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Disclosure, banks CDS spreads and the European sovereign crisis*

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Abstract

We investigate the impact of banks disclosure on the evolution of their CDS spreads during the European sovereign crisis. The disclosure of information helps investors in building expectations; disclosure may participate into the reduction of the information risk premium and may lead to a decrease of CDS spreads. We analyze the CDS spreads changes following the announcement of sovereign credit rating downgrades. We consider 16 dates in the period 2011-2013 and, for each one, we assess the cumulative abnormal CDS spread change (CASC). We build two disclosure indexes: one general and one specifically dedicated to sovereign exposure. We show that the bank exposure to sovereign risk has a positive impact on the CASC. Disclosure about sovereign exposure has a negative impact on CASC showing that information reduce risk premiums. However, the global disclosure increases the CASC; investors may disapprove the disclosure of too much abundant and broad information.

JEL Classification: G14, G21

Key words: bank, sovereign crisis, disclosure, CDS

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1 Introduction

The European sovereign crisis during the early 2010s has raised major concerns about the solvability of European banks. First, the increasing sovereign credit risk has a negative impact on the value of banks portfolio. Furthermore, deeply in debt countries may not bail out banks in financial difficulties. As domestic banks are more likely to buy domestic sovereign debt the combined effect of "no bailing out" and "higher risk" assets can be harmful for the banking sector. At last, the lower value of sovereign bonds - collaterals for ECB facilities - reduced the possibility of refunding and may lead to liquidity problems. For instance, Acharya et al (2015) emphasize these different channels of diffusion and their negative influence on credit supply. The degradation of banks credit risk conducts to variations in the value of financial assets, e.g. to a decrease in the value of the bonds they issued, and to an increase of the credit default swap (CDS) spread on these bonds (For more details see for instance Hull et al., 2004). Investors may overreact at the announcement of a sovereign credit risk downgrade, and lead to a too strong adjustment of the bond value or the CDS spread by requiring an informational risk premium, especially when uncertainty is strong. The consequence is a high volatility on financial markets, leading to a higher financial instability. However, this informational risk premium can be reduced if investors are well informed, for instance if the issuer discloses information (see Baumann and Nier, 2004 or Akhigbe and Martin, 2008). As a consequence, another important issue of the recent years concerns the disclosure of information to investors. Actually, the so-called "subprime crisis" has enlightened the lack of transparency by banks and has led regulation authorities to review the international agreement in order to restore and maintain stability in the banking sector. For this purpose, the European Central Bank (ECB) and the European Banking Authority (EBA) organized stress tests to prepare banks to extreme scenarios and to help them reacting to emergency situations[1]. The first stress-testing exercise was done in 2009 with 22 participants and none of the results nor the identity of the participants were disclosed. After that, EBA and the ECB decided to disclose the results and the data used for the two following resilience tests. The second and third stress tests were led in 2010 and 2011, and their results published in the same year. Petrella and Resti (2013) and Bishof and Daske (2013) show that these stress tests actually provided new information to financial markets. To face the sovereign crisis, the EBA also led Capital Exercises, in 2011 and in 2012. Their aim was to review banks sovereign exposure and to control the adequacy of their capital to this risk. The EBA disclosed the results of these exercises in 2011 and 2012. Furthermore, disclosure also plays an important role in the banking regulation, as the Basel III Pillar 3 (and Basel II Pillar 3 before it) emphasizes, in order to increase banks resilience (See Frolov, 2007). The governance codes of the listed firms also require disclosure, for instance with the principles of pay on say or comply or explain. The banks themselves have increased their disclosure towards investors and public, in order to satisfy a growing

[1]The objective of the EU's stress testing exercises of the banking sector is the assessment of whether banks will maintain an adequate level of capitalization even when facing an exogenous shock.

demand for transparency. The aim of this article is to analyze whether disclosure by banks plays a role in the investors reaction during the European sovereign crisis. We analyze the relationship between disclosure by banks and their credit default swaps (CDS) spreads from 2011 to 2013. We focus on the reaction of CDS spread when the credit rating of a European country has been downgraded. The disclosure of information by the banks should reduce the informational risk premium, and, as a consequence, disclosure should reduce the reaction of the CDS market. We consider two kinds of disclosure: first, we consider disclosure of information about sovereign risk exposure in order to know whether investors more or less react when they have access to such information than when they do not. Second, we consider disclosure of general information (such as corporate governance), because a strategy of global disclosure may create confidence: if investors have access to general information they may react less than if they do not. This question is important from a regulatory point of view: does disclosure increase financial stability? Is disclosure a key of the market discipline on the financial markets? The policy implications are important: If disclosure acts like an enhancer of stability over the CDS spreads, the recommendations and the decisions to increase the mandatory level of disclosure coming from banks have provided beneficial output. We use the data obtained from the European Banking Authority in order to know the banks exposure to sovereign risk: results of the capital exercises in 2011 and 2012 are considered. We assess the impact of downgrading sovereign credit ratings on the evolution of the CDS spreads. We calculate cumulative variations of spread above a CDS index. Then we analyze the role played by banks' disclosure on the CDS spread reactions, when controlling for bank sovereign exposure to the countries included in the EBA capital exercise. We used a ordinary least square model with correction for heteroskedasticity. We show that specific disclosure reduces reactions of the CDS spreads, estimated by the cumulative abnormal CDS spreads changes. Global disclosure has the opposite influence. We also show that banks in the Eurozone are more likely than non-eurozone banks to see their CDS spreads increasing during this period. This article provides several contributions. First, we analyze the role of disclosure by banks when a sovereign downgrading is announced whereas only the impact of disclosure by the EBA has already been analyzed (see Petrella and Resti, 2013, or, in the US context, Neratina et al., 2014). The role played by the banks as information providers during the EMU crisis has not been analyzed before. Second, we create a new disclosure index based on yearly reports of banks. The index rewards banks that are the most transparent. Third, we use the results of the capital exercises, whereas only the results of the EBA stress-tests have been exploited (for instance by Petrella and Resti, 2013 or Ellahie, 2012). Our last originality comes with the use of the bank CDS instead of equities or bonds, as used by most empirical literature related to disclosure. Actually, a growing financial literature shows the CDS spreads provide relevant information. Hull et al (2004) argue that CDS spreads are more reliable than bonds spreads; Delatte et al (2012) show that during stress periods, information are transmitted from CDS market to bonds market. The article will be divided as follows. The section 2 presents the background, reviewing the existing literature on with our

article lies. Section 3 describes the empirical strategy and the data set. Statistics about the variables and the downgrading events are given in section 4. Section 5 presents our empirical findings, including robustness checks. Section 6 concludes.

2 Background

Our article relies on two fields of literature. The first one is about the link between bank disclosure and financial stability; the second one focuses on the bank resilience during the European crisis.

