THE EFFECTIVENESS OF THE SPANISH BANKING REFORM APPLICATION OF ALTMAN'S Z-SCORE

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Abstract

The recent financial crisis which causes bankruptcy around the world, Spain was placed at the top list because of the crucial state of its banking. This lead to a call to ensure adequate bank capitalization and reduce uncertainty regarding the strength of their balance sheets. In the light of recent event, the important of knowing the financial position of banks is imperative to shareholders. Thus, the aim of this study is to affirm the validity of Altman Z"-Score model as a predictors of the uncertainty regarding financial sector in Spain. This study takes into consideration two periods: before the banking reform and after the banking reform. It requires 30 financial institutions in Spain both big as well as small. Ratio analysis was carried out on the 30 banks before and after the reforms for five years prior to their bankruptcy or nationalisation as the Z" Score model has predictive power of up to five years before the reforms.

Keywords: Z"- Score, Bankruptcy, Banking Reform, Financial Crisis

1. INTRODUCTION

After the 2008 financial crisis, the performance of financial service has become the number one priority of most government officials. It is because banks and other financial institutions are known as the most important activity since their strategies affect economic development, employment, prices and national income (IMF, 2014). Thus, any positive or negative events encountered in this sector, is possible to impose threat to the entire economy. In other word, financial crisis encountered by countries primarily have its effect on the banking sector which is later being spread on the others sectors in the economy (Cibrán et al., 2008; Pison et al., 2014).

According to the recent financial crisis which causes bankruptcy around the world, Spain was placed at the top list because of the crucial state of its banking system which makes its economy vulnerable (Carbó-Valverde, 2011), unsustainable fiscal deficits, rising borrowing cost, rapid job loss and severe financial turmoil (IMF, 2014). Before the crisis, the presentation of the income statements of Spanish banks 2007 reveal more traditional banking crisis, consisting of excess leverage and excess mismatch of the timing of assets and liabilities which was materialized under the shadow of an unregulated and unsupervised banking system.

Following the diagnosis of financial stability forum, evidence shows that low real interest rates and abundant liquidity; and a wave of financial innovation with little or no supervision by the authorities in charged were the core stimulus of the Spanish banking crisis. Thus, the spin off effect of the global financial crisis on Spanish banking sector makes Spain in collaboration with the European Financial Stability Facility (EFSF) developed a supported program aimed to gear the financial sector´s participation to these forces by requiring weak banks to more decisively clean their balance sheet and by reforming the sector´s policy framework (FSF, 2008).

According to Altman and Loris, 1976) an economic is characterised with business failure as firms enter and exist in a function of the over business and expectation. The first empirical study that verifies the prediction of bankruptcy was carried by Beaver (1966). The study shows that corporate failure is the sequential conclusion due to systematic and non-systematic factor. However, in 1968, Altman shows that certain ratio analysis forecasts potential corporate failures. Thus, this study verifies the validity of the Altman Z-Score as a prediction of financial institution's failures in Spain. The study illustrate if truly the Z-Score can be used as an efficient and effective indicator for failure in the banking sectors.

2. LITERATURE REVIEW

In broad term, financial service firm refers to any firm that is able to produce financial products or services. In Spain especially, when referring to financial service firms, more reference can be seen from the evolution of the Cajas de Ahorros Españoles (Pison Fernández, & Feijóo Souto, 2003). In fact, financial sector has been one of the most innovation and dynamic in the last 20 or 30 years (Huarte et al., 1989). It was precisely this intense innovation alone side with under-regulated financial system which incubated the 2008 financial crisis. Speaking of Spanish banks, creditable legislation was passed even though the separation between banks, insurance companies, investment banks and firms was always seemed artificial (Pison et al., 2014).

According Real Decreto-Ley11/2010, banks were giving a wide range of choosing the legal form they wish to develop specific financial activity. Recently, even though the financial crisis has marked a decline in the Spanish financial system, it

is certain that is only part of the European financial system and as such demonstrate the continue need for external funding, integration and unification of the European financial system. Thus, the financial service sector has been the foundation of the Spanish economy (Pisón Fernández, 1980); banks providing much of the capital for growth and foreshadow both equity and bond markets as pioneers in risking sharing. Table 1 below summarizes the market capitalization of publicly traded banks, insurance companies, brokerage houses, investment firms and thrift in Spain after the reforms in the financial sector.

