THE IMPACT OF U.K.'S REFERENDUM TO THE EU'S MARKET INDICES:

WHO WAS WORST OFF?

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By

Georgios R. Kostoglou & Emmanouil M. Zaganidis

Supervisor

Dr. Artikis Panagiotis

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Abstract

UK government considered the referendum as a one-way street (exit EU or not) after the changes in the political and economic status of Europe. The direct impact of such an event must be characterized as a shock, not only to the EU society, but on a worldwide level as well. In the aftermath of the approval vote to leave EU, nothing more than an uncertain environment has been left. This paper examines the effect of that political event in the economic world and more specific on asset prices of the 28 countries of Europe. Therefore, the purpose of this paper is to investigate the impact of such an event, in the stock market in terms of abnormal returns. The impact of Brexit in the world economy in the long run must considered as impossible to measure reliably, thus, a short-run event study is more suitable in this case. Methodology concerns the European Union the period of 260 days before the announcement of the referendum (24/06/2016) until 10 days after. From the results, we conduct some key comparisons and measurements (EU Less PIIGS, PIIGS, Non-Eurozone, Eurozone, EU Less UK) after we put in order the countries, according to the level of influence from the referendum and the end we examine other smaller economic unions. These national and international events are highly affect the stock markets, due to the rise of trade volume worldwide and react accordingly. During such political and economic uncertainty, there is a large amount of public and inside information exchanges, which is the perfect opportunity for testing the validity of the Efficient Market Hypothesis (EMH). As there are significant Abnormal Returns, it is easy to conclude that the stock prices don't react quickly and efficiently to the new information or event without bias.

Key Words: Brexit, European Union, Abnormal Returns, Event study, Asset Prices

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2 INTRODUCTION

The "separation" of a country from a strong union is not something that happens usually in the global economic world. However, the impact of that kind of event is considered to be severe. The recent event of the decision, in the form of a referendum, of the United Kingdom leaving the European Union, known as BREXIT (British EXIT), although unexpected and possibly bad for the economies, creating uncertainty, of both the EU and the UK, raises a lot of questions and gives way for interesting research topics. Taking this opportunity, we shall try to answer some of them, focusing mainly on the immediate impact of the United Kingdom's referendum outcome to each and every one of the European Union's national market indices (including the United Kingdom) in the form of residual analysis (event study) and identify how much, if any, were the price drop in every national market index price. Focusing in the European Union, we observe the direct relations between countries of the Union and the dependence of each country separately and in specialized groups of countries. With that event study, we can conclude not only how much United Kingdom affected the rest of European Union in terms of percentage but also the reasons of that changes.

2.1 MAIN PURPOSE AND HYPOTHESIS DEVELOPMENT

The importance of that paper is great, due to the fact that a well specified and well establish measurement in the short-term environment has the ability to generate valuable information that can influence the policies and choices of households, cities, industries and even the monetary policy of countries *(Antulio N. Bomfim, 2003)*. That kind of information can be translated in the stock market and the informational efficiency of each market separately. It is a great example and opportunity to measure the level of efficiency according to the Efficient Market Hypothesis(EMH) as summarized by *Fama (1970 & 1976)*. Does the media play a significant role on the results of such an event and what happened before the crucial date of the announcement of the results [*(C. Justin Robinson & Prosper Bangwayo-Skeete, 2017), (Sofia Vasilopoulou, 2016*)]? One other characteristic of the upcoming results is that the uncertainty reaches global high after the event, and drove economic policies to be tighter (Davis, 2016). That kind of uncertainty has a valid influence in the financial markets and what is the relation with the political uncertainty (Lee A. Smales, 2016). Moreover, the affect in the banking sector separately is crucial and useful, to measure and purpose ideas about the drop down of the stock markets, and how they react (*Miyajima, H., Yafeh, Y. ,2007), (Van Dijk, M.A., 2011).*

And at the end of the day, who was worst off?

Our goal is to answer the above question as accurately as possible. In order to achieve that we conducted a series of Hypothesis', that were the results of the above-mentioned papers. So, in that way we have a clearer view, not only for the results, but also for the procedure of our methodology.

Hypothesis 1: *Brexit's vote was bad news for the European Union in short term period*
Here we expect not to reject this, as there is no sign of any paper which indicates an upward trend in the stock market when there is uncertainty.

Hypothesis 2: *There is a semi strong-form efficient market hypothesis.*
There is not Insider/Private Information regarding the referendum
There are evidences on the papers that we have analyzed above, that most of the stock markets, in the 20th century, follow the semi-strong form efficiency.

Hypothesis 3: *U.K. affected more than any other European country*
Since the U.K. is the country that the event got real, will be also the country that affected the most.

Hypothesis 4: *Euro protects the countries of its use*
Euro as currency, was created in the first place as a mean to increase the trade among the members, strengthening and protecting their values in times of uncertainty.

Hypothesis 5: *The level of influence was affected according to the level of debt of each country*
As the economic crisis of Europe during the last decade, is a demand and debt crisis, we expect that the results will be influenced the most, by the size of the debt of each country according to its GDP.

Limitations:
We were occupied with the stock markets of the European Union and not of all around the globe.
The time of the event, there is the assumption that the only significant event that influence the stock markets is the one that we research for.

We focus on European Union and the regional unions inside of it, as well as every single country separately, and in the end, we team them up according to some certain characteristics. Our purpose is the contribution of the results of our hypothesis, together with comparative tables that can be used as a reference, or even as a starting point, for future researches, indicating, in an orderly manner and fashion, the national indices that were, from the least to the most, worse off due to the outcome of this referendum, if significant. This will assist us, and any other researcher, to find out the actual quantitative impact of the UK's referendum outcome to every of the EU's national stock markets (28 countries, including UK). Of course, this shall, also, create room for further research e.g. on other countries and industries, as well as, research on the next stages of the Brexit journey and event studies as a whole.

2.2 OVERVIEW OF THE PAPER

So, in the next chapter, one may find the literature review of this work that enabled us to develop this research, the authors of which, we would like to thank and give credits to. In the literature review, we start from a broader perspective and we end up specific in the referendum for the Brexit of 2016. In the first place we analyze the Efficient Market Hypothesis and how that impact the scientific world and the need of "event studies created". In upcoming chapter, there are the data utilized in the methodology, and in the fifth chapter exists the methodology presentation itself and why we used that specific procedure. The seventh chapter is consisted of the results, some of which unexpected, trying to reject or not reject the initial hypothesis, and how the individual results of each country makes us proceed with further investigation that is customized by the results themselves. In the eighth chapter you can find our closing thoughts, discussion, conclusions and what is the room left for further research. Last, but not least, as one may be interested, in the ninth and tenth chapters, can be found the references, appendix and the detailed tables of our calculations.

3 LITERATURE REVIEW

3.1 THEORETICAL BACKGROUND ON EVENT STUDIES

Historical Prices are not affected by their past. This is the main assumption of the random-walk theory, in order to declare that there is no trend that can be found, so you can predict the upcoming price of a security. The Efficient Market Hypothesis EMH theory does the same assumption, so the future prices are random.

[(Alexander (1961), Fama, (1965), Ball and Brown (1968), Jensen and Benington, (1970), Fama, (1970), Charest and Jarrell (1978), Jensen and Ruback (1983), Collins and Dent (1984), DeBondt and Thaler (1985), Brickley and Netter (1988), Corrado (1989), Rosenstein and Wyatt (1990), Chopra et al. (1992), Seppi (1992), Elton et al. (1993), Malkiel (1995), Kothari and Warner (1997), MacKinlay (1997), Campbell, Lo, and MacKinlay (1997)]

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"The efficient market hypothesis is associated with the idea of a "random walk," which is a term loosely used in the nuance literature to characterize a price series where all subsequent price changes represent random departures from previous prices. The logic of the random walk idea is that if the ow of information is unimpeded and information is immediately reflected in stock prices, then tomorrow's price change will reflect only tomorrow's news and will be independent of the price changes today.*" [Malkiel (2003), p. 59.]*

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The information that we can absorb from the previous sentences are absolutely important for the market as a whole, how it reacts into new information or an event, as Efficient Market Hypothesis express that the price of securities reflect all the information that is available to the market about the specific security *(Fama, 1970)*. As a result, all the information, public or private, microeconomic or macroeconomic, has an impact on the price. The adjustment of the price to the new information, such as splits, deaths of a CEOs, merges and acquisition, issuance of bonds, issuance of new shares, new major stakeholders, shocks, balance sheet announcements, dividends, rise of earnings, investments, terror attacks, change of political parties, change of currency, banks failures, referendums, is immediate. With that in mind, stock returns follow a random walk as we have analyzed above, so it is impossible to beat the market and outperform it, by finding or creating a pattern with historical prices. That is why this subject occupied not only professors and fundamental analysts but technical analysts in order to prove

them wrong. Either way, Fama himself wasn't absolute that the market is efficient. He started to build a theory around the previous one, and separate market into three forms depending on the information that is reflected to the prices of stocks. That three are the weak, the semi-strong and the strong. *Heston and Sigha (2016)* did a great research about the previous subject and the reaction of news in stock prices and they conclude that the good stories have positive effects to the daily prices of stocks and vice versa.

It is easy to identify that there is a need in the scientific environment to create a way to measure reliably those effects in the security prices of stocks, not only in the short term, but for the long run as well. So, the concept of the event study created, and it is used until today as an analytical tool in finance with a sufficient statistical technique for analyzing all kind of information we pointed out previously. The first one who touched the subject was *James Dolley (1993)* by measuring the effect in stock prices of stock splits and if there any pattern, after him *Archie Bakay (1948)* and *John Ashley (1962)* followed.

Relating to event studies themselves, to structure our research, as correctly as possible, we took under consideration the methodology and the advancements of the event study procedure, as developed through time. We could not exclude the initial endeavor of *Fama, Fisher, Jensen, and Roll (FFJR) and their pioneer work (1969)*. This work, although interested in the splits, dividends, and new information, had set the foundations for the modern event study methodology. From there onwards many papers tried to identify this kind of methodology, with the most successful and pivoting ones to be the works of *Brown and Warner (1980, 1985, S. J. Brown, J. B. Warner)* which identified the issues and propositions, by analyzing the specification and power of several modifications of the FFJR approach, for conducting an event study on monthly and daily data (issues of non-normality, non-synchronous trading and market model parameter estimation, and variance estimation), that assisted us with our own issues as we are interest in the latter ones (daily data). Notable, also, is the work of *Bowman (1983)* who tried really early to give an interpretation on that new, for that time, methodological approach to market based empirical research in finance and accounting of residual analysis (event study methodology). He managed to differ himself from the previous authors as he categorized event studies into four basic types:

1) Information content *(Ball and Brown)*

2) Market efficiency *(FFJR)*

3) Model evaluation

4) Metric explanation

It is clear, we have discussed already the first two. How about the other types? In the third type, Bowman tried to capture differential price effects, the magnitude of the excess return metric will be directly affected by the expectations model, and as a result, it allows us to evaluate alternative models for the expectations. This going to help with our hypothesis of private information or propaganda, as in empirical testing, the expectations model with imperfect expectations and that makes it interesting in the end of the day. Interesting because every model and every reason is open of discussion and re-evaluation, due to asymmetry of information and agency problem.

This kind of re-evaluation model is the last basic type of event studies, the metric explanation type. Its goal is to identify the variables which explain the impact in prices and indexes due to the information that is claimed from the event, the results of the referendum in the United Kingdom in our case, or test the market efficiency hypothesis. We conduct our own metric explanation, trying to find the significant reasons behind that movement of stock exchange for each country except of United Kingdom, which is affected from internal reasons that have already measured and calculated from previous papers in "The sectoral effects of Brexit on the British economy: early evidence from the reaction of the stock market "by *Vikash Ramiah, Huy N. A. Pham & Imad Moosa (2016)*, and we are going to analyze in the chapters below. To compare the two last types, we quote *Bowman* himself: "Perhaps the easiest way to characterize the two types is to note that model evaluation entails an ex ante specification of models of expected security price reaction. Metric explanation is an ex post attempt to explain (i.e., model) the observed return metrics."

After Bowman, maybe the most widely used paper is the one of *MacKinlay* (*1997*) whose methodology and step by step procedure is utilized by this current research, because he concludes that, in rational market, prices react to new information. One year after, *Binder* tried to create successfully a sum of every development in the event study methodology since then, with his marvelous work (*1998, The Event Study Methodology since 1969, J. J. Binder*), giving a great and quite detailed overview of event studies, especially for someone starting his or her research from scratch.

He identifies from the first page the two major reasons that event studies are used widely for financial event and accounting issues:

1) Test the null hypothesis that the market efficiently incorporates information (see Fama (1991) for a summary of this evidence)

2) Under the maintained hypothesis of market efficiency, at least with respect to publicly available information, to examine the impact of some event on the wealth of the firm's security holders.

He doesn't act so innovative as we can observe, but he organizes all the previous studies and explaining them in a way that seems new and different. Moreover, in our case, very insightful were the works of *Lamdin, Bartholdy, Olson, Peare, Aktas, de Bodit, and Cousin*. By reviewing these papers, it helps us in three levels of ambiguous matters:

1) We were reassured that the event study methodology is truly the best approach to go on (*2001, D. J. Lamdin*), as he is highlight the three concerns of an event study: the importance of finding true event periods, the use of cross sectional tests, and the use of other supporting evidence. We test every possible choice that we had, in order to find the perfect combination in every one of those, as it is clear in the calculations in appendix.

2) how to approach thinly traded markets and by adopting less restrictive criteria (*2005, J. Bartholdy, D. Olson, P. Peare*), and

3) understood how to proceed, if the situation arises of contamination in estimation period (*2006, N. Aktas, E. de Bodit, J. G. Cousin*), because unrelated events do affect the specification and the power of standard event-study methods.

After we pointed out the most notable event studies of all time for our opinion, we are mentioning some key event studies that have different events (general elections, president re-elections, terrorist attacks, etc.) and their affects in the attitude of the returns of stocks and bonds. Their purpose was to answer two major questions:

1)Does the returns are more volatile the day of the event or the non-event days?
2)Does good news to has a good impact to the stock market?

Nordhaus (1975), MacRae (1977), Hibbs (1977), Cowart (1978), Allvine, O''Neill (1980), Ploeg (1984), Huang (1985), Alesina and Sachs (1986), Maning (1989), Schwert (1989), Roberts (1990), Stovall (1992); Gemmil (1992),Gartner (1994), Gärtner and Wellershoff (1995), Hensel and Ziemba (1995), Kim and Mei (1999), Johnson et al. (1999), Herron et al.

(1999), Pantzalis et al. (2000), Drazen (2001), Mei & Guo (2002), Nishat, M. and Mustafa, K. (2002)Acemoglu, et al. (2003), Zach (2003), Ma, Sun and Tang (2003), Martínez and Santiso (2003), Guo (2003), Nicholas Chen (2004), Carter and Simkins (2004), Zhao et al. (2004), Lin & Wang (2005), Akysha and Shakil (2005), Leblang and Mukherjee (2005), Beaulieu et al. (2005), Bernanke and Kuttner (2005), Dopke and Pierdzioch (2006), Anoop Singh (2006); Li and Born (2006), Ling-Fang Liu (2007), Wing-Keung Wong and Michael McAleer (2007), Clark, Masood and Tunaru (2008), Beyer et al. (2008), Jones (2008), Ray M. & Nickles (2009), Ahmad (2009), Khalid, Ahmed et al. (2010), Abidin & Martin (2010), Kongprajya (2010), Bechtel and Füss (2010), Ling-Chun Hung (2011), Salameh & AlBash (2011), Aslam and Kong (2011), Suleman (2012), Leduc & Pammett (2013), Sturm (2013), Kabiru et al. (2015), Kumar Deva et al. (2015)

The majority of these studies, identifies that political events creates greater uncertainty in the stock market, and as a result the markets are more sensitive to that kind of news, good or bad, national or international. That volatility in the security market is the perfect situation to investigate the Efficient Market Hypothesis. In our case, referendum in United Kingdom the 23rd of June 2016 was a great opportunity.

"According to the proponents of the Efficient Market Hypothesis, stock prices reflect all available information about companies and investors can't beat the market indexes by stock picking. They say investors trying to and a secret formula are wasting their time because stock prices follow a random walk. Interestingly, this theory also implies that a monkey selecting stocks by throwing darts at a newspaper's financial pages should perform as well as any star hedge fund manager who may or may not use inside information. You could guess how this was such a huge relief for millions of stock market investors. Suddenly, one need not worry about timing or stock picking skills. Since all the information is incorporated into stock prices, there's no need to do any research about the companies, or the macro economic developments, or the regulatory environment. Nothing, nada. Do you want to invest in an internet start-up that sells toys, with $30 million in revenue, $50 million in losses and $6 billion in market cap? Don't worry. Markets are efficient. Just buy it, as simple as that."
(Warren Buffet, 2010)

There are many other papers making use of the event study methodology as their empirical method of choice, from which we had gotten inspiration *(e.g. Ritter)*, but we have chosen to

omit them and focus on the procedural or methodological papers on event studies rather than papers of how they were applied.

3.2 PREVIOUS STUDIES FOR THE REFERENDUM OF "BREXIT"

Since it is a recent event, most current articles have been majorly focused on the impact to volatility, due to this event, only to the major EU markets (*2016, The Response of European Stock Markets to the Brexit, M. Raddant*) and to the worldwide markets(2016, Policy Uncertainty and international Financial Markets: The case of Brexit, Angsar Belke, Irina Dubova, Thimas Osowaski), or the impact to the financial stability (*2016, Brexit (Probability) and Effects on Financial Market Stability, T. Krause, F. Noth, Lena*), as well as its connection with the political uncertainty (2016, "Brexit": A case study in the relationship between political and financial market risk, Lee A. Smales). Nothing would be possible if Antulio N. Bomfim hasn't published in 2001, "Pre-announcement effect, news effects and volatility: Monetary policy and stock market" in order to connect these two dots and macroeconomy with event studies. Moreover, other articles focused mainly on the economic impact of BREXIT, providing a theoretical macroeconomic view of such an event (*2013, Europe without Britain, T. Oliver & 2016, BREXIT 2016 Policy Analysis from the Center for Economic Performance, LSE*) So, by building up from there, we shall go one step further and analyze the impact to every EU country index (including UK at that point), testing for abnormal returns. Notable to us, was the work of Sathyanarayana and Gargesha, which assisted us gravely in the development of this work and we will not hide the fact that was an inspiration of our title (*2016, Impact of BREXIT Referendum on Indian Stock Market, S. Sathyanarayana, S. Gargesha*).

4 DATA

The European Union is a tapestry of differently flavored countries, each with their own characteristics and paces. As we are interested in the European Union national stock indices market performance of each European Union country (sample of 28), our data are comprised by each and every national stock market index, as well as an international one for the market model necessary to our event study. Our database of choice is the Bloomberg one. Thus, collecting the time series for the 28 European Union members, plus the international equally weighted index, the Global Dow. All of our data are in the Euro currency and are consisted of 271 daily observations. This amount is chosen since, in this way, we are able to extract 270 daily return observations, and combining that with our event window duration which is -10 days & + 10 days of the event of interest (announcement of the United Kingdom's referendum results, 24/06/2016), we are able to provide 250 returns to our market model (from -260 to - 11), more on that on Methodology.

One thing that should be mentioned here, is the fact that in almost all of the indices the data are not completely "synchronous" to each other, meaning that due to national holidays, special events, or even unreasonable cases certain national stock exchanges are not trading every day. This problem, of missing dates, can be tackled by either removing the missing date of the specific time series, from all the rest or by filling the missing day price from the previous (since the price has not altered as the stock exchange was closed). We have chosen the latter in order to avoid exceeding the annual performance of each stock exchange with respects to the global index (explaining, dates were adjusted according to the global information available, the calendar that the Global Dow was traded).

