

**THE SOVEREIGN CREDIT RATING EFFECT ON
THE PRICE OF BANKS ACROSS THE EURO AREA**

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Resumo

É de conhecimento geral o que aconteceu ao banco de investimento Lehman Brothers, em setembro de 2008, e o impacto financeiro que este evento teve. As consequências deste acontecimento nos Estados Unidos da América fizeram sentir-se globalmente, como foi possível verificar na Europa, onde se viria a originar mais tarde uma crise na dívida soberana.

O impacto da falência do Lehman Brothers e da crise a ela associado – a crise do *subprime* - foi transversal a diversos setores, tendo sido provavelmente o setor bancário o mais afetado. A contribuir para este enfraquecimento do sistema bancário, uma vez instalada a desconfiança por parte dos investidores, foram as agências de notação de crédito e as suas constantes revisões negativas às notas de crédito dadas, tanto à dívida soberana como aos bancos europeus.

Com a investigação levada a cabo nesta tese de mestrado pretende-se perceber o impacto no mercado de ações das instituições financeiras dos países da Zona Euro face aos diferentes anúncios da agência de rating Standard & Poor's na esfera da dívida soberana. Para o efeito, foi adotado um estudo de eventos como metodologia a aplicar.

Segundo os resultados obtidos, não se verifica um impacto negativo mais acentuado, no que diz respeito a *downgrades* e *negative watch outlooks*, nos retornos das instituições bancárias dos países da Zona Euro com maiores pressões financeiras comparativamente aos países com uma economia mais sustentável. Ou seja, o efeito dos anúncios negativos de rating foi transversalmente sentido de forma relativamente semelhante. Comparando *upgrades* e *positive watch outlooks*, apenas o primeiro grupo de países registou impactos positivos estatisticamente significantes, como espectável. Contudo, apenas os mercados das instituições financeiras da Grécia e de Portugal verificaram resultados conclusivos, pelo que podemos afirmar com alguma prudência que o efeito dos ratings no mercado financeiro na Zona Euro apenas regista diferenças significativas entre países no caso dos *upgrades*.

Palavras-chave: Agências de Notação de Crédito, Zona Euro, Sistema Bancário, Estudo de Eventos

Classificação JEL: G24

Abstract

It is well known what happened to the investment bank Lehman Brothers on September 2008 and the financial impact of such event. The consequences it had spread globally, as seen in Europe, where a sovereign debt crisis emerged subsequently.

The impact of the bankruptcy of Lehman Brothers and the related crisis – the subprime crisis - was transversal to different sectors, with the banking sector probably being the most negatively affected. Credit rating agencies were accountable to this impairment of the banking system, given the distrust generated among investors following their constant negative revisions of the credit notes assigned to both sovereign debt and European banks.

With this investigation we aim to understand and assess the impact on the stock price of financial institutions of the Eurozone, in view of the different announcements by rating agency Standard & Poor's to sovereign debt. To that purpose, we adopt an event study as the methodology to be applied.

According to the results obtained, there is no more severe negative impact, regarding downgrades and negative watch outlooks, on the stock price returns of banking institutions of the Eurozone stressed countries compared to those of banks in non-stressed countries. Thus, negative rating announcements were transversely and similarly felt. Comparing upgrades and positive watch outlooks, only the first group of banks showed statistically significant positive impacts, as expected. Nevertheless, only the markets of the financial institutions of Greece and Portugal reveal conclusive results, so we must say with some prudence that differences in the Euro Area financial market appear only in the case of upgrades.

Key words: Credit Rating Agencies, Euro Area, Banking System, Event Study

JEL classification: G24

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Acronyms

AAR	Average Abnormal Return
BES, S.A.	Banco Espírito Santo, S.A.
BPI, S.A.	Banco BPI, S.A.
CAAR	Cumulative Average Abnormal Return
CRA	Credit Rating Agency
EC	European Commission
GDP	Gross Domestic Product
IMF	International Monetary Fund
NHI	Non-High Income
OLS	Ordinary Least Squares
S&P	Standard and Poor's

1. Introduction

The Eurozone debt crisis was a consequence of several disastrous financial events that triggered the worst economic instability in Europe in the recent years. Events such as: (i) The Great Recession (where weak financial sector regulation, lack of scrutiny of investment banks and excessive personal and corporate credits led to a financial collapse); (ii) The bankruptcy of the investment bank Lehman Brothers (and consequent global spread of effects); (iii) Governmental statements such as Greek Government, in 2009, announcing considerably higher levels of indebtedness than the previous government had projected (and speculation that more European countries were in the same situation); (iv) Real estate bubbles by several European countries.

The events previously mentioned help to justify the inability that European countries had, particularly peripheral countries, to finance themselves to meet their financial obligations as well as redeeming a European banking system which was completely discredited.

Given the distrustfulness regarding sovereign debt of European countries by investors, as well as a weakening banking system, the credit rating agencies have made constant negative revisions to credit notes assigned to sovereign debt and, consequently, to European financial institutions.

Several researchers show the influence of sovereign debt rating announcements on corporate stock market returns, specifically downgrades (Dichev and Piotrosky, 2001 or Kräussl, 2003). However, there are only a few studies examining the reactions of the European banking system, specifically the listed Eurozone Banks. Currently some questions still remain: Are the listed Euro Area banks influenced in their daily stock market returns by changes in the sovereign credit rating? If so, what are the types of announcements where this occurs? Are they just downgrades and upgrades, or are credit watch and outlooks also statistically significant? In a country-by-country analysis, are there significant differences between stressed countries and non-stressed countries? Based on the event study methodology and using data from 2000 to 2018, it was possible to observe the abnormal returns of 26 listed Euro Area banks and answer these questions, an outlined objective for this dissertation.

Regarding negative announcements, we conclude that downgrades positively affect the daily stock market returns of financial institutions in countries such as Portugal and Spain. In Italy, on the other hand, there has been a negative impact on the financial market due to downgrades. Given that negative watch announcements are not found to be statistically significant for the

market, the fact is that only stressed countries have shown conclusive results in relation to downgrade news, however it cannot be concluded that they have a greater negative impact on non-stressed countries.

With respect to positive announcements, positive watch announcements are not statistically informative for the financial market. In the case of upgrades, it was possible to observe significant positive results in Portugal and Greece, corroborating the theory that countries with lower ratings are more vulnerable to rating changes (Kaminsky and Schmulker, 2002). It can be concluded that there are indications that the stock market of financial institutions reacts around upgrades rather than around positive watch announcements.

Apart from the introduction, this dissertation is structured as follows. Section 2 reviews the literature on credit ratings, the Eurozone debt crisis and the role of financial institutions in this. Section 3 and Section 4 present the data and describe the methodology used, respectively. Section 5 reports the empirical results observed and their analysis and, finally, Section 6 presents the conclusions.

2. Review of Literature

2.1. What is a Credit Rating Agency?

External auditor, credibility barometer, financial reference. These are expressions that could easily apply to what a rating agency does. However, the description for the role a credit rating agency (CRA) plays is not consensual, not even on behalf of the great leaders of the market. Anyway, it can be assumed, in a very simplistic way and meeting the understanding of the European Commission (2006: 1), that “*Credit Rating Agencies issue opinions on the creditworthiness of a particular issuer or financial instrument. In other words, they assess the likelihood that an issuer will default either on its financial obligations generally (issuer rating) or on a particular debt or fixed income security (instrument rating)*”.

Credit default assessment is the main purpose of CRAs. According to the Cambridge dictionary, credit default occurs whenever you “*fail to do something, such as pay a debt, that you legally have to do*”. By means of this concept, we can conjecture its application to the corporate environment. What the recent economic history taught us is that, regardless of the economic strength of the issuer and even taking into consideration the occasional level of the defaults, all bonds in the market have their associated risk. Such risk may be relevant and it cannot be neglected anyway. Under the assessment of this risk, the related estimates may have to be determined with a certain level of subjectivity. In Figure 1 it is possible to have a global picture of the defaults market.

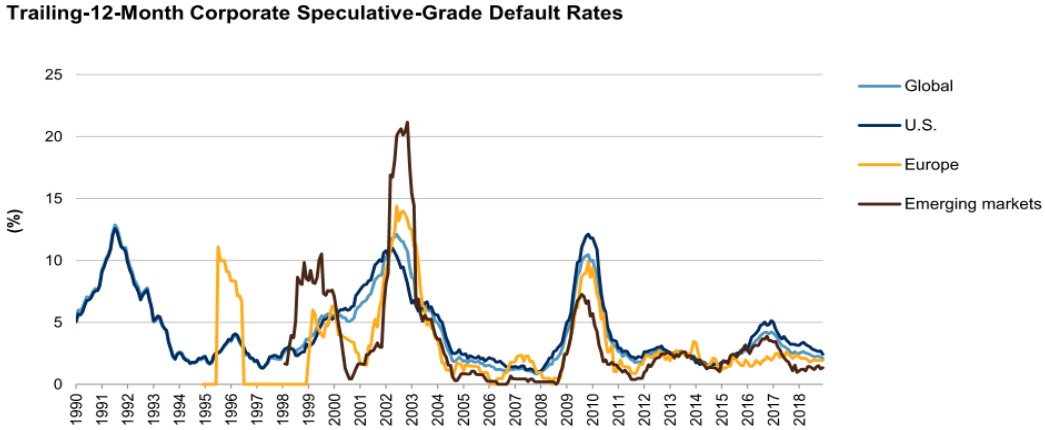


Figure 2.1. – Trailing-12-Month Corporate Speculative-Grade Default Rates

Source: S&P Global Fixed Income Research and S&P Global Market Intelligence’s CreditPro®

Taking into account the time frame encompassed in the previous graph, the cyclical swings of default are perceptible, representing one of the reasons for the large size of the rating agencies'

market. These cyclical oscillations are always associated with major socio-economic events resented on a global scale, for example, at the beginning of the twentieth century, the Internet bubble, which triggered the corporate speculative-grade default rate (global) to nearly 12.0%. Years later, the rate in question achieves again significant values, this time with the outbreak of the financial crisis in 2007-2008. However, the stimulus resulting from the expansionary monetary policies followed by the major central banks, the significant GDP growth in the G-20 countries, as well as the greater sustainability in companies' earnings, the default rate reduced significantly, to values near 2.5% in 2018. Note that, although this percentage only shows results since the 1990s, there has always been a large dimension in the market under analysis, and that's why defaults is considered a prodigious market niche.

