HOW DO BANK RISK AND SOVEREIGN RISK INTERACT? A CDS MARKET-BASED ANALYSIS

The sovereign crisis afflicting parts of the euro area has unfortunately provided a vibrant illustration of the vulnerability of a banking sector when combined with high sovereign risk. Many metrics, of course, exist to gauge the strength of the close relationship between the risks in the sovereign bond markets and the banking sector. One approach is to use credit default swap (CDS) markets to analyse the multitude of transmission channels which may exist. First, the direct exposure of the banking sector to sovereign bonds implies a transfer of risk from the sovereign CDS to the banking CDS. Second, the "fiscal cost" of banking crisis resolution implies a risk transfer from the bank CDS market to the sovereign CDS. Third, the cross-border links between financial institutions can be qualified as the banking channel of sovereign risk. Even if the analysis of market prices is not a panacea for a complete assessment of these transmission channels, it allows for a daily monitoring of market participants' expectations concerning the potential risk spillovers between banking risk and sovereign risk.

In this box, the sovereign five-year CDS spreads for the four largest euro area countries (Germany, France, Italy and Spain) are considered, with a synthetic five-year CDS constructed as the average premium for the main banks in each country. While in normal times the bank CDS spread is always higher than the sovereign CDS spread, some convergence between the two premia is observed during crisis episodes, especially during the most recent period. Moreover, the euro area crisis has been characterised by an increase in correlations between these two CDS market segments. However, measuring risk spillovers only with correlations is partial since this indicator is symmetric by definition, thereby preventing any interpretation on the direction of contagion.

To consider the transmission channels between these two risks, an expected shortfall indicator[1] may contribute to a better understanding of the rationale for the two premia being interconnected. More precisely, the expected shortfall for CDS A conditional on CDS B is computed as $ES_{AB} = E\left(r_A \mid r_B > Q_B^\alpha\right)$ with a tail risk α of 0.95; a tail event is considered as an increase in the CDS premium above its 95% quantile (denoted Q^α). This indicator gives the increase in basis points of CDS A conditional on a tail event for CDS B. Moreover, two sub-samples before and after 1 January 2010 are considered to observe the changes in CDS market interdependencies.

1 For more information on the general properties of such indicators, see ECB, "New quantitative measures of systemic risk", *Financial Stability Review*, December 2010.

Chart A Historical expected shortfalls for sovereign CDS markets before the euro area debt crisis
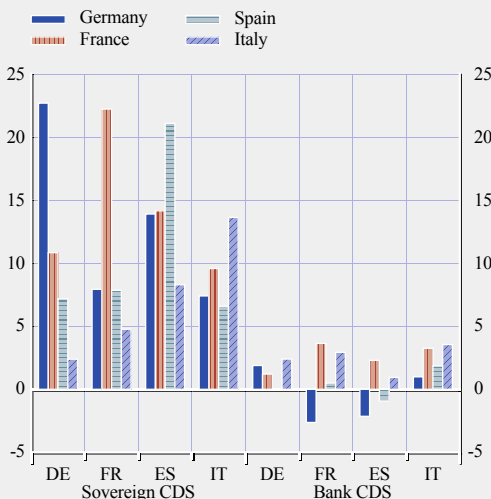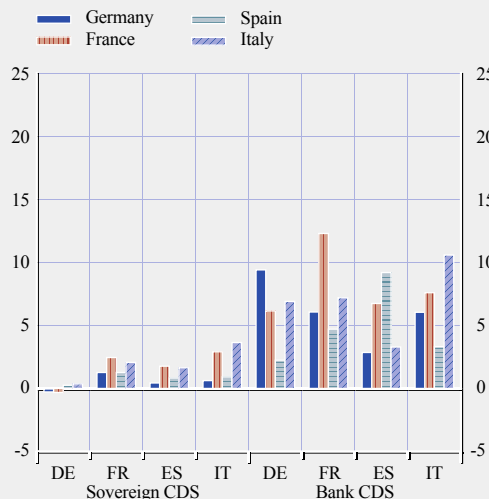
(Nov. 2007 – Jan. 2010; basis points)

 ■ Germany   ■ Spain
 ■ France   ■ Italy

Sources: Bloomberg and ECB calculations.
Note: This chart should be read as a tail event in which the asset mentioned on the x-axis impacts by N basis points the sovereign CDS of the country mentioned.

Chart B Historical expected shortfalls for bank CDS markets before the euro area debt crisis

(Nov. 2007 – Jan. 2010; basis points)

 ■ Germany   ■ Spain
 ■ France   ■ Italy

Sources: Bloomberg and ECB calculations.
Note: This chart should be read as a tail event in which the asset mentioned on the x-axis impacts by N basis points the bank CDS of the country mentioned.