Moreover, there are a lot of economic unions according to region and history. Main force of these unions is the economic dependence from each other, as they are traded in daily basis, for many decades. We identified the most interesting groups of countries for our event to investigate and measure the impact in countries that are inside the European Union. So, we attempted to group our data according to the followings. Initially, we measured the impact to the European Union as a whole and without the United Kingdom, as the country of the event. Secondly, we wanted to see that if there is a different amount of influence due to different currency, so we divide it to Eurozone and Non-Eurozone. Thirdly, the weak countries of European Union, that have the biggest debt as a percentage of the DGP and slow growth rates. That group of countries, the last few years, are the PIIGS and in addition how the rest of Europe handle that uncertainty. The last key characteristic that we used is the official regional

economic unions, and we chose the following: Baltic, Nordic, Benelux, British Isles, and the Balkans.

In detail, the indices of each European Union country are the following and have been ordered (alphabetically) & abbreviated (according to Bloomberg's tickers) as such: 00. GDOW (Global), 01. ATX (Austria), 02. BEL20 (Belgium), 03. SOFIX (Bulgaria), 04. CRO (Croatia), 05. CYSMMAPA (Cyprus), 06. PX (Czech Republic), 07. KFX (Denmark), 08. TALSE (Estonia), 09. HEX (Finland), 10. CAC (France), 11. DAX (Germany), 12. ASE (Greece), 13. BUX (Hungary), 14. ISEQ (Ireland), 15. FTSEMIB (Italy), 16. RIGSE (Latvia), 17. VILSE (Lithuania), 18. LUXXX (Luxembourg) 19. MALTEX (Malta), 20. AEX (the Netherlands), 21. WIG20 (Poland), 22. PSI20 (Portugal), 23. BET (Romania), 24. SKSM (Slovakia), 25. SBITOP (Slovenia), 26. IBEX (Spain), 27. OMX (Sweden), 28. UKX (the United Kingdom). For an even more detail data presentation please check Table 1.1., where one can find the Eurozone – Non-Eurozone separation, as well.

To check our data for stationarity, we have used both the KPSS and the ADF test. All of our time series are integrated at I (1), so, in order to make them stationary we took the natural logarithms of their returns by:

$$R_{it} = LN (P_{it} / P_{it-1})$$

Thus, testing again, as such, we have derived to stationarity, so, we were able to proceed with the estimations.

5 METHODOLOGY

As it is already understood, so far, we are interested in applying the event study methodology for our quantitative research. An event study's basic assumption is the one for the efficiency of the market (Efficient Market Hypothesis – EMH). An efficient market is one where the market price is an unbiased estimate of the true value of an investment, or better the impact of an event will be instantly reflected in stock prices. There are three forms of market efficiency, the weak form, the semi strong one, and the strong form efficiency. Elaborating, just a little, for the sake of academic purposes, we have:

Under the weak form efficiency, the current price reflects the information contained in all past prices, suggesting that charts and technical analyses that use past prices alone would not be useful in finding mispriced stocks.

Under the semi strong form efficiency, the current price reflects the information contained not only in past prices but all public information (including financial statements and news reports) and no approach that was predicated on using and messaging this information would be useful in finding mispriced stocks.

Lastly, under the strong form efficiency, the current price reflects all the information, public as well private, implying that not even insider information could give an investor an advantage of identifying mispriced stocks.

We consider the European Union's national stock markets to have semi strong form efficiency, as information are widely and easily spread throughout the Union. However, as the practical saying goes in the professional world, that "most of the markets are efficient for most of the investors, most of the times, more or less", here, there is a remarkable opportunity to test market efficiency as a whole. More of that can be found in the chapter 5 and 6.

So, by trying to follow the event study methodology in order to come up with the results of our research, a lot of literature was investigated. As widely used by other articles, the "standard" methodology as it came up to be lately, presented by *The Econometrics of Financial Markets (1997, J. Y. Campbell, A. C. Lo & A. C. MacKinlay)*, is applied here, as well.

To outline our event study into steps, we have to explain the following:

5.1 EVENT DEFINITION:

Our event of interest is the United Kingdom's referendum, commonly known as BREXIT, calling the British people to the polls to answer the question "Should the United Kingdom remain a member of the European Union or leave the European Union?"[1]. Although, the polls took place at 23/06/2016, our date of interest is the next day (24/06/2016), when the national declaration of the referendum result took place. Not only that, we are also interested about the 3, 5, 7, and 20 days window in order to capture the full motion of that event.

Thus, setting as the event date (t=0) the one of 24/06/2016, as T_0 the one of 26/06/2015, as T_1 the one of 10/06/2016, and as T_2 the date of 08/07/2016, we have defined our windows appropriately.
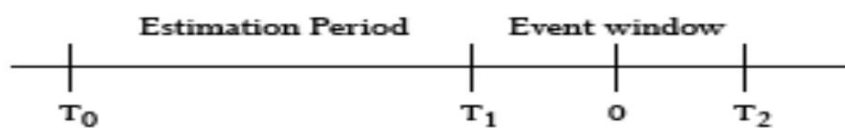
Estimation Period:	(T_0 to T_1 -1 day)	26/06/2015 to 09/06/2016	(260 days)
Event Window:	(T_1 to T_2)	10/06/2016 to 08/07/2016	(21 days)
Event Date:	(t=0)	24/06/2016	(1 day)

5.2 SELECTION CRITERIA:

Since our area of interest is all of the European Union, we have selected each and every national stock market index of the European Union members (as mentioned in the previous chapter: Data) to identify how they were impacted individually, in groups, and as a whole. No biases were introduced, since every country (national index) was included, no matter its performance or special events, as long as it is in the European Union, of course.

5.3 NORMAL AND ABNORMAL RETURNS:

After defining our windows and selecting our time series (national market indices daily prices), we must estimate the expected returns of each, as if the event did not occur, and then "extract" the abnormal ones.

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[1] http://www.bbc.com/news/uk-politics-33141819

In order to do that, we have to calculate the normal returns, at first, during the windows. The normal returns are calculated using the natural logarithms of the returns, with the formula:

$$R_{it} = LN (P_t / P_{t-1})$$

To estimate the expected returns during the event window (as if the event did not occur), we employ the market model, alone, as previous research done, indicates that "*beyond a simple, one-market model, there is no evidence that more complicated methodologies convey any benefit*" (*1980, Measuring Security Price Performance, S. J. Brown, J. B. Warner*).

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}, \; E(\varepsilon_{it}) = 0, \; Var(\varepsilon_{it}) = \sigma^2\varepsilon_i$$

where R_{it} and R_{mt} are the period-t returns on security i and the market portfolio, respectively, and ε_{it} is the zero-mean disturbance term. α_i, β_i and $\sigma^2\varepsilon_i$ are the parameters of the market model.

In order to appraise the impact of the event, we have to calculate the abnormal return during the event window by extracting the residuals:

$$\varepsilon^*_{it} = R_{it} - E(R_{it} \mid X_t)$$

where ε^*_{it}, R_{it} and $E(R_{it})$ are the abnormal, actual, and normal returns, respectively, for time period t. X_t is the conditioning information for the normal performance model.

Thus, by taking the normal returns at the time of the event (and during the event window, of course), we derive to the abnormal ones for each national stock market index.

5.4 ESTIMATION PROCEDURE:

As we have defined how we went about identifying abnormal returns and our normal performing model (market model), the parameters of the model are estimated via the estimation window. Our estimation window duration has been set to 250 days prior the event window (-10, +10 days), as had been explained in the data chapter. Of course, the estimation period is not included in the event one, in order to avoid any influence on the normal performance model parameter estimates. A small duration event window is used because this can always lead to better and more robust results, according to McWilliams and Siegel (*1997*), capturing, much better, the consequences that an announcement has on the share prices due to the new information being released in the market. Also, a longer duration would violate the market efficiency assumptions.

5.5 Testing Procedure:

Having identified the parameters for the normal performing model, the abnormal returns are calculated. In order to test the abnormal returns for significance, we have used the t-test and applied the hypothesis testing procedure. Our null hypothesis for the abnormal returns (ARi) is set as 0 abnormal returns and our alternative one is other than 0 for every national market index during the event period.

H_0: ARi = 0

H_1: ARi ≠ 0

Here should be noted that our significance level of choice is 5%, which we believe is enough to justify any abnormality in return, due to the event (t critical = 1.960).

Moreover, to capture the overall impact of event during our period of interest, we calculate the Cumulative Abnormal Returns, through time (-3 to +3 days), using the hypothesis testing procedure, as applied to the Abnormal Returns testing procedure.

H_0: CARi = 0

H_1: CARi ≠ 0

Also, we have to inform that we inspected, extensively, this period of interest of -3 and +3 days to identify any abnormality, not only on the event day, but also on the adjacent dates. All that for each specific national stock market index.

5.5.1 Cross-Sectional Testing:

To move one step further, we have aggregated the Abnormal and the Cumulative Abnormal Returns into Average Abnormal Returns (AARi) and Cumulative Average Abnormal Returns (CAARi), testing them using the cross-sectional t-test procedure, applying the hypothesis testing procedure, as well.

H_0: AARi = 0

H_1: AARi ≠ 0

H_0: CAARi = 0

H_1: CAARi ≠ 0

This aggregation, through countries (national market indices), was a result of our endeavor to answer our questions of who were worst off. More specifically, by aggregating among European Union, United Kingdom, Eurozone, Non-Eurozone, and PIIGS (Portugal, Ireland, Italy, Greece, and Spain), we are able to compare the impact of Brexit among these groups.

Not only that, we extend this aggregation to other economic unions of the European Union, by aggregating for the Baltic, Nordic, Benelux, British Isles, and the Balkans (NOTE: For the countries of these Unions that belong in the European Union, of course.)

After that, we draw our results, in the forms which are explained seen below.

5.6 EMPIRICAL RESULTS

Having found out the magnitude and significance of abnormality for every national market index, we have shaped our results in a sorting fashion, from greatest to least impact (abnormal returns), producing two tables, one for the Abnormal Returns (ARi) at the day of the event (t=0) and another for the Cumulative Abnormal Returns (CARi) for the period -1and +1 days, where the abnormality is found to be the most significant. Please, see appendix Table 2.1.

Also, we attempt to explain (in chapter 4), the financial and economic impact, as well as, our expectations, for each of the European Union's national stock market index, the European Union as a whole, the Eurozone and non-Eurozone results (currency impact), the weakest economies, and finally the impact to other economic unions of the European Union.

5.7 ADDITIONAL STEPS:

5.7.1 Regression Analysis

To understand the driving force, or the economic one if you prefer, of our empirical results of the event study, we shall attempt to generate a regression model to find out about the factor that explain the empirical results as to with each national market index is more or less affected by the UK's Referendum. Thus, utilizing the multivariate linear regression, we identify three possible factors explaining the results, through a structural econometric model

$$y_i = a_i + b_1 X_1 + b_2 X_2 + b_3 X_3 + e_i$$

As our y variable (dependent) we have chosen the Cumulative Average Abnormal Returns (CARi) for -1, +1 days from the event date and as x variables (independent) Debt / GDP,

F [(value of exports + value of imports) With U.K. / (Total sum of exports + imports)], and the Cumulative Average Abnormal Returns (CARi) for -5 to -1 days from the event date.

In this way, we try to explain the abnormality – severity of the impact to all of the European Union countries as a function of the indebtedness, the trade, and the rumors or insider trading before the event. The result, of this regression is quite interesting, as it explains pretty well the abnormality around the event date (-1, +1, around the date to be exact). More on that on the next chapter.

5.7.2 Robustness Test

In order to be 100% sure about the expectations of the significance of our results and their robustness through time and across groups (as expected), we have applied a kind of customized test of the robustness one by checking the significance (at 95%, as always) of the Cumulative Abnormal Returns (CARi) and the Cumulative Average Abnormal Returns (CAARi) for the periods (-3, -1), (-5, -1) or (-10, -1). In this way, we are able to assess the presence of insider information, propaganda, and predisposition on the decision of the British people.

6 RESULTS

6.1 WHAT ARE OUR EXPECTATIONS? ECONOMIC EXPLANATION

Our expectations originate from the economic theory and the effect of uncertainty due to the increase of volatility in stock market (finance based measurement) to macroeconomic performance. The uncertainty and risk in practice imply the divergence of opinion, and it is clear from the referendum's results, almost 50-50, that no one can predict not even the near future.

Here the forecasts are in disagreement, which create the tendency to the long-term yield to maturity of the 10 Year-bond of each specific country to fall slightly and they have negative correlation with Treasury-Bills (Markus Leippold, Felix H. A. Matthys,2015). The countries that already have relative high bond yield will be influenced the most, as they are more fragile and sensitive due to the already existed risk of default.

The fall of the stock market, in addition to the above, and the expected increase of interest rates causes a wave of inflation. In European Union due to Quantitative Easing From the ECB, the interest rates do not get influenced at all. There is a small change in inflation though, and the cost of that goes to businesses mainly and to customers.

Another effect is that since the value of market shrink, money strengthen and the cost of borrowing increases, since the investments that period reduces. That influence mainly the banks and the interbank system. Since there is that particular movement in the market, the debt has a different value as well.

A large debt encourages inflation additionally and if inflation is high, the debt will be serviced and ultimately paid off with cheaper real euros in the future. How much is the country going to be influenced is a different issue, because the structure of debt has a crucial part as well. In other words, to whom one country owe money to. This measurement has the ability to identify the trade and independence of countries. There are two types of debts: Government debt that has borrowed primarily from the private sector and External debt that owe to the rest of the world. The countries that hold the external debt of United Kingdom will have straight impact at their finances and there will be a direct impact. Since the foreign investors now are not willing to receive the same performance and return from the bonds with higher risk.

Trading Volume between countries has a major role as well. So, if the value of exports and imports for each country individually has a relative high percentage of Gross Domestic Product (GDP) will be high influenced, since with Brexit on the table these will be limited, as a wave

of certainty occurs. The Openness with U.K. between two countries is also an indicator of a well political history.

All the variables above are considered representative indicators for the political future. We expect the countries or a group of countries with a big number of political and economic changes to be more fragile to environment of uncertainty that prevails. In investments and in the world of money markets, trust is the key. There is no trust without stability, both in quantitative and qualitative evaluation.

Since United Kingdom was between the three big forces of European Union, with France and Germany, the relative position of the other two strengthen and on the other hand the rest of the countries is getting relative weaker. It may not be the first thought of citizens of European Union, but we expect the market to return in previous levels in the first 10 days.

According to the above, it is easier to identify the countries that are going to be influenced more than the rest, except from the United Kingdom, that is the country of the event, are the PIIGS (Portugal, Italy, Ireland, Greece, Spain). There are a lot of common characteristics about these countries such as relative high bond yields with high level of debt, political and economic instability, low growth rates and relative high deficit. Furthermore, the Balkans and the Baltics have less economic dependence from United Kingdom since they are trading, in bigger frequency and value, with other neighbor countries like Russia, Turkey and Germany. Scandinavian countries, we expect not to be influenced due to their strong and stable economic performance.

6.2 EVENT STUDY RESULTS PER COUNTRY (AR & CAR ANALYSIS)

The results from the analysis from country to country is the answers to the following questions:

- Is ARi significant in time 0? If yes, for how many days these abnormal returns are continued?

  The answer will show us, if this event is significant and for how many days this effect continued in same levels.

- Is CARi Significant in any time? If yes, is this time, the time 0 or after? If yes, what is the highest number of time that CARi is significant?

  The answer will show us, if the average abnormal returns all the previous day have affected and for how long. The highest the number of time of significance, the greater the influence.

- Is any significance in CARi (-1, +1), (-2, +2) or (-3, +3)? If yes, in which ones?

  The answer will show us, if there is a significance influence around the period of the event which is the most crucial. The longer the period, the greater the influence.

- Is any significance in CARi (-3, -1), (-5, -1) or (-10, -1)? If yes, in which ones?

  The period before the time zero, we measure the expectations of people from every country. If the sign is the same with the one of our event, then there is inside information, but if is the opposite, then there is a propaganda from the media to drive public opinion to the opposite direction.

Austria: See Table 2.1 And picture 2.1

In that case of Austria, the day of the event, the returns are significant different from the normal performance of the stock market with negative results, and this continued until the second day, which is a great and fast drop in the stock market of Austria. It is normal after that information to find CARi (-1 +1) will be easily significant. In case of CARi, the highest number of significance is 8, which is relative a high number, which translate that Austria have influenced by the referendum of Brexit for several days and in relative large amounts. This is confirmed in our next observation from CARi (-2, +2) and (-3, +3) are significant, and with that the referendum in United Kingdom can recognized are a major event for the area of Austria. In the end, we can find a high significant level of influence for CARi (-5, -1) only, which means that the last week before the event, the stock exchange market has noted an abnormal increase in returns. This is the opposite sign of the actual performance after the event. The demand due to

the referendum, show us that the majority of investors in Austria believed that United Kingdom will vote to stay in European Union, due to media and exit polls.

Similarly, we worked in the rest of the countries.
(Belgium: See Table 2.2 And picture 2.2, Bulgaria: See Table 2.3 And picture 2.3, Croatia: See Table 2.4 And picture 2.4, Cyprus: See Table 2.5 And picture 2.5, Czech Republic: See Table 2.6 And picture 2.6, Denmark: See Table 2.7 And picture 2.7, Estonia: See Table 2.8 And picture 2.8, Finland: See Table 2.9 And picture 2.9, France: See Table 2.10 And picture 2.10, Germany: See Table 2.11 And picture 2.11, Greece: See Table 2.12 And picture 2.12, Hungary: See Table 2.13 And picture 2.13, Ireland: See Table 2.14 And picture 2.14, Italy: See Table 2.15 And picture 2.15, Latvia: See Table 2.16 And picture 2.16, Lithuania: See Table 2.17 And picture 2.17, Luxembourg: See Table 2.18 And picture 2.18, Malta: See Table 2.19 And picture 2.19, Netherlands: See Table 2.20 And picture 2.20, Poland: See Table 2.21 And picture 2.21, Portugal: See Table 2.22 And picture 2.22, Romania: See Table 2.23 And picture 2.23, Slovakia: See Table 2.24 And picture 2.24, Slovenia: See Table 2.25 And picture 2.25, Spain: See Table 2.26 And picture 2.26, Sweden: See Table 2.27 And picture 2.27, United Kingdom: See Table 2.28 And picture 2.28)

6.3 CROSS SECTIONAL RESULTS (CAAR ANALYSIS)

There are a lot of economic unions according to region and history. Main force of these unions is the economic dependence from each other, as they trade in daily basis for many decades. We valued the most interesting groups of countries for our event to investigate and measure the impact in countries that are inside the European Union. Initially, we measure the impact European Union as a whole and without the United Kingdom, as the country of the event. We wanted to see the if there a different amount of influence due to different currency, so we divide it to Eurozone and Non-Eurozone. The weak countries of the European Union, that have the biggest debt as a percentage of the DGP and slow growth rates. That group of countries, the last few years, are PIIGS and we measure in addition how the rest of Europe handle that uncertainty. The last key characteristic that we used is the official regional economic unions, and we chose the following: Baltic, Nordic, Benelux, British Isles, and the Balkans.

