, the level of interest rates, and measures of real economic activity. The first factor in F_{2t} captures the overall level of credit spreads and has almost no contemporaneous correlation with real activity, inflation or stock returns. This first credit factor is also uncorrelated with yields on French and German five year sovereign bonds but has a strong positive correlation with yields on Italian and Spanish sovereign bonds. The second credit factor exhibits low but varying correlation across a variety of variables and therefore has no obvious economic interpretation.

To understand the importance of credit disruptions on the economy we compute the

impulse response to a one-standard deviation shock to the first credit factor, that is, the first factor in F_{2t}. The impulse response functions for variables that enter the FAVAR in first-differences are cumulated and hence represent the log-deviation from zero at a given horizon (or in the case of unemployment, the percentage point change in the level of unemployment). These variables include industrial production, inflation, unemployment, stock market indices, oil prices and the exchange rate. The interest rate and credit spread responses are already in level terms and hence do not need to be cumulated.

Figures 7 displays the impulse response of a subset of the euro area variables to a shock to the first factor in F_{2t}. We report bootstrapped 95% confidence bounds along with the mean estimated impulse response. As shown in Figure 7 , the shock to the first credit factor is contractionary and causes euro area unemployment to rise and industrial production and prices to fall. Industrial production declines 0.5% at it's peak contraction approximately eight months after the shock occurs. Both the magnitude and timing of this effect is in line with the estimated effects of a credit shock for the U.S. based on the findings of Gilchrist, Yankov and Zakrajsek (2008). The inflation and unemployment responses are relatively modest however. The peak response of unemployment is 0.05% percent and occurs at the eight month horizon while prices exhibit a 0.07% decline after eighteen months and then appear to level off.

Consistent with the conduct of countercyclical monetary policy, the credit supply shock causes a reduction in short-term interest rates as measured by the EONIA, and a rise in the term spread as measured by the difference between the yield on the ten-year German Bund and the EONIA. The credit supply shock also leads to a sharp increase in risk factors as measured by the implied volatility in both European (VIX ZE) and U.S. (VIX US) stock markets but appears to have a negligible effect on conditions in the interbank market as measured by the BOR-OIS spread. Finally, contractionary credit supply shocks also have very little impact on the U.S./Euro exchange rate.

Figure 8 displays the impulse responses of industrial production, unemployment and core inflation to the credit supply shock across the four countries. The effect of the credit supply shock on industrial production is relatively uniform across countries and very similar to the results obtained for the euro area reported in Figure 7 – industrial production contracts by roughly 0.5 percent at its peak response. The response of core inflation and unemployment is also similar in Germany, France and Italy but clearly more pronounced in Spain where

the increase in unemployment and the fall in prices is roughly double the response that is observed in the other three countries.

Figure 9 displays the country-specific impulse responses to the overall stock market, five-year sovereign bond yields and the bank credit spreads. The credit shock causes a 3 percent decline in the stock markets across all four countries. This decline is eventually reversed however so that credit shocks lead to an immediate fall in stock returns but do not have a lasting impact on the level of asset prices. Yields on five-year bonds also decline by a modest five basis points. There is a differential effect on Italian and Spanish sovereign yields relative to German yields in that Italian and Spanish yields do not fall quite as much as German yields but the effect is quantitatively small. This implies that credit shocks that are contemporaneously orthogonal to sovereign yields do not cause a substantial future increase in sovereign spreads of the riskier countries.

The lower panel of Figure 9 displays the effect of the credit supply shock on bank credit spreads. By construction, credit spreads respond contemporaneously to the credit shock. The size of the credit spread increase varies between 0.1 percentage points for German and French banks to 0.2 to 0.25 percentage points for Spanish and Italian banks respectively.[10] Overall, these results imply that a credit shock that elicits a 0.1 to 0.2 percentage point increase in euro area credit spreads results in a 0.5 percent decline in industrial production, a 3 percent decline in broad measures of stock returns and more moderate effects on inflation and unemployment.

Although not shown, we have also computed the fraction of the variance associated with the shock to the first credit factor for the euro area and country-specific variables displayed in Figures 7-9. Upon impact, the shock to the first credit factor accounts for 85% of the variation in bank credit spreads in Germany, 90% of the variation in France, 70% of the variation in Italy and 45% of the variation in Spain. This is consistent with the notion that shocks originating in the credit markets are the primary driving force for credit spreads in Germany, France and Italy but that credit spreads in Spain are more strongly influenced by other macroeconomic events that are already captured in the real activity and asset price data included in X_{1t}. These credit shocks also account for an important fraction of the variation in economic activity and asset prices – 20% of the variation in country-specific

[10] Although not reported, we observe a similar reaction of NFC credit spreads. Bank stock returns also respond in a very similar manner to the broad stock indices displayed in Figure 9.

industrial production and stock returns at the peak horizon – and a more modest but not insignificant fraction of the variation in euro area interest rates –between 10 to 15% of the variation at peak the peak horizon. Finally, although credit shocks account for only 5% of the variation in German and French long-term yields they account for 15% of the variation in Italian and Spanish long-term yields.

5 Conclusion

This paper provides new indices that measure financial conditions in the euro area using credit spreads obtained from secondary market prices of debt securities issued by both banks and non-financial firms. The evolution of these series over time highlight the increasing fragmentation of the European financial system along national lines as the sovereign debt crisis has emerged since 2010. Consistent with the view that a deterioration in financial conditions has real economic consequences, we document that these financial indices have substantial predictive content for economic activity variables such as industrial production, unemployment and real GDP for the euro-area as a whole and for individual countries in the euro-zone. Moreover, credit spreads also contain substantial predictive content for the volume of loans outstanding. These findings are further supported by FAVAR analysis that shows that financial disruptions as measured by shocks to credit spreads that are contemporaneously uncorrelated with real activity and other asset prices cause significant contractions in future output. Overall these results imply that European bond markets provide robust signals regarding future economic activity via the movement in credit spreads for both banks and non-financial firms.

References

Albertazzi, U., Ropele, T., Sene, G., Signoretti, F. M. (2012), "The impact of the sovereign debt crisis on the activity of Italian banks," Bank of Italy, Occasional Papers No. 133.

Angeloni, Ignazio, Anil Kashyap, Benoit Mojon and Daniele Terlizesse (2003): "Monetary Policy Transmission in the Euro area: Where do we Stand?," *Monetary Policy Transmission in the Euro area*, Cambridge University Press, 383-412.

Battistini Niccolo, Marco Pagano and Saverio Simonelli (2013), "Systemic Risk and Home Bias in the Euro Area," mimeo.

Bernanke, Ben S. and Jean Boivin (2003), "Monetary policy in a data-rich environment," *Journal of Monetary Economics*, vol. 50(3), pages 525-546, April.

Bernanke, Ben S., Jean Boivin and Piotr S. Eliasz (2005), "Measuring the Effects of Monetary Policy: A Factor-augmented Vector Autoregressive (FAVAR) Approach," *The Quarterly Journal of Economics*, 120(1), 387-422.

Bernanke Ben S., Mark Gertler and Simon Gilchrist (1999), "The Financial Accelerator in a Quantitative Business Cycle Framework," *The Handbook of Macroeconomics*, Elsevier Science B.V, editor John B.Taylor and Michael Woodford, 1341-1393.

Biais, Bruno, Fany Declerck, James Dow, Richard Portes and Elu von Thadden (2006), "European Corporate Bond Markets: transparency, liquidity, efficiency," CEPR.

Bleaney Michael, Paul Mizen and Veronica Veleanu (2012), "Credit Spreads as Predictors of Economic Activity in 8 European Countries," Working Paper, University of Nottingham.

de Bondt, G., A. Maddaloni, A., and J.L. Peydró, , S. Scopel (2010), "The euro area Bank Lending Survey matters: empirical evidence for credit and output growth," ECB Working Paper Series No. 1160.

Brunnermeier Markus K. (2009), "Deciphering the Liquidity and Credit Crunch of 2007-08," *Journal of Economic Perspectives*, 23, 77-100.

Ciccarelli Matteo, Angela Maddaloni and Jose-Luis Peydro (2010), "Trusting the Bankers: A New Look at the Credit Channel of Monetary Policy," European Central Bank Working Paper No. 1228.

Del Giovane, P., G. Eramo, and A. Nobili (2011). "Disentangling demand and supply in credit developments: a survey-based analysis for Italy," *Journal of Banking & Finance*, 35, 2719-2732.

Del Giovane, Paolo, Andrea Nobili and Federico M. Signoretti (2013), "Supply tightening or lack in demand: Is the sovereign debt crisis different from Lehman?," Banca d'Italia mimeo.

Ehrmann Michael, Leo Gambarcorta, Jorge Matinez-Pages, Patrick Sevestre and Andreas Worms (2003), "Financial Systems and the Role of Banks in Monetary Policy Transmission in the Euro Area," *Monetary Policy Transmission in the Euro area*, Cambridge University Press, 235-269.

Estrella, Arturo and Gikas A. Hardouvelis (1991), "The Term Structure as a Predictor of Real Economic Activity," *Journal of Finance*, vol. 46(2), pages 555-76, June.

Estrella, Arturo and Frederic S. Mishkin (1998), "Predicting U.S. Recessions: Financial Variables As Leading Indicators," *The Review of Economics and Statistics*, vol. 80(1), pages 45-61, February.

Friedman, Benjamin M and Kuttner, Kenneth N (1992). "Money, Income, Prices, and Interest Rates," *American Economic Review*, vol. 82(3), pages 472-92, June.

Friedman Benjamin M and Kenneth N. Kuttner (1993). "Economic Activity and the Short-term Credit Markets: An Analysis of Prices and Quantities," *Brookings Papers on Economic Activity*, vol. 24(2), pages 193-284.

Gertler, Mark and Simon Gilchrist (1993), "The Role of Credit Market Imperfections in the Monetary Transmission Mechanism: Argument and Evidence," *Scandinavian Journal of Economics*, Vol. 95, 1993, 43-64.

Gertler, Mark and Cara S. Lown (1999), "The Information in the High-Yield Bond Spread for the Business Cycle: Evidence and Some Implications," *Oxford Review of Economic Policy*, vol. 15(3), pages 132-50.

Gilchrist Simon, Vladimir Yankov and Egon Zakrajsek (2009), "Credit Market Shocks and Economic Fluctuations: Evidence From Corporate Bond and Stock Markets," *Journal of Monetary Economics*, 56, 471-493.

Gilchrist, Simon and Egon Zakrajsek (2012a), "Bank Lending and Credit Supply Shocks" in Approaches to the Evolving World Economy. The Proceedings of the 16th World Congress of the International Economic Association Vol. III: The Global Macro Economy and Finance. Edited by Franklin Allen, Masahiko Aoki, Nobuhiro Kyotaki, Richard Gordon and Joseph Stiglizt.

