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MARKET REACTION TO THE ADOPTION OF BASEL ACCORDS IN THE EUROPEAN BANKING INDUSTRY

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Abstract

This study examines European stock market reactions to 14 events associated with the adoption and implementation of Basel Accords II and III in Europe. European banking industry was and still is in the middle of an economic turmoil. Various agents affiliate them with the financial crisis, creating controversy reaching the highest levels of government and governance. We detect an all-around positive reaction to the progressive adoption of the Basel Accords, in accordance with what was expected. We find two exceptions to what was expected: banks based in common law countries do not behave much differently from the others; and banks based in countries in EU admission processes during our period of analysis reflect a more robust positive reaction. We observe that it is indifferent for investors the bank size, the benefits perceived are similar in bigger and smaller banks, since the risk of failure is not seen separately for each bank. Finally, we find a higher positive reaction to Basel accords events in banks with stronger Core Tier 1 Capital ratios; the investors perceive these banks as having stronger shock absorbers.

Key Words: Basel Accords, Banks, BCBS, Europe

JEL Classification: G14, G18, K20

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Resumo

Este trabalho estuda as reações nas bolsas Europeias a 14 eventos associados com a adoção e implementação dos Acordos de Basileia II e III na Europa. A banca Europeia tem estado e continua a estar no centro das atenções no mundo económico. Vários agentes financeiros relacionam-na com a crise financeira, criando vários focos de controvérsia, chegando mesmo aos mais altos níveis da gestão governamental Europeia. Detetamos uma reação geral positiva à adoção progressiva dos Acordos de Basileia, em conformidade com o que era esperado. Encontramos duas exceções ao que era esperado: os bancos sediados em países de direito comum não se comportam de forma muito diferente dos restantes, e os bancos sediados em países em processos de admissão à UE durante o nosso período de análise refletem uma reação positiva mais robusta que os demais. Observamos ainda que é indiferente para os investidores a dimensão do banco, os benefícios percebidos são semelhantes em bancos maiores ou em bancos com menor dimensão, uma vez que o risco de queda é analisado isoladamente para cada banco. Finalmente, encontramos uma reação positiva superior aos eventos relacionados com os Acordos de Basileia em bancos com rácios de capital Core Tier 1 mais robustos, os investidores identificam nestes bancos forte capacidade de resistência a choques financeiros.

Palavras-chave: Acordos Basileia, Bancos, BCBS, Europa
Classificação JEL: G14, G18, K20

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Sumário Executivo

Este trabalho estuda as reações nas bolsas Europeias a 14 eventos considerados relevantes e associados com a adoção e implementação dos Acordos de Basileia II e III na Europa. O período de análise está compreendido entre 1 de Janeiro de 2004 e 31 de Março de 2012. Desde 1975, que o BCBS (Basel Committee on Banking Supervision) estuda o mercado bancário e emite orientações para os seus membros, por forma a conseguir-se um maior e melhor controlo do mercado. A banca Europeia tem estado e continua a estar no centro de um turbilhão económico. Vários agentes financeiros relacionam-na com a crise financeira, criando vários focos de controvérsia, chegando mesmo aos mais altos níveis da gestão governamental Europeia.

Utilizámos na nossa análise alguns métodos de estudo de eventos como o método "three-day value-weighted market-adjusted return" e o método "cumulative average abnormal returns". Estes métodos foram aplicados à capitalização bolsista de 217 bancos europeus durante o período de análise. Efetuaram-se, ainda, vários testes de impactos cross-sectional entre as variáveis que considerámos relevantes neste estudo e vários testes de robustez à qualidade da informação e dos resultados, recorrendo por vezes a benchmarks semelhantes à nossa amostra de eventos.

Detetamos uma reação geral positiva à adoção progressiva dos Acordos de Basileia, em conformidade com o que era esperado. Segmentámos a nossa amostra em 4 realidades, por forma a tentar encontrar resultados mais relevantes e robustos (admissão à EU; regime legal do país de sede; dimensão do banco; Rácio de Core Tier 1 de cada banco). Encontrámos duas exceções ao que era esperado: os bancos sediados em países de direito comum não se comportam de forma muito diferente dos restantes, e os bancos sediados em países em processos de admissão à UE durante o nosso período de análise refletem uma reação positiva mais robusta que os demais. Observamos ainda que é indiferente para os investidores a dimensão do banco, os benefícios percebidos são semelhantes em bancos maiores ou em bancos com menor dimensão, uma vez que o risco de queda não é analisado isoladamente para cada banco. Finalmente, encontramos uma reação positiva aos eventos relacionados com os Acordos de Basileia em bancos com rácios de capital Core Tier 1 mais robustos, os investidores identificam nestes bancos forte capacidade de resistência a choques financeiros.

I. Introduction

This paper tries to study the impacts of new introductions in European banking supervision and legislation. Our period of analysis goes from January of 2004 until March of 2012, covering all the 14 events that we assessed was being relevant and related with the preparation and implementation of Basel II and Basel III Accords in the European banking industry. We measured and examined the impacts based on the investors' reaction to the referred relevant events, by looking in to the market capitalization of listed European banks.

Since 1975, that the BCBS issues guidelines regarding international standards on capital adequacy, core principles, effective banking supervision and cooperation in cross-border supervision. This culminated in the first main framework release in 1988, known as Basel I Accord. It introduced the first indications on credit risk measurement with a minimum capital standard of 8%. The objective was that Basel I should be in practice worldwide by the end of 1992. In 1995, BCBS started to think in a revision of the initial document and published a new proposal based on 3 pillars: minimum capital requirements, guidelines for banking supervision and effective and comparable financial disclosure in order to improve market discipline. The final framework was issued in June of 2004.

In September of 2008, a worldwide financial crisis burst conducting to Lehman Brothers bankruptcy, to the dismantlement and sale of Fortis Bank and to the collapse of the Icelandic financial system, amongst others. Concerning this financial crisis, the BCBS decided it was necessary an energetic response that brought back security, credibility and confidence to the market, reinforcing regulation, supervision and risk management. In order to obtain this, it was necessary to improve stress events resistance and shock absorbents in banks, to improve risk management and governance and to reinforce transparency in banks financial disclosure. Thus, the BCBS is working since 2009-2010 on a new response, an upgrade of the previous framework, issuing new documents which are called Basel III Accord. The main changes compared to previous documents are individual regulation, at a micro level (each bank), testing stress resistance capability, and macro supervision, looking at a cross-border level for the systemic risks and shock absorbers (Caruana, 2010).

We hope that investors react positively to the adoption of the measures provided in all the Basel Accords. But for that to happen, some conditions have to be fulfilled. For instance, if those investors perceive that the Basel Accords implementation will result in more benefits for themselves, increasing the control for calculations of credit, liquidity or market

risk along with increasing capital requirements, it is expected that they react positively. Adding to the previous points, more efficiency from the legislation and regulation entities conduct to a lower systemic risk and to a lower fear of financial losses by the investors.

On the other hand, there are still some assumptions that could indicate negative reactions to the Basel Accords adoption on the listed banking market. For example, if the investors are based in countries with low efficient stock markets or with legislation and regulation entities that usually do not act according to Basel Accords guidelines, one could expect a negative reaction. With the financial crisis in 2008, followed by the sovereign debts crisis, disbelief in new legislations is growing among the investors and they have difficulty to perceive any benefits in adopting such legislations.

Summarizing, for investors the main point is the positive or negative relation between Basel Accords perceived benefits and costs. In order to study this perception, we used three methods: a three-day value-weighted market-adjusted return for the market capitalization of 217 European banks in the Basel Accords 14 events assessed by us as being relevant for the adoption; a cross-sectional analysis taking in to account financial information quality, country legislation, EU membership, bank size and bank Core Capital TIER 1, again for the 14 relevant events previously referred; and a cumulative average abnormal returns, where we only studied six events due to our method restrictions.

No matter what the reality or segment observed, we found a positive mean return across events, in accordance with what our positive overall expectation. Thus, we detected an all-around accepted progressive adoption of the Basel Accords, the Basel II framework and the Basel III framework, as we look at our 14 relevant events together and not isolated.

Investors based in recently EU admitted countries or in countries applying for EU membership have a more robust positive reaction, probably due to admission requirements by the European Community, supported by many inspection initiatives made by the EU institutions to those countries. On the other hand, bank investors based in countries that are EU members denote to be more informed and to have more confidence in the market efficiency, relying more in the quality of financial disclosure. Contrary to what we expected, market reaction to Basel Accords implementation process in European countries with Common Law legislation do not behave much differently from the one in European countries with Code Law legislation, with no adoption difficulties and in some events with even higher positive reactions.

We did not find any material differences in the values of investors' reactions when we are speaking of banks with systemic risk dimension compared with the market reactions

observed in smaller banks. Investors are not differentiating their fears focused on bank dimension. Bigger banks investors realize that losses or bankruptcies in smaller banks will affect all the market and could result in systemic risks. Banks are reinforcing their Core Capital TIER 1 ratios, mainly because of authorities' legislation. But in the ones that still have less than 8% ratio, investors denote more doubts about the Basel Accords implementation process than others, having more difficulties perceiving the benefits compared with the inherent costs of such adoption. All the factors referred are important and relevant for our analysis; this becomes evident when we look to our cross-sectional results, where we reached a positive correlation between all of the variables. Positive and negative market reactions to Basel Accords implementation are well explicit graphically in our third analysis method, although sometimes we find impacts in our observation period from other events not related to Basel Accords adoption process, mainly concerning financial crisis events.

Various types of analysis reveal that our results are robust to alternative proxies for information quality, measures of standards enforcement environments and benchmarks returns.

Section II reviews the literature related with event study and with the Basel Accords adoption process, providing the basis for interpreting the market reaction to each event and in each scenario. Section III describes the 14 events description assessed by us as being relevant to the Basel Accords adoption process. Section IV discusses our methods and data design. Section V presents our results and Section VI concludes the study.

