

VIEWPOINTS

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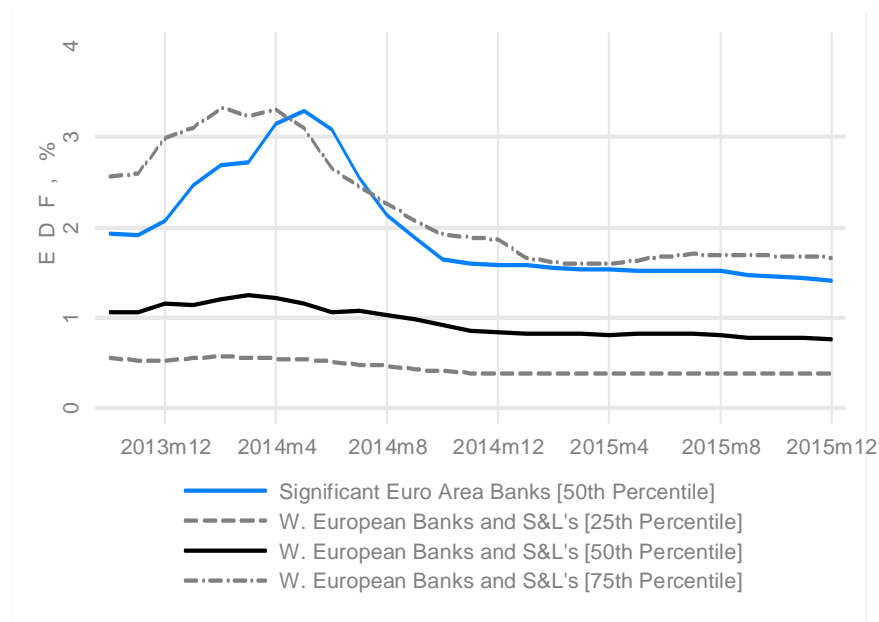
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Gauging the Risk of European Banks: What Might the ECB Find?

Abstract

The outcomes of the European Central Bank's (ECB) comprehensive assessment of the euro area banking sector, which includes an EU-wide stress test, will be closely monitored both inside and outside Europe. Given the currently fragile nature of the European economy and extensive cross-border credit exposures, the results could have implications for Europe's recovery and global financial markets. Recent Expected Default Frequency™ (EDF) measures show that the average default risk of the euro area's largest ("significant") banks has declined nearly to the average default risk of a peer group of Western European banks and S&Ls. Stressed EDF measures, however, suggest that this normalization may be temporary. Under Moody's Analytics' baseline economic scenario, the median EDF of significant banks is projected to rise to levels more comparable with the EDF of the peer group at the 75th percentile. The increased default risk of significant euro area banks in absolute terms and relative to the peer group is more severe under the two stressed economic scenarios considered.

Exhibit 1: Baseline Scenario Stressed EDF of Significant Euro Area Banks vs. Western European Banks and S&Ls



Source: Moody's Analytics

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Introduction

In November 2014, euro area banks will come under direct regulatory supervision of the European Central Bank (ECB). In preparation, the ECB is conducting a comprehensive assessment of the banking system. The exercise involves three elements – a supervisory risk assessment to identify and analyze key risks in banks' balance sheets, an asset quality review to assess valuations and provisioning, and a stress test to assess banks' abilities to withstand an adverse economic shock. The comprehensive assessment will include banks considered "significant", according to the following criteria: 1) total assets greater than €30 billion, 2) total assets more than 20 percent of GDP, or 3) one of the three largest credit institutions in the country.¹ The list of significant banks will be finalized in 2014, using more recent data, but it is expected to include approximately 130 institutions with assets equal to 85 percent of euro area bank assets.

The last EU-wide stress test was viewed as somewhat opaque and not stringent enough. The ECB has designed the comprehensive assessment to be more broad in scope and lists its goals as transparency, repair, and confidence building. The ECB has already announced that the minimum capital requirement will be a Common Equity Tier 1 ratio of 8 percent, and it is reasonable to expect that the adverse economic scenario used in the stress test will be relatively more adverse than that of the 2011 stress test conducted by the European Banking Authority (EBA).

The results of the comprehensive assessment, which will be published at the conclusion of the full exercise and before the ECB assumes new responsibilities under the single supervisory mechanism (SSM) in a year from now, will be closely monitored both inside and outside of Europe. Currently, many of Europe's economies remain in recession, and sovereign bond spreads in the so-called peripheral countries remain elevated. Given the fragile nature of the European economy and extensive cross-border credit exposures, the outcomes of the comprehensive assessment could have implications for Europe's recovery and global financial markets.

In this ViewPoints paper, we examine the market signal-driven credit risk of large, publicly traded euro area banks likely to be included in the comprehensive assessment. Specifically, we use Moody's Analytics' Expected Default Frequency™ (EDF) measures and Stressed EDF measures to compare the default risk of the euro area's significant banks with a peer group of Western European banks and S&L's. In our analysis, significant banks are represented by a subset – shown in Exhibit 2 – of the preliminary list of institutions identified by the ECB using end-of-2012 data. The selection of these 38 banks is based on the availability of EDF data.² Unsurprisingly, they are among the largest publicly traded banks in Europe, with assets accounting for two thirds of the total assets of all Western European banks and S&Ls in Moody's Analytics' EDF database.³

¹ European Central Bank, *Note: Comprehensive Assessment*, October 2013.

