# CRITICAL ANALYSIS OF STRESS TESTS IN THE YEAR 2011

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## SUMMARY

Stress Tests are conducted by national supervisors as well as by the European Banking Authority (EBA). This paper aims to make a critical analysis of the latest edition of the stress tests published on 15th July 2011. To achieve this objective, we have also established a secondary aim: to examine the financial and patrimonial situation of some of the European and Spanish banks in the period 2010-2012, taking into account the relevant EBA index.

From the historical data available, we can conclude that the aggregate Net Equity of the example we analysed, from 2010, including the recapitalization estimated by the EBA, reached a level of Net Equity/Assets, not even reached by the equivalent figures for 1985 (without recapitalization). Considering that Net Equity constitutes a safety zone for creditors in general, it can be stated that this basic criterion of solvency has deteriorated.

## KEY WORDS

Stress Test, Banking, European Banking Authority, Solvency.

## 1. INTRODUCTION AND AIMS

The latest edition of the stress tests was published on 15th July 2011 (Article 35 (2) (b) of the EU Parliament and Council Regulations Nº 1093/2010, dated 24th November 2010). These resistance tests are designed and developed by the EBA[1], along with national banking supervisors (in our case, the Bank of Spain), the European Commission and the European Central Bank. Their aim is to assess the ability of the European banking system to withstand adverse scenarios, and thus lend transparency to the market, as well as establishing the additional capital required to ensure the solvency of the banking sector and its components in stressful scenarios.

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[1] The European Banking Authority (EBA) is composed of senior representatives of bank supervisory authorities and central banks of the European Union. Its features include giving advice to the European Commission, on request, either within a time limit which the Commission may set depending on the urgency of the matter, or directly to the Committee itself, in particular as regards the preparation of draft measures within the scope of credit activities. It also has the task of ensuring EU directives are correctly implemented and the convergence of financial supervisory practices in member states across the whole European Community. The EBA officially began to operate on 1st January 2011 after the disappearance of the CEBS, and from then on, took over its duties and responsibilities.

One new feature we can point out, as regards the 2010 analysis, is the strengthening of the methodology of exercise, including macroeconomic assumptions, definitions of Core Tier 1 Capital and the ratio threshold (5% as opposed to a solvency ratio of 6%, in 2010).

Significant stress scenarios were taken into account in the evolution of the banking system's balance sheets by the effect of a significant increase in the risk premium to individual funding costs for each entity.

The European Commission designed, for this latest edition, a macroeconomic profile to calibrate the Spanish banking system's capacity to withstand the following adverse scenarios:

- Reduction in economic activity measured by a decrease of 1% in GDP for the year 2011 and 1.1% for the year 2012 (2.1% in cumulative terms).

- Predicted negative evolution of property prices in the period December 2010 to December 2012 of:

+ Housing: - 21.9%.
+ Commerce (including land): - 46.7%.

- Sudden fall in stock market index of 20.7 %[2].
- Unemployment rate of 21.50%.
- Increase in the cost of long-term public debt of 165 basis points (in other words, the stress tests have been performed assuming that the long-term rates in Spain would be around 6.5%).

In any case, these stress tests are theoretical predictions based on statistical simulations, and so should not be considered as evolutionary economic forecasts. At this point, therefore, it is worth remembering that Stress Tests are not forecasting applications, and so these models are more like the antithesis of the financial instability described by (**Borio and Drehmann 2011)**, as they have been designed for conditions that do not involve severe macroeconomic shocks. This year's Stress Tests were carried out taking into account the static, unchanging balances in the period analyzed, and so the initial data on which the estimates are based are the balance sheets at the close of 31st December 2010.

This paper aims to make a critical analysis of the latest edition of the stress tests. To achieve this objective, we have established a secondary aim: to examine the financial and patrimonial situation of some the European and Spanish banks in the period 2010-2012, taking into account the relevant EBA index.

In this article, we will also present an economic, financial and statistical analysis of the consequences of critical scenarios designed for this edition of the stress test: turnover cuts and the

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[2] In the period from 1-10 August 2011, the Ibex-35 index lost 8,000 points, which meant that in this period there had been a decrease of 17.2%.

occurrence of losses, particularly in the loan portfolio, which significantly affect the deterioration of assets.

## 2. EBA REFERENCE POINTS FOR IMPLEMENTING STRESS TESTS

Before developing this point, we must take into account a basic question about the possible ways there are of processing information, such as the commonest and most accurate software used for empirical analysis in the fields of IT and social sciences.

The scenario map models are processes in which a wide variety of tools and stages are used. Basically, there are two kinds of processes of these types of models, "bottom-up" and "top-down". In the second category, the supervisor evaluates the internal models of each bank to process the information.

A combination of the two was used in this edition of the Stress Tests by the EBA as well as in other initiatives, such as the Supervisory Capital Assessment Program (SCAP) or the Board of Governors of the Federal Reserve System (2009).

