



# Technology as a Lever for the Evolution and Recovery of the Financial and Construction Sectors in Spain

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**Abstract.** The economic crisis started in Spain between 2008 and 2009. During the previous years there had been a growth of the Spanish economy above 3% per year, combined with a reduction of the unemployment rate to values close to 8%, the lowest unemployment rate in the last two decades. This situation was seen by analysts and politicians as a perfect situation for the Spanish economy, which did not foreshadow the existence of the crisis that would follow, beyond a minority that warned of a bubble in the real estate sector and a possible slowdown in the economy. This study reviews the ratios and sectors that have suffered most from the consequences of the crisis and describes the need for the implementation of technology as levers to improve the productivity of these sectors.

**Keywords:** GDP · Spanish crisis · Subprime crisis · Financial sector · Construction sector

## 1 Introduction

The economic crisis suffered by Spain was not an isolated factor, as it was influenced by the subprime mortgage crisis in the United States which quickly moved to Europe and was aggravated by the real estate bubble suffered by Spain during those years [3]. The subprime crisis and the housing bubble were followed by the sovereign debt crisis, which once again had a major impact on Spain [1]. During those years, there were many cases of bankruptcy among Spanish companies, some of the most notable being the bankruptcy of Martinsa Fadesa and Bankia, both of which are related to the two sectors we are going to study in this article. These two bankruptcies would be only a part of the large number of bankruptcies and restructurings that occurred in the construction sector and the financial sector respectively. The impact in economic importance with respect to the GDP of these two sectors before the economic crisis and their subsequent decline during that crisis is one of the reasons why we have decided to choose these two sectors for our study. During the years of economic growth prior to the crisis there were two sectors, in addition to the hotel and catering industry, which grew rapidly and achieved extraordinary profits, these two sectors being construction and financial and insurance activities. In 2008, the construction sector contributed

11.30% of the Gross Added Value (GVA) of the GDP, and financial and insurance activities contributed 5.09% of the GVA [4].

Two of the most affected sectors during the crisis were those mentioned above, suffering large losses and a significant decrease in their contribution to GDP. They were the sectors with the highest number of companies in bankruptcy proceedings [4]. In 2018, construction contributed 6.23% of the GVA of the GDP while financial and insurance activities contributed 4.03% of the GVA of the GDP [4]. This reduction is very notable, since the current GDP is higher than that of 2008, but the contributions of the aforementioned sectors have not recovered. In the case of financial sector activities, and more specifically in banks, we can see that in addition to a deterioration in their importance in terms of their contribution to GDP, there is also a deterioration in their solvency, measured as the ratio between equity and assets, which went from 7.03% in 2004 to 6.03% in 2009, reaching a minimum of 5.94% in 2008 [1]. In absolute terms, the joint contribution to GDP in GVA of the construction sector and financial and insurance activities has decreased by 56,107 million euros between 2008 and 2018 [2]. The decrease in the level of importance in relation to the total GDP of the Spanish economy, both of the sector of financial and insurance activities and of the construction sector, has been the factor that has motivated the study that is presented below. We will focus on analyzing the differences in the solvency ratios in these two sectors in the period 2013–2018, coinciding with the exit from the crisis. We will use the solvency ratio as several studies have shown it to be a good indicator for measuring financial results when restructuring companies [8]. In addition, we will analyze the importance of the inclusion of technology in both sectors as a measure to improve their productivity and importance in the coming years.

## 2 Methodology

To obtain the data we have used the SABI (Iberian Balance Sheet Analysis System) database and for the data related to the contribution of the sectors to economic activity we have used the INE databases. We have selected companies corresponding to the construction sector and the financial and insurance activities sector, differentiating in turn between active and competitive companies in order to analyze their differences. The period chosen is from 2013 to 2018. However, we only have taken this period into account for active companies, since for companies in competition we consider the last year available before ceasing activity up to the previous 5 years. Once the companies for which we did not have data were eliminated, we were left with a total of 34 companies in tender in the financial and insurance activities sector, 948 companies in tender in the construction sector, 27,550 companies active in the financial and insurance activities sector, and 40,000 companies active in the construction sector. In order to obtain the average value of the ratios, the function of limited average was used, excluding from the sample the values belonging to the top 10% and the bottom 10% in order to eliminate the outliers that distorted the sample. Before analyzing the results, it should be pointed out that the values of the ratios obtained will be different, since the business activity of each sector is different in terms of how it operates. In addition to the study of the companies obtained through SABI, we have also carried out an

analysis of the main companies listed in both sectors on the Spanish stock exchange to see how they have evolved since the beginning of the crisis. We have focused on analyzing their price and market capitalization. The data for the analysis of the listed companies has been obtained through a tool for the analysis of the financial sector called Koyfin<sup>1</sup>.