II. Literature Review

In order to make an event study paper, we have primarily to define an event, since event study methodology is the most common method in financial research. Peterson (1989) defines that the objective of this kind of study "*is to assess whether there are any abnormal or excess returns earned by security holders accompanying specific events*". Thus, what are specific events? Still the same author describes it as "*the release of information to market participants through the financial press or through corporate releases*", adding legislation introductions or some specific firm actions.

Our paper is based in event analysis but daily data generally present certain difficulties for event study methodologies. Some early studies in the 80's, found relatively powerful results for monthly returns (Brown & Warner, 1980), but more recent papers indicate that the same robust results can be found in daily event studies. However, these two types of data differ in potentially important aspects such as sample normality. We found various types of literature on this issue and how the particularities of the data affect the study on impacts of firm-specific or general market events (Brown & Warner, 1985). The main conclusions are that daily data can sometimes be advantageous, mainly when variance of returns excess around the event increases.

The type of event study to be used is available in a large variety of authors and many compare methodologies, like Corrado & Zivney (1992) did in their paper comparing a sign test with a t-test for abnormal stock prices returns. In finance, a sign test may be compared with a t-test to validate the statistical significance of an excess returns distribution, but both are very robust. Nevertheless, a sign test cannot be based in false assumptions, especially concerning the median of a sample.

In our paper, we use a little of both of these methods, we use the sign test in one of the methodologies to conclude on the predicted signal expected for the relevant events. But, more importantly, we use t-test for significance proposes, because this test is used by various papers on different areas of finance (Armstrong, Barth, Jagolinzer, & Riedl, 2010). By using it, the papers are able to analyze if the benchmark used is the correct one, just like Fama & MacBeth (1973) studied when they proved that portfolio returns associated with different events are uncorrelated, so the benchmark used for market adjustment should isolate the relevant events and exclude the non-events.

The market model is very relevant for us, so in the vast event study literature we found indications of the main method to use. It is important to market adjust our event returns, just like most of the authors defend. Primarily, because it is important to eliminate non-events confounding impacts in the investigations, leading the researchers to erroneously conclude (Campbell, Lo, & MacKinlay, 1997).

There are various types of event studies methodologies, all of them serve in proving or not stock market efficiency. For instance, earnings announcements in banking industry are very important for accounting and for investors; these investors have to perceive the market impact only after announcements, proving the market efficiency (Kothari & Warner, 2005). This means that all other areas are interested in event study such as accounting, law or economics, so the related literature is enormous, covering various methods.

Even with numerous researches on event study and a constant evolution in this area throughout the last four decades, publications like Fama, Fisher, Jensen, & Roll (1969) still are the main reference and basis for any author studying this kind of methodology. Following these fundamentals, Corrado (2011) tried to be more specific in his paper, investigating the optimal method for cross-sectional weighting of abnormal returns, concluding that the optimal method often depends from the alternative hypothesis to be tested. In other words, the comparisons made should be quite robust and mainly use more appropriated methods to the kind of sample used for the comparison.

The cross-sectional issue is also studied by other authors and found in other literature where the importance of the correlation between events is evident (Kolari & Pynnonen, 2010). Pynnonen and Kolari also studied alternatives to the t-test for this kind of correlation, primarily because they found that even low cross-sectional correlation among the abnormal returns may be relevant for the decision to reject the null hypothesis of obtaining a mean of zero in those abnormal returns of the sample.

Finally and related to one of the methods chosen in this paper, we want to refer an addiction in the previous discussed methodology. In the thesis developed by Rizzardi (2011) it is used a new element in the event study models accumulating the abnormal returns surrounding the relevant events before applying all the methods, sign tests or statistical tests. This gives a new sense to the analysis, because it studies how the market adjusted abnormal results evolve, becoming possible to draw more conclusions based on graphics.

Beyond reflecting on all the literature on event study methodology, it is extremely important to refer other papers that support the Basel Accords history and that led to our assumptions and expectations. To begin, historically the Bank for International Settlements

(BIS) was created in 1930 and had as his main resolution to supervise and potentiate the worldwide monetary and financial cooperation. In other words, it was a Bank serving the Central Banks from the Committee members. BIS has many discussion forums, but the most important in our study is the BCBS. This Committee defined the first guidelines for banking regulatory purposes that were adopted by 12 countries (G-10 plus Luxembourg and Switzerland) in 1988.

At that time it was very important to understand if the main objectives of capital ratio increasing (these ratios until then were seen as being too low) and of promoting financial stability, reviewing risk measure methods and making them more easy and general, were possible in a competitive environment (Van Roy, 2005). In the literature reviewed we found evidences that banks based in countries that adopt Basel Accords effectively increased their capital ratios, not being detected major modifications in credit risk policies. In other words, it was possible to find in those days some bank management adjustment, but not sufficient to become evident a market pressure to reduce investments risk in banks.

The risk management is one of the main issues for us, since errors or gains in risk management may provoke market reactions and mainly affect the investors' confidence level in the financial system (Caruana, 2010), in the supervisory entities and in the regulatory authorities. Central Banks have nowadays an increasingly higher relevance in defending the fundamentals written in Pillar 2 of Basel II, banking supervision (Goodhart, 2011). Additional macro-prudential and counter-cyclical instruments are indispensable, but a better control over their own balance sheet, deciding in a better way the investments in the systemic liquidity (lending to individual banks or buying individual banks bonds), is the main issue for many authors (Caruana, 2010). As it was proved by some of the authors reviewed, the first Basel Accords did not give the enough attention needed to the Pillar 3 fundamentals stated in Basel II and to the market discipline, becoming difficult to control systemic risk and leading in most cases to bankruptcies and banks nationalizations (Ojo, 2009).

Maybe the main fears and the main critics made to the first two Basel Accords derived from the increasing procyclicity risk, becoming patent the difficulties in financing the economy in market decelerating or crisis. With this in mind, we found evidence it is highly probable that investors perceive this kind of risks and/or costs. Thus, one can expect negative reactions to Basel Accords improvements or future implementations (Lamy, 2006). There are authors advocating that banks with better rating and with more resources should be encouraged to use these buffers to inject liquidity in the market in difficult periods, without being downgraded or seeing their capital robustness image affected (Heid, 2007).

In addition to credit risk, it is important to refer the literature related to operational risk, also focused in Basel Accords, mostly in Basel II. The operational risk became an important issue in risk management in financial institutions. The methods, the controls and the quantitative measures provided in the Basel Accords guidelines increasingly influenced the way market react to regulatory implementations and the way regulatory and supervisory entities transmit confidence and reliability to the economy, reducing therefore systemic risks or fears (Jobst, 2007).

One of the most important issues when studying the market impact related to Basel Accords relevant events is the benefits perceived by investors versus the costs associated with the implementation. The best way to measure this topic is looking in to the impacts in operational costs derived from this adoption, just as Piatti (2010) did for the banking industry in Italy. This author found evidences that major regulatory introductions, like Basel Accords or IAS, effectively have compliance costs that are not visible only by analyzing the banking income. These conclusions are extensible to other segment analysis, independently of the observed banks productivity, size, credit quality or equity.

Taking in to account our analysis period (2004-2012), the majority of literature reviewed is focused on the Basel II Accord, in his impacts and repercussions in the European and World financial economy. Most of the papers try to conclude on the connection with the financial crisis initiated in 2007, with the crisis in subprime. In others words, there are many papers trying to answer the question whether Basel II had negative influence on the crisis and whether the market is evolving to react adversely to future regulatory implementations, losing confidence in his effectiveness. Thus, the efficient market hypothesis, one of the most common assumptions in finance papers, was questioned and the theory limitations became explicit. The limitations do not explain everything and it is questionable if the stock markets should have predicted the crash (Ball, 2009).

Cannata & Quagliariello (2009) validated that many market agents have the opinion that Basel II was one of the main reasons for the 2007 financial crisis, but he concluded that it is very important not to abandon the main guidelines proposed in the Basel II Accord. There were many factors that failed and it is necessary to enforce the Accord topics, but the author did not found significantly qualitative or quantitative reasons for abandon the fundamentals registered in Basel II. Maybe some of the banks with systemic risk dimension were taking excessive risks before the financial crisis; this should be one of the hypothesis. Pinheiro, Gulamhussen, & Pozzolo (2011) concluded that international diversification increases bank risk, not in accordance with previous scholars conclusions stating that multinational banks

could benefit from a more diversified portfolio, having therefore less risk. But, were the investors perceiving those risk positions taken by bigger banks? All the protective aspects of the legislation became important for them.

For this reason, authors like Rochet (2004) studied how to rebalance the three Pillars of Basel II, in order to adopt future implementations to financial market. In the future, it will not be possible to maintain so many emphasis in the risks quantification and in capital ratios without defining the best way to validate those internal controls and implementations (Pillar 2 – Supervision) or to become mandatory a market discipline extensible to all banks, systemic or not (Pillar 3 – Market Discipline). Conclusions as the possibility for capital requirements reducing with restricted subordinated debt issuances or as the desired complementarity and not replacement relation between the supervision and market discipline entities should benefit all the banking market investors.

Still focused in financial disclosure, one can find papers defending that transparency of information associated with asset securitizations and derivatives likely was insufficient for investors to assess properly the values and riskiness of bank assets and liabilities. This indicates that stock market investors are not aware of all the financial information, becoming more explicit this mismatch of information in crisis periods. It is of much importance to improve Pillar 2 and Pillar 3 guidelines (Barth & Landsman, 2010).

Therefore, and as response to the financial crisis of 2007-2009 and to the presumably Basel II failure in avoiding stress periods, the BCBS started to work in a new framework and in issuing a new document known as Basel III. As it is studied in some of the reviewed papers, many of the main introductions in Basel III try to eliminate the previous most discussed issues in Basel II Accord, such as the measures to eliminate procyclicity and that potentiate stability throughout long periods of time. We are referring to measures like "*counter cyclical capital charges and forward looking provisions capital conservation rules for stronger capital buffers and systemic capital surcharges for systemically relevant financial institutions*" (Ojo, 2010).

