EU-wide stress testing announcement: The reaction of stock returns

Nikolaos Tsiouris

SCHOOL OF ECONOMICS, BUSINESS ADMINISTRATION & LEGAL STUDIES

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Student Name: Nikolaos Tsiouris

SID: 1103140019
Supervisor: Prof. Nikos Nomikos

I hereby declare that the work submitted is mine and that where I have made use of another's work, I have attributed the source(s) according to the Regulations set in the Student's Handbook.

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Abstract

This dissertation was written as part of the MSc in Banking & Finance at the International Hellenic University.

A bank stress test is an analysis performed under extreme economic scenarios which is planned to investigate whether the institution has enough capital to cope with the impact of various economic abnormalities in the financial system. The main purpose of this study is to find out the impact that the 2014 stress test results' announcement, conducted by the European Banking Authority (EBA), has on the stock returns of the tested banking institutions. The first concern was to clearly set the scene of the stress test procedure by illustrating some vital aspects regarding the roots of this process, the mechanics behind that, the objectives and generally all the factors that lead the regulatory authorities perform this type of analysis.

In order to have measurable outcomes that could help me precisely estimate the impact of the announcement I employed the standard event study methodology. I firstly defined the event of interest along with the estimation and event window. Moreover, I set the selection criteria so as to have the final sample and then moved to the estimation of the normal and abnormal returns. After calculating the Average Abnormal Return (AAR) and Cumulative Average Abnormal Return (CAAR) I assessed whether the estimated t-statistic values are statistically significant or not.

This study was formed under the supervision of Professor Nikos Nomikos. His valuable guidelines, comments and corrections helped me finish my dissertation in the time allotted.

Keywords: (Stress test; Basel Accord; stock returns; standard event study methodology)

Nikolaos Tsiouris

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1. Introduction

It was 2008 when the world economy and especially the world banking system faced the second most severe incident after the Great Depression in 1929. The collapse of Lehman Brothers which at that time had been triggered by the overexposure of the institution to large positions in subprime and other lower-rated mortgage tranches brought in light inefficiencies that had not been fully identified and controlled. The insolvency of Lehman Brothers made clear that risk mitigation is of vital importance for the financial system due to its central role. Such inefficiencies that in many cases are able to fuel a financial shock had to be identified and reviewed periodically for risk mitigation or even elimination purposes. For that reason the stress testing procedure conducted by the European Banking Authority (EBA) can prove to be one of the most important tools for the expansion and well-being of the banking system.

The purpose of my study is to identify to what extent the announcement of stress testing results affect the stock price of the examined financial institutions. The main questions to be answered are:

- What are the roots and structure of the stress testing procedure?
- What are the mechanics of stress testing?
- Does the stress testing announcement affect the financial markets and especially the stock returns of the tested institutions?

For these reasons, I will follow the standard event study methodology in order to examine the reaction of stock returns to the fourth EU-wide stress test of 2014.

1.1 The role of stress testing for the banking system

It is lucid that banks due to their central role face risks that could threaten the national and global economic stability. These risks may include market risk, credit risk or liquidity risk. The mitigation of these types of risk involve pro-action of both the bank individually and the regulators. The banking system is so interconnected that an unprecedented shock in one institution can cause a domino effect which in turn may impact the global financial soundness.

In order to ensure the safety of the system the stress testing procedure is becoming stricter, applying more and more scenarios that in extreme cases could harm the viability of the tested institutions. The whole examination procedure provides valuable help to all concerned parties so as to enhance the well-being of the system. It is the major role, the "too big to fail" idea that makes the regulatory authorities at European and national level to take actions for the implementation of stress testing plans in order to shield the banking system.

1.2 Objectives of stress tests

When discussing about stress testing we have to consider the objectives that drive banks and regulators to perform these case scenarios. Perhaps, the most important objective of financial stress testing is to identify the impact that financial implications have on the whole financial system. The purpose of this procedure is a factor that distinguishes these tests to those used firstly for internal and secondly for external use. Internal stress testing mainly reflects the managerial ethics and culture of the organization while external testing has to be clearly understood by the target audience.

As Drehmann (2008) suggests, there is a difference on how private and central banks view stress tests. Private Banks approach stress tests from a risk management point using mainly financial theory, mathematics and statistics. On the other hand, Central Banks approach stress tests from a macroeconomic perspective demanding macroeconomic fundamentals to be included in the formation of the procedure.

For internal purposes we can recognize two broad objectives: *validation* and *decision making*. Validation is employed as a tool in order to assess the model's accuracy. In other words, it is used to estimate the might of the capital model. For example, "*historical stress tests can offer insights whether the 99th confidence interval indicated by a capital model may be correct or not*"(Drehmann, 2008). Validation as a tool can lead us in another major objective which is the decision making process. Stress testing in internal level has proved to be beneficial in the institution's performance forecasting. Thus, a bank can set some capital and trading goals according to its risk profile and periodically evaluate their performance. In the organization's long term planning, stress tests should facilitate the tractability of the model so as to help senior managers engage in the analysis of different case scenarios. Supervisory authorities can use stress tests for decision making as well. By using these tools the authorities can detect some core vulnerabilities of the financial system. Additionally, broad stress testing by authorities like the European Banking Authority (EBA) in tandem with national testing enhance cross-checking, making it easier to identify failures in the system and hence boosting comparability.

As far as the external purposes are concerned the key objective mainly for Central Banks that do not act as supervisory authorities is the external *communication*. The aforementioned banks illustrate stress test results in their financial stability reports proving that there is a close link between external communication and internal decision making. The model used in this process should be sufficient for storytelling to support the presentation and quantification of possible susceptibilities and complications of the system. In addition, it is noteworthy that the model should be fully transparent and tractable in order to be clear and understandable for the concerning audience. This audience can vary from risk managers to executive and financial officers of a private bank.

The objectives of stress test are pretty clear but in order to be plausible they have to overcome some challenges. The biggest problem a modeler is facing is: data

limitation and endogeneity of risk. Data scarcity is a great implication when forming strict stress episodes. The availability of data influence the modeler's decision to what risks the model should be exposed and ultimately what risk measures to choose. "*For example, very few stress tests endogenise cyclical variations in loss given default (LGD) because of data problems"*(Drehmann, 2008).The other big challenge is the endogeneity of risk. Endogenous risk is the type of risk generated by the own behavioral reactions of the different parties of the economy (policy makers etc.). The endogeneity of risk is a prominent aspect that questions the fundamentals and the status of a stress test model.

1.3 The Basel Accord regulatory framework

The background of the Basel Accords date back in the 1973 when the Cologne-based Herstatt Bank was messy liquidated by the German authorities. The time lag due to the different time zones made the settlement with counterparty banks impossible causing a huge shock to the system. This event urged the G-10 countries to form the Basel Committee on Banking Supervision (BCBS). The Basel Committee was designed under the patronage of the Bank for International Settlements (BIS) based in Basel, Switzerland. Since then there have been released three Accords in 1988 (Basel I), in 2004 (Basel II) and in 2013 (Basel III).

1.3.1. Basel I

Basel I was implemented in 1988 mainly focusing to mitigate credit risk. To do so a minimum capital requirement for credit risk was needed. Basel I, is divided into four major pillars (Balin, 2008):

- Pillar 1(*The constituents of capital*): It defines what types of on-hand capital are counted as a bank's reserves and how much of each type of reserve capital a bank can hold. The capital reserves are categorized into 2 tiers. The Tier 1 capital includes two types of funds: the disclosed cash reserves and other capital

paid for by the sale of bank equity. Tier 2 include reserves created to cover potential loan losses, holdings of subordinated debt, hybrid debt/equity instrument holdings, and potential gains from the sale of assets purchased through the sale of bank stock.