By considering the main banks for each country for which CDS data are available, any metrics of interdependence based on bank CDSs should be perceived as a "floor" indicator since smaller banks may be highly interconnected to sovereign risk given their less diversified portfolios.

Prior to January 2010, as shown in Chart A, the expected shortfalls are segmented: sovereign CDSs are mainly sensitive to tail events in other sovereign CDSs and quite immune to the bank CDS market. Reciprocally, a tail event in the bank CDS segment is mainly transmitted to other bank CDSs, while any tail event in the sovereign CDS does not transmit to the bank CDS segment (see Chart B). Even if a transmission from the bank CDSs to the sovereign during the 2008 financial crisis episodes could have been feared, given the fiscal cost of the crisis resolution, the market was not pricing in any risk spillover in this direction.

After January 2010 (see Charts C and D), if the expected shortfalls do not show any modification of the bank-to-bank vulnerability, the transmission channels among sovereign CDSs have changed and are now more heterogenous: for example, a shock to the French sovereign CDS currently impacts

Chart C Historical expected shortfalls for sovereign CDS markets during the euro area debt crisis
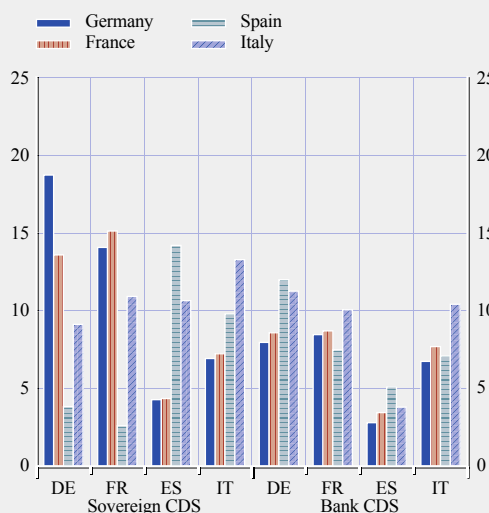
(Jan. 2010 – Nov. 2011; basis points)

 ■ Germany   ■ Spain
 ■ France   ■ Italy

Sources: Bloomberg and ECB calculations.
Note: This chart should be read as a tail event in which the asset mentioned on the x-axis impacts by N basis points the sovereign CDS of the country mentioned.

the German CDS by 14 basis points, against only 7 basis points before January 2010, while a shock to the Spanish sovereign CDS now impacts the French and German CDSs only by 4 basis points, against 14 basis points before 2010.

Another crucial modification after January 2010 is that the cross-segment transmission channels are stronger. For example, Chart C shows that a tail event for the Italian bank CDS, which corresponds to an increase above 10 basis points over a day, implies on average an increase of the sovereign CDS by 7 basis points for France, Germany and Spain and 11 basis points for Italy; or a tail event for the German bank CDS (daily variation above 7 basis points) implies an increase in the sovereign CDS by about 8 basis points for France and Germany, 13 basis points for Spain and 12 basis points for Italy.

Chart D Historical expected shortfalls for bank CDS markets during the euro area debt crisis
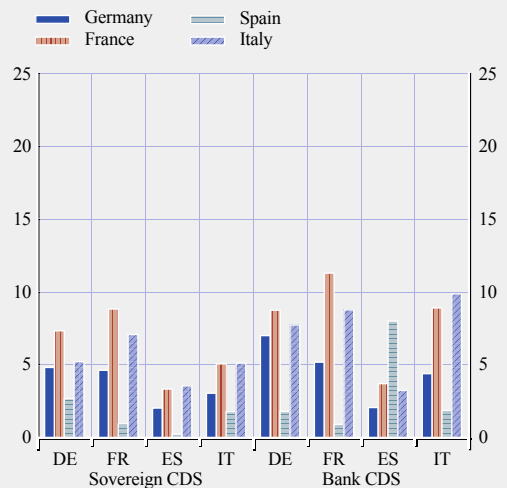
(Jan. 2010 – Nov. 2011; basis points)

- Germany
- France
- Spain
- Italy

Sources: Bloomberg and ECB calculations.
Note: This chart should be read as a tail event in which the asset mentioned on the x-axis impacts by N basis points the bank CDS of the mentioned country.

From the sovereign to the banks, Chart D shows that the sensitivity is also stronger than before, but overall lower than from the bank CDS to the sovereign; for example, a tail event for the French sovereign CDS (daily variation above 15 basis points) increases the bank CDS by about 9 basis points in France, 7 basis points in Italy, 5 basis points in Germany and 3 basis points in Spain.

To conclude, the current high correlations between bank and sovereign CDS spreads and the conditional expected shortfall approach suggest feedback loops exist between the two segments. Since the tensions on sovereign debt and banks' pricing cannot be disentangled, focusing on recapitalisation of banks may not be enough to stabilise banking system soundness.