Gilchrist Simon and Egon Zakrajsek (2012b), "Credit Spreads and Business Cycle Fluctuations," *American Economic Review*, 102(4), 1692-1720.

Hempell Hannah and Cristoffer Kok Sorensen (2010), "The impact of supply constraints on bank lending in the euro area - crisis induced crunching?," European Central Bank Working Paper No. 1262.

Lacroix Renaud and Jeremi Montornès, (2009), "Analyse de la portée des résultats du Bank Lending Survey au regard des données de crédit," Bulletin de la Banque de France 178, Q4

Panetta, F., Signoretti, F.M.(2010), "Credit demand and supply in Italy during the financial crisis". Occasional Papers No. 63, Bank of Italy.

Vuillemey, Guillaume and Tuomas Peltonen (2013), "Sovereign Credit Events and their Spillovers- the Interplay Between Sovereign Bonds and CDS Holdings," ECB mimeo.

Data appendix

Our database is constructed from extracts of datastream for bonds prices, yield to maturity, duration, maturity, size of issuance, currency of issuance, ABS status, ect... However, because the characteristics of the bonds were frequently missing, where necessary, we also extracted bond characteristics from dealogic and Bloomberg. From this data set we constructed a sub-sample of non-floating rate, non-callable, non-collaterizable bonds that are denominated in euros. The full data set along with details of the subsample are described in Table A1. From this dataset, we have also excluded outliers as follows: bonds with spreads above 30% or less than -5%; bonds with duration or maturity greater than 30 years, or bonds with maturity less than two years. We also exclude observations for which the size of issuance is not reported.