Consequently, given the significant percentage of securities classified as default, the CRAs appear with the purpose of trying to recognize which companies are close to achieve a status of default. As Langohr and Langohr (2008: 27) state, "*put bluntly, defaults are the bread and butter of the credit ratings business*".

We are dealing with an industry where there is a clear and assumed oligopoly situation, the main players being Moody's, Fitch and Standard & Poor's (S&P). Nevertheless, there are a considerable number of competitors, near 150, according to White (2010).

For S&P, "*a credit rating is Standard & Poor's opinion of the general creditworthiness of an obligor, or the creditworthiness of an obligor with respect to a particular debt security or other financial obligation, based on relevant risk factors*" (S&P, 2006: 8).

According to Rhee (2015), there are two theories to justify the presence of CRAs in the financial environment. One is the "ameliorate information asymmetry between issuers and investors" and the other is a reduction of costs of regulation. The public nature of the functions performed by the CRAs is indisputable.

However, there are also some caveats regarding CRAs, namely several issues that have left investors and rated companies concerned. One of these concerns is that rating agencies are not as insightful as expected in reacting to changes in credit conditions, sometimes giving a certain credibility to a company that does not correspond to reality. In addition to the forfeit of credibility of the agencies that have occurred in recent years, due to the non-forecasting of default events, another of the observed disadvantages was generalization of opinion about a certain sector of the market, placing in the same brush companies that neither requested the evaluation.

Notwithstanding what has been said previously, CRAs provide a certification of services, where rating have an influence on institutional demand and market liquidity, and suit as triggers for investment decisions and regulatory oversight. Assistance in coordinating investor convictions in hypothetical multiple equilibrium occurrences is another asset of these institutions (Boot et al., 2006).

Thereby, the output provided by risk assessment entities, denoted as CRAs, is synthetically an opinion on credit risk, subject to certain parameters of objectiveness, congruence, comparability, visibility and clarity. Such entities aim to render to the market an unbiased opinion of creditworthiness, based on the principles each defines, allowing investors to compare hypothetical investments.

2.2. How to obtain a Credit Rating

According to Regulation (EC) n.º 1060/2009, Article 3 (1) (a), a rating is deemed to be “*an opinion on the credit quality of an entity, a debt obligation or debt securities, preferred shares or other financial instruments, or of the issuer of such debt obligations, or financial obligations, debt securities, preferred shares or other financial instruments, issued through a classification system established and defined it different rating categories*”. But what is in the genesis of the issuance of these credit ratings?

Ratings issued by the CRAs, are the result of a range of determinants exposed to an exceptionally scrutiny. Such determinants include the business profile, where the competition is verified, core products, number of collaborators, which are the customers, in situations where the object of analysis is a corporate entity. They also include the operating segment of the company and corresponding industrial position. Other determinants are business risks, historical financial performance (calculate margins, growth rates of revenue, etc.), revenues and margins drivers in the past, and the analysis of the balance sheet, the liquidity profile and some financial ratios that may be relevant (Freire, 2015).

Nevertheless, before all these considerations on economic and non-economic indicators, there is an enchainment of events to go through in what is the preparation of the output provided by the CRAs. They go beyond the mere analysis of ratios but which, as we will be able to perceive thereafter, will have equal or greater relevance than these.

On a regular basis, what triggers the existence of a customer-supplier relationship between an organization/country and a rating agency, respectively, is the customer’s intention to issue debt. According to Langohr and Langohr (2008), the interested party establishes contact with a CRA in which it seeks to elucidate incipient concerns such as what the evaluation process will require, how much time is imputed to it, how it will be managed the confidential information and lastly, in what amount, monetarily speaking, the whole process will be converted.

As S&P enunciate, “*proper assessment of debt protection levels requires a broader framework, involving a thorough review of business fundamentals, including judgments about the company’s competitive position and evaluation of management and its strategies*” (S&P, 1998: 4).

The client will have to be mentally aware of the intrusion that will be the whole process, of the time that will have to allocate to the same, since it will be necessary regular meetings with the agency or eventually facility tours.

Although the client may feel a sense of disappointment at not being able to know how the CRA has fulfilled all its analysis in a simple credit note, the issuer will have the opportunity, over time spent with the agency, to understand its perspective towards the area of business, its evaluation and mainly, to detect some signs of adversities that could translate into problems of greater relevance.

Introductorily, the client's cooperation will consist in providing relevant information in reference to the economic-financial performance of the company. This includes the description of what the operations consists of, its outputs, the planned financial projects, as well as the financial statements duly certified of the last years or even the disposal of the company itself in what is the market where it is allocated.

In all this process, strictly private, there is the possibility for the issuer to resort to external cooperation, by electing a third legal personality for its consultant. In most cases, we are talking about investment banks where it is up to them to adviser their client insofar as the latter intends to acquire the most advantageous credibility opinion from CRA, with the purpose of having a more efficient and profitable access to the financial market.

By collaborating as intermediaries in this process, banks will be entrusted a capital influence, considering that this will be the first experience of the client in the troubled financial market. The intermediary will enable a balanced communication between the client and the supplier.

Investment banks have all interest in anticipating, excelling in clarity and accuracy, what may be the opinion, embodied in a letter, conjectured by the CRA for a certain company.

At times, rating agencies make use of their authority by using their contractual relationship with the company in valuation. Intrusive, the agencies understand, at some point in the process, full-fledged to request any kind of information. It should be clarified that, legally and contractually, the issuer is fully fledged to only authorize the disclosure of information at his convenience, and CRA should not encroach on what is not available to them.

Having analyzed the respective responsibilities of two of the three actors in the whole process, it is still necessary to explain what the service provider's point of view is. It is known in advance that, by default, the rating agencies choose to split the labor activity by sectors, not delimiting their employees to perform a particular analysis. The teams of these companies are mentally and intellectually qualified to take responsibility for a diversified number of business areas, although they are eventually allocated to certain clusters of industry sectors, covering all the hostages of the rating agencies incorporated in the same industry (Langohr and Langohr, 2008).

The main agencies of the market stand out, from their competition, by their own line of evaluation, thus guiding themselves by different economic, social and political criteria and indicators.

In the specific case of S&P (Dimitrijevic et al., 2011), in the economic folder, they invoke indicators such as the income pattern, earnings expectations and economic heterogeneity in what is its diagnosis to the economic structure and its development potentials. In fiscal matters, the agency considers relevant the indicators that affect the balance of the statutory obligations and their indebtedness, resorting to existing fiscal agility, long-term fiscal propensities and respective weakness, as well as debt structure and the obtaining of financing.

Finally, S&P takes into account, in a monetary perspective, some factors such as the reliability of the monetary policy in force, the measurement of the progress of the generalized rise in prices, the control of the money supply and the external liquidity circumstances in order to verify the versatility in this matter.

Considering Moody's approach, this one does not have any constraint in disclosing the peculiarities of the factors considered as relevant in a given analysis. Therefore, the issuance of a rating is always based on four segments: economic strength, institutional strength, fiscal strength and, finally, risk susceptibility.

About the first segment, the agency considers relevant some indicators such as the average real GDP growth, the nominal GDP, the GDP per capita, the real GDP growth volatility, the Global Competitiveness Index. In the institutional framework, the US agency considers that the World Bank's Government Effectiveness Index and the World Bank's Corruption Control Index are expressive and relevant coefficients for the balance of this domain, but not only.

Fiscally speaking, there are several indicators considered by this agency, most of whom refer to the interpretation of indebtedness, as are examples of the ratios that tell us the weight of public debt in a country's gross domestic product or which the weight of the public debt in the revenues of the same.

Finally, the last scope of observation that this entity makes a point of expressing is the vulnerability of a hypothetical risk scenario. Within this balance, we can perceive the plurality of risks considered by the agency, ranging from the internal political and geopolitical risk, to the liquidity risk of the government, to the risk of the banking sector (evaluating the solidity of the banking system, as well as its size and weaknesses in its financing), to the extent of the danger of external weaknesses.

Moving forward to the analysis process of the third giant in the oligopoly of the ratings industry, we now analyze Fitch, which is the one that makes possible the more particularized knowledge of its analysis. This agency uses a multiplicity of indicators such as demographic, pedagogical, structural, study of employability, diagnosis of medium-term development constraints, macroeconomic policy, international segmentation, or even state external and political obligations.

Deliberately, in order to provide a clearer and more transparent interpretation to key interested investors, coupled with the need to safeguard confidential knowledge, rating agency evaluations began to materialize in notes, through letters, numbers and arithmetic signals, properly sorted, each one corresponding to a certain classification in the ranking.

These same classifications, following different standards delineated by each agency as well as having different interpretations, depending on the period in question (short or long term), may present modified scales. Typically, in long-term considerations, it is the letter "A" that corresponds to an entity's or a country's greater ability to meet its financial obligations (maximum rating denoted as AAA) or, in occasion of being an investment, corresponds to what it will more likely to be a good financial return for the investor, and as this ability to meet financial obligations or financial return capacity deteriorates. The rating decreases in alphabetical order to "B", "C", or "D", with the latter corresponding to default. Attached to ratings there are rating modifiers shown as a combination of uppercase and lowercase letters, or an addition of digits like "1", "2" and "3" and plus signs " + "Or subtraction" - " (Figure 2).