² Since we do not currently compute Stressed EDF measures for companies in Eastern Europe, the analysis using Stressed EDF measures excludes the final three banks in the table.

³ Based on market value of assets.

Exhibit 2: Large, Publicly Traded Banks with EDF Credit Measures

BANK	COUNTRY	BANK	COUNTRY
Erste Group Bank AG	Austria	National Bank of Greece, S.A.	Greece
Osterreichische Volksbanken AG	Austria	Allied Irish Banks plc	Ireland
Dexia NV	Belgium	Bank of Ireland	Ireland
KBC Group NV	Belgium	Banca Carige S.P.A.	Italy
Aareal Bank AG	Germany	Banca Monte dei Paschi di Siena S.p.A.	Italy
Commerzbank AG	Germany	Banca Piccolo Credito Valtellinese	Italy
Deutsche Bank AG	Germany	Banca Popolare Dell'Emilia Romagna	Italy
IKB Deutsche Industriebank AG	Germany	Banca Popolare Di Milano	Italy
Banco Bilbao Vizcaya Argentaria, S.A.	Spain	Banca Popolare di Sondio	Italy
Banco Popular Espanol, S.A.	Spain	Credito Emiliano S.p.A.	Italy
Banco Santander, S.A.	Spain	Intesa Sanpaolo S.p.A.	Italy
Bankinter, S.A.	Spain	Mediobanca	Italy
Liberbank, S.A.	Spain	Unicredit, S.p.A.	Italy
Nordea Bank Finland Abp	Finland	Banco BPI, SA	Portugal
BNP Paribas	France	Banco Comercial Portugues, SA	Portugal
Groupe Credit Agricole	France	Espirito Santo Financial Group, SA	Portugal
Societe Generale	France	Nova Kreditna Banka Maribor d.d.	Slovenia
Alpha Bank, S.A.	Greece	Vseobecna uverova bankca, a.s.	Slovakia
Eurobank Ergasias, S.A.	Greece	Tatra banka, a.s.	Slovakia

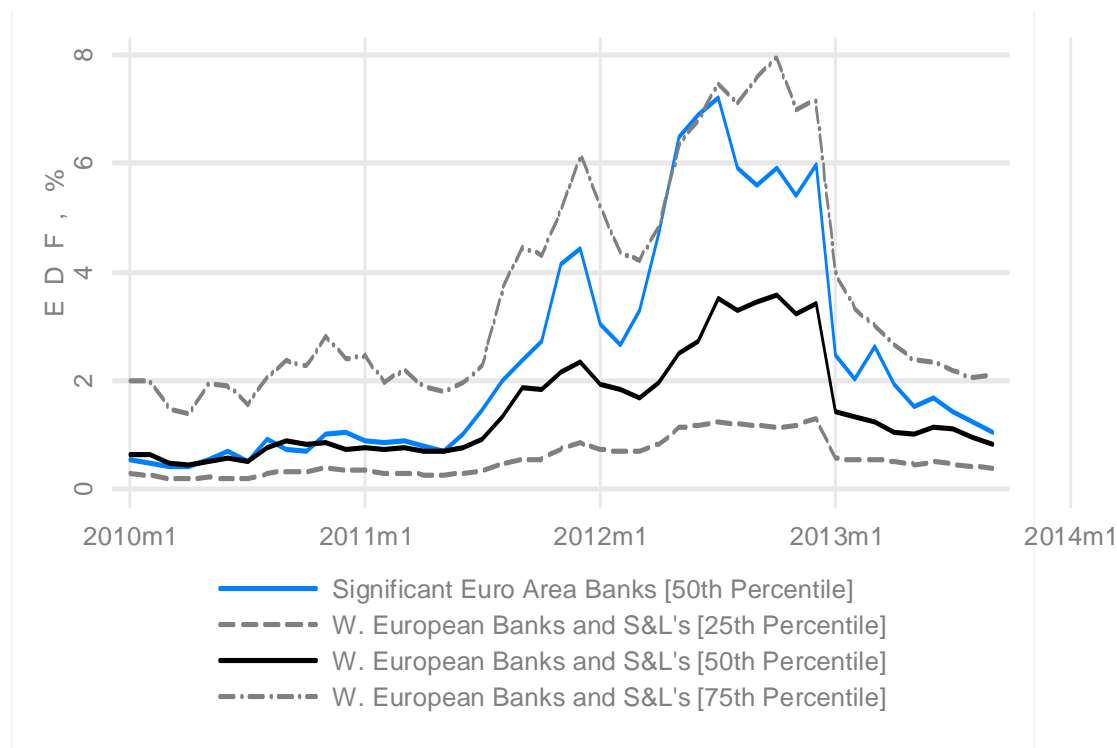
Average Default Risk of Significant Euro Area Banks Is On the Decline

Moody's Analytics' EDF measures provide one way to gauge the credit risk of the euro area's significant banks. These firm-level probability of default estimates combine a fundamentals-based approach to credit analysis with forward-looking asset valuations embedded in global equity markets.⁴ The 1-year EDF estimates the probability that a given firm will default within the next one year. First, we examine EDF measures to assess the current default risk of significant banks in absolute terms and relative to a larger peer group of Western European banks and S&Ls. Later, we consider possible future paths for the EDF measures of significant banks and Western European banks and S&Ls under different, hypothetical macroeconomic scenarios.