2.1 Bank disclosure and financial stability

A growing literature analyzes the impact of disclosure on financial stability. Most of the literature studies the impact of bank disclosure on stock markets. Baumann and Nier (2004) show that the stock prices volatility is decreased by disclosure. Their results suggest that disclosure is useful to investors because it reduces the rumor effect and participates into the reduction of unwanted volatility. Akhigbe and Martin (2008) also find a negative relationship between disclosure and volatility. They show that disclosure decreases the individual risk and the total risk even if it has no effect on the systematic risk[2]. Tadesse (2006) focuses on the impact of the introduction of mandatory disclosure on banking stability. He shows that the quantity and quality of disclosure reduce the probability of occurrence of a systemic banking crisis. The importance of disclosure for bank solvability, and for banking sector stability, has also been emphasized. This aspect can play a role, even indirect, in the perception of bank credit risk by investors. Vauhkonen (2011) shows that information disclosure has a positive impact on bank safety. In a model of banking competition in which the bank probability of continuing its activity depends on the quality of its risk management, mandatory disclosure (e.g. Basel II Pillar 3) fosters bank's quality competition, and avoids behaviors which could be harmful to the financial market stability. Cordella and Yeyati (2002) also study the impact of disclosure on bank risk taking, via the control exerted by depositors. Banks have an incentive to improve the quality of their portfolio and to become less risky when the monitoring of the bank is possible. Informed depositors participate to an increase in stability through the modification of the risk management. Cordella and Yeyati (1998) are more qualified. They show that if banks do not chose the risk of their assets (because of systematic issues for instance), banks disclosure may increase their probability of default. Studying US banks, Neratina et al. (2014) show that the disclosure of the stress-tests results decreases the CDS spreads and, in the long term, reduces the systematic risk: disclosure may lead to a lower risk taking and a lower systemic risk.

[2]For more details about the impact of disclosure on financial markets, see for instance Farvaque et al. (2011).

2.2 Sovereign debt exposure and bank resilience during EMU crisis

A recent literature analyzes the relationship between sovereign risk and banking risk during the recent European sovereign crisis. Grammatikos and Vermeulen (2012) show that a transmission of sovereign risk to the financial markets (to bonds and stocks of financial firms) starts after the Lehman collapse. A group of articles focuses on the link between sovereign CDS and bank CDS. Arnold (2012) shows that the sovereign risk has a positive impact on banking risk during the first phase of the crisis in 2010. He shows that the more banks are exposed to distressed sovereign debt the more their stock returns and their CDS spreads respond to a change in sovereign CDS rates. However, this reaction appears to be driven by fixed effects on banks located in the in crisis countries (ICC: Spain, Ireland, Greece and Portugal). Banks in these countries appear more vulnerable to sovereign risk either directly due to their exposure to domestic debt or indirectly by the impossibility of government to bail them out, increasing the risk of default of bank. Actually, Acharya et al. (2014) show that financial sector bailouts and sovereign credit risk are intimately linked: the announcement of financial sector bailouts was associated with an immediate opening of sovereign CDS spreads, while the banks' one were becoming more and more narrow. After the bailout, however, a significant co-movement between bank CDS spread and sovereign CDS spread is visible. However, Alexandre and Wang (2015) obtain more qualified results: co-movements between sovereign CDS spread and banks CDS spread are only significant in Belgium and in Greece. De Bruyckere et al. (2013) also study the contagion in the European debt crisis from sovereign debt to banks over the period 2006-2011. Contagion between bank and sovereign credit risk (defined as an excess of correlation between CDS spread of banks and sovereign CDS spread) exists especially at the emergence of the debt crisis in 2009 (significant spillovers for 86% of the banks of the sample). An important channel of contagion holds on a strong home bias in banks exposure. A second group of articles focuses on the information provided by the stress-tests. Petrella and Resti (2013) analyze the impact of supervisors tests as an information tool on banks stock prices in 2011. The abnormal returns of bank stock prices are strongly correlated to their output, meaning that stress-tests reveal new information. Their results are consistent with Morgan et al. (2014) in an US context: stress-tests provide information on the gap between the required capital and the banks capital, as shown by an event study on stock market. However Ellahie (2012), in line with microstructure theory, shows that stress-tests in 2010 and 2011 may increase information asymmetry on financial markets. At least Bischof and Daske (2013) study the consequences of supervisory disclosure of bank specific information such as credit risk exposure and stress-test simulations. They analyze how mandatory supervisory disclosures interact with banks' subsequent voluntary disclosures or opaqueness. Their results show a substantial rise in voluntary disclosure on sovereign credit risk exposure from 2009 to 2011. The general pressure of investors, auditors, regulators or rating agencies to provide such specific disclosure increased with the severity of the Eurozone debt crisis.

2.3 Testable hypotheses

The purpose of this article is to analyze whether or not disclosure increases stability on the CDS market. When a sovereign credit risk increases, the consequences are twofold: first, the value of the assets owned by the bank decreases; second the value of the collateral banks can provide to the ECB for a refunding decreases, and may lead to liquidity problems. Thus, banks credit risk may be deteriorated and their CDS spread will increase too[3]. The consequence is greater when the bank is located in the downgraded country, because the ability of the State to bail out banks is reduced. If the investors are rational and well informed, the increase for a bank is proportional to its exposure to sovereign risk. Sovereign debt exposure is supposed to have a positive impact on the CDS spreads. As sovereign risk has an important systematic component (see for instance Longstaff at al., 2007) their reaction may also be linked to the exposure to other weakened countries.

A change in the banks' CDS spread is not only explained by a change in the risk premium but also in the informational risk premium. We assume that disclosure has stability effect over the CDS spreads: More disclosed information reduce the uncertainty, and therefore the informational risk premium. So the disclosure of information reduces the CDS spread of the banks when the signal emitted is able to reassure investors. By disclosing information regularly, a bank can smooth the market reaction to new information. If investors have a good knowledge of bank exposure, their reaction to an announcement of sovereign downgrading will be lower because the informational risk premium will be lower. Thus, we assume that the information disclosed by the bank on its sovereign exposure have a negative impact in the evolution of the CDS spreads. Furthermore, banks can provide other kind of information than the one related to sovereign exposure. These information may have an impact on the investors reaction by creating confidence (Coates, 2007), and reducing the risk premium. We also assume that global disclosure (not related to sovereign debt) has a negative impact in the reaction of the CDS spreads.

3 Data and empirical methodology

The following paragraph presents the sample and the dataset. Then, we introduce the 16 events we consider for our analysis. At last, we explain our empirical strategy, and we describe the dependent variables and the independent variables: disclosure by the bank, exposure to sovereign risk and control variables.

3.1 Sample and dataset

Our study focuses on the European banks that have participated to the capital exercises in 2011 and 2012, in order to use the information given in their reports: the exposure to sovereign risk and the RWA (risk

[3]The literature shows that the CDS spread actually raises whan the credit risk increases, see for instance Annaert et al. (2013)

weighted assets). 79 banks ran the exercise in 2011, and 61 banks in 2012. To have the same sample over the global period, we only consider the 59 banks that ran the exercises both in 2011 and 2012. Furthermore, we must focus on the banks with CDS emitted in their name. Our sample contains the 47 banks respecting these three conditions. We also use Bloomberg and Bankscope (from Bureau Van Dijk) databases. The Bloomberg database provides the CDS spreads. Bankscope provides the accounting data and information about tier one capital. We build banks disclosure indexes on the analyses of their financial reports. The sample contains large international banks such as the Deutsche Bank, which has the largest total asset of our sample (more than 2,655,138 million USD). Our sample includes other large banks such as BNP Paribas, Cr_dit Agricole or HSBC. On the other hand the bank with the smallest amount of assets the Banco Pastor with only 39,301 million USD. The average size of total assets is 697,663 millions USD. The geographical distribution of banks among Europe is rather uniformly distributed but gives a higher representativeness to German, Italian and Spanish banks. The largest banks are located in France, UK and Germany. 37 banks over the 47 are located in the Eurozone, and 14 banks over 47 are located in Portugal, Ireland, Greece or Spain (In crisis countries).