- Pillar 2 (*Risk Weighting*): Risk weighting creates a solid system to risk-weight a bank's assets, that is to say, its loanbook. There are five categories that include all the assets on the balance sheet of a bank. The first category gives 0% weight to the assets characterizing them as riskless. These assets are: cash held by a bank, sovereign debt held and funded in domestic currency, all OECD debt, and other claims on OECD central governments. The second risk class, weights asset at 20% (low risk assets). In this category are included multilateral development bank debt, bank debt created by banks incorporated in the OECD, non-OECD bank debt with a maturity of less than one year, cash items in collection, and loans guaranteed by OECD public sector entities. The third category gives 50% weight to residential mortgages calling them securities of "moderate risk". The fourth, "high risk" category is weighted at 100% of an asset's value and includes a bank's claims on the private sector, non-OECD bank debt with a maturity of more than one year, claims on non-OECD dollar-denominated debt or Eurobonds, equity assets held by the bank, and all other assets. Lastly, the fifth class incorporates claims on domestic public sector entities, which can be valued at 0, 10, 20, or 50% depending on the central bank's discretion.
- Pillar 3 (*A Target Standard Ration)*: The third pillar consolidates the first and second pillars of the Basel I Accord. It sets a minimum 8% of risk weighted assets that should be covered by Tier1 and Tier 2 capital reserves. Half of that (4%) must be covered by Tier 1 capital.
- Pillar 4 (*Implementation*): It is requested by every country's central bank to set strong monitoring and enforcement mechanisms to make sure that the Basel Accords are followed and transition weight are given so the banks can adopt the standards of the accords within a four-year period.

1.3.2. Basel II

The criticism followed the implementation of Basel I Accord made the Basel Committee to move on by releasing a more comprehensive framework for capital adequacy, known as the "*International Convergence of Capital Measurement and Capital Standards*" or informally the Basel II Accord.

Basel II is composed of three pillars(Cardinali & Nordmark, 2011):

- Minimum Capital Requirements
- Supervisory Review Process
- Market Discipline

In the first pillar the committee gives an overview of the calculation of the minimum capital requirements for credit, market and operational risk. The capital ratio is calculated using the definition of regulatory capital and risk-weighted assets. The total capital ratio must be no lower than 8%. Tier 2 capital is limited to 100% of Tier 1 capital (Basel Committee on Banking Supervision, 2006). In the first pillar we have an evaluation of the regulatory capital in terms of the three types of risk: credit risk, market risk and operational risk.

Regarding credit risk, banks have the permission by the committee to follow two broad methodologies for calculating the capital requirements. The first is the Standardized Approach which measures credit risk in a standardized manner using external credit assessments while the second the Internal Ratings-based Approach is subject to the explicit approval of the bank's supervisor, allowing banks to use their internal rating systems for credit risk (Basel Committee on Banking Supervision, 2006).

As for the operational risk the calculation of the reserves is such to protect the bank from failures in the internal processes and some other unexpected external events. Market risk on the other hand is decomposed by the Basel II Accord in subcategories like interest rate risk and volatility risk separating fixed income products from other products such as equity, commodity and foreign exchange products (Balin, 2008).

The second pillar deals with the Supervisory Review Process. This process is designed not only to ensure that banks have all the necessary capital to support any risk they undertake from their operations but also to encourage banks to use state-of-the-art techniques to monitor and mitigate any threat that may arise. As it is mentioned by the committee (2006): "*The supervisory review process recognizes the responsibility of bank management in developing an internal capital assessment process and setting capital targets that are commensurate with the bank's risk profile and control environment*".

The third pillar copes with market discipline. Market discipline can be enhanced by creating a bunch of requirements which will encourage all the market participants to assess information on the scope of application, capital, risk exposures, risk assessment processes, and hence the capital adequacy of the institution (Basel Committee on Banking Supervision, 2006).

1.3.3. Basel III

The global financial crisis triggered in 2007-2008 forced the Basel Committee to release a new set of rules, known as the Basel III Accord. The new regulatory framework was originally developed to strengthen bank capital requirements. To do so banks should increase their liquidity along with decreasing their leverage[1]. The third Accord was introduced in 2013 and was scheduled to hold until 2015 but the financial conditions urged the committee to extend the implementation period until 2019.

According to the Bank for International Settlements[2] (BIS) the Basel III Accord aims to:

- Improve the banking sector's ability to absorb shocks arising from financial and economic stress, whatever the source.

[1] https://en.wikipedia.org/wiki/Basel_III

[2] http://www.bis.org/bcbs/basel3.htm

- Improve risk management and governance.
- Strengthen banks' transparency and disclosures.

The key principles of the third Accord can be classified into three categories: capital requirements, leverage ratio and liquidity requirements.

Concerning the capital requirements all banks are asked to hold 4.5% of common equity of risk weighted assets. Additionally, since 2015 all banks are obliged to maintain a minimum Common Equity Tier 1 (CET1) ratio of 4.5%.The minimum Tier 1 capital increases from 4% in Basel II to 6%, applicable in 2015, over RWAs. This 6% is composed of 4.5% of CET1, plus an extra 1.5% of Additional Tier 1 (AT1)[3].

As far as the Leverage Ratio is concerned, the Accord imposes a minimum ratio that is calculated by dividing Tier 1 capital by the bank's average total consolidated assets. It is mandatory that all banks maintain a minimum 3% Leverage Ratio under the norms of Basel III.

To fortify the liquidity requirements of the banking sector the committee introduced two major liquidity ratios: the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio. According to the LCR, banks are required to hold enough high-quality liquid assets to cover their total net cash outflows over 30 days. As for the Net Stable Funding Ratio the banking institutions should maintain sufficient amount of stable funding to exceed the required amount of stable funding over a one-year period of extended stress[4].

1.4 EU-wide stress testing overview

The idea of performing a collective stress testing exercise in EU-wide level came in 2009 when the ECOFIN authorized the Committee of European Banking Supervisors (CEBS) along with the European Commission and the European Central Bank (ECB) to

[3] http://www.bis.org/bcbs/basel3/basel3_phase_in_arrangements

[4] https://en.wikipedia.org/wiki/Basel_III

coordinate an EU-wide forward looking stress testing process on the banking sector. This process was built on common directives and scenarios for a group of 22 leading European banking institutions. The main objective of this exercise was to boost the quantity and quality of information that policy makers have, when estimating the flexibility of the European financial system[5].

The first EU-wide stress testing exercise carried out in 2009 was based on two main elements (CEBS press release, 2009):

1. An assessment of credit risks based on two sets of commonly agreed macro economic scenarios. A baseline scenario and an adverse one representing a severe but plausible event based on the data provided by the European Commission and the European Central Bank.
2. A sensitivity analysis on the trading book based on commonly agreed parameters.

The second exercise performed in 2010, has been conducted on a sample of 91 European banking institutions, representing 65% of the total assets of the EU banking sector. That particular stress testing process focused mainly on risks such as credit and market risk, including the exposure of the institutions to European sovereign debt. Two sets of macro-economic scenarios (benchmark, adverse) have been used to proceed with the exercise, including a sovereign shock scenario covering the period 2010-2011.

In 2011 the European Banking Authority decided to launch a new round of stress test in close cooperation with the national supervisory authorities, the European Systemic Risk Board (ESRB), the European Central Bank (ECB) and the European Commission. The third stress test exercise was built upon the exercise of the former year testing the resilience of 91 European banks to adverse but plausible scenarios.

[5] cebs's press release on the results of the EU-wide stress testing exercise, 1 October 2009

According to the European banking Authority (EBA)[6] the 2011 EU-wide stress test results illustrate that:

- At the end of 2010, twenty banks would fall below the 5% Core Tier 1 Ratio (CT1R) threshold over the two-year horizon of the exercise. The overall shortfall would total EUR 26.8 billion.
- Between January and April 2011, a further net amount of some EUR 50 bn. of capital was raised.
- Taking into account these capital raising actions implemented by the end of April 2011 eight banks fall below the capital threshold of 5% CT1R over the two year time horizon with an overall CT1 shortfall of EUR2.5 bn. and sixteen banks display a CT1R of between 5% and 6%.