The main objective of the banking sector reforms was to ensure adequate bank capitalization and reduce uncertainty regarding the strength of their balance sheets; legal framework for a swift and orderly process of financial sector restructuring and sound operating environment with the ultimate goal of improving the allocative efficiency of resources through operational flexibility, improved financial viability and institutional strengthening (RGS, 2012). Furthermore, the reforms have focussed to re-establish its access to the market, ensuring credit starts to flow into the real economy, removing financial repression through reductions in statutory pre-emption, while stepping up prudential regulations at the same time (RGS, 2012). The banking sector reform was strategized in two approaches.

First, clean up and protecting order of the balance sheets of financial entities (IMF, 2014) was approved under an initiative from the government, with two separate external assessment reports. In particular, a special emphasis was placed on improving credibility of the Spanish financial system and clarifies any doubts regarding the bank´s balance sheets, thus creating flexibility for recapitalisation of about 100 billion Euros from its European partners with a proportion of 16 and 26 billion Euros at best and of between 51 and 62 billion Euros at worst (RGS, 2012).

Second, active step were taken by the Spanish government to established legislation assumed under the *memorandum of understanding* for the recapitalisation of the banking sector and strengthens the crisis resolution instruments available to credit entities, thus, reducing the probability and seriousness of future economic crises. Also, the supervisory system was revamped in view of the crucial role of supervision in the creation of an efficient banking system.

Measures to improve the performance of the Spanish banking system have included (i) early stage risks are identify and address through continued pro-active monitoring and supervision in order to ensure adequate provisioning; (ii) banks are encourage bolster capital in ways that do not irritate already - tight credit condition; (iii) restructuring corporate debt and reducing impediments to assets disposal; (iv) the use of more complete banking union and more monetary easing by the ECB to further reduce funding cost and easing of credit condition through swift progress; (v) institutionalisation of a mechanism facilitating greater coordination for regulation and supervision of financial conglomerates; and (vi) mitigation of conflict of interest through enhance of FROB´s checks and balances as well as maintaining corporate governance and internal control strategy for the loss of control over saving and commercial banks (RGS, 2012 & IMF, 2014).

2.1. Bankruptcy

The research of bankruptcy forecast, and especially using the Altman Z-Score model is vast. The focus of most research is the useful aid of accounting information in predicting bankruptcy across non-financial industries. Moreover, the origin of the methodology used in predicting bankruptcy can derived from Altman's 1968 model, who reformulated the Beaver (1966) univariate analysis, comparing financial ratios of 79 failed firms and 79 non-failing firms. In Altman's (1968) model, he incorporated four more variables into the model of Beaver's work to give an overall more precise bankruptcy prediction of manufacturing firms.

The major difference between the Beaver's (1966) model and Altman's (1968) model was that the former only allows for one ratio used at a time, thus, making it inconsistent to capture the financial complexity by relying on one ratio, meanwhile, the later employed twenty-two ratios that have been used in the prior literature and finds that five ratios are best at discriminating between bankrupt and non-bankrupt firms. The poor nature of these ratios in the Beaver univariate model, but it does not reject the fact that these variable boosted the discriminating power of the function. The choice of variable regarding company bankruptcy was based on four balance sheet and income statement variables: profitability, leverage, solvency, liquidity and activity. The result of the combination of ratios gives rise to a discriminants score otherwise called the Z-Score. The ratios are X_1 = Working Capital/Total Assets, X_2 = Retained Earnings/Total Assets, X_3 = Earnings Before Interest and Taxes/Total Assets, X_4 = Market Value of Equity/Book Value of Total Debt, and X_5 = Sales/Total Assets. In 1995, Altman redefined his model by excluding X_5 (sales/total assets) to forecast corporate failure for non-manufacturing firms in Mexico. The weighted coefficients thus have different values:

$$Z'' = 6.5X_1 + 3.2X_2 + 6.72X_3 + 1.0X_4$$

Source: Altman, Hartzell and Peck (1995, pge3)

To forecast the Z" Score, a constant (+3.25) was added in order to normalise the results so that the scores that equal or less than zero would be equivalent to the default situation (Altman, Hartzell and Peck, 1995). Finally, in order to check the bankruptcy situation of these firms, Altman and Hotchkiss (2006) matched a corresponding between the Standard and Poor's rating and the score, which make the model reliable and consistent as shown in Table 1.