3.2 Events: Sovereign credit risk downgrades

We use the Europress.com database to determine the exact date of each downgrade by Standard & Poor's, Moody's, and Fitch. The ratings agencies announced more than 65 sovereign downgrades over the period January 2011 to June 2013 in the European Union. The choice of the period is justified by the fact that the results of the EBA capital exercises are only known since 2011. The different rating agencies even announced several downgrades on the same day, reducing the 65 announcements to 56 dates. We consider a restricted number of downgrades in order to focus on the main events. We consider three different kinds of event: first when the magnitude of the downgrade is at least equal to three, second when a triple A country is downgraded (even if the magnitude is below 3), and finally when at a single date there is more than one country downgraded. By choosing only the events that have a larger magnitude, we eliminate the downgrades that are considered as adjustments[4]. By choosing to incorporate AAA countries that are suffering from a downgrade of their sovereign debt rating, we ensure that we take into account other countries and not only Portugal, Ireland, Greece and Spain. Choosing to incorporate the downgrade of France, the United Kingdom or other AAA countries, allows us to analyze sovereign debt that used to be considered as "risk free". The investors can consider the lost of a triple A as important as a downgrade of magnitude 3. We also integrate an event with more than one downgrade on the same day. In January 13th, 2012 S&P downgraded 9 European countries. Those downgrades are the answer from S&P to European policy

[4]The downgrade of a country can be interpreted as an adjustment when the country is in a situation where its economic forecast will not be fulfill. For example: if Spain economics forecast is supposed to be negative, and 6 months after the rating agency downgrades the sovereign debt; then this downgrade is considered as an adjustment because it is supposed to be anticipated.

makers, judging that their initiatives taken in the previous weeks may be insufficient to fully address ongoing systemic stresses in the Eurozone. The list of events is now up to 16 dates around which we conduct our study. The events we selected cover the following period: From January 1st 2011 and to June 30 2013.

3.3 Empirical methodology and variables description

We analyze the evolution of CDS spreads of banks over the period 01/03/2011 to 06/30/2013. Our sample contains 742 observations: 47 banks over 16 events. The dependent variable is the cumulative abnormal spread change (CASC) of CDS in order to measure the reaction of the market to a downgrading in sovereign credit ratings. For each event, and for each bank, we determine the CASC over different windows: from 5 days before the event to 5 days after the event; from 2 days before the event to 2 days after the event. We also use post event windows: 5 days after the event and 2 days after the event. The choice of several windows allows us to analyze more in details the reaction of the CDS spreads, and to check the robustness of our results (see MacKinlay, 1997 or De Bruyckere, 2012). The empirical model estimates the relationship between the CASC and four different groups of independent variables (see below). These variables assess the sovereign disclosure (SOVEREIGN DISCLOSURE), the global disclosure (GLOBAL DISCLOSURE), the exposure to sovereign risk (SOVEREIGN EXPOSURE) and control variables (CONTROL). The model we run can be summarized as:

$$CASC^{T}_{b,-i,+j} = \alpha + \beta_1 SOVEREIGN\ DISCLOSURE_{b,T} + \beta_2 GLOBAL\ DISCLOSURE_{b,T} \quad (1)$$
$$+\beta_3 SOVEREIGN\ EXPOSURE_{b,T} + \beta_4 CONTROL_{b,T} + \varepsilon_{b,T}$$

where T is the date of the event and b is the bank, i the number of days we observe the CDS spread before the event and j the number of days we consider the CDS spread after the event. The White's General Heteroskedasticity Test was particularly significant for the global disclosure and for the exposure to Spain, Portugal, Ireland and Greece. The model we run is an OLS corrected for heteroskedasticity using a heteroskedasticity - consistent covariance matrix estimator. In a first step, we run an OLS estimation of the model. Then, in a second step, we estimate the error variance by regressing the log of the squared residuals from the OLS on the regressors and their squares. Then in the last step, we run a weighted least squares, using the reciprocal of the estimated variance as weight. We tested the existence of non-linear links between the dependent variables and the independent variables but it was not statistically significant; consequently we only use linear specifications.

3.3.1 Dependent variables

The dependent variable is the cumulative abnormal variation of the CDS spreads, following the announcement of a downgrade of sovereign credit rating. Following Norden and Weber (2004), we first assess use the

abnormal CDS spread change (ASC). The $ASC_{b,t}$ for the bank b at time t is the difference between the daily variation of the CDS spread and the daily variation of a CDS market Index (the SNRFIN CDSI GEN 5Y published by iTraxx). The choice of this broad index rather than a European CDS index allows to limit the over representation of the European sovereign debt crisis in the index and reduces the country-specific effects. Then, we compute a cumulative abnormal CDS spread change (CASC):

$$CASC^{T}_{b,-i,+j} = \sum_{t=T-i}^{T+j} (CDSspread_{(b,t)} - CDSindex_t) \tag{2}$$

where T is the date of the event, b the bank, i the number of days we observe the CDS spread before the event and j the number of days we consider the CDS spread after the event. For each one of the 16 events, and for each bank, we determine the CASC over four different windows in the neighborhood of the date of the event: $CASC^{T}_{b,-5,+5}$, $CASC^{T}_{b,-2,+2}$, $CASC^{T}_{b,0,+5}$, $CASC^{T}_{b,0,+2}$.

3.3.2 Disclosure variables

We consider two kinds of disclosure: disclosure about sovereign exposure and global disclosure. We build the two variables on the basis of the financial reports of each participating bank for the year 2010 and 2011. The yearly financial reports are usually published during the month of March for the previous year. This information allow us to cover our whole set of events from early 2011 to mid 2013. The financial reports of 2010 are used to define our disclosure index from early 2010 till March 2012. The financial reports of 2011 give the disclosure index of 2012 till the first quarter of 2013. We build a disclosure index about sovereign exposure with different elements. First, we consider the number of times the word "sovereign" is pronounced in each financial report (Times). In order to have a normed indicator, we assess Times by dividing the number of times for each bank by the maximal number provided by a bank (the greatest disclosure).

$$Times = \frac{time\,the\,word\,sovereign\,is\,pronounced_{\,b,n}}{\max time\,the\,word\,sovereign\,is\,pronounced} \tag{3}$$

where b is the bank b and n=2010, 2011.

We also consider the number of pages devoted to sovereign risk (Pages). In order to have a normed indicator, we assess Pages by dividing the number of pages for each bank by the maximal number provided by a bank (the greatest disclosure).

$$Pages = \frac{number\,of\,pages\,dedicated\,to\,sovereign\,exposure_{\,b,n}}{\max number\,of\,pages\,dedicated\,to\,sovereign\,exposure} \tag{4}$$

where b is the bank b and n=2010, 2011.

We also consider the quality of disclosure devoted to sovereign exposure. Quality is measured by a 100% to 0% scale. In order to obtain the maximum grade, here 100%, the financial report must provide graphical

analysis, charts, figures and must be easy to find in the report (typically if the sovereign exposure is easy to find across the summary or the table of content). The bank gets a grade of 66,66% if no graphical analysis if provided, gets a grade of 33,33% if it not easy to find in the report, and a grade of 0% if not reported or poorly reported.

We calculate a sovereign disclosure index (Sovereign Disclosure) that takes into account the three previous components.

$$Sovereign\ Disclosure = Mean\,(Times,\ Pages,\ Quality) \tag{5}$$

We build a second disclosure index, Global Disclosure. It integrates several subcomponents, listed in the table 1, concerning the global policy of disclosure by each bank. We consider the size of the financial reports (in pages), the presence or absence of the Basel II Pillar 3 (B2P3) annexes, the presence of information about the remuneration of the decision maker (number of pages devoted to the say on pay), the presence of information about the bank compliance with national or supranational rules of governance (comply or explain), the presence of information about the majority shareholder, the presence of noticeable shareholders (holding more than 3% of the capital) and finally the presence of information about the attendance of board members to meetings. For the two variables based on the number of pages, we transform both variables into dummy variables, equal to 1 if the number of pages is above the median of the sample, 0 otherwise. For the five other variables, we use dummy variables that reward disclosure: for example, if the financial report of a bank gives information about the attendance of boards members to meeting the value of this variable will be 1, and 0 otherwise. Global Disclosure is computed by cumulating the value of each component divided by 7, so its value is between 0 and 1.

