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The Effect of Italy's Sovereign Debt Downgrades on Stock Returns

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There are few studies that take into consideration the effects of the Italian rating downgrade in the context of the current crisis. This paper aims to identify which sovereign debt downgrades have had the highest impact on the stock market. More specifically, the study analyzed a sample of shares belonging to the key sectors, that is, finance, technology, fashion, food and beverage and health sectors. In addition, the analysis was conducted in order to verify if the "border downgrades" have an amplified impact on the stock market than the other ones. It was found, through the 'event study dummy' approach methodology, that the transitions from one grade to another have had a greater impact than transitions into the same grade. Moreover, the first Italian downgrade had an important impact on the stock market returns, because this downgrade represented the alarm bell that the crisis was intensifying also in the country under consideration. Only in the technology industry did the first downgrade had no effect. In fact, the technology industry is more robust because it can be defined as the most innovative industry, and so it detected the crisis earlier.

Keywords: Financial Crisis, Sovereign Rating, Italian Downgrades, Stock Market, Event Study.

JEL Codes: G01, G12 and G14

1. Introduction

In the last few years, the concept of rating took up a more important role in the economic world; in fact, the rating agencies assessments on the sovereign credit produced effects on political and economic spheres of countries around the world. This paper examines the last phase of the crisis which occurred in the last two years after the sovereign rating review by the rating agencies. The first sovereign rating downgrade occurred in the US on August 5, 2011 when Standard & Poor's downgraded the United States credit rating from AAA to AA+ with the motivation that the plan that the Congress and the Administration agreed to implement could not stabilize the government's medium-term debt dynamics.

This announcement caused a financial crisis which spread like a domino to other countries. Afterwards, other downgrades occurred in European countries causing an upheaval on the European financial market. An interesting aspect for this survey is the following: such downgrades have had different impacts depending on the macroeconomic condition of the country in question.

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This study was motivated by the desire to answer to the following research questions:

- What are the effects of Italian downgrades on the stock returns?

The study investigated the relationship between downgrade announcements and financial market trend, and it quantified the strength of this relationship. With more details, the study analyzed if a particular type of downgrade, named “border downgrades” had an amplified impact on financial markets compared to others or not. Cantor and Packer (1996) show that the impact of rating announcements for below-investment-grade sovereign bonds is stronger than the impact for investment-grade sovereign bonds. In addition, Creighton et al. (2007) analyzed the effects of corporate rating changes on the Australian financial market; they found greater effects for downgrades from “investment grade” to “speculative grade”.

It would be useful to verify if these results are generalizable to sovereign rating changes or not. So, the aim of this study is to ascertain how much amplified effect downgrades have over stock returns of sample shares. We expect to replace the results of Creighton et al., that is, to find a greater impact in transitions from a grade to another than downgrades into the same grade. The attended result showed that the transitions from upper medium grade to lower medium grade produced a greater impact on the stock market when compared with the transitions in the same grade and the transitions from high grade to upper medium grade. We believe that the transitions from upper medium grade to lower medium grade have a higher impact because they are relevant for the solvibility and the reputation of a Country and so they are important in helping investors take financial decisions. The contribution of this work to the investor behavior include suggesting the policy to adopt in changing stocks for bonds in the periods of downgrades, giving an indication about what sectors of the economy are more/less sensitive to Italy’s sovereign debt downgrade.

Literature review is presented in the second section, while in the third section, the methodology, model and data, divided into four subsections to explain the methodological approaches used and why they are chosen, are presented. In the fourth section, findings are described. In the fifth section, conclusions are developed and finally there are references.

2. Literature Review

This work is aimed at filling a gap in the literature because there are only a few studies that have taken into consideration, the effects of the Italian rating downgrade announcements, or more generally, the effects of sovereign rating changes, in the context of the current crisis. Research on sovereign credit ratings can be divided into two categories: studies which analyze the determinants of sovereign credit ratings and studies which examine the price impact of rating announcements; the latter group usually focuses on the sovereign bond market; while this research analyzes the impact of the Italian downgrades on the stock market and more specifically on each ones of all key sectors.

The sovereign rating change announcements produce effects not only on the cost of the sovereign credit but also on the financial market.Sovereign ratings summarizes the information of macroeconomic indicators such as Income per person, GDP growth, level of economic development, inflation, external debt, and they are therefore related to the spread of securities. Research on sovereign credit ratings can be divided into two categories: studies which analyze the determinants of sovereign credit ratings and studies

examining the price impact of rating announcements; the latter group usually focuses on the sovereign bond market.