### 3 Results

The solvency ratio of the construction sector and the financial and insurance activities sector has been analyzed, distinguishing between active companies and those in competition. The solvency ratio is defined as assets divided by liabilities and denotes the ability to meet payment obligations. Ideally, this ratio should be above 1.5, although it will depend on the type of company which will be its optimum values. In any case, the ideal is that the assets are always higher than the liabilities, especially in the short term for the daily operation of the company (Table 1 and 2).

Figure 1 shows how the solvency ratios of companies in insolvency proceedings are deteriorating in both sectors, showing a trend towards difficulty in meeting their payment obligations, which would have led companies to enter into insolvency proceedings.

It can also be seen that the solvency ratio of the financial and insurance activities before entering into a tendering procedure is significantly lower than that of the construction sector, which maintains ratio levels above 2, above the ideal level.

However, if we analyze the EBITDA, we can see a progressive deterioration to negative values in the last year so that in the case of construction companies the declaration of insolvency by the company is due more to poor financial results than to a bad financing structure. Therefore, the solvency ratio would not be a good indicator to determine if a construction company is going to enter into bankruptcy proceedings (Tables 3 and 4).

Despite the fact that the period chosen for analysis (2013-2018) corresponds to the Spanish economy's exit from the crisis and high growth rates, many companies have been dragged down by poor results during the crisis period and have had to declare bankruptcy.

Figure 2 shows the differences between the solvency ratio for companies that are active in both sectors. As mentioned above, as in Fig. 1, there is a wide difference between the values of the solvency ratio for the construction sector and the financial and insurance activities. For construction companies the solvency ratio has similar values every year around values of 3.4 oscillating in a range of less than 0.2 points. These values denote stability in terms of their financial structure and maintain this stability throughout the years following the exit from the crisis. If we consider the companies listed on the IBEX 35, we can also see that from 2008 to date there have been significant losses in market capitalization and notable decreases in share prices in

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<sup>1</sup> <https://www.koyfin.com/>.

**Table 1.** Financial and insurance activities (active companies).

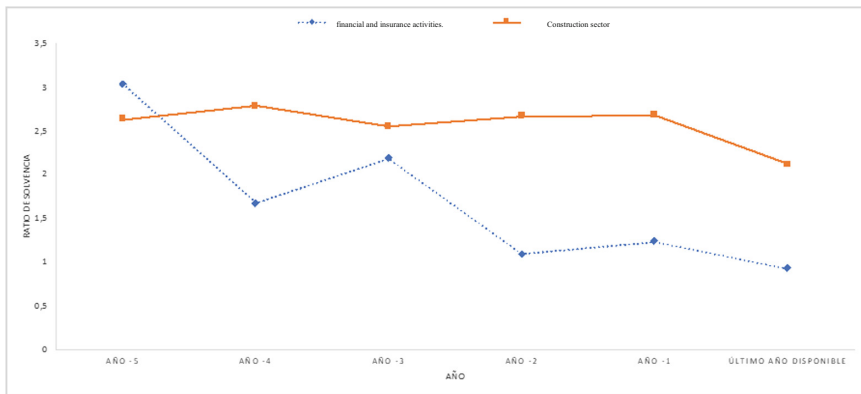
Year	2013	2014	2015	2016	2017	2018
Ratio of solvency	59,77	56,89	60,83	62,70	56,53	59,24
EBITDA (thousand. Euros)	11,52	11,91	10,93	13,12	14,22	14,40

Source: own elaboration

**Table 2.** Financial and insurance activities (companies in bankruptcy).

	2013	2014	2015	2016	2017	2018
Ratio of solvency	3,03	1,67	2,18	1,10	1,23	0,92
EBITDA (thousand. Euros)	304,46	170,74	-757,68	-16647,73	-4720,44	-1501, 60

Source: own elaboration



**Fig. 1.** Comparison of solvency ratios for companies in insolvency proceedings. Prepared by SABI. Source: own elaboration