Sovereign Disclosure and Global disclosure are expected to have a negative impact on CASC.

Table 1: Global disclosure index

Variable name	Meaning	Value
Financial Report Size		1 if above median 0 otherwise
B2P3 Appendix	Presence or not of the appendix	1 if appendix is provided on website or in report 0 otherwise
Say On Pay	Number of pages devoted to directors remuneration	1 if above median 0 otherwise
Comply Or Explain	Presence or not of information about compliance with the governance code	1 if provided in the financial report 0 otherwise
Majority Shareholder	Presence or not of information in the report	1 if provided in the financial report 0 otherwise
Noticeable Shareholder	Presence or not of information in the report	1 if provided in the financial report 0 otherwise
Member's Attendance to Board Meeting	Presence or not of information in the report	1 if provided in the financial report 0 otherwise

3.3.3 Sovereign exposure per bank

The capital exercises conducted by the EBA in 2011 and 2012 disclose the sovereign exposure of each participating bank per country. The exercises provide these exposures for 3 different times: 31st, December 2010, 31st, December 2011 and 30th, June 2012. For each date, the EBA gives information about the amount, the maturity and the type of sovereign risk held by the bank for each country. We compute nine different variables. For each event, we consider the exposure to the country concerned by the downgrade, but also the exposure to the other European countries. Actually, as shown by Longstaff et al. (2007), the sovereign risk contains an important systematic component: following the increase of credit risk in a country, investors may anticipate an increase of credit risk in the other European countries. The first variable is the total exposure of each bank towards all the countries concerned of the EBA stress tests, divided by the total assets of the bank, in order to control the size effect (Relative Exposure). The expected sign of this variable on the evolution of the spread of the CDS is positive. The second variable is the total exposure towards the all in crisis countries (ICC Exposure) in order to identify banks that are exposed to the riskier sovereign debts. The third variable assesses the exposure of each bank to countries that suffered from a downgrade over

the period 01/01/2011 to 06/30/2013 (Downgrade Exposure). So this variable does not take into account the exposure towards Germany, Luxembourg, Sweden and Norway. The last 6 variables consider the specific exposure (gross or net) of the country or countries that were downgraded at the date of the event. Short Term Gross Exposure (from 0 to 3 months), Medium Term Gross Exposure (from 3 months to 1 year), Long Term Gross Exposure (from 1 year to 5 years) express the gross exposure towards the country/countries suffering the downgrade for each event. Short Term Net Exposure, Medium Term Net Exposure and Long Term Net Exposure express the net exposure towards the country suffering the downgrade for each event. In the case of the event of 12th, January 2012, we add up the exposure data for each country that were affected by the different downgrades (nine in total). Each of these variables is expected to affect positively the cumulative abnormal CDS spread changes.

3.3.4 Control variables

First, we control whether the bank is located in the country affected by the downgrade. Domestic equals 1 in this case, 0 otherwise. We expect this variable to have a positive impact on the CASCs, as a State deeply in debt cannot easily provide financial support to the national banking sector. In order to take into account the peculiar economic problems of Eurozone members, we consider EuroZone, equals to 1 if the bank is located in a Euro member country, and 0 otherwise. Our sample is composed of 10 banks that are not located in a Euro member country. Both expectations about the sign of this variable are possible. First, the Eurozone variable may have a negative impact on CASCs, if CDS market participants anticipate that the size and the strength of the institutions of the Eurozone ensure the stability of the all zone even in period of trouble. Secondly, the Eurozone factor may have positive impact on CASCs, if CDS market participants anticipate that the situation in the Eurozone is difficult enough that the stability cannot be ensure. ICC (In Crisis Countries) takes the value 1 if the bank is located in one of the following country: Portugal, Ireland, Greece and Spain, the four countries that benefited from a ECB emergency rescue plan during the period. These countries are the less able to ensure the bail out process in case of default because of their high level of debt. We expect this variable to have a positive impact on the CASCs. We also consider a cross variable measuring the exposure to the ICC sovereign debt when the bank is located in one of those countries: the variable ICCxICC Exposure. At last, to control the risk of the bank, we use the Risk-weighted asset (RWA)[5]. RWA is expected to have a positive impact on the CASCs. We also consider Non Performing Loans, equal to the percentage of non performing loans in the loans portfolio of a bank. A non performing loan is defined as a sum of borrowed money upon which the debtor has not made his or her schedule payments for at least 90 days. This variable is supposed to have a positive impact over the CASCs.

[5]This asset calculation determines the level of capital requirement for a bank.

4 Statistical analysis

4.1 CASCs statistical analysis

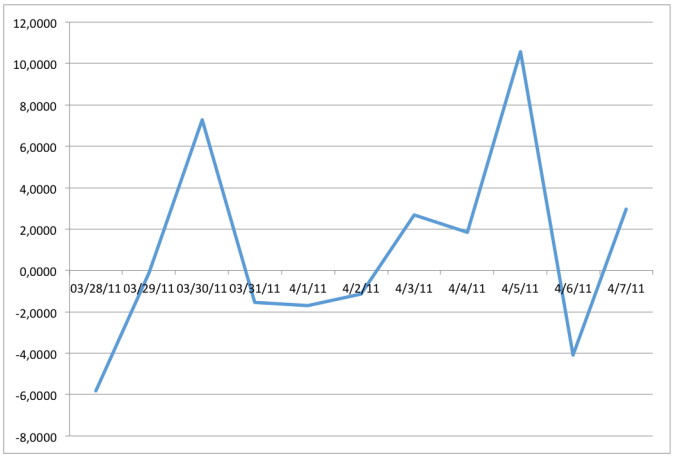
Table 2 reviews descriptive statistics about the CASC around the events, for the four windows we consider. As expected, in average, the CASC is positive: announcements of a downgrading in sovereign credit risk lead to an increase in the CDS spreads. The longer the window is, the higher the CASC is. Two interpretations can be given. First, the investors on the CDS market do not (in average) correct their first reaction after two days (as the means of CASC 0,+5 and CASC -5,+5 are higher than the means of CASC 0,+2 and CASC -2,+2). Second, the investors on the CDS market may anticipate the downgrading, as in average, CASC -5,+5 is higher than CASC 0,+5 and, in average, CASC -2,+2 is higher than CASC 0,+2. The standard deviation is high, revealing heterogeneous reaction of CDS spreads.