### 2.1. SOVEREIGN DEBT AND CORPORATE FINANCING IN THE INVESTMENT PORTFOLIO

As far as fundamental credit analysis is concerned, the risk was assessed using one of the following two methods:

- IRB Methodology (Basel), adapted to EBA norms, in which each banking organization must assess these types of scenarios based on the evolution of the probability of default (PD) for its loss given default (LGD) and carried out through two possible approaches, unexpected losses (UL) and expected losses (EL).

- Standard Method: like the Basel provisions, banks based their analysis and valuation on established by the ECAI[3] ratings. Depending on the starting qualification level, the following options could be used to evaluate the rating:

* AAA / Aaa: rating would be unchanged
* AA / Aa2 to A- / A3: rating would be lowered two categories.
* BBB + / Baa1 or less: rating would be lowered four categories with soil (CCC or junk bond).

In Spain's case, in particular, the sovereign debt rating according to the different agencies was, at that time[4], as follows:

* Moody's: Aa2 with a negative outlook.

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[3] External credit assessment or credit rating institutions/agencies.
[4] http://www.bloomberg.com/Bloomberg, (1st June 2011).

\* Standard & Poor's: AA with a negative outlook.

\* Fitch: AA +: with a negative outlook.

A guide provided by the European supervisor EBA (2011) quantified the impact of sovereign debt on the investment portfolio, stating that the worst case scenario (the lowest rating, CCC, or equivalent) would involve significant assumptions based on corporate standards with a default probability of around 36.5%.

## 2.2. INCREASES IN SOVEREIGN DEBT EXPOSURE IN THE TRADING PORTFOLIO

After reading the EBA review, the most striking cases in point were Greece, Ireland, Portugal and, to a lesser degree, Cyprus. As far as Spain is concerned, the EBA did not alter the initially established rating, which in the author's point of view was an error, because only a few months later, the markets themselves changed the main points of this approach.

Table 1, below, shows the main EBA reference points for implementing the Stress Tests and their impact:

**Figure 1: EBA Reference Points for running Stress Tests**
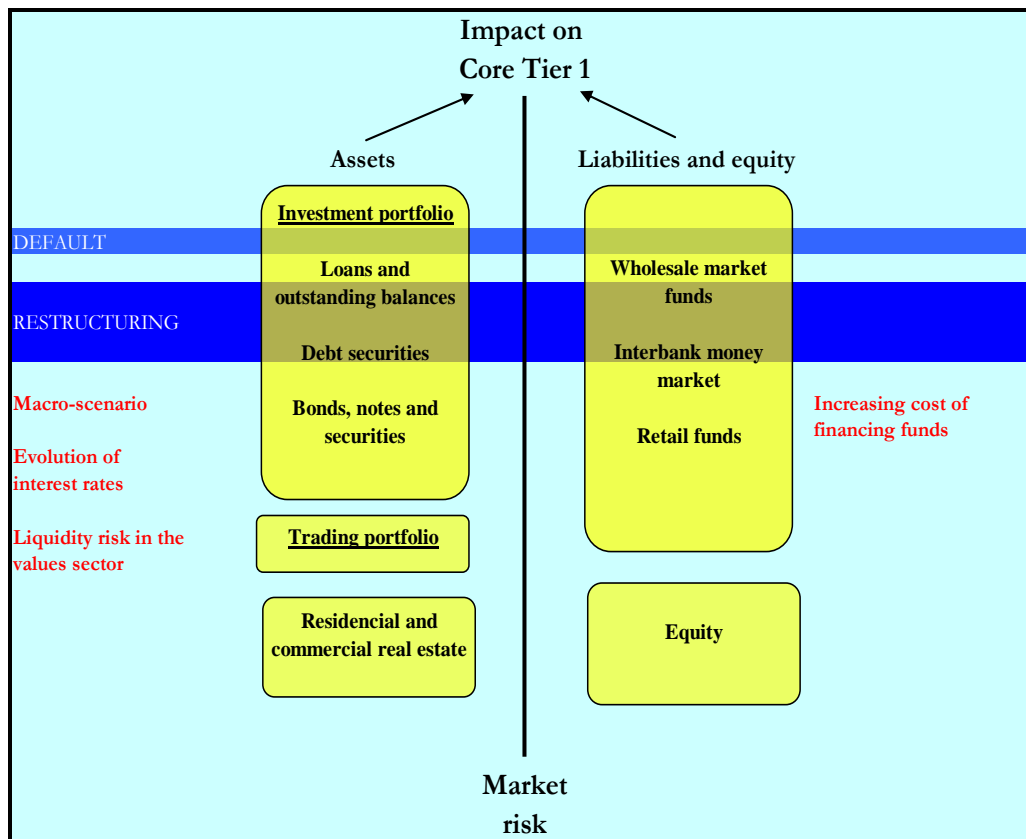


(Compiled by the authors from EBA data)

## 3. BASIC ECONOMETRIC PRINCIPLES TO TAKE INTO ACCOUNT

It is very important to bear in mind that Stress Tests are based on non-linear models **(Drehmann et al., 2007; Juselius and Kim, 2011)** and their econometric support is poor. The reason for this assertion lies in the fact that these models do not record satisfactorily the effects of episodes of

stress. Linear models, to be exact, tend to show responses to such eventualities **(Alfaro and Drehmann, 2009)**, but the degree of trust is extremely limited: the relevant episodes (in the present case of a macroeconomic profile designed by the EBA) are rarely completely covered and are therefore inconsistent. That is the reason why models tend to show inaccuracies precisely during episodes of stress.