Unlike corporate ratings, sovereign ratings have no effects on single firms but on the market as a whole, as evidenced by the survey of Brooks et al. (2004), and on Sovereign bonds. The study of Brooks et al. analyzes the impact of sovereign rating changes on the market using both local and foreign rating changes. Consistently with the findings observed for corporate changes ratings, credit rating downgrades have a negative impact on returns. Downgrades have a negative impact on both local market and Dollar Area Countries one. Among the four agencies examined, only Standard & Poor's and Fitch ratings downgrades appear to have a significant effect on yields.

Another interesting aspect are the asymmetric effects on the sovereign rating announcements, as highlighted by the studies of Klimavičienė (2011), Ferreira and Gama (2007) and Gande and Parsley (2005). The first work investigates the relevance of sovereign rating announcements in the Baltic stock market testing the degree of anticipation and price reaction. The methodology used is the event study with the market-model-adjusted method (or "market model") where the return on the market is approximated by the MSCI EM of a small country. In particular, the aim is to analyze the price impact of sovereign rating announcements by Moody's, Standard & Poor's and Fitch ratings on the price. Through this survey, it emerged that sovereign rating announcements contain relevant pricing information; in fact, the price impact of negative events is sometimes larger than the impact of positive events.

In addition, the impact of rating announcements is relevant in the announcements day although some announcements are anticipated. The second contribute analyzes the effects of Standard & Poor's sovereign rating of 29 countries, both developing and developed countries. The results, obtained through the event study methodology, show that sovereign rating upgrades are synonymous with positive effects on stock market prices in the US while downgrades are synonymous with a negative effect. When a country is downgraded the remaining countries do much worse than the US market. Rather than positive ones, negative news in the sovereign debt market, seem to have a significant impact on the stock markets of non-event countries.

Gande and Parsley (2005) show the effects of sovereign downgrades on sovereign debt markets. They apply the event study methodology with the market model regression, the expected return on the market index as predicted from the (OLS) coefficients is then estimated in the market model regression. They find that there is an asymmetric impact on sovereign debt markets: downgrades abroad are associated with a significant increase in sovereign bond. One possible explanation for the asymmetric effects to rating news is that upgrades are partially anticipated by market participants, unlike downgrades. Sovereign ratings affect not only the financial system but also political aspects related to macroeconomic variables. Taking into account, as it emerged, that negative announcements have strong effects and positive announcements have weak effects, you can then understand how important the sovereign rating is. At the same time, it is possible to understand why that assessment is particularly complex, given the often irreversible nature of its effects.

A different and more specific result on the impact of sovereign rating changes emerged by the survey of Cantor and Packer (1996) that investigates which announcement has a greater effects than the other. In particular, they argue that the assessments of rating agencies affect market returns. The analysis was carried out using the event study

methodology and it confirms the authors' hypothesis that announcements of sovereign rating changes are followed by significant movements in the yields bonds (Sovereign Bond and dollar bond spreads as the difference [(yield - Treasury) / Treasury]) in the expected directions. The regression includes four variables for actual rating changes, positive events, Moody's decisions, or speculative grade sovereigns. Three proxies are used: the change in relative spreads (in the direction of the anticipated change); the rating gaps between the agencies (the sign of the gap between the rating of the agency making the announcement and the other agency's rating); the third proxy is an indicator variable that equals 1 if another rating announcement of the same sign had occurred during the previous sixty days. All proxies measure conditions before the announcement. A final regression adds all three anticipation proxy variables simultaneously to the basic regression. The results are robust to the addition of the proxy variables. The sample is composed by dollar-bond spreads and sovereign bond spreads. The results show that the impact of rating announcements for below-investment-grade bonds is stronger than investment-grade sovereign bonds. In addition, the rating announcements already anticipated have a greater impact than the less predictable announcements.

For this reason, the assessments of rating agencies have a predictable component. Regarding the effects of sovereign rating announcements on the CDSs (Afonso et al., Arezki et al.), and for the sovereign rating announcements, it emerged that negative events cause significant reactions. More specifically, Afonso et al. (2011) analyze the effects of announcements by credit rating agencies Standard & Poor's, Moody's and Fitch ratings on the returns of Sovereign Bonds and CDSs. The methodology used is the event study on daily data. The results show significant abnormal returns on government bonds, especially in the case of negative announcements, while being more tenuous in the case of positive announcements. Moreover, Countries downgraded from less than 6 months have higher spreads than Countries with the same rating but not downgraded in the last 6 months.