The last stress testing exercise till nowadays came in 2014.The major objective of the 2014 stress tests was to help regulators assess the resilience of the European banking system to severe market developments. The overall process was planned to give concerned parties (regulators, market participants etc.) all the information needed to evaluate the flexibility of the EU banking institutions under extreme events. 124 EU banks participated and were asked to point up a group of risks including: credit risk, market risk and sovereign risk. Moreover, trade and banking book assets were set under scrutiny along with off-balance sheet exposures. The official EBA press release regarding the results of the 2014 stress test mentions:

> **"…***EU banks' common equity ratio (CET1) drops by 260 basis points, from 11.1% at the start of the exercise, after the asset quality reviews' (AQRs) adjustment, to 8.5% after the stress. By disclosing these results, the EBA is providing unparalleled transparency into EU banks' balance sheets, with up to 12,000 data points per bank, an essential step towards enhancing market discipline in the EU*".

[6] Results of the 2011 EU-wide stress test, 15 July 2011

2. Literature Review

The effect that different types of announcements have on stock prices has been broadly studied in the scientific community. Particularly, a lot of academic papers cover the effect of dividend, stock split, M&A announcement on the stock returns of the examined companies. Some of these essays applied the standard event study methodology which is a statistical technique mainly used to examine how stock returns react to various corporate events.

Gunasekarage and Power (2002) examined the post-announcement performance of U.K. companies which disclose dividend and earnings news to the capital market on the same day. They analyzed the market-adjusted excess returns for three periods around the announcement and then studied the financial performance in the year of the announcement and in the following five year period. They collected a sample of 1,787 announcements during a five year period from 1989-1993. Their main findings suggest that the performance of these companies deteriorated consistently throughout the post-announcement period. They also point out that the mean reverting pattern in the accounting variables propose that a reduction in dividend is evidence of a company adapting its corporate finance policies to turn their performance around.

Burton, Lonie and David (1999) tried to shed light on the way in which equity investors react to news of large cash outflows by companies in which they have a large stake. In other words, they investigated the UK stock market reactions to the announcement of different types of capital expenditure. They examined approximately 500 announcements made by UK firms during a three year period from 1989-1991. They came to a conclusion by mentioning that investors' response to this news depends on (i) whether the project is undertaken by an individual firm or as part of a joint venture and (ii) whether the investment generates cash immediately or recoups its investment only after a period of several years.

Beer (1993) explored the market reaction to dividend changes on the Brussels Stock Exchange by relating it to information releases by the firms. The purpose was to determine whether unexpected dividend changes convey pertinent information for example, information beyond that provided by earnings numbers. She investigated two samples of Belgian companies. The first sample includes firms paying dividends on a regular basis and the second sample contains firms resuming payment of dividends after a lapse of at least three consecutive years. The sample size was 135 companies comprising 68% of the total number of domestic companies. Beer ended up by presenting that the market reaction is weak and not significant. She also found differences between Belgian investors' behavior and US investors' behavior.

Easton and Harris (1991) in their paper "*Earnings as an Explanatory Variable for Returns"* studied the possibility that the level of earnings divided by price at the beginning of the stock return period is relevant for evaluating earnings/returns associations. They selected 20,188 observations for a period of 17 years from 1969-1986. In their concluding remarks they mention that there is a relationship between the level of current accounting earnings divided by beginning-of-period price and stock returns. It is also suggested that earnings variables do play a role in security valuation.

Bhana (2008) conducted a study on capital investment announcements by applying the standard event study methodology to measure whether the investment decisions of South African companies are consistent with the goal of maximizing shareholder wealth. He employed 378 capital expenditure announcements by companies listed on the JSE during the period 1 January 1995 to 31 December 2004. All in all, he found significant positive excess returns surrounding capital spending announcements. He also observed that information related to the capital expenditure decisions are impounded in the share prices three days prior to the public announcement and that the market responds significantly and positively to capital announcements by focused firms, whereas there is a much weaker response to announcements by diversified companies.

Neuhierl, Scherbina and Davis (2013) assess the relative importance of corporate news to the market. They also investigate the patterns of changes in stock volatility, bid-ask spreads, and trading volume following different types of news. They gathered corporate press releases that have been issued between April 2006 and August 2009. Their results show that volatility tends to increase following most types of announcements, and attribute these volatility increases to higher levels of news-induced valuation uncertainty. Lastly, they illustrate that press releases remove the informational advantage of firm insiders, resulting in lower post-announcement bid-ask spreads.

Fama et al. (1969) stressed the process by which common stock prices adjust to the information that is implicit in a stock split. They collected 940 splits occurred in the New York Stock Exchange (NYSE) from January 1927, through December 1959.By using the event study methodology they proved that the market utilizes the announcement of a split to re-evaluate the stream of expected income from the shares. Their main finding is that stock prices adjust very rapidly to new information hence we can see the market as efficient.

As far as the standard event study methodology is concerned Armitage (1995) outlines widely used methods of estimating abnormal returns and testing their significance, highlights respects in which they differ conceptually and reviews research comparing results they produce in various empirical contexts. He suggests that event study methods are worth reviewing because of their many variations and their very wide application in empirical research. Additionally, Bowman (1983) provided a structure for the design of event studies, to differentiate them by type and to discuss some issues which are crucial to their understanding. Lastly, Binder (1998) points out that the event study methodology is, with some corrections for statistical problems that arise in certain cases, a powerful tool to detect the impact of specific events on security prices. He mentions that the market model works well as a measure of the benchmark rate of return and that researchers found unbiased and powerful tests of hypotheses about the average effect of the event on the sample firms.

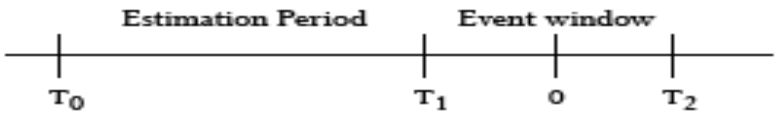
3. Data and Methodology

In this part we have to employ the standard event study methodology in order to pinpoint the impact that the 2014 EU-wide Stress testing results' announcement had on the returns of the participating financial institutions. According to Campbell et al. (1997) the standard event study methodology is categorized into five main steps. These steps include: event definition, selection criteria, normal and abnormal returns, estimation procedure and testing procedure.

3.1 Event Definition

In order to start working with a standard event study methodology we should first define the event of our interest. In our case the event that we need to examine is the announcement of the results of the 2014 EU-wide stress testing procedure that took place on the 27th October 2014. We use a ten-day window, where the announcement day is the event day [-10, 0, +10]. It is clear cut that we are interested in the stock price reaction after the announcement day. In Figure 1 we can see the timeline for an event window but before we move on it is essential to define and distinct between the estimation and the event period. The estimation period (examined first) is the period which proceeds the announcement day. On the other hand, the event period is defined as the duration for computing the consequences of the results' announcement on the shareholders share prices. An important issue regarding the estimation and event period is that many times these periods are not defined well and coincide with each other, driving into wrong and misleading results. For this project as it can be seen in the figure below the estimation period will be from (T_1-T_0), accounting for 300 days and the event window from *(T_1*+1 to *T_2)* with length of 21 days.

Figure 1. Timeline for an event window



3.2 Selection Criteria

The banking institutions that form the sample should meet some criteria so as to be selected. The criteria in order for a bank to be included in the sample are:

- Banks should have daily traded stock 300 days prior to the event window (estimation period) and 10 days subsequent to the announcement date.
- Banks should not be private or unlisted.