Table 1. Correspondence between Z"-Score and Standard & Poor Rating

	Rating	*Z" - Score Threshold*	*Rating*	*Z" - Score Threshold*	
Safe Area	AAA	>8.15	BB+	5.65	Grey area
	AA+	8.15	BB	5.25	
	AA	7.60	BB-	4.95	
	AA-	7.30	B+	4.75	
	A+	7.00	B	4.40	Distress Area
	A	6.85	B-	4.15	
	A-	6.65	CCC+	3.75	
	BBB+	6.40	CCC+	3.20	
	BBB+	6.25	CCC-	2.50	
	BBB-	5.85	D	<1.75	

Source: Altman and Hotchkiss (2006, page, 314)

Lastly, other group of research used a wide range of statistical method to predict bankruptcy of companies in the 70s, 80s and 90s (Deakin, 1972; Moyer, 1977; Kez, 1978; Booth, 1983; Hennaway and Morris, 1983; Fryman et al., 1985; Gombola et al., 1987, McGurr and DeVaney, 1998; Yang et al., 1999, Dimitra et al., 1999).

3. METHODOLOGY

The aim of this study is to illustrate an application of the most suitable bankruptcy model (Altman Z-Score) to financial sector in Spain over the period 2005 to 2012. Corresponding to Diamond and Rajan, (2001), financial institutions in Spain are considered as the centre of financial crisis due to the frasil capital structure of banks to provide liquidity to both leaders and borrowers. During the reforms, financial institutions with poor performance were forced to merge with other banks with good performance. Thus, the purpose of this study is to show how effective Z-Score in predicting bankruptcy and can be used to verify if the Spanish banking reform was effective or not. The Z-Score model is a discriminant analysis which was applied by many social and physical scientists, and became applicable in the business field (Beaver, 1966).

3.1. Data

The list of financial firms was obtained from the the SABI of the Bureau Van Dijk. The list includes financial institutions that were under sever banking crisis from 2005 to 2012. The subsample of financial institutions that were not experiencing financial distressed after the banking reform, over 2013 to 2014. The accounting ratios for all firms are obtained from the SABI database. Lastly, the financial institutions for this study must meet the following characteristics: each financial institution must have full record of financial statements publicly available in SABI for five years priors to the financial crisis; financial institutions must be active for at least five years before the Spanish banking reform; and must be a Spanish based financial institution. In order to confirm the Altman's Z-Score can predict bank failure five year prior to the Spanish banking reforms, it is important to consider that financial institutions examined had to be of going concern at least five years prior to the reforms. The election of the five year period is based on a similar study carried by Altman et al., (2013) for large non-financial firms in Italy. To discriminate between the depressed banks and safe banks, comparable banks were required to identify any similar or dissimilar trends.

4. EMPIRICAL RESULTS

The Altman Z"- Score applied to all financial institutions before and after the Spanish banking reform, over the period 2005 to 2014 as illustrated in Table 2. First, a critical look at the Z"-Scores' board rating equivalent for five year prior to the banking crisis in Spain, 63.33% were classified in the distress area in 2005 and 57.14% by 2014. The Standard and Poor's rating categories of most financial institutions approaching bankruptcy with the letter "D", meaning default. For instance in year 2005, before declaring bankruptcy 33.33 % of Spanish banks had scores in that area, meanwhile 63.33% fell the Standard and Poor's rating of 4.50% for the distressed area. However, in year 2008 and 2009, 75.00% and 74.1% of the financial institutions were classified in category D of the Standard Poor's rating, and 87.87% and 83.33%of them were classified as scoring below the rating 4.50%. This result illustrated the situation of banking sector in Spain before the banking reform.