Another interesting result is that while a significant reaction of sovereign yield and particularly, CDS spreads to negative events, the reaction to positive events is much more muted. Arezki et al. (2011) studied the impact of sovereign rating announcements on European financial markets in the period between 2007-2010. The methodology used is the event study. The dummy approach event analysis takes into account the potential linkages between markets through the Vector Autoregression (VAR) framework, the dummy is equal to 1 at time t and zero otherwise. The results show that the effects depend on the type of announcements, and how the country lives the downgrade; in addition, new rating downgrades have a stronger effects than revisions of outlooks which could be explained by banking regulation, ECB collateral rules, CDS contracts or investments mandates.

Finally, Pukthuanthong-Le et al. (2007) studied the effect of sovereign ratings announcements on stock and bond markets. The methodology is the event study; the market model was applied by using a world stock index and U.S treasury bond returns as benchmark. The sample contains rating changes and rating reviews of 34 Countries for the period 1990-2000. The results show that both share and bond prices react to downgrades but not to upgrades. In addition, sovereign bond yields anticipate rating downgrades. With regards to the Rating reviews, both positive and negative, they do not affect a country's stock market, but they lead to a price reaction in sovereign bond markets. It is consistent with previous studies in the literature, which generally conclude that only negative credit rating announcements have significant impacts on yields and

CDS spreads. By the analysis of this research field it emerged that emerging markets are particularly sensitive to rating changes.

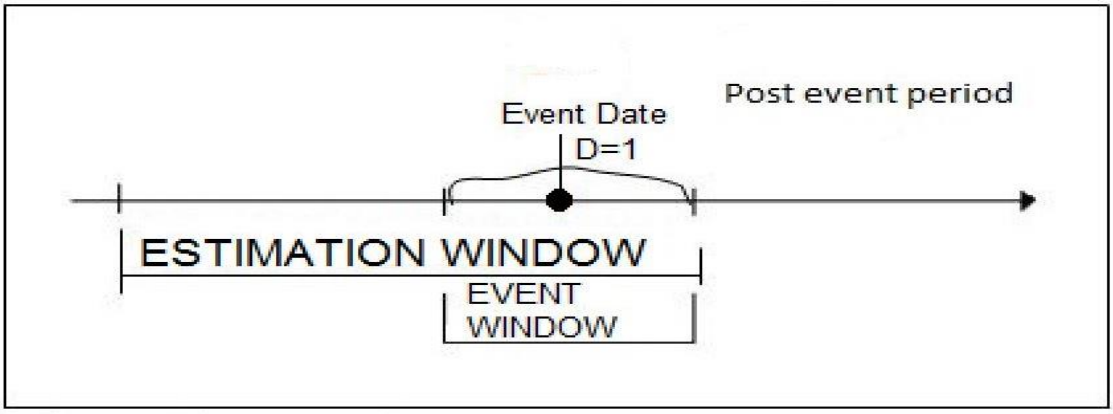
3. The Methodology and Model

The methodology applied is the event study. It represents, as viewed in the literature review, the typical statistic method to identify the impact of unexpected events on financial series. More specifically, it applied a particular model based on the event study dummy approach studied in order to investigate the impact of the Italian Downgrades on the stock market.

3.1 The Event Study Dummy Approach

The event study dummy approach was chosen because this methodology allows researchers to consider multiple event and to solve the «volatility clustering» problem. In this approach, differently to the event study, the estimation window is extended up to contain the event window [Binder (1998)].

Figure 1: The timeline of an event study dummy approach



Source: own processing

The dummy variable is equal:

- To 0 for the observation of the estimation window, period of the time line (Figure 2) that precedes the event window.
- To 1 for the observation of the event window.

3.2 The Model

In order to answer to the research question, we try to verify one of the following hypotheses:

H_0: There is not a relation between the Italian downgrade announcements and the Italian stock
market.
H_1: There is a relation between the Italian downgrade announcements and the Italian stock market.