## 4. EMPIRICAL STUDY OF KEY STATISTICS IN THE SPANISH BANKING SYSTEM EXAMINED BY STRESS TESTS.

### 4.1. PRELIMINARY NOTES ON THE STATE OF SOLVENCY AND FINANCIAL MANAGEMENT IN THE SPANISH FINANCIAL SYSTEM.

Before discussing the statistical analysis of the results of the Stress Test, we will analyze the normal ratios in the banking industry. As reference, we will cite two different scenarios from the Consolidated Balance Sheet of Credit Institutions of Spain, as well as Banking Supervision Records from the Bank of Spain (2007 to 2010), **(Calvo, 2010; Tamames, 1985 and 1996)**. For this analysis, the comparative table is shown below for the years 1985 to 2010

**Table 1: Solvency and financial management ratios for the Spanish credit system**

| SOLVENCY AND FINANCIAL MANAGEMENT RATIOS | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | 29/11/1985 | 30/04/1996 | 31/12/2000 | 31/05/2006 | 31/03/2008 | 31/12/2010 | 31/12/2010 + Recapitalizatión |
| **SOLVENCY RATIO** $\frac{\text{Net Equity}}{\text{Total Liabilites}}$ x100 | 9.55% | 9.98% | 7.59% | 8.03% | 7.94% | 5.95% | 6,84% |
| **LEVERAGING** $\frac{\text{Total Liabilities}}{\text{Net Equity}}$ | 10.47 | 10.02 | 13.18 | 12.46 | 12,59 | 16.79 | 14.61 |
| **PASSIVE RATIO** $\frac{\text{Total Liabilities}}{\text{Total assets}}$ x100 | 91.28% | 90.92% | 92.95% | 92.57% | 92,64% | 94.38% | 93.60% |
| **NET EQUITY RATIO** $\frac{\text{Net Equity}}{\text{Total assets}}$ x100 | 8.72% | 9.08% | 7.05% | 7.43% | 7.36% | 5.62% | 6.40% |

Compiled by the authors from the Bank of Spain Banking Supervision Records and the Manual of the Spanish Financial System (CALVO, J, 2010)

From the above table, it can be deduced, among other points, that:

1. - In 1985, the Spanish credit system had a solvency of 9.55%, and went on to raise this level to nearly 10% in 1996. Between 2000 and 2008, it remained at around 8%; however, at the end of 2010, it fell to 5.95%. We must remember that these solvency ratios, from the general public's perspective, and even more so from clients, investors and the State's point of view, were not exactly ideal: only 5.95% of equity and 94.05% of external funds does not exactly reflect a situation of "solvency" for an organization belonging to the financial sector.

2. – The leverage of the Spanish financial system in 1985 and 1996 was rated at around 10. Already in 2000, this indicator rose significantly to stand at 13.18, showing that debt was gaining ground in the economic balance. However from 2006, this figure improved and settled at around 12.5. However, in 2010, it rose again to 16.79, which shows that equity itself had lost prominence at the expense of debt. Therefore, if we take the first scenario as a reference point and compare it with the year-end 2010, the credit system had increased its leverage significantly.

3. – As for the ratio of liabilities in the year 1985, for every € 100 of economic structure of the Spanish credit system balance, borrowed funds accounted for € 91.28 of that figure, and remained in the range of € 90-92.6 for the period 1996 to 1998. However, at the end of 2010, for every € 100 of assets, € 94.38 was financed by external sources.

4. - Finally, as regards the net equity ratio, starting at figures of around 9% until 1996, this ratio shows us that the equity financed total investment in 2000 at a rate of € 7.05 for every € 100; and 10 years later, this occurred at a rate of € 5.62 in € 100. The ratio also indicates that for every € 100 of total financial structure in 2000, € 7.05 was equity in 2000 and a decade later, € 5.62. This means that the participation of debt in the financial structure is becoming greater and greater. It must also be remembered that this ratio shows unmistakable signs of weakness.

## 4.2. DATA SOURCE FOR STATISTICAL ANALYSIS OF STRESS TEST RESULTS

Results of the stress tests can be viewed on the EDPS website, with a sample of Spanish banks EBA (2011 a). Below is a statistical analysis of this data, taking into account the solvency ratios with different elements of loss absorption.

## 4.3. REGULATORY CAPITAL RECONCILIATION AND EXTRACTION OF CORE TIER 1

It should be noted that these stress tests were implemented on the basis that banks, savings banks and SIPs[5] were able to strengthen their balance sheets during the first four months of the year 2011 by increasing their capital and obligatory restructuring plans.