6.3.1 Groups (Aggregations) of Interest

6.3.1.1 European Union

It is clear from the graph that the overall impact of the referendum had a negative effect in the stock markets of European Union, but there is no sign of propaganda and any mislead in average to investors. A well-informed market is a sign of EMH but due to the fact that we find evidence of significant abnormal returns in AAR_1, AAR_2 and CAARi (-1, +1), we reject that the market is efficient and definitely not in strong form. So, the referendum can be considered a major economic event due to the drop of stock market by 4,85% in the first two days of announcement.
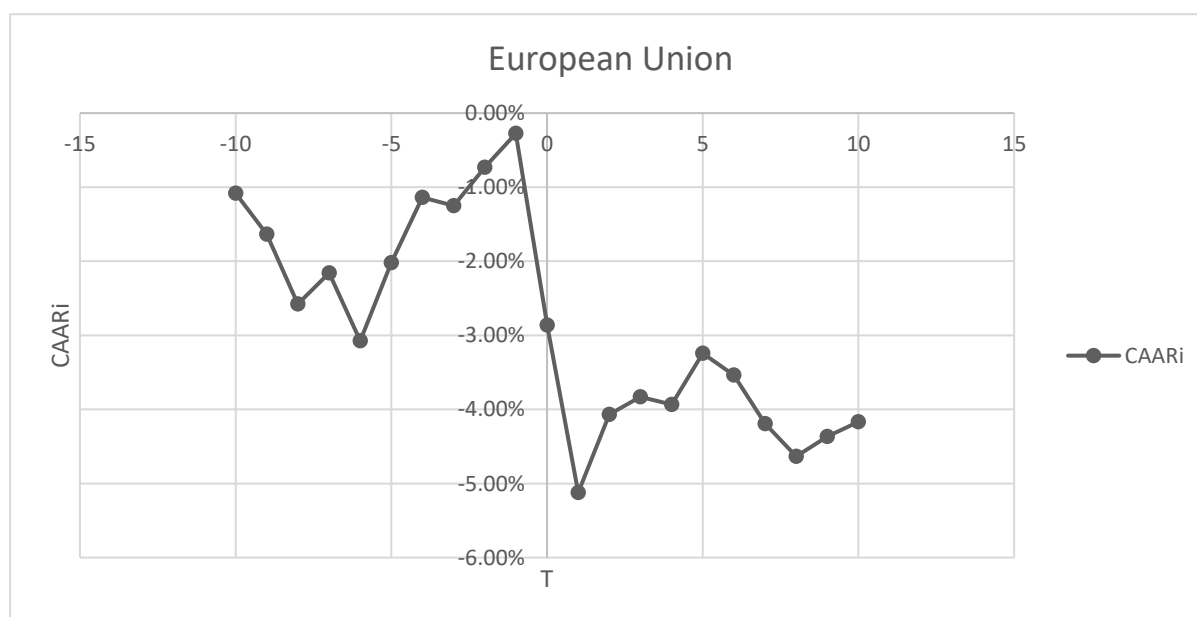
European Union

6.3.1.2 *European Union Less United Kingdom*

In that graph, we cancel out United Kingdom in order to observe the change in the drop and in what level does European Union is affected by one country. We can see that the graph is similar to the previous one. That means, there are countries that affected in the same or higher amount than United Kingdom. It is the first interesting result of our research, that drive us to search deeper to find the weaker links of this political and economic event. As we expected the results in terms of significant were the same as European Union as a whole.
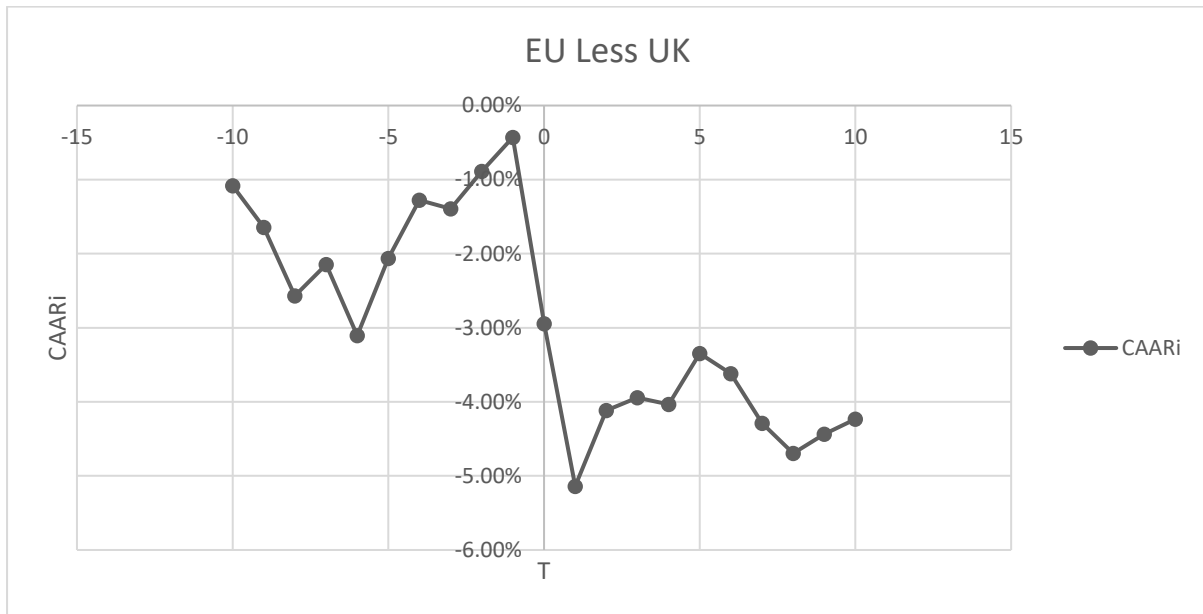
6.3.2 **Currency**

6.3.2.1 *Eurozone*

The purpose of that is to actually find if the Euro is strong enough and protect their countries. It may the graph seems similar and in terms of significance in abnormal returns, but actually we can observe in the details that Eurozone affected slightly more than the European Union. That means that the Euro doesn't help their countries for sure and even the country of the event, use the Pound. These new are not good for the Eurozone and the power of the currency but are representative of the real power of Euro.
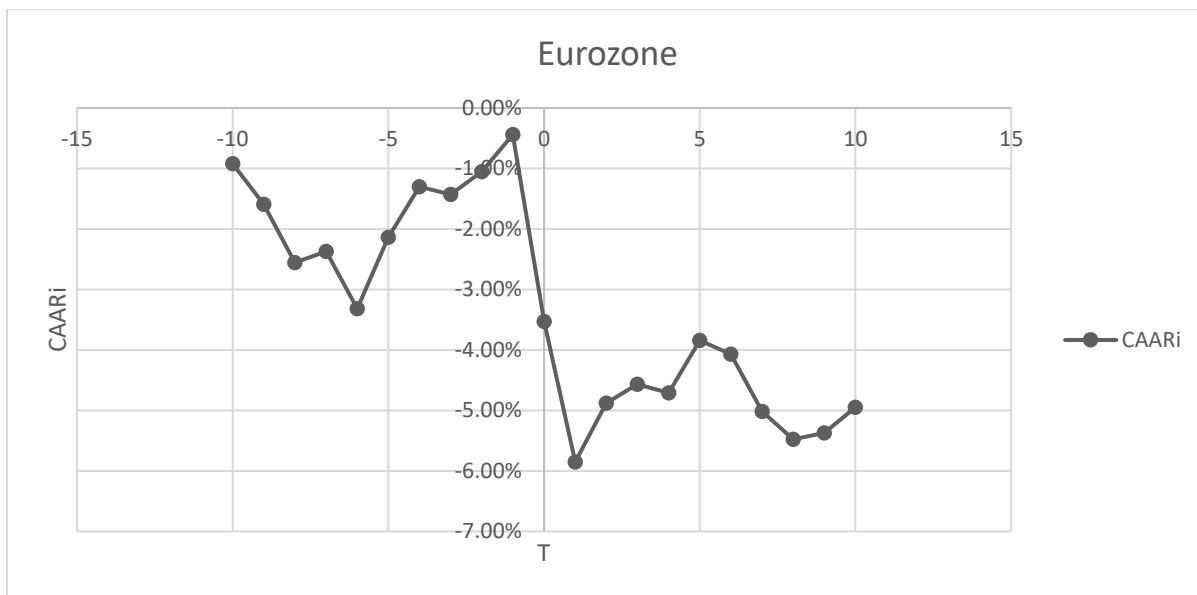
Eurozone

6.3.2.2 *Non-Eurozone*

In countries that don't use Euro as main currency, the volatility of their stock market was to minimum and the only significant amount of change in abnormal returns by 3,53%, was the day of the announcement of the results at the CAARi (-1, +1) measure, which means that only that day there was a change and not the entire 20 days around the event.

Non-Eurozone
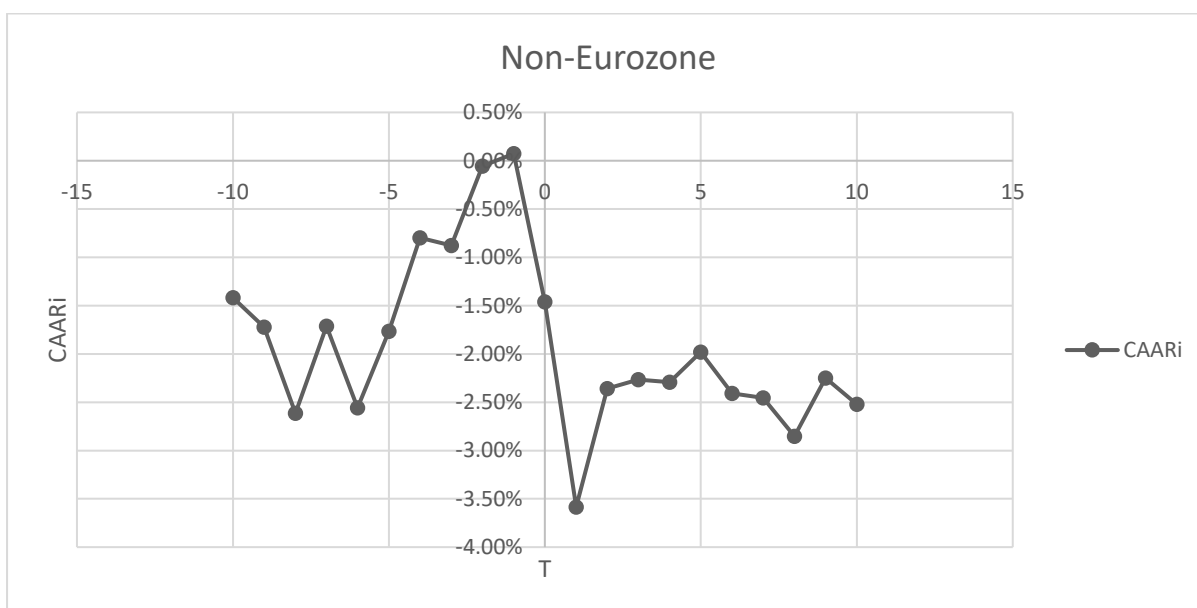
6.3.3 Weak Link of European Union

6.3.3.1 PIIGS

The last years, the European Union endorse specific countries with the same characteristics of bad results. These countries are considered the weak link of European Union and in these times of uncertainty are the first ones that lose. But how much are they lost? The results are absolutely huge. We can also notice from the graph that there is an absolutely huge drop in stock markets equal to almost 12% and stay in that level the next days as well. We can conclude from $CAAR_8$ that is significant, which means that the last 18 days there is a significant drop in the stock market of these countries. Of course, CAARi (-1, +1), (-2, +2) and (-3, +3) are easily significant and there is another interesting information that the CAARi (-5, -1) is not significant with a positive sign by a little.
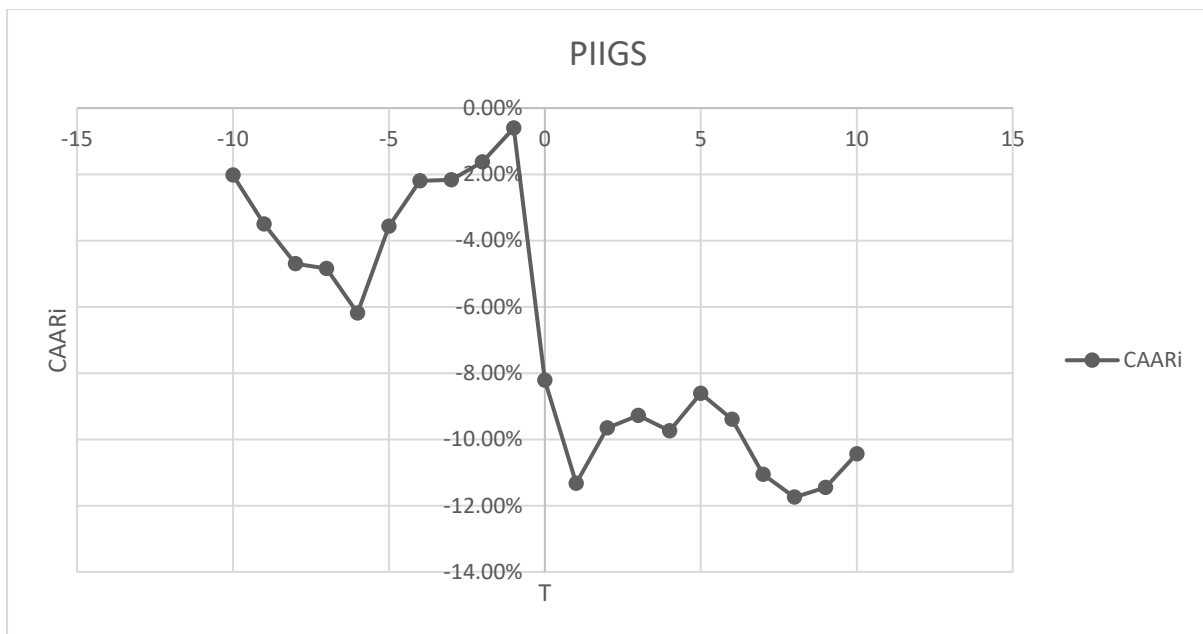
6.3.3.2 European Union Less PIIGS

Here the results may be significant in CAARi (-1, +1) but the drop in the stock market is less than the average of European Union. The results are very expected for that group of countries, that have a relative stronger economy

European Union Less PIIGS
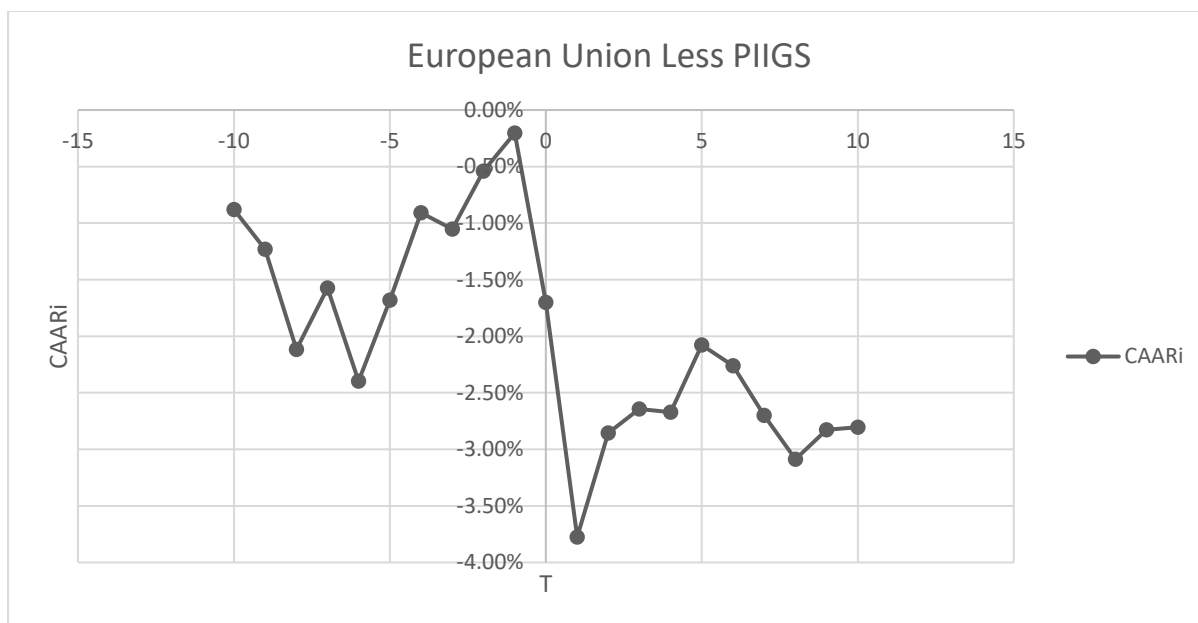
6.3.4 Regional Economic Unions

6.3.4.1 Baltic

		SIGN?	Robustness		SIGN?
CAARi (-1, +1)	-1,31%	NO	CAARi (-3, -1)	-0,53%	NO
CAARi (-2, +2)	-1,06%	NO	CAARi (-5, -1)	-0,81%	NO
CAARi (-3, +3)	-0,58%	NO	CAARi (-10, -1)	-2,52%	NO
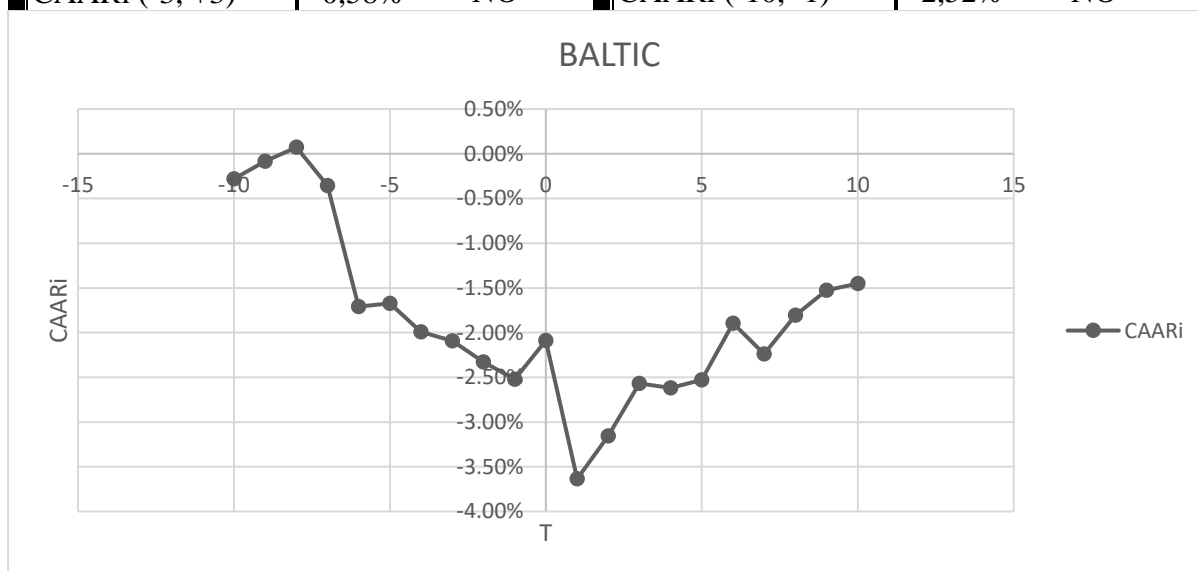
In that area, we don't find any significant change in abnormal returns in any time, which means despite the political instability the citizens of these counties are were well informed as we can see that little by little the returns are dropping as they are already knew the result of referendum. As an addition, their market slowly raises after the event to its natural level. They are prepared for a situation like that, and they don't have the closest relation with Great Britain.