Ranks			Investment-grade rating (S&P)
S&P (1)	Fitch (2)	Moody's (3)	(4)
AAA	AAA	Aaa	Extremely strong capacity to meet financial commitments - Highest rating.
AA+	AA+	Aa1	Very strong capacity to meet financial commitments.
AA	AA	Aa2	
AA-	AA-	Aa3	
A+	A+	A1	Strong capacity to meet financial commitments, but somewhat more susceptible to adverse economic conditions and changes in
A	A	A2	
A-	A-	A3	
BBB+	BBB+	Baa1	Adequate capacity to meet financial commitments, but more subject to adverse economic situations.
BBB	BBB	Baa2	
BBB-	BBB-	Baa3	
Sub-investment grade bond status (S&P)			
BB+	BB+	Ba1	Less vulnerable in the near-term but faces major ongoing uncertainties and exposures to adverse business, financial and economic situations.
BB	BB	Ba2	
BB-	BB-	Ba3	
B+	B+	B1	More vulnerable to adverse business, financial and economic conditions but currently has the capacity to meet financial commitments.
B	B	B2	
B-	B-	B3	
CCC+	CCC+	Caa1	Currently vulnerable and dependent on favourable business, financial and economic conditions to meet financial commitments.
CCC	CCC	Caa2	
CCC-	CCC-	Caa3	
CC	CC	Ca	Currently highly vulnerable.
A marked shortcoming has materialized			
C	C	C	A bankruptcy petition has been filed or similar action taken but payments or financial commitments are continued .
D	DDD		Payment default on financial commitments .
	DD		
	D		

Table 2.1. – Long-term issue credit rating major scale

Source: Standard & Poor's, 2007, *Standard & Poor's Ratings Definitions*, September 21: 1-93.

2.3. The Sovereign Ratings

According to Langohr and Langohr (2008: 286), “*credit ratings agencies rate the risk that sovereign governments may default on their debt obligations to private creditors, in particular those issued in capital markets*”.

The sovereign ratings are nothing more than, in contrast to what happens to the corporate entities, a concise and solid evaluation regarding the availability of a state entity to comply with the financial requirements assigned in the scope of sovereign debt. These special credit ratings are crucial parameters in weighing the respective development and accessibility to the financial structure of the countries. And what are the reasons for such relevance in government, international financial markets and other economic players?

Beforehand, the interest rates that countries will be subject in relation to their external financing will be the repercussions of a more or less favorable rating, thus materializing, in a simplistic way, in a higher loan cost if the note is less advantageous and by its inverse, a lighter cost of loan if a more prosperous sovereign rating occurs (Afonso, Gomes, and Rother, 2011).

Secondly, sovereign ratings may be negatively constrained, i.e., assigning a credit note to a particular government may prevent the assignment of certain credit notes to designated banks or profit-seeking organizations. Therefore, CRAs are able to limit the access of certain companies from a given country to the global capital markets by issuing the credit note to the country in which those companies are located (Butler and Fauver, 2006).

Relevant, it should take into consideration that some of the clients of the financial markets have some limitations regarding the structuring of their investment portfolio, and this type of investors has, as primary criteria, the credit notes issued on potential investments. If these risk margins are breached, the investor will certainly select for another investment that does not cause any inconvenience to his investment portfolio.

For all the above reasons, we can easily understand the effect that a country's credit score has on the country's cash flows, the amount expended regarding the financing of the state, the stock markets where it is involved, and in the capacity of its business fabric to access financing under suitable conditions.

Since the government body of any country is the largest issuer of debt in international markets, it is understandable the influence and weight of the changes that may exist in the classifications issued by CRAs on the sovereign debt risk of each country (Afonso, 2003). These ratings are issued mostly, if not totally, by the market leaders and mirror the weaknesses in both the public

sector and the private sector.

The truth is that the good standing of the sovereign ratings has been somewhat disturbed, as Alcubilla and del Pozo (2012) have made a point of referring it, raising some reservations regarding "the appropriateness of the methodologies and models used by CRAs, the level of qualification and expertise of CRA's staff, the effectiveness of the monitoring of these ratings and the timing of rating publications ".

Albeit, given such a strong influence of rating agencies in the financial markets, especially on the subject of sovereign ratings, there was a necessity to study the determinants that influenced the whole process of issuing the credit note for a country. Thus, come up, from an early age, throughout the scientific community very conclusive studies on this reality.

Cantor and Packer (1996) found that determinants such as GDP per capita, inflation, GDP growth, foreign debt, economic development, and the history of default are key factors influencing the grade of credit issued by the CRAs, materializing these conclusive results in explanations such as the positive correlation between a higher GDP per capita and higher rating, as well as the inverse, a negative correlation between lower inflation and external debt and a more favorable credit note.

Later on, there were those who went further, reaching new determinants such as the external debt/current account receipts ratio, commercial openness and central government gross debt/total fiscal receipts ratio.

Notwithstanding all the investigations of the previously mentioned research scientists, in which quantitative macroeconomic variables were evidenced, it became clear that some qualitative elements were included in the subsequent investigations, such as the research of Bissoondoyal-Bheenick (2005), in which the investigator came to the conclusion that there were political and social indicators that were not part of the equation and were to some extent important for the explanation of the sovereign ratings.

It was in the wake of this research that new grounds emerged regarding the fact that non-economic factors were definitely pertinent, as Butler and Fauver (2006) testified through their study, which confirms that the inclusion of elements such as public opinion, governance and corruption, as well as the government's control over existing corruption, converted and afterthought as a legal environment index, had a very positive correlation with the opinion of rating agencies, materialized in credit notes, about the countries.

Later, appear investigations in which the comparison between the credit notes issued by CRAs

were the object of study (Hill, Brooks and Faff, 2010), and it was found that among the different rating agencies under analysis there were some discrepancies in the notes issued, there existing a superiority of disagreement in the face of concordance with respect to credit ratings. Considering that the number of occurrences of defaults events obtained by the agencies was different, it was concluded that the agencies gave different percentages of relevance to the different determinants, verifying a heterogeneity among them.

2.3.1. Determinants

Both S&P and its main competitor, Moody's, are keen to engage in a panoply of distinct qualitative factors coupled with a variety of quantitative indicators to be more cohesive in their analysis. But It is common knowledge that there are some factors more critical than others such as GDP per capita on a purchasing power basis, real GDP growth, inflation rate, level of economic development and default history.

From the previously mentioned investigations, the CRAs largely base their analysis on macroeconomic elements but it should be noted that the political and social implications also have their word. Although the agencies do not publicly communicate the attribution of relevance/weight to each determinant in their credit note determination process, it is known that there are elements that, both transversally in all agencies and in the regularity recognized in all processes, are variables with a lot of expression in the ratings, as is the case of GDP per capita, inflation rate performance or default history. However, with a diversified identification of relevant indicators, the following variables are described:

- **Real GDP per capita** – Being one of the most significant macroeconomic indicators, this indicator reflects the average level of income produced by the population and has the capacity to expose the political and financial weaknesses of a state. The greater the expression of this indicator, the greater will be the ability of a country to meet its financial obligations.
- **Volatility in real GDP per capita** – Following the rationale of the indicator described above, the larger the GDP variation (positively speaking), the greater the country's ability to settle the debt contracted, as well as the reverse if the variation its negative.
- **Consumer price index** - This index reflects the general increase in the prices of goods and services available to the population. A higher rate of inflation may denounce some setbacks in a country's financial system.

- **Unemployment rate** - The unemployment rate, calculated by the percentage of unemployed population in the active population, when it obtains a negative change allows the state to moderate the costs with the fiscal benefits in which this one must spend with the unemployed population, as well as contributes to the budget equilibrium, by increasing the taxable amount and consequently decreasing the probability of occurrence of the default event.
- **Default history** - History repeats itself and, in this context, default history becomes important inasmuch as it will be taken into account by rating agencies, if the country has some precedents of non-compliance with its obligations.
- **World Bank governance indicators** – There are six indicators established by The World Bank although only three are transversal to the main rating agencies and they are:
 - **Government Effectiveness Index** – According with the World bank, this index *“captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies.”*
 - **Rule of Law Index** - This indicator shows the behavior of the law state of a given country and how its population interprets it.
 - **Control of Corruption Index** - The determination of the control of corruption is made through the understanding of the influence that the political power exerts in obtaining benefits for private or personal usufruct. The scale varies between - 2.5 and 2.5 points, and the higher the score obtained, greater transparency exists.
- **Current account balance / GDP** – A country's long-term sustainability can be called into question if there is an increase in the current account deficit, which could be a repercussion of population surplus verified on consumption. However, the increase in the deficit may result from continued investment, and we will subsequently achieve sustainable development in the medium term. Thus, depending on the deficit analysis perspective, the variation of the variable in question may be favorable or unfavorable in terms of compliance with the obligations.
- **Official reserves** - The official reserves of a country, usually retained by the central banks of each country, correspond to reserves of gold, negotiable foreign currencies and special drawing rights.

- **Trade balance** - This indicator it is resumed to the difference between the exported products and the imported products. An increase in the production capacity will imply a supplant of exports in the face of imports.
- **Leverage banking** - The bank financial leverage is assessed through the appropriation of a third party's resources in a capital structure of a banking institution, wherefore a positive variation in this indicator will lead to the conclusion that the financial institution will be in a better position to be able to provide support to their country's economic agents, thereby reducing the likelihood of non-compliance with sovereign debt.
- **Net foreign direct investment (FDI) / GDP** - The weight of the difference between foreign direct investment by non-resident economic agents in a particular economy and the investment made by residents in external economies in a country's GDP is just another element considered by the CRAs. It is more interesting to a country obtain greater external investment than observe their own residents investing abroad.

2.3.2. Euro Area, Sovereign Debt Crisis and Financial Institutions

It was in 1999 that a monetary union in Europe began to be built, with the purpose of eliminating the asymmetries that existed between the countries that integrate the European Union. As a result, the Eurozone was born. It was then expected, according to the European Commission, greater price stability, more opportunities for the business sector and its markets, greater economic growth and, above all, greater economic dimension on a worldwide scale.