Table 2: CASC - Descriptive statistics

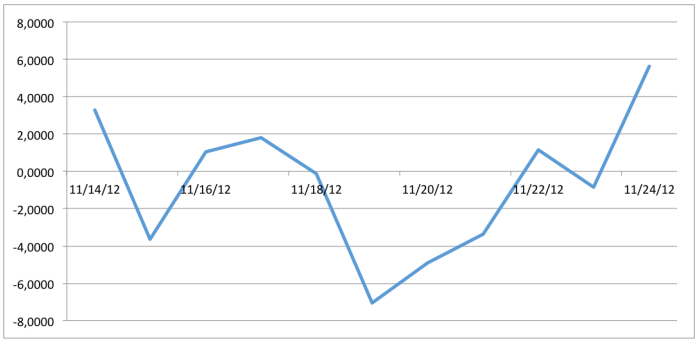
	CASC 0,+5	CASC -5,+5	CASC 0,+2	CASC -2,+2
MEAN	904.19	1644.10	459.85	760.20
STDEV	2047.20	3711.80	1036.70	1726.60
MEDIAN	84.41	155.55	41.06	63.80
Q1	200.23	271.23	-24.63	-44.89
Q3	1079.50	1820.20	530.94	885.47
MIN	-898.86	-1665.00	-469.09	-789.17
MAX	12290.00	23119.00	6197.80	10375.00

In order to show the effect before and after the downgrading, graphs 1, and 2 present the evolution of ASC from 5 days before to 5 days after the announcement. We selected two downgrading. The 2nd of April 2011 corresponds to the downgrading of Portugal by Fitch, from A- to BBB+ (Graph 1). The 29th of November 2012 corresponds to the lost of the rate AAA by France (From Aaa to Aa1 by Moodys) We can observe an increase of the abnormal spread changes starting at the date of announcement, or, more clearly, the day after the announcement.

Grah 1: Event 2nd of April 2011 - Donwgrading of Portugal credit rating



Graph 2: Event 29th of November 2012 - Lost of Aaa by France



4.2 Disclosure variables' analysis

Table 3 reviews descriptive statistics about Sovereign Disclosure and Global Disclosure in 2010 and 2011, and presents their evolution. The highest level of disclosure about sovereign exposure is 92% in 2010 obtained by the Deutsche Bank, while the highest value in 2011 is equal to 88% obtained by Allied Irish Bank. The evolution over the period is positive, after the rise of awareness all over Europe, and most largely all around the world, about the European sovereign debt crisis: the average value is increasing by more than 16% when its median is increasing by more than 30%. Five banks (Bayerische Landesbank, Caja de Ahorros y Pensiones de Barcelona, Norddeutsche Landesbank, Rabobank Nederland and Swedbank) have an index equal to 0 during the year 2010 and only one for the year 2011 (Danske Bank). The different participating banks decided to explain throughout annual reports theirs exposure to the different European countries. On the other hand, we can see an increase in the standard deviation translating a more heterogeneous behavior among banks. Concerning the global disclosure variable, the assessment is somehow reverse. On average, the level of global disclosure is reducing in 2011 compared to what it was in 2010, but the dispersion of the

distribution is also reducing. The banks may reorient their communication on what matters the most at a given period, deciding to communicate more on the sovereign and reducing their other disclosures. The maximum level of global disclosure in 2010 is 75%, obtained by three banks (Allied Irish Bank, Barclays and HSBC). In 2011, the maximum is still 75% and is obtained by two banks (Royal Bank of Scotland and Commerzbank). In the mean time, the minimum value is 0% in both year obtained by the National Bank of Greece in 2010 and in 2011.

Table 3: Disclosure variables - Descriptive statistics

	2010		2011		Evolution	
	Sovereign Disclosure	Global Disclosure	Sovereign Disclosure	Global Disclosure	Sovereign Disclosure	Global Disclosure
MEAN	27.28%	41.48%	32.75%	39.72%	16.70%	-4.45%
STDEV	24.90%	20.15%	26.49%	19.59%	6.02%	-2.87%
MEDIAN	24.82%	37.5%	36.31%	37.5%	31.71%	0.00%
Q1	3.79%	25%	3.82%	25%	0.83%	0.00%
Q3	47.03%	62.5%	54.59%	56.25%	13.85%	-11.11%
MIN	0%	0%	0%	0%	0%	0%
MAX	92%	75%	88%	75%	-5.63%	0.00%

4.3 Sovereign exposure analysis

Table 4 presents statistics about the total exposure variables. The total exposure to sovereign risk (Total Exposure = Relative Exposure x Total Assets) shows a negative evolution for the year 2012 compared to the 2011 situation. The evolution is ranged from 0% to -45%. The maximum is held by BNP Paribas for the year 2011 and by Unicredit for the year 2012. The minimum exposure fluctuates less by only a decrease of 5%. The bank holding the smallest amount of sovereign debt is Irish Life and Permanent for the year 2012 and by Banco Pastor for the year 2011. The decrease in the average exposure to ICC risk of the participating banks is larger, but the dispersion of the distribution remains stable. Three banks decided not to hold any ICC sovereign debt for the year 2011 and four banks for the year 2012. The maximum exposure is held by the BBVA bank for both years. Concerning the last variable (Downgrade Exposure), the comments are similar: both the average total exposure to the downgraded countries and the standard deviation are decreasing. The maximum exposure is held by BNP Paribas in 2011 and in 2012. The negative evolution of the three variables indicates that the ECB plan to reduce exposure to the countries that are under surveillance by the ECB and the IMF was a success.

Table 4: Total exposure variables - Descriptive statistics

	Total Exposure (million EUR)			ICC Exposure (million EUR)			Downgrade Exposure (million EUR)		
	2011	2012	EVO	2011	2012	EVO	2011	2012	EVO
MEAN	37804.80	35120.06	-8%	6570.00	5379.47	-22%	23691.36	20963.39	-13%
STDEV	31512.95	26073.45	-21%	11698.00	11644.30	0%	25597.53	21445.29	-19%
MEDIAN	32445	30444.38	-7%	2608.00	2152.01	-21%	12347	9479.70	-30%
Q1	10123.75	9420.68	-7%	456.00	170.40	-62.6%	3964.75	4350.34	9%
Q3	58110.25	58250.66	0%	6982.00	4472.63	-36%	37711.50	31146.64	-21%
MIN	2553.00	2434.67	-5%	0.00	0.00	0%	0	0	0%
MAX	139661.00	96426.16	-45%	56514.00	53925.00	-5%	99189.00	70058.39	-42%

4.4 Control variables analysis

On average, only 9,04% of the banks have the same nationality that the downgraded country (Domestic). Our sample is composed of 37 banks located in Euro-zone member country (EUROZONE); the ten other banks are residents of the following countries: Denmark (1 bank), Norway (1 bank), United Kingdom (4 banks) and Sweden (4 banks). In the same time, our sample is composed of 14 banks located in countries in crisis (ICC): Portugal (2 banks), Ireland (3 banks), Greece (2 banks) and Spain (7 banks). 17 banks are not located in a country that has been downgraded during the period. Most of these banks are located in "AAA" countries like Germany (7 banks), Netherlands (4 banks), Denmark (1 bank), Norway (1 bank) and Sweden (4 banks) during the period from 01/01/2011 to 06/31/2013.

5 Results and comments

This section first presents the result of our main models. We analyze the impact of disclosure, of sovereign exposure and of control variables. Then, we present robustness checks of our main results.

5.1 Disclosure and CDS market reaction

We run two regressions for each of the four windows surrounding the events (Tables 5&6). We consider in the first column the gross exposure to sovereign risk, and we consider in the second column the net exposure to sovereign risk. Sovereign Disclosure has a negative influence on the cumulative abnormal CDS spread changes for each of our window and for both net and gross exposure. The results obtained are consistent with our expectation: sovereign disclosure participates into the reduction of the value of CDS spreads. The results are robust on the several windows. They confirm the results of the literature about the role of disclosure in decreasing volatility in financial markets (see Baumann and Nier, 2004 or Akhigbe and Martin, 2008). On the other hand, Global Disclosure increases the CASCs. Such result shows that investors worship more oriented, specific, disclosure in their calculation of the risk premium. The disclosure of characteristics which are more

in line with the current financial and economic situation are more likely to participate to the reduction of the spreads of CDS. Specific disclosure is rewarded by investors in the value of the spread whereas global disclosure, potentially judged vague, increases the spread. This result can also be linked to Ellahie (2012) and the theoretical microstructure literature, showing that disclosure may increase asymmetric information on the financial market, and lead to a higher risk premium. We rerun our main models (over the CASC 0,+5 and CASC -5 ,+5) in order to check if the investors are more sensitive to the quantitative dimension information (number of pages for instance), or, at the contrary, to the qualitative dimension of information (quality of the report for instance). We break up our disclosures indexes in order to separate the quantitative dimension from the qualitative dimension. Results are given in table 7. The stability of our results show that the investors take care about the subject of the disclosed information. They desire and reward both higher quality and higher quantity of disclosure, if the information are about sovereign risk.