The aforementioned criteria in our case are only met by 55 European banks from the following countries: Austria, Belgium, Cyprus, Germany, Denmark, Spain, France, Greece, Hungary, Ireland, Italy, Malta, Norway, Poland, Portugal, Sweden and UK.

3.3 Normal and Abnormal Returns

Having decided the estimation and the event window, the next step is to choose the most appropriate model initially for the estimation of the expected returns and then for the abnormal ones. But first we should define normal returns. The normal return of a stock price is defined as the return that would be expected if the event did not take place. We estimate normal returns as:

$$R_{i,t} = \ln(P_{i,t}) - \ln(P_{i,t-1}) \qquad (1)$$

Where: $R_{i,t}$ = the actual return of share i on day t;

$P_{i,t}$ = the price of share i on day t;

$P_{i,t-1}$ = the price of share i on day t-1.

It is generally accepted that there are numerous models that can be used to estimate the expected returns. Some of them are statistical and some economic. The most common statistical models used, are the market model, the risk adjusted model and the constant mean return model while the most known economic model is the Capital Asset Pricing Model (CAPM). It is widely accepted that the use of economic models provide better results than these of the statistical, because they do not fail to take into account statistical assumptions (MacKinlay, 1997). For this project the market model is employed for the simple reason that it embodies not only the two other models, but it can lead to better and more reliable results, since it manages to decline the increased variance of the abnormal returns, where the other models fail to do it. The market model can be defined as the model at which the stock returns is a linear function of the market return (R_m) plus a constant alpha (a). The beta (β) represents the firm's systematic risk and is included to the equation because it directly influences the sensitivity of the firm's return with response to the market return. The expected return can be calculated as:

$$E(R_{it}) = \alpha_i + \beta_i \, E(R_{mt}) \qquad (2)$$

Where R_{it} = the rate of return on stock price of firm i at time t;

R_{mt} = the rate of return of the market index;

α_i = the intercept term; and,

β_i = a regression constant.

The next step in our calculations is to estimate the abnormal returns. The abnormal return is the difference between the actual and the expected return and can be written algebraically as:

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) \qquad (3)$$

Where $AR_{i,t}$ = the abnormal return on share i on day t; and,

E(Ri,t) =the expected return on share i on day t.

The average abnormal return *(AAR)* for the examined institutions in each country in period t is calculated as follows:

$$AAR_t = \frac{1}{n}\sum_{i=1}^{n} AAR_{it} \qquad (4)$$

Where AAR_t = the average abnormal return for time t;

AAR_{it} = the abnormal return for bank I at time t; and,

n = the sample size.

In order to find the magnitude of the abnormal returns over the event window we have to calculate the Cumulative Average Abnormal Returns (CAARs) which can be estimated as:

$$CAAR_t = CAAR_{t-1} + AAR_t \qquad (5)$$

Where $CAAR_t$ = the cumulative average abnormal return at time $_t$;

$CAAR_{t-1}$ = the cumulative average abnormal return at time $_{t-1;}$

AAR_t = the average abnormal return at time $_t$.

3.4 Estimation Procedure

McWilliams and Siegel (1997) had proved that choosing a shorter duration for an event window can always lead to better and more robust results. A shorter period can better capture the consequences that the announcement will have on the share

price, due to the new information being released in the market. Contrary, a longer event window can significantly decline the robustness of the test statistic, leading therefore to wrong results regarding the importance of the event as stated by Brown and Warner (1985). Finally according to Siegel and McWilliams (1997) the use of a long event window violates the market efficiency assumptions and that comes from the fact that it is difficult for the new information to be included in the stock price effectively in the long run.

3.5 Testing Procedure

The last step in the methodology in order to conduct a standard event study is to estimate the parametric t-statistics. This estimation is a good as well as reliable way to find out whether the excess returns are significantly different from zero at a specified significance level. In other words the null Hypothesis that we test is:

AAR Significance: H_o: $E(AAR_t) = 0$ (6)

Against the two-sided alternative hypothesis

H_1: $E(AARt) \neq 0$

and

CAAR Significance: H_o: $E(CAAR\ t_1,t_2) = 0$ (7)

Against the two-sided alternative hypothesis

H_1: $E(CAAR\ t_1,t_2) \neq 0$

If (H_0=0) is true then it means that the announcement of the stress test results do not have either positive or negative impact on share price. On the other hand, if H_0 is not true then the announcements of the results affect in a positive or negative way the share prices.

4. Empirical Results

After conducting the standard event study methodology, the estimated results (Appendix, tables 1-10) give valuable information regarding the impact that the announcement of the 2014 stress tests have on the returns of the examined banking institutions. The findings illustrate that the results' announcement does not affect the participating banks in the same way but the magnitude of the impact depends on different aspects. In order to proceed with the interpretation of the main findings for the banks of each EU country that we tested, we should first define two major factors that we employed in the methodology section and play the most vital role in the explanation of the results. These two factors are the Average Abnormal Returns (AAR) and the Cumulative Average Abnormal Returns (CAAR). By using the Average Abnormal Return (AAR) we aggregate all the abnormal returns for all stocks so as to estimate the average abnormal return at time *t*. This can help us eradicate peculiarities in our estimation due to specific stocks. On the other hand the Cumulative Average Abnormal Return (CAAR) which is the sum of the average abnormal returns can prove to be a very useful statistical tool because it can help us understand the cumulative effect of the abnormal returns. The interpretation of our main findings will be based on the estimated AAR's and CAAR's of each country which are statistically significant at a 95% confidence level according to t-test.

In Austria we can observe that the AAR is statistically significant at the event day (27/10/2014) as well as three days after that. All the other days in the event window are proved to be insignificant. The CAAR is significant at the event day and all the following days of the event window but it is also significant at the first, fourth, fifth and seventh day before the event. As far as Belgium is concerned we can see that the AAR is only significant the tenth day after the announcement date while the CAAR is significant five times after the 27th of October and two times before that. It is significant at 14/10, 21/10, 28/10, 30/10, 3/11, 7/11 and 10/11. In Cyprus the Average Abnormal Return (AAR) is significant only four days after the event day while the Cumulative Av-

erage Abnormal Return (CAAR) is significant ten consecutive days after the announcement day. In Germany the Average Abnormal Return (AAR) is statistically insignificant throughout the event window. Regarding the Cumulative Average Abnormal Return (CAAR) it is only significant the sixth day after the 27th of October when the stress testing results were announced. Moving on to Denmark we can note that there is not a single day in the event window that the AAR is statistically significant, but this is not the case for the CAAR where the event day, the following ten days and four successive days before that are significant. In Spain the Average Abnormal Returns (AAR) follows the same pattern as Denmark where all days in the event window are statistically insignificant. As for the CAAR only the nineteenth day of the event window is significant. In terms of the AAR, in France the 27th of October is statistically insignificant. Before that day only the second and ninth day of the pre announcement event window are significant. With reference to the post announcement event window we can detect that the coming two days after the announcement are also statistically significant including the 7th of November which is the ninth day of our event window. The Cumulative Average Abnormal return (CAAR) in France is not significant in the event day but five consecutive days before that including the ninth day of the pre announcement event window. After the event only the fifth and eighth day of the post announcement window are insignificant. The results in Greece are pretty weird. Although everybody would expect that the announcement of the stress testing results would have a severe impact on the stock returns, this is not the case. While the event day is insignificant both in terms of the AAR and the CAAR we can see that as regards the AAR only the ninth day of the pre announcement window is significant followed by the first, second and eighth day ex post. All days before the event have totally insignificant CAAR and there are only four days after the event in which the CAAR is proved to be significant. The findings for Hungary are obvious. The AAR is insignificant all over the event window. As for the CAAR the situation is the same with the only exception to be the 15th of October that is five days before the results' release. In Ireland the Average Abnormal Returns (AAR) indicates that the market reacts to the news only the second, third, sixth, seventh and ninth day after the event took place. On the other hand the