Because of this integration of financial markets, the non-stressed Euro Area countries were exposed to the stressed Euro Area countries¹. Several obstacles to financial agreements between Eurozone countries were then broken down, allowing peripheral countries¹ convenient access to credit at relatively low interest rates. They benefited from a considerable low risk because the Euro Area included economies such as Germany, where it was expected that they would never let a financial collapse occur. According to Constâncio (2015), the exposure of banks from core to peripheral countries quintupled between 1999 and 2008.

¹ Designation given by Constâncio (2014), which delimits the stressed countries to Cyprus, Greece, Ireland, Italy, Portugal, Slovenia and Spain. Later, Constâncio (2015) refers to stressed countries and non-stressed countries as peripheral and core countries, respectively, without changing the delimitation of countries.

Through this excess financing, especially in stressed countries, a culture of excessive consumption had been generated where, to a certain extent, countries were no longer able to meet their financial obligations.

The consequences are what we already know. Increased sovereign debt of each country, sovereign downgrades actions by CRAs, increased long-term interest rates, greater difficulty for countries in refinancing their debt, loss of investor confidence and political and social instability. The corollary of this whole context was a financial crisis, leading countries such as Greece, Ireland, Portugal or Spain to require financial intervention from the European Central Bank, the IMF, and the European Commission.

There are various interpretations for the causes of this crisis but for Constâncio (2014: 5), “In more recent years, the narrative of seeing it as a banking crisis has gained attention”. In fact, if we look at the whole picture, the financial institutions were at the epicenter of this entire financial disaster, where they still seek to re-establish their credibility indices and restore the profitability rates obtained previously.

Accordingly, it is in this sense that the object of analysis of this study will be the banking sector.

2.5. Overview of Related Research

It is no novelty that sovereign debt announcements have relevant spillover effects on corporations and as well as all the subjects previously discussed, what is not lacking, are researchers to prove them, regardless the dimension of the country's economy or the institution structure under consideration.

Ferri et al. (2001) had the ability to interpret the expressive interdependence between the ratings issued by the agencies on the business fabric and financial institutions of the countries considered as "non-high income (NHI)" and the financial credibility of these countries. This was something not observed with so much relevance in "high income countries".

Following the above explained conclusions, Ferri and Lu (2002) decided to further deepen the approach to the subject of spillover effects on corporations, extending their field of observation to emerging economies and developed economies. The researchers detected a pattern in the comparison between different types of economies, concluding that, in developing economies there was an emphasis on the relevance of sovereign ratings in explaining the ratings, as well as the stock market returns, of the business fabric of the country under observation, a magnitude that was disproportionate relative to what happened in developed economies. The study was also proficient in the sense that it allowed the investigators to verify that this influence of the sovereign ratings in the credit assessments of the companies was even more notorious, when the generality of the income obtained by the companies was expressed in internal market, as well as in companies whose financial credibility is assessed at the same level as the country's rating.

Kaminsky and Schmulker (2002), in the same line of reasoning, with a sample compounded by 16 emerging countries from different continents, decided to examine reactions to emerging market ratings. They have been able to conclude that there is contagion in the equity markets of one country in the face of a change in another country's sovereign credit, although this is only true in times of crisis. However, they did not distinguish between changes in sovereign debt ratings (upgrades/downgrades) and outlooks or credit watch news.

Faff et al. (2004), regarding the type of rating announcement, demonstrated by analyzing stock market returns, during the period from 1 January 1973 to 31 July 2001, that only rating downgrades were statistically significant in their impact.

Williams et al. (2013) restrict the scope of the issue to the banking sector. The conclusion was that the changes in the sovereign ratings were also highlighted to the changes on the ratings of

financial institutions in growing markets. Apart from the conclusions reached by the investigators previously mentioned, they found that all banks whose rating correspond to the same rating assigned to their country's sovereign debt were more vulnerable to the possible variations in the sovereign rating compared to banks that were rated lower than the sovereign.

De Bruyckere et al. (2013), through an investigation to the hypothetical contagion between banks and sovereign default risk in Europe, between 2007-2012, found a positive correlation between the two variables. They stated that banks with unbalanced financing structure, less traditional banking activities, and scarcity of capital reserves were more vulnerable to spillover effects.

Drago and Gallo (2017), regarding the impact of sovereign rating changes on European banks, concluded that downgrades do have an impact on the regulatory capital ratio, profitability, liquidity and lending supply of financial institutions. On the other hand, the upgrades did not register statistically significant results.

In a recent study, Tahmoorespour et al. (2018), decided to study the impact of sovereign ratings news (upgrades, downgrades and changes in credit watch and/or outlook) on G7 banking industry. They concluded that, around downgrade news (rating downgrade, outlook downgrade and negative watch), the market reacts more aggressively compared to upgrade news, which had a more subdued reaction. Regarding positive watch announcements news (positive credit watch and/or outlook), only two countries, Canada and Italy, had statistically significant reactions.

Considering all the studies cited so far, as well as the conclusions resulting from them, to our knowledge, there is no specific research that compare the reaction of the listed Euro Area banks from stressed countries and non-stressed countries to sovereign rating news, in order to realize if there is an anticipation of the event, an immediate reaction or later consequences in stock market returns.

Primarily, it is expected a faster reaction to the negative rating events from stressed countries to non-stressed countries. Negative significant abnormal returns are expected for the days before/after downgrade news for peripheral countries. Therefore, the following hypothesis was defined.

H1: Banks in stressed countries reveal more abnormal returns following sovereign rating downgrades announcements compared to banks in non-stressed countries.

Second, significant positive stock market reactions are expected to occur when there is an

upgrade. However, the same is not expected for positive outlooks and credit watch news and, in this sense, the following hypothesis is established.

H2: No significant abnormal returns are found around positive watch announcements, but significant positive abnormal returns exist around upgrades.

3. Data

For the purposes of this study, it was necessary to collect data from 11 European countries which have adopted the same currency and are therefore part of the so-called Eurozone. The countries analyzed were carefully chosen with the purpose of having a variety of socio-economic conditions, thus including in the database countries such as Greece, Ireland, Italy, Portugal and Spain, in contrast to countries such as Austria, Belgium, Finland, France, Germany and Netherlands.

Regarding the stock market data, this was defined through the daily adjusted closing price value of 3 financial sector companies belonging to the stock market indices of each of the aforementioned countries. However, it was not always possible to obtain data from three banks, either because there are only one or two banks in the country index or lack of data (see appendix 1.). The analysis occurs from 1 January 2000 to 31 December 2018.

In respect of the market variable and remembering the diversity of assets that it must represent (Fama and French, 1992), it was decided to use, for each country, the respective stock market index (see appendix 2.). It was also examined from 1 January 2000 to 31 December 2018.

In relation to the rating announcements, the observed period was the same as considered by the stock market data. It should be noted that whenever a country has been excluded from an analysis, it is because the announcement under study, as in the case of the Belgium and Germany, has not taken place in the observation period.

Note that were solely considered S&P's rating announcements, since as Gande and Parsley (2005) and Reisen and Maltzan (1999) consider, it contains the most reliable data.

Data related to the ratings announcements were collected from Bloomberg, while Thomson Reuters Data Stream was the source for stock market returns information. It should be noted that for Greece, it was only possible to extract data from 1 January 2001, as it only integrated the Eurozone on that date and from 29 June to 3 August 2015 had its stock market closed.

3.1. Rating disclosure

According to table 3.1, S&P has recorded a total of 90 announcements of different rating categories from the beginning of 2000 until the end of 2018.

	2000-2007	2008-2018	Total
Downgrade	1	21	22
Negative Outlook/Watches	3	36	39
Upgrade	3	8	11
Positive Outlook/Watches	2	16	18
Total	9	81	90

Table 3.1. – Total of Rating Announcements by Category and by Period
Source: Bloomberg

In the period from 2008 to 2018, there were a higher number of announcements (81) compared to the previous period (9), mainly because it covers the euro debt crisis. Regarding the categories, the registration of downgrades (22) over upgrades (11) is also quite distinct, as well as the negative outlooks/watches (39), which presents a supremacy over the other types of announcements.

In the face of these announcements, companies tend to react (see Appendix 3.). In the period of 2000-2007, regarding upgrade news², only 0.14% and 0.03% of the number of firm actions were recorded, which reacted in the same direction as the sovereign change, in the time window of [0-1] and [2-3] days, respectively, after the day of the announcement.

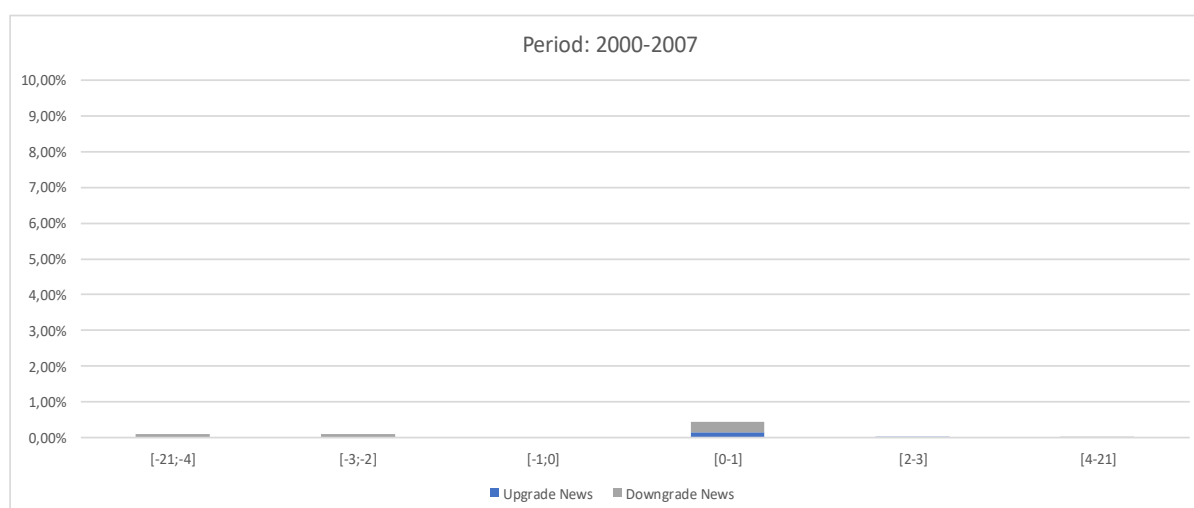


Figure 3.1. – Reaction of Companies Ratings (in days and in same direction of sovereign actions) to Upgrade/Downgrade News between 2000-2007.