6.3.4.2 Nordic

		SIGN?	Robustness		SIGN?
CAARi (-1, +1)	-3,43%	YES	CAARi (-3, -1)	0,71%	NO
CAARi (-2, +2)	-1,28%	NO	CAARi (-5, -1)	2,76%	NO
CAARi (-3, +3)	-0,72%	NO	CAARi (-10, -1)	-1,24%	NO
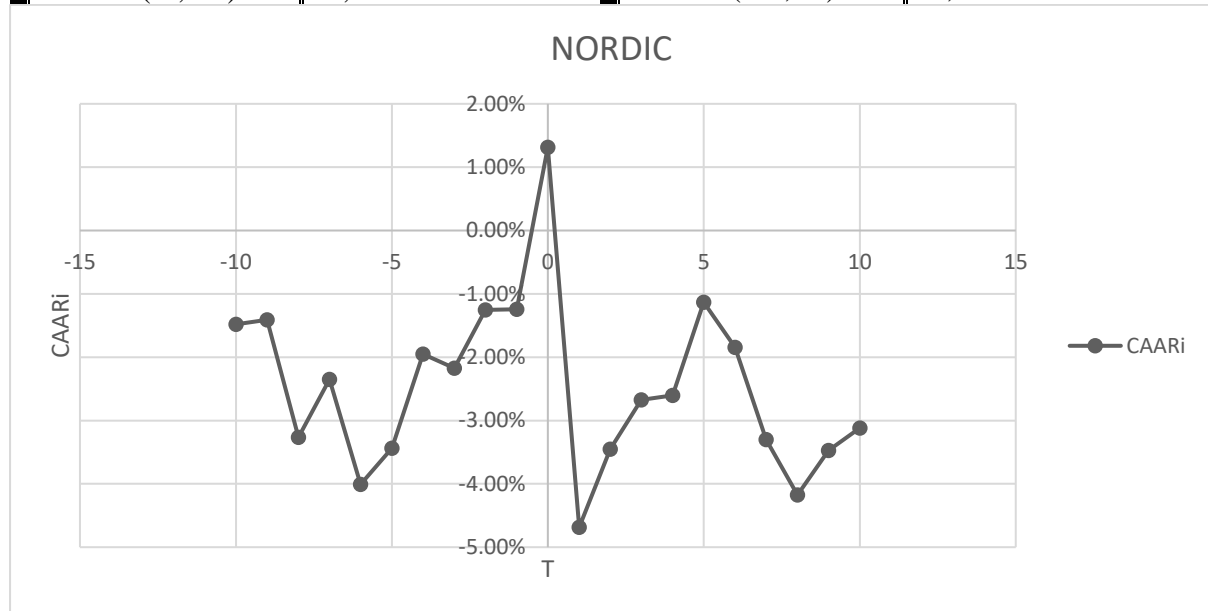
In this region, due to the strong economic history, great performance in macroeconomic variables and political stability, we expected that will actually benefit from this uncertainty in the European Union. We find interesting about this region that the two of its representations (Finland and Sweden) had significant positive Abnormal Returns the day of the event, and triggered us to search about the regional unit. The same expectation with the initial had the investors of those stock markets and that's why they note positive abnormal returns the day of the announcement which is significant and with a positive sign. It follows a sharp drop, because they understood that the relative position advantage that they gain through the exit of United Kingdom in European Union was not enough to cover the losses from the trade with them. The drop was so deep that the CAARi (-1, +1) is significant, although of that positive abnormal returns.

6.3.4.3 Benelux

		SIGN?	Robustness		SIGN?
CAARi (-1, +1)	-4,74%	YES	CAARi (-3, -1)	1,12%	NO
CAARi (-2, +2)	-3,55%	NO	CAARi (-5, -1)	3,50%	NO
CAARi (-3, +3)	-3,32%	NO	CAARi (-10, -1)	0,81%	NO
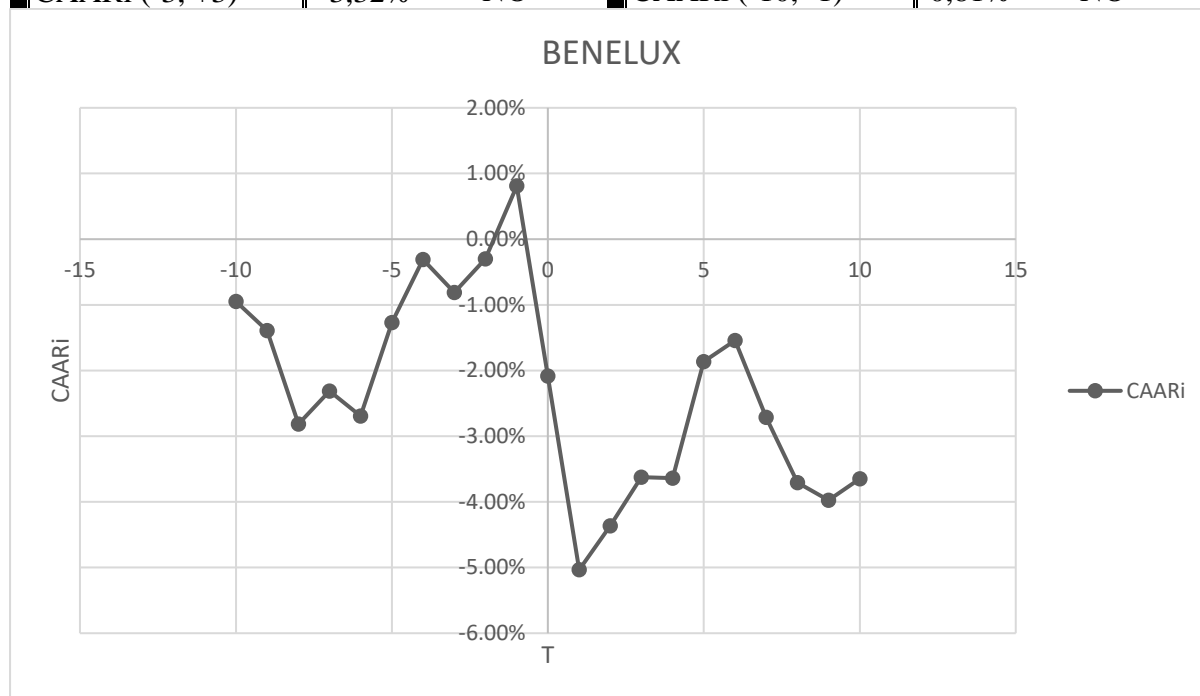
In the center of Europe and three of the closest countries to United Kingdom, BENELUX show us if a smaller economic union protect their countries and the answer definitely is no, even if in that case as well, there are positive abnormal returns the day of the referendum followed by a sharp drop of stock market of 5,84% in two days. We can observe, even if the CAARi (-5, -1) is insignificant, there are positive cumulative returns, which is in the opposite direction of the event.

6.3.4.4 British Isles

		SIGN?	Robustness		SIGN?
CAARi (-1, +1)	-11,10%	YES	CAARi (-3, -1)	0,93%	NO
CAARi (-2, +2)	-8,41%	YES	CAARi (-5, -1)	5,59%	YES
CAARi (-3, +3)	-7,28%	YES	CAARi (-10, -1)	1,84%	NO
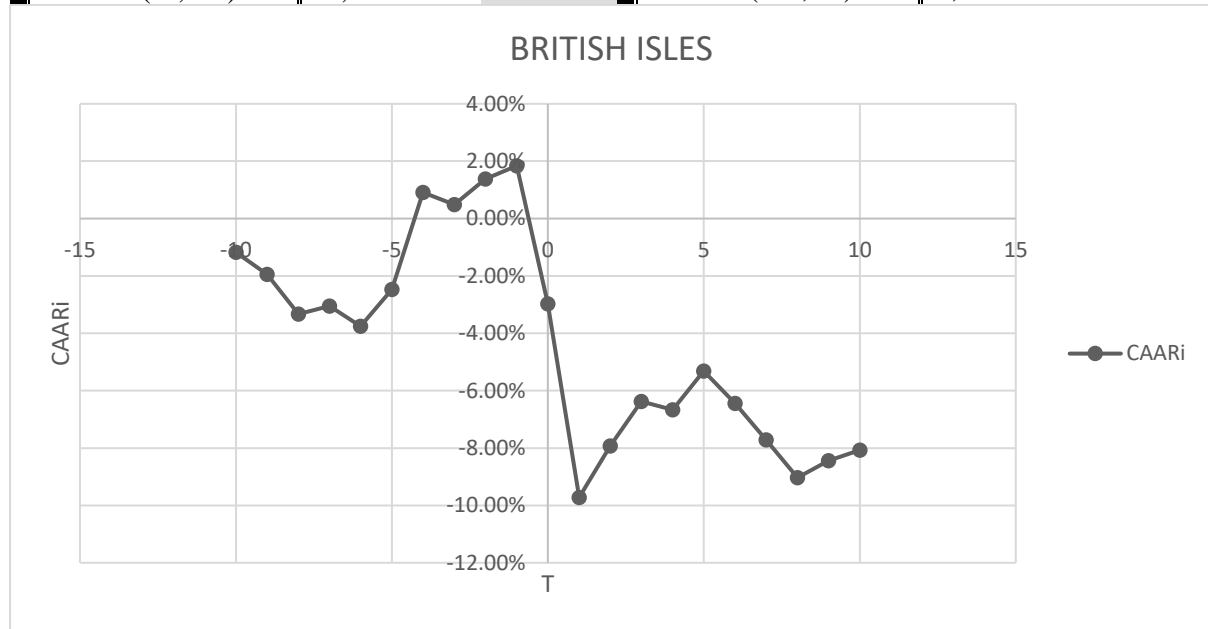
For that regional economic Union, disagreement is the representative word to describe the situation, since the results of United Kingdom and Ireland was positive before the announcement of referendum and the drop after was extremely sharp. Media have a big part of that upward trend due to the formed opinion about the results. The expectations are the opposite of the result and one of the reasons of that kind of continuous drop.

6.3.4.5 *Balkans (without Greece)*

		SIGN?	Robustness		SIGN?
CAARi (-1, +1)	-1.36%	NO	CAARi (-3, -1)	0.41%	NO
CAARi (-2, +2)	-0.06%	NO	CAARi (-5, -1)	0.55%	NO
CAARi (-3, +3)	-0.45%	NO	CAARi (-10, -1)	0.61%	NO
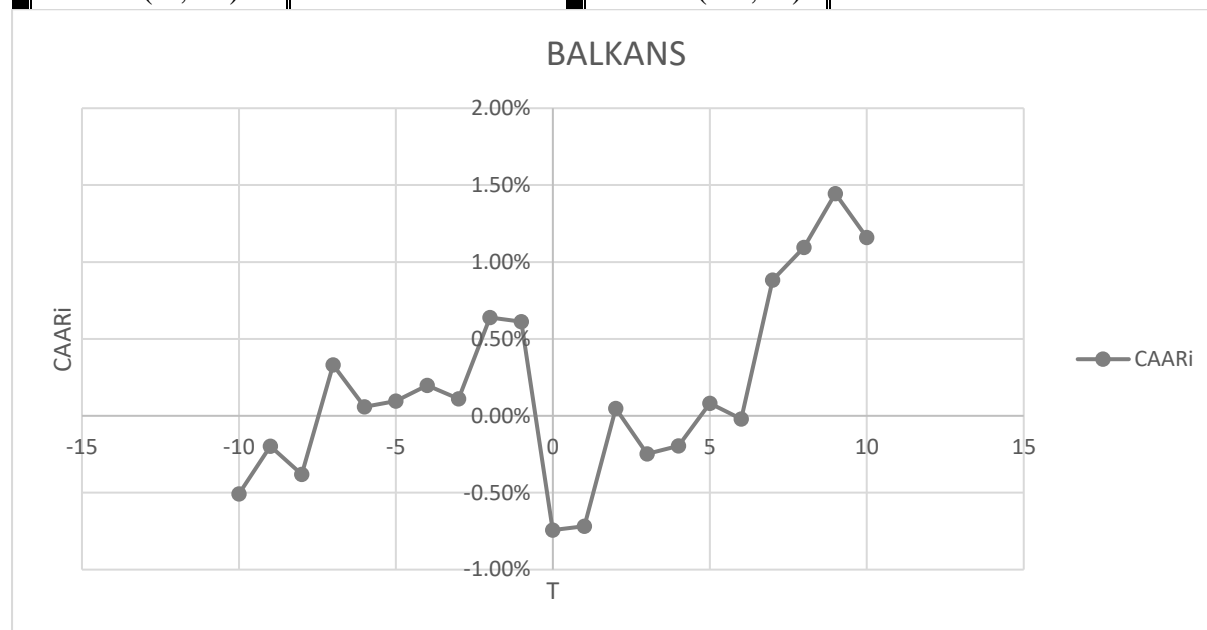
The Balkans have been considered a grey area for the European Union, both due to historical events and due to the great influence from other economic forces (e.g. Russia). Although, during the last decades the countries of the Balkans have quite been westernized and developed, still, their economies are characterized as weak. The European Union's countries of the Balkans (Bulgaria, Croatia, Romania, and Slovenia), being the strongest economically, show no sign of significance from the event according to CAARi. (-1, +1,) to CAARi (-3, +3). Even the robustness check indicates no significance, meaning that no affecting information existed before the event. Moreover, as most of the Europeans Union's Balkan countries are not inside the Eurozone (apart from Slovenia), explains a bit this apathy as to Brexit. Finally, only on the day of the event the AARi (t=0) was significantly low at -1.35% with a t value of -2.004, but this is very close to the rejection region of 0 abnormal returns, reassuring us about the absence of affection of these countries due to the event.

6.4 COMBINATION AND COMPARISONS OF RESULTS

6.4.1 Ranking According to AR(t=0) and CAR (+1, -1)

Country	Ari at t=0	SIGN?	Country	CARi (-1, +1)	SIGN?
Greece	-11,42%	YES	Ireland	-14,05%	YES
Spain	-9,12%	YES	Greece	-13,06%	YES
Italy	-8,74%	YES	Italy	-8,64%	YES
Ireland	-5,07%	YES	Spain	-8,46%	YES
United Kingdom	-4,56%	YES	United Kingdom	-8,15%	YES
France	-4,31%	YES	Austria	-7,03%	YES
Poland	-3,96%	YES	Belgium	-6,02%	YES
Austria	-3,87%	YES	Luxembourg	-5,43%	YES
Portugal	-3,73%	YES	Czech Republic	-5,34%	YES
Hungary	-3,45%	YES	France	-5,06%	YES
Belgium	-3,39%	YES	Sweden	-4,99%	YES
Luxembourg	-3,32%	YES	European Union	-4,39%	YES
Cyprus	-3,28%	YES	Cyprus	-4,37%	YES
Germany	-3,10%	YES	Hungary	-4,30%	YES
European Union	-2,59%	YES	Portugal	-4,27%	YES
Romania	-2,27%	YES	Germany	-4,02%	YES
Czech Republic	-2,19%	YES	Finland	-3,91%	YES
Netherlands	-1,97%	YES	Poland	-3,63%	NO
Slovenia	-1,47%	YES	Netherlands	-2,75%	YES
Croatia	-1,02%	YES	Romania	-1,75%	NO
Bulgaria	-0,65%	NO	Latvia	-1,59%	NO
Malta	-0,58%	NO	Slovenia	-1,48%	NO
Slovakia	0,01%	NO	Denmark	-1,40%	NO
Latvia	0,05%	NO	Croatia	-1,27%	NO
Denmark	0,21%	NO	Lithuania	-1,22%	NO
Lithuania	0,54%	NO	Estonia	-1,11%	NO
Estonia	0,71%	NO	Bulgaria	-0,93%	NO
Finland	3,36%	YES	Malta	-0,25%	NO
Sweden	4,11%	YES	Slovakia	1,61%	NO

We cannot hide our initial expectation of the United Kingdom to be impacted the most, out of the event of Brexit Referendum, as country leaving a powerful union is expected to do worst in the capital markets than the larger union itself. However, by digging and analyzing deeper, we have come up to some interesting results.

As can be seen in both the benchmarking tables (Ari at t=0 Ordering and CARi (-1, +1) Ordering), the United Kingdom's national index was 3rd (ARi, -4.56%) and 5th place (CARi (-1, +1), -8.15%). The other rest of the 5 first positions are held by the PIIGS countries' indices (ISEQ, FTSEMIB, ASE, IBEX), apart from Portugal (PSI20). This, while not shocking, but quite unexpected finding, since the event is one country focused, gives us the great insight that from the Brexit Referendum, or in general from an uncertainty inducing event, the markets that

are impacted the most are the weakest, more volatile ones. After PIIGS the countries that affected are its neighbors such as France and Belgium. A big surprise was Austria that we didn't has any indicator for that kind of drop. After a closer look Austria has a large number of subsidiaries in United Kingdom and large amount of trading volume. On the bottom of the ARi ordering table, are the two Nordic countries of European Union with significant positive returns, but the market corrects its self in just a day, and there is an extreme drop the next day. So, in the end of day 1, the Balkans and the Baltics were stronger than everyone else in the European Union.

6.4.2 European Union Less United Kingdom vs United Kingdom

European Union Less UK		SIGN?	United Kingdom		SIGN?
CAARi (-1, +1)	-4,25%	YES	CARi (-1, +1)	-8,15%	YES
CAARi (-2, +2)	-2,72%	NO	CARi (-2, +2)	-5,35%	YES
CAARi (-3, +3)	-2,67%	NO	CARi (-3, +3)	-3,35%	NO

In the beginning of that paper, we though that this is its purpose and we will analyze in deep that specific graph. But we can observe, that in comparison United Kingdom was expecting that the results of the referendum would be to stay in the European Union, and this is the main reason for that fast drop in just a day, in order to meet in the exact same point, the European Union. The damage was the same, but expectations were different, and that's why the fall of the United Kingdom Stock Market was significant even and in CARi (-2, +2).
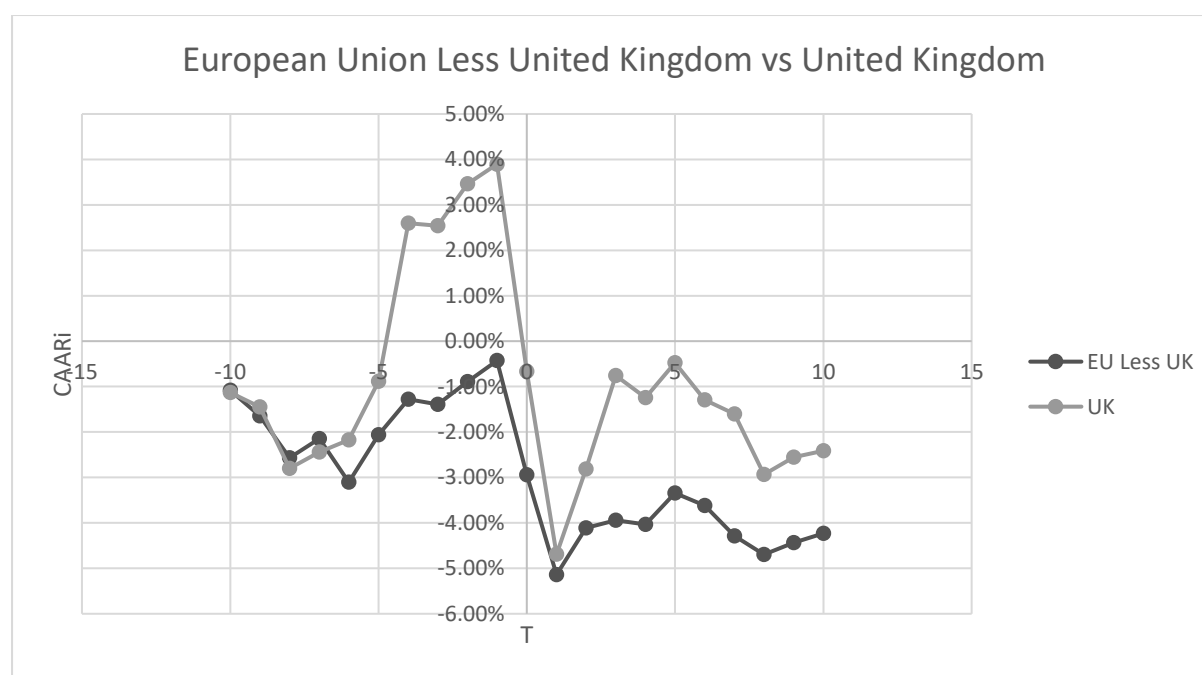
6.4.3 Eurozone vs Non-Eurozone

Eurozone		SIGN?	Non-Eurozone		SIGN?
CAARi (-1, +1)	-4,80%	YES	CAARi (-1, +1)	-3,53%	YES
CAARi (-2, +2)	-3,45%	NO	CAARi (-2, +2)	-1,48%	NO
CAARi (-3, +3)	-3,27%	NO	CAARi (-3, +3)	-1,47%	NO