Figure 1: Euro area corporate credit spreads for banks

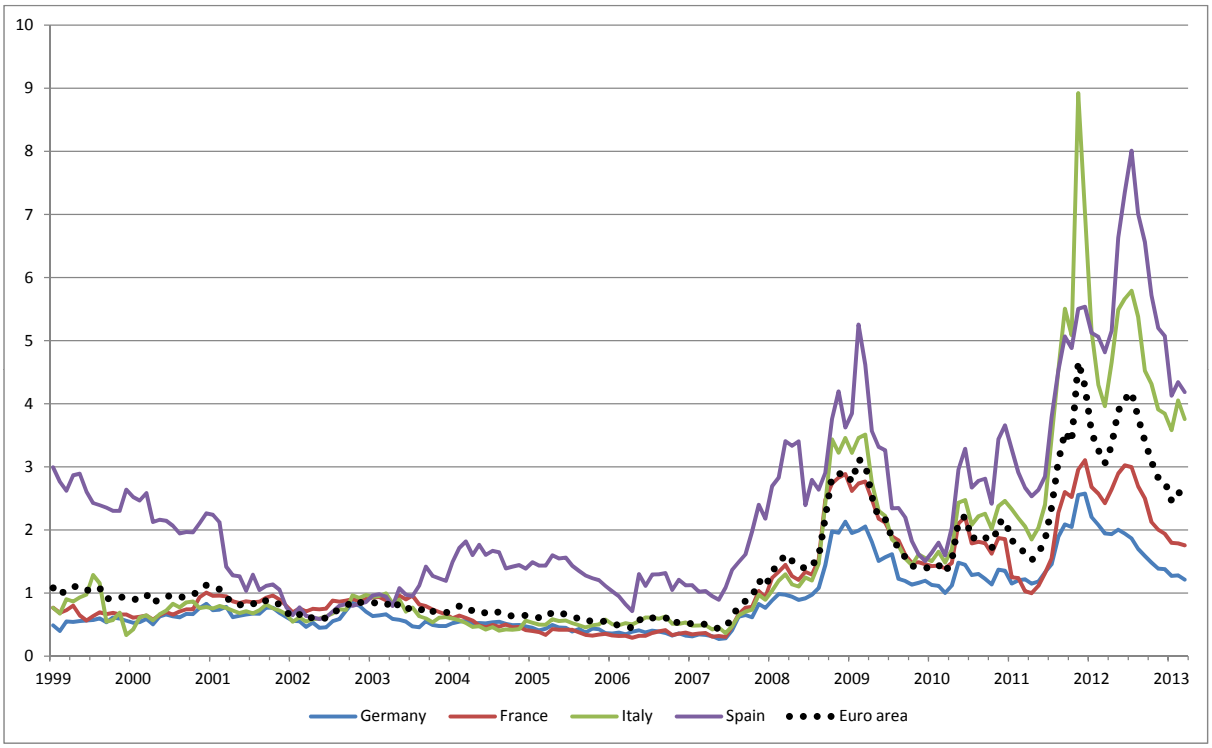

Figure 2: Euro area corporate credit spreads for NFCs

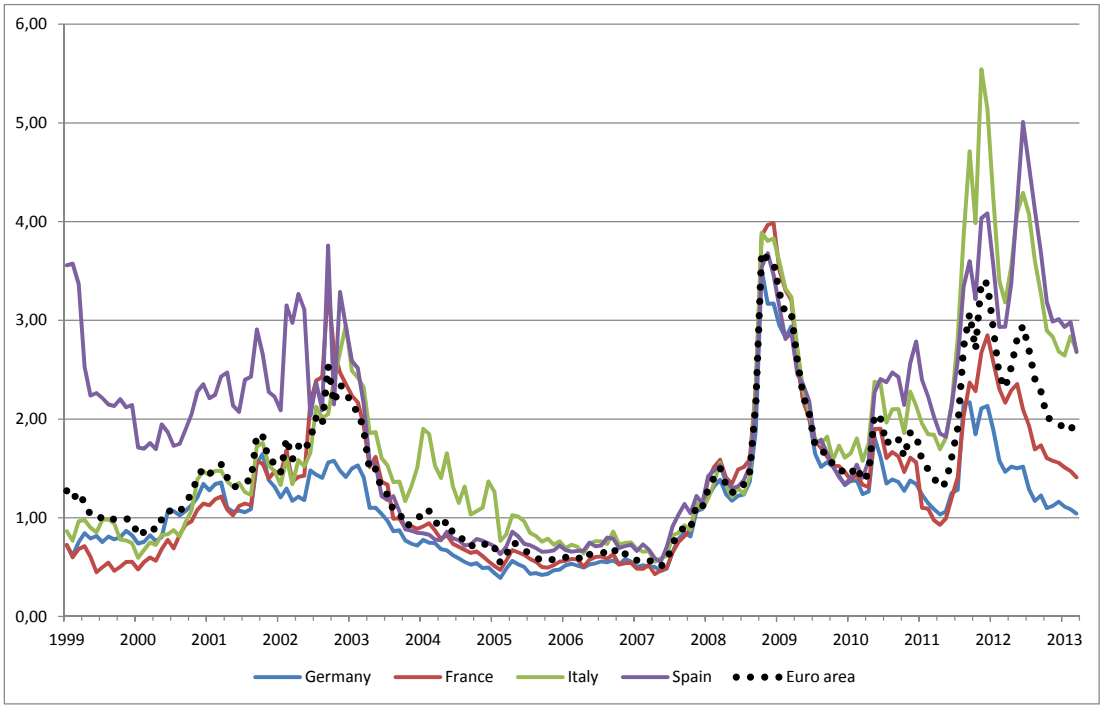

Figure 3: Credit spreads for euro area banks compared to BOR-OIS Spread

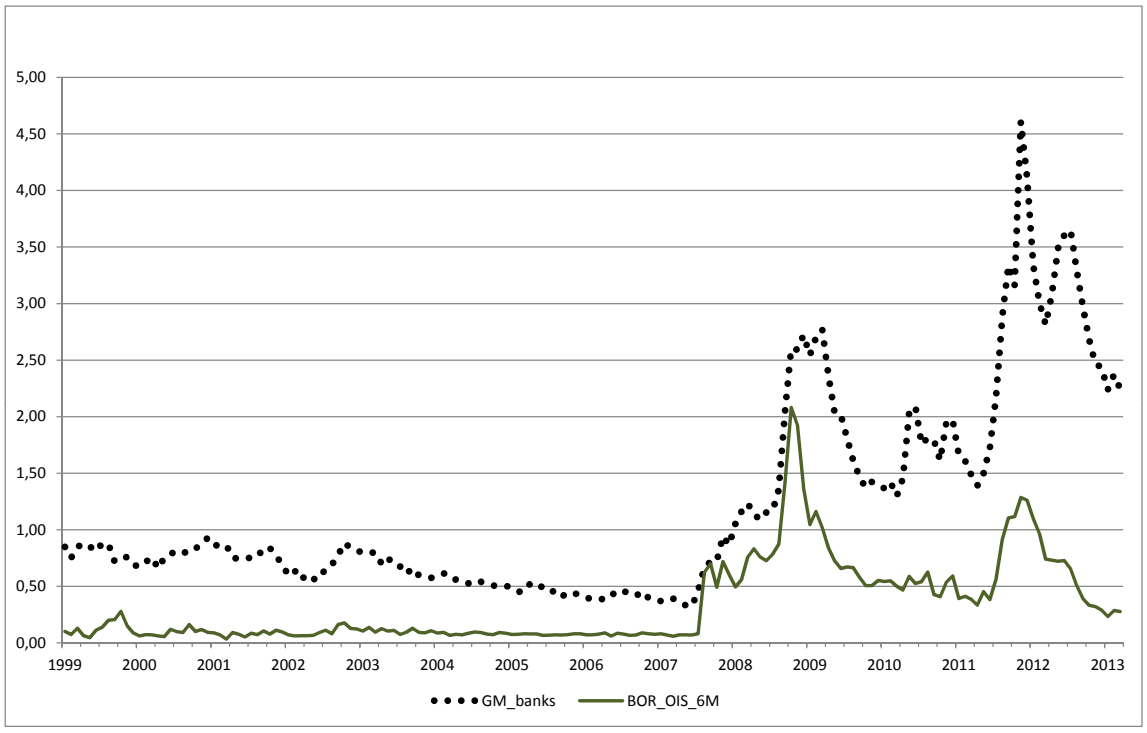

Figure 4: Credit spreads for euro area NFCs compared to retail lending rates

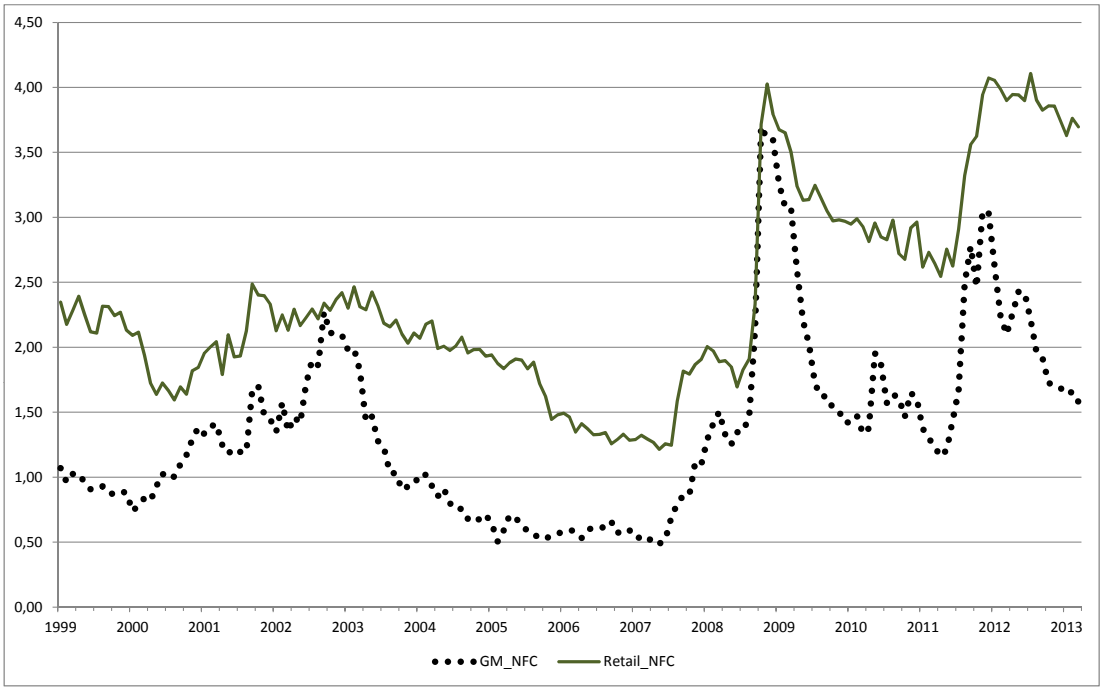

Figure 5: GM Bank credit spreads versus CDS rates

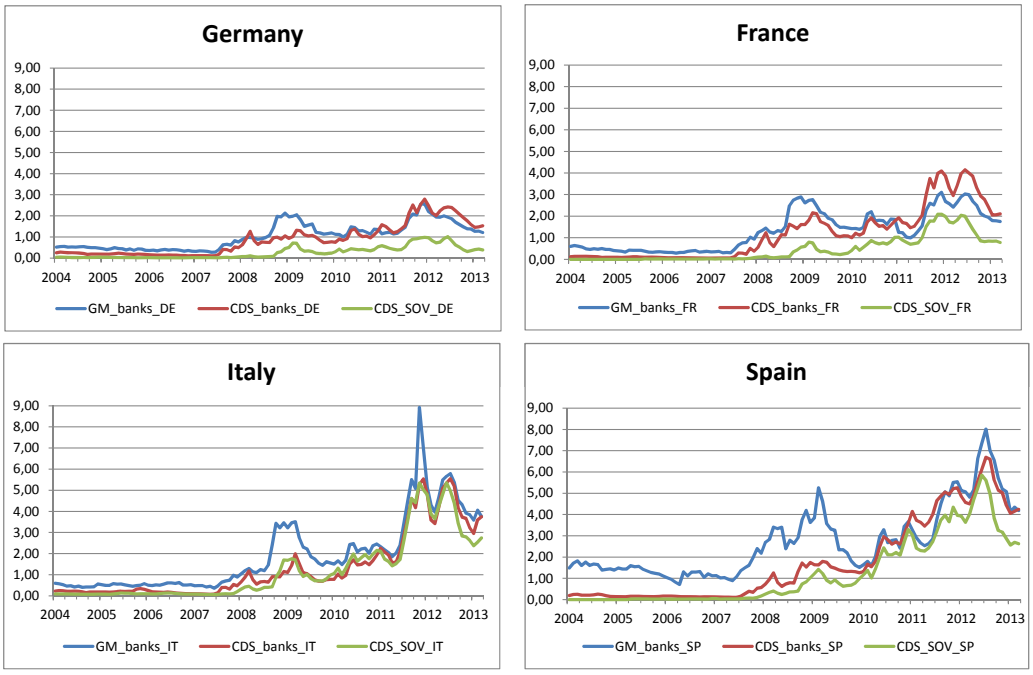

Figure 6: GM NFC credit spreads versus CDS rates

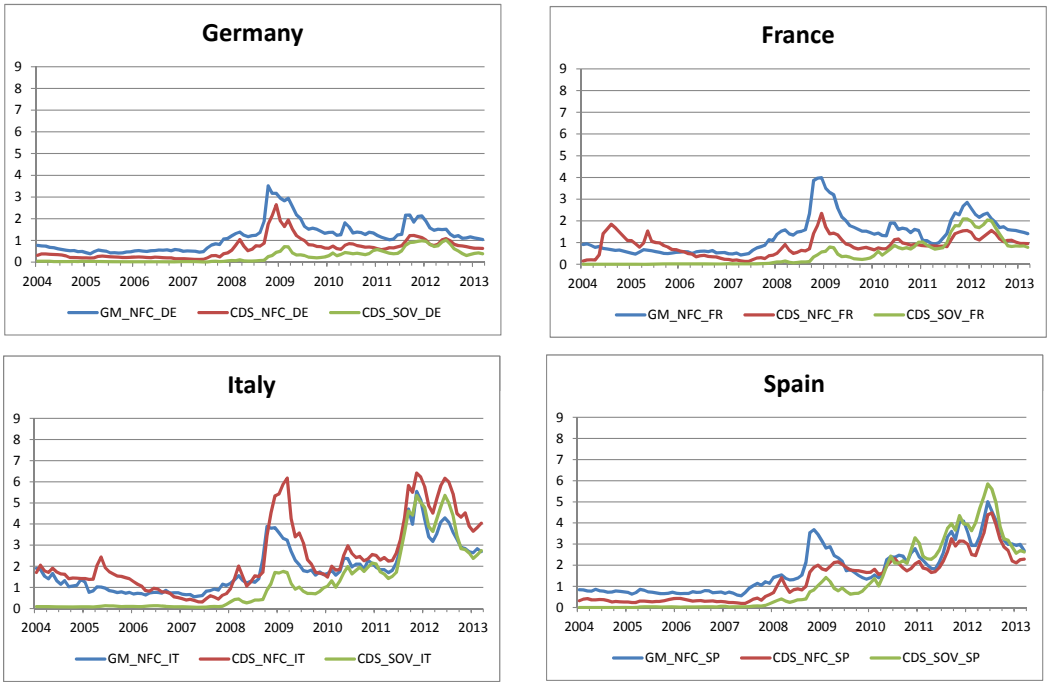

Figure 7: Impulse response: euro area real and financial variables

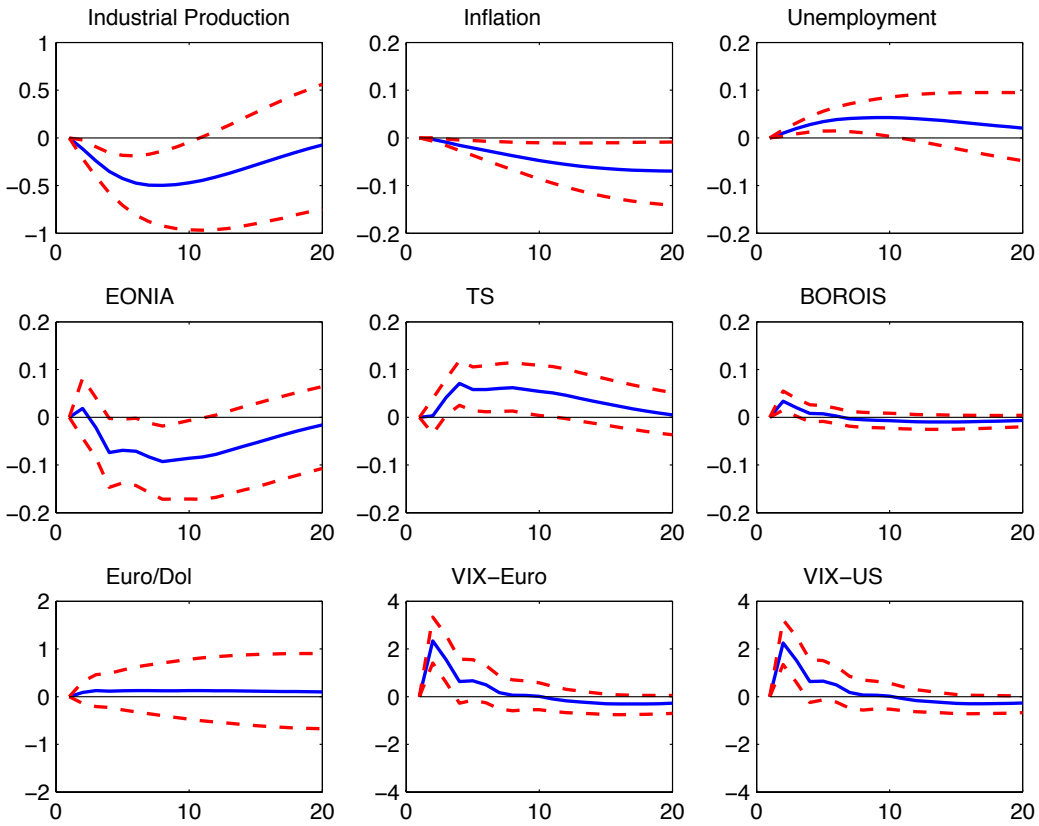

Figure 8: Impulse response: country-specific real activity and inflation.