The Spanish banking system made significant increases in equity before the end of April 2011 to ensure its resilience in the EBA stress tests of that year. In the Spanish banking system sample analyzed, equity was increased by € 41,208 million. This was achieved by different means: Ordinary Capital gains (Common Equity) derived from RDI 2/2011, private market funding, general provisions, convertible bonds, divestitures or capital gains, in the following way:

- Ordinary Capital increases (Common Equity) derived from RDI 2/2011 to the value of € 14,472 million.
- Amounts deriving from general provisions up to December 31, 2010 of € 17,752 million.
- Convertible bonds and other instruments amounting to € 9,164 million.

The figures given above can be shown in relative values using the graph below:

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[5] Integration formula for credit companies without loss of legal personality.

**Graph 1: Increase in Heritage in Spanish Banking System (January-April 2011)**
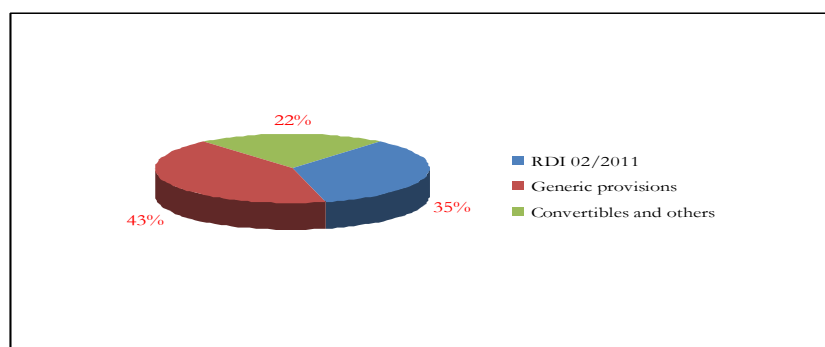


(Compiled by the authors from EBA data)

Equity, as measured by the estimated regulatory capital according to the definition of the EBA to December 2010, for the sample we analyzed, amounted, in the baseline scenario, to € 139,863 million (Core Tier 1 of 7.4% of the sum of weighted assets based on static balance in an unstressed scenario, amounting to € 1,900,519 million).

After discounting the net damage or surpluses and the effects of dividends and other items, we arrive at a net regulatory capital in absolute terms amounting to € 130,064 million.

If we add to this figure the RDI 2/2011 capital of € 14,472 million or capital increases, equity for the sample tested in the stressed scenario would amount to € 144,536 million (Core Tier 1 of 7.3% of € 1,991,274 million). We can illustrate this in the table below, which shows the figures discussed above:

**Table 2: Reconciliation of Regulatory Capital in base and stress scenarios**

| REGULATORY CAPITAL RECONCILIATION IN BOTH SCENARIOS | |
|---|---|
| In millions of euros | |
| REGULATORY CAPITAL RECONCILIATION IN BOTH SCENARIOS In millions of euros I - REGULATORY CAPITAL (SCF | 139,963 |
| II.- Net Deterioration | -13,598 |
| III.-Dividends & others | 3,799 |
| IV. -Regulatory Capital without RDL 2/2011 and with no increases in capital * (I+II+III) | 130,064 |
| V.- Increase in capital dervied from RDl 2/2011 + private emissions | 14,472 |
| VI.- REGULATORY CAPITAL IN STRESSED SCENARIO WITHOUT RDL 2/2011 OR INCREASES OF CAPITAL (IV+V) | 144,536 |
| * Includes emissions of capital and debentures converted during the period of stress, where the decision was taken between 01.01.2011 and 30.04.2011. | |

(Compiled by the authors from EBA information)

The addition of the sample considered would evolve in the following way: starting from a solvency as measured by Core Tier 1 of the initial stage at the year-end 2010 of 7.4%, it would decrease to 7.3% in a stressed scenario two years later (a fall of 0.1%).

The volume of final Regulatory Capital, as defined by the EBA, would be € 171,271 million, a figure which represents a Core Tier 1 of 8.6% of the € 1,991,274 million weighted assets mentioned above. The table below illustrates the different factors involved in obtaining the final Regulatory Capital.

**Table 3: Obtaining the Final Regulatory Capital**

| OBTAINING THE FINAL REGULATORY CAPITAL | |
|---|---|
| In millions of euros | |
| I.- Regulatory capital without RDL 2/2011 or increases in Capital | 144,536 |
| II.- General provisions * | 17,572 |
| III.- Regulatory capital with general provisions (I+II) | 162,108 |
| IV.- Divestments and other business deceisions up to 30.04.2011 | 2,483 |
| V.- Other mandatory convertible bonds | 5,417 |
| VI.- Others | 1,264 |
| VII.- Regulatory capital as of Dec 2012, with other elements which absorb losses (III+IV+V+VI) | 171,272 |

(Compiled by the authors from EBA information)

In addition, risk assets (the denominator of Core Tier 1) would rise from € 1,900,519 million in an unstressed baseline scenario to € 1,991,274 million in the adverse scenario (a rise of 4.8%). This increase is particularly important in light of the rationale used by the EBA for considering balance in static terms, which leads to zero growth in nominal terms. Moreover, it should be noted that this increase in RWA is basically due to the change in valuation of assets of credit risk (IRB approach) and in particular because of assets which are considered to have failed.