Other authors like Goodhart (2010) went a bit further trying to explain and find solutions or alternatives for the regulatory failures that derived in to one of the major financial crisis ever in Europe. For Goodhart, aspects like bank insolvency regimes, lack of counter-cyclical instruments, commercial bank liquidity risk management or procyclicity of capital adequacy requirements, made the crisis possible. Investors are more caution, have more fears and are restraining themselves, making bad practices and expeculators work easier. Market needs to feel more protect and confident as soon as possible.

III. Events Description

The Basel Accords are on the top news in the media whenever we hear about capital requirement, liquidity or solvency ratios. These were the main weapons found by the supervision authorities to avoid financial problems or bankruptcies' in systemic or non-systemic banks. Therefore, we tried to find events related with the likelihood of the implementation, firstly, of Basel II Accord and more recently the developments to implement Basel III Accord until 2019.

We identified our events by searching in the Bank for International Settlements site, looking in the themes "Basel II", "Basel III" and "Press Releases" by date. We also looked in Rizzardi (2011), where we found 6 events identified and studied by him, and in the European Commission and European Council sites, in their press releases. In our search we used the terms "Basel Accords", "Basel implementation events" and "Basel Committee on Banking Supervision".

Initially we found a group of 25 events that we thought had relevant impacts. After looking deeper in those 25 events, their descriptions, the amount and complexity of the news in the media and the available data, we considered important to focus our analysis only in 14 events, identified in Table 1. In this Table 1, we describe our assessments on the increase or decrease probability of Basel Accords implementation. We complement this, by referring how we expect the investors to react when they observe the benefits and costs of the adoption, taking into account our assessments.

The first event observed happened in June of 2004, on the 26th. The Basel Committee on Banking Supervision published the final Basel II framework. This document includes a revision on the original document for the Basel II Accord ("International Convergence of Capital Standards: A Revised Framework"), together with the 1988 Basel Accord data. It is divided in four parts, the Scope of Application, the First Pillar – Minimum Capital Requirements, the Second Pillar – Supervisory Review Process and the Third Pillar – Market Discipline (Bank for International Settlements, 2004).

The BCBS wanted to improve all the measures and recommendations made before in order to achieve their objective in market supervision and regulation. It was very important to let all the market agents (investors and so on) perceive the improvements and commitment put in this publication. The majority of the banking industry accepted well the improvements,

nevertheless, there was some fear of problems in worldwide implementation, the Basel II Accord could have less priority than other regulation investments.

With this publication and the timeframe in it, the BCBS took a major step towards the Basel II implementation, so we assess this event as an increase in the probability of adoption in European banking. Thus, it was expected that the market would react positively, perceiving benefits in having better capital adequacy measurements or more risk-sensitive capital requirements, among others.

In July 2004, the European Commission issued a proposal of a new Community Directive (the document was the COM (2004) 486), with the objective of adoption of Basel II Accord by all the banks, credit institutions and investment firms in the European Union. This was the beginning for the EU implementation, so we expected a positive reaction from the investors, mainly because market protective measures were closer from being adopted and financial crisis or systemic fails protection were among the benefits from this implementation (Directives of the European Parliament and of the Council - COM(2004) 486, 2004).

The third event took place in September, 23rd 2004 and was the Thirteen International Conference of Banking Supervisors in Madrid, organized by the Bank of Spain, the BCBS, a group of central banks and the supervision and regulatory entities from G-10. All together there were around 120 countries represented. As conclusion of the Conference it was issued a joint declaration defending a more efficient and profound cooperation among supervisors in order to achieve more easily and quicker all the objectives described in Basel II. The purpose of this joint declaration was to reinforce the financial system stability and encourage improvements in banking risk management ((ICBS), 2004).

This kind of meetings or conferences and all the declarations that circulated in the media demonstrate or try to demonstrate to the public opinion the benefits of a quick and efficient implementation of Basel II Accord worldwide. This is also our expectation; this event increased the probability of Basel II adoption in Europe and a positive reaction from the market was expected.

In the pursuit of convergence between accounting supervision and regulatory and supervision parameters based on the Basel pillars, in January of 2005 a major input came into force, the mandatory adoption of International Accounting Standards for all listed banks in EU. The EU directive (EC) 1606/2002 regulated the obligations in consolidated financial reports based on the IFRS; these new obligations improved the financial disclosure and increased the amount and quality of information that investors could assess. Thus, this relationship between IFRS implementation and the Basel Accords objectives is normal,

because the investors would have more information and data that would permit them to perceive better all the benefits of Basel II implementation. In accordance with all this, we assess this event as increasing the probability of acceptance.

In the fifth event, on May, 15th 2005, we emphasized an event that occurred outside Europe, located in the U.S.; nonetheless we considered it as being important and having high relevance in our study, because we assessed it as having a negative impact and as decreasing the probability of Basel II adoption. The result of the QIS 4 indicates a delay in the Basel II adoption, but the main objective was to understand the expected effect of the proposed Basel II standards at the industry, institution or portfolio level. In May 2005, Fed released the results along with feedback sessions with the respondent institutions; these sessions were a boost to financial institutions to develop their data loss risk detection or to improve the stress scenario analyses, but it left uncovered the amount of work still missing. We expect the investors to have some reservations about one of the fundamentals in the Basel Accords, the equality and fair competition among financial institutions, in other words, "everyone is playing the same game".

In June, 2nd 2006 the BCBS published the paper "*International Convergence of Capital Measurement and Capital Standards*" to disclose the Basel II framework implementation. This paper establishes the main principles to information sharing among the supervision entities of home and host banks. These principles are of the most importance, because with banking globalization and multi countries financial operations, it is normal that fears of local "bad behavior" rise, with global economies and market impacts.

This was a paper written by representatives from almost every element of the Committee, the International Monetary Fund and the World Bank. It increases the probability of a good execution, so it is expected that the market perceives this and that the investors feel more safe and comfortable with the adoption, reacting positively to it.

Just a few weeks later, still in June, 2006, the European Parliament and the European Council issued two European directives. The main objective was to legislate Basel II implementation in EU: directive 2006/48/EC is related to Credit Institutions business or operations, in other words, defines the scope of adoption coverage; the second directive is 2006/49/EC, and regulates capital adequacy in Investment Firms or Credit Institutions. At that time it was given the choice to European banks which capital measurement method they would adopt: standard, intern or advanced. This was a giant step towards Basel II adoption in EU, increasing, in our opinion, the likelihood of achieving a fair and beneficial adoption. In

an efficient market, the investors should perceive this step as being benefic to their investments protection, so the market reaction should be positive.

The objective of implement Basel II framework by the end of 2007 was accomplished and in the first day of 2008 Basel II and all the rules and directives contained in it became mandatory in the EU. The EU institutions decided to put into operation the full Basel II for all banks. Since January 2007 banks could initiate the introduction of the standard or intermediate methods in their routines and controls, but the more advanced ones could only be established beginning in this event date. This is a different event, because this is not an intermediate event, this is an implementation event, so it is obvious our assessment on increasing the likelihood of Basel regulation adoption throughout Europe, not only in the EU. From this date on, the investor should recognize easily the benefits of Basel Accords, so we expected a positive response.

In November, 20th 2008 the Committee, still leaded by the Dutch Nout Wellink, released a press note stating they were planning to issue some tangible proposals to "battle" the financial crisis in the first months of 2009, such as restricting banks concentration (systemic risk), building more shock absorbers in the financial system during stress periods improving the quality of TIER I Capital, regulating more financial disclosure for banks or improving risk management. The main objective was for the banking industry to continue to be seen as a shock absorber like until that date, and not like a cause of financial problems. At that time, it was important for BCBS to communicate to the real economy that the banks would not be an amplifier of one of biggest crisis of modern world. Therefore, some of the recommendations issued by the G-7, in April 2008 in their Financial Stability Forum, should be part of these proposals.

In those days, the financial crisis was evolving rapidly with the bankruptcy of Lehman Brothers, so banks were being "accused" of taking too many high risk financial positions, not protecting themselves with enough capital buffers against possible losses. Consequently, it is expected that markets diminish the existing doubts and react positively in this event, increasing the urgency and the likelihood of Basel Accords implementation.

In the tenth event, on September, 21st 2009, Nout Wellink, the Chairman of BCBS and Chairman of Netherlands Bank gave a speech in the workshop "*Towards new framework for monetary policy? Lessons from the crisis*", where he tries to seam optimistic identifying which were the previous problems with the Basel Accords and what is the best path in a near future. The main issue is that the 2008-2009 period was considerably negative and, in our opinion, the market should react badly to this speech, having difficulties to believe in these

new proposed measures, that could be not so restrict as expected or not be crisis absorbent. For banks, the expected costs should be higher than the expected benefits, with difficult methods to implement in their management controls. It is because of all these reasons, that we expect a decrease in the probability of Basel Accords implementation.

In the beginning Nout Wellink mentioned what they learned about the causes for the crisis: U.S. growing external debt and U.S. trade balance deficit, reflecting the debt culture existing in the U.S.; pour monetary and interest rates policies; low interest rates led to debt growth and to high risk taking by financial agents; high private debt; among others. According to the speaker, the lessons about the monetary policy were to create a new culture emphasizing the bad behavior and responsibility in the financial markets, supported by a better banking regulation by central banks. Other issues were the prices stability, the interest rates policy and flexibility and inflation policy… Too many questions unanswered (Wellink, 2009).

In January, 5th 2010 the Obama administration signed the Dodd-Frank Wall Street Reform and Consumer Protection Act. This document was seen as an American answer to the late 2000's recession, bringing many changes to financial regulation in the U.S.. This law was initially proposed in June 2009 and its basics were to endorse the financial stability promoting improvements in accounting and transparency in the system, in order to avoid that investors and the society in general suffer with fails in banks or abusive practices from financial management.

The United States were, at that time, late in their Basel Accords adoption, thus creating difficulties to implement one of the Basel fundamentals, having the same conditions and information for all the banks worldwide. So, the signing of this law led to increasing the likelihood of worldwide and more specifically European adoption of Basel II. The European market was a bit apprehensive in those days, but with this law approved in the U.S. It was expected that the market would perceive its benefits for global protection, because like it was proved in 2008, crisis in the U.S. reflect very quickly in Europe and its banks.