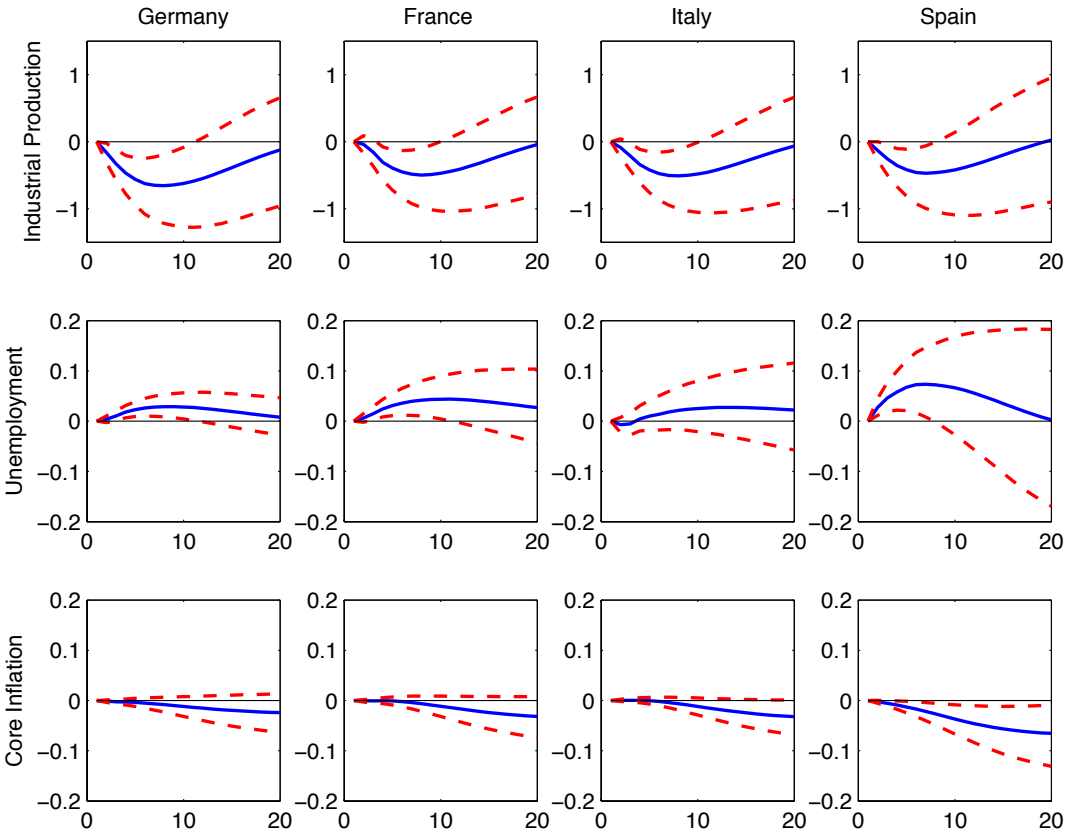

Figure 9: Impulse response: country-specific financial variables.

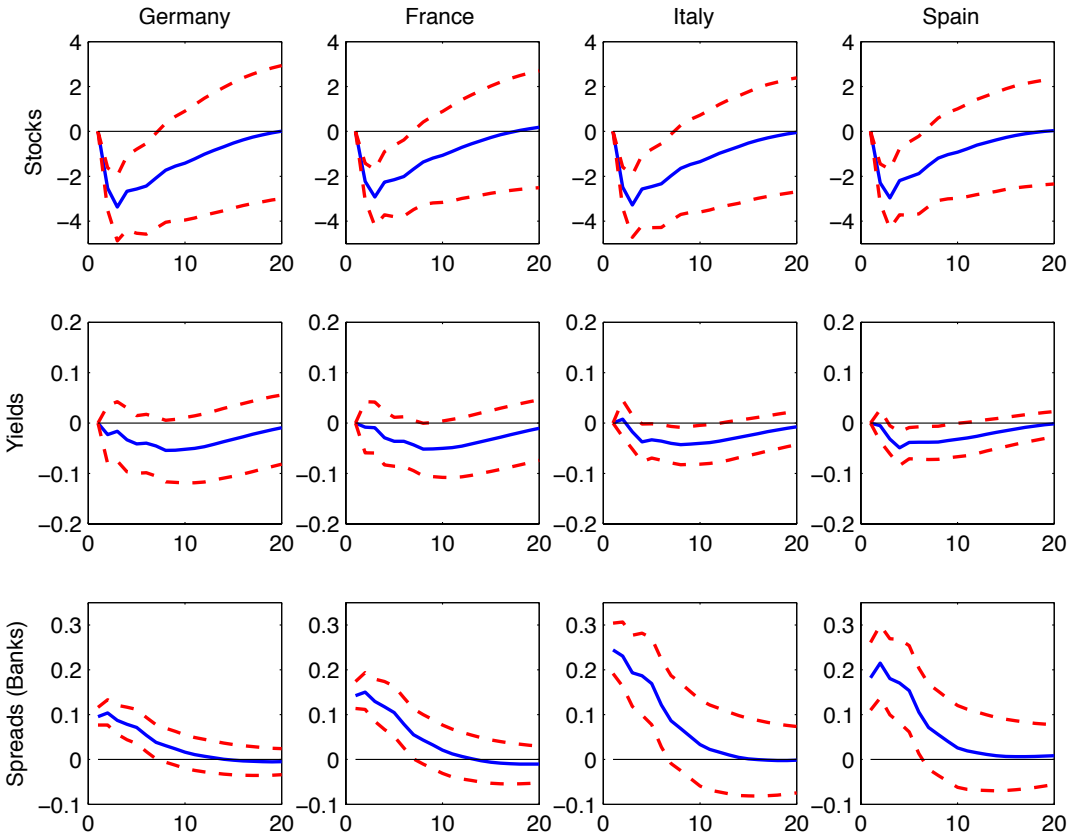

Table 1: Descriptive statistics of the micro data used to build the indices

Banks

	Germany			France			Italy			Spain		
Number of observations	27860			11573			8889			2774		
Number of securities	867			241			296			69		
Number of securities in May 2012	561			122			166			35		
Number of securities in June 2005	191			67			32			16		
Number of securities in January 1999	34			30			22			10		
Total number of issuers	66			40			47			26		
	mean	median	sd	mean	median	sd	mean	median	sd	mean	median	sd
Mkt value of issue ($ thousands)	333881	120875	587179	498888	279601	578111	570700	307093	653037	342691	200000	423537
Maturity at issue (yrs.)	6.6	5	3.9	9.5	10	3.3	7.7	8	3.5	9.8	10	6.5
Remaining maturity	4.1	3.5	2.9	4.8	5	6.7	4.4	3.4	3.2	3.3	2.5	2.5
Duration (years)	3.4	2.9	2.1	4.4	4.3	2.4	3.7	3.3	2.3	5	3.9	3.7
Domestic sovereign ZCY	2.3	2.4	1.4	3.1	3.2	1.2	3.6	3.5	1.2	3.7	3.8	1.1
German sovereign ZCY	2.3	2.4	1.4	3	3.2	1.4	2.3	2.2	1.5	2.2	2.2	1.7
Spread / German sov. ZCY	1.6	1.3	1.9	1.4	0.9	1.6	2.4	1.7	2.8	2.5	2.5	2.4

Non financial corporations

	Germany			France			Italy			Spain		
Number of observations	15471			13696			6702			2695		
Number of securities	333			283			139			39		
Number of securities in May 2012	188			142			62			22		
Number of securities in June 2005	98			98			44			19		
Number of securities in January 1999	14			16			4			4		
Total number of issuers	112			88			62			22		
	mean	median	sd	mean	median	sd	mean	median	sd	mean	median	sd
Mkt value of issue ($ thousands)	907783	672495	767060	798285	708968	561291	891480	753742	736147	517025	494007	411515
Maturity at issue (yrs.)	7.8	7	4.5	8.5	7	3.7	9.2	7	6	11.8	10	7
Remaining maturity (yrs)	4.4	4	5.9	5.2	4.5	3.4	5	4.3	10.2	5.5	5.3	3.1
Duration (years)	4	3.5	2.6	4.3	4	2.4	5.1	4	3.7	5.4	5	3.2
Domestic sovereign ZCY	2.6	2.7	1.3	3	3.1	1.1	3.8	3.8	1.1	3.7	3.8	0.9
German sovereign ZCY	2.6	2.7	1.3	2.9	3	1.2	3.1	3.2	1.2	3.1	3.3	1.2
Spread / German sov. ZCY	1.4	1.1	1.3	1.4	1	1.7	2.2	1.6	2.4	2	1.5	2.1

Table 2: Credit spreads and euro area economic activity (monthly series)

		Unemployment rate			Industrial production		
Real eonia	Coef	-0.51	-0.34	-0.43	2.13	1.08	1.56
	std	(0.12)***	(0.09)***	(0.09)***	(0.80)***	(0.95)	(0.89)*
Term spread	Coef	0.11	0.20	0.05	4.99	4.53	4.53
	std	(0.19)	(0.11)*	(0.09)	(1.54)***	(1.57)***	(1.62)***
Bank credit spread	Coef		0.82			-2.46	
	std		(0.10)***			(1.04)**	
NFC credit spread	Coef			0.81			-2.64
	std			(0.10)***			(1.02)**
R2		0.31	0.72	0.74	0.38	0.45	0.45

The sample includes 166 observations from January 1999 to October 2013 for the unemployment rate and 153 observations, from January 2000 to September 2013 for year-over-year changes in the log of industrial production.

Real eonia is the eonia interest rate minus HICP inflation over the prior 12 months. Term spread is the difference between the euro area AAA ten year interest rate and the 3 month swap eonia.

The table reports the estimated coefficient and standard error of the 12th lag of each financial variable in regressions of unemployment or industrial production on their own 12th lag and a constant. All standard errors are computed using a Newey-West correction for serial correlation in errors.

Table 3a: Credit spreads and euro area economic activity (quarterly series), Full sample

		GDP			Consumption			Residential Investment			Non Res. Investment		
Real eonia	Coef	0.73	0.31	0.59	0.49	0.31	0.53	0.85	0.21	0.73	2.07	0.47	1.36
	std	(0.43)*	(0.45)	(0.37)	(0.20)**	(0.16)*	(0.14)***	(0.60)	(0.89)	(0.70)	(1.30)	(1.08)	(1.01)
Term spread	Coef	1.92	1.74	1.80	0.80	0.70	0.79	4.30	4.04	4.27	5.45	4.55	4.35
	std	(1.01)*	(0.95)*	(0.92)*	(0.25)***	(0.22)***	(0.21)***	(1.14)***	(1.32)***	(1.22)***	(3.01)*	(2.62)*	(2.63)
Bank credit spread	Coef		-1.24			-0.86			-1.63			-4.38	
	std		(0.52)**			(0.22)***			(1.07)			(1.15)***	
NFC credit spread	Coef			-1.64			-0.85			-1.03			-5.29
	std			(0.51)***			(0.26)***			(1.11)			(1.20)***
R2		0.31	0.46	0.52	0.50	0.68	0.65	0.61	0.65	0.63	0.26	0.53	0.57

The sample includes 48 observations, from 2000 Q1 to 2012 Q4 for year-over-year changes in the log of GDP and its spending components. Financial variables are dated as of the final month of the quarter. See notes from Table 2 for a description of variables and estimation procedure.