CAAR presents some market reaction the seventh day before the event as well as the third, sixth, seventh, ninth and tenth day after that. In Italy both the Average Abnormal Returns (AAR) and the Cumulative Average Abnormal Returns (CAAR) are insignificant through the whole event period window. In Malta the only day that illustrates some market reaction is the second day after the event regarding the CAAR while the AAR's are totally insignificant. In Norway we can spot that throughout the event window the AAR is statistically significant only during the event day as well as the second, sixth and seventh day of the pre announcement period. The CAAR is significant during the whole period excluding only the first, second and fourth day of the window. According to the estimated t-statistic values for both the AAR and the CAAR in Poland we can notice that the market reacted only the sixth day of the post announcement CAAR event window. In Portugal the impact of the stress test results is minor. Considering the AAR, the t-stat values are significant only in three particular days. Those are the 20th October and the 5th and 6th of November. The calculated CAAR values illustrate that the first and third day before the event the returns are proved to be significant followed by the second, eighth and tenth day of the post announcement era. In Sweden, regarding the AAR the market shows some significance during the event day. There are also four days in the whole event period that present the same significance. In chronological order these days are the 17th, 21st, 29th October and the 4th of November. In the CAAR's case the market reacted differently. As we can notice there is a strong impact in the t-statistic values one day before the event and for all the following days of the window. Finally, in the UK the AAR values do not bear any noticeable impact from the announcement of the results. The only market reaction in our UK sample can be detected the last 6 days of the CAAR event window.

5. Conclusion

With this study we tried to sheds light on a field that is rather new in the economic and financial community. Although banking issues tend to concern economists for many decades the so called banking stress tests appeared in such a scale after the

financial distress in the USA that came after the collapse of Lehman Brothers. Lehman Brothers caused a domino effect that influenced most of the economies worldwide. The strongest economies easily overcame this abnormality but the weakest for example; Portugal, Ireland, Italy, Greece and Spain (PIIGS) still face the consequences, trying to reform their banking and public sectors. In order to shield the European banking structure the European Union implemented a periodic stress testing procedure which examines the strength and capabilities of some European banking institutions under extreme case scenarios. The scene for this process was set by the Basel Accord Regulatory Framework which is nothing more than a set of directives whose main purpose is to act supplementary to the European and national legislature framework. The aforementioned regulatory framework has been released by the Basel Committee on Banking Supervision (BCBS), formed by the Bank for International Settlements (BIS) based in Basel, Switzerland and came into three parts: Basel I, Basel II and Basel III. Back to the study itself, this essay examines stress testing from an economic perspective, providing a theoretical background supported by an empirical research. More concretely, it analyses the financial impact that the announcement of the 2014 stress testing results have on the stock returns of the target shareholders. In a theoretical level, this study answers some vital questions regarding the roots and structure of the procedure as well as the mechanics of stress testing. Specifically, it enlightens the role of stress testing for the banking system, the objectives of stress testing and finally makes a broad analysis of the Basel Accord Regulatory Framework. In the second section of this study we come across the Literature Review. There is a large pool of academic papers written by known economists concerning various issues related to the structure and role of the banking institutions, the threats that banks may face and possible solutions. As far as the empirical part of the study is concerned; an event study was conducted with the use of the market model as a statistical tool. The employment of the market model was necessary for the estimation of normal returns during the estimation period of 300 days and then of the abnormal returns during the event period of 21 days. Specifically the event study tested the change in target shareholders' return before, on and after the announcement day for 55 European Banks that met the selection criteria.

Trying to have a clear picture of the key empirical findings we estimated and tested the Average Abnormal Return (AAR) and the Cumulative Average Abnormal Return (CAAR). By using the AAR we average the abnormal return so as to eliminate idiosyncratic elements of specific stocks while employing the CAAR which is the sum of the AAR's helps us discern the collective effect of the abnormal returns. A two tail test for both the AAR and CAAR gave the t-statistic for these two factors. The t-statistic gives a clear indication of the impact that the announcement of the stress test results have on the stock returns of the examined banking institutions. The calculated findings suggest that there is not an ordinary pattern among the tested banks. The force of the announcement varies among countries. As we can observe some of the countries face a more profound impact while others a smoother one. This is because of many reasons that have to do with the economic, political and social environment of every country which cannot be included in this study but give feedback for future examination.

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Appendix

Table 1

	Austria						Belgium					
	AAR	t-statAAR	Significant	CAAR	t-statCAAR	Significant	AAR	t-statARR	Significant	CAAR	t-statCAAR	Significant
-10	0,0142	0,8201	No	0,0142	0,8201	No	-0,0261	-0,8803	No	-0,0261	-0,6225	No
-9	-0,0140	-0,8099	No	0,0002	0,0102	No	-0,0038	-0,5519	No	-0,0299	-3,0475	Yes
-8	0,0145	0,8384	No	0,0147	0,8486	No	0,0047	0,4821	No	-0,0252	-1,8500	No
-7	0,0198	1,1476	No	0,0345	1,9963	Yes	-0,0360	-0,6606	No	-0,0612	-0,7948	No
-6	-0,0056	-0,3266	No	0,0289	1,6697	No	0,0271	0,7647	No	-0,0341	-0,6819	No
-5	0,0182	1,0502	No	0,0470	2,7199	Yes	-0,0205	-0,5694	No	-0,0547	-1,0727	No
-4	-0,0115	-0,6667	No	0,0355	2,0532	Yes	-0,0159	-1,4085	No	-0,0706	-4,4097	Yes
-3	-0,0143	-0,8270	No	0,0212	1,2261	No	0,0099	0,4457	No	-0,0607	-1,9374	No
-2	0,0090	0,5189	No	0,0302	1,7451	No	0,0076	0,3555	No	-0,0532	-1,7671	No
-1	0,0247	1,4315	No	0,0549	3,1766	Yes	-0,0185	-0,4360	No	-0,0716	-1,1966	No
0	0,0583	3,3711	Yes	0,1132	6,5477	Yes	0,0163	0,5465	No	-0,0553	-1,3100	No
1	-0,0011	-0,0646	No	0,1121	6,4831	Yes	-0,0075	-0,5798	No	-0,0628	-3,4531	Yes
2	-0,0012	-0,0705	No	0,1109	6,4127	Yes	-0,0036	-0,0889	No	-0,0663	-1,1675	No
3	0,0462	2,6724	Yes	0,1571	9,0851	Yes	0,0192	1,4011	No	-0,0471	-2,4359	Yes
4	-0,0074	-0,4280	No	0,1497	8,6571	Yes	-0,0242	-0,5213	No	-0,0714	-1,0858	No
5	0,0116	0,6694	No	0,1612	9,3264	Yes	-0,0019	-0,3899	No	-0,0732	-10,8128	Yes
6	0,0110	0,6378	No	0,1723	9,9643	Yes	0,0148	0,4575	No	-0,0585	-1,2785	No
7	-0,0289	-1,6744	No	0,1433	8,2899	Yes	-0,0185	-0,3788	No	-0,0770	-1,1131	No
8	0,0125	0,7216	No	0,1558	9,0115	Yes	0,0129	0,4964	No	-0,0641	-1,7448	No
9	0,0111	0,6403	No	0,1669	9,6518	Yes	-0,0167	-0,5909	No	-0,0808	-2,0214	Yes
10	0,0110	0,6352	No	0,1778	10,2870	Yes	-0,0081	-2,0257	Yes	-0,0889	-15,7200	Yes