The Group of Governors and Heads of Supervision (Basel Committee basis) met at September 2010 and issued a press release on the 13th, where they announced a significant increase in capital requirements for banks, as well as reinforcement of many other measures discussed previously in this paper. These measures together with the introduction of a global liquidity standard would be placed in the global financial agenda as well as in the G-20 meeting agenda in Seoul, taking place in November 2010 (Bank for International Settlements, 2010).

In terms of capital requirements, banks would have a new equity minimum of 4,5%, against the previous 2%, adding an extra 2,5% buffer to support the banks in stress periods, resulting in 7% minimum capital requirement. These decisions were expected to contribute to stability and growing in the long term financial market (Slovik & Cournède, 2011). Adaptation periods were needed for banks, the institutions did not want to close the door to economy financing. Thus, although it was perceptible some fears still in the markets, in our opinion it was normal that a positive reaction to this event happened. In other words, in Europe we were much closer of implementing a decision that would protect the all banking market from systemic risks.

The 13th event studied in this paper happened on December, 15th 2010 and was the publication of the paper "*Strengthening the resilience of the banking sector*" by the BCBS, also known as the first publication of the main fundamentals supporting the adoption of Basel III in the financial system. This document formalizes and supports some of the measures already mentioned in the previous events (Bank for International Settlements, 2010).

It had reviews afterwards, like the one in July 2011, but it is obvious that this event greatly increases the likelihood of adoption, being already a final document or publication, mentioning timeframes and introducing very specific instructions for the regulatory entities worldwide. With all the benefits announced previously it was expected that the European financial players would have a positive reaction to this event.

Finally, on October, 15th 2011, we return to an event with focus on the U.S., but with global impact and with expected negative reaction in Europe, mainly because of recent historic financial crisis events. This event is based on the publication, released by the European Parliament, about a study prepared on the Basel II implementation and scope in American banks. The results of this study were very negatives, in other words, quite a few banking institutions were found still in Basel I, fulfilling only the requirements for the first Basel Accord. Thus, the Basel Accord adoption would be delayed and we perceive this event as decreasing the probability of timely implementation.

IV. Methods and Data

Our objective is to investigate the investors' perceptions relating to Basel Accords adoption by examining European Banks equity return reaction to our 14 adoption events.

We start our analysis by looking at the data and trying to obtain general conclusions. But the main objective is to obtain conclusions on more specific sectors of the European banking industry, in order to be able to validate and better confirm our theories and expectations. All of our conclusions are taken by the observation of the 14 events together (*see Table I*), as an all, not looking individually to each one of them. We do this because the Basel process and implementation was, is and will be put in practice in a long period of years. Only by looking at all the events as whole, we can conclude about the Basel process.

Our initial sample had 300 banks distributed all over Europe. This sample was obtained through SNL Financial European Coverage website, with their historical data base, where it was possible to select 300 listed banks, spread over several European countries. Then we extracted the entire end of day prices from Bloomberg data base for these 300 banks since January, 1st 2004 until March, 31st 2012. Analyzing the data obtained, only 217 of them had available data in our analysis period. (*see Table II*)

Our investigation is based on some premises, like the efficiency in the stocks market, in other words, the investors can measure correctly all the benefits and costs of Basel Accords adoption or events, or like the perception that supervision and regulation entities are efficient and effective in controlling the Basel requisites implementation. Thus, it is expected that all the information related to each of our events will be reflected in the shares prices during the 3-day examination we are performing. Some of the countries where the sample banks are based could not be so efficient and this assumption could be fragile, so we have to be careful to prove that our results are robust and cannot be biased.

In order to obtain coherent information from our data base we calculate a three day average (previous and after working day) for each date. With this we expected to have all the market impacts for each event date, because any rumors of an event or any late impact of the event is reflected in the market capitalization for the event day. With this calculated three day average market capitalization we could compute all the returns for each market day for our analysis period. We will call it 3-day average return (**3-DAR**).

After obtaining 3-DAR for each date and in order to mitigate the impact of other world events in our events examination, we market adjusted it with a reference market index, we chose DJ STOXX® index. In this paper we focus on the STOXX® Global 1800 Ex-Europe (we wanted to exclude the possibility that including the influence of European

companies could remove some of the effects we wanted to certificate) and STOXX® Global 1800[1] (to check if we had major differences) by subtracting it to our initial 3-DAR results.

We based our final tests in a value-weighted view, in other words, we will tried to reflect banks market dimension in our analysis. If we only analyze stocks value and returns, distinguishing systemic dimension and number of stock would be difficult, so we included the value-weighted variable[2] in our calculations. This new item is called 3-day value-weighted market adjusted average returns (**VEMAR**). We calculated each VEMAR (*j*,*e*) where *j* is the bank and *e* is the event (*see Table III*).

In order to test the significance of our portfolio event returns, we ran three statistical tests, being the first one a t-test to test if the average of our 14 VEMAR events in our portfolio differs from zero. This type of tests are based on the assumption of normality in the distribution and that our market adjustment is the ideal benchmark, revealing a null result for the expected market-adjusted return, in other words, the benchmark is the hypothesis equal to zero. The second statistical test is a t-test on whether the 14 VEMAR events average in our portfolio differs from a similar to ours non-events return distribution. This analysis assumes different variances between the two samples and admits the possibility that returns of European banks differ systematically on returns of banks based in other regions. The third and final statistical test reflects the probability that our 14 VEMAR events average exceeds the randomly selected 14 non-events average obtained in a similar way. This test assumes that the original distribution has the same attributes than the new data, in other words, in this test we bootstrap 14 non-events 600 times in order to obtain a p-value that is the probability of obtaining a higher average in the non-events in relation to VEMAR events.

In order to reach the desired conclusions, in the events that we assess as decreasing the likelihood and in which we expect a negative market reaction to Basel adoption, we multiplied the associated return values by minus one.

In order to better conclude or distinguish differences in our results we separated our data base in smaller groups, dividing our data base. First of all, we analyzed the banks by date of European Union admission, being the EU one of the Committee members, its members

[1] STOXX® Global 1800 index "*provides a representation of the world's most developed markets*" with a fixed number of 1800 companies. It contains 600 European, 600 American and 600 Asia/Pacific region stocks, that are represented in STOXX® Europe 600, STOXX® North America 600 and STOXX® Asia/Pacific 600. STOXX® Global 1800 Ex-Europe Index only contains 1200 companies and it excludes one of the three major world regions.

[2] In order to obtain each of our bank stock value-weighted, we extracted all of the market capitalizations (end of day prices multiplied by the number of stocks in the market) from Bloomberg. Then we extracted the 3-day average returns from stocks market capitalization, not only from stocks end of day prices.

would have to adopt Basel accords more quickly than other non-EU country based banks. Thus, we divided the data in 5 segments: *EU admission before 2004*, *EU admission in 2004*, *EU admission in 2007*, *EU admission candidate* and *Other European countries* (*see Table II*). Our second segment analysis was the Code and Common Law countries (*see Table II*), which is in our opinion an important point in the Basel implementation, since it is more easy to introduce this kind of regulation in a Code Law country, with more flexible laws application.

Thirdly, the banks dimension and their systemic risk perception in the market must be a point in our analysis. We chose to study this point by segmenting our sample by the value of bank's assets, having two kind of results, the ones of banks with lower than 500.000 MM assets' value, and the ones with higher than 500.000 MM assets value. In this segment of the study, we will have different numbers of banks in each of the events; banks grow or decrease their assets value almost every day. For last we save perhaps the most important segment analysis to our conclusions on the theme of the paper, separating our sample by banks TIER 1 Capital. We separated the data into 3 groups for event; a group with banks that have lower than 8% TIER 1 Capital, a second group with banks that have a TIER 1 Capital between 8% and 10%, and a third group with banks that have higher than 10% TIER 1 Capital. Again, just like the previous assets' dimension analysis, we will have different number of banks in each of the events; banks could be or not capitalizing themselves throughout the time.

We found it important to study with more detail and have more conclusive results about cross-sectional variations, in other words, to have another method to validate the relationships and variations among each of the parameters/segments that we assess as having influence in perception of Basel implementation benefits and costs. In order to accomplish this, we estimated the following equation:

(1) $$VEMAR_{j,e} = \beta_0 + \beta_1 InfoQualFactor + \beta_2 Commom/CodeLaw + \beta_3 EUAdmission + \beta_4 Size + \beta_5 TIER1 + \varepsilon$$

In order to reach the desired conclusions, in the events that we assess as decreasing the likelihood and that we expect a negative market reaction to Basel adoption, we multiplied the associated return values by minus one.

In the first point, InfoQualFactor, to obtain the level for quality of information it is important to take into account the entities that have ADR's in American stocks indexes, because we have some events that are focused in the US, not in Europe. The variable equals

one, if the bank has ADR's during the event in study, and zero otherwise. We expected that banks with lower quality in information would be more benefited by the Basel implementation, so we multiplied this variable by minus one so that higher values would correspond to lower quality information. If the investors perceive that the benefits of this legislation introduction are higher with banks with lower pre-adoption information quality, then we expect the first variable to be positive.

As we mentioned before, another important point is the type of legislation in each country, so we perceive the Code/Common Law variable as being presented in this equation. We mentioned that Code Law countries are more flexible to regulation and legislation changes or introductions, so we considered it as one when the bank is based in a Code Law country during the event in study and zero if it is based in a Common Law country. The perceived benefits could not be so relevant to investors in a Code Law country, so we expect this proxy to be negative.

Being the EU a permanent member of the Basel Committee, it is of much relevance if the bank is based in EU country or not, just like we mentioned before. Thus, we assessed this variable, EU Admission, as one when the bank is based in an EU country during the event and zero if it is not. It is more likely that investors perceive a higher benefit for Basel implementation in non-EU countries, comparing to EU countries, so we assessed this variable as being negative.

Another variable is the TIER 1 Capital, in this case we assessed it as lower than 8% equals zero, meaning it will be more difficult to implement Basel and costs will be more visible, and as higher than 8% equals one, meaning it will be more likely and easier to adopt Basel Accords. In this case, it is difficult to predict the investors' expectations, but we expect that this proxy will be positive, in the sense that the costs for investors in accomplishing the Basel Accords guidelines for banks with lower than 8% ratio could be excessive, so banks with higher than 8% TIER 1 Capital should be seen as the ones with more benefits.