Table 3b: Credit spreads and economic activity (quarterly series) Euro zone, prior to 2008

		GDP			Consumption			Residential Investment			Non Res. Investment		
Real eonia	Coef	-1.01	-0.95	-0.74	-0.29	-0.06	-0.03	-3.63	-3.41	-3.67	-2.76	-1.27	-2.59
	std	(0.14)***	(0.15)***	(0.17)***	(0.08)***	(0.08)	(0.09)	(0.49)***	(0.52)***	(0.53)***	(0.54)***	(0.54)**	(0.52)***
Term spread	Coef	-0.60	-0.56	-0.53	0.02	0.22	0.17	-2.25	-2.12	-2.30	-1.48	-0.41	-1.47
	std	(0.38)	(0.38)	(0.38)	(0.12)	(0.10)**	(0.11)	(0.78)***	(0.69)***	(0.79)***	(1.06)	(1.06)	(1.08)
Bank credit spread	Coef		-0.36			-1.42			-1.88			-9.06	
	std		(0.61)			(0.54)**			(2.17)			(3.41)**	
NFC credit spread	Coef			-0.57			-0.60			0.25			-0.50
	std			(0.20)***			(0.15)***			(0.61)			(1.05)
R2		0.73	0.73	0.75	0.36	0.47	0.53	0.73	0.73	0.73	0.70	0.80	0.71

The sample includes 28 observations, from 2000 Q1 to 2007 Q4 for year-over-year changes in the log of GDP and its spending components. Financial variables are dated as of the final month of the quarter. See notes from Table 2 for a description of variables and estimation procedure.

Table 4: Credit spreads and national economic activity

GDP (4 quarters changes in the log level)

		Germany			France			Italy			Spain		
Real eonia	Coef	0.30	-0.10	0.28	0.45	0.22	0.42	0.93	0.44	0.51	0.47	0.27	0.51
	std	(0.61)	(0.54)	(0.49)	(0.30)	(0.26)	(0.26)	(0.36)**	(0.46)	(0.43)	(0.26)*	(0.22)	(0.20)**
Term spread	Coef	1.58	1.69	1.83	1.57	1.45	1.53	2.16	1.95	2.07	1.99	1.70	2.04
	std	(1.25)	(1.12)	(1.04)*	(0.71)**	(0.60)**	(0.67)**	(0.83)**	(0.90)**	(0.87)**	(0.66)***	(0.58)**	(0.67)***
Bank credit spread	Coef		-1.96			-1.23			-0.72			-0.85	
	std		(0.99)*			(0.36)***			(0.33)**			(0.17)***	
NFC credit spread	Coef			-2.10			-0.89			-1.04			-0.60
	std			(0.85)**			(0.35)**			(0.45)**			(0.29)**
R2		0.18	0.29	0.37	0.39	0.57	0.51	0.39	0.48	0.50	0.67	0.77	0.72

Unemployment rate

		Germany			France			Italy			Spain		
Real eonia	Coef	0.30	0.35	0.29	-0.38	-0.30	-0.32	-0.41	0.01	-0.09	-0.00	-0.03	0.17
	std	(0.11)***	(0.11)***	(0.10)***	(0.06)***	(0.05)***	(0.05)***	(0.18)**	(0.13)	(0.15)	(0.28)	(0.28)	(0.24)
Term spread	Coef	0.15	0.15	0.11	0.11	0.02	-0.02	-0.15	0.02	-0.03	-1.95	-1.63	-2.21
	std	(0.18)	(0.18)	(0.17)	(0.13)	(0.09)	(0.09)	(0.19)	(0.09)	(0.11)	(0.56)***	(0.44)***	(0.58)***
Bank credit spread	Coef		0.33			0.44			0.55			0.62	
	std		(0.31)			(0.08)***			(0.09)***			(0.42)	
NFC credit spread	Coef			0.56			0.42			0.60			-0.68
	std			(0.22)**			(0.06)***			(0.12)***			(0.36)*
R2		0.11	0.12	0.19	0.70	0.81	0.83	0.33	0.63	0.54	0.38	0.41	0.41

Industrial production (12 months changes in log levels)

		Germany			France			Italy			Spain		
Real eonia	Coef	1.44	-0.19	0.76	1.48	0.88	1.19	3.17	2.02	2.30	0.07	-0.71	0.08
	std	(0.98)	(0.86)	(0.84)	(0.57)**	(0.53)*	(0.59)**	(0.81)***	(1.24)	(1.35)*	(0.73)	(0.80)	(0.67)
Term spread	Coef	5.61	5.12	5.25	4.08	3.81	3.74	5.77	5.10	5.27	2.27	1.95	2.23
	std	(1.85)***	(1.71)***	(1.71)***	(1.25)***	(1.14)***	(1.28)***	(1.73)***	(1.98)**	(2.06)**	(1.79)	(1.76)	(1.68)
Bank credit spread	Coef		-5.77			-2.58			-1.45			-2.25	
	std		(1.45)***			(0.72)***			(0.86)*			(1.18)*	
NFC credit spread	Coef			-4.79			-1.77			-1.70			1.49
	std			(1.15)***			(0.67)***			(1.26)			(0.98)
R2		0.38	0.48	0.50	0.37	0.47	0.43	0.36	0.40	0.39	0.24	0.30	0.27

The sample includes 166 observations from January 1999 to October 2013 for the unemployment rate, 153 observations, from January 2000 to September 2013 for year-over-year changes in the log of industrial production and 48 quarterly observations, from 2001 Q1 to 2012 Q4 for year-over-year changes in the log of GDP.

Bank and NFC credit spreads are country-specific indices as described in the text.

See notes from Table 2 for a description of variables and estimation procedure.

Table 5: Credit spreads and national GDP components

Consumption

		Germany			France			Italy			Spain		
Real eonia	Coef	-0.19	-0.25	-0.16	0.33	0.35	0.40	0.99	0.38	0.60	0.79	0.49	0.82
	std	(0.18)	(0.17)	(0.16)	(0.17)	(0.14)*	(0.16)*	(0.43)*	(0.26)	(0.29)*	(0.29)**	(0.28)	(0.26)**
Term spread	Coef	0.06	0.13	0.18	0.44	0.56	0.53	1.26	1.03	1.21	1.62	1.40	1.64
	std	(0.14)	(0.15)	(0.16)	(0.23)	(0.18)**	(0.22)*	(0.30)**	(0.28)**	(0.25)**	(0.70)*	(0.63)*	(0.72)*
Bank credit spread	Coef		-0.40			-0.99			-0.96			-1.06	
	std		(0.24)			(0.23)**			(0.17)**			(0.35)**	
NFC credit spread	Coef			-0.41			-0.41			-1.11			-0.48
	std			(0.18)*			(0.25)			(0.33)**			(0.37)
R2		0.10	0.14	0.17	0.27	0.47	0.32	0.39	0.64	0.57	0.50	0.61	0.52

Residential Investment

		Germany			France			Italy			Spain		
Real eonia	Coef	-2.52	-2.45	-2.53	1.65	0.67	1.39	2.29	1.46	1.87	1.36	0.82	1.41
	std	(0.76)**	(0.89)**	(0.77)**	(0.75)*	(0.84)	(0.73)	(0.49)**	(0.72)*	(0.65)**	(0.80)	(0.82)	(0.76)
Term spread	Coef	0.56	0.48	0.44	6.11	5.08	5.75	4.46	3.81	4.28	6.96	6.68	7.07
	std	(1.22)	(1.26)	(1.31)	(1.68)**	(1.76)**	(1.71)**	(0.73)**	(0.91)**	(0.78)**	(2.24)**	(2.14)**	(2.32)**
Bank credit spread	Coef		0.50			-3.25			-1.17			-2.08	
	std		(1.98)			(0.86)**			(0.77)			(0.82)*	
NFC credit spread	Coef			0.43			-2.04			-1.06			-0.54
	std			(1.63)			(0.83)*			(0.71)			(1.04)
R2		0.39	0.39	0.39	0.61	0.71	0.68	0.64	0.69	0.67	0.74	0.78	0.74

Non Res. Investment

		Germany			France			Italy			Spain		
Real eonia	Coef	0.24	-1.52	-0.10	0.50	-0.21	0.23	3.12	2.05	2.20	2.85	1.97	2.82
	std	(1.76)	(1.08)	(1.00)	(1.06)	(0.76)	(0.87)	(0.76)**	(0.97)*	(0.93)*	(0.72)**	(0.84)*	(0.69)**
Term spread	Coef	3.76	4.74	4.32	2.73	2.64	2.16	4.92	4.59	4.97	7.22	6.00	7.04
	std	(3.02)	(2.49)	(2.24)	(2.72)	(1.93)	(2.21)	(1.76)**	(1.82)*	(1.69)**	(1.74)**	(1.83)**	(1.91)**
Bank credit spread	Coef		-9.88			-4.29			-1.63			-2.08	
	std		(2.06)**			(1.10)**			(0.78)*			(0.55)**	
NFC credit spread	Coef			-8.71			-3.52			-2.52			-1.21
	std			(1.64)**			(1.29)**			(1.03)*			(0.92)
R2		0.14	0.51	0.57	0.12	0.48	0.37	0.44	0.52	0.56	0.69	0.74	0.71

The sample includes 48 observations, from 2000 Q1 to 2012 Q4 for year-over-year changes in the log of GDP components. Financial variables are dated as of the final month of the quarter. See notes from Table 2 for a description of variables and estimation procedure.

Bank and NFC credit spreads are country-specific indices as described in the text.

Table 6: Credit spreads and euro area inflation (monthly series)

		HICP inflation			Core inflation		
Real eonia	Coef	-0.08	-0.21	-0.13	0.02	-0.03	0.01
	std	(0.09)	(0.13)*	(0.11)	(0.06)	(0.08)	(0.07)
Term spread	Coef	-0.16	-0.20	-0.13	-0.25	-0.24	-0.22
	std	(0.20)	(0.20)	(0.18)	(0.09)***	(0.08)***	(0.09)**
Bank credit spread	Coef		-0.33			-0.16	
	std		(0.21)			(0.11)	
NFC credit spread	Coef			-0.46			-0.16
	std			(0.15)***			(0.11)
R2		0.65	0.68	0.71	0.55	0.58	0.57

The sample includes 166 observations from January 1999 to October 2013.

See notes from Table 2 for a description of variables and estimation procedure.