Table 2

	Cyprus						Germany					
	AAR	t-statAAR	Significant	CAAR	t-statCAAR	Significant	AAR	t-statARR	Significant	CAAR	t-statCAAR	Significant
-10	-0,0273	-0,6252	No	-0,0273	-0,6252	No	-0,0107	-0,5283	No	-0,0107	-0,2362	No
-9	-0,0013	-0,0289	No	-0,0286	-0,6542	No	0,0109	0,7162	No	0,0003	0,0079	No
-8	-0,0058	-0,1336	No	-0,0344	-0,7877	No	-0,0035	-0,1626	No	-0,0033	-0,0672	No
-7	-0,0109	-0,2491	No	-0,0453	-1,0369	No	-0,0095	-1,1024	No	-0,0128	-0,6623	No
-6	0,0304	0,6959	No	-0,0149	-0,3410	No	-0,0049	-0,1595	No	-0,0177	-0,2581	No
-5	-0,0393	-0,9002	No	-0,0542	-1,2413	No	0,0001	0,0043	No	-0,0177	-0,5048	No
-4	0,0189	0,4316	No	-0,0354	-0,8097	No	0,0142	0,7405	No	-0,0035	-0,0819	No
-3	-0,0286	-0,6550	No	-0,0640	-1,4647	No	0,0162	0,5354	No	0,0127	0,1877	No
-2	0,0096	0,2196	No	-0,0544	-1,2451	No	0,0122	0,6021	No	0,0249	0,5499	No
-1	-0,0159	-0,3633	No	-0,0703	-1,6085	No	-0,0010	-0,1690	No	0,0239	1,8173	No
0	-0,0107	-0,2447	No	-0,0810	-1,8532	No	0,0008	0,0295	No	0,0247	0,3971	No
1	-0,0122	-0,2799	No	-0,0932	-2,1331	Yes	0,0122	0,7209	No	0,0370	0,9753	No
2	-0,0010	-0,0238	No	-0,0942	-2,1569	Yes	-0,0038	-0,1416	No	0,0331	0,5502	No
3	-0,0200	-0,4568	No	-0,1142	-2,6137	Yes	0,0064	0,3799	No	0,0395	1,0527	No
4	-0,1916	-4,3863	Yes	-0,3058	-7,0000	Yes	-0,0030	-0,3296	No	0,0366	1,8259	No
5	-0,0313	-0,7169	No	-0,3371	-7,7170	Yes	0,0030	0,1634	No	0,0396	0,9652	No
6	-0,0048	-0,1097	No	-0,3419	-7,8267	Yes	0,0061	0,6603	No	0,0457	2,1984	Yes
7	-0,0176	-0,4035	No	-0,3596	-8,2302	Yes	-0,0043	-0,3554	No	0,0414	1,5326	No
8	-0,0338	-0,7733	No	-0,3934	-9,0035	Yes	0,0014	0,1169	No	0,0428	1,6428	No
9	-0,0207	-0,4739	No	-0,4141	-9,4774	Yes	0,0011	0,0956	No	0,0439	1,6726	No
10	-0,0016	-0,0368	No	-0,4157	-9,5142	Yes	0,0044	0,1591	No	0,0483	0,7832	No

Table 3

	Denmark						Spain					
	AAR	t-statAAR	Significant	CAAR	t-statCAAR	Significant	AAR	t-statARR	Significant	CAAR	t-statCAAR	Significant
-10	-0,1825	-0,6209	No	-0,1825	-0,3585	No	0,0094	0,7954	No	0,0094	0,3247	No
-9	-0,1664	-0,5970	No	-0,3489	-0,7228	No	0,0040	0,2452	No	0,0023	0,0592	No
-8	-0,1663	-0,6113	No	-0,5151	-1,0935	No	-0,0070	-0,2769	No	-0,0014	-0,0226	No
-7	-0,1782	-0,6327	No	-0,6933	-1,4215	No	-0,0037	-0,6972	No	0,0000	0,0011	No
-6	-0,1467	-0,4929	No	-0,8400	-1,6296	No	0,0014	0,0792	No	0,0063	0,1446	No
-5	-0,1711	-0,5723	No	-1,0111	-1,9527	No	0,0063	0,4468	No	0,0128	0,3704	No
-4	-0,1535	-0,4995	No	-1,1645	-2,1884	Yes	0,0065	0,3897	No	0,0181	0,4429	No
-3	-0,1540	-0,5171	No	-1,3185	-2,5560	Yes	0,0053	0,4361	No	0,0139	0,4687	No
-2	-0,1635	-0,5555	No	-1,4821	-2,9066	Yes	-0,0043	-0,6251	No	0,0141	0,8460	No
-1	-0,1785	-0,6051	No	-1,6606	-3,2496	Yes	0,0003	0,0326	No	0,0150	0,7626	No
0	-0,1466	-0,5026	No	-1,8072	-3,5761	Yes	0,0009	0,0437	No	0,0125	0,2614	No
1	-0,1651	-0,5413	No	-1,9724	-3,7327	Yes	-0,0024	-0,6417	No	0,0062	0,6679	No
2	-0,1430	-0,5005	No	-2,1154	-4,2750	Yes	-0,0063	-0,4877	No	0,0069	0,2166	No
3	-0,1545	-0,5443	No	-2,2699	-4,6161	Yes	0,0007	0,0413	No	-0,0149	-0,3705	No
4	-0,1744	-0,5775	No	-2,4443	-4,6736	Yes	-0,0218	-0,5929	No	-0,0251	-0,2795	No
5	-0,1716	-0,6055	No	-2,6159	-5,3282	Yes	-0,0103	-1,0665	No	-0,0364	-1,5460	No
6	-0,1635	-0,5763	No	-2,7794	-5,6573	Yes	-0,0113	-0,5524	No	-0,0436	-0,8706	No
7	-0,1682	-0,5659	No	-2,9475	-5,7263	Yes	-0,0071	-0,5328	No	-0,0482	-1,4697	No
8	-0,1699	-0,5887	No	-3,1174	-6,2360	Yes	-0,0046	-0,5490	No	-0,0419	-2,0415	Yes
9	-0,1666	-0,5841	No	-3,2840	-6,6484	Yes	0,0062	0,6193	No	0,0108	0,4391	No
10	-0,1761	-0,6086	No	-3,4601	-6,9044	Yes	0,0527	0,6237	No	0,0108	0,0521	No