We based our standard errors inferences on the dummy variable that reflects a country based analysis. We clustered this variable because it is easy to assume that these kinds of implementations are more likely within a common country or community of countries, than across several countries.

We calculated the VEMAR in this method for all of the event dates, meaning that we got 3.038 observations (N = 217 banks * 14 events = 3.038 observations).

Finally, we tested all of our previous results and conclusions, introducing another method. This method is based in Abnormal Returns (**AR**) and Cumulative Average Abnormal

Results (**CAAR**). We have two types of periods, the **Estimation Period**, 190 observation days before the **Event Period**, 21 days around the event in study (*see figure 1*).

It was necessary to check if previous studied events were in the estimation period of each of the 14 events. This was required because the existence of one of the 14 events in the estimation period could cause impacts in the reference Average Abnormal Return (**AAR**) related directly with Basel Accords implementation. Thus, as it is shown in the table annex, only 6 events can be analyzed in this method.

Taking this into account, we calculated the AR for each day, in other words, we calculated ARs for the estimation period 190 days and then for the event period 21 days. The ARs for the estimation period served as a reference in our calculations, in order to compare the returns during the event period.

To reach the ARs we subtracted the reference market return values from the daily returns, just like in previous methods, in other words, we subtracted the DJ STOXX® Global 1800 Ex-Europe and DJ STOXX® Global 1800 from all the daily returns. We also did this calculus for the two scenarios, MAR and VEMAR. We obtained the daily AR in the following equation:

(2) $$AR_{i,t} = R_{i,t} - R_{i,t}^{Merc} \quad ; \quad i = \text{each stock; } t = \text{each day}$$

After obtaining the values for equation (2), we needed to calculate the AAR for all the "realities", MAR e VEMAR market-adjusted. This new value was the reference in the calculation of the adjusted AAR for each event period day, in other words, we subtracted the sum of estimation period ARR to each event period day AR, using the following equation:

(3) $$AAR^{Event}(d_1;d_2) = AR_{i,t}^{Event} - \frac{1}{N}\sum_{t=d_1}^{d_2} AR_{i,t}^{Merc} \quad ; \quad (d_1;d_2) = \text{Estimation Period}$$

After obtaining the AARs for the event period, we needed to calculate the cumulative value, which is achieved by the sum of the values for the days within the period, meaning that we needed to accumulate the daily AARs values in order to obtain the Cumulative Average Abnormal Returns, using the following equation:

(4) $$CAAR^{Event} = \sum_{t=d_1}^{d_2} AAR_{i,t} \quad ; \quad (d_1;d_2) = \text{Event Period}$$

Taking all of this into account, we checked the results of this method by looking to the graphics for CAARs. We did the analysis for the global group of banks, the all 217 banks, but like in the other methods we explored the segments or cross-sectional approach by studying the impacts of the EU admission, the countries legislation (Code vs Common Law), the assets size and the bank's TIER 1 Capital policy. All of the conclusions of this method are visible in the figures/graphics.

V. Results

Overall European Banking Market Reaction

In the Descriptive Statistics in Table VI we analyzed the values for the entire sample and for the entire period, from January, 1st 2004 until March, 31st 2012 (*see Table VI, Panel A*). The minimum and maximum values are more extreme than the descriptive statistics for the event dates (*see Table VI, Panel B*). In the general sample values, the means are more close to zero, more distributed, but the event dates means for MAR and VEMAR are more in accordance with our expectations, positive reactions.

We divided this analysis into 4 realities, as we mentioned before, VEMAR Ex-Europe, our main reference with results for market adjusted STOXX® Global 1800 Ex-Europe 3-day value weighted returns; and 3 others untabulated: MAR Ex-Europe, where we have the results for market adjusted STOXX® Global 1800 Ex-Europe 3-day returns; MAR Global, where we have the results for market adjusted STOXX® Global 1800 3-day returns; and VEMAR Global, where we study the results for market adjusted STOXX® Global 1800 3-day value weighted returns (*see Table III*).

In Table IV, one can check the statistics for our 14 relevant events. For each of the events we calculated the 3-DAR in the 217 banks sample, the STOXX® reference index and the difference between both, we called it 3-day market adjusted return for the events. In this table we also can observe the predicted signal for market reaction and compare it with the real reaction, our market adjusted returns, in order to introduce some conclusions.

In the field "Mean Return across Events", in other words, the mean of our 14 events seen as an all, we multiplied by minus one every event with a predicted negative impact in the likelihood of Basel Accords implementation. By using this calculus we assure that the only way the mean value obtained could be positive is if the investors perceiving benefits are superior to the adoption costs. In every method we obtained positive values. In the **MAR Ex-Europe** method we had 0,16%, meaning that the perceived benefits are higher than the costs.

In this technique we did not included the value weighted, nevertheless the mean return across events is significantly different from zero (t-statistic $_{vs0}$ = 1,79) and also significantly different from the 600 non-events means (t-statistic $_{vs600}$ = 2,79). Further, with the bootstrap technique we concluded that there are only little more than 7% chances of randomly drawing 14 similar to ours non-events returns with a standardized mean bigger than our 14 events standardized mean (p-value $_{bootstrap}$ = 0,07).

When we included the market dimension factor into our analysis, in the **VEMAR Ex-Europe** method, we obtained a new mean, equally positive of 0,17%, that just like the previous conclusions is significantly different from zero (t-statistic $_{vs0}$ = 1,18) and is significantly different from the 600 non-events means (t-statistic $_{vs600}$ = 0,95). Again, the bootstrap technique was conclusive and there are only around 7,5% chances of randomly drawing 14 similar to ours non-events returns with a standardized mean bigger than our 14 events standardized mean (p-value $_{bootstrap}$ = 0,08).

We also included two other analysis where we used the same methods MAR and VEMAR, but the reference market adjustment return was the STOXX® Global 1800. We wanted to document if there were significant differences when we market adjusted our returns including European firms, surely some of them are in our sample. Getting material differences would have made us study them more profoundly. Both means, **MAR Global** returns and **VEMAR Global** returns, are positive, 0,17% and 0,19%, respectively. Also, both mean values are significantly different from zero (t-statistic $_{vs0}$ = 1,12 and 1,59, respectively) and significantly different from the 600 non-events means (t-statistic $_{vs600}$ = 1,12 and 0,25, respectively). Further, with the bootstrap calculus we concluded that there are approximately 6% chances of randomly drawing 14 similar to ours non-events returns with a standardized mean bigger than our 14 events standardized mean (p-value $_{bootstrap}$ = 0,06 and 0,064, respectively).

Considering the results we got, whatever the method, the 14 relevant events seen together behave the way we expected, an all-around accepted progressive adoption of Basel Accords. We were able to prove, with statistical significance, that investors perceive the benefits linked to such legislation implementation as bigger than the inherent costs (*see Table IV*). We can say also that our market adjustment reference, the STOXX®, was the correct one, since the financial markets were very negatively agitated during our period of analysis, being very difficult to extract impacts related to our events, but with this market adjustment we were able to conclude on several aspects. In the **VEMAR Ex-Europe** method, the most relevant method, the mean return across events is higher than other methods. The analysis of market

reaction by segments, the cross-sectional analysis and the CAAR graphs provided us with more interesting conclusions.

In relation to market reaction by segments analysis, when we are taking about EU admission segmentation as well as other segmentations we used the same methodology as explained before, the only difference is that we applied it by sample segments, trying to have better and more robust conclusions. The major risk in this kind of analysis is that in some cases, the segment sample could not have statistical significance and the results could not be as robust as expected. We tried to identify and explain these cases.

In the EU admission segmented sample we divided our 217 banks into five sub-groups. We covered the results for these five segments in all four MAR and VEMAR realities and we obtained the same result for all the means return across events, they are positive as expected. In other words, even investors from countries outside of EU perceive the benefits of Basel Accords adoption (*see Table V*). Is this segment, the results are very constant between **MAR Ex-Europe** and **MAR Global** realities, and between **VEMAR Ex-Europe** and **VEMAR Global** realities. It is visible that the results are more robust for **VEMAR Ex-Europe**, for us, the method that retracts better the reality.

The values are bigger for the three latter segments, EU admission in 2007, EU admission candidate and Other European countries. For us this makes sense because the requisites for EU admission are huge and the legislation in each of these countries is much inspected, thus we believe the banks based in these countries are asked to have more controls according to Basel Accords, making more explicit for investors the advantages of adopting this legislation. On the other hand, looking to each event we can see that banks based in earlier admitted countries in EU are the ones with more reactions accordingly with the expected signals. This could have two explanations, first they are the most representative in our sample and if the overall sample has an expected result, this should happen in this segment too; second the investors in the EU are better informed and react more as one to these events (*see Table V*).

Concerning the sample divided into countries with Code Law legislation and Common Law legislation, this is perhaps the more risky analysis in segmentation, because we only have in our sample 9 banks based in countries with Common Law legislation, Ireland and Great Britain. This has a statistical significance issue. In the banks based in Code Law countries analysis, and because they are very representative in the initial sample, we found similar results to the ones with the total sample. Nevertheless, contrary to what we had expected, we could not find evidence that the Basel Accords implementation in Common Law countries

was more difficult or had more negative reaction comparing it with the adoption in Code Law countries. This is visible in all methods, especially in **MAR Ex-Europe** and in **MAR Global**, where the results are extremely higher than the initially sample.

Not counting with some events like the one concerning the issue of EU directives for Basel II adoption, data from banks based in Common Law countries are even more in accordance with the expected positive reaction than the ones based in Code Law countries. This was a surprise for us, we expected adverse and conservatory reaction from investors, but in general the expected positive reaction was obtained again in this scenario (*see Table V*).