Here, as well the impact is more significantly depected by the Cumulative Abnormal Returns (CAARi (-1, +1)) as the Eurozone market indices were -4.80% against a -3.53% for the Non-Eurozone ones. The impact was greater for the Eurozone countries, as not expected at all. That question heavily the power of Euro and the exact reasons behind that change in the drop of stocks with different currencies.
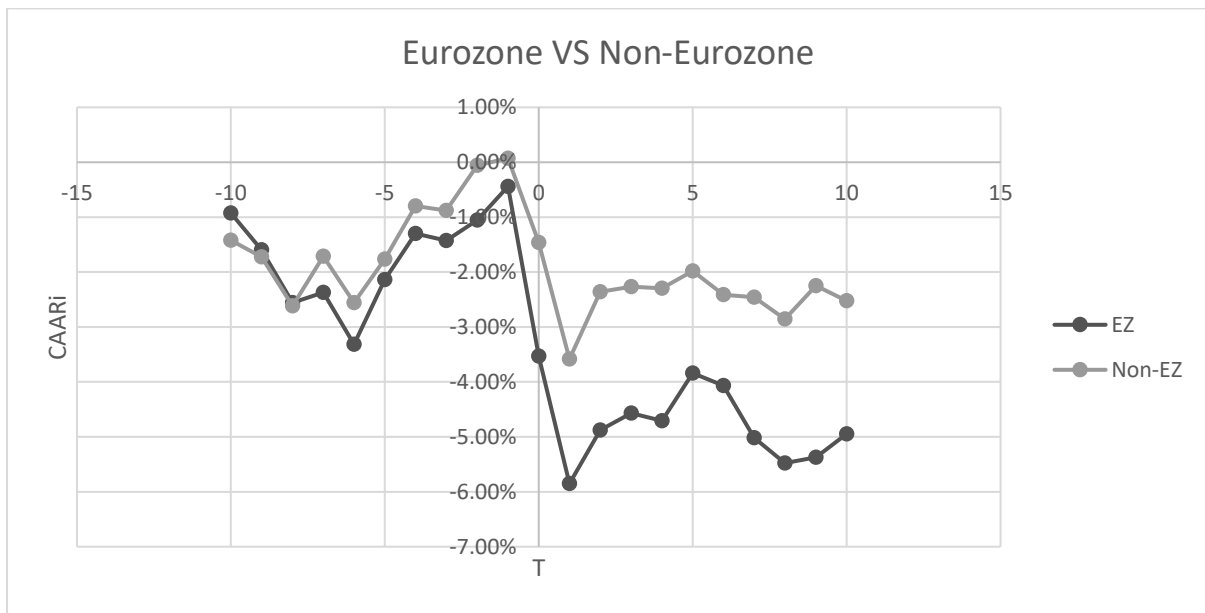
6.4.4 European Union Less PIIGS vs PIIGS

EU Less PIIGS		SIGN?	PIIGS		SIGN?
CAARi (-1, +1)	-3,24%	YES	CAARi (-1, +1)	-9,70%	YES
CAARi (-2, +2)	-1,80%	NO	CAARi (-2, +2)	-7,48%	YES
CAARi (-3, +3)	-1,73%	NO	CAARi (-3, +3)	-7,09%	YES

This heavier impact insight is also reinforced by the aggregation of Abnormal Returns (AARi) of the PIIGS, compared with those of the European Union as a whole (Less PIIGS). This great impact is significantly depicted by the CAARi (-1, +1) where EU without the PIIGS was -3.24% where for the PIIGS was -9.70%.
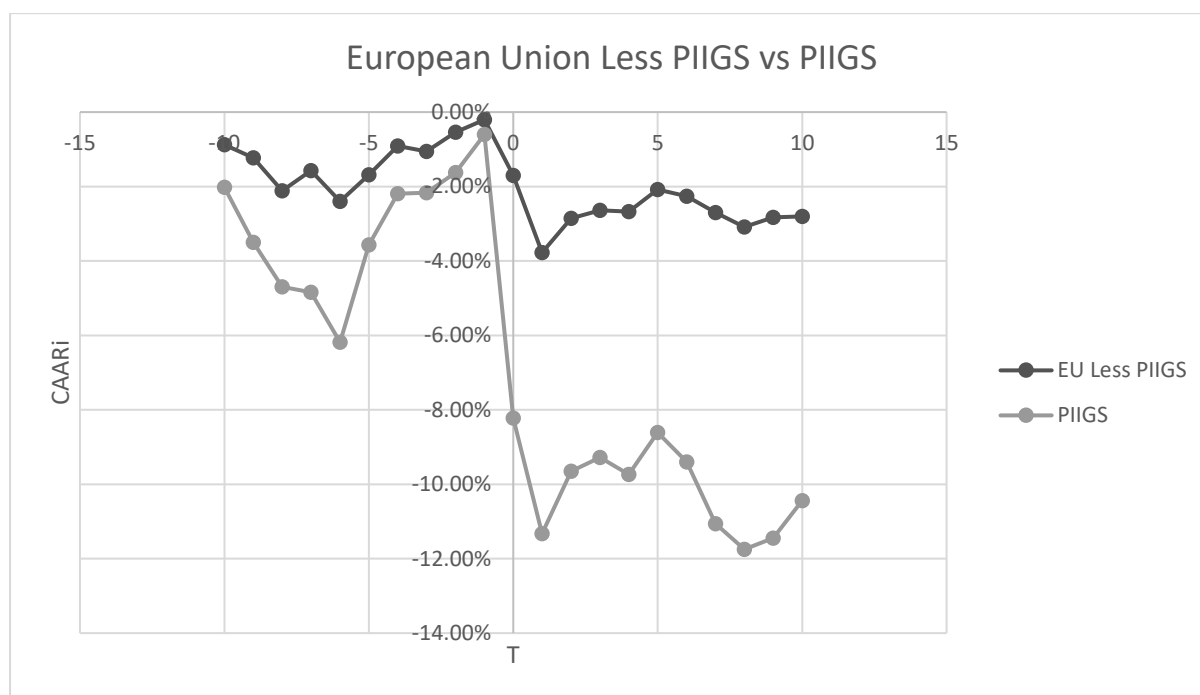
6.5 DOES THE RESULTS MEET OUR EXPECTATIONS?

6.5.1 Results of Previous Studies

One year after Brexit, *Richard C. K. Burdekin, Eric Hughson & Jinlin Gu* published an article about called "A first look at Brexit and global equity markets". It is clear that, they used stocks worldwide (64 stock exchanges, 41 countries) to understand the impact in global scale, by measuring these stocks exchanges. They conclude that not every country reacted to the same direction, for example PIIGS and BRICS have an extra interest of research for their bad and good results respectively. So, in addition to the previous, bad political news doesn't have always bad results on the stock market, but which are the factors affecting it? All in all, the paper proves that Brexit had a big negative effect on stock market worldwide, especially on the ones in the European Union, and that was one of the main reason why we dig in the area of the event. They used two main variables and three dummies (BRICS, PIIGS, Eurozone) that covered the 65% of the results. We inspired by that procedure and we alternate one variable, we add another and remove all dummies and the results are magnificent. The previous question, also tried to answer, with a PARCH (Power GARCH, combination with a dummy variable "Brexit") model approach, *Boris van Bruggen in 2016*, but with completely different variables (dividend yield, industrial production, inflation, trading volume, stock market volatility and the Amihud illiquidity measure, e relative exchange rate). There is another paper that influence our paper heavily in order to understand the inside effects of such an event in a country and what particular sectors damaged the most, and that is the work of *Ramiah, Pham and Moosa (2016)*. That paper showed us that the macroeconomic variables affected the most and also the export would be influenced the most, and that's why we used a variable for both of these information in our regression.

6.5.2 Selection of Metric Explanation

In order to find the reasons behind the results, we conduct a regression analysis with various variables. We focus in 28 countries of European Union, except United Kingdom, and as the dependent variable we chose CARi (-1, +1) since we believe that this is the most representative results, because it includes a day before, a day after the announcement and the day of the event, as Cutler, *Poterba and Summers (1989)* in their study argued that returns on the special event days are more volatile than returns on the non-event days, and we want it the overall picture of the short-term influence in the markets. As explanation of such results, we focus on economic related and political variables, and for your information, we didn't find any significance in the

following variables: interest rates, bond yields, political stability and political events the previous year, distance from United Kingdom, number of immigrants of each country in United Kingdom, past wars (ally, enemy or neutral), currency. The systematic factors underlying the stock market return, in the paper of Chen, Roll and Ross (1986), a set of macroeconomic variables are compiled that are expected to have an effect on the stock market returns. The set of variables consists of the inflation rate, the treasury-bill rate, the long-term government bonds, industrial production, low-grade bonds, equally weighted equities, value-weighted equities, consumption and oil price. The reason behind that insignificance is the power of European Central Bank and the Quantitative Easing policy that have adopted from March 2015. The effects of that policy shown in the stability of interest rates that strengthen and secure high volatility in prices of market and built a wall of protection against uncertainty. In the paper of July 2016 by Boris van Bruggen, he analyzes the announcement effects on the United Kingdom stock market and the reasons behind that change in prices in one day. We focus in the European Union, except the United Kingdom, in order to find out if are the same variables significant to the domain research. We had the same procedure for variable selection, but the results were completely different. Nowadays, the economic position of a country measured by the percentage of its debt to GDP, which means that a country is fragile or not relative to others. In addition, in such an event the direct economic dependence with the country of the event must have a big influence in the dependent variable.

"We show that the overall short-run trade impact on the UK's goods trade due to Brexit is less than 2 percent. This result assumes that the UK will not have any preferential access to the EU market and all its products will enter the EU, the US and China on the Most Favored Nations (MFN) basis. This result also assumes that in the short-run, firms and investments are not free to move across borders. The long-run consequences of Brexit most likely depend on whether the UK can continue to attract and retain its foreign direct investment. "(Hiau Looi Keey, Alessandro Nicit, 2017)

In order to turn the previous sentence into a numerical one and to show the relation of every country separately, we add up the exports and imports in terms of value with the United Kingdom and we divide this with the total sum of exports and imports of each country to find out the dependence of earning with United Kingdom in the trade balance. In first place, we had divide the sum of imports and exports with United Kingdom with the GDP of every country as Richard C. K. Burdekin, Eric Hughson & Jinlin Gu (2017, "A first look at Brexit and global equity markets") uses the variable openness, but seems insignificant. That is since countries and policies uncertainty created in times of unexpected results, and a "bad" result is not always

unexpected. So, the variables that includes that information is the one who we chose, because it shows how much a country has indirectly invested a part of its trading volume in United Kingdom. So, we have the following variables:

The results of that paper are focus globally in equity markets and identify debt as the number one independent variable. In addition to the previous findings, there are papers that measure the percentage drop or rise of every sector separately, and found that the three variables with the most significant drop are real estate, banks and insurance, which is mainly macroeconomic factors, strictly connected with the trust of citizens to the government. That loss of trust, we tried to measure it and fail, but we found the reasons behind its existence. So, media and common opinion about the event plays an important role, so any surprise causes a negative effect in the stock prices. In other words, if the investors expect that drop, they are prepared and are getting the proper actions to avoid losses, so there is not a significance drop of the stock market. The variable that shows the 5 previous days of the event can be a representative variable of the previous theory. In addition, in the research about the factors that affected the result of the referendum, was not the media, but the R^2 was relative small to 57,7%, so we figure out that there is something missing from it (Sofia Vasilopoulou, 2016).

6.5.3 Results of the Metric Explanation

It is clear that with only three variables, the results for such a complicated matter, can be explain the 75,8% of its results. We observe that the P-value of each variable is 0,0018 for the CARi (-5, -1), 0,0082 for the Debt/ GDP and 0,0014 for Openness with U.K. which are extremely small and make all the variable significant. The f-statistic for the three variables is 24,04 and the critical value of F with 23 Degrees of freedom and a=0,05 is 3,02, which is smaller than the F-statistic. The significance of F is extremely small which shows the percentage of failure of our model. Another conclusion of the ANOVA is that all coefficients have negative sign and the most significant one is CARi (-5, -1). We can say that as long as a country have a large percentage of debt, will reflect negatively the results of the event, as there will be a drop in CARi (-1, +1). In addition, the bigger the Openness with U.K., the bigger the drop. And in the end, the biggest influence has the market the previous days, which means that if the market has an upwards trend in Abnormal Returns will have a quick drop and vice versa.

COUNTRY	CAR(-1, +1)	CARi(-5 , -1)	Debt/GDP (t=0)	Openness with U.K. (t=2015)
AUSTRIA	-7,03%	4,27%	84,60%	2,53%
BELGIUM	-6,02%	3,42%	105,90%	7,24%
BULGARIA	-0,93%	0,86%	29,50%	2,15%
CROATIA	-1,27%	-0,48%	84,20%	1,40%
CYPRUS	-4,37%	0,19%	107,80%	6,92%
CZECH REPUBLIC	-5,34%	2,99%	37,20%	3,77%
DENMARK	-1,40%	2,49%	37,80%	5,52%
ESTONIA	-1,11%	-1,02%	95,00%	2,63%
FINLAND	-3,91%	1,78%	63,60%	4,05%
FRANCE	-5,06%	4,07%	96,00%	5,67%
GERMANY	-4,02%	4,01%	68,30%	5,98%
GREECE	-13,06%	8,30%	179,00%	3,45%
HUNGARY	-4,30%	1,76%	74,10%	2,99%
IRELAND	-14,05%	5,11%	75,40%	17,41%
ITALY	-8,64%	6,12%	132,60%	4,27%
LATVIA	-1,59%	-1,40%	40,10%	3,71%
LITHUANIA	-1,22%	-0,02%	40,20%	4,05%
LUXEMBOURG	-5,43%	3,00%	20,00%	7,24%
MALTA	-0,25%	0,81%	58,30%	4,34%
NETHERLANDS	-2,75%	4,08%	62,30%	7,73%
POLAND	-3,63%	6,08%	54,40%	4,83%
PORTUGAL	-4,27%	3,24%	130,40%	4,71%
ROMANIA	-1,75%	-0,10%	37,60%	3,20%
SLOVAKIA	1,61%	1,62%	51,90%	3,43%
SLOVENIA	-1,48%	1,93%	79,70%	1,87%
SPAIN	-8,46%	5,12%	99,40%	6,19%
SWEDEN	-4,99%	4,02%	41,60%	6,46%

SUMMARY OUTPUT

Regression Statistics

Multiple R	0,870754768
R Square	0,758213866
Adjusted R Square	0,726676544
Standard Error	0,019084416
Observations	27

ANOVA

	df	SS	MS	F	Significance F
Regression	3	0,026269144	0,008756381	24,04179624	2,82727E-07
Residual	23	0,008376944	0,000364215	Critical Value at 0,05	
Total	26	0,034646088		3,027998382	

Variables	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	0,02486506	0,010507322	2,366450722	0,026759125	0,003129008	0,046601112	0,003129008	0,046601112
CARi(-5 , -1)	-0,682741275	0,193746556	-3,523888579	0,001818935	-1,083536562	-0,281945988	-1,083536562	-0,281945988
Debt/GDP	-0,034038217	0,011776372	-2,890382339	0,008254063	-0,058399499	-0,009676936	-0,058399499	-0,009676936
Openness with U.K.	-0,485372436	0,134661369	-3,604392557	0,001493884	-0,763940702	-0,20680417	-0,763940702	-0,20680417

7 CONCLUSION

7.1 SUMMARY DISCUSSION

The overall picture of this paper is about the surprise of the people of European Union with the unexpected decision not to be part of that Union anymore. It is shown the expectations of investors and stakeholders of every country's public companies for how much is it going to affect their economy and the market balance. The goal is to investigate if there is a significant effect of the announcement of the results of the referendum that Great Britain will leave European Union, in the countries that belong in it, and the factors behind that attitude of the stock market of each county individually and in specialized group of countries depending on characteristics. Volatility measure uncertainty, and prices measures political independence in our case, as event studies deepen our understanding of regulations and political decision making.

In order to conduct a representative event study that can fully describe the effects, we chose the 28 countries that are in the European Union, as the most direct to the problem. It was clear from the beginning that the answer to our initial question wasn't that easy. We make an ordering table of the countries for the CARi (-1, +1), to have the overall picture, and after that we conduct a metric explanation we that as a dependent variable. We establish that one of the many variables that are significant is the Debt/GDP with no surprise here. But the two other are the innovative idea about this paper. Openness with United Kingdom, which is the percentage of total exports and imports with the U.K. and not with the value of exports and imports with U.K. divide to GDP, have more influence from the previous one. The third independent variable is the answer to the following question: "Does the investors we found off guard? ". CARi (-5, -1) describes fully the previous days of the event and what the investors thought that will happen to the results of the referendum and as conscience to the rise of the stock market, as a confidence sign. That help us to conclude one more time that the market is not efficient.

But another outcome of the ordering table is that we had the opportunity to identify some pattern after a closer look, and verify all the previous results. Euro doesn't help us in that particular event because the eurozone have high volume of trade with the United Kingdom and have made major investments towards that country, but the results of not-Euro countries are slightly better. Furthermore, Portugal, Italy, Ireland, Greece and Spain are on top of the list, so

PIIGS have a difficulty to absorb the uncertainty that have created in just one day, due to different value of their debt after the event. The regional European union that affected the most were British Isles as the countries of the union is Great Britain, the country of the event, and Ireland, member of PIIGS. After that Benelux and Nordic countries have significant drop in their stock market, as they trade and connect with Great Britain in high volume. With insignificant drop in the stock market had the Baltic, and in the end the Balkans (without Greece) had positive Abnormal Returns after two days of the event, which opposite of the general trend in the rest of the Europe.

7.2 CONCLUSION

First of all, let's answer step by step the initial hypothesis.

Hypothesis 1: Brexit's vote was bad news for the European Union in short term period

Absolutely, the initial hypothesis of Fama (1970) can be confirmed that bad news has a negative effect in the stock markets. In all cases of CARi (-1, +1), CARi (-2, +2) and CARi (-3, +3) it is negative, expect Slovakia, which means one out of twenty-eight countries. The day of the event is not that clear as there are seven countries with positive Abnormal Returns (Slovakia, Latvia, Denmark, Lithuania, Estonia, Finland, Sweden) and the last two were on significant level as well, but in both cases the next there were a sharp drop. Although because of these countries, the hypothesis 2 becomes even more interesting to evaluate.

Hypothesis 2: There is a semi strong-form efficient market hypothesis.

There is not Inside/Private Information regarding the referendum

That is a hard Hypothesis to reject with certainty. In first place, general election in the past have shown that were the only event studies with characteristics and signs of semi-strong market, as the stock market reflect significant the information after the event, but the problem is that they are not accurate (Justin Robinson & Prosper Bangwayo-Skeete,2008). The rest of event studies with different themes are for sure not even semi-strong. In our case, we confident that we can team our case with the general elections event studies, there is a lot of significance change according to new information but not on point, and is a highly political issue that affect policies and domain and international relations.

This hypothesis also, is the main reason for our robustness test, in order to identify if there is any significant movement towards the upcoming drop. In the other way around, there were cases that the significance was in the other way before the event. That means that not only there

is not private information from the investors, so they can outperform it, but the public opinion was wrong. So, that causes a chain of reactions, the stock markets that bet to Brexit had the minimum loss and the smallest percentage change in abnormal returns. In the regression for the reasons behind that specific results, the days before the event as variable was highly significant with negative sign, as much as the level of debt, which means the market is not efficient.

Hypothesis 3: U.K. affected more than any other European country

That was the most unexpected information from the results. Not only United Kingdom was not affected the most, but there are the four same countries (Ireland, Greece, Italy, Spain) in every way of comparison (CAARi and ARi). The country of the event and the country of bad news is not in the first place of this ranking and this create a numerous of questions.

Hypothesis 4: Euro protects the countries of its use

In our specialized comparisons between Eurozone and Non-Eurozone had similar results, but in the details the non-Eurozone countries won the race. So, we cannot accept this hypothesis, as the euro seems more fragile in macroeconomic uncertainty.