Before 2010, significant euro area banks had lower default risk, on average, than Western European banks and S&Ls. As the European sovereign debt crisis developed, however, the average EDF among significant banks began to creep up faster than that of the peer group. By June 2012, the median EDF of significant banks had reached 6.9 percent, 34,400 percent higher than its last cyclical low of 0.02 percent and 4.0 percentage points higher than the median EDF of the peer group. Exhibit 3 shows that while in 2013 default risk has declined among both samples, recovery has been more dramatic among significant banks so that the gap as of September 2013 stood at just 0.15 percentage points. Although this may be indicative of a normalization of credit risk among significant euro area banks relative to the peer group, the next section suggests that it may simply be a temporary reprieve from a "new normal" in which significant banks are on average more risky than Western European banks and S&Ls as a whole.

⁴ For a detailed explanation of the methodology behind the Public Firm EDF model, see: Sun et al, *Public Firm Expected Default Frequency Credit Measures: Methodology, Performance, and Model Extensions*, June 2012.

Exhibit 3: 1-Year EDF of Significant Euro Area Banks vs. Western European Banks and S&Ls



Source: Moody's Analytics

A New Normal May Be Emerging

Exhibit 1, on page 1, uses Moody's Analytics' Stressed EDF measures to examine the likely credit risk of significant euro area banks relative to Western European banks and S&Ls over the next three years. Stressed EDF measures are forecasts for firm-level, 1-year EDF measures conditioned on a hypothetical economic scenario. Stressed EDF measures are calculated using a robust econometric framework that directly translates macroeconomic and financial market risk into default risk using economically interpretable structural relationships.⁵

The baseline economic forecast of Moody's Analytics' Economics and Consumer Credit Analytics (ECCA) division, viewed as the most likely scenario, describes a modest return to euro area growth beginning in the fourth quarter of 2013. Annual real GDP growth averages 1.0 percent in 2014 and 1.6 percent in 2015, with consumer inflation comfortably within the ECB's comfort zone.⁶ The ECB begins raising the official refi rate sometime in 2015.

In order to understand the rise in Stressed EDF measures under this baseline scenario of modest growth shown in Exhibit 1, it is necessary to note that the annual growth rate of Europe's major stock indices slows in the baseline scenario. This important macroeconomic risk factor in the Stressed EDF model helps to push EDFs higher, on average, in the early part of the forecast horizon despite declining unemployment rates.⁷

⁵ For a detailed explanation of the methodology behind the Stressed EDF model, see: Ferry et al, *Stressed EDF Credit Measures for North America*, May 2012 and Ferry et al, *Stressed EDF Credit Measures for Western Europe*, October 2012.

⁶ Moody's Analytics, Economic and Consumer Credit Analytics. *Euro Zone Macroeconomic Outlook Alternative Scenarios*. October 2013.

⁷ It is important to note that there is no reason to expect EDF measures under the baseline macroeconomic scenario to be close to standard (unconditional) EDF measures over the same time horizon. Stressed EDFs are calculated under a particular, specific set of macroeconomic conditions. Standard EDF measures reflect investors' collective view of the future (as expressed through the market value of assets). This collective market view can be viewed as a probability weighted estimate of all possible future macroeconomic states, of which the Stressed EDF scenarios are a very small subset.

The rise in default risk is especially pronounced among significant euro area banks. In mid-2014, the median baseline scenario Stressed EDF of significant banks is on par with that of the Western European banks and S&Ls at the 75th percentile. Although Stressed EDF measures of significant banks do revert lower in the second half of 2014 and beyond, they never approach levels considered typical for an expansionary economic period. In fact, they remain, at the median, deeply in sub-investment grade territory. Additionally, the average significant euro area bank never recovers the gap with the average Western European bank.

These results suggest that a new normal may be emerging in which the default risk of significant euro area banks remains elevated relative to the peer group. With nearly 40 percent of European banks' \$3.4 trillion in foreign claims vis-à-vis euro area banks and the largest banks likely accounting for the greatest foreign claims, it is easy to see how significant banks may be viewed as more risky than the peer group for the foreseeable future.⁸ Among French and German banks, consolidated claims vis-à-vis other euro area banks represent over 40 percent of all foreign claims, and for Italian banks this ratio exceeds 63 percent.⁹

To take the analysis a step further, it would be instructive to consider Stressed EDF measures under the ECB's/EBA's 2014 stress test's baseline and adverse scenarios.¹⁰ However, the details of these are still unknown. For the following analysis, then, we selected the scenarios shown by taking guidance from the EBA's 2011 stress test.

Exhibits 3a-3c show the EBA's assumptions for the 2011 stress test for real GDP growth, the unemployment rate, and consumer inflation. The time horizon for the stress test was 2011 and 2012, and the economic scenarios were defined on an annual basis for these two years. The baseline scenario corresponded to the European Commission's (EC) Autumn 2010 forecast, whereas the adverse scenario was derived by specifying deviations from the baseline path.¹¹

The ex-post realizations of these macroeconomic indicators, also shown, reveal the adverse scenario to be, by some measures, less severe than reality. For example, real GDP contracted by 0.06 percent in 2012, three times the 0.02 percent assumed by the adverse scenario. The realized unemployment rate exceeded the specifications of the adverse scenario in both years. Consumer inflation, on the other hand, was stronger in reality than in both the baseline and adverse scenarios, though this had in part to do with rising global energy prices.