5.2 Sovereign exposure and CDS market reaction

The analysis of the role played by the banks exposure to sovereign risk provides several results. The total exposure per asset ratio (Relative Exposure) has a significantly positive influence on the cumulative abnormal CDS spread changes. The result is consistent with our expectations: the more a bank is implicated in the sovereign debt market the more the increase of its CDS spreads is. Informed investors react to the amount of global exposure to sovereign debt even if it is not directly concern by a downgrade. This result is robust whatever the window is.

Investors also pay attention to the exposure to sovereign debt of countries in crisis. Actually, the ICC exposure has a negative significant influence on the cumulative abnormal CDS spread changes. This result is a bit surprising when we expect a bank to see its CDS spread increase more when the bank has a bigger amount of exposure to countries in crisis. It can be explain with the nationality of bank holding sovereign debt of countries in crisis not located in one of those countries. If a strong German bank holds a significant amount of Italian sovereign debt, investors are less afraid of the situation because of the solvability of the German government. In order to confirm the previous result, we see the impact on the evolution of CDS spreads of the cross variable ICCxICC Exposure which is positive and significant. Such result indicates that investors are more likely to revise positively their calculation about the CDS spread when the bank exposed to ICC is located in one of the four countries. This result can be explained by the diminishing capacity of those governments to ensure the stability of their banking sector due to their highly indebted situation. Our results are in line with Arnold (2012). This article shows that the banks reactions to variations in sovereign CDS spreads were higher when they were more exposed to sovereign risk, especially for banks in ICC.

Table 5: Model estimation with CASC 0,+5 and CASC -5,+5

The full sample consists of 752 observations in 2011, 2012 and 2013. The dependent variables are the cumulative abnormal spread changes over four different windows. Independent variables definitions are provided in paragraphe 3.3. They are all present in the regressions. The OLS regressions are based on standard errors adjusted for heteroskedasticity. In parentheses are the t- test values. ***, **,* indicate statistical significativity at the 1%,5% and 10% level respectively.

Type Of Exposure	**CASC 0,+5 Gross Exposure**	**CASC 0,+5 Net Exposure**	**CASC -5,+5 Gross Exposure**	**CASC -5,+5 Net Exposure**
const	−1366.73***	−1192.84***	−2528.55***	−2618.83***
	(-14.42)	(-14.69)	(-14.11)	(-14.29)
Sovereign Disclosure	−263.41***	−224.39***	−515.55***	−530.95***
	(-3.49)	(-3.38)	(-3.65)	(-3.63)
Global Disclosure	1756.12***	1535.31***	3308.37***	3482.34***
	(13.28)	(13.46)	(13.13)	(13.41)
Relative Exposure	3954.3***	3427.6***	7184.41***	7318.81***
	(6.38)	(6.46)	(6.25)	(6.35)
ICC Exposure	−0.09***	−0.08***	−0.17***	−0.18***
	(-8.09)	(-8.54)	(-8.24)	(-8.41)
Downgrade Exposure	0.01***	0.0093***	0.02***	0.02***
	(7.24)	(6.67)	(7.21)	(6.74)
Short Term Exposure	0.056*	−0.02	0.11*	−0.08
	(1.65)	(-0.49)	(1.72)	(−1.07)
Medium Term Exposure	0.023	0.05*	0.03	0.11*
	(0.83)	(1.72)	(0.65)	(1.74)
Long Term Exposure	−0.04**	−0.02	−0.08**	−0.02
	(-2.24)	(-0.84)	(-2.45)	(-0.41)
Domestic	318.40**	258.75**	705.75**	521.14*
	(2.20)	(2.00)	(2.51)	(1.79)
Eurozone	668.44***	604.68***	1241.99***	1315.57***
	(11.58)	(12.35)	(11.37)	(11.83)
ICC	3317.27***	3012.13***	6164.06***	6336.27***
	(14.93)	(16.29)	(15.29)	(15.50)
ICCxICC Exposure	0.03***	0.03***	0.06***	0.06***
	(3.11)	(3.32)	(3.42)	(3.44)
Tier 1	−3.51e-06*	−2.49e-06	−6.66e-06*	−6.702e-06*
	(-1.79)	(-1.57)	(-1.78)	(-1.88)
RWA	−9.242e-08	−1.06e-07	−1.65e-07	−2.212e-07
	(-0.44)	(-0.62)	(-0.43)	(-0.59)
Non Performing Loans	−2.52e-06	−2.34e-06	−5.07e-06	−5.51e-06
	(-1.01)	(-1.00)	(-1.09)	(-1.10)
R^2	0.62	0.62	0.61	0.61
Adjusted R^2	0.60	0.60	0.60	0.60
F(15. 477)	52.07	52.06	49.68	50.06
p-value	0.00	0.00	0.00	0.00

Table 6: Model estimation with CASC 0,+2 and CASC -2,+2

The full sample consists of 752 observations in 2011, 2012 and 2013. The dependent variables are the cumulative abnormal spread changes over four different windows. Independent variables definitions are provided in paragraphe 3.3. They are all present in the regressions. The OLS regressions are based on standard errors adjusted for heteroskedasticity. In parentheses are the t- test values. ***, **,* indicate statistical significativity at the 1%,5% and 10% level respectively.

Type Of Exposure	**CASC 0,+2 Gross Exposure**	**CASC 0,+2 Net Exposure**	**CASC -2,+2 Gross Exposure**	**CASC -2,+2 Net Exposure**
const	−643.38***	−667.66***	−1157.66***	−1793.91***
	(-14.24)	(-14.63)	(-14.49)	(-10.77)
Sovereign Disclosure	−92.53**	−99.54***	−212.51***	−612.62***
	(-2.48)	(-2.66)	(-3.26)	(-4.32)
Global Disclosure	817.78***	838.06***	1484.44***	2298.84***
	(12.73)	(13.11)	(13.04)	(11.09)
Relative Exposure	1850.89***	1979.69***	3274.66***	6895.79***
	(6.15)	(6.43)	(6.23)	(6.72)
ICC Exposure	−0.046***	−0.047***	−0.08***	−0.11***
	(-8.76)	(-8.70)	(-8.18)	(-7.44)
Downgrade Exposure	0.005***	0.01***	0.01***	0.01**
	(7.20)	(6.95)	(6.95)	(2.39)
Short Term Exposure	0.03*	−0.01	0.07***	−0.12***
	(1.91)	(-0.46)	(2.80)	(-2.98)
Medium Term Exposure	0.01	0.03**	0.02	0.03
	(0.80)	(2.10)	(0.77)	(0.81)
Long Term Exposure	−0.02***	−0.01	−0.04***	0.03
	(-2.67)	(-0.99)	(-3.03)	(1.35)
Domestic	238.63***	174.64**	372.63***	639.82***
	(2.94)	(2.07)	(2.84)	(3.90)
Eurozone	336.55***	337.56***	586.62***	811.22***
	(12.24)	(12.17)	(12.03)	(8.72)
ICC	1553.01***	1633.72***	2863.73***	3435.08***
	(14.24)	(14.51)	(16.25)	(26.86)
ICCxICC Exposure	0.02***	0.02***	0.03***	0.04***
	(3.96)	(3.66)	(3.18)	(3.38)
Tier 1	−1.61e-06*	−1.56e-06*	−2.24e-06	3.38e-06
	(-1.72)	(-1.77)	(-1.32)	(0.80)
RWA	−1.05e-07	−7.63e-08	−1.29e-07	−2.60e-08
	(-1.07)	(-0.82)	(-0.71)	(-0.06)
Non Performing Loans	−1.32e-06	−1.34e-06	−2.10e-06	8.53e-07
	(-1.00)	(-0.98)	(-0.97)	(0.15)
R^2	0.62	0.62	0.62	0.63
Adjusted R^2	0.60	0.61	0.61	0.62
F(15. 477)	53.19	54.38	53.88	56.25
p-value	0.00	0.00	0.00	0.00