Table 4

	France						Greece					
	AAR	t-statAAR	Significant	CAAR	t-statCAAR	Significant	AAR	t-statARR	Significant	CAAR	t-statCAAR	Significant
-10	-0,0002	-0,0450	No	-0,0002	-0,0318	No	0,0137	1,5368	No	0,0137	0,7684	No
-9	0,0047	3,1896	Yes	0,0045	2,1767	Yes	-0,0710	-3,1615	Yes	-0,0572	-1,2749	No
-8	-0,0037	-0,8852	No	0,0008	0,1393	No	-0,0395	-1,4698	No	-0,0968	-1,7986	No
-7	-0,0018	-0,4989	No	-0,0009	-0,1889	No	-0,0014	-0,0507	No	-0,0982	-1,8024	No
-6	0,0049	0,8266	No	0,0040	0,4716	No	0,0396	1,0883	No	-0,0586	-0,8057	No
-5	0,0021	1,6518	No	0,0060	3,3934	Yes	0,0365	1,2620	No	-0,0221	-0,3809	No
-4	0,0013	0,6531	No	0,0074	2,5418	Yes	0,0509	1,9003	No	0,0288	0,5381	No
-3	-0,0013	-1,7465	No	0,0060	5,5666	Yes	-0,0091	-0,2294	No	0,0197	0,2496	No
-2	0,0088	2,7160	Yes	0,0149	3,2326	Yes	-0,0039	-0,2689	No	0,0159	0,5495	No
-1	-0,0001	-0,0826	No	0,0148	7,8232	Yes	0,0272	1,4002	No	0,0431	1,1076	No
0	0,0016	0,2296	No	0,0163	1,7034	No	-0,0215	-0,6031	No	0,0216	0,3037	No
1	0,0010	2,2036	Yes	0,0173	27,4131	Yes	-0,0473	-2,3253	Yes	-0,0257	-0,6311	No
2	0,0032	3,7659	Yes	0,0205	17,2126	Yes	-0,0487	-3,5547	Yes	-0,0744	-2,7144	Yes
3	0,0018	1,1187	No	0,0222	9,8472	Yes	0,0005	0,0236	No	-0,0739	-1,8849	No
4	0,0094	1,7340	No	0,0316	4,1427	Yes	0,0173	0,7176	No	-0,0566	-1,1700	No
5	0,0030	0,2140	No	0,0346	1,7204	No	0,0081	0,4995	No	-0,0485	-1,5031	No
6	0,0047	1,7652	No	0,0393	10,5270	Yes	0,0057	1,1536	No	-0,0428	-4,3097	Yes
7	-0,0020	-0,1990	No	0,0373	2,6383	Yes	0,0018	0,1636	No	-0,0410	-1,9159	No
8	-0,0043	-0,2787	No	0,0331	1,5269	No	-0,0716	-2,4840	Yes	-0,1127	-1,9533	No
9	-0,0029	-25,5484	Yes	0,0302	190,4815	Yes	-0,0004	-0,0184	No	-0,1131	-2,4707	Yes
10	-0,0086	-1,5378	No	0,0216	2,7367	Yes	-0,0115	-0,9340	No	-0,1246	-5,0786	Yes

Table 5

	Hungary						Ireland					
	AAR	t-statAAR	Significant	CAAR	t-statCAAR	Significant	AAR	t-statARR	Significant	CAAR	t-statCAAR	Significant
-10	-0,0047	-0,2912	No	-0,0047	-0,2912	No	-0,0243	-0,9441	No	-0,0243	-0,6675	No
-9	-0,0036	-0,2233	No	-0,0023	-0,1436	No	-0,0070	-0,0661	No	-0,0313	-0,2092	No
-8	0,0024	0,1476	No	-0,0028	-0,1747	No	0,0157	0,2190	No	-0,0156	-0,1536	No
-7	-0,0005	-0,0311	No	-0,0262	-1,6171	No	-0,0304	-1,9434	No	-0,0460	-2,0774	Yes
-6	-0,0233	-1,4424	No	-0,0361	-2,2283	Yes	0,0133	0,6024	No	-0,0326	-1,0419	No
-5	-0,0099	-0,6112	No	-0,0149	-0,9220	No	0,0097	0,1830	No	-0,0229	-0,3058	No
-4	0,0211	1,3063	No	-0,0152	-0,9372	No	-0,0111	-0,6793	No	-0,0340	-1,4765	No
-3	-0,0002	-0,0152	No	0,0015	0,0950	No	0,0629	1,0711	No	0,0289	0,3483	No
-2	0,0167	1,0322	No	0,0058	0,3554	No	0,0141	0,2006	No	0,0430	0,4338	No
-1	0,0042	0,2604	No	0,0036	0,2232	No	-0,0926	-1,4523	No	-0,0496	-0,5502	No
0	-0,0021	-0,1322	No	0,0119	0,7373	No	-0,0062	-0,2985	No	-0,0558	-1,9129	No
1	0,0083	0,5140	No	-0,0027	-0,1650	No	0,0216	0,1823	No	-0,0342	-0,2036	No
2	-0,0146	-0,9022	No	-0,0038	-0,2345	No	0,0297	2,4827	Yes	-0,0044	-0,2611	No
3	-0,0011	-0,0695	No	0,0100	0,6185	No	0,0380	4,1388	Yes	0,0336	2,5859	Yes
4	0,0138	0,8529	No	0,0056	0,3445	No	-0,0498	-1,0245	No	-0,0162	-0,2360	No
5	-0,0044	-0,2740	No	-0,0055	-0,3397	No	0,0237	0,3524	No	0,0075	0,0785	No
6	-0,0111	-0,6841	No	0,0038	0,2339	No	-0,0567	-3,3943	Yes	-0,0492	-2,0844	Yes
7	0,0093	0,5736	No	-0,0001	-0,0035	No	-0,0125	-5,9463	Yes	-0,0618	-20,7186	Yes
8	-0,0038	-0,2374	No	-0,0093	-0,5770	No	0,0179	0,4098	No	-0,0439	-0,7093	No
9	-0,0093	-0,5735	No	-0,0074	-0,4548	No	-0,0368	-20,1926	Yes	-0,0807	-31,2924	Yes
10	0,0020	0,1221	No	-0,0074	-0,4548	No	-0,0150	-0,5182	No	-0,0957	-2,3376	Yes

Table 6

	Italy						Malta					
	AAR	t-statAAR	Significant	CAAR	t-statCAAR	Significant	AAR	t-statARR	Significant	CAAR	t-statCAAR	Significant
-10	-0,0025	-0,2408	No	-0,0025	-0,0761	No	-0,0192	-1,9043	No	-0,0192	-1,9043	No
-9	0,0001	0,0050	No	-0,0024	-0,0423	No	0,0043	0,4260	No	-0,0046	-0,4603	No
-8	-0,0063	-0,5827	No	-0,0086	-0,2541	No	0,0145	1,4441	No	0,0043	0,4236	No
-7	-0,0023	-0,0874	No	-0,0110	-0,1294	No	0,0089	0,8839	No	0,0020	0,1990	No
-6	0,0055	0,4663	No	-0,0055	-0,1468	No	-0,0023	-0,2246	No	-0,0020	-0,2017	No
-5	0,0029	0,2465	No	-0,0025	-0,0673	No	-0,0040	-0,4008	No	0,0011	0,1101	No
-4	0,0080	0,7734	No	0,0055	0,1673	No	0,0031	0,3118	No	-0,0006	-0,0634	No
-3	-0,0030	-0,1648	No	0,0025	0,0431	No	-0,0017	-0,1735	No	-0,0015	-0,1457	No
-2	-0,0075	-0,6774	No	-0,0050	-0,1431	No	-0,0008	-0,0823	No	-0,0022	-0,2160	No
-1	0,0189	0,6487	No	0,0139	0,1507	No	-0,0007	-0,0703	No	-0,0015	-0,1466	No
0	-0,0386	-0,5791	No	-0,0248	-0,1174	No	0,0007	0,0693	No	-0,0024	-0,2433	No
1	0,0010	0,0729	No	-0,0238	-0,5562	No	-0,0010	-0,0966	No	-0,0066	-0,6590	No
2	-0,0094	-0,5878	No	-0,0332	-0,6559	No	-0,0042	-0,4157	No	-0,0245	-2,4335	Yes
3	-0,0226	-0,6832	No	-0,0558	-0,5331	No	-0,0179	-1,7745	No	-0,0122	-1,2131	No
4	-0,0147	-0,3538	No	-0,0705	-0,5371	No	0,0123	1,2204	No	-0,0036	-0,3620	No
5	0,0037	0,2188	No	-0,0668	-1,2445	No	0,0086	0,8511	No	-0,0029	-0,2911	No
6	0,0103	0,2796	No	-0,0565	-0,4851	No	0,0007	0,0709	No	-0,0045	-0,4444	No
7	0,0130	0,7603	No	-0,0435	-0,8010	No	-0,0015	-0,1532	No	-0,0047	-0,4678	No
8	-0,0136	-1,2032	No	-0,0571	-1,5942	No	-0,0002	-0,0234	No	-0,0046	-0,4585	No
9	0,0030	0,2735	No	-0,0541	-1,5699	No	0,0001	0,0093	No	0,0081	0,8035	No
10	-0,0137	-0,6792	No	-0,0678	-1,0645	No	0,0127	1,2620	No	0,0081	0,8035	No