Source: Bloomberg

² Upgrade news include upgrade ratings and positive watch announcements (credit watch or outlooks)

Concerning to corporate reactions in the same direction as downgrade news³, the reaction of companies was faster, verifying, for example, in the period of [0-1] days after the announcement, a record of 0.30 % of number of firm actions. However, the existing discrepancy is not significant.

For the period from 2008 to 2018, compared to Figure 3.1, a closer reaction of the corporate ratings to both positive and negative sovereign rating changes is visible.

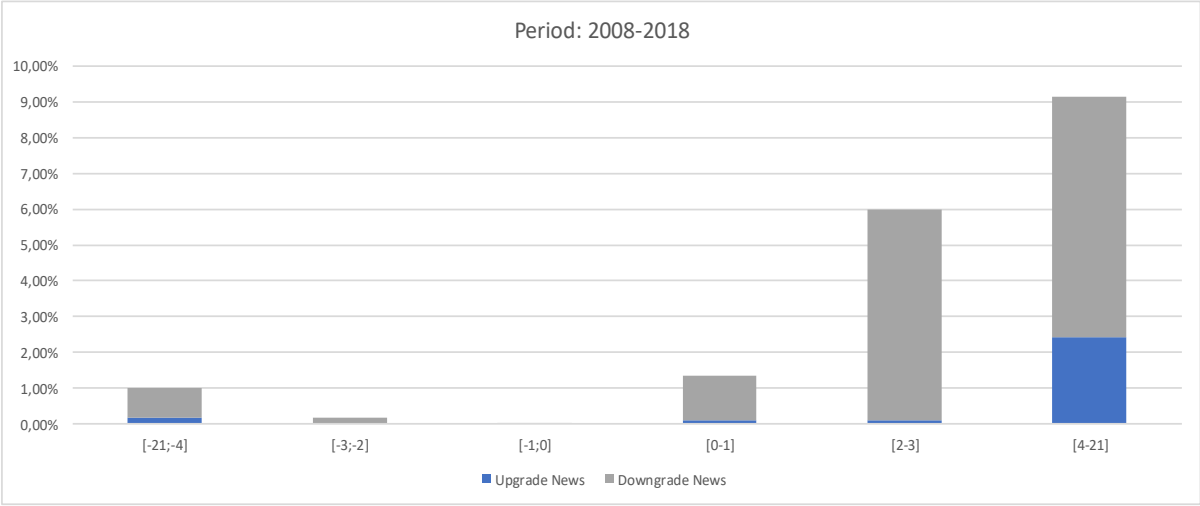


Figure 3.2. – Reaction of Companies Ratings (in days and in same direction of sovereign actions) to Upgrade/Downgrade News between 2008-2018.

Source: Bloomberg

The percentage of companies that saw their ratings decline at the expense of downgrade news reached 1.24%, 5.89% and 6.73% in the time windows of [0-1], [2-3] and [4-21] days after the announcement, respectively, and the percentage of companies that saw their rating improve after upgrade news in the same time periods only reached the following percentages: 0.10%, 0.10% and 2.42%. The difference may be justified by the earlier demonstrated activity of negative sovereign actions, but it does not justify the whole fact. Companies tend to have a substantially immediate reaction to negative sovereign actions than positive sovereign actions.

³ Upgrade news include upgrade ratings and positive watch announcements (credit watch or outlooks)

3.2. Stock Exchange Returns

This table shows what was the appreciation or depreciation of the index of each country during the period from 2000 to 2007, in contrast to what happened in the period from 2008 to 2018, and finally, an aggregation of both periods.

	2000-2007	2008-2018	2000-2018
Austria	276,77	-39,17	237,6
Belgium	23,56	-22,62	0,94
Finland	-6,6	22,43	15,83
France	-5,78	-15,74	-21,52
Germany	15,94	32,83	48,77
Greece	-6,92	-88,22	-95,14
Ireland	38,53	-21,2	17,33
Italy	-9,51	-51,82	-61,33
Netherlands	-23,19	-4,29	-27,48
Portugal	8,85	-63,3	-54,45
Spain	30,42	-43,08	-12,66

Table 3.2. – Country Index Value Appreciation (in %) by Period.

Source: Bloomberg

Again, this table emphasize the different reality between the periods in question. Over the period from 2000 to 2007, most of the indices appreciated, such as Belgium, Germany, Ireland, Portugal and Spain, which gained 23.56%, 15.94%, 38.53%, 8.85% and 30.42%, respectively. Mention should be made to the excellent performance of the Austrian index over this period, with an appreciation of 276.77%.

By contrast, as regards to the period from 2008 to 2018, the few exceptions that did not depreciate their index were rare, being the only ones Finland and Germany (+22.43% and +32.83%, respectively). Greece was the country with the largest devaluation, reaching a percentage of - 88.22%. The euro debt crisis in mid-2008 was devastating to the markets of Euro Area countries and its effect is particularly noticeable by the table in question.

In a global analysis of both periods, it is evident that the countries that obtained the best results were the ones that actually had some margin of comfort resulting from the first period, highlighting Austria (+237.60%), Germany (+48.77%) and Finland (+15.83%).

4. Methodology

4.1. Event Study

As Campbell, Lo and MacKinley (1996) said, “the usefulness of such a study comes from the fact that, given rationality in the marketplace, the effect of an event will be reflected immediately in asset prices.”. According to the existing literature, there is no better methodology to apply than a study of events when the purpose is to draw conclusions about possible financial market reactions to sovereign ratings news. Thus, in this dissertation, and according to Campbell, Lo and Mackinley’s structure (1996), sovereign ratings news was defined as the event while the implications of these news will be analyzed within the scope of stock market returns of Euro Area banks.

According to the aforementioned authors, after identifying the event to be analyzed, it is necessary to define a time window of the event, where this period will include the stocks returns that are important to study.

The events of interest were not only upgrades and downgrades, but also outlooks and credit watch news were included. As Afonso, Furceri and Gomes (2012) defined, the rating event under review will always be set to day zero.

The event window was defined based on the principle that it was possible to observe the temporal dimension of banks' reaction to sovereign rating news, i.e., it was sought to understand if the market (of financial institutions) foresees these events in any way and note anticipation reactions, or, conversely, considers them completely unexpected, and has a momentary or long-term reaction. Given this, different events windows were defined.

Regarding the calculation of returns, the methodology used was logarithmic returns, since the difference between these and arithmetic returns, according to Thompson (1988), did not present considerable differences in event studies.

Therefore, in order to proceed to any kind of analysis, it is necessary to obtain the abnormal returns. Abnormal returns can be determined as

$$AR_{it} = R_{it} - E[R_{it}|X_t] \quad (1)$$

where AR_{it} is the abnormal return of each individual bank i at time t , R_{it} is the actual observe return of each individual bank i at time t , $E[R_{it}]$ is the expected return of each individual bank i at time t , and X_t are the limiting variables for the normal performance model.

Once it was necessary to measure the normal (expected) returns, it was understood that the most correct approach, which is the one most used and with the most coherent results by the researchers (Armitage, 1995; Campbell, Cowan, and Salotti, 2010; Brown and Warner, 1985), would be to use the market model where R_{it} is the market return.

Therefore, the market model for compute the normal return of a given stock i on day t can be defined as

$$\begin{aligned} R_{it} &= \alpha_i + \beta_i R_{mt} + \epsilon_{it} \\ E[\epsilon_{it}] &= 0 \quad v[\epsilon_{it}] = \sigma_{\epsilon_i}^2 \end{aligned} \quad (2)$$

where R_{it} is the period- t expected return, with α_i and β_i to be considered the market model parameters, R_{mt} is the return obtained by the market index in which the stock is integrated and ϵ_{it} the expected zero-mean disturbance term, with the variance defined through

$$\sigma_{\epsilon_i}^2 = \frac{1}{L-2} \sum_{\tau=\tau_1}^{\tau_2} (R_{it} - \alpha_i - \beta_i R_{mt})^2 \quad (3)$$

where τ_1 and τ_2 represent the minimum and maximum of the estimated period, respectively, while L refers to the estimated period as a whole.

For the purpose of estimating the market model parameters (α and β), it is necessary to establish an estimation window. Again, the literature is not in harmony, and some have used an estimation window of 24 months (Fama et al, 1969) or an interval of 140 trading days prior to the event (Mikkelson and Partsch, 1986). In this dissertation, the market model parameters will be estimated from 15 to 100 trading days prior to the event, never including dates under analysis. Note that, in case of event windows from different event of interests colliding, these announcements were excluded from analysis to remove biases in the results.

With α and β properly calculated, we are in position to realize whether the market generates expected returns in face of the event of interest.

Considering $AR_{i\tau}$ as the sample of abnormal returns of each individual bank i for period τ , and using the market model for the calculation of expected returns, abnormal returns are defined as

$$AR_{i\tau} = R_{i\tau} - \hat{R}_{i\tau} \quad (4)$$

whereby

$$\hat{R}_{i\tau} = \hat{\alpha}_i + \hat{\beta}_i R_{mt} \quad (5)$$

whose $\hat{\alpha}_i$ and $\hat{\beta}_i$ are estimates of α and β for each individual bank i , by resorting to Ordinary Least Squares (OLS).