The total exposure to countries that have been downgraded during the period (Downgrade Exposure) has a significant positive influence on the cumulative abnormal CDS spread changes, which is consistent with our hypothesis. (This result is robust whatever the window is). This result is important: investors react to announcement of downgrade when banks hold sovereign debt that have been, or will be downgraded. The investors are really sensitive to downgrades, whatever the country affected by the event. The sovereign risk is perceived as global (in line with Longstaff et al, 2007). This result is consistent with the fact that the net and gross exposure for either short, medium and long term, do not always have a significant impact on CASCs. It could be interpreted as the fact that the banks are not specifically affected by one event for a unique country.

More precisely, we observe that the short-term (and less strongly medium-term) exposure to the downgraded country has, in general, a positive impact on the CACS, when the coefficient is significant. Event if this result is not as robust as the others, it is consistent with our expectations: the investors anticipate loss for the bank, affecting its credit risk. However, the impact of the long-term exposure is negative when the coefficient is significant. This result could mean that investors anticipate a resolution of the European sovereign crisis in the long term.

5.3 Nationality, risk of the bank and CDS market reaction

The control variables also provide interesting results. The variable Domestic has a positive influence on the CASCs. Such result indicates that investors react negatively to announcement of downgrade by asking for a greater premium when using CDS for banks located in the downgraded country. The value of the coefficient increases also significantly from 722 for the shortest window (from the announcement to 2 days after) to 3752 for the longest window (from 5 days before the announcement to 5 days after). Investors attach importance to the nationality of the bank and attach even more importance when the window is large at the surrounding of the event. So investors take into account the lower ability of governments in helping their banking sector. This result is robust whatever the window is.

Table 7: Model estimation with separation between Qualitative and Quantitative disclosure indexes

The full sample consists of 752 observations in 2011, 2012 and 2013. The dependent variables are the cumulative abnormal spread changes over four different windows. Independent variables definitions are provided in paragraphe 3.3. They are all present in the regressions. The variables Sovereign Disclosure and Global Disclosure are decomposed following their qualitative and quantitative nature to check the robustness of the results. The OLS regressions are based on standard errors adjusted for heteroskedasticity. In parentheses are the t- test values. ***, **,* indicate statistical significativity at the 1%,5% and 10% level respectively.

	CASC 0,+5	**CASC 0,+5**	**CASC -5,+5**	**CASC -5,+5**
Type Of Exposure	Gross	Net	Gross	Net
const	-1468.12***	-1524.45***	-2728.71***	-2803.76***
	(-15.62)	(-15.64)	(-14.93)	(-14.78)
Qualitative Sovereign	-0.002 ***	-179.37 ***	-322.00 ***	-321.14***
Disclosure	(-5.07)	(-4.33)	(-4.18)	(-4.00)
Quantitative Sovereign	-297.38 ***	-302.74 ***	-619.43 ***	-576.62***
Disclosure	(-3.82)	(-3.64)	(-3.87)	(-3.56)
Qualitative Global	1386.63 ***	1453.85 ***	2615.81 ***	2717.87***
Disclosure	(12.48)	(12.49)	(12.019)	(12.19)
Quantitative Global	566.34***	584.03 ***	1075.64 ***	1101.68***
Disclosure	(8.96)	(9.04)	(8.91)	(8.79)
Relative Exposure	4920.15 ***	4970.59 ***	8556.38***	8741.94***
	(8.20)	(8.15)	(7.84)	(7.65)
ICC Exposure	-0.07 ***	-0.07 ***	-0.13 ***	-0.14***
	(-8.17)	(-8.43)	-(7.91)	(-8.27)
Downgrade Exposure	0.01 ***	0.01 ***	0.02***	0.02***
	(6.67)	(6.82)	(6.38)	(7.03)
Short Term Exposure	0.03	-0.02	0.05	-0.03
	(1.08)	(-0.66)	(1.23)	(-0.43)

Medium Term	0.004 *	0.05	0.08 *	0.08
Exposure	(1.72)	(1.55)	(1.79)	(1.30)
Long Term Exposure	-0.003 *	-0.01	-0.05 **	-0.02
	(-1.87)	(-0.56)	(-2.03)	(-0.65)
Domestic	80.80	129.33	2.77E+02 *	388.10**
	(1.07)	(1.50)	(1.66)	(2.10)
Eurozone	620.30 ***	649.29 ***	1190.88 ***	1205.38***
	(11.86)	(12.01)	(11.55)	(11.34)
ICC	3684.54 ***	3563.53 ***	6.66E+03 ***	6771.64***
	(16.31)	(14.98)	(15.39)	(14.73)
ICCxICC Exposure	0.003	0.01	0.01	0.02
	(0.33)	(1.13)	(0.77)	(1.24)
Tier 1	-2.78E-06 ***	-3.74E-06 ***	-5.98E-06 ***	-7.03E-06***
	(-2.69)	(-2.75)	(-2.95)	(-2.78)
RWA	-3.36E-07 ***	-3.07E-07 **	-6.11E-07 ***	-7.36E-07***
	(-3.17)	(-1.95)	(-3.01)	(-2.65)
Non Performing Loans	-2.98E-07	-1.78E-06	-9.51E-07	-1.97E-06
	(-0.11)	(-0.64)	(-0.19)	(-0.41)
R^2	0.66	0.65	0.66	0.65
Adjusted R^2	0.65	0.64	0.66	0.64
F(15. 477)	55.60	53.14	53.90	51.82
p-value	0.00	0.00	0.00	0.00

The relationship between ICC and the CDS spread reveals interesting results. The ICC variable has a positive and significant relationship with the evolution of the CDS spreads. This result shows that investors do take into account the nationality of the bank in their calculation of the spread. The fact of being located

in one of the four countries in crisis is interpreted as an increase of the probability of default of the bank and can be explained by the diminishing capacity of governments of those countries to ensure the potential bailing out of banks in trouble. The fact that investors take care about the nationality of the bank seems to be confirmed by the positive impact of Eurozone on the CASCs: ceteris paribus, a downgrade influences more the spread of a bank if it is in the Eurozone than if it is not. This result is robust whatever the window is. It tends to show that investors worried about the financial stability of Eurozone and the cohesion of banking system in Eurozone.

Concerning the risk of the bank, the Tier 1 variable's coefficient is generally negative and significant. In average, the higher the Tier 1, the more the CDS spread is reduced when a downgrade happens, ceteris paribus. This result is consistent with the recommendations of Basel III capital agreement. Investors tend to reward banks with the highest Tier 1 at the downgrade announcement, as Tier 1 is a source of a bank's financial strength. The RWA is never significant. Such result is interesting in a sense that investors do not react to the RWA and they largely react to Tier 1. The absence of reaction can be interpreted as RWA does not provide enough information to investors. At last, the Non Performing Loans variable does not present a significant influence on the cumulative abnormal CDS spread change.