We used the following model:

- The dummy variable regression, developed through the methodology described above, can be represented as:

$$R_{it} = \alpha + \beta R_{mt} + \gamma_t D_t + \xi_{it} \quad (1)$$

Where:

α is the regression constant;
R_{it} is the return on the stock i at the time t;
R_{mt} is the return on the market at time t, approximated through the FTSE Italia All-Share index;
D_t is the dummy variable,
γ_t is the coefficient of dummy variable and represents the abnormal return on stock i at day t;
ξ_{it} is the stochastic variable.

The estimation window is five years and contains six event windows, we chose to use event windows of three days following Afonso et.al. (2011) and Ferreira and Gama (2007) because this time horizon is long enough for a correct analysis.

We apply this model to analyze multiple events, so the regression is:

$$R_{it} = \alpha + \beta R_{mt} + \gamma_{1t} D_{1t} + \gamma_{2t} D_{2t} + \ldots + \xi_{it} \quad (2)$$

Where:

γ_{1t} , γ_{2t} , etc… are the coefficients of the dummy variables D_{1t}, D_{2t} and so on.

As better specified in the next section, we have six coefficients γ_t relating to six dummy variables, being that we take into account six announcement events. So, we have: γ_1, γ_2, γ_3,… showing the effects of the first, the second, the third announcement and so on… of sovereign rating downgrade on stock returns.

With the aim to verify the significance of the regression coefficients, we use the t-test, which in the event study analysis can be used also to test the abnormal returns, and the Durbin Watson test to verify the absence of autocorrelation among variables; in addition, the VIF coefficients are analysed to test the absence of multicollinearity.

3.3 Data

Table 1 represents all the Italian downgrade announcements which occurred in the period between 4th October 2011 and 9th July 2013. All the downgrades except the second and the fourth one are selected. We discarded the second downgrade because it is close to the first one, so it is difficult to separate the effects of the first and those of the second downgrade; therefore for the same reason, the fourth downgrade is discarded.

Table 1: The events taken into consideration by the survey

Event dates	Rating agencies	Downgrades	Transitions grade
10/04/11	Moody's	Aa2 to A2	High to Upper medium
10/07/11*	Fitch	AA- to A+	High to Upper medium
01/13/12	S&P	A to BBB+	Upper medium to Lower medium
01/27/12*	Fitch	A+ to A-	Upper medium (no transition)
02/13/12	Moody's	A2 to A3	Upper medium (no transition)
07/13/12	Moody's	A3 to Baa2	Upper medium to Lower medium
03/08/13	Fitch	A- to BBB+	Upper medium to Lower medium
07/09/13	S&P	BBB+ to BBB	Lower medium (no transition)

* discarded downgrade; source: own processing

The sample is made up of shares belonging to various sectors with the aim to capture the rating downgrade impact of different industries. In detail, it includes 106 shares of companies belonging to: finance (bank, insurance, financial services), technology, fashion, food and health sectors. They are chosen because they represent the Italian market key sectors. More specifically, the sample is composed by the company included in the indices FTSE Italia fashion, FTSE Italia finance, FTSE Italia food and beverage, FTSE Italia health and care and FTSE Italia technology.

Total return prices (which include stock dividends) of the period between 9th September 2008 and 9th September 2013 are extrapolated by Thomson Reuters Datastream, stock returns are calculated through the logarithm of the ratio between the price at time t and t_{-1}.

$$R_{it} = \ln\left(\frac{p_{it}}{p_{i(t-1)}}\right) \qquad (3)$$

Where:

p_{it} : is the total return price at time t;
$p_{i(t-1)}$: is the total return price at time t-1.

4. The Findings

The findings show that the Italian downgrade announcements caused different effects on different sectors analysed, especially regarding the border downgrade, and more specifically, the transition from upper-medium grade to lower medium grade. More particularly, through the analyses, it emerged that there is a negative relation between the Italian downgrades announcements and the stock market returns, but this relation is especially related to specific downgrades. It is an interesting result because we started this analysis with the aim to understand which downgrades could demonstrate more pronounced effects in the crisis context and, then, to study the development of the current crisis.

Table 2 shows that downgrades that represent a transition from upper medium grade to lower medium grade have had a significant impact on the Italian stock market. In addition, it also has had an important impact on the stock market returns the first Italian downgrade of October 4, 2011. The possible explanation of this is that, this downgrade occurred in a context of general review of the sovereign credit rating, so it represented the alarm bells that the crisis was intensifying in Italy also; another important aspect is that this downgrade from Aa2 to A2 is a transition from high grade to upper medium grade.