In this adverse scenario, there would be 7 financial institutions with a Core Tier 1 in the range of 5-6%. The breakdown by institutions and ranking is shown in the graph below:

**Graph 2: Number of Spanish banks, classified by Core Tier 1 ranking**
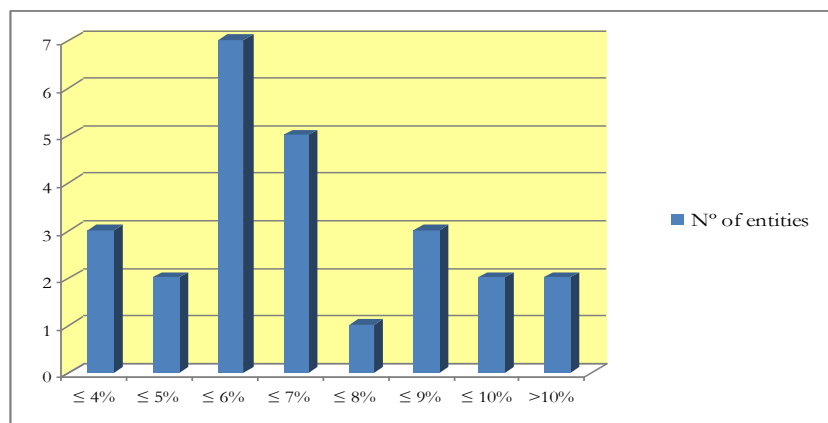


(Compiled by the authors from EBA data)

While the aggregate capital shows an average well above the 5% threshold even in a stressed scenario, the dispersion, in the case of financial institutions in the analyzed sample, shows quite different results with a considerable degree of dispersion.

If we apply the Core Tier 1 differential to both scenarios (baseline and stressed), the following conclusions can be reached:

1. The largest negative differential would be that of BBVA and Banca March, which would accumulate a -1.3 percentage point difference, which would indicate that despite the impact of the macroeconomic table designed by the EBA, they would improve their solvency as measured by Core Tier 1.

2. At the other extreme would be Colonya-Caixa: what is most noticeable is the baseline scenario with a Core Tier 1 of 11.2% from 6.2% in the stressed scenario, which would mean a loss of solvency of 500 basis points. Another entity that shows a decline in solvency in these circumstances would be Banco Pastor, by 4.3% (we should remember they have already been absorbed by Banco Popular).

## 5. EUROPEAN BANKS, A STUDY CASE: DEXIA

In 2011, what happened to the French-Belgian bank Dexia had a special impact. Here is an analysis of its capital structure, its risk and its solvency.

First, solvency will be analyzed through the Core Tire 1 (expressed in millions of euros) in EBA base and stress scenarios (2011 d). The analysis uses the Core Tier 1 ratio:

$$\text{Core Tier 1} = \frac{\text{Tier 1 Ordinary Capital or Basic Capital}}{\text{Risk-weighted Assets (RWA)}}$$

$$\text{Core Tier 1 (December 2010)} = \frac{17{,}002}{140{,}835} \times 100 \quad \Longrightarrow \quad 12.1\%$$

$$\text{Core Tier 1 (December 2012)} = \frac{15{,}204}{146{,}439} \times 100 \quad \Longrightarrow \quad 10.4\%$$

However, in order to analyze the situation in greater detail, the attached table shows the different components of this financial institution's capital up to 30 June 2010, compared with the same period of 2011, by cumulative quarterly periods (latest data given 30/06/2011) by Dexia and CreditSights (2011):

**Table 4: Reconciliation of Dexia Capital**

| CONCILIATION OF CAPITAL | 30/06/11 | 31/03/11 | 31/12/10 | 30/09/10 | 30/06/2010 |
|---|---|---|---|---|---|
| I  BASIC CAPITAL | 14,426 | 18,635 | 18,743 | 18,903 | 18,852 |
| II  Minority participations | 679 | 663 | 660 | 645 | 644 |
| III  Deduction of trading fund and other intangible assets | -1,941 | -2,169 | -2,262 | -2,422 | -2,492 |
| IV  Regulatory adjustments | -139 | -139 | -139 | -139 | -139 |
| V  CORE TIER 1 (I+II+III+IV) | 13,025 | 16,990 | 17,002 | 16,987 | 16,865 |
| VI  Hybrid debt/capital instruments | 1,423 | 1,452 | 1,423 | 1,431 | 1,351 |
| VII  TIER 1 CAPITAL (V+VI) | 14,448 | 18,442 | 18,425 | 18,418 | 18,216 |
| VIII  Supplementary capital | 3,215 | 3,063 | 3,417 | 3,198 | 3,617 |
| IX  Regulatory adjustments | -1,191 | -1,250 | -1,206 | -955 | -1,125 |
| X  TOTAL REGULATORY CAPITAL (VII+VIII+IX) | 16,472 | 20,255 | 20,636 | 20,661 | 20,708 |
| Millions of euros | | | | | |

(Compiled by the authors from CreditSights and Dexia data)

From the above, it follows that:

- By 30/06/11, the Core Tier 1 decreased compared with the previous quarter by € 3,965 million (down 23.33%).