Table 7: Credit spreads and national inflation (monthly series)

HICP year on year inflation

		Germany			France			Italy			Spain		
Real eonia	Coef	-0.22	-0.33	-0.24	-0.00	-0.12	-0.03	-0.04	-0.06	-0.07	0.26	0.02	0.32
	std	(0.12)*	(0.15)**	(0.12)**	(0.08)	(0.12)	(0.10)	(0.12)	(0.13)	(0.14)	(0.15)*	(0.23)	(0.19)*
Term spread	Coef	-0.37	-0.37	-0.33	-0.01	-0.04	-0.00	-0.06	-0.07	-0.06	0.28	0.10	0.38
	std	(0.22)*	(0.21)*	(0.19)*	(0.19)	(0.19)	(0.19)	(0.19)	(0.18)	(0.19)	(0.35)	(0.34)	(0.32)
Bank credit spread	Coef		-0.51			-0.41			-0.02			-0.52	
	std		(0.24)**			(0.16)**			(0.13)			(0.22)**	
NFC credit spread	Coef			-0.53			-0.23			-0.06			-0.40
	std			(0.12)***			(0.14)*			(0.19)			(0.19)**
R2		0.61	0.65	0.69	0.70	0.74	0.72	0.59	0.59	0.59	0.59	0.67	0.63

Core year on year inflation

		Germany			France			Italy			Spain		
Real eonia	Coef	-0.22	-0.25	-0.22	0.01	-0.01	0.01	0.14	0.11	0.13	0.13	0.07	0.16
	std	(0.07)***	(0.08)***	(0.07)***	(0.07)	(0.07)	(0.07)	(0.08)*	(0.10)	(0.10)	(0.13)	(0.11)	(0.13)
Term spread	Coef	-0.45	-0.44	-0.44	-0.22	-0.21	-0.22	-0.00	-0.01	-0.00	-0.06	-0.21	-0.02
	std	(0.09)***	(0.09)***	(0.09)***	(0.09)**	(0.09)**	(0.10)**	(0.11)	(0.11)	(0.10)	(0.21)	(0.15)	(0.22)
Bank credit spread	Coef		-0.14			-0.12			-0.04			-0.45	
	std		(0.13)			(0.12)			(0.06)			(0.19)**	
NFC credit spread	Coef			-0.07			0.00			-0.02			-0.22
	std			(0.10)			(0.13)			(0.11)			(0.14)
R2		0.63	0.64	0.63	0.48	0.50	0.48	0.52	0.53	0.52	0.24	0.42	0.28

The sample includes 166 observations from January 1999 to October 2013.

Bank and NFC credit spreads are country-specific indices as described in the text.

See notes from Table 2 for a description of variables and estimation procedure.

Table 8: Credit spreads and loan volumes (monthly series)

Consumption loans (12 months changes in the log level)

		Euro area			Germany			France			Italy			Spain		
Real eonia	Coef	0.90	0.10	0.80	1.04	1.34	1.02	1.28	-0.03	0.60	3.10	1.28	2.40	-1.69	-1.69	-1.68
	std	(0.52)*	(0.41)	(0.34)**	(0.34)***	(0.39)***	(0.42)**	(0.51)**	(0.40)	(0.41)	(0.61)***	(0.84)	(0.80)***	(0.74)**	(0.74)**	(0.76)**
Term spread	Coef	0.44	0.31	0.31	0.81	0.68	0.58	2.21	0.46	1.05	3.69	2.92	3.49	4.64	4.66	4.51
	std	(0.67)	(0.50)	(0.34)	(0.38)**	(0.42)	(0.41)	(0.79)***	(0.63)	(0.63)	(0.68)***	(0.52)***	(0.62)***	(1.60)***	(1.40)***	(1.65)***
Bank credit spread	Coef		-2.98			1.47			-3.11			-2.03			0.03	
	std		(0.60)***			(0.73)**			(0.43)***			(0.72)***			(1.33)	
NFC credit spread	Coef			-4.06			1.22			-2.26			-1.20			-0.30
	std			(0.91)***			(0.44)***			(0.46)***			(0.77)			(1.87)
R2		0.18	0.43	0.63	0.21	0.31	0.34	0.34	0.63	0.58	0.61	0.68	0.63	0.82	0.82	0.82

Housing loans (12 months changes in the log level)

		Euro area			Germany			France			Italy			Spain		
Real eonia	Coef	0.82	0.48	0.80	-0.53	-0.46	-0.50	0.95	0.23	0.65	3.00	-0.21	0.32	-0.52	-0.57	-0.64
	std	(0.29)***	(0.30)	(0.29)***	(0.09)***	(0.12)***	(0.10)***	(0.40)**	(0.33)	(0.34)*	(0.74)***	(0.89)	(0.99)	(0.41)	(0.42)	(0.43)
Term spread	Coef	2.27	1.90	2.17	0.23	0.21	0.20	3.39	1.18	1.87	4.88	4.19	4.63	3.56	3.43	3.22
	std	(0.34)***	(0.34)***	(0.37)***	(0.06)***	(0.07)***	(0.07)***	(0.58)***	(0.83)	(0.74)**	(0.73)***	(0.53)***	(0.51)***	(0.55)***	(0.58)***	(0.57)***
Bank credit spread	Coef		-1.29			0.16			-2.83			-2.96			-0.31	
	std		(0.50)**			(0.16)			(0.49)***			(0.66)***			(0.44)	
NFC credit spread	Coef			-0.44			0.11			-1.94			-3.72			-1.48
	std			(0.35)			(0.12)			(0.51)***			(0.89)***			(1.02)
R2		0.72	0.76	0.72	0.68	0.69	0.69	0.61	0.76	0.72	0.50	0.71	0.66	0.83	0.83	0.84

NFCs loans (12 months changes in the log level)

		Euro area			Germany			France			Italy			Spain		
Real eonia	Coef	0.28	-1.32	0.00	-0.65	-1.04	-0.98	1.40	0.34	0.72	2.67	0.48	0.52	-2.91	-2.81	-2.68
	std	(0.77)	(0.52)**	(0.41)	(0.57)	(0.96)	(0.60)	(0.46)***	(0.36)	(0.30)**	(0.61)***	(0.57)	(0.52)	(0.62)***	(0.57)***	(0.56)***
Term spread	Coef	-1.42	-0.38	-1.02	-3.90	-3.57	-3.00	-4.74	-1.82	-1.75	-2.92	-3.17	-2.80	6.08	4.82	4.74
	std	(1.51)	(0.75)	(0.56)*	(0.68)***	(0.79)***	(0.81)***	(0.98)***	(0.78)**	(0.64)***	(1.58)*	(0.87)***	(0.84)***	(0.79)***	(0.76)***	(0.77)***
Bank credit spread	Coef		-4.55			-1.12			-4.02			-2.21			-1.85	
	std		(0.72)***			(1.61)			(0.63)***			(0.55)***			(0.51)***	
NFC credit spread	Coef			-5.20			-1.87			-3.96			-3.34			-2.96
	std			(0.40)***			(1.14)			(0.35)***			(0.41)***			(1.05)***
R2		0.38	0.73	0.85	0.55	0.56	0.58	0.53	0.82	0.86	0.48	0.72	0.77	0.92	0.93	0.93

The sample includes 98 observations for Germany, France, Italy and Spain from December 2003 to January 2013, 145 for the euro area from January 2000 to January 2013.

See notes from Table 2 for a description of variables and estimation procedure.

Table 9: Correlation of euro area variables with factors

	General factors (F1)				Credit risk factors (F2)	
	f1	f2	f3	f4	f5	f6
Industrial production	-0,42	0,29	-0,31	-0,51	0,08	0,33
Unemployment	0,31	-0,62	0,45	0,19	0	0,06
HICP Inflation	0,57	0,49	0,43	0,4	0,04	-0,04
Core Inflation	0,62	0,25	0,53	0,04	-0,2	0,22
Stock returns	-0,79	0,26	0,42	0,15	0,06	-0,07
Bank stock returns	-0,8	0,3	0,42	0,19	0,04	0,03
Euro area VIX	0,44	-0,45	-0,02	0,43	0,28	0,28
GM Spread (Bank)	0,12	-0,67	0,35	-0,21	0,58	-0,14
GM Spread (NFC)	0,38	-0,64	0,33	0,14	0,51	0,22
German Treas. Yields (5y)	0,17	0,75	-0,31	0,45	-0,14	0,1
French Treas. Yields (5y)	0,23	0,74	-0,28	0,46	-0,05	0,07
German Treas. Yields (5y)	0,36	0,4	0,06	0,05	0,64	-0,25
German Treas. Yields (5y)	0,27	0,37	0,02	-0,08	0,64	-0,28

Table A1: Descriptive statistics of the entire database

Banks

	Germany	France	Italy	Spain
Number of observations	4913255	500748	780983	372767
Number of issuers	74	116	145	110
Mkt value of issue ($ thousands)	238488	550779	387048	855026
Maturity at issue (yrs.)	7	8.4	7.9	7.4
Duration (years)	3.3	4.1	3.8	4
Callable = N (%)	90	78	87	87
Float = N (%)	82	56	53	44
Curr = EURO (%)	74	59	71	92
Curr = USD (%)	2	9	3	1
Nominal effective yield (pct.)	3.8	4.1	4.3	4.4

Non financial corporations

	Germany	France	Italy	Spain	US
Number of observations	312542	184080	109464	83804	346126
Number of issuers	121	142	125	65	1112
Mkt value of issue ($ thousands)	791440	695866	752287	654336	322900
Maturity at issue (yrs.)	7.5	8.5	9.2	10.8	13
Duration (years)	3.7	4.2	4.8	5.3	6.5
Callable = N (%)	88	90	84	74	67
Float = N (%)	86	88	79	57	na
Curr = EURO (%)	59	60	70	70	na
Curr = USD (%)	14	8	20	3	100
Nominal effective yield (pct.)	4.4	4.4	5.4	5.5	7.6

Note: US data from Table 1 of Gilchrist and Zakrajcek (2012).