The relatively mild nature of the EBA's adverse scenario in the 2011 stress test is unlikely to be repeated in 2014. The Federal Reserve (Fed) has defined its adverse scenarios to be generally consistent in severity with past recessions. The ECB/EBA may design the 2014 stress test's adverse scenario along these lines.

⁸ Bank of International Settlements, Consolidated Banking Statistics, Table 9E (consolidated claims on an ultimate risk basis), preliminary data for 2Q2013.

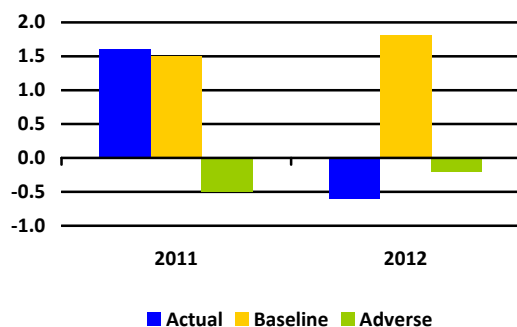
⁹ Ibid.

¹⁰ The ECB will be conducting the upcoming stress test in conjunction with the EBA, which carried out the 2011 stress test.

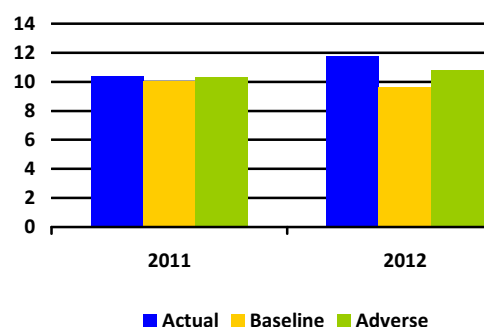
¹¹ European Banking Authority, *2011 EU-Wide Stress Test: Methodological Note*, March 2011.

Exhibit 3: 2011 ECB Stress Test Assumptions vs. Actual

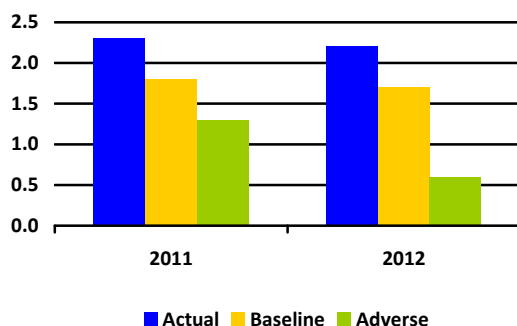
A: Real GDP Growth, %



B: Unemployment Rate, %



C: HICP Inflation Rate, %



Source: European Banking Authority; Moody's Analytics

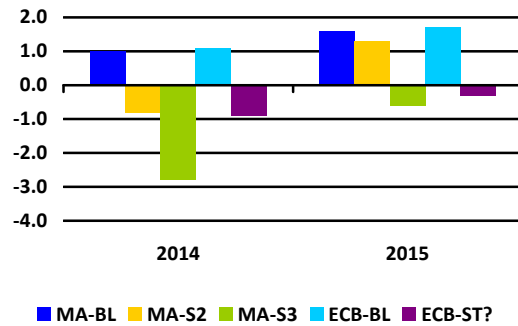
We hypothesize the 2014 stress test's scenarios by first assuming that the baseline path will correspond to the EC's Autumn 2013 forecast. These forecasts are shown in the light blue bars in Exhibits 4a-4c. The purple bars represent the stress scenario specifications if the ECB/EBA were to use the same deviations from the baseline that were used in the 2011 stress test. This implies a 0.09 percent decline in real GDP in 2014 and a 0.03 percent decline in 2015. The unemployment rate would average 12.5 percent in 2014 and 13.0 percent in 2014. In practice, the 2014 stress test's adverse scenario will likely be more severe than this.

In addition to the baseline, Moody's Analytics' ECCA division defines each month a range of alternative economic scenarios. Among these are the S2, or "moderate recession" scenario and the S3, or "deep recession" scenario, also shown in Exhibits 4a-4c. In the moderate recession scenario, the European sovereign debt crisis intensifies, causing Spain to seek a bailout to support its banking sector and regional government finances and France to further tighten fiscally as investor focus turns toward the sustainability of that country's debt. Globally, consumer confidence is impacted as are stock markets, business investment, and hiring. Europe's recession extends into 2014, while growth in the US stagnates. The deep recession scenario describes a downturn that is more severe than in the S2 scenario, but still less negative than the 2008-2009 recession. The trigger is a disorderly sovereign default in Greece that forces Greece to exit the euro zone and both Spain and Italy to seek bailouts. In this scenario, the US and global economies return to recession in late 2013.

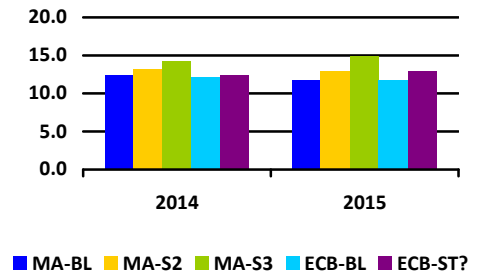
Exhibits 4a-4c suggest that on balance, our hypothesized adverse scenario is relatively similar to Moody's Analytics' moderate recession scenario and more optimistic than the deep recession scenario. The S2 and S3 scenarios, therefore, are reasonable benchmarks for analyzing European banks' credit risk under a stressed scenario likely to be employed in the ECB/EBA's 2014 stress test. In the rest of this analysis, we focus on Stressed EDF measures based on the moderate and deep recession scenarios.