- In this case, Total Regulatory Capital fell in the same time period by the sum of € 3,783 million (a decrease of 18.67%).

The table below analyzes the Risk-Weighted Assets during this same period (30/06/2010 to 30/06/2011) for Dexia and CreditSights (2011), relating them to the capital figures in the table above, which produces solvency ratios which are also presented below:

**Table 5: Risk-weighted assets and capital ratios of Dexia**

| Risk-weighted assets (RWA) | | | | | |
|---|---|---|---|---|---|
| (Millions of euros) | | | | | |
| | 30/06/11 | 31/03/11 | 31/12/10 | 30/09/10 | 30/06/2010 |
| Credit risk | 110,169 | 125,499 | 128,240 | 130,292 | 135,537 |
| Market risk | 7,183 | 2,983 | 2,945 | 3,251 | 3,298 |
| Operative risk | 9,650 | 9,650 | 9,650 | 10,419 | 10,419 |
| TOTAL RWA | 127,002 | 138,132 | 140,835 | 143,962 | 149,254 |
| Capital Ratios | | | | | |
| | 30/06/11 | 31/03/11 | 31/12/10 | 30/09/10 | 30/06/2010 |
| Core Tier 1 capital ratio | 10.3% | 12.3% | 12.1% | 11.8% | 11.3% |
| Tier 1 capital ratio | 11.4% | 13.4% | 13.1% | 12.8% | 12.2% |
| Total capital ratio | 13.0% | 14.7% | 14.7% | 14.4% | 13.9% |

(Compiled by the authors from CreditSights and Dexia data)

Therefore, it can be stated that Dexia's solvency was affected primarily because the effect of the deterioration of the different components of capital exceeded the reduction of the risk weighted assets.

What happened last August was particularly interesting: this entity published quarterly losses as a result of the deterioration of its Greek debt portfolio.

Next, we will analyze its credit risk: this entity on 31-12-2010 had a direct position of exposure to gross sovereign debt amounting to € 56,245 million EBA (2011 c). Of this sum, € 3,462 million (i.e. 6.15%) was Greek debt, € 1,927m (3.42%) Portuguese, € 15,009m (26.68%) Italian and € 1,443m (2.56%) was Spanish.

Even more surprising was the European supervisor EBA ruling (2011 b): the sovereign debt rating according to ECAI (this brought the possibility of PD default at each step in the ECAI ratings which was assigned by the EBA at the time) was:

**\* Greece:**

- Moody's: B1.

- Standard & Poors: B.

- Fitch: B+

This step in the ECAI ratings was assigned by the EBA a PD of 5.78%.\*

**\*Italy:**

- Moody's: Aa2, stable outlook.

- Standard & Poor's: A+, negative outlook.

- Fitch: AA-, negative outlook.

This step in the ECAI ratings was assigned by the EBA a PD of 0.18%.

**\* Portugal:**

- Moody's: Baa1, stable outlook.

- Standard & Poor's: BBB-, negative outlook.

- Fitch: BBB-.

This step in the ECAI ratings was assigned by the EBA a PD of 1.17%.

If we analyse the events now with hindsight (the publication date of the Stress Test was July 11 and the publication date of the losses by the company was 15 August 2011), the supervisor undoubtedly made a serious error. In particular, the rationale used by the EBA to consider this asset at a fair value and not to have accounted for it at market value was a mistake. The above statements are supported by the following arguments:

a. - This bank revealed, after bank stress tests, € 10,000m of unrealized losses to date in its trading portfolio, of which € 7,000m was sovereign debt. This was due primarily to a reclassification carried out by the bank on its financial situation. We must bear in mind that the assets that any bank has in its trading portfolio may lead to losses in recessionary periods as a result of their adjustment to a fair value. Banks are able to transfer those assets to their investment portfolio and avoid future losses, according to the provisions of an amendment by the International Accounting Standards Board[6] to the International Accounting Standard No. 39: Recognition and Measurement and IFRS 7 Financial Instruments: Disclosures (IASB 2008).

The above legislation establishes that such transfers between trading and investment portfolios as a result of unrealized losses (as might be the case of differential market value and fair value) must be deducted from the total equity of the entity in question (and not on Core Tier 1). It is precisely at

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[6] The IASB was founded on April 1, 2001 as the successor to the International Accounting Standards Committee (IASC). It is responsible for developing International Financial Reporting Standards (the new name for International Accounting Standards issued after 2001), and promoting the use and application of these standards.

this point where some of the triggers of the current situation of Dexia can be found, since this option was used widely and continuously, leading to the situation that its Core Tier 1 feigned robustness when analyzed by the EBA in the Stress Test.

b. – Similarly, we can state that the trigger may have been the risk weighting: government debt is not always without risk and even more so in the case of the Greek government (with a 5.78% possibility of default)

c. – It should be added that the impact on tangible equity of this entity was not actually taken into account: it was based on total tangible assets, not adjusted assets, as in the case of Basel II. The tangible common equity of a bank can be defined as the sum of total equity plus the non-controlling participation in the subsidiaries, minus mercantile credit and unamortized intangible assets.