In terms of variance of abnormal returns, this is defined as

$$var(AR_{i\tau}) = \hat{\sigma}_{\epsilon_i}^{*2}. \quad (6)$$

In event study, the formulation of hypotheses is always assumed as a premise for statistical tests, where the null hypothesis corresponds to the non-observation of impacts on returns in the face of events of interest, meaning in this case that the announcement of a rating change, has no impact on the returns of the banks under review. If the null hypothesis is rejected on any statistical test, then we have a situation where the event has a significant impact on stock market returns in the event window.

According to the methodology presented by Campbell, Lo and MacKinley (1996), the distribution inherent to the null hypothesis is then

$$AR_{i\tau} \sim N[0, var(AR_{i\tau})].$$

There are external factors to the event of interest that may justify non-normality of daily returns, and it is in this sense that an average of abnormal returns is useful by eliminating unrelated variables (de Jong, 2007). It is also known that the larger the number of stock markets included in the sample, the more common the abnormal returns tended to be (Brown and Warner, 1985).

Therefore, in order to have statistically more robust results, since an individual analysis of each bank's abnormal returns may lead to misinterpretations, results was initially aggregated across stock markets (Average Abnormal Return) and then aggregated by time according to the analyzed event windows (Cumulative Average Abnormal Return).

4.1.1. Average Abnormal Returns

The Average Abnormal Return (AAR) is the average, in the study concerned, of all bank stock market returns observed over a given period, being a country-by-country analysis, i.e., only stock returns from banks of the same countries.

Considering AAR_τ as the average abnormal return observed in period τ ,

$$AAR_\tau = \frac{1}{N} \sum_{i=1}^N AR_{i\tau} \quad (7)$$

where N refers to the number of stock markets (banks) considered.

Thus, according to previously cited authors⁴, the variance as well as the inherent distribution of the null hypothesis are defined as

$$var(AAR_\tau) = \frac{1}{N^2} \sum_{i=1}^N var(AR_{i\tau}) \quad (8)$$

and

$$AAR_\tau \sim N[0, var(AAR_\tau)],$$

respectively.

4.1.2. Cumulative Average Abnormal Returns

Consequently, after obtaining the AAR of the different banks of a given country for different periods, these were aggregated by time taking into account the event windows under analysis, obtaining the Cumulative Average Abnormal Returns (CAAR).

Assuming $CAAR(\tau_3, \tau_4)$ as the cumulative average abnormal return observed in the event window (τ_3, τ_4) , we get the following definition

$$CAAR(\tau_3, \tau_4) = \sum_{\tau=\tau_3}^{\tau_4} AAR_{i\tau}. \quad (9)$$

Again, and according to the methodology of the authors⁴ cited above, the variance and distribution inherent to the null hypothesis of $CAAR(\tau_3, \tau_4)$ is defined as

$$var(CAAR(\tau_3, \tau_4)) = \sum_{\tau=\tau_3}^{\tau_4} var(AAR_{i\tau}) \quad (10)$$

and

$$CAAR(\tau_3, \tau_4) \sim N[0, var(CAAR(\tau_3, \tau_4))],$$

respectively.

⁴ Campbell, Lo and MacKinley (1996)

However, all these data become analytically useless without a statistical test that lays them to the proof.

What really matters is to understand if the hypothesis defined as null are effectively rejected, that is, if the value of the test value is in the rejection region, in order to confirm the theories discussed. The rejection region is where the values allow rejecting the null hypothesis and obtaining statistically significant results, where the values are properly tabulated and associated with a certain significance level. Typically, the significance level used in most research studies vary from 0.01 to 0.10, although the most common are 0.01 and 0.05.

In the present study, it is necessary to bear in mind that were not observed the same number of events of interest, as well as the same number of banking institutions, in all countries, so the significance level was analyzed country by country.

Thereby, given the contextualization, and since the null hypothesis defined were as follows

$$\begin{cases} H_0: AAR_{\tau} = 0 \\ H_0: CAAR(\tau_3, \tau_4) = 0 \end{cases} \quad (11)$$

they can be tested through

$$\theta_1 = \frac{AAR_{\tau}}{\sqrt{var(AAR_{\tau})}} \quad (12)$$

and

$$\theta_2 = \frac{CAAR(\tau_3, \tau_4)}{\sqrt{var(CAAR(\tau_3, \tau_4))}}, \quad (13)$$

respectively.

5. Empiric Results

By applying the methodology described above to the collected data, the empirical findings on the investigation are as follows on section 5.1. and 5.2.. At an early stage, the reaction time and stock market returns of different banks, in different countries, will be tested around downgrade news (H1). Subsequently, considering the same assumptions of the first hypothesis, we will analyze the impacts of upgrade news on listed Euro Area banks in different countries (H2).

5.1. Stressed countries VS Non-stressed countries (Downgrade News)

Restricting the scope of downgrade news to banking the banking sector, there are already some studies (e.g., De Bruyckere et al., 2013; Williams et al., 2013) on the impact of negative sovereign ratings changes (without distinction between the type of announcement) over stock market returns, as well as to the greater exposure by the most financially vulnerable banks to these impacts.

In this regard, it seems appropriate to perform an analysis of the temporal reaction and impacts of both downgrade ratings and negative credit watch or outlook announcements on the stock market returns of listed Euro Area banks, preparing a country- by-country analysis.

Looking at table 5.1, we only have a statistically significant result, which corresponds to the case of Italy obtaining positive abnormal returns on day -1 – the day before the event. As downgrades are expected to lead to a negative reaction in the market, a potential explanation may be that the market already anticipated the downgrade. This means that in the pre-announcement phase, the most representative securities (from banking sector) were less affected than less liquid securities in the market, since after the downgrade announcement is confirmed, the abnormal returns are no longer detected.

		DOWNGRADE			NEG. WATCH ANNOUCEMENTS		
		Trading Day			Trading Day		
		-1	0	1	-1	0	1
Austria	AAR	3,00%	-1,95%	0,43%	3,66%	5,52%	0,91%
	t-test	1,64	-1,07	0,24	1,99	3,00	0,50
Finland	AAR	-0,48%	0,63%	-0,09%	3,48%	2,67%	-1,34%
	t-test	-1,17	1,53	-0,21	2,69	2,06	-1,04
France	AAR	3,12%	1,29%	-0,22%	3,97%	1,46%	-0,13%
	t-test	1,14	0,47	-0,08	2,87**	1,06	-0,09
Germany	AAR	NA	NA	NA	4,90%	-2,71%	0,63%
	t-test	NA	NA	NA	2,25	-1,24	0,29
Greece	AAR	-3,04%	-0,03%	-0,16%	1,14%	-1,67%	-1,63%
	t-test	-1,71	-0,01	-0,09	1,01	-1,48	-1,45
Ireland	AAR	-5,04%	0,63%	1,32%	0,27%	6,34%	-1,24%
	t-test	-1,66	0,21	0,43	0,10	2,34	-0,46
Italy	AAR	2,24%	1,08%	-0,16%	-2,84%	1,49%	-0,57%
	t-test	2,82**	1,36	-0,20	-4,07***	2,14**	-0,82
Portugal	AAR	0,83%	-0,73%	4,04%	-0,16%	-0,19%	1,35%
	t-test	0,39	-0,34	1,88	-0,20	-0,25	1,75
Spain	AAR	0,43%	0,28%	0,03%	-0,55%	0,13%	-1,10%
	t-test	1,15	0,76	0,08	-0,60	0,14	-1,21

NA represents the analyzes that were not allowed to be obtained due to non occurrence of the event study in question. *, ** and *** denote statistically significance at the 10%, 5% and 1% levels, respectively.

Table 5.1. – Average Abnormal Returns of downgrade news and respective t-test value by country.

Concerning to negative watch announcements, French banks also obtain on the day before the event occurs significant positive abnormal returns, and the possible justification may be the same as the previously stated. For such announcements, Italy registers significant abnormal returns, but this time, the day before the event occurs, a significant abnormal return of -4.07 is observed, indicating that banks studied in Italy anticipated the announcements and reacted negatively to them (see figure 5.1).

However, on day 0 – the day the event occurs – Italian financial institutions recomposed, achieving a positive significant abnormal return, as Tahmoorespour et al. (2018) had concluded. Although the results are not as conclusive as expected, Italy and France corroborate the theory of Norden and Weber (2004), according to which stock markets anticipate rating announcements, although in this case some of the results were counter-intuitive.

Despite these initial conclusions, the truth is that the event window analyzed is too small for more robust conclusions. In this sense, the cumulative average abnormal returns were used, defining three event windows, as can be seen from table 5.2.

		DOWNGRADE			NEG. WATCH ANNOUCEMENTS		
		Trading Day			Trading Day		
		[-15;15]	[-15;0]	[0;15]	[-15;15]	[-15;0]	[0;15]
Austria	CAAR	22,19%	4,22%	20,97%	19,12%	13,37%	11,27%
	t-test	2,18	0,42	2,06	1,87	1,31	1,10
Finland	CAAR	2,14%	1,55%	1,22%	12,11%	9,44%	5,33%
	t-test	0,93	0,94	0,74	1,68	1,82	1,03
France	CAAR	11,55%	-4,10%	16,94%	-1,92%	0,34%	-0,79%
	t-test	0,76	-0,38	1,55	-0,25	0,06	-0,14
Germany	CAAR	NA	NA	NA	15,00%	6,47%	5,81%
	t-test	NA	NA	NA	1,23	0,74	0,67
Greece	CAAR	10,73%	-1,48%	12,19%	-2,96%	0,19%	-4,82%
	t-test	1,09	-0,21	1,72	-0,47	0,04	-1,07
Ireland	CAAR	-7,96%	-15,57%	8,25%	6,32%	9,26%	3,40%
	t-test	-0,47	-1,28	0,68	0,42	0,86	0,31
Italy	CAAR	-9,61%	-12,60%	4,07%	-4,79%	-3,97%	0,67%
	t-test	-2,18*	-3,97**	1,28	-1,23	-1,42	0,24
Portugal	CAAR	43,12%	24,97%	17,43%	-2,50%	-5,77%	3,08%
	t-test	3,59*	2,90	2,02	-0,58	-1,87	1,00
Spain	CAAR	6,52%	2,04%	4,76%	-1,85%	-0,41%	-1,31%
	t-test	3,17**	1,38	3,22**	-0,37	-0,11	-0,36

NA represents the analyzes that were not allowed to be obtained due to non occurrence of the event study in question. *, ** and *** denote statistically significance at the 10%, 5% and 1% levels, respectively.