We considered important to have a segment analysis based on banks assets size, because the market reaction is surely different when we are referring to a bank with systemic risk dimension than to one with no systemic risk. This segmentation is not fixed and floats from event to event, in other words, the bank with systemic risk size sample grows during our period of analysis. It was interesting to find this phenomenon; it confirms that the European banking industry has been growing, consolidating itself through minor banks fusions and acquisitions becoming even more important to have investors protecting measures (*see Table VI)*.

Out of the four segmentations examinations we did, this was the one that revealed fewer differences to the initial total sample results. The mean return across events was always positive and very close from the ones in the total sample. It is also important to mention the reaction of minor banks investors' to the event where Nout Welling spoke about the right answer to the financial crisis, because it was different from the bigger banks, proving that these investors follow the market in non-banking events (*see Table V*).

Finally, we decided to analyze perhaps the most important bank parameter in order to be prepared to the Basel Accords transition and adoption, TIER 1 Core Capital. As we mentioned before, Pillar I of Basel speaks of capital requirements, thus, if a bank is not well capitalized it may lead to one of two market reactions: the investors may feel that the costs to obtain the mandatory capital ratios are too high comparing with the financial protection provided and react negatively; or the investors are prepared to these inherent costs, preferring the financial protection and financial stability associated and react positively (*see Table V*).

In order to obtain conclusions we decided to divide our sample into three groups, TIER 1 Core Capital until 8%, between 8% and 10% and higher than 10%. Like the previous segmentation, the values for each of the samples are not fixed and float between events. It is easier to identify an inversion tendency between samples, in other words, in the first events there are many banks with less than 8% TIER 1 Core Capital, but as the time progresses this

changes and in the latter events the biggest sample is the banks with more than 10% TIER 1 Core Capital. It is very important to notice this reaction; it follows the Basel II implementation directives in earlier 2008 and it shows how banks are preparing to Basel III, where the capital requirements are much higher than previously (*see Table VII*). As expected, looking to the market reaction results in Table V, all the three samples follow the initial sample results, even when we look event by event, but the most important conclusion is that in banks with TIER 1 Core Capital lower than 8% the investors' fears are higher. These fears are explicit in the mean return across events that are positive, but less robust when compared with other samples, especially when we look to **VEMAR Ex-Europe** results, the only mean return obtained below 0,10% (*see Table V*).

Cross-Sectional Analysis

In Table VI, Panel C, one can observe some descriptive statistics on the variables of equation (1), used for the cross-sectional analysis. We estimated the values of equation (1) for all the elements in our sample and in all the 14 relevant events (N = 14 events * 217 banks = 3.038 observations). We observe that only 3,42% of our sample has ADR's, in other words, only that percentage of banks have what we considered as being an information quality factor where impacts regarding Basel Accords implementation reflects in both sides of the Atlantic. The values regarding the other variables are an image of what we already referred in the previous methodology: a high percentage of Code Law country based observations; a higher percentage of observations regarding EU members, summing the banks that already belonged to EU to the ones that were admitted in 2004 and 2007; a lower but growing percentage of systemic risk banks observations; and finally a percentage beneath 50% of the observations with above 8% TIER 1 Core Capital, because in the first events the percentage was very high regarding the banks with bellow 8% TIER 1 Core Capital.

The correlation between variables analysis (*see Table VIII*) reveal that all the variables relate positively to one another. All the correlations are significantly different from zero, being the more fragile the ones between Code and InfoQualFactor and between EU admission and InfoQualFactor, and being the more robust the one between Code and EU.

We performed linear regressions with all the sample variables in order to obtain the linear relation among them, being the constant variable the VEMAR values for all the 3.038 observations (*see Table IX*). With the variable InfoQualFactor we obtained a correlation coefficient negative and significantly different from zero (Coefficient = -0,09; t $statistic_{vs0}$ = -0,78). These values indicate that investors react more negatively to Basel Accords

implementation regarding banks that do not have ADR's in the US Stock Exchange and, therefore, presumably have worst financial information disclosure, in accordance with our market reaction expectation. For the variable Code Law countries we obtained positive values and significantly different from zero (Coefficient = 0,003; t statistic$_{vs0}$ = 0,07). This means that banks based in non-Code Law legislation countries reacted better to the adoption, being these results consistent with previous obtained values and against our expectation. The investors react well to the likelihood of Basel Accords implementation, even in Common Law legislation countries.

Regarding the variable EU country based banks; we got a positive correlation coefficient and an indicator that the variable is significantly different from zero (Coefficient = 0,03; t statistic$_{vs0}$ = 0,62). In other words, the market reaction is higher in countries not belonging to EU, for us mainly because the necessity to fulfill the EU requirements for admission. Still in the same Table, one can check the results for the variable Size. Again, we obtained a positive correlation coefficient and indicators that the variable is significantly different from zero (Coefficient = 0,02; t statistic$_{vs0}$ = 0,24), as in the last variable, TIER 1 Core Capital ratio (Coefficient = 0,01; t statistic$_{vs0}$ = 0,28). Both cases validate our expectation that investors in banks with lower dimension along with investors in banks with lower TIER 1 Core Capital react positively, but, most importantly, not with the same easiness that in bigger banks or that in banks with higher and more robust TIER 1 Core Capital ratios.

Cumulative Average Abnormal Returns

The first event observed occurred in June, 2nd 2006, when it was published the Basel II framework, named "*International Convergence of Capital Measurement and Capital Standards*". This paper established the main principles to information sharing among the supervision entities of home and host banks.

The CAAR values shown in figures 2 represent the values during the June, 2nd 2006 Event Period with a negative tendency. In this event we were able to observe that in the days surrounding the event the values decrease tendency slows and stabilizes around – 1% and – 2% and even grows right after the event. Even though the values do not behave exactly like we expected, an upward tendency along the Event Period, we can validate a relative impact to the event, just like it was confirmed in the previous analyzed method of Market Reaction. Other negative events in the Event Period could justify the negative tendency founded (*see Figures 2*).

The second observed event in this method was the January, 2nd 2008 event. In this date the Basel II Accord became mandatory in the EU for all EU countries based banks. Unlike the previous event where the CAAR's tendency was negative, in this case the values are leaning towards positive returns for all the Event Period, more pronounced during the days closer to the event itself. When we observe the graphics it is possible to validate the referred values growing expectation (*see Figures 2*). The Event Period CAAR's approximates from 4%, even if initially it was in slight decline, which indicates that news or rumors of this event had the expected impact, with investors reacting positively and validating previous methods results.

The third event happened in November, 20th 2008 where the Committee, still leaded by the Dutch Nout Wellink, released a press note stating they were planning to issue some tangible proposals to "battle" the financial crisis in the first months of 2009. As in the first event, in this event the general tendency for the Event Period is negative, indicating that negative events occurred around the event date. But, in any of the 4 scenarios and in particular in the **VEMAR Ex-Europe** scenario we were able to easily observe a positive reaction surrounding the day's $z - 3$ and $z + 3$, in other words, the event impact is visible with an increase of almost 2,5% on CAAR's (*see Figures 2*). We believe that in this case, even though the general tendency was not in accordance with our expectation, it was proved the positive impact for this event.

The next event, the Nout Welling speech occurred in September, 21st 2009. Just like in the previous Market Reaction method, when we studied this event singly we found a contrary tendency to what we expected. We were expecting a negative reaction to Nout Welling statements, but what we can observe is that in general the reaction is positive and is evident when we look to the CAAR's graphs, the positive slope throughout the Event Period.

The fifth event is the Group of Governors and Heads of Supervision meeting in September, 13th 2009 and their press release. At this time, we lived difficult times in financial terms with many negative news and pessimism in the markets. Therefore, it is easy to observe the negative tendency in the early days CAAR of the Event Period, but on the other hand when the event day nears, the CAAR values totally change the tendency. Thus, it is proved our expectation with investors' positive reaction to this announcement (*see Figures 2*).

Finally, the sixth event occurred in October, 14th 2011 and is based on the publication, released by the European Parliament, about a study prepared on the Basel II implementation and scope in American banks. The results of this study were very negative and quite a few banking institutions were still in Basel I. For us, we are in presence of an event with evident negative impact. When we observe the CAAR evolution in the Event Period it is proven the

negative tendency expected, being this event the more explicit and more easily observed, with a constant negative slope in all 4 scenarios studied. In the **VEMAR Ex-Europe** scenario the negative CAAR values reach – 7% (*see Figures 2*).

VI. Conclusion

This study examines European stock market reactions to 14 events associated with the adoption and implementation of Basel Accords II and III in Europe. The BCBS issues guidelines regarding international standards on capital adequacy, core principles, effective banking supervision and cooperation in cross-border supervision. These guidelines, the Basel Accords frameworks, do not have any mandatory authority, but the Committee member's compromise to adopt it in their national supervision and regulation entities.

We expected that all European investors reacted positively to the adoption of the measures provided in all the Basel Accords. The main objective was to protect the economy from failures and to create shock absorbers. For investors, these and other benefits have to be evident and measurable when compared with the costs associated with such legislation implementation. The investors have to perceive that the Basel Accords implementation will result in more benefits for themselves, increasing the control for calculations of credit, liquidity or market risk along with increasing capital requirements, but lack of efficiency in these markets could be a problem. Adding to the previous points, more efficiency from the legislation and regulation entities conduct to a lower systemic risk and to a lower fear of financial losses by the investors. With European banks investing and growing in a cross-border view, it is likely to observe an optimistic reaction to the Basel III introduction for cooperation among countries.

In our analysis we concluded that it is evident an all-around positive reaction to the progressive adoption of the Basel Accords, in accordance with what was expected. When we look at the results of the implementation as a process, the 14 relevant events seen together, all the tests made and realities analysed confirmed our premises. Only when we analysed our samples by segment became visible two exceptions to what was expected: banks based in common law countries do not behave much differently from other banks based in code law legislation countries, the majority of our sample; and banks based in countries in EU admission processes during our period of analysis reflect a more robust positive reaction, probably due to admission requirements by the European Community, supported by many inspection initiatives made by the EU institutions to those countries.