Tangible common equity is calculated by dividing tangible common equity between risk-weighted assets. In the financial sector, this difference in concept and approach may be considerable. The table below shows the data from this entity for the period 30/06/2010 to 30/06/2011, by cumulative quarters, compiled by Dexia and CreditSights (2011):

**Table 6: Ratio of Dexia's Tangible Capital**

| Tangible Capital Ratio | | | | | |
|---|---|---|---|---|---|
| | 30/06/11 | 31/03/2011 | 31/12/10 | 30/09/10 | 30/06/2010 |
| Total consolidated assets (millions of euros) | 517,747 | 526,636 | 566,735 | 588,054 | 608,510 |
| RWA/Total consolidated assets | 24.5% | 26.2% | 24.9% | 24.5% | 24.5% |
| Consolidated equity; including minority (millions of euros) | 8,761 | 11,453 | 10,728 | 10,830 | 9,331 |
| Tangible Capital Ratio | 1.7% | 2.2% | 1.9% | 1.8% | 1.5% |
| Core Tier 1 / tangible assets | 2.5% | 3.2% | 3.0% | 2.9% | 2.8% |
| Tangible Capital Ratio / Core Tier 1 capital ratio | 16.5% | 17.7% | 15.7% | 15.6% | 13.6% |

(Compiled by the authors from CreditSights data)

From the above, it can be deduced that, regarding Tangible Capital Ratio, for every € 100 of total assets, including risk-weighted assets, Dexia had € 1.9% of Tangible Common Equity available on 31-12-2010 (and 1.7% six months later). What is most striking is not how this coefficient has evolved, but its amount, which is clearly lower than the European sector average (average of 4%) or the American sector average (average ranging from 6% to 7%).

It is also vital to analyze the relationship between Tangible Capital Ratio and Core Tier 1 Capital Ratio, since, as of 30/06/2011, it stood at 16.5%, which resulted in a low level of the highest quality capital among all the equity considered by the EBA for the implementation of the Stress Tests.

Finally, as of September 30th, 2011, other information must be added which attests to the weakness of the financial institution analyzed and the inadequacy of the solvency ratios used by Dexia (2011). At that date, the entity's balance, € 412,000 million, was backed by a net equity of as little as € 1,100 million. However, the Core Tier 1 calculation made at the same date produced a score of € 7,800 million, or 9.9%.

**6. NEW CAPITAL REQUIREMENTS FROM THE EUROPEAN BANKING SYSTEM**

On October 26th 2011, the EBA, following the agreement reached by the European Council on the plan to recapitalize European banks, published the Core Tier 1 figures needed for the affected Spanish banking sector to reach the 9% threshold set by that body. The deadline given to the sector to reach the agreed figures was June 30th 2012. The total amounted to € 26,162 million.

However, it must be noted that the above figure was only provisional in nature, since the final calculation was modified, on December 8th, to produce a definitive calculation for the group of five Spanish banks affected of € 26,171 million, a figure that includes the exposure to sovereign entities included in the year up to September 30th, 2011.

If we analyze the sample of European banks as a whole, as of June 30th 2012, the 65 banks surveyed are also required to reach a Core Tier 1 of 9% of their risk weighted assets (RWA). This component of capital was calculated as a net figure, including valuation losses on sovereign debt exposures at September 30, 2011. In the following graph, with the data available on the European supervisor website, EBA (2011 e), on a logarithmic scale (base 10), the ordinate shows the Core Tier 1 (net sovereign debt) and the abscissa the different scenarios of RWA. The banks are shown beneath the regression line (capital = 0.09 RWA); these had, as of late September 2011, a rate below the 9% target with a total deficit of € 84,685 million. The aggregate deficit of the 71 banks in the EBA sample amounted to € 114,685 million, a figure that includes six Greek banks.

**Graph 3: Recapitalization of the European banking system**
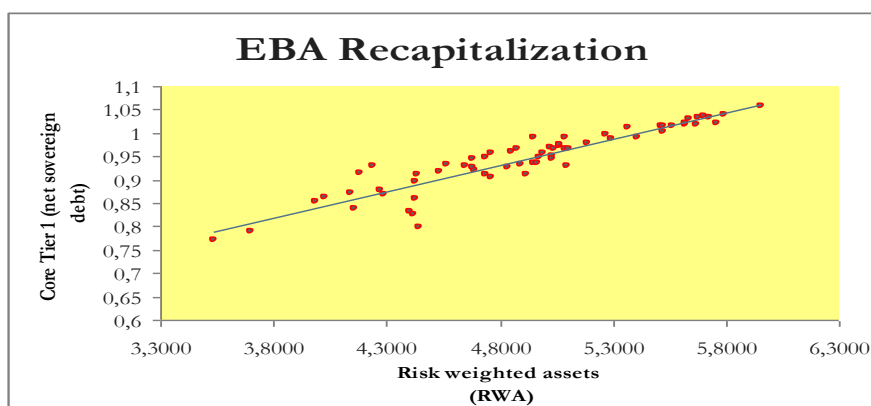


(Compiled by the authors from EBA data)