Exhibit 4: Possible 2014 ECB/EBA Stress Test Assumptions vs. MA Scenarios

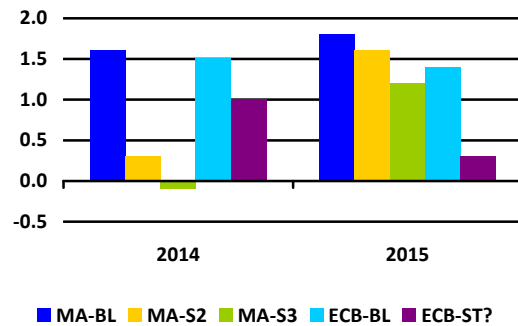
A: Real GDP Growth, %



B: Unemployment Rate, %



C: HICP Inflation Rate, %

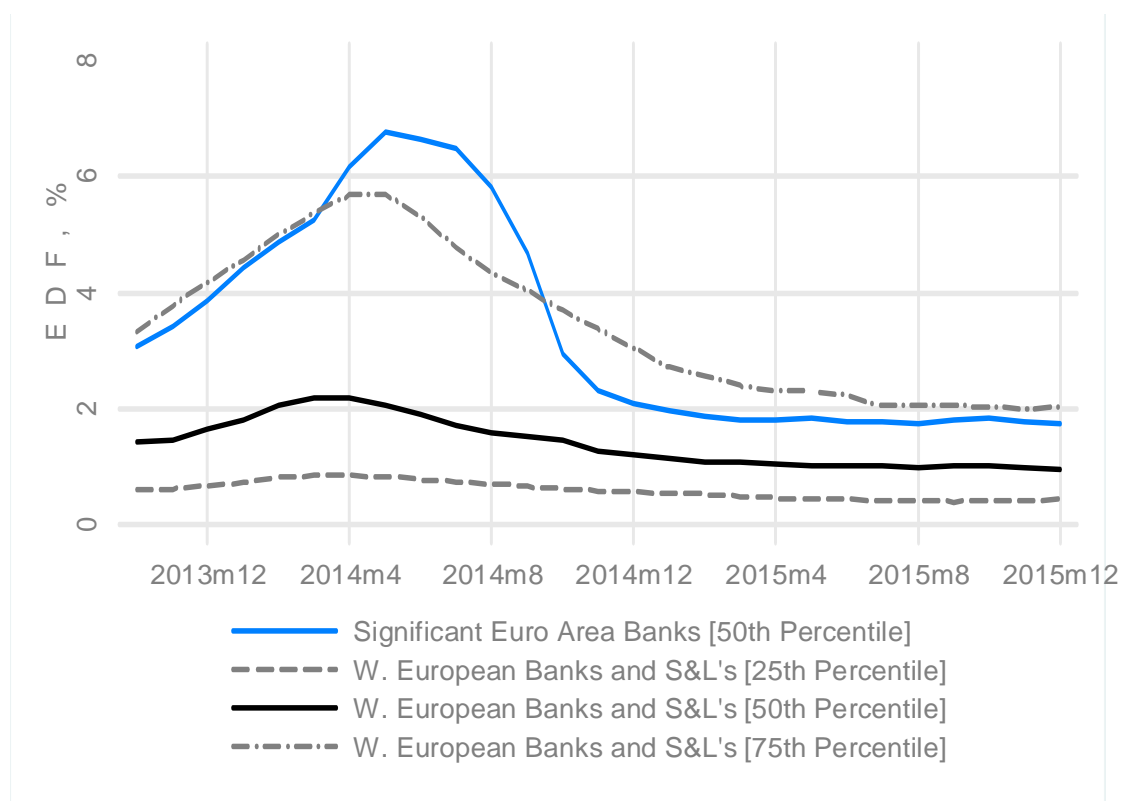


Source: Moody's Analytics

Stressed EDF measures based on the moderate recession scenario indicate that the average default risk of significant euro area banks would be higher than in the baseline over the full three year forecast horizon considered (Exhibit 5). Additionally, the relative default risk of significant banks compared with Western European banks and S&Ls would be even more disadvantageous. Between May 2014 and September 2014, the median Stressed EDF of significant banks would be higher than the EDF of the peer group at the 75th percentile, and for four of those months, the gap between the median Stressed EDF of significant banks and Western European banks and S&Ls would exceed 4.60 percentage points.