We observed that it is indifferent for investors the bank size, the benefits perceived are similar in bigger and smaller banks, since the risk of failure is not seen separately for each bank. Bank investors realize that losses or bankruptcies in smaller banks will affect all the market and could result in systemic risks also. Finally, we found a higher positive reaction to Basel accords events in banks with more robust Core Tier 1 Capital ratios; the investors perceive these banks as having stronger shock absorbers. The investors tend to channel their money and investments more to these banks, where they feel more protected.

Other two conclusions emerged from our segmentation analysis, the consolidation and growing in the European banking industry and the concerning with increasing the Core Tier 1 Capital ratio in European banks. It was interesting to find this evolution phenomenon. On one hand, it confirmed that the European banking industry has been growing, consolidating itself through minor banks fusions and acquisitions becoming even more important to deploy investors protecting measures. On the other hand, it was easy to identify an inversion tendency between samples, in other words, in the first events there were many banks with less than 8% TIER 1 Core Capital, but as the time progresses this changes and in the latter events the biggest sample was the banks with more than 10% TIER 1 Core Capital.

As possible future studies, we would like to mention an extension of this paper, studying the evolution and the future events of the implementation process of Basel III throughout Europe, mainly in the banking industry. Other hypothesis should be to study the impacts of the events referred in this paper or of future events in the banks results, financial disclosure, ratios or growing policies.

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Appendix 1 - Tables

Table I

Events and Predicted Effects on Likelihood of European Banks Adoption of Basel Accords

Event Date	Description	Assessed effect on likelihood of Basel Accords Adoption	Predicted market reaction if Basel benefits > Basel costs (Basel benefits < Basel costs)
June 26, 2004	BCBS published BASEL II Framework	Increase	+ (-)
July 14, 2004	E.C. approved Basel II rules and issued a directive proposal (COM(2004)486)	Increase	+ (-)
September 23, 2004	Global banking supervisors pledge deeper cooperation in Madrid (Thirteenth International Conference of Banking Supervisors)	Increase	+ (-)
January 3, 2005	IFRS Mandatory in Europe (Regulation (EC) 1606/2002)	Increase	+ (-)
May 16, 2005	US, after a preliminary review of its QIS4, announced that issuance of BASEL II will be delayed	Decrease	- (+)
June 2, 2006	BCBS published a paper "International Convergence of Capital Measurement and Capital Standards"	Increase	+ (-)
June 14, 2006	Directive 2006/48 and 49/EC of the European Parliament and of the Council to implement Basel II in the European Union	Increase	+ (-)
January 2, 2008	BASEL II in operation in Europe	Increase	+ (-)
November 20, 2008	The Committee announces plans to strengthen capital buffers and limit leverage to address the lessons of the financial crisis	Increase	+ (-)
September 21, 2009	Nout Wellink, former Chairman of the BCBS, gave a speech about the correct response to the financial crisis	Decrease	- (+)
January 5, 2010	Obama signed the Dodd-Frank Wall Street Reform and Consumer Protection Act	Increase	+ (-)
September 13, 2010	Group of Governors and Heads of Supervision announces higher global minimum capital standards	Increase	+ (-)

December 15, 2010	BCBS published "Strengthening the resilience of the banking sector" - Basel III	Increase	+ (-)
October 14, 2011	European Parliament published paper on Basel II US implementation developments, with negative response, still in Basel I	Decrease	- (+)

This table presents the 14 events, our assessment of their effect on the likelihood of the European Banking Industry adoption of Basel Accords as issued by the Basel Committee, and the predicted market reaction to each event. In the last column, Basel $_{Benefits}$ > Basel $_{Costs}$ refers to the predicted market reaction if expected benefits associated with Basel Accords adoption exceed expected costs. Basel $_{Benefits}$ < Basel $_{Costs}$ refers to the predicted market reaction if expected benefits associated with Basel Accords adoption are lower than expected costs.

Key persons/organizations referred to in the event descriptions are defined as follows:

- BCBS (Basel Committee on Banking Supervision) is a Committee of banking supervision and is a cooperation forum between all the members' supervision entities and all the members Central Banks. Its main objective is to enhance understanding of key supervisory issues and to improve the quality of banking supervision and communication worldwide.
- E.C. (European Commission) was created in the EU beginning. It represents the executive power of the EU, proposing legislation, issuing directives, implementing Parliament or other institutions decisions or keeping up with the EU treaties.
- IFRS (International Financial Reporting Standards) are the internationally accepted accounting standards. Previously known has IAS (International Accounting Standards) are nowadays issued and accompanied by the IASB, the board created to study this issue.
- QIS 4 (Quantitative Impact Study 4) was a study conducted by the CEIOPS (Committee of European Insurance and Occupational Pensions Supervisors) and aimed to test the progress of the implementation of Basel II measures.
- Dodd-Frank Wall Street Reform and Consumer Protection Act was signed in July, 2010 in Washington by the US President Barack Obama. It was a response to the financial crisis and implemented the most revolutionary decisions in banking and financial supervision since the Great Depression in the US.

Table II

Sample Composition by Country, by European Union Admission and by Common Law and Code Law Countries

Country	European Union	Type of Legal System	Total
Belgium	EU 1952	Code law	2
France	EU 1952	Code law	17
Germany	EU 1952	Code law	7
Italy	EU 1952	Code law	18
the Netherlands	EU 1952	Code law	1
Denmark	EU 1973	Code law	28
Ireland	EU 1973	Commom law	2
United Kingdom	EU 1973	Commom law	7
Greece	EU 1981	Code law	9
Portugal	EU 1986	Code law	5
Spain	EU 1986	Code law	9
Austria	EU 1995	Code law	5
Finland	EU 1995	Code law	2
Sweden	EU 1995	Code law	4
Cyprus	EU 2004	Code law	4
Czech Republic	EU 2004	Code law	1
Hungary	EU 2004	Code law	2
Lithuania	EU 2004	Code law	3
Malta	EU 2004	Code law	4
Poland	EU 2004	Code law	12
Slovakia	EU 2004	Code law	4
Bulgaria	EU 2007	Code law	1
Romania	EU 2007	Code law	2
Croatia	Candidate	Code law	5
Macedonia	Candidate	Code law	4
Montenegro	Candidate	Code law	2
Turkey	Candidate	Code law	11
Bosnia	Other Countries	Code law	3
Liechtenstein	Other Countries	Code law	2
Monaco	Other Countries	Code law	1
Norway	Other Countries	Code law	19
Russia	Other Countries	Code law	3
Switzerland	Other Countries	Code law	16
Ukraine	Other Countries	Code law	2
	Grand Total		**217**

This Table presents the sample composition by country, by EU admission year segment and by Common Law and Code Law countries segment. The sample includes all European listed banks with returns available for all 14 events in January 2004 – March 2012 period listed in Table 1. The data was obtained in Bloomberg and in SNL® data base.

Table III

Methodology	Data	Method	Market Adjusted	Value-Weigthed
MAR Ex-Europe	Stock Market Valuation of 217 Banks (SNL®) from Bloomberg	3-day average return in the analysis period (01-01-2004 until 31-03-2012)	DJ STOXX® 1800 Ex-Europe	
MAR Global			DJ STOXX® 1800	
VEMAR Ex-Europe			DJ STOXX® 1800 Ex-Europe	Dimension (number of stocks - market capitalization), data from Bloomberg
VEMAR Global			DJ STOXX® 1800	

This Table presents the four types of methodology used in this study and what characterizes each of them, where the data was based, the event study method used, the benchmark used for market adjustment and the Value-Weighted component description.

Table IV

Methodology	Predicted Sign	3-day average return	DJ STOXX Adjustment	Mean return across events	t-statistic vs 0	t-statistic vs 600	p-value bootstrap
MAR Ex-Europe	+	-0,03%	-0,18%	0,16%	1,785	2,790	0,072
MAR Global	+	-0,03%	-0,20%	0,17%	1,885	1,117	0,060
VEMAR Ex-Europe	+	-0,01%	-0,18%	0,17%	1,183	0,952	0,076
VEMAR Global	+	-0,01%	-0,20%	0,19%	1,593	0,250	0,064

This Table presents a summary of the results obtained with each of the four methodologies. First of all, the predicted expected reaction from the market to the Basel implementation process. It presents the three-day raw returns centered on the 14 relevant events identified as affecting the likelihood of Basel Accords adoption by European banks. *DJ STOXX 1800* represents the three-day return for our reference index. *Mean Return Across Events* is calculated by reaching the mean of the individual event returns, after multiplying by minus one the returns with negative predicted sign. *t-statistic vs0* assesses whether the mean return differs from zero. *t-statistic vs600* assesses whether the mean return differs from the mean return for 600 non-overlapping non-events. *p-value bootstrap*s the proportion of 500 random draws for which the standardized mean return for 14 non-events exceeds the standardized mean event return. Each random selection reflects the predicted signs year distribution.

Table V

Mean Return across Events		EU Admission					Common Law vs Code Law		Bank Assets Dimension		Bank TIER 1 Capital		
Methodology	**Expected Market Reaction**	**EU Admission before 2004**	**EU Admission in 2004**	**EU Admission in 2007**	**EU Admission candidate**	**Other European Countries**	**UK e Ireland - Common Law**	**Others - Code Law**	**Assets > 500.000 MM**	**Assets 0 until 500.000 MM**	**TIER I < 8%**	**8% < TIER I < 10%**	**TIER I > 10%**
MAR Ex-Europe	+	0,17%	0,09%	0,24%	0,12%	0,18%	0,57%	0,14%	0,14%	0,15%	0,12%	0,22%	0,18%
MAR Global	+	0,18%	0,11%	0,26%	0,14%	0,20%	0,59%	0,15%	0,16%	0,17%	0,13%	0,24%	0,20%
VEMAR Ex-Europe	+	0,17%	0,14%	0,39%	0,27%	0,29%	0,44%	0,17%	0,14%	0,17%	0,09%	0,24%	0,19%
VEMAR Global	+	0,11%	0,09%	0,34%	0,22%	0,24%	0,39%	0,12%	0,16%	0,18%	0,10%	0,25%	0,21%

This Table represents the Market Return across Events for all the 14 relevant events in each of the segments and in each of the methodologies. The first segment analysis is for EU admission. *EU Admission before 2004* relates to banks based in countries admitted to EU before 2004. *EU Admission in 2004* and *EU Admission in 2007* represent the values for banks based in countries admitted to EU in 2004 and 2007, respectively. *EU Admission candidate* relates to banks based in countries still applying to be an EU member. *Other Countries* represent banks based in countries with no relationship with EU yet. The second segment analysis is for Common Law and Code Law legislation. *Common Law* relates to banks based in countries with Common Law legislation, only UK and Ireland. *Code Law* represents the values for banks based in countries with Code Law legislation. The third segment analysis is for Bank Assets Dimension. *Assets > 500.000 MM* relates to banks with more than 500.000 MM assets value in Balance. *Assets < 500.000 MM* relates to banks with less than 500.000 MM assets value in Balance. This segment analysis is for Bank TIER 1 Core Capital. *TIER 1 < 8%* relates to banks with less than 8% TIER 1 Core Capital. *8% < TIER 1 < 10%* relates to banks with TIER 1 Core Capital between 8% and 10%. *TIER 1 > 10%* represents banks with higher than 10% TIER 1 Core Capital. *Mean Return Across Events* is calculated by reaching the mean of the individual event returns, after multiplying by minus one the returns with negative predicted sign.