**7. MACROECONOMIC CONSEQUENCES OF THE NEW CAPITAL REQUIREMENTS**

The decision of the EBA to anticipate the Basel III recommendations and apply them prior to June 2012 has serious overtones as a result of the adverse scenarios for European economies. To meet the needs estimated by the European supervisor in Spain's particular case, as discussed in the previous section, the recapitalization reached by that body was initially € 26,162 million, for the five banks involved . According to a study by Barclays Capital[7], this figure would mean a conversion of Core Tier 1 to risk weighted assets of over € 290,000 million.

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[7] See Appendix 1.

This study estimates at € 727,000 million the total assets affected by this conversion. In any case, according to the banks affected, we should consider that the net capital requirements would amount to € 15,871 million after calculating the convertible debt. This would mean, according to this study, around € 433,000 million of assets which Spanish banks would have to get rid of in the unlikely event of them not generating enough capital, a figure which represents around 40% of Spain's GDP and 12% of the assets of the Spanish financial system as a whole.

## 8. CONCLUSIONS

From the study of the regulations and economic data analyzed, it can be concluded that European supervision and standards seek to strengthen the foundations of the European system and try to implement an improvement in regional financial stability. It also pursues the incentive of establishing new liquidity standards and tries to avoid accumulation as well as leverage in the banks.

This does not take into account that the application of stress tests may have suffered a certain laxity in the following areas:

- Some lobbyists in the industrial sector have argued that given the diversity of the sector, the Minimum Total Capital Ratio does not apply uniformly to all of them.

- It can be stated that there are certain gaps in the basic considerations such as deferred assets or the discount on financial holdings in insurance companies.

- It is a fact that, due to the diversity of regulations and supervision of domestic banking systems of each country, certain differences do exist as regards areas such as preferred stock or countercyclical provisions.

- The preponderance of the EBA Core Tier 1, without considering other solvency ratios which are very common in this sector, such as tangible capital.

- Evaluation criteria followed by the EBA of the sovereign debt on the balance sheets in banks, starting from its fair value and not updating to their market value at the time of the initial estimates.

Since the launching of banking supervision on a national level with the birth of the Basel Supervisory Committee in February 1974, it can be seen, just as we have discussed in section 4.1 of this study, that there has been a significant decline in the % of Net Equity of the Spanish Credit System over total assets. Thus, it fell from levels of around 9% in 1985 and 1996, to about half that figure (5.62%) in 2010.

It should be added that the aggregate Net Asset Value in the year 2010 and the recapitalization estimated by the EBA (section 6 of this study), would reach a level of Equity / Assets which would not even exceed the level analysed in March 2008, when it stood at 7.43%, just as has been shown in section 4.1, nor even the 1985 records.

Given that Equity constitutes, or at least should constitute, a security strip for creditors in general, we can say that this basic criterion of solvency has deteriorated.

Therefore, all the financial engineering that the EBA proposes is carried out on a net equity which is obviously insufficient.

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**APPENDIX**

**Table 7: Macroeconomic impact of EBA capital requirements.**

| Country | Estimation of EBA recapitalization | Transposition from Core Tier 1 to RWA | Estimation of Weighted Risk (*) | % GPD | % of assets of financial system |
|---|---|---|---|---|---|
| Cyprus | 3,587 | 39,856 | 99,639 | 571% | 73% |
| Greece | 30,000 | 333,333 | 833,333 | 362% | 170% |
| Portugal | 7,804 | 86,711 | 216,778 | 126% | 38% |
| Spain | 26,162 | 290,678 | 726,694 | 68% | 20% |
| Belgium | 4,143 | 46,033 | 115,083 | 33% | 10% |
| Austria | 2,938 | 32,644 | 81,611 | 29% | 8% |
| Italy | 14,771 | 164,122 | 410,306 | 26% | 10% |
| Slovenia | 297 | 3,300 | 8,250 | 23% | 16% |
| France | 8,844 | 98,267 | 245,667 | 13% | 3% |
| Norway | 1,312 | 14,578 | 36,444 | 11% | 5% |
| Switzerland | 1,358 | 15,100 | 37,750 | 10% | 3% |
| Germany | 5,184 | 57,600 | 144,000 | 6% | 2% |
| Denmark | 47 | 522 | 1,306 | 1% | 0% |
| **Totals** | **106,447** | **1,182,744** | **2,956,861** | **33%** | **10%** |
| Absolute figures in millions of euros. | | | | | |
| (*) Around 40% of assets | | | | | |

(Compiled by the authors from Barclays Capital data)