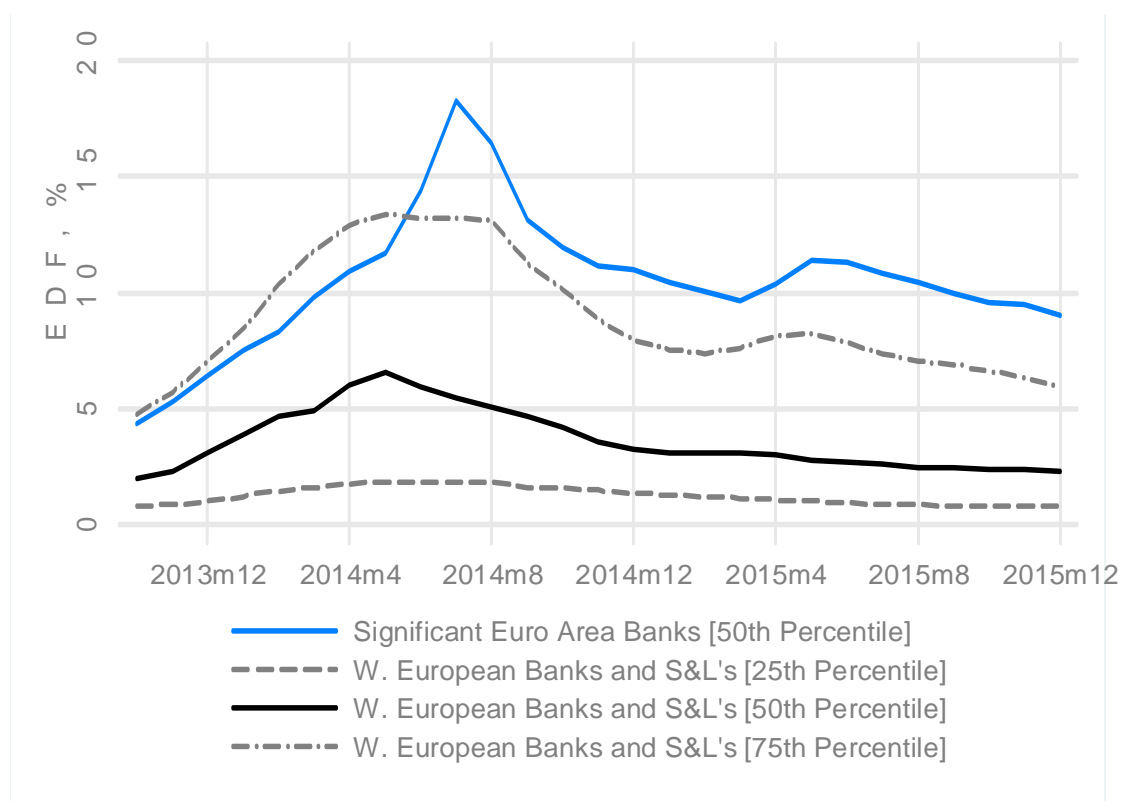
The absolute and relative default risk of significant banks worsens further under the deep recession scenario (Exhibit 6). Given the assumption of a severe global recession, the Stressed EDF of the average significant bank rises above that of a bank in the peer group at the 75th percentile in mid-2014 and never recovers on a relative basis. For most of the forecast horizon, the median Stressed EDF of significant banks describes a credit with an implied junk rating.

Exhibit 5: Moderate Recession Scenario Stressed EDF for Significant Euro Area Banks vs. Western European Banks and S&Ls



Source: Moody's Analytics

Exhibit 6: Deep Recession Scenario Stressed EDF for Significant Euro Area Banks vs. Western European Banks and S&Ls



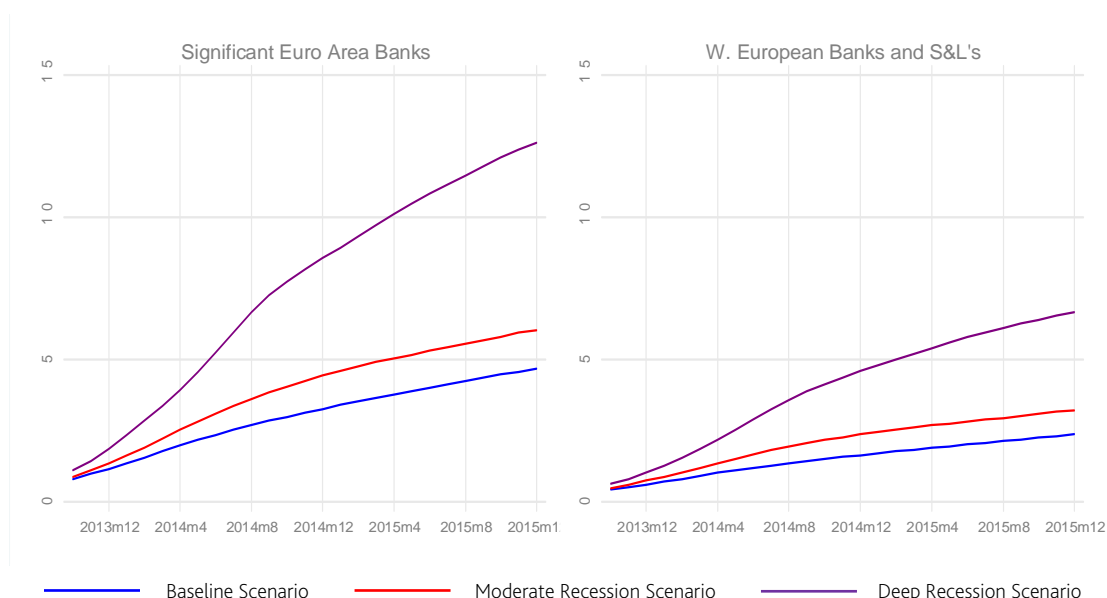
Source: Moody's Analytics

Lending to Significant Banks Is Likely to Remain Risky Relative to the Peer Group