Table 5.2. – Cum. Average Abnormal Returns of downgrade news and respective t-test value by country.

After analyzing the defined event windows, Italy again rejects the null hypothesis of no effects in the event windows of [-15;15] and [-15;0], emerging with significant negative cumulative average abnormal returns regarding downgrades (see figure 5.1). It is concluded that Italian financial institutions react in advance to downgrades announcements, strengthening the theory of Hite and Warga (1997), who find anticipation of S&P's downgrades in the corporate bond market.

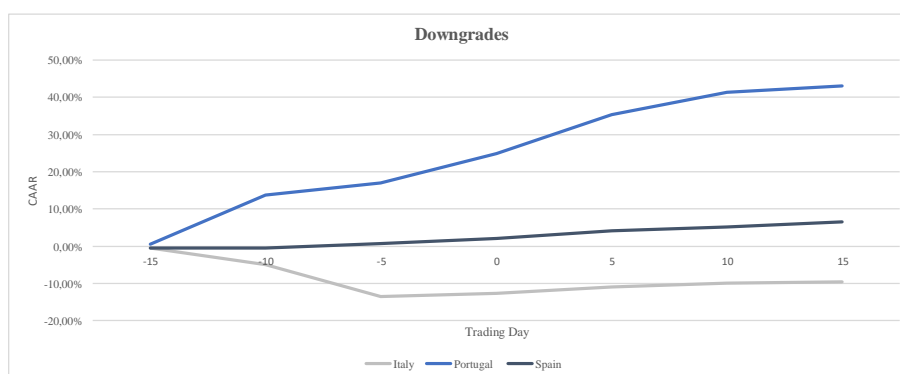


Figure 5.1. – Cum. Average Abnormal Returns of Italy, Portugal and Spain for downgrade ratings.

Regarding the other statistically significant results, Portuguese banks obtain an unexpected trend, as they record positive cumulative abnormal average returns in the event window [-15;15].

One possible justification is that since it was only possible to analyze data from one event of interest (13/01/2012), as event windows from other dates interspersed with other announcements and considering them, we could be getting biased conclusions. Secondly, some data used was from banks which are not currently part of the PSI 20 but which at the time were part of the index (BES, S.A. and BPI S.A.), and had been subject to financial adjustments, namely BPI, S.A., with state support, which allowed a reinforcement of capital and liquidity in the banks that could justify the uptrend verified in the figure 5.1.

In the case of Spain, and even though it was in financial stress on the observed dates, banks seemed relentless about downgrades, having recorded significant positive cumulative abnormal returns in the event windows of [-15;15] and [0;15]. These results contradict all investigations in which the conclusions were that downgrades have significant negative impact on stock returns (e.g., Dichev and Piotrosky, 2001).

It should be noted that Portugal and Spain, obtained very few eligible announcements for analysis given the established methodology, in order not to achieve biased results. Thereby, this may also explain part of these results.

The analysis of cumulative average abnormal returns did not allow any conclusion to be drawn regarding negative watch announcements as a result of no statistically significant result.

In the general context, and looking to the hypothesis defined, despite observing statistically significant results, mostly in stressed countries, the results obtained do not allow us to reject the

null hypothesis, i.e., to draw any conclusions about a greater negative influence of downgrade news in stressed countries compared to non-stressed countries, by virtue of there is no clear pattern in the results.

5.2. Upgrades News by Type

As a result of the analysis of downgrade news, it also seemed pertinent to analyze the existence of any contagion in the stock market returns of the listed Euro Area banks around rating positive announcements.

Some studies have focused on upgrade ratings, but the conclusions obtained have not been homogeneous. This is the case of Ferreira and Gama (2007) or Drago and Gallo (2017), who did not have substantial effects on the impact of upgrades ratings on the financial market, opposing to Tahmoorespour, et. al (2018), where they found positive abnormal returns around upgrade ratings as well as positive watch announcements, in an analysis to G7 countries.

Following this, we decided to measure the impact of upgrades news on Eurozone banking institutions.

		UPGRADE			POS. WATCH ANNOUNCEMENTS		
		Trading Day			Trading Day		
		-1	0	1	-1	0	1
Belgium	AAR (%)	NA	NA	NA	6,78%	1,30%	0,77%
	t-test	NA	NA	NA	2,19	0,42	0,25
Finland	AAR (%)	-0,77%	0,58%	0,07%	2,62%	1,90%	-0,69%
	t-test	-0,68	0,52	0,06	2,06	1,49	-0,54
Germany	AAR (%)	NA	NA	NA	3,39%	3,74%	-0,83%
	t-test	NA	NA	NA	1,60	1,77	-0,39
Greece	AAR (%)	-0,20%	-1,68%	2,33%	-0,04%	0,11%	-0,63%
	t-test	-0,06	-0,48	0,67	-0,05	0,13	-0,76
Ireland	AAR (%)	3,06%	-0,92%	1,43%	1,71%	0,63%	2,40%
	t-test	1,30	-0,39	0,61	1,06	0,39	1,48
Italy	AAR (%)	NA	NA	NA	-1,40%	0,07%	-0,56%
	t-test	NA	NA	NA	-2,04	0,11	-0,81
Portugal	AAR (%)	-0,62%	-1,75%	2,98%	-0,35%	0,30%	0,11%
	t-test	-0,81	-2,29	3,88***	-0,35	0,31	0,11
Spain	AAR (%)	-0,38%	-0,06%	0,11%	-0,04%	0,06%	-0,30%
	t-test	-0,70	-0,10	0,20	-0,13	0,16	-0,85

NA represents the analyzes that were not allowed to be obtained due to non occurrence of the event study in question. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Table 5.3. – Average Abnormal Returns of upgrade news and respective t-test value by country.

Consequently, and considering the results obtained in table 5.3., there was only one Eurozone country where the significant positive average abnormal return was recorded for the upgrade ratings: Portugal. Portuguese banks, on the day following the upgrades ratings – day 1 – reacted positively, thus leading to the rejection of H_0 , which means a significant impact of such events on the stock market returns.

Despite Portugal recorded on the day of the event – day 0 – a negative average abnormal return, the same is not statistically significant so we cannot draw conclusions about such result. As for positive watch announcements, no significant result was found that could be conclusive.

In order to perceive the market reaction in a longer time window, cumulative average abnormal returns were again used, defining the same three event windows, as shown in table 5.4..

		UPGRADE			POS. WATCH ANNOUNCEMENTS		
		Trading Day			Trading Day		
		[-15;15]	[-15;0]	[0;15]	[-15;15]	[-15;0]	[0;15]
Belgium	CAAR (%)	NA	NA	NA	32,04%	1,06%	32,28%
	t-test	NA	NA	NA	1,86	0,09	2,61
Finland	CAAR (%)	-4,11%	-1,80%	-1,73%	8,21%	3,45%	6,66%
	t-test	-0,66	-0,40	-0,38	1,16	0,68	1,31
Germany	CAAR (%)	NA	NA	NA	11,01%	-0,40%	15,15%
	t-test	NA	NA	NA	0,93	-0,05	1,79
Greece	CAAR (%)	66,63%	26,28%	38,66%	-2,63%	0,89%	-3,41%
	t-test	3,44**	1,89	2,78**	-0,58	0,27	-1,04
Ireland	CAAR (%)	4,27%	4,00%	-0,65%	-13,07%	-10,85%	-1,59%
	t-test	0,33	0,42	-0,07	-1,45	-1,67	-0,24
Italy	CAAR (%)	NA	NA	NA	2,08%	-0,52%	2,67%
	t-test	NA	NA	NA	0,55	-0,19	0,97
Portugal	CAAR (%)	-1,83%	-5,96%	2,37%	2,67%	-2,98%	5,95%
	t-test	-0,43	-1,94	0,77	0,49	-0,75	1,51
Spain	CAAR (%)	-4,90%	-3,40%	-1,56%	-1,01%	-0,63%	-0,32%
	t-test	-1,61	-1,56	-0,71	-0,51	-0,44	-0,23

NA represents the analyzes that were not allowed to be obtained due to non occurrence of the event study in question. *, ** and *** denote statistically significance at the 10%, 5% and 1% levels, respectively.

Table 5.4. – Cum. Average Abnormal Returns of upgrade news and respective t-test value by country.

Assimilating the above results, we realize that of all Euro Area countries analyzed, only Greece obtained cumulative average abnormal returns to reject H_0 and conclude that there are indeed significant positive abnormal returns around upgrades rather than around positive watch announcements.

For a more detailed analysis of the cumulative average abnormal returns obtained by Greece and Portugal against upgrades ratings, see Figure 5.2..

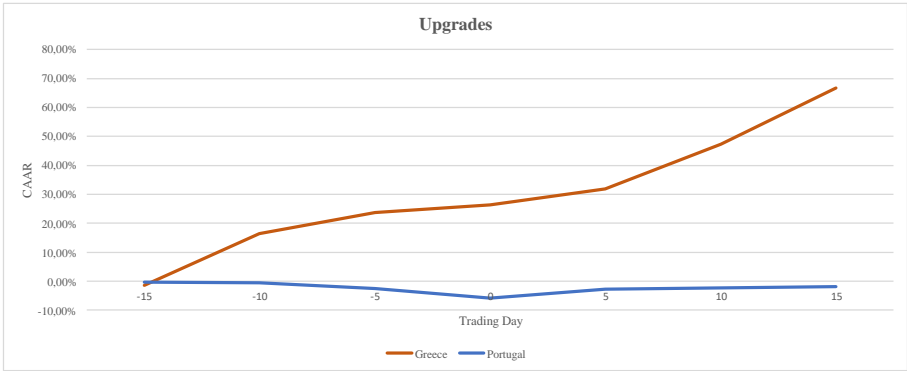


Figure 5.2. – Cum. Average Abnormal Returns of Greece and Portugal for upgrade ratings.