Table 7

	Norway						Poland					
	AAR	t-statAAR	Significant	CAAR	t-statCAAR	Significant	AAR	t-statARR	Significant	CAAR	t-statCAAR	Significant
-10	0,0149	1,3993	No	0,0149	1,3993	No	0,0004	0,0524	No	0,0004	0,0214	No
-9	0,0043	0,4001	No	0,0192	1,7994	No	0,0003	0,0217	No	0,0007	0,0216	No
-8	0,0138	1,2938	No	0,0329	3,0932	Yes	0,0064	0,2701	No	0,0071	0,1228	No
-7	-0,0272	-2,5566	Yes	0,0057	0,5366	No	0,0240	0,3328	No	0,0310	0,1760	No
-6	0,0236	2,2159	Yes	0,0293	2,7525	Yes	-0,0118	-0,5752	No	0,0192	0,3813	No
-5	-0,0059	-0,5570	No	0,0234	2,1955	Yes	-0,0122	-0,6247	No	0,0070	0,1470	No
-4	0,0195	1,8297	No	0,0428	4,0253	Yes	0,0201	0,7578	No	0,0272	0,4172	No
-3	0,0127	1,1922	No	0,0555	5,2174	Yes	0,0002	0,0244	No	0,0274	1,2677	No
-2	0,0423	3,9780	Yes	0,0979	9,1955	Yes	-0,0148	-1,2438	No	0,0126	0,4341	No
-1	0,0037	0,3434	No	0,1015	9,5389	Yes	0,0055	0,3154	No	0,0181	0,4247	No
0	0,0239	2,2418	Yes	0,1254	11,7808	Yes	0,0206	0,6971	No	0,0387	0,5351	No
1	0,0024	0,2249	No	0,1278	12,0057	Yes	-0,0061	-0,5217	No	0,0326	1,1429	No
2	0,0113	1,0607	No	0,1391	13,0663	Yes	0,0126	0,7813	No	0,0452	1,1459	No
3	-0,0029	-0,2728	No	0,1362	12,7935	Yes	-0,0043	-0,3415	No	0,0409	1,3114	No
4	-0,0078	-0,7300	No	0,1284	12,0634	Yes	-0,0018	-0,1315	No	0,0390	1,1426	No
5	-0,0034	-0,3227	No	0,1250	11,7408	Yes	0,0089	0,4541	No	0,0480	0,9936	No
6	0,0052	0,4841	No	0,1301	12,2249	Yes	-0,0022	-0,3448	No	0,0458	2,9487	Yes
7	0,0090	0,8452	No	0,1391	13,0701	Yes	-0,0075	-0,5196	No	0,0383	1,0850	No
8	-0,0143	-1,3458	No	0,1248	11,7243	Yes	-0,0004	-0,0170	No	0,0379	0,6910	No
9	0,0070	0,6530	No	0,1318	12,3773	Yes	-0,0074	-0,5412	No	0,0305	0,9101	No
10	-0,0063	-0,5920	No	0,1255	11,7853	Yes	-0,0078	-0,7582	No	0,0227	0,8985	No

Table 8

	Portugal						Sweden					
	AAR	t-statAAR	Significant	CAAR	t-statCAAR	Significant	AAR	t-statARR	Significant	CAAR	t-statCAAR	Significant
-10	0,0053	0,2721	No	0,0053	0,1924	No	-0,0065	-1,4252	No	-0,0065	-0,7126	No
-9	0,0038	0,1032	No	0,0090	0,1743	No	0,0013	0,4084	No	-0,0052	-0,8534	No
-8	-0,0003	-0,0380	No	0,0088	0,8861	No	-0,0145	-1,6535	No	-0,0197	-1,1255	No
-7	-0,0292	-1,4511	No	-0,0205	-0,7182	No	0,0047	0,5258	No	-0,0150	-0,8293	No
-6	-0,0108	-0,7025	No	-0,0312	-1,4411	No	0,0261	7,9763	Yes	0,0112	1,7045	No
-5	0,0391	2,4155	Yes	0,0078	0,3430	No	-0,0019	-0,2759	No	0,0093	0,6938	No
-4	0,0380	1,6882	No	0,0458	1,4406	No	0,0265	2,5744	Yes	0,0358	1,7403	No
-3	-0,0040	-0,9619	No	0,0418	7,1288	Yes	0,0002	0,0154	No	0,0359	1,7367	No
-2	-0,0132	-1,2603	No	0,0286	1,9355	No	0,0034	0,2408	No	0,0393	1,4047	No
-1	0,0034	0,9107	No	0,0321	6,0247	Yes	-0,0020	-0,4158	No	0,0373	3,8879	Yes
0	0,0157	0,4175	No	0,0478	0,8961	No	0,0102	4,4812	Yes	0,0475	10,4563	Yes
1	0,0082	0,2694	No	0,0560	1,3049	No	0,0058	1,4999	No	0,0533	6,8850	Yes
2	0,0038	0,9821	No	0,0597	11,0168	Yes	0,0170	6,1887	Yes	0,0703	12,7948	Yes
3	-0,0188	-1,0930	No	0,0410	1,6871	No	0,0074	1,3490	No	0,0777	7,0865	Yes
4	-0,0155	-1,3062	No	0,0254	1,5102	No	-0,0019	-0,6292	No	0,0758	12,4224	Yes
5	-0,0042	-0,2615	No	0,0212	0,9380	No	-0,0099	-1,3746	No	0,0658	4,5524	Yes
6	-0,0167	-1,3314	No	0,0045	0,2534	No	0,0102	9,0831	Yes	0,0761	33,7626	Yes
7	-0,0186	-2,2936	Yes	-0,0141	-1,2288	No	0,0008	0,2487	No	0,0768	12,1556	Yes
8	-0,0041	-4,4704	Yes	-0,0182	-13,9518	Yes	-0,0052	-0,8200	No	0,0717	5,6742	Yes
9	-0,0215	-1,2770	No	-0,0397	-1,6688	No	0,0014	0,3734	No	0,0731	9,4713	Yes
10	0,0034	0,8031	No	-0,0363	-6,0515	Yes	0,0001	0,0148	No	0,0732	4,7961	Yes

Table 9

	UK					
	AAR	t-statAAR	Significant	CAAR	t-statCAAR	Significant
-10	0,0060	0,5969	No	0,0060	0,2985	No
-9	0,0008	0,1087	No	0,0069	0,4426	No
-8	-0,0122	-2,0777	Yes	-0,0054	-0,4564	No
-7	-0,0020	-0,3269	No	-0,0074	-0,5981	No
-6	0,0026	0,3966	No	-0,0047	-0,3554	No
-5	0,0098	0,5890	No	0,0051	0,1525	No
-4	0,0032	1,4046	No	0,0083	1,8116	No
-3	0,0021	0,3200	No	0,0104	0,7984	No
-2	0,0043	1,1436	No	0,0147	1,9590	No
-1	-0,0044	-0,6830	No	0,0103	0,7897	No
0	-0,0047	-1,6561	No	0,0056	0,9857	No
1	-0,0108	-0,7184	No	-0,0052	-0,1730	No
2	0,0170	1,8153	No	0,0118	0,6306	No
3	0,0108	1,8569	No	0,0226	1,9451	No
4	0,0340	1,2292	No	0,0566	1,0222	No
5	-0,0095	-1,2918	No	0,0471	3,2094	Yes
6	0,0077	1,3834	No	0,0548	4,9112	Yes
7	0,0021	0,3391	No	0,0570	4,5449	Yes
8	0,0010	0,2161	No	0,0580	6,1436	Yes
9	0,0005	0,1081	No	0,0585	6,0096	Yes
10	0,0054	1,6401	No	0,0639	9,6519	Yes