Hypothesis 5: The level of influence affected accordingly of the level of debt of each country

Debt was, is and will be one of the most crucial indicators for economic stability and negotiation power. So, in a situation that both, politics and trade, shook up, we would have expected to be the most important reason of change, but no, we find out from the regression analysis that Debt/GDP came third in significance, behind openness with United Kingdom and the winner, the performance before the day of the event.

Let's answer the title of this paper: **Who was worst off?**

We believed that was a battle between the United Kingdom and European Union as a unit, but no. Ireland is worst off the United Kingdom from the European Union, and we establish that PIIGS are the most fragile countries, in any kind of uncertainty creation in the European Union. So, in the end the countries that are in relative better place, are the ones with low level of debt, their trade balance is well diversified (not heavily committed to one country) and doesn't act prematurely affected from the media and public trends.

7.3 RECOMMENDATIONS AND FUTURE RESEARCH

There is plenty of room for future researches in five levels.

At first, the short-term event study can provide crucial information for the trend of the period after the event. Here there is room to find out, how much is the significant period of influence of the results and from what variables every country or business depends on that significance. That was a result from our second Limitation: *The time of the event, there is the assumption that the only significant event that influence the stock markets is the one that we research for.*

Secondly, a long-term event study can be conducted regarding the Brexit and observe if the results are similar with ours. In that level, can be a research about the relation between the financial markets and the political announcement from the United Kingdom and its macroeconomic performance of the country.

Our inspiration and the future papers should start from our Limitation: We occupied with the stock markets of European Union, not of all around the globe

The third level is about the broad range of countries that can be selected to analyze. We focused in the European Union and the regional union inside of it. The future research can do the same methodology for all countries of the globe. After that due to a lot of calculations, it is better to focus in countries of G20 (Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russian Federation, Saudi Arabia, South Africa, South Korea, Turkey, United Kingdom, United States, and the European Union) or G7 (Canada, France, Germany, Italy, Japan, the United Kingdom and the United States) and of course after that in countries and to the largest public companies of the world according to market capitalization (Financial Times Global 500) and after that, individually to some notable companies like Apple or Amazon or Facebook.

As an extension of the above, there is a key information that can be turned into a scientific paper and an investment decision afterwards according to the results. The paper will be about the companies that affected the less after a significant macroeconomic or political event in domain and global perspective. If the reasons of that "no effect" company is due to strong fundamental ratios will be an investment with low market beta or even a negative one, which mean low volatility, and if not, what are the reasons behind that movement.

Another type of research can be conducted is about connecting the proper way of methodology of event studies according to the nature of the event (political, M&A, stock splits, earnings, losses etc.).

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9 APPENDIX

9.1 DATA

Table 1.1.

DATA DESCRIPTION			
ID	Country	Status	Blomberg Index Ticker
1	Austria	Eurozone	ATX Index
2	Belgium	Eurozone	BEL20 Index
3	Bulgaria	Non-Eurozone	SOFIX Index
4	Croatia	Non-Eurozone	CRO Index
5	Cyprus	Eurozone	CYSMMAPA Index
6	Czech Republic	Non-Eurozone	PX Index
7	Denmark	Non-Eurozone	KFX Index
8	Estonia	Eurozone	TALSE Index
9	Finland	Eurozone	HEX Index
10	France	Eurozone	CAC Index
11	Germany	Eurozone	DAX Index
12	Greece	Eurozone	ASE Index
13	Hungary	Non-Eurozone	BUX Index
14	Ireland	Eurozone	ISEQ Index
15	Italy	Eurozone	FTSEMIB Index
16	Latvia	Eurozone	RIGSE Index
17	Lithuania	Eurozone	VILSE Index
18	Luxembourg	Eurozone	LUXXX Index
19	Malta	Eurozone	MALTEX Index
20	Netherlands	Eurozone	AEX Index
21	Poland	Non-Eurozone	WIG20 Index
22	Portugal	Eurozone	PSI20 Index
23	Romania	Non-Eurozone	BET Index
24	Slovakia	Eurozone	SKSM Index
25	Slovenia	Eurozone	SBITOP Index
26	Spain	Eurozone	IBEX Index
27	Sweden	Non-Eurozone	OMX Index
28	United Kingdom	Non-Eurozone	UKX Index

Table 1.2.

ARi at t=0 Ordering						
ID	Country	Status	Blomberg Index Ticker	Ari at t=0	tARi	SIGN?
26	Greece	Eurozone	ASE Index	-11.42%	-5.375	YES
15	Spain	Eurozone	IBEX Index	-9.12%	-9.819	YES
28	Italy	Eurozone	FTSEMIB Index	-8.74%	-7.077	YES
14	Ireland	Eurozone	ISEQ Index	-5.07%	-5.867	YES
12	United Kingdom	Non-Eurozone	UKX Index	-4.56%	-5.970	YES
10	France	Eurozone	CAC Index	-4.31%	-5.227	YES
2	Poland	Non-Eurozone	WIG20 Index	-3.96%	-3.321	YES
1	Austria	Eurozone	ATX Index	-3.87%	-4.234	YES
5	Portugal	Eurozone	PSI20 Index	-3.73%	-3.588	YES
22	Hungary	Non-Eurozone	BUX Index	-3.45%	-3.403	YES
11	Belgium	Eurozone	BEL20 Index	-3.39%	-4.582	YES
13	Luxembourg	Eurozone	LUXXX Index	-3.32%	-2.748	YES
21	Cyprus	Eurozone	CYSMMAPA Index	-3.28%	-4.170	YES
18	Germany	Eurozone	DAX Index	-3.10%	-3.418	YES
0	European Union	Both	-	-2.59%	-2.696	YES
6	Romania	Non-Eurozone	BET Index	-2.27%	-2.468	YES
20	Czech Republic	Non-Eurozone	PX Index	-2.19%	-2.666	YES
23	Netherlands	Eurozone	AEX Index	-1.97%	-2.522	YES
25	Slovenia	Eurozone	SBITOP Index	-1.47%	-2.188	YES
4	Croatia	Non-Eurozone	CRO Index	-1.02%	-2.066	YES
19	Bulgaria	Non-Eurozone	SOFIX Index	-0.65%	-1.229	NO
3	Malta	Eurozone	MALTEX Index	-0.58%	-1.465	NO
24	Slovakia	Eurozone	SKSM Index	0.01%	0.014	NO
16	Latvia	Eurozone	RIGSE Index	0.05%	0.038	NO
7	Denmark	Non-Eurozone	KFX Index	0.21%	0.203	NO
8	Lithuania	Eurozone	VILSE Index	0.54%	1.293	NO
17	Estonia	Eurozone	TALSE Index	0.71%	1.179	NO
9	Finland	Eurozone	HEX Index	3.36%	4.093	YES
27	Sweden	Non-Eurozone	OMX Index	4.11%	4.226	YES

Table 1.3.

ID	Country	Status	Blomberg Index Ticker	CARi (-1, +1)	tCARi	SIGN?
CARi (-1, +1) Ordering						
14	Ireland	Eurozone	ISEQ Index	-14.05%	-9.395	YES
12	Greece	Eurozone	ASE Index	-13.06%	-3.548	YES
15	Italy	Eurozone	FTSEMIB Index	-8.64%	-4.043	YES
26	Spain	Eurozone	IBEX Index	-8.46%	-5.258	YES
28	United Kingdom	Non-Eurozone	UKX Index	-8.15%	-6.163	YES
1	Austria	Eurozone	ATX Index	-7.03%	-4.440	YES
2	Belgium	Eurozone	BEL20 Index	-6.02%	-4.698	YES
18	Luxembourg	Eurozone	LUXXX Index	-5.43%	-2.593	YES
6	Czech Republic	Non-Eurozone	PX Index	-5.34%	-3.758	YES
10	France	Eurozone	CAC Index	-5.06%	-3.541	YES
27	Sweden	Non-Eurozone	OMX Index	-4.99%	-2.961	YES
0	European Union	Both	-	-4.39%	-2.640	YES
5	Cyprus	Eurozone	CYSMMAPA Index	-4.37%	-3.211	YES
13	Hungary	Non-Eurozone	BUX Index	-4.30%	-2.444	YES
22	Portugal	Eurozone	PSI20 Index	-4.27%	-2.374	YES
11	Germany	Eurozone	DAX Index	-4.02%	-2.559	YES
9	Finland	Eurozone	HEX Index	-3.91%	-2.751	YES
21	Poland	Non-Eurozone	WIG20 Index	-3.63%	-1.760	NO
20	Netherlands	Eurozone	AEX Index	-2.75%	-2.040	YES
23	Romania	Non-Eurozone	BET Index	-1.75%	-1.094	NO
16	Latvia	Eurozone	RIGSE Index	-1.59%	-0.745	NO
25	Slovenia	Eurozone	SBITOP Index	-1.48%	-1.268	NO
7	Denmark	Non-Eurozone	KFX Index	-1.40%	-0.789	NO
4	Croatia	Non-Eurozone	CRO Index	-1.27%	-1.492	NO
17	Lithuania	Eurozone	VILSE Index	-1.22%	-1.677	NO
8	Estonia	Eurozone	TALSE Index	-1.11%	-1.061	NO
3	Bulgaria	Non-Eurozone	SOFIX Index	-0.93%	-1.009	NO
19	Malta	Eurozone	MALTEX Index	-0.25%	-0.369	NO
24	Slovakia	Eurozone	SKSM Index	1.61%	0.891	NO

9.2 NATIONAL MARKET INDICES

Table 2.1.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-7.03%	-4.440	YES	CARi (-3, -1)	1.07%	0.524	NO
CARi (-2, +2)	-5.28%	-2.583	YES	CARi (-5, -1)	4.27%	2.087	YES
CARi (-3, +3)	-4.89%	-2.021	YES	CARi (-10, -1)	0.29%	0.144	NO
1. Austria							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	0.48%	0.520	NO	-7.29%	-1.739	NO
9	7/7/2016	0.50%	0.550	NO	-7.76%	-1.898	NO
8	7/6/2016	0.44%	0.476	NO	-8.27%	-2.073	YES
7	7/5/2016	-2.26%	-2.474	YES	-8.70%	-2.242	YES
6	7/4/2016	-1.01%	-1.104	NO	-6.44%	-1.707	NO
5	7/1/2016	0.47%	0.517	NO	-5.43%	-1.484	NO
4	6/30/2016	-0.23%	-0.256	NO	-5.90%	-1.666	NO
3	6/29/2016	0.70%	0.762	NO	-5.67%	-1.656	NO
2	6/28/2016	0.79%	0.867	NO	-6.37%	-1.930	NO
1	6/27/2016	-3.58%	-3.915	YES	-7.16%	-2.259	YES
0	6/24/2016	-3.87%	-4.234	YES	-3.58%	-1.179	NO
-1	6/23/2016	0.42%	0.459	NO	0.29%	0.102	NO
-2	6/22/2016	0.96%	1.048	NO	-0.12%	-0.045	NO
-3	6/21/2016	-0.31%	-0.334	NO	-1.08%	-0.419	NO
-4	6/20/2016	1.17%	1.275	NO	-0.78%	-0.321	NO
-5	6/17/2016	2.03%	2.218	YES	-1.94%	-0.868	NO
-6	6/16/2016	-1.42%	-1.549	NO	-3.97%	-1.943	NO
-7	6/15/2016	1.15%	1.255	NO	-2.56%	-1.397	NO
-8	6/14/2016	-1.57%	-1.714	NO	-3.70%	-2.338	YES
-9	6/13/2016	-1.09%	-1.187	NO	-2.14%	-1.651	NO
-10	6/10/2016	-1.05%	-1.148	NO	-1.05%	-1.148	NO

Picture 2.1.
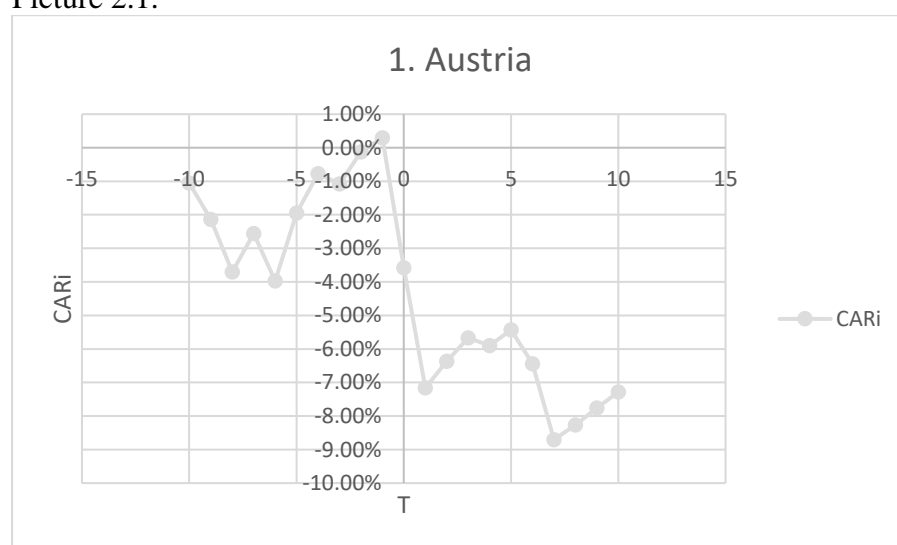
Table 2.2.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-6.02%	-4.698	YES	CARi (-3, -1)	0.75%	0.455	NO
CARi (-2, +2)	-4.68%	-2.830	YES	CARi (-5, -1)	3.42%	2.068	YES
CARi (-3, +3)	-3.63%	-1.854	NO	CARi (-10, -1)	-0.82%	-0.496	NO
2. Belgium							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	0.89%	1.208	NO	-6.09%	-1.796	NO
9	7/7/2016	0.18%	0.243	NO	-6.98%	-2.110	YES
8	7/6/2016	-0.94%	-1.266	NO	-7.16%	-2.221	YES
7	7/5/2016	-1.18%	-1.589	NO	-6.23%	-1.983	YES
6	7/4/2016	-0.79%	-1.063	NO	-5.05%	-1.655	NO
5	7/1/2016	0.60%	0.813	NO	-4.26%	-1.441	NO
4	6/30/2016	0.34%	0.456	NO	-4.87%	-1.698	NO
3	6/29/2016	1.09%	1.477	NO	-5.20%	-1.879	NO
2	6/28/2016	1.02%	1.377	NO	-6.30%	-2.360	YES
1	6/27/2016	-3.10%	-4.195	YES	-7.32%	-2.854	YES
0	6/24/2016	-3.39%	-4.582	YES	-4.21%	-1.716	NO
-1	6/23/2016	0.47%	0.640	NO	-0.82%	-0.351	NO
-2	6/22/2016	0.32%	0.431	NO	-1.29%	-0.583	NO
-3	6/21/2016	-0.04%	-0.053	NO	-1.61%	-0.771	NO
-4	6/20/2016	1.50%	2.022	YES	-1.57%	-0.804	NO
-5	6/17/2016	1.17%	1.583	NO	-3.07%	-1.694	NO
-6	6/16/2016	-0.78%	-1.060	NO	-4.24%	-2.564	YES
-7	6/15/2016	0.21%	0.283	NO	-3.46%	-2.336	YES
-8	6/14/2016	-1.37%	-1.845	NO	-3.67%	-2.861	YES
-9	6/13/2016	-1.00%	-1.352	NO	-2.30%	-2.199	YES
-10	6/10/2016	-1.30%	-1.758	NO	-1.30%	-1.758	NO

Picture 2.2.
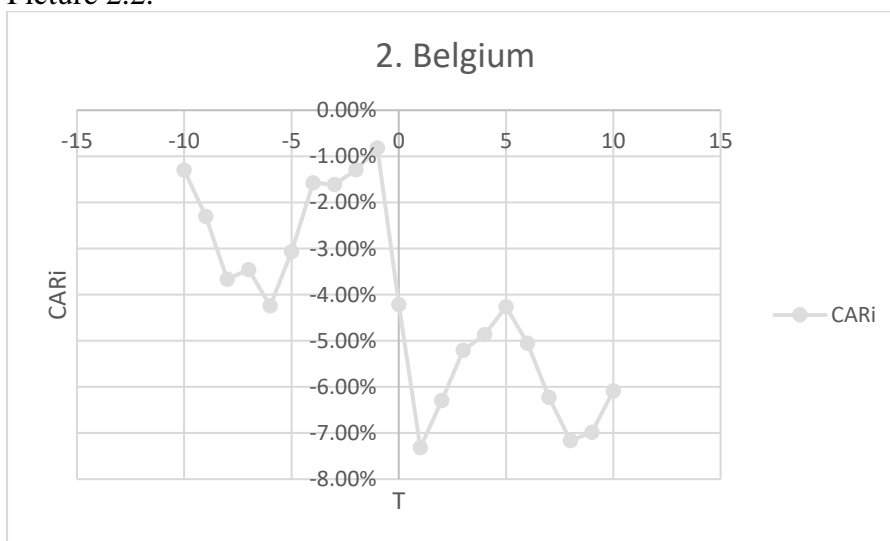
Table 2.3.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-0.93%	-1.009	NO	CARi (-3, -1)	0.65%	0.550	NO
CARi (-2, +2)	-0.58%	-0.483	NO	CARi (-5, -1)	0.86%	0.723	NO
CARi (-3, +3)	-1.26%	-0.895	NO	CARi (-10, -1)	2.82%	2.367	YES
3. Bulgaria							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	-0.80%	-1.509	NO	0.75%	0.309	NO
9	7/7/2016	0.29%	0.546	NO	1.56%	0.654	NO
8	7/6/2016	0.43%	0.799	NO	1.27%	0.546	NO
7	7/5/2016	0.20%	0.381	NO	0.84%	0.372	NO
6	7/4/2016	-0.84%	-1.586	NO	0.64%	0.291	NO
5	7/1/2016	-0.21%	-0.398	NO	1.48%	0.696	NO
4	6/30/2016	0.79%	1.485	NO	1.69%	0.822	NO
3	6/29/2016	-0.74%	-1.381	NO	0.90%	0.454	NO
2	6/28/2016	-0.16%	-0.305	NO	1.64%	0.854	NO
1	6/27/2016	-0.36%	-0.681	NO	1.80%	0.977	NO
0	6/24/2016	-0.65%	-1.229	NO	2.16%	1.226	NO
-1	6/23/2016	0.09%	0.161	NO	2.82%	1.674	NO
-2	6/22/2016	0.52%	0.974	NO	2.73%	1.711	NO
-3	6/21/2016	0.05%	0.094	NO	2.21%	1.470	NO
-4	6/20/2016	0.18%	0.347	NO	2.16%	1.536	NO
-5	6/17/2016	0.02%	0.041	NO	1.98%	1.518	NO
-6	6/16/2016	0.60%	1.130	NO	1.96%	1.644	NO
-7	6/15/2016	1.77%	3.321	YES	1.36%	1.273	NO
-8	6/14/2016	-0.43%	-0.799	NO	-0.41%	-0.447	NO
-9	6/13/2016	0.86%	1.613	NO	0.01%	0.017	NO
-10	6/10/2016	-0.85%	-1.588	NO	-0.85%	-1.588	NO

Picture 2.3.
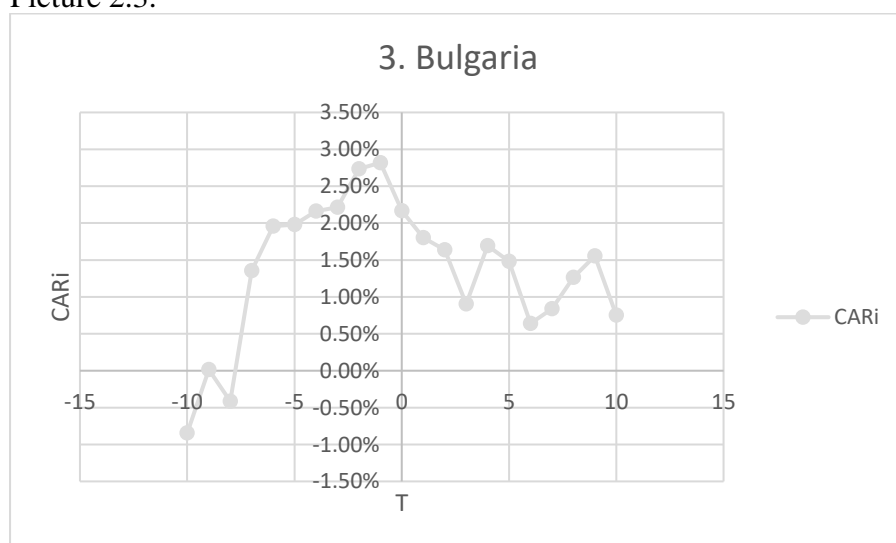
Table 2.4.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-1.27%	-1.492	NO	CARi (-3, -1)	-0.30%	-0.272	NO
CARi (-2, +2)	-0.61%	-0.557	NO	CARi (-5, -1)	-0.48%	-0.439	NO
CARi (-3, +3)	-1.02%	-0.785	NO	CARi (-10, -1)	-0.96%	-0.875	NO
4. Croatia							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	0.40%	0.804	NO	1.96%	0.869	NO
9	7/7/2016	0.99%	2.008	YES	1.56%	0.711	NO
8	7/6/2016	0.37%	0.744	NO	0.57%	0.268	NO
7	7/5/2016	0.75%	1.533	NO	0.21%	0.100	NO
6	7/4/2016	0.36%	0.726	NO	-0.54%	-0.269	NO
5	7/1/2016	0.46%	0.932	NO	-0.90%	-0.459	NO
4	6/30/2016	0.32%	0.659	NO	-1.36%	-0.714	NO
3	6/29/2016	-0.23%	-0.467	NO	-1.68%	-0.915	NO
2	6/28/2016	0.59%	1.202	NO	-1.45%	-0.820	NO
1	6/27/2016	-0.07%	-0.137	NO	-2.05%	-1.201	NO
0	6/24/2016	-1.02%	-2.066	YES	-1.98%	-1.213	NO
-1	6/23/2016	-0.19%	-0.381	NO	-0.96%	-0.619	NO
-2	6/22/2016	0.07%	0.137	NO	-0.77%	-0.525	NO
-3	6/21/2016	-0.18%	-0.365	NO	-0.84%	-0.605	NO
-4	6/20/2016	0.05%	0.098	NO	-0.66%	-0.509	NO
-5	6/17/2016	-0.23%	-0.470	NO	-0.71%	-0.590	NO
-6	6/16/2016	-0.13%	-0.267	NO	-0.48%	-0.436	NO
-7	6/15/2016	-0.33%	-0.679	NO	-0.35%	-0.354	NO
-8	6/14/2016	0.21%	0.418	NO	-0.01%	-0.017	NO
-9	6/13/2016	0.02%	0.047	NO	-0.22%	-0.316	NO
-10	6/10/2016	-0.24%	-0.494	NO	-0.24%	-0.494	NO

Picture 2.4.