In this section, we compare expected losses on two hypothetical lending portfolios – one comprised of significant euro area banks and a larger portfolio of Western European banks and S&Ls. Expected loss is calculated as probability of default (PD) X loss given default (LGD) X exposure at default (EAD). We project expected loss forward using Stressed EDF measures as the PD and assuming an LGD of 45 percent for equally weighted exposures. The LGD assumption is derived from prior Moody's Analytics research in which Stressed EDF measures combined with 45 percent LGD yielded C&I expected loss rates on par with those calculated by the Fed in its annual bank stress testing exercise.¹² In practice, LGD assumptions might be specific to exposure (or exposure type) and time varying, but for these illustrative purposes, a single, flat LGD path allows us to isolate the impact on expected loss of PDs, which are typically more variable across both borrowers and stages of the economic cycle.

¹² See: D. Ferry, *Assessing Moody's Analytics' 2013 CCAR Estimates for C&I Loan Losses*, March 2013 and D. Ferry, *An Integrated Approach to Stress-Testing Corporate Credit Risk*, June 2012. Note, however, that the methodology in these studies, which was an approximation of the Fed's approach, assumed an LGD of 50%. Repeating the analysis for the 2013 CCAR using a methodology that more closely followed that of the Fed revealed that 45% LGD was more appropriate.

Exhibit 7: Average Cumulative Expected Loss, % - Significant Euro Area Banks vs. Western European Banks and S&Ls



Source: Moody's Analytics

Cumulative expected loss rates over a three year horizon are shown in Exhibit 7 for each hypothetical portfolio and assuming Moody's Analytics' baseline, moderate, and deep recession economic scenarios. By the end of the horizon, average cumulative expected losses on loans to significant euro area banks are roughly twice the average cumulative loss on loans to the peer group under the baseline scenario. The end-of-period ratio of average significant bank to average peer group bank cumulative expected loss narrows only minimally when we consider the moderate and deep recession scenarios.

Exhibits 8 and 9 reveal why loss rates are expected to be much higher on loans to significant banks. In December 2015, average expected losses on loans to banks domiciled in the peripheral countries (Greece, Ireland, Portugal, Spain, and Italy) are nearly identical whether the sample is significant banks or all Western European banks and S&Ls (comparing like economic scenario assumptions). Expected loss rates for exposures to banks domiciled outside the peripheral countries tell a different story. Among the peer group, average expected losses are higher for lending to banks domiciled in the peripheral countries, significantly so given severe economic scenario assumptions. Among significant euro area banks, the reverse is true. Average cumulative expected losses through December 2015 under the moderate recession scenario, for example, are 4.8 percent on lending to peripheral country banks and 8.0 percent on lending to banks outside the peripheral countries. Under the deep recession scenario, average end-of-period expected losses on loans to ex-peripheral significant banks are lower than on loans to peripheral country significant banks, but only slightly so (11.7 percent vs. 13.2 percent).

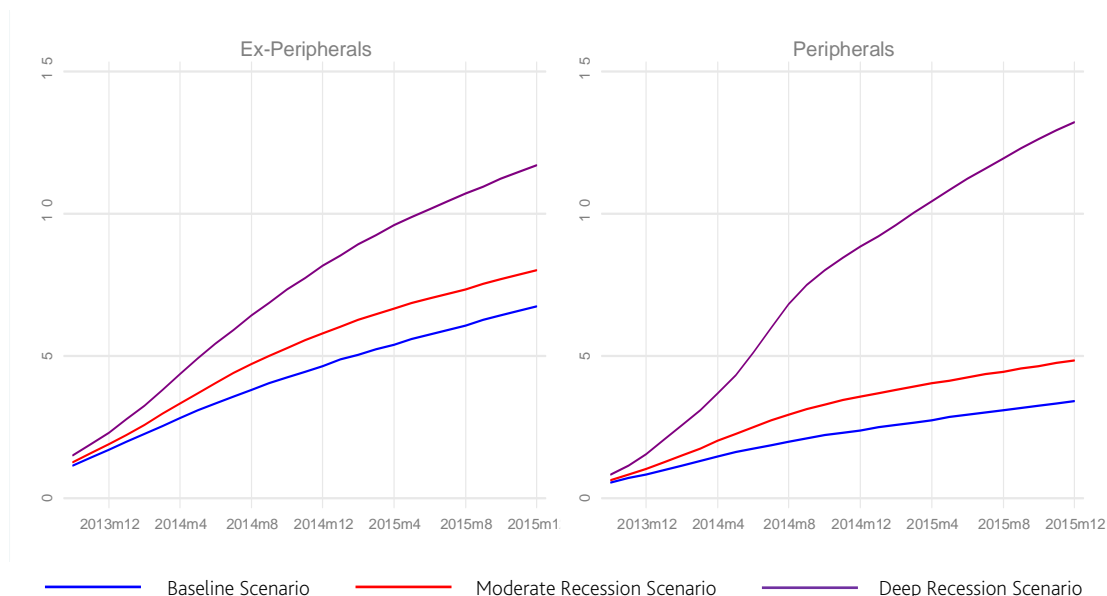
The reason for this is almost certainly tied to extensive foreign claims within Europe. On an ultimate risk basis, consolidated foreign claims of European banks vis-à-vis borrowers domiciled in the peripheral countries total \$1.5 trillion, or 9.4 percent of all foreign claims.¹³ For French and German banks, consolidated foreign claims on borrowers in the peripheral countries represent 18.5 percent and 13.5 percent of their totals, respectively.¹⁴ By comparison, US banks have only \$165 billion of consolidated foreign claims on peripheral country borrowers, just 5.1 percent of all foreign claims.¹⁵ Given the size of their assets and their presence in multiple countries, significant euro area banks headquartered outside the peripheral countries are highly likely to be exposed to borrowers in the peripheral countries, both directly and indirectly – more so than smaller Western European banks and S&Ls.