Table A2: List of Issuers

GERMANY, Banks	SECT	2012m6 # of bonds	2012m6 Amount issued	2013m6 # of bonds	2013m6 Amount issued
Commerzbank AG	A	33	396437	25	433523
Deutsche Bank AG	A	14	379380	12	439679
Deutsche Bank AG (London)	A	19	111652	15	129145
Dresdner (South East Asia) Ltd	A	1	24841	1	24841
Dresdner Bank AG	A	3	14979	3	14979
Dresdner Bank Luxembourg SA	A	1	91208	1	91208
Grenke Finance plc	A	4	124256	2	117277
Volkswagen Bank GmbH	A	4	506243	2	551760
Wuerth Finance International BV	A	2	551760		
	Total A	**81**	**2200754**	**61**	**1802411**
Aareal Bank AG	B	7	225059	4	180771
Berlin-Hannoversche Hypothekenbank AG	B	2	518515	2	518515
Berliner Hypotheken Und Pfandbriefbank AG	B	1	83811	1	83811
Deutsche Apotheker-und Aerztebank eG - DAPO BANK	B	11	111110	5	23769
Deutsche Hypothekenbank AG	B	3	69003	2	39672
Deutsche Pfandbriefbank AG	B	4	13463	3	13463
Erste Europaeische Pfandbrief- und Kommunalkreditbank	B	1	12235	1	12235
Eurohypo AG	B	4	15483	3	16158
Hypo Real Estate Bank AG	B	1	15406	1	15406
Hypothekenbank in Essen AG - Essen Hyp	B	1	9112	1	9112
Muenchener Hypothekenbank eG	B	8	27612	3	30013
Pfandbrief Bank International SA - PBI	B	1	21548	1	21548
WL Bank AG Westfaelische Landschaft Bodenkreditbank	B	16	75472	11	55328
Westdeutsche ImmobilienBank AG	B	2	8588	2	8588
Westfaelische Hypothekenbank AG	B	1	9149	1	9149
	Total B	**63**	**1215565**	**41**	**1037537**
Bayerische Landesbank	C	7	814178	4	587456
Bayerische Landesbank Girozentrale	C	2	55560	2	55560
Bremer Landesbank Kreditanstalt Oldenburg Girozentrale	C	2	125820	2	125820
Deutsche Postbank AG	C	1	30788	1	30788
DG Bank Deutsche Genossenschaftsbank AG	C	1	138223	1	138223
DZ Bank AG Deutsche Zentral-Genossenschaftsbank	C	15	39966	13	30469
HSH Nordbank AG	C	3	911924	1	869133
Hamburgische Landesbank-Girozentrale	C	2	35938	2	35938
Landesbank Baden-Wuerttemberg - LBBW	C	88	122435	66	128803
Landesbank Berlin AG	C	1	757002	1	757002
Landesbank Berlin Girozentrale	C	3	1420277	3	1420277
	C	10	220800	7	236814
Landesbank Rheinland-Pfalz Girozentrale - LRP	C	6	33041	5	36994
Norddeutsche Landesbank Girozentrale - NORD/LB	C	15	389255	9	382934
Sachsen LB Europe plc	C	1	123655	1	123655
Stadtsparkasse Koeln	C	1	11956		
WestLB AG	C	169	105619	123	96760
	Total C	**327**	**5336438**	**241**	**5056626**
	Total A+B+C	**471**	**8752756**	**343**	**7896574**

Table A2: List of Issuers

GERMANY, NFC	SECT	2012m6 # of bonds	2012m6 Amount issued	2013m6 # of bonds	2013m6 Amount issued
Air Berlin PLC & Co Luftverkehrs KG	O	1	275748	1	275748
Asklepios Kliniken GmbH	O	1	203721	1	203721
BASF AG	O	1	633152	1	633152
BASF Finance Europe NV	O	4	1594788	3	1594038
BASF SE	O	2	348588	2	348588
BMW Finance NV	O	8	1723398	6	1701940
BMW US Capital LLC	O	1	2738225	1	2738225
Bastei Lubbe GmbH & Co KG	O	1	41713	1	41713
Bayer Capital Corp BV	O	1	1758420	1	1758420
Bertelsmann AG	O	3	944371	2	939092
Brenntag Finance BV	O	1	566332	1	566332
Celesio Finance BV	O	1	669882	1	669882
Ciba Speciality Chemicals Finance Luxembourg SA	O	1	656753	1	656753
Daimler AG	O	4	1759262	3	1869015
Daimler International Finance BV	O	1	2661344		
Degussa AG	O	1	1527930		
Deutsche Lufthansa AG	O	2	1094294	1	1044423
Evonik Industries AG	O	1	1119570	1	1119570
Franz Haniel & Cie GmbH	O	3	909155	3	909155
Fraport AG - Frankfurt Airport Services Worldwide	O	2	692520	2	692520
GEA Group AG	O	1	582157	1	582157
Gerresheimer AG	O	1	429492	1	429492
HeidelbergCement Finance BV	O	2	747240	2	747240
Hella KGaA Hueck & Co	O	1	448229	1	448229
Henkel AG & Co KGaA	O	1	1366867		
Henkel KGaA	O	1	1167542		
Heraeus Finance GmbH	O	1	306824	1	306824
JM Voith AG	O	1	875146	1	875146
K+S AG	O	1	1099384	1	1099384
LEONI AG	O	1	250407		
Lanxess Finance BV	O	1	658328		
Linde Finance BV	O	9	509538	6	694565
MAN AG	O	1	688421	1	688421
Maschinenfabrik Spaichingen GmbH	O	1	42469	1	42469
Merck Financial Services GmbH	O	2	96186	2	96186
Metro AG	O	3	1038066	3	1038066
Metro Finance BV	O	2	398384	1	161687
	O	1	148258	1	148258
Otto (GmbH & Co KG)	O	3	293252	2	68297
PERI GmbH	O	1	132873	1	132873
Procar Automobile Finance Holding GmbH & Co KG	O	1	15977	1	15977
Rheinmetall AG	O	1	670062	1	670062
Rhoen-Klinikum AG	O	1	547196	1	547196
Robert Bosch GmbH	O	4	810190	3	745965
SAP AG Systeme Anwendungen Produkte in der Datenverarbeitung	O	3	711081	1	668003
Semper Idem Underberg AG	O	1	72611	1	72611
Siemens Financieringsmaatschappij NV	O	3	2102813	3	2102813
Sixt AG	O	1	349162	1	349162
Stada Arzneimittel AG	O	1	468604	1	468604
Suedzucker International Finance BV	O	1	564493	1	564493
Symrise AG	O	1	418702	1	418702
Tchibo Holding AG	O	1	864411	1	864411
ThyssenKrupp AG	O	2	1194781	2	1194781
ThyssenKrupp Finance Nederland BV	O	1	1271132	1	1271132
Valensina GmbH	O	1	74129	1	74129
Volkswagen International Finance NV	O	6	1571746	5	1548622
adidas International Finance BV	O	1	698519	1	698519
	Total O	**105**	**45603836**	**84**	**37596761**
Deutsche Telekom International Finance BV	U	20	900470	18	852542
E.ON AG	U	1	192604	1	192604
E.ON International Finance BV	U	11	1271325	10	1204488
EWE AG	U	2	698677	2	698677
EnBW International Finance BV	U	6	841056	5	822374
Freenet AG	U	1	580889	1	580889
RWE AG	U	1	887443	1	887443
RWE Finance BV	U	7	1331347	6	1345579
	Total U	**49**	**6703810**	**44**	**6584596**
	Total O+U	**154**	**52307646**	**128**	**44181357**

Sectors: U, utilities; O, Others. Amounts in thousands of US dollars

Table A2: List of Issuers

FRANCE, Banks	SECT	2012m6 # of bonds	2012m6 Amount issued	2013m6 # of bonds	2013m6 Amount issued
BNP Paribas	A	1	1 423 082	1	1 423 082
BNP Paribas SA	A	13	1 267 168	10	1 415 205
Banque PSA Finance SA	A	8	913 832	4	1 047 174
Caisse Nationale de Credit Agricole SA - CNCA	A	1	757 355		
Calyon	A	2	15 673	2	15 673
Compagnie Financiere de Nouvelles Galleries SA - Cofinoga	A	1	502 386	1	502 386
Compagnie Financiere du Credit Mutuel	A	3	1 039 852	2	909 753
Credit Agricole Corporate & Investment Bank	A	2	9 182	1	5 774
Credit Agricole SA	A	7	1 396 145	5	1 679 796
Credit Agricole SA (London)	A	8	1 000 890	7	699 044
Credit Mutuel Arkea	A	2	491 698	2	491 698
Fortis Bank SA/NV	A	5	319 263	4	394 133
Fortis Banque Luxembourg SA	A	2	105 984	1	66 809
Michelin Finance Luxembourg SA - Mifilux	A	1	994 299		
NATIXIS Structured Products Ltd	A	1	14 306		
RCI Banque SA	A	10	819 999	7	808 546
Societe Generale	A	24	658 195	19	719 939
	Total A	**91**	**11 729 311**	**66**	**10 179 012**
Caisse Centrale du Credit Immobilier de France	B	2	1 041 719	2	1 041 719
Caisse Centrale du Credit Immobilier de France - 3CIF	B	1	138 889	1	138 889
Gecina SA	B	2	667 509	2	667 509
Rodamco Europe Finance BV	B	1	620 887	1	620 887
Unibail-Rodamco SE	B	6	565 829	6	565 829
	Total B	**12**	**3 034 832**	**12**	**3 034 832**
BPCE SA	C	7	532 046	6	597 518
BRED Banques Populaires	C	1	288 775	1	288 775
Banque Federative du Credit Mutuel - BFCM	C	13	1 063 608	11	1 066 137
Caisse Federale du Credit Mutuel Nord Europe	C	2	90 457	2	90 457
CDC IXIS Capital Markets	C	1	63 031	1	63 031
Caisse Nationale des Caisses d'Epargne et de Prevoyance SA - CNCE	C	8	589 630	8	589 630
Credit Cooperatif	C	1	39 925	1	39 925
Natexis Banques Populaires SA	C	1	464 468		
	Total C	**34**	**3 131 941**	**30**	**2 735 473**
	Total A+B+C	**137**	**17 896 084**	**108**	**15 949 318**