With regard to the grey area, 3.37% of Spanish financial institutions were classified as scoring above 4.5%.These banks were better off than those in the distress area. However, our study show that very few banks were found in this area. Consistent with the classification Table 1 above and the Standard and poor's rating; we argue that the results provide true evidence of the Spanish banking sectors before the reform. Notice that in the grey area where banks futures are uncertain as to whether they will fail or recover, is reduced to 3.37% in 2005 and 0.0% in 2008 and 0.03% in 2009. As we move from 2005 to 2008 and 2009, the average aggregate of banks in the grey area diminishes.

Besides the distress and grey areas, we found some banks doing extremely well. These banks were found in the safety area even though very few. According to our result, 6.31% and 9.44% score above the Standard and Poor's rating of 5.85%. These banks fell under the zone of safety. Contrary to year 2005 and 2006, with the large proportion of financial institutions were classified under the safe zone.

Table 2. Z"-Score Results

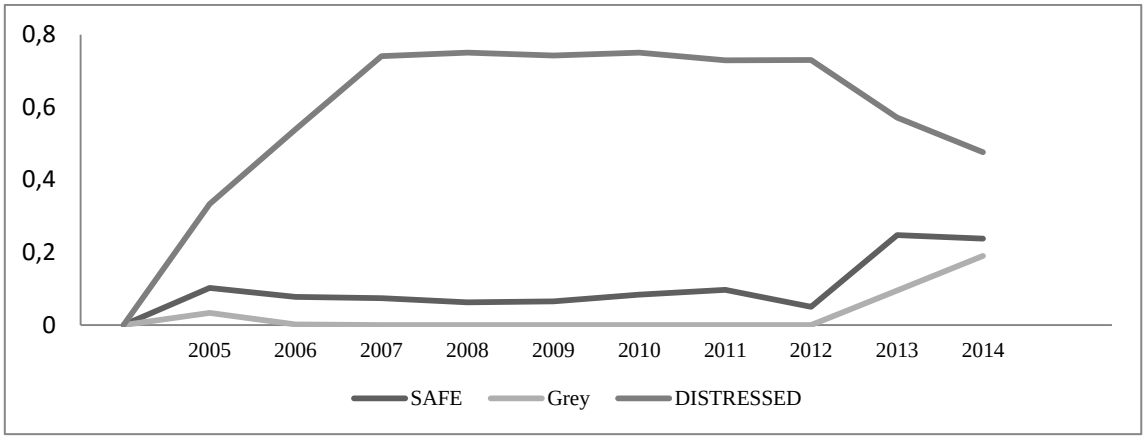
	Rating	Threshold	2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		Average values
			n.	%	n.	%	n.	%	n.	%	n.	%	n.	%	n.	%	n.	%	n.	%	n.	%	
SAFE AREA	AAA	>8.15	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	2	0,08%	0	0,00%	0	0,00%	0	1,00%	0	0,00%	0,11%
	AA+	8.15	1	3,33%	1	3,85%	1	3,70%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	1	1,00%	1	4,76%	0	0,00%	1,66%
	AA	7.60	2	0,07%	0	0,00%	0	0,00%	2	6,25%	2	6,45%	1	4,17%	0	0,00%	0	0,00%	0	0,00%	3	14,29%	3,12%
	AA-	7.30	2	6,67%	1	3,85%	1	3,70%	0	0,00%	0	0,00%	0	0,00%	1	3,13%	0	1,00%	1	4,76%	0	0,00%	2,31%
	A+	7.00	0	0,00%	0	0,00%	0	0,00%	1	0,03%	1	0,03%	1	4,17%	0	0,00%	0	0,00%	0	0,00%	1	4,76%	0,90%
	A	6.85	3	0,10%	1	0,04%	0	0,00%	1	0,03%	0	0,00%	0	0,00%	0	0,00%	0	1,00%	1	4,76%	1	4,76%	1,07%
	A-	6.65	0	0,00%	0	0,00%	0	0,00%	0	0,00%	1	0,03%	0	0,00%	1	3,13%	0	1,00%	1	4,76%	0	0,00%	0,89%