Table VI

Panel A

Descriptive Statistics (Initial sample returns - all analysis period)

	Mean	Min	Max	Std
DJ STOXX® Global 1800	0,01%	-4,02%	3,40%	0,61%
DJ STOXX® Global 1800 Ex-Europe	0,01%	-4,55%	3,36%	0,61%
SNL® 217 European listed banks	-0,00%	-3,92%	2,64%	0,52%
VEMAR Ex-Europe	0,01%	-3,50%	3,43%	0,72%

Panel B

Descriptive Statistics (Initial sample returns - event dates)

	Mean	Min	Max	Std
DJ STOXX® Global 1800	-0,15%	-2,31%	0,62%	0,67%
DJ STOXX® Global 1800 Ex-Europe	-0,12%	-1,83%	0,67%	0,55%
SNL® 217 European listed banks	-0,10%	-1,62%	0,75%	0,51%
VEMAR Ex-Europe	0,03%	-0,64%	0,62%	0,38%

Panel C

Descriptive Statistics (Cross sectional analysis - Events)

	Mean
Info Qual Factor (ADR's)	3,42%
Code Law	95,85%
EU country based bank	67,97%
Size (> 500.000 MM)	8,00%
Tier 1 (> 8 %)	39,30%

This Table presents Descriptive Statistics for the variables used in the market reaction analysis and in the cross-sectional analysis. Panel A, B and C present distributions. In all the panels, N = 3.038, DJ STOXX® is the reference index which was used for market adjust the sample returns. SNL® was the index used to select the sample for this study, where 217 banks had the needed characteristics. VEMAR is the 3-day value-weighted market adjusted return for our sample, calculated by reaching each event 3-day value-weighted raw return minus the reference market adjustment of DJ STOXX® Global 1800 Ex-Europe. *Info Qual Factor* is the variable in which we obtained the level for quality of information by taking into account the entities that have ADR's in American stocks indexes. *Code Law* refers to countries with Code law legislation which should be more flexible to regulation and legislation changes or introductions. *EU country based bank* refers to entities that are based in EU countries. In the variable *Size (>500.000 MM)* we wanted to identify the banks with higher than 500.000 MM assets dimension. Finally, the *Tier 1 (> 8%)* variable refers to bank entities that have, in our 3.038 observations, Tier 1 Core Capital higher than 8% throughout those observations.

Table VII

Number of Banks in Sample		1st Event	7th Event	14th Event
Dimension	**Assets > 500.000 MM**	10	17	23
	Assets 0 until 500.000 MM	207	200	194
Bank TIER 1 Capital	**TIER I < 8%**	183	154	69
	TIER I > 8%	34	63	148

This table represents the evolution of our sample of 217 banks throughout the period of analysis. In terms of dimension, the banks in the sample become bigger, with higher assets numbers and with higher systemic risks. Concerning the Tier 1 ratios, the banks in the sample become more robust, following Basel Accords indications, throughout the study period.

Table VIII

Cross-Sectional Correlation

	ADR	Code	EU	Size	Tier1
ADR	1,00				
Code	0,10	1,00			
EU	0,18	0,89	1,00		
Size	0,43	0,20	0,26	1,00	
Tier1	0,33	0,41	0,44	0,46	1,00

Table IX

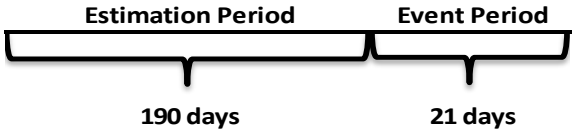
Cross-Sectional Regression

	Unstandardized Coefficients		Standardized Coefficients	
	B	**Std. Error**	**Beta**	**t**
VEMAR	,00	,00		,63
Info Qual Factor (ADR's)	-,09	,12	-,02	-,78
Code Law	,00	,04	,00	,07
EU Admission	,03	,04	,03	,62
Size	,02	,09	,01	,24
Tier 1	,01	,05	,01	,28

These Tables represent the cross-sectional correlation with Pearson correlations, in Table XIV, and the cross-sectional regression with the B coefficient and t-statistic in Table XV. In the first table we studied the correlation between the variables and in the second table we studied the relation between the variables and the results in VEMAR according with our Equation (1). *Info Qual Factor* is the variable in which we obtained the level for quality of information by taking into account the entities that have ADR's in American stocks indexes. *Code Law* refers to countries with Code law legislation which should be more flexible to regulation and legislation changes or introductions. *EU country based bank* refers to entities that are based in EU countries. In the variable *Size (>500.000 MM)* we wanted to identify the banks with higher than 500.000 MM assets dimension. Finally, the *Tier 1 (> 8%)* variable refers to bank entities that have, in our 3.038 observations, Tier Core Capital higher than 8% throughout those observations

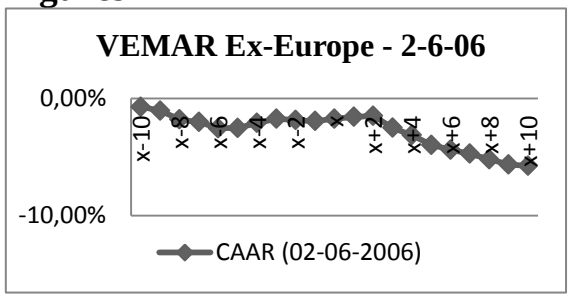
Appendix 2 – Figures

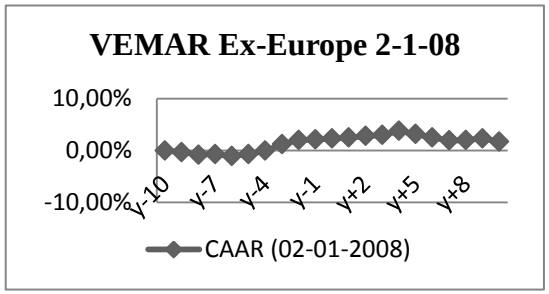
Figure 1

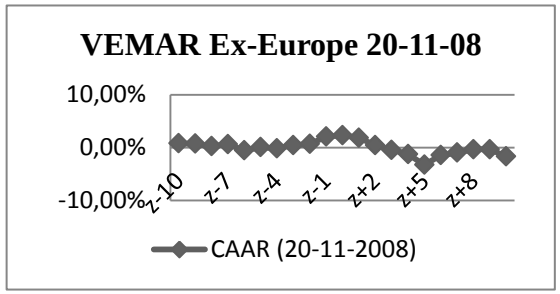


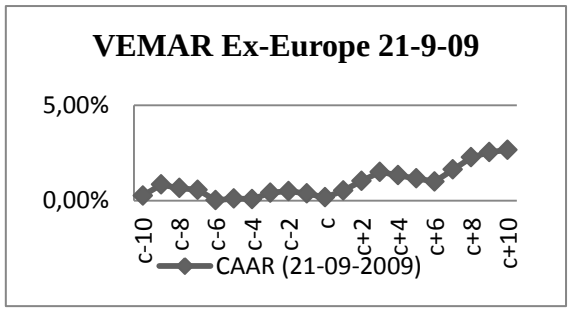
This Figure represents the Estimation Period, 190 days before the 20 days surrounding the relevant event, forming the 21 days Event Period.

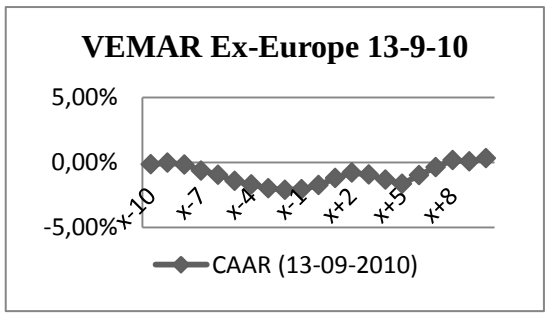
Figures 2

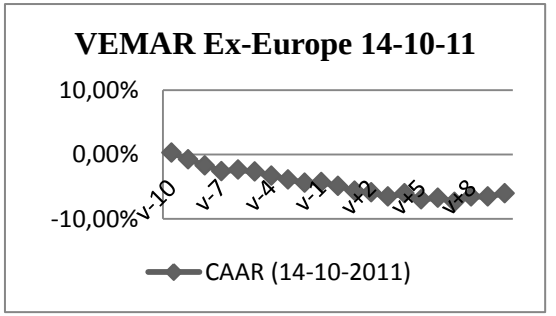












These Figures represent the values for CAAR in the Event Period referring to the June, 2nd 2006, to the January, 2nd 2008, to the November, 20th 2008, to the September, 21st 2009, to the September, 13th 2010 and to the October, 14th 2011 relevant periods. The CAAR, Cumulative Average Abnormal Returns, is achieved by the sum of the values for the days within the period, meaning that we needed to accumulate the daily Average Abnormal Return values. The graphics relate to the most relevant scenario, the CAAR calculated with the VEMAR Ex-Europe.