¹³ Bank of International Settlements, Consolidated Banking Statistics, Table 9D (consolidated claims on an ultimate risk basis), preliminary data for 2Q2013.

¹⁴ Ibid.

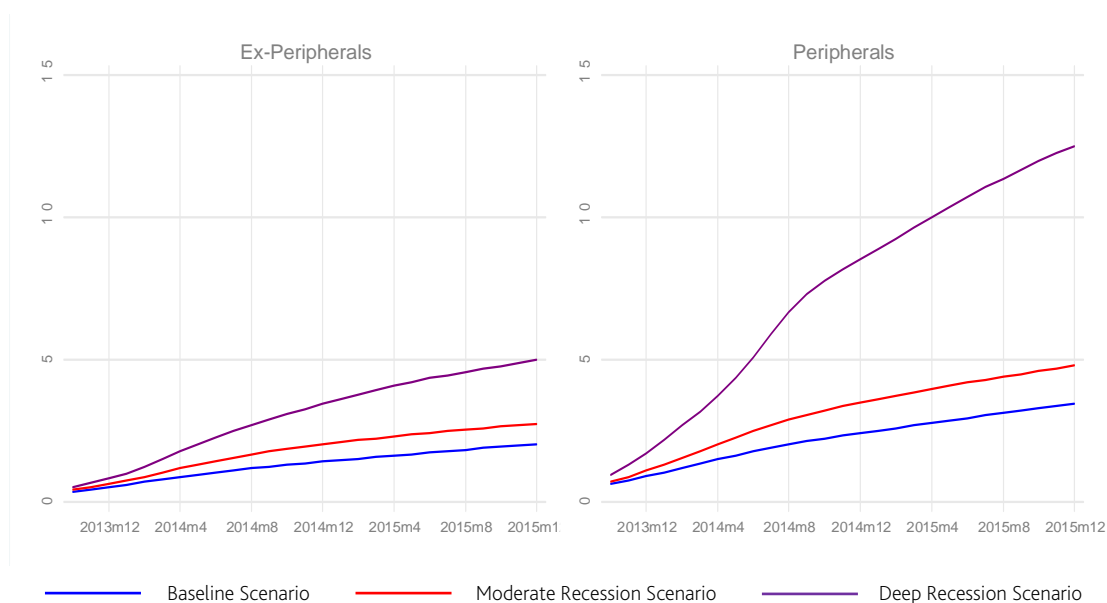
¹⁵ Ibid.

Exhibit 8: Average Cumulative Expected Loss, % - Significant Euro Area Banks



Source: Moody's Analytics

Exhibit 9: Average Cumulative Expected Loss, % - Western European Banks and S&Ls



Source: Moody's Analytics

Conclusion

In this article, we provided insight on the credit risk of the European banking sector on the eve of the ECB's comprehensive assessment. Current and recent EDF measures indicate that the default risk of publicly traded European banks has recently been declining, with the greatest improvement being achieved among the largest banks, those deemed systemically significant by the ECB. However, default probabilities remain elevated relative to the cyclical lows reached in 2007 and are likely to rise over the coming months, as growth in Europe's stock indices slows. Stressed EDF measures conditioned on Moody's Analytics' baseline, moderate recession, and deep recession scenarios suggest that a new normal may be emerging in which the average default risk of the euro area's significant banks exceeds that of a larger peer group of Western

European banks and S&Ls. The gap is evident in the baseline scenario and becomes more pronounced under the adverse scenarios considered.

Our analysis of three-year cumulative expected loss rates on hypothetical loans to European banks reveals the significance of cross-border exposures, especially to borrowers in the peripheral countries. Whereas average expected loss rates are comparable for loans to peripheral country banks, both large and small, they are higher for loans to significant euro area banks domiciled outside the peripheral countries. Significant banks' direct and indirect exposures to claims on peripheral country borrowers, even among banks domiciled in France and Germany likely account for these findings.

Given that the full extent of banks' foreign claims is not publicly known (e.g., seniority, maturity, etc.), our analysis suggests that the ECB's comprehensive assessment may reveal previously unknown weaknesses in the European banking sector. However, the extent to which their assessment agrees with our findings will depend on a number of factors. For example, EDF measures signal default risk for all creditors, and the ECB may focus on a specific class (or classes) of creditors (e.g., senior lenders). Similarly, EDF measures do not consider the possibility of bailouts or other government support. The underlying assumptions of the ECB's assessment could include certain backstops. Finally, it is important to note that the expected loss rates for hypothetical loans to the significant euro area banks may or may not be indicative of the expected loss rates of their credit portfolios. While the latter are likely to play a key role in the ECB/EBA's stress test, they are highly dependent on the portfolio composition of their credit exposures.

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