	BBB+	6.40	1	0,03%	1	0,04%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	1	3,13%	0	1,00%	1	4,76%	0	0,00%	0,90%
	BBB+	6.25	0	0,00%	0	0,00%	1	0,04%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0,00%
	TOTAL		**9**	**10,20%**	**4**	**7,77%**	**2**	**7,41%**	**4**	**6,31%**	**4**	**6,52%**	**4**	**8,42%**	**3**	**9,38%**	**1**	**5,00%**	**5**	**24,81%**	**5**	**23,81%**	**10,96%**
GREY AREA	BBB-	5.85	1	3,33%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	1,00%	1	4,76%	0	0,00%	0,91%
	BB+	5.65	0	0,00%	0	0,00%	1	0,04%	0	0,00%	0	0,00%	0	0,00%	1	0,03%	1	1,00%	1	4,76%	3	14,29%	2,01%
	BB	5.25	0	0,00%	4	0,15%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0,02%
	BB-	4.95	1	0,03%	1	0,04%	0	0,00%	0	0,00%	1	0,03%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	1	4,76%	0,49%
	B+	4.75	0		0		0		0		0		0		0		0		0	0,00%	0	0,00%	0,00%
	TOTAL		**2**	**3,37%**	**5**	**0,19%**	**1**	**0,04%**	**0**	**0,00%**	**1**	**0,03%**	**0**	**0,00%**	**1**	**0,03%**	**1**	**2,00%**	**2**	**9,52%**	**4**	**19,05%**	**3,42%**
DISTRESS AREA	B	4.40	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	1	4,76%	0,48%
	B-	4.15	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	1	3,13%	1	0,00%	0	0,00%	0	0,00%	0,31%
	CCC+	3.75	3	0,10%	1	0,04%	1	0,04%	1	0,03%	1	0,03%	1	0,04%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0,03%
	CCC+	3.20	5	16,67%	0	0,00%	2	7,41%	1	3,13%	1	3,23%	1	4,17%	0	0,00%	1	2,00%	2	9,52%	1	4,76%	5,09%
	CCC-	2.50	1	0,03%	2	0,08%	1	0,04%	2	0,06%	1	0,03%	0	0,00%	1	3,13%	0	0,00%	0	0,00%	0	0,00%	0,34%
	D	<1.75	10	33,33%	14	53,85%	20	74,07%	24	75,00%	23	74,19%	18	75,00%	26	81,25%	25	86,21%	12	57,14%	10	47,62%	65,77%
	TOTAL		**19**	**63,33%**	**17**	**65,38%**	**24**	**88,89%**	**28**	**87,50%**	**26**	**83,87%**	**20**	**83,33%**	**28**	**87,50%**	**27**	**0,8821**	**14**	**66,67%**	**12**	**57,14%**	**77,18%**
	TOTAL		**30**		**26**		**27**		**32**		**31**		**24**		**32**		**29**		**21**		**21**		