5.4 Robustness tests

We rerun our main regressions, considering CASC 0,+5 and CASC -5,+5, in order to check the robustness of our results. First, we test the robustness of our results by introducing control variables of macroeconomic stability: the VIX and the CISS. The VIX is the CBOE (Chicago Board Options Exchange) Volatility Index, measuring the market expectations of short-term volatility as they appear in the S&P 500 Index options prices. The VIX reflects the market perception of financial volatility, and can be used as a proxy of macro-financial stability. The CISS is the Composite Indicator of Systematic Stress elaborated by the ECB. Its aim is to measure the systemic stress present on the financial system. Results are given in table 8. The conclusion of this analysis is that our results do not rely on the macroeconomic stability, as showed by the stability of our results.

The, we rerun the model for two sub-samples: depending on the SIFI (Systemically Important Financial Institution, as given by the Financial Stability Board) or not SIFI nature of the banks. The results are quite similar, but some interesting differences appear. First, the tier one is not significant for the SIFI banks, as if investors were sure of the resilience of these banks and do not car about their level of required capital. Second, the role played by Sovereign Disclosure is not significant for non SIFI banks, as if when the risk is important, a strategy of transparency can not reassure investors. Then, we try to see if being or not a bank located in a In Crisis Country (ICC) changes the results, following Delatte et al. (2014). The results are robust. We also regress the model depending in the year of the event. We regress the model for the

2011 event and then for the 2012 and 2013 events. The results are robust, but the Sovereign Disclosure is significant only for the first period: we can assume that the transparency mattered especially at the beginning of the crisis, when investors were worried and when information about exposure were particularly scarce. Moreover, considering the nature of our sample, we estimate the cluster-robust estimator, clustering either by the country of the bank (following for instance Neratina et al, 2014) or by the date of the event (to prevent the problem of event-date clustering, emphasized for instance by Kalori and Pynnönen, 2010). Our results are robust (They are available upon request).

6 Conclusion

The article provides results on the relationship between disclosure and financial market stability. The results tend to outline some interesting results about the impact of disclosure. We can see that a too broad measure of disclosure, too global, has not the expected effect and does not participate to the reduction of CDS spreads. This finding is consistent with a large section of the empirical and theoretical literature which advocate for less disclosure (see Coates 2007 for instance). This phenomenon can be also interpreted by the fact that the macroeconomic situation of each of the participating bank was not as stable as it could have been a couple of years before. The global disclosure may not be rewarded during crisis or when there is an unstable perspective but it will require further research to understand more globally the impact of global disclosure on the CDS market. Although, targeted disclosure, information about sovereign risk do decrease the CDS spreads. As mentioned before the literature around disclosure is dual sided about the impact of disclosure on stability. We see in our results a negative correlation between targeted disclosure, here sovereign disclosure, and the evolution of the CDS spreads compared to the evolution of the CDS index in most of the cases. Targeted disclosure is in fact participating to market stability during a period of unstable macroeconomic environment. The results found here also tend to corroborate the critics emitted during the European sovereign debt crisis. It looks like that being a bank located in the Eurozone tend to significantly increase the volatility of the CDS spreads. The recent crisis has proven that the Eurozone has been weakened due to the crisis and so a bank located in one of the countries: the fact of being located in countries in crisis seems to increase the probability of default for those banks. Those banks are holding a large amount of sovereign debts that were getting closer to default after each downgrade: the risk of default was then transferred from the country to the subsequent bank. The contagious effect found by Arnold (2012) is here verified. Meanwhile, on the other hand the exposure to countries in crisis does not seem to influence positively the CDS volatility. These findings are a key for further researches in two different macroeconomics situations: in a growing macroeconomics situation and in another crisis to corroborate the results. It would also be extremely pertinent to develop some theoretical research on the impact of disclosure and the volatility of CDS spreads, in either stable and unstable environment.

Table 8 : Model estimation including VIX and CISS

The full sample consists of 752 observations in 2011, 2012 and 2013. The dependent variables are the cumulative abnormal spread changes over four different windows. Independent variables definitions are provided in paragraphe 3.3. They are all present in the regressions. The variables VIX and CISS are included to check the robustness of the results. The OLS regressions are based on standard errors adjusted for heteroskedasticity. In parentheses are the t- test values. ***, **,* indicate statistical significativity at the 1%,5% and 10% level respectively.

	CASC 0,+5	**CASC 0,+5**	**CASC -5,+5**	**CASC -5,+5**
Type Of Exposure	**Gross**	**Net**	**Gross**	**Net**
const	-1331.15***	-1376.08***	-2486.21***	-2542.36***
	(-10.41)	(-10.51)	(-10.43)	(-10.71)
Sovereign Disclosure	-279.99***	-300.24***	-553.53***	-559.40***
	(-4.20)	(-4.33)	(-4.40)	(-4.30)
Global Disclosure	1684.35***	1750.62***	3162.77***	3222.53***
	(12.37)	(12.58)	(12.41)	(12.48)
Relative Exposure	4399.68***	4522.08***	7713.44***	7965.36***
	(7.91)	(8.13)	(7.68)	(7.91)
ICC Exposure	-0.07***	-0.07***	-0.12***	-0.13***
	(-7.65)	(-7.50)	(-7.39)	(-7.34)
Downgrade Exposure	0.01***	0.009***	0.02 ***	0.02***
	(5.95)	(5.51)	(5.60)	(5.31)
Short Term Exposure	0.10***	0.06	0.18***	-0.06
	(3.05)	(-0.54)	(2.91)	(-0.72)
Medium Term	0.01	-0.06 *	0.03	0.11*
Exposure	(0.42)	(1.76)	(0.55)	(1.74)
Long Term Exposure	-0.06***	-0.03	-0.11***	-0.03
	(-4.15)	(-1.13)	(-3.83)	(-0.84)

Domestic	690.84 ***	528.68***	1019.71***	863.05***
	(5.26)	(3.456)	(4.42)	(3.04)
Eurozone	582.40***	605.86***	1094.51***	1125.97***
	(10.31)	(10.42)	(10.49)	(10.51)
ICC	3794.50***	3914.81***	6932.73***	7046.84***
	(16.36)	(17.16)	(16.05)	(16.32)
ICCxICC Exposure	0.004	0.003	0.003	0.01
	(0.36)	(0.29)	(0.19)	(0.53)
Tier 1	-1.69E-06	-1.86E-06	-4.04E-06	-3.62e-06
	(-0.88)	(-0.98)	(-1.23)	(-1.51)
RWA	-1.66E-07	-9.82E-08	-1.89E-07	-1.33e-07
	(-0.78)	(-0.46)	(-0.54)	(-0.35)
Non Performing Loans	-8.61E-07	-7.59E-07	-1.44E-06	-1.41e-06
	(-0.34)	(-0.27)	(-0.30)	(-0.27)
VIX	-0.15	-0.17	0.02	-0.01
	(-0.20)	(-0.22)	(0.02)	(-0.008)
CISS	27.41	19.63	89.35	-0.01
	(0.48)	(-0.34)	(0.81)	(0.49)
R^2	0.65	0.63	0.63	0.63
Adjusted R^2	0.64	0.62	0.62	0.61
F(15. 477)	50.80	48.57	45.89	45.20
p-value	0.00	0.00	0.00	0.00

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