4. Croatia
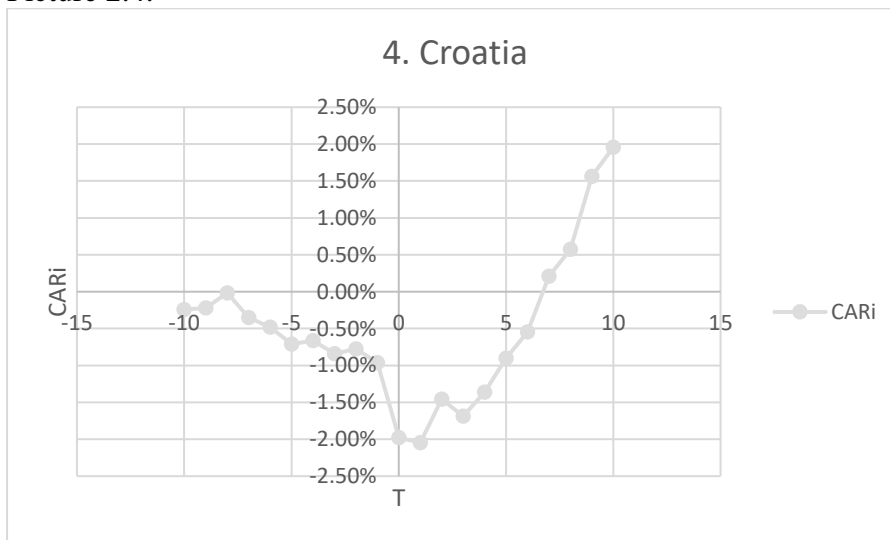
Table 2.5.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-4.37%	-3.211	YES	CARi (-3, -1)	-0.55%	-0.315	NO
CARi (-2, +2)	-4.07%	-2.319	YES	CARi (-5, -1)	0.19%	0.106	NO
CARi (-3, +3)	-4.62%	-2.223	YES	CARi (-10, -1)	-1.52%	-0.864	NO
5. Cyprus							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	0.86%	1.098	NO	-6.10%	-1.693	NO
9	7/7/2016	-1.31%	-1.666	NO	-6.96%	-1.980	YES
8	7/6/2016	-0.09%	-0.109	NO	-5.65%	-1.650	NO
7	7/5/2016	-0.67%	-0.857	NO	-5.57%	-1.669	NO
6	7/4/2016	0.34%	0.439	NO	-4.89%	-1.510	NO
5	7/1/2016	0.20%	0.254	NO	-5.24%	-1.666	NO
4	6/30/2016	0.15%	0.193	NO	-5.44%	-1.786	NO
3	6/29/2016	-1.27%	-1.621	NO	-5.59%	-1.900	NO
2	6/28/2016	1.11%	1.406	NO	-4.31%	-1.522	NO
1	6/27/2016	-0.62%	-0.794	NO	-5.42%	-1.990	YES
0	6/24/2016	-3.28%	-4.170	YES	-4.79%	-1.840	NO
-1	6/23/2016	-0.47%	-0.599	NO	-1.52%	-0.611	NO
-2	6/22/2016	-0.81%	-1.029	NO	-1.05%	-0.444	NO
-3	6/21/2016	0.73%	0.924	NO	-0.24%	-0.108	NO
-4	6/20/2016	-0.08%	-0.098	NO	-0.97%	-0.464	NO
-5	6/17/2016	0.82%	1.037	NO	-0.89%	-0.462	NO
-6	6/16/2016	-0.30%	-0.377	NO	-1.70%	-0.970	NO
-7	6/15/2016	0.10%	0.131	NO	-1.41%	-0.895	NO
-8	6/14/2016	0.35%	0.447	NO	-1.51%	-1.109	NO
-9	6/13/2016	-2.02%	-2.566	YES	-1.86%	-1.675	NO
-10	6/10/2016	0.15%	0.197	NO	0.15%	0.197	NO

Picture 2.5.
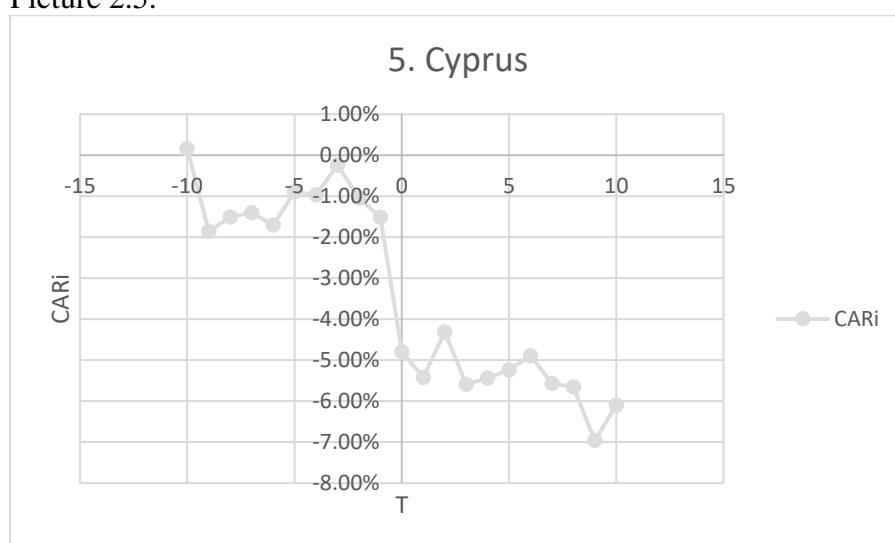
Table 2.6.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-5.34%	-3.758	YES	CARi (-3, -1)	1.12%	0.608	NO
CARi (-2, +2)	-2.68%	-1.460	NO	CARi (-5, -1)	2.99%	1.631	NO
CARi (-3, +3)	-3.48%	-1.602	NO	CARi (-10, -1)	-1.52%	-0.827	NO
6. Czech Republic							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	-1.01%	-1.234	NO	-6.26%	-1.665	NO
9	7/7/2016	-1.63%	-1.989	YES	-5.25%	-1.430	NO
8	7/6/2016	0.41%	0.499	NO	-3.62%	-1.011	NO
7	7/5/2016	0.35%	0.424	NO	-4.03%	-1.156	NO
6	7/4/2016	0.42%	0.506	NO	-4.38%	-1.293	NO
5	7/1/2016	0.78%	0.950	NO	-4.79%	-1.459	NO
4	6/30/2016	0.54%	0.662	NO	-5.57%	-1.752	NO
3	6/29/2016	-0.75%	-0.911	NO	-6.12%	-1.991	YES
2	6/28/2016	1.25%	1.526	NO	-5.37%	-1.813	NO
1	6/27/2016	-2.91%	-3.548	YES	-6.62%	-2.327	YES
0	6/24/2016	-2.19%	-2.666	YES	-3.71%	-1.361	NO
-1	6/23/2016	-0.24%	-0.296	NO	-1.52%	-0.585	NO
-2	6/22/2016	1.41%	1.720	NO	-1.28%	-0.518	NO
-3	6/21/2016	-0.05%	-0.064	NO	-2.69%	-1.157	NO
-4	6/20/2016	0.13%	0.160	NO	-2.63%	-1.213	NO
-5	6/17/2016	1.75%	2.127	YES	-2.77%	-1.375	NO
-6	6/16/2016	-0.08%	-0.093	NO	-4.51%	-2.458	YES
-7	6/15/2016	0.92%	1.116	NO	-4.44%	-2.701	YES
-8	6/14/2016	-1.03%	-1.249	NO	-5.35%	-3.763	YES
-9	6/13/2016	-1.76%	-2.146	YES	-4.33%	-3.726	YES
-10	6/10/2016	-2.56%	-3.124	YES	-2.56%	-3.124	YES

Picture 2.6.
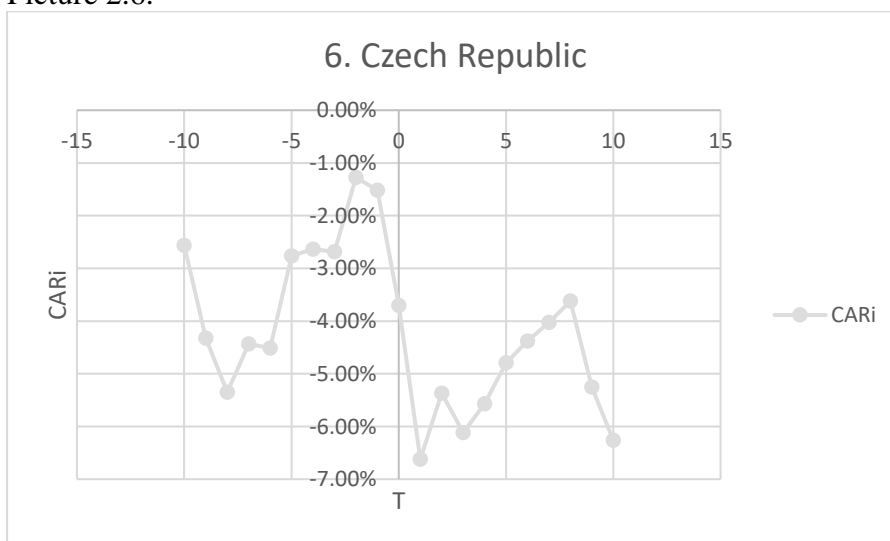
Table 2.7.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-1.40%	-0.789	NO	CARi (-3, -1)	1.38%	0.602	NO
CARi (-2, +2)	0.69%	0.303	NO	CARi (-5, -1)	2.49%	1.087	NO
CARi (-3, +3)	1.48%	0.546	NO	CARi (-10, -1)	-3.99%	-1.744	NO
7. Denmark							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	-0.11%	-0.104	NO	-4.22%	-0.900	NO
9	7/7/2016	1.25%	1.224	NO	-4.12%	-0.899	NO
8	7/6/2016	-1.59%	-1.549	NO	-5.37%	-1.203	NO
7	7/5/2016	-0.98%	-0.954	NO	-3.78%	-0.871	NO
6	7/4/2016	-0.25%	-0.246	NO	-2.81%	-0.665	NO
5	7/1/2016	1.40%	1.363	NO	-2.56%	-0.624	NO
4	6/30/2016	-0.06%	-0.056	NO	-3.95%	-0.996	NO
3	6/29/2016	0.88%	0.863	NO	-3.89%	-1.016	NO
2	6/28/2016	1.04%	1.016	NO	-4.78%	-1.294	NO
1	6/27/2016	-2.03%	-1.985	YES	-5.82%	-1.640	NO
0	6/24/2016	0.21%	0.203	NO	-3.79%	-1.114	NO
-1	6/23/2016	0.43%	0.415	NO	-3.99%	-1.233	NO
-2	6/22/2016	1.05%	1.028	NO	-4.42%	-1.438	NO
-3	6/21/2016	-0.10%	-0.096	NO	-5.47%	-1.889	NO
-4	6/20/2016	0.71%	0.694	NO	-5.37%	-1.983	YES
-5	6/17/2016	0.40%	0.390	NO	-6.08%	-2.425	YES
-6	6/16/2016	-1.85%	-1.809	NO	-6.48%	-2.831	YES
-7	6/15/2016	0.47%	0.458	NO	-4.63%	-2.261	YES
-8	6/14/2016	-3.31%	-3.230	YES	-5.10%	-2.875	YES
-9	6/13/2016	0.18%	0.180	NO	-1.79%	-1.237	NO
-10	6/10/2016	-1.98%	-1.930	NO	-1.98%	-1.930	NO

Picture 2.7.
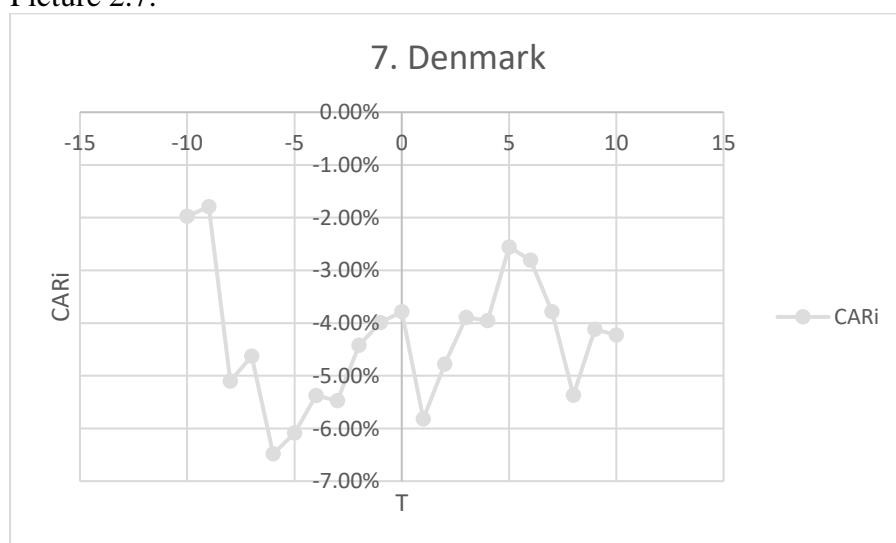
Table 2.8.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-1.11%	-1.061	NO	CARi (-3, -1)	0.47%	0.347	NO
CARi (-2, +2)	0.79%	0.589	NO	CARi (-5, -1)	-1.02%	-0.755	NO
CARi (-3, +3)	1.71%	1.074	NO	CARi (-10, -1)	-3.41%	-2.533	YES
8. Estonia							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	-0.09%	-0.142	NO	-2.04%	-0.739	NO
9	7/7/2016	-0.39%	-0.645	NO	-1.95%	-0.726	NO
8	7/6/2016	0.56%	0.930	NO	-1.57%	-0.597	NO
7	7/5/2016	0.17%	0.287	NO	-2.13%	-0.832	NO
6	7/4/2016	-0.05%	-0.077	NO	-2.30%	-0.926	NO
5	7/1/2016	0.07%	0.119	NO	-2.25%	-0.935	NO
4	6/30/2016	-0.16%	-0.260	NO	-2.32%	-0.997	NO
3	6/29/2016	1.04%	1.728	NO	-2.17%	-0.962	NO
2	6/28/2016	1.04%	1.733	NO	-3.21%	-1.478	NO
1	6/27/2016	-1.55%	-2.575	YES	-4.25%	-2.038	YES
0	6/24/2016	0.71%	1.179	NO	-2.70%	-1.352	NO
-1	6/23/2016	-0.27%	-0.442	NO	-3.41%	-1.791	NO
-2	6/22/2016	0.86%	1.423	NO	-3.14%	-1.741	NO
-3	6/21/2016	-0.12%	-0.205	NO	-4.00%	-2.349	YES
-4	6/20/2016	-1.20%	-1.990	YES	-3.88%	-2.434	YES
-5	6/17/2016	-0.29%	-0.474	NO	-2.68%	-1.817	NO
-6	6/16/2016	-1.89%	-3.146	YES	-2.39%	-1.778	NO
-7	6/15/2016	-0.80%	-1.326	NO	-0.50%	-0.415	NO
-8	6/14/2016	0.02%	0.026	NO	0.30%	0.287	NO
-9	6/13/2016	0.87%	1.449	NO	0.28%	0.333	NO
-10	6/10/2016	-0.59%	-0.978	NO	-0.59%	-0.978	NO

Picture 2.8.
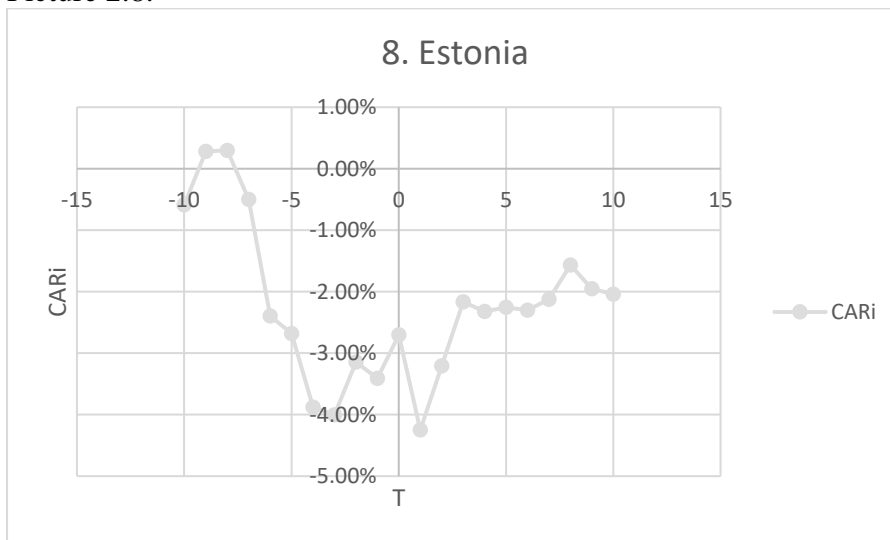
Table 2.9.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-3.91%	-2.751	YES	CARi (-3, -1)	0.09%	0.049	NO
CARi (-2, +2)	-1.68%	-0.917	NO	CARi (-5, -1)	1.78%	0.967	NO
CARi (-3, +3)	-1.30%	-0.598	NO	CARi (-10, -1)	-0.69%	-0.374	NO
9. Finland							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	0.77%	0.940	NO	-1.87%	-0.497	NO
9	7/7/2016	0.29%	0.356	NO	-2.64%	-0.719	NO
8	7/6/2016	-0.41%	-0.501	NO	-2.93%	-0.820	NO
7	7/5/2016	-1.69%	-2.053	YES	-2.52%	-0.724	NO
6	7/4/2016	-0.74%	-0.903	NO	-0.84%	-0.247	NO
5	7/1/2016	1.67%	2.027	YES	-0.09%	-0.029	NO
4	6/30/2016	0.32%	0.386	NO	-1.76%	-0.553	NO
3	6/29/2016	0.84%	1.028	NO	-2.08%	-0.676	NO
2	6/28/2016	1.47%	1.791	NO	-2.92%	-0.986	NO
1	6/27/2016	-7.07%	-8.604	YES	-4.39%	-1.544	NO
0	6/24/2016	3.36%	4.093	YES	2.68%	0.982	NO
-1	6/23/2016	-0.21%	-0.253	NO	-0.69%	-0.264	NO
-2	6/22/2016	0.76%	0.924	NO	-0.48%	-0.194	NO
-3	6/21/2016	-0.46%	-0.561	NO	-1.24%	-0.533	NO
-4	6/20/2016	1.51%	1.843	NO	-0.78%	-0.357	NO
-5	6/17/2016	0.17%	0.210	NO	-2.29%	-1.138	NO
-6	6/16/2016	-1.18%	-1.438	NO	-2.46%	-1.341	NO
-7	6/15/2016	0.72%	0.882	NO	-1.28%	-0.780	NO
-8	6/14/2016	-1.19%	-1.451	NO	-2.01%	-1.410	NO
-9	6/13/2016	-0.20%	-0.247	NO	-0.81%	-0.701	NO
-10	6/10/2016	-0.61%	-0.744	NO	-0.61%	-0.744	NO

Picture 2.9.