Table A2: List of Issuers

	SECT	2012m6		2013m6	
FRANCE, NFC		**nb_titres**	**mean_aisd**	**nb_titres**	**mean_aisd**
Accor SA	O	1	612 975		
Air Liquide Finance	O	2	644 802	2	644 802
Air Liquide SA	O	3	579 488	3	579 488
Alstom SA	O	4	771 388	4	771 388
Autoroutes du Sud de la France - ASF	O	4	1 312 593	4	1 312 593
Bollore	O	1	494 840	1	494 840
Bouygues SA	O	4	1 069 987	4	1 069 987
Carrefour SA	O	6	1 209 432	5	1 273 292
Casino Guichard-Perrachon SA	O	2	1 001 732	2	1 001 732
Christian Dior SA	O	1	427 350	1	427 350
Compagnie Financiere & Industrielle des Autoroutes - Cofiroute	O	2	644 478	2	644 478
Compagnie de Saint-Gobain SA	O	4	1 100 160	3	1 185 583
Danone	O	1	679 810	1	679 810
Edenred SA	O	1	1 114 982	1	1 114 982
Eutelsat SA	O	1	1 038 422	1	1 038 422
Financiere Agache SA	O	1	280 584	1	280 584
Groupe Auchan SA	O	3	731 352	3	731 352
Groupe SEB	O	1	439 174	1	439 174
Havas SA	O	1	520 756	1	520 756
LVMH Moet Hennessy Louis Vuitton SA	O	4	785 064	3	591 814
Lafarge SA	O	8	809 124	8	809 124
Legrand SA	O	2	487 593	2	487 593
Nexans SA	O	1	475 673	1	475 673
PPR SA	O	1	668 003	1	668 003
Pernod Ricard SA	O	2	1 251 612	2	1 251 612
Peugeot SA	O	4	955 926	3	878 629
Pinault-Printemps-Redoute SA - PPR	O	1	212 314	1	212 314
Prodware SA	O	1	7 595	1	7 595
Publicis Groupe SA	O	1	362 863	1	362 863
Rallye SA	O	3	712 765	2	736 347
Renault SA	O	2	776 771	2	776 771
Saint-Gobain Nederland BV	O	1	606 794		
Sanofi-Aventis SA	O	3	1 566 782	3	1 566 782
Schneider Electric SA	O	6	922 299	4	1 070 029
Societe Anonyme de Gestion des Stocks de Securite (SAGESS)	O	1	780 470	1	780 470
Societe des Autoroutes Paris Rhin Rhone - APRR	O	5	854 975	5	854 975
	O	2	968 234	1	1 268 377
Thales SA	O	1	824 402	1	824 402
Valeo SA	O	2	680 253	2	680 253
Vallourec SA	O	1	843 718	1	843 718
Vinci SA	O	1	1 282 708	1	1 282 708
	Total O	**96**	**31 510 241**	**86**	**30 640 663**
Alcatel Lucent SA	U	1	660 939	1	660 939
Alcatel SA	U	1	562 539		
Electrabel SA/NV	U	1	939 555	1	939 555
France Telecom SA	U	12	1 382 222	10	1 410 713
GDF Suez SA	U	5	1 179 872	5	1 179 872
GIE Suez Alliance	U	2	1 007 600	2	1 007 600
Gaz de France - GDF	U	1	806 018	1	806 018
Suez Environnement SA	U	3	789 028	3	789 028
TOTAL (Old)	U	1	180 347		
Technip SA	U	1	259 943	1	259 943
Total Capital SA	U	7	1 103 437	5	958 982
Total Infrastructures Gaz France SA	U	1	718 184	1	718 184
Veolia Environnement SA	U	6	1 063 556	5	944 834
Vivendi SA	U	3	1 076 179	3	1 076 179
	Total U	**45**	**11 729 419**	**38**	**10 751 847**
	Total O+U	**141**	**43 239 660**	**124**	**41 392 510**

Sectors: U, utilities; O, Others. Amounts in thousands of US dollars

Table A2: List of Issuers

ITALY	SECT	2012m6		2013m6	
Banks		# of bonds	Amount issued	# of bonds	Amount issued
Banca IMI SpA	A	3	50 143	2	39 430
Banca Intesa SpA	A	1	764 832	1	764 832
Banca Monte dei Paschi di Siena SpA - MPS	A	8	990 736	5	709 925
Bank Austria AG	A	1	6 845	1	6 845
Bank Austria Creditanstalt AG	A	1	14 366	1	14 366
Credito Valtellinese Scarl - Creval	A	1	573 066		
Intesa Bank Ireland plc	A	1	9 068	1	9 068
Intesa Sanpaolo SpA	A	28	811 324	23	883 524
Mediobanca - Banca di Credito Finanziario SpA	A	10	414 708	7	440 585
Olivetti Finance NV	A	2	791 267	2	791 267
UniCredit Bank Ireland plc	A	2	44 335	2	44 335
UniCredit SpA	A	17	554 845	13	484 997
UniCredito Italiano SpA	A	13	593 426	10	522 920
Unione di Banche Italiane Scpa - UBI Banca	A	4	692 495	2	640 945
Veneto Banca Holding ScpA	A	1	858 861		
	Total A	**93**	**7 170 315**	**70**	**5 353 037**
Banca Agrileasing SpA	B	1	67 159	1	67 159
Banca Carige SpA	B	2	143 472	2	143 472
Bayerische Hypo- und Vereinsbank AG - HVB Group	B	1	12 164	1	12 164
	Total B	**4**	**222 795**	**4**	**222 795**
Banca Carige SpA - Cassa di Risparmio di Genova e Imperia	C	20	38 847	6	56 801
Banca di Credito Cooperativo di Cherasco	C	1	28 086	1	28 086
Banca Popolare dell'Alto Adige - Sudtiroler Volksbank	C	2	164 344	2	164 344
Banca Popolare dell'Etruria e del Lazio Scarl	C	1	100 414	1	100 414
Banca Popolare di Lodi Scarl	C	1	384 446	1	384 446
Banca Popolare di Milano Scarl	C	1	702 040	1	702 040
Banca Popolare di Vicenza Scarl	C	3	841 875	2	999 253
Banco Popolare Scarl	C	10	427 146	8	454 635
	Total C	**39**	**2 687 197**	**22**	**2 890 018**
	Total A+B+C	**136**	**10 080 307**	**96**	**8 465 851**
NFC		# of bonds	Amount issued	# of bonds	Amount issued
Atlantia SpA	O	2	1 662 367	2	1 662 367
Buzzi Unicem SpA	O	1	589 449	1	589 449
Compagnie Industriali Riunite SpA - CIR	O	1	397 614	1	397 614
Concessioni e Costruzioni Autostrade SpA	O	2	1 944 873	2	1 944 873
Davide Campari-Milano SpA	O	1	522 466	1	522 466
	O	5	1 527 044	5	1 527 044
Fiat Industrial Finance Europe SA	O	2	1 530 328	2	1 530 328
Finmeccanica Finance SA	O	2	967 113	1	900 630
Finmeccanica SpA	O	2	630 897	2	630 897
Gruppo Editoriale L'Espresso SpA	O	1	298 816	1	298 816
Impregilo International Infrastructures NV	O	1	198 702	1	198 702
Italcementi Finance SA	O	1	1 015 297	1	1 015 297
Luxottica Group SpA	O	1	689 370	1	689 370
Mediaset SpA	O	1	417 944	1	417 944
Prysmian Cables & Systems SpA	O	1	540 103	1	540 103
Saras SpA	O	1	318 959	1	318 959
Societa Iniziative Autostradali e Servizi - SIAS SpA	O	1	693 097	1	693 097
	Total O	**26**	**13 944 437**	**25**	**13 877 955**
A2A SpA	U	1	1 477 104	1	1 477 104
ENEL Finance International NV	U	5	1 157 363	5	1 157 363
ENEL Finance International SA	U	2	2 948 547	2	2 948 547
Enel Investment Holding BV	U	1	347 866	1	347 866
ENEL SpA	U	7	1 692 858	6	1 827 890
ENI SpA	U	9	1 616 635	8	1 614 599
Telecom Italia SpA	U	8	1 158 795	6	1 372 778
TERNA - Rete Elettrica Nazionale SpA	U	2	1 293 854	2	1 293 854
TERNA - Trasmissione Elettricita Rete Nazionale SpA	U	2	892 174	2	892 174
Terna SpA	U	1	1 644 087	1	1 644 087
	Total U	**38**	**14 229 284**	**34**	**14 576 263**
	Total O+U	**64**	**28 173 721**	**59**	**28 454 218**

Sectors: A,commercial banks; B housing banks; C, savings banks, U, utilities; O, Others. Amounts in thousands of US dollars

Table A2: List of Issuers

SPAIN	SECT	2012m6		2013m6	
Banks		# of bonds	Amount issued	# of bonds	Amount issued
BBVA Paraguay SA	A	1	100 000	1	100 000
BPE Financiaciones SA	A	1	124 506	1	124 506
Banco Bilbao Vizcaya Argentaria SA - BBVA	A	1	173 845	1	173 845
Banco Santander Chile	A	2	401 070	2	401 070
Banco Santander SA (Old)	A	1	71 100	1	71 100
Banco de Sabadell SA	A	1	669 882	1	669 882
Bankinter SA	A	3	152 247	3	152 247
	Total A	**10**	**1 692 649**	**10**	**1 692 649**
Alliance & Leicester plc	B	2	83 312	2	83 312
Banco Santander Totta SA	B	2	20 599	2	20 599
	Total B	**4**	**103 911**	**4**	**103 911**
Caixa d'Estalvis de Tarragona	C	1	38 803	1	38 803
Caixa de Ahorros de Vigo Ourense e Pontevedra - Caixanova	C	1	814 996	1	814 996
Caja Insular de Ahorros de Canarias	C	1	149 948		
Caja de Ahorros de Murcia - Caja Murcia	C	4	208 029	1	14 178
Caja de Ahorros de Santander y Cantabria - Caja Cantabria	C	1	53 893	1	53 893
Caja de Ahorros de Valencia Castellon y Alicante - Bancaja	C	1	656 513	1	656 513
Caja de Ahorros de la Rioja - Cajarioja	C	1	146 685	1	146 685
Caja de Ahorros del Mediterraneo - CAM	C	1	1 858 649	1	1 858 649
Caja de Ahorros y Monte de Piedad de Madrid - Caja Madrid	C	2	162 094	2	162 094
Caja de Ahorros y Monte de Piedad de Navarra - Caja Navarra	C	2	40 620	1	14 170
Caja de Ahorros y Monte de Piedad de Zaragoza Aragon y Rioja - IBERCAJA	C	1	711 035	1	711 035
Caja de Ahorros y Pensiones de Barcelona - La Caixa	C	1	1 959 774	1	1 959 774
Santander Holdings USA Inc	C	1	500 000	1	500 000
	Total C	**18**	**7 301 037**	**13**	**6 930 790**
	Total A+B+C	**32**	**9 097 596**	**27**	**8 727 349**
NFC		**# of bonds**	**Amount issued**	**# of bonds**	**Amount issued**
Abertis Infraestructuras SA	O	5	889 930	4	968 033
Autopista Vasco-Aragonesa CESA - AVASA	O	1	242 483	1	242 483
Autopistas Concesionaria Astur-Leonesa SA - AUCALSA	O	2	172 924	2	172 924
Autopistas del Atlantico Concesionaria Espanola AUDASA	O	5	114 346	5	114 346
Autovia de los Vinedos SA	O	1	82 497	1	82 497
	Total O	**14**	**1 502 179**	**13**	**1 580 283**
Iberdrola Finanzas SAU	U	2	462 029	1	876 680
Minicentrales Dos SA - MICDOS	U	1	92 009	1	92 009
Red Electrica de Espana Finance BV	U	1	899 887		
	U	1	1 133 144		
Telefonica Emisiones SAU	U	1	1 930 203		
Telefonica Europe BV	U	1	539 724	1	539 724
	Total U	**7**	**5 056 996**	**3**	**1 508 413**
	Total O+U	**21**	**6 559 175**	**16**	**3 088 695**

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