We realize that in the Greek case, there is an uptrend clairvoyant regarding this type of announcements. There is a stronger reaction after the event, with the market rising 38.66% ([0;15]), which indicates a positive impact of the event of interest on the Greek banks' financial markets. This is an expected result, which was likely to extend to more Eurozone countries.

In the case of Portugal, albeit there were no significant positive abnormal returns in the defined event windows, we highlight the timid reaction after the day of the event, which was significant.

One admissible justification for these reactions, and to support the theory of Kaminsky and Schmulker (2002), is that countries with lower sovereign ratings are more vulnerable to the impacts of rating announcements. Greece and Portugal were, among the Euro Area, countries that had the lowest ratings, so the upgrades somewhat rehabilitated investor confidence indices, causing statistically significant impacts on both countries' banking sector.

In fact, and not disregarding what was the hypothesis, the truth is that there were no statistically significant results regarding positive watch announcements, while around upgrades, we obtained significant positive abnormal returns. However, given the Euro Area framework, it was expected that the null hypothesis would be rejected in a larger number of countries for a more solid result. Not being possible, only the cases of Greece and Portugal are noted.

6. Conclusion

Given the hypotheses established and using the event study as a methodology to be applied, it was possible to obtain interesting conclusions, which still do not allow to fully confirm these hypotheses.

With respect to credit rating downgrades, previous studies report a negative impact on stock market returns. Within the listed Euro Area banks, only Italy confirms these findings. In contrast, Portugal and Spain, against all theories, verified a positive effect on the banking market of these countries. Therefore, although only relevant data are found in stressed countries, the truth is that a greater negative influence of this type of announcements cannot be confirmed on stressed countries compared to non-stressed countries, given the counter-intuitive cases previously explained.

In terms of negative watch announcements, although there was a positive (and contradictory) anticipation on the part of France and a negative statistically significant anticipation in Italy, none of these results led to significant cumulative average abnormal returns and therefore the financial market was not statistically informative regarding this study event.

Concerning credit rating upgrades, previous studies have proved to be inconclusive. In this case, only Portugal and Greece had positive impacts on their banking sector. These countries have confirmed the theory that countries with lower ratings are more vulnerable to rating changes.

It is true that banks only show reactions to upgrade ratings, once the market proves to be unrelated to positive watch announcements. Nevertheless, significant results were expected to be obtained in a larger number of countries, so we can say that there are indications of positive returns only around upgrade ratings against positive watch announcements, but we cannot categorically conclude in this regard.

In the near future, it would be pertinent to draw a comparison between the listed European banks and the non-listed European banks in order to understand whether there is a divergence in reaction to the study events covered in this research. To assess how markedly different stock markets react to financial news, it would be interesting as well to compare banks in Europe and those the U.S., or compare the results among firms from different sectors of activity.

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Appendix

Appendix 1. Listed Euro Area banks analyzed and respective percentage in the stock market indices of the following countries.

Country	Banks	% in Index (in 2019)
Austria	Erste Group Bank AG	19,37%
	Raiffeisen Bank International AG	
Belgium¹	KBC Group N.V.	11,27%
	Dexia N.V./S.A.	
Finland²	Nordea Bank Abp	3,84%
	OP-Pohjola Group	
France	BNP Paribas	10,40%
	Crédit Agricole S.A. Société Générale	
Germany³	Commerzbank Aktiengesellschaft	1,73%
	Deutsche Bank	
Greece	Alpha Bank AE	20,61%
	Eurobank Ergasias S.A.	
	National Bank of Greece S.A.	
Ireland	AIB Group plc	8,80%
	Bank of Ireland Group plc	
Italy	Intesa Sanpaolo SpA	17,88%
	Mediobanca SpA	
	UniCredit SpA	
Netherlands	ING Bank N.V.	7,10%
Portugal⁴	Banco Comercial Português, S.A.	14,48%
	Banco Espírito Santo , S.A.	
	Banco BPI, S.A.	
Spain	Banco Santander, S.A.	27,47%
	BBVA, S.A.	
	CaixaBank, S.A.	

¹ Dexia N.V. is no longer listed

² OP-Pohjola Group is no longer listed

³ Commerzbank Aktiengesellschaft is no longer listed

⁴ BES, S.A. and Banco BPI, S.A. is no longer listed

Source: Bloomberg

Appendix 2. Eurozone countries analyzed and respective stock market index

Country	Index
Austria	ATX
Belgium	BEL
Finland	HEX
France	CAC
Germany	DAX
Greece	ASE
Ireland	ISEQ
Italy	FTSEMIB
Netherlands	AEX
Portugal	PSI20
Spain	IBEX

Appendix 3. Time reactions of the companies in face of changes in sovereign debt ratings of their countries by period.

Period: 2000-2007		Same direction as Sovereign												Opposite direction			
Country	Number of firm actions	Positive Sovereign actions						Negative Sovereign actions						[-21;21]			
		[-21;-4]	[-3;-2]	[-1;0]	[0-1]	[2-3]	[4-21]	[-21;-4]	[-3;-2]	[-1;0]	[0-1]	[2-3]	[4-21]				
Austria	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Belgium	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Finland	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,45%
France	587	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany	1577	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Greece*	43	-	-	-	2,33%	-	-	-	-	-	-	-	-	-	-	-	2,33%
Ireland	207	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,93%
Italy	291	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,37%
Netherlands	383	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Portugal	98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spain	162	-	-	-	2,47%	-	-	-	-	-	-	-	-	-	-	-	1,23%
Total	3519	-	-	-	0,14%	0,03%	-	0,08%	0,08%	-	-	0,30%	-	0,03%	-	-	0,33%

* Data only from 2001

Period: 2008-2018		Same direction as Sovereign												Opposite direction				
Country	Number of firm actions	Positive Sovereign actions						Negative Sovereign actions						[-21;21]				
		[-21;-4]	[-3;-2]	[-1;0]	[0-1]	[2-3]	[4-21]	[-21;-4]	[-3;-2]	[-1;0]	[0-1]	[2-3]	[4-21]					
Austria	170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,29%
Belgium	177	-	-	-	-	-	2,26%	-	-	-	-	-	-	-	-	-	-	1,69%
Finland	86	-	-	-	-	-	1,16%	-	-	-	-	-	-	-	-	-	-	2,33%
France	1043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,40%
Germany	1573	-	-	-	-	-	2,23%	-	0,38%	-	-	-	-	-	-	-	-	53,15%
Greece	186	-	-	-	-	-	5,38%	-	0,06%	-	0,06%	-	-	-	-	-	-	4,30%
Ireland	382	2,36%	-	-	0,26%	-	3,40%	-	4,30%	-	-	-	-	-	-	-	-	6,02%
Italy	701	0,14%	-	-	0,43%	-	2,71%	-	1,43%	-	-	-	-	-	-	-	-	1,14%
Netherlands	692	0,14%	-	-	0,14%	-	1,59%	-	0,72%	-	-	-	-	-	-	-	-	2,17%
Portugal	272	-	-	-	-	-	3,69%	-	1,64%	-	-	-	-	-	-	-	-	1,23%
Spain	509	-	-	-	-	-	8,27%	-	1,18%	-	-	-	-	-	-	-	-	1,18%
Total	5791	0,18%	-	-	0,10%	0,10%	2,42%	-	0,82%	0,18%	0,02%	1,24%	-	5,89%	-	-	-	15,18%

Period: 2000-2018		Same direction as Sovereign														Opposite direction		
Country	Number of firm actions	Positive Sovereign actions							Negative Sovereign actions							[-2;2]		
		[-2;-4]	[-3;-2]	[-1;0]	[0-1]	[2-3]	[4-21]	[-2;-4]	[-3;-2]	[-1;0]	[0-1]	[2-3]	[4-21]					
Austria	226	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	796%	3,98%
Belgium	223	-	-	-	-	-	1,79%	-	-	-	-	-	-	-	-	-	2,69%	1,35%
Finland	156	-	-	-	-	-	0,65%	-	-	-	-	-	-	-	-	-	0,65%	1,94%
France	1630	-	-	-	-	-	-	-	-	-	-	-	0,25%	0,06%	-	-	6,81%	1,53%
Germany	3151	-	-	-	-	-	1,12%	-	-	-	-	-	0,06%	0,03%	-	-	0,71%	26,93%
Greece*	229	-	-	-	-	-	4,37%	-	2,18%	0,44%	-	-	3,49%	-	-	-	6,55%	3,93%
Ireland	589	1,53%	-	-	-	-	2,21%	-	0,17%	0,17%	-	-	1,70%	-	-	-	4,75%	4,58%
Italy	992	0,10%	-	-	-	-	1,92%	-	-	0,30%	-	-	1,31%	0,30%	-	-	8,37%	1,21%
Netherlands	1075	0,09%	-	-	-	-	1,03%	-	0,09%	-	-	-	0,47%	-	-	-	0,56%	1,40%
Portugal	370	-	-	-	-	-	2,63%	-	-	-	-	-	1,17%	-	-	-	11,40%	0,88%
Spain	671	-	-	-	-	-	6,27%	-	0,60%	0,30%	-	-	0,90%	1,49%	-	-	13,43%	1,19%
Total	9312	0,11%	-	-	0,11%	0,07%	1,53%	0,56%	0,15%	0,01%	0,91%	3,71%	4,26%	9,73%				

* Data only from 2001

Source: Bloomberg