Source: authors' elaborations

From the Figure 1 below, you can see that great number of financial institutions in Spain were already showing distress signals between the year 2007 and 2012 classified according to the Standard and Poor's rating. These had taken a deep plunge from 33.33% to 73.0%. Considering a Z" Score of less than 1.75 signals insolvency, most of these banks under this area were already very much on the road to bankruptcy. This shows the Z" Score could predict a high risk of bankruptcy five year prior to collapse. However, after the banking reform in Spain, Figure 1 show how the insolvency situation of the firms has reduces drastically.

The Z" Score encompasses the four ratios gives the best prediction of corporate failure, due the fact that after the reform, 23.81% de banks were classified in the safe area and 19.05% banks fell on the grey area in year 2014. This shows a reverse situation. The Z" Score provide an accurate prediction capabilities in term of banking failures. With regard to the distress area, we found that by year 2012 after the reform, the distress line fall drastically to the end of 2014, from 73% to 47.62%. Finally, we have able to proof that the Altman Z" Score is a trustworthy indicator for verifying the state of financial institution in Spain. Lastly Table 3a and 3b below illustrate the analysis of banks before and after the banking reform over the period 2005 to 2007.

Figure 1. Z"- Score trend for financial sector in Spain



Source: authors' elaborations

Figure 2 shows before the banking reforms approximately 63% of the financial institutions in Spain ware in the letter "D". This means that the average classification of the banks reflect a state of bankruptcy. However, after the banking reform, we found that 23.81% of Spanish banks were classified in the safe area. Most of the banks in the safe area from 2013 to 2014 have an extremely good rating equivalent of AA+ or AA. In our option, this shows that the Z"-Score model is well suited for the predicting the effectiveness of the Spanish banking reform in the Spanish economy.

CONCLUSION

The empirical results suggest that Altman Z"- Score model is a reliable predictor of Spanish bank failure before and after the banking reforms. In this study, we show how the Altman's Z" Score can be effectively apply to the Spanish banking sector, and how it have resulted to 100% prediction of bankruptcy before the Spanish banking reform. Before the reform, applying the indicator to the sample from 2005 to 2012 shows that a relatively high proportion of Spanish banks were classified in the distress area. The so-called grey area is relatively narrow compared to the Z" – Score model, at least in term of the average classification.

The bond rating equivalents allows analysts to understand the nuances regarding the state of health of a bank. Meanwhile, the grey area enable us to get a greater clarity on what will be the short-term future for a banks: insolvency or recovery. As in the case of Spanish banks, due to the rescue process in the reforms, majority of the banks moved from the distress area to the grey area while those who are previously in the grey area moves to the safe position. For this reason, we conclude that the application of the Z"-Score in the Spanish banking sector context is extremely informative, but not without it complications. We are convinced that such models can be extremely helpful to investors, regulators and even political decision makers to evaluate if the goal of the Spanish banking reforms is archived.

Table 3a. Before the Spanish Banking reform

		RATING	2005		2006		2007		2008		2009		2010		2011		2012	
			n.	%	n.	%	n.	%	n.	%	n.	%	n.	%	n.	%	n.	%
SAFE ZONE	AAA	>8.15	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	2	0,08%	0	0,00%	0	0,00%
	AA+	8.15	1	3,33%	1	3,85%	1	3,70%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	1	1,00%
	AA	7.60	2	0,07%	0	0,00%	0	0,00%	2	6,25%	2	6,45%	1	4,17%	0	0,00%	0	0,00%
	AA-	7.30	2	6,67%	1	3,85%	1	3,70%	0	0,00%	0	0,00%	0	0,00%	1	3,13%	0	1,00%
	A+	7.00	0	0,00%	0	0,00%	0	0,00%	1	0,03%	1	0,03%	1	4,17%	0	0,00%	0	0,00%
	A	6.85	3	0,10%	1	0,04%	0	0,00%	1	0,03%	0	0,00%	0	0,00%	0	0,00%	0	1,00%
	A-	6.65	0	0,00%	0	0,00%	0	0,00%	0	0,00%	1	0,03%	0	0,00%	1	3,13%	0	1,00%
	BBB+	6.40	1	0,03%	1	0,04%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	1	3,13%	0	1,00%
	BBB+	6.25	0	0,00%	0	0,00%	1	0,04%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
	TOTAL		**9**	**10,20%**	**4**	**7,77%**	**2**	**7,41%**	**4**	**6,31%**	**4**	**6,52%**	**4**	**8,42%**	**3**	**9,38%**	**1**	**5,00%**
GREY ZONE	BBB-	5.85	1	3,33%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	1,00%
	BB+	5.65	0	0,00%	0	0,00%	1	0,04%	0	0,00%	0	0,00%	0	0,00%	1	0,03%	1	1,00%
	BB	5.25	0	0,00%	4	0,15%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
	BB-	4.95	1	0,03%	1	0,04%	0	0,00%	0	0,00%	1	0,03%	0	0,00%	0	0,00%	0	0,00%
	B+	4.75	0		0		0		0		0		0		0		0	
	TOTAL		**2**	**3,37%**	**5**	**0,19%**	**1**	**0,04%**	**0**	**0,00%**	**1**	**0,03%**	**0**	**0,00%**	**1**	**0,03%**	**1**	**2,00%**
DISTRESS ZONE	B	4.40	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
	B-	4.15	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	1	3,13%	1	0,00%
	CCC+	3.75	3	0,10%	1	0,04%	1	0,04%	1	0,03%	1	0,03%	1	0,04%	0	0,00%	0	0,00%
	CCC+	3.20	5	16,67%	0	0,00%	2	7,41%	1	3,13%	1	3,23%	1	4,17%	0	0,00%	1	2,00%
	CCC-	2.50	1	0,03%	2	0,08%	1	0,04%	2	0,06%	1	0,03%	0	0,00%	1	3,13%	0	0,00%
	D	<1.75	10	33,33%	14	53,85%	20	74,07%	24	75,00%	23	74,19%	18	75,00%	26	81,25%	25	86,21%
	TOTAL		**19**	**63,33%**	**17**	**65,38%**	**24**	**88,89%**	**28**	**87,50%**	**26**	**83,87%**	**20**	**83,33%**	**28**	**87,50%**	**27**	**0,8821**
	TOTAL		**30**		**26**		**27**		**32**		**31**		**24**		**32**		**29**	