**Table 3.** Construction sector (active companies).

Year	2013	2014	2015	2016	2017	2018
Ratio of solvency	3,34	3,38	3,33	3,31	3,33	3,49
EBITDA (thousand. Euros)	12,72	13,83	17,07	17,75	20,08	22,57

Source: own elaboration

**Table 4.** Construction sector (Companies in competition).

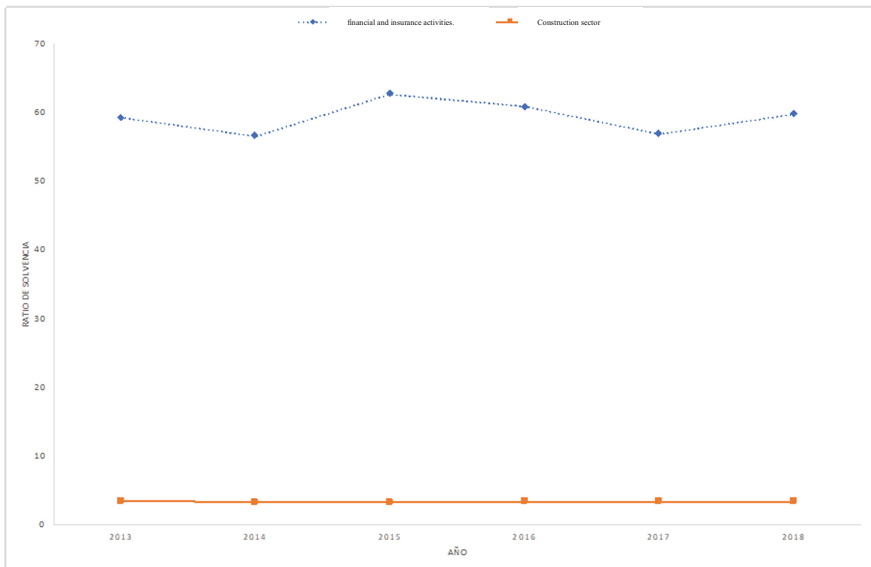
Year	2013	2014	2015	2016	2017	2018
Ratio of solvency	2,63	2,79	2,55	2,67	2,68	2,12
EBITDA (thousand. Euros)	106,74	107,62	74,85	47,79	14,83	-90,73

Source: own elaboration

both sectors. Due to the fact that these securities were very important in the composition of the IBEX in the pre-crisis period, the value of the index continues to be much lower than in 2007.

#### 4 Technology as Levers for Recovery and Growth

The decrease in the importance of the two sectors studied in the Spanish economy, their difficulty in maintaining an adjusted financial structure, and their difficulty in increasing profits leads us to propose the need to introduce technology in their production process to try to solve the aforementioned problems. In the case of the financial and insurance activities sector, a very important digitalization process takes place [9], where the provision of more personalized services for each client through digital platforms such as computers or smartphones is becoming more important. This digitalization process combined with a reduction in staff and the number of offices is enabling the sector to reduce costs and increase productivity in recent years. For the construction sector, an increase in technology in its production process is necessary to increase productivity. In the case of Spain, there has been a drop-in productivity of around 0.5% between 1995-2015 measured in dollars per hour worked and per person employed [7]. To improve productivity in the industrial sector, it is necessary to introduce an element that has already been included in production processes in other sectors, automation and connectivity, giving way to an analysis of the benefits of what we call IoT [10]. In recent years we have seen the first steps in automation and robotization in the construction



**Fig. 2.** Comparison of solvency ratios of active companies. Prepared by SABI. Source: own elaboration

sector, with innovations that in the coming years we will see if they result in improved productivity in the sector, since they allow for cost savings and increased efficiency.

## 5 Conclusions

In the sector of financial and insurance activities, solvency ratios are observed with values above 50 every year. However, there is greater variability in this sector as a complete transformation of the sector is taking place with changes in regulation and the appearance of new business models that do not allow it to have constant stability over the years. The high values of the solvency ratio in the financial sector, could be due to the fact that since the crisis there have been greater restrictions on the granting of credit and greater regulation of financial activities which has allowed them to adjust their balance sheets to obtain profits with greater financial stability. The decline in both the importance in the economy and the profits obtained in the sectors studied makes it necessary to adopt better technology in their productive processes that allows them to increase their productivity and income in order to continue developing an adequate economic activity in the future.

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