The first Italian downgrade has expressed its impact, more specifically, on sectors like: fashion (γ_1: -0,012), finance (γ_1: -0,011), food and beverage (γ_1: -0,014) and health and care (γ_1: -0,010); it is only in the technology industry that the first downgrade had no effects. This may be due to the fact that it is more robust, being that it is the most innovative industry, and so it detected the crisis more later.

In all industries analysed, the transition from upper medium grade to lower medium grade had a negative impact, specifically, in addition to the first downgrade analysed previously:

- Fashion industry: the 2nd (γ_2: -0,003) and the 5th (γ_5: -0,003) downgrade.
- Finance industry: the 4th (γ_4: -0,02) and the 5th (γ_5: -0,003) downgrade.
- Food and beverage industry: the 2nd (γ_2: -0,002) and the 5th (γ_5: -0,036) downgrade.
- Health and care industry: the 4th (γ_4: -0,001) and 5th (γ_5: -0,012) downgrade.
- Technology: the 4th (γ_4: -0,011) and the 5th (γ_5: -0,016) downgrade.

The VIF test (always close to 1) and the Durbin Watson test (always close to 2) show that there is no correlation and multicollinearity among the variables.

Table 2. Summaries of the regressions results

SECTOR INDUSTRIES	**γ_1 D_2**	**γ_2 D_2**	**γ_3 D_3**	**γ_4 D_4**	**γ_5 D_5**	**γ_6 D_6**
	10/04/11	01/13/12	02/13/12	07/13/12	03/08/13	07/09/13
Fashion	***-0,012***	***-0,003****	*0**	*0*	***-0,003****	*0*
Finance	***-0,011****	*0*	*0,001***	***-0,02*****	***-0,003****	*0,001*
Food and beverage	***-0,014*****	***-0,002****	*0,018*****	*0,003*	***-0,036*****	*0,002*
Health and care	***-0,010****	*0,009*	*0*	***-0,001****	***-0,012****	*0,001*
Technology	*0,019****	*0,014****	*0,008*	***-0,011****	***-0,016****	*-0.006**
Durbin Watson test is always close to 2 and VIF is always close to 1						

Significance level: *90%; **95%; ***99%; ****99,9%. Source own processing

The results differ from other studies for different aspects. First of all, it has emerged that Italy's sovereign debt downgrades had a downslide effect on the technology sector, so it is a robust sector. This finding could be a signal that the most innovative sectors are less conditioned by the sovereign debt downgrades. It is an interesting aspect about the investor behaviour. Another significant finding is that the first sovereign downgrades represent the alarm bells and so it has the most significant impact on all of the Italian sectors analysed whilst the next downgrades have had a slide impact.

Finally, contrary to the results of Norden and Weber (2004) who found that financial market is more sensitive to Standard & Poor's announcements than Moody's and Fitch Rating ones, this analysis indicates that in the Italian stock market, there are no significant differences among the effects produced by the different agency announcements. In other words, there is no agency stronger than others in impacting the Italian stock market.

5. Summary and Conclusions

This paper examined the last phase of crisis which occurred in the last two years after the sovereign rating review of the rating agency. The first sovereign rating downgrade occurred in US when Standard & Poor's downgraded the United States credit rating from AAA to AA+. This announcement caused a financial crisis which spread like a domino to

other countries. Afterwards, other downgrades occurred in the European countries that caused a crisis in the European financial market. The aim of the survey is to verify if those downgrades that represent a transition have an amplified effect on the stock returns of our sample shares or not. It is believed that the transitions from Upper medium grade to lower medium grade have a higher impact because they are relevant for the solvibility and reputation of a Country and so they are significant to the financial decisions of investors.

The findings highlight that there is a negative relation between the Italian downgrade announcements and the stock market returns and this relation is especially referred to specific downgrades. The key results that provide a contribution to the existing literature show that the downgrades representing a transition from upper medium grade to lower medium grade are those that have had a significant impact on the Italian stock market. In addition, the first Italian downgrade has had an important impact on the stock market returns, maybe because this downgrade occurred in the context of general review of the sovereign credit rating, so it represented the alarm bells that the crisis was also intensifying in Italy. The first Italian downgrade has expressed its impact, more specifically, on sectors like: fashion, finance, food and beverage and health care. Only in the technology industry does the first downgrade had no effects, maybe because the high tech industry is more robust. It is the most innovative industry, and so, it was able to detect the crisis much earlier.

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