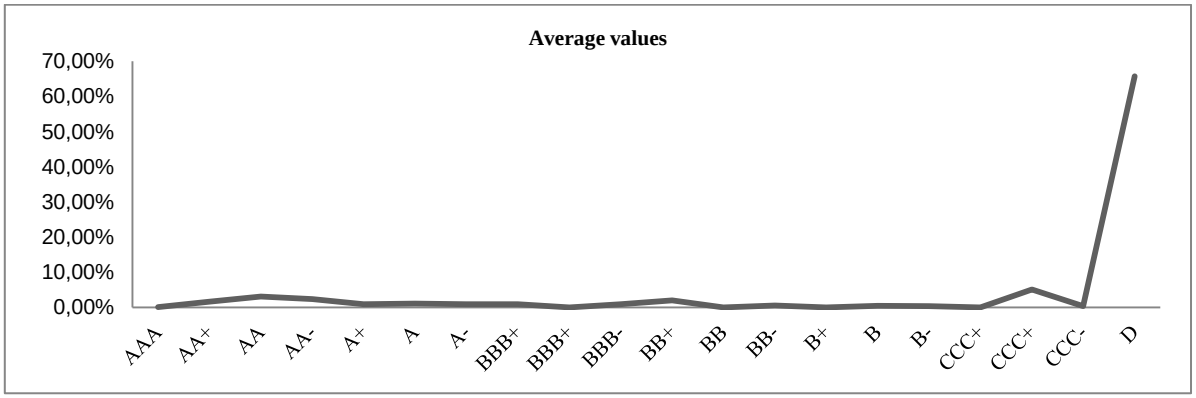
Source: authors' elaborations

Table 3b. After the Spanish Banking reform

	Rating	Threshold	2013		2014	
			n.	%	n.	%
SAFE ZONE	AAA	>8.15	0	1,00%	0	0,00%
	AA+	8.15	1	4,76%	0	0,00%
	AA	7.60	0	0,00%	3	14,29%
	AA-	7.30	1	4,76%	0	0,00%
	A+	7.00	0	0,00%	1	4,76%
	A	6.85	1	4,76%	1	4,76%
	A-	6.65	1	4,76%	0	0,00%
	BBB+	6.40	1	4,76%	0	0,00%
	BBB+	6.25	0	0,00%	0	0,00%
	TOTAL		**5**	**24,81%**	**5**	**23,81%**
GREY ZONE	BBB-	5.85	1	4,76%	0	0,00%
	BB+	5.65	1	4,76%	3	14,29%
	BB	5.25	0	0,00%	0	0,00%
	BB-	4.95	0	0,00%	1	4,76%
	B+	4.75	0	0,00%	0	0,00%
	TOTAL		**2**	**9,52%**	**4**	**19,05%**
DISTRESS ZONE	B	4.40	0	0,00%	1	4,76%
	B-	4.15	0	0,00%	0	0,00%
	CCC+	3.75	0	0,00%	0	0,00%
	CCC+	3.20	2	9,52%	1	4,76%
	CCC-	2.50	0	0,00%	0	0,00%
	D	<1.75	12	57,14%	10	47,62%
	TOTAL		**14**	**66,67%**	**12**	**57,14%**
	TOTAL		**21**		**21**	

Source: authors' elaborations

Figure 2. Z"- Score for average distribution in financial sector in Spain



Source: authors' elaborations

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