Table 2.10.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-5.06%	-3.541	YES	CARi (-3, -1)	1.48%	0.804	NO
CARi (-2, +2)	-3.16%	-1.712	NO	CARi (-5, -1)	4.07%	2.204	YES
CARi (-3, +3)	-2.76%	-1.264	NO	CARi (-10, -1)	1.34%	0.728	NO
10. France							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	0.54%	0.655	NO	-4.76%	-1.260	NO
9	7/7/2016	0.21%	0.249	NO	-5.30%	-1.438	NO
8	7/6/2016	-1.20%	-1.450	NO	-5.51%	-1.532	NO
7	7/5/2016	-1.11%	-1.348	NO	-4.31%	-1.232	NO
6	7/4/2016	-0.90%	-1.086	NO	-3.20%	-0.941	NO
5	7/1/2016	0.95%	1.156	NO	-2.30%	-0.698	NO
4	6/30/2016	-0.36%	-0.435	NO	-3.26%	-1.020	NO
3	6/29/2016	0.56%	0.684	NO	-2.90%	-0.939	NO
2	6/28/2016	1.18%	1.435	NO	-3.46%	-1.164	NO
1	6/27/2016	-1.68%	-2.034	YES	-4.65%	-1.626	NO
0	6/24/2016	-4.31%	-5.227	YES	-2.97%	-1.085	NO
-1	6/23/2016	0.93%	1.127	NO	1.34%	0.515	NO
-2	6/22/2016	0.72%	0.871	NO	0.41%	0.167	NO
-3	6/21/2016	-0.17%	-0.201	NO	-0.31%	-0.131	NO
-4	6/20/2016	1.92%	2.327	YES	-0.14%	-0.064	NO
-5	6/17/2016	0.66%	0.803	NO	-2.06%	-1.019	NO
-6	6/16/2016	-0.27%	-0.325	NO	-2.72%	-1.476	NO
-7	6/15/2016	0.71%	0.862	NO	-2.45%	-1.488	NO
-8	6/14/2016	-1.74%	-2.112	YES	-3.17%	-2.215	YES
-9	6/13/2016	-0.33%	-0.402	NO	-1.42%	-1.220	NO
-10	6/10/2016	-1.09%	-1.323	NO	-1.09%	-1.323	NO

Picture 2.10.
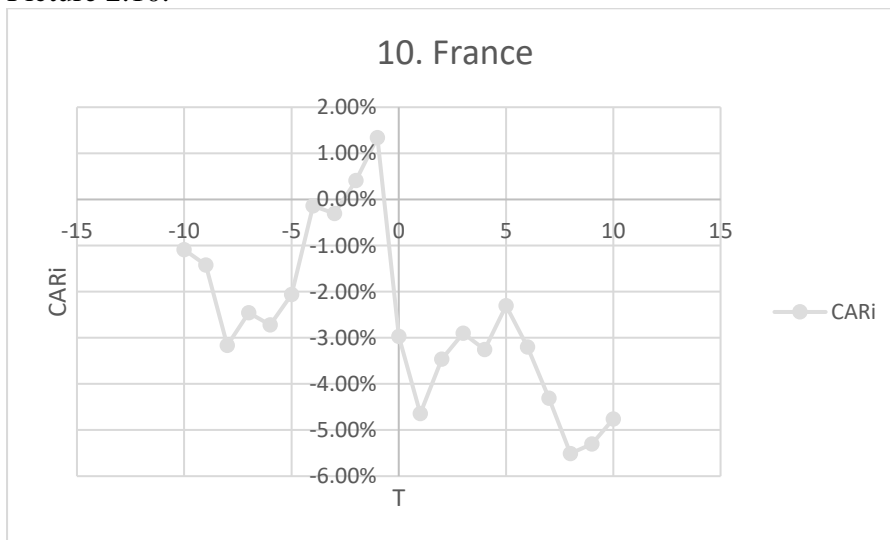
Table 2.11.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-4.02%	-2.559	YES	CARi (-3, -1)	1.59%	0.785	NO
CARi (-2, +2)	-2.50%	-1.235	NO	CARi (-5, -1)	4.01%	1.980	YES
CARi (-3, +3)	-2.95%	-1.230	NO	CARi (-10, -1)	1.63%	0.802	NO
11. Germany							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	1.03%	1.137	NO	-4.45%	-1.071	NO
9	7/7/2016	-0.09%	-0.099	NO	-5.48%	-1.352	NO
8	7/6/2016	-1.01%	-1.110	NO	-5.39%	-1.364	NO
7	7/5/2016	-1.26%	-1.392	NO	-4.38%	-1.140	NO
6	7/4/2016	-0.67%	-0.736	NO	-3.12%	-0.836	NO
5	7/1/2016	1.08%	1.191	NO	-2.46%	-0.677	NO
4	6/30/2016	-0.62%	-0.687	NO	-3.54%	-1.007	NO
3	6/29/2016	-0.23%	-0.249	NO	-2.91%	-0.859	NO
2	6/28/2016	0.55%	0.603	NO	-2.69%	-0.822	NO
1	6/27/2016	-1.76%	-1.944	NO	-3.23%	-1.030	NO
0	6/24/2016	-3.10%	-3.418	YES	-1.47%	-0.490	NO
-1	6/23/2016	0.84%	0.930	NO	1.63%	0.567	NO
-2	6/22/2016	0.97%	1.067	NO	0.78%	0.288	NO
-3	6/21/2016	-0.22%	-0.242	NO	-0.18%	-0.072	NO
-4	6/20/2016	1.89%	2.084	YES	0.04%	0.015	NO
-5	6/17/2016	0.53%	0.590	NO	-1.85%	-0.835	NO
-6	6/16/2016	-0.41%	-0.458	NO	-2.39%	-1.178	NO
-7	6/15/2016	0.64%	0.704	NO	-1.97%	-1.089	NO
-8	6/14/2016	-0.89%	-0.977	NO	-2.61%	-1.664	NO
-9	6/13/2016	-0.32%	-0.355	NO	-1.73%	-1.347	NO
-10	6/10/2016	-1.40%	-1.549	NO	-1.40%	-1.549	NO

Picture 2.11.
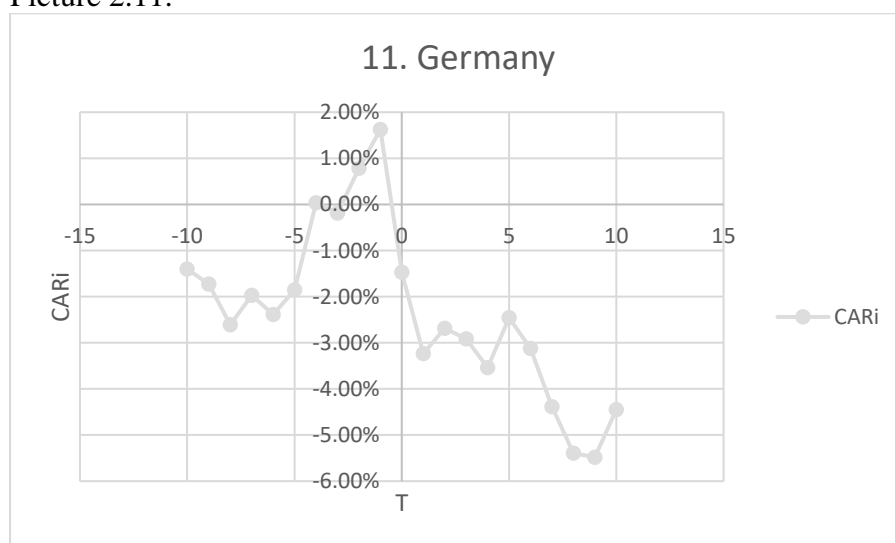
Table 2.12.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-13.06%	-3.548	YES	CARi (-3, -1)	4.30%	0.905	NO
CARi (-2, +2)	-9.48%	-1.996	YES	CARi (-5, -1)	8.30%	1.747	NO
CARi (-3, +3)	-7.19%	-1.279	NO	CARi (-10, -1)	-4.07%	-0.857	NO
12. Greece							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	0.18%	0.085	NO	-17.46%	-1.793	NO
9	7/7/2016	-0.01%	-0.007	NO	-17.64%	-1.856	NO
8	7/6/2016	1.02%	0.478	NO	-17.62%	-1.903	NO
7	7/5/2016	-1.91%	-0.897	NO	-18.64%	-2.067	YES
6	7/4/2016	-0.86%	-0.404	NO	-16.73%	-1.910	NO
5	7/1/2016	0.59%	0.279	NO	-15.87%	-1.867	NO
4	6/30/2016	-0.90%	-0.425	NO	-16.46%	-2.001	YES
3	6/29/2016	-0.82%	-0.386	NO	-15.56%	-1.957	NO
2	6/28/2016	2.68%	1.260	NO	-14.74%	-1.924	NO
1	6/27/2016	-1.92%	-0.905	NO	-17.42%	-2.366	YES
0	6/24/2016	-11.42%	-5.375	YES	-15.49%	-2.199	YES
-1	6/23/2016	0.29%	0.136	NO	-4.07%	-0.606	NO
-2	6/22/2016	0.89%	0.421	NO	-4.36%	-0.684	NO
-3	6/21/2016	3.12%	1.466	NO	-5.26%	-0.874	NO
-4	6/20/2016	-1.07%	-0.503	NO	-8.37%	-1.489	NO
-5	6/17/2016	5.07%	2.387	YES	-7.30%	-1.403	NO
-6	6/16/2016	-3.20%	-1.505	NO	-12.37%	-2.604	YES
-7	6/15/2016	-3.24%	-1.523	NO	-9.18%	-2.159	YES
-8	6/14/2016	0.26%	0.123	NO	-5.94%	-1.614	NO
-9	6/13/2016	-2.82%	-1.327	NO	-6.20%	-2.064	YES
-10	6/10/2016	-3.38%	-1.592	NO	-3.38%	-1.592	NO

Picture 2.12.

Table 2.13.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-4.30%	-2.444	YES	CARi (-3, -1)	-0.27%	-0.117	NO
CARi (-2, +2)	-1.71%	-0.754	NO	CARi (-5, -1)	1.76%	0.775	NO
CARi (-3, +3)	-2.35%	-0.875	NO	CARi (-10, -1)	-2.56%	-1.130	NO
13. Hungary							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	-0.42%	-0.409	NO	-3.35%	-0.720	NO
9	7/7/2016	1.84%	1.817	NO	-2.93%	-0.646	NO
8	7/6/2016	0.48%	0.473	NO	-4.78%	-1.080	NO
7	7/5/2016	0.97%	0.956	NO	-5.26%	-1.221	NO
6	7/4/2016	-0.24%	-0.235	NO	-6.23%	-1.488	NO
5	7/1/2016	-0.75%	-0.740	NO	-5.99%	-1.475	NO
4	6/30/2016	-0.59%	-0.581	NO	-5.24%	-1.333	NO
3	6/29/2016	-0.47%	-0.460	NO	-4.65%	-1.224	NO
2	6/28/2016	2.68%	2.639	YES	-4.18%	-1.143	NO
1	6/27/2016	-0.84%	-0.829	NO	-6.86%	-1.951	NO
0	6/24/2016	-3.45%	-3.403	YES	-6.02%	-1.788	NO
-1	6/23/2016	0.00%	-0.001	NO	-2.56%	-0.799	NO
-2	6/22/2016	-0.09%	-0.092	NO	-2.56%	-0.842	NO
-3	6/21/2016	-0.17%	-0.168	NO	-2.47%	-0.861	NO
-4	6/20/2016	0.60%	0.594	NO	-2.30%	-0.856	NO
-5	6/17/2016	1.42%	1.401	NO	-2.90%	-1.167	NO
-6	6/16/2016	-1.87%	-1.846	NO	-4.32%	-1.905	NO
-7	6/15/2016	1.47%	1.449	NO	-2.45%	-1.207	NO
-8	6/14/2016	-0.16%	-0.156	NO	-3.92%	-2.230	YES
-9	6/13/2016	-2.39%	-2.359	YES	-3.76%	-2.622	YES
-10	6/10/2016	-1.37%	-1.349	NO	-1.37%	-1.349	NO

Picture 2.13.
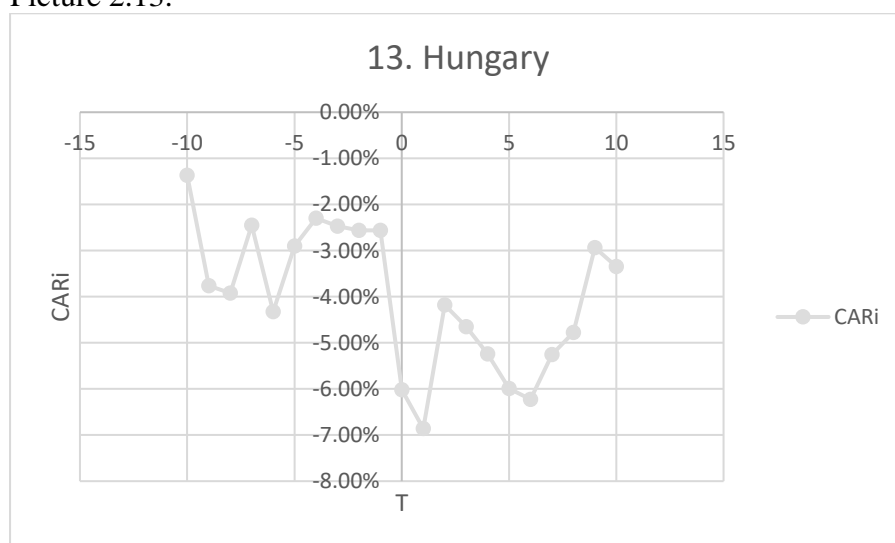
Table 2.14.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-14.05%	-9.395	YES	CARi (-3, -1)	0.56%	0.292	NO
CARi (-2, +2)	-11.48%	-5.945	YES	CARi (-5, -1)	5.11%	2.648	YES
CARi (-3, +3)	-11.21%	-4.908	YES	CARi (-10, -1)	-0.22%	-0.112	NO
14. Ireland							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	0.60%	0.695	NO	-13.72%	-3.469	YES
9	7/7/2016	0.79%	0.921	NO	-14.32%	-3.710	YES
8	7/6/2016	-1.29%	-1.493	NO	-15.12%	-4.017	YES
7	7/5/2016	-2.24%	-2.593	YES	-13.83%	-3.776	YES
6	7/4/2016	-1.43%	-1.654	NO	-11.59%	-3.256	YES
5	7/1/2016	1.92%	2.221	YES	-10.16%	-2.943	YES
4	6/30/2016	-0.09%	-0.103	NO	-12.08%	-3.613	YES
3	6/29/2016	1.04%	1.209	NO	-11.99%	-3.712	YES
2	6/28/2016	1.71%	1.980	YES	-13.04%	-4.187	YES
1	6/27/2016	-9.46%	-10.960	YES	-14.75%	-4.930	YES
0	6/24/2016	-5.07%	-5.867	YES	-5.28%	-1.844	NO
-1	6/23/2016	0.48%	0.554	NO	-0.22%	-0.079	NO
-2	6/22/2016	0.86%	0.999	NO	-0.70%	-0.268	NO
-3	6/21/2016	-0.78%	-0.900	NO	-1.56%	-0.638	NO
-4	6/20/2016	3.27%	3.792	YES	-0.78%	-0.341	NO
-5	6/17/2016	1.28%	1.477	NO	-4.05%	-1.917	NO
-6	6/16/2016	-1.67%	-1.930	NO	-5.33%	-2.760	YES
-7	6/15/2016	0.20%	0.227	NO	-3.66%	-2.121	YES
-8	6/14/2016	-1.41%	-1.633	NO	-3.86%	-2.580	YES
-9	6/13/2016	-1.22%	-1.412	NO	-2.45%	-2.005	YES
-10	6/10/2016	-1.23%	-1.424	NO	-1.23%	-1.424	NO

Picture 2.14.
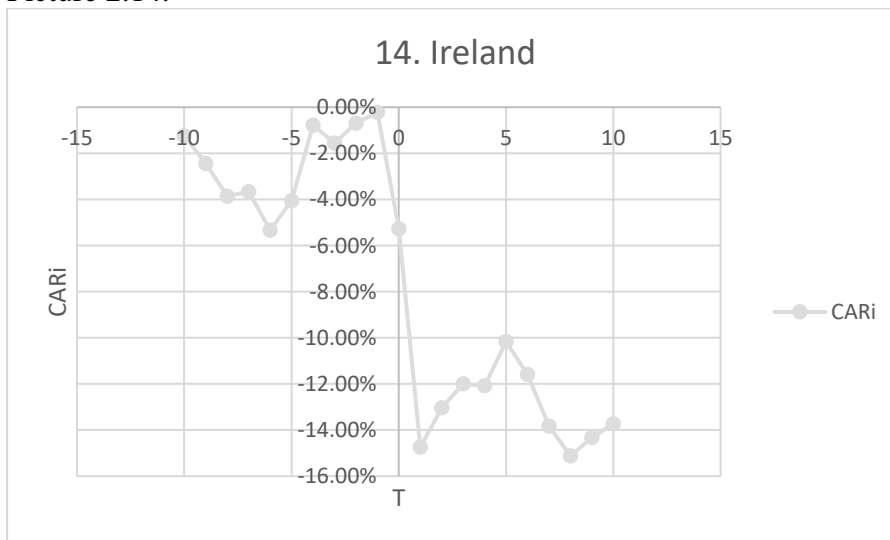
Table 2.15.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-8.64%	-4.043	YES	CARi (-3, -1)	2.12%	0.767	NO
CARi (-2, +2)	-6.99%	-2.534	YES	CARi (-5, -1)	6.12%	2.217	YES
CARi (-3, +3)	-7.35%	-2.250	YES	CARi (-10, -1)	1.66%	0.600	NO
15. Italy							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	2.70%	2.190	YES	-8.64%	-1.527	NO
9	7/7/2016	-0.52%	-0.422	NO	-11.34%	-2.055	YES
8	7/6/2016	-1.45%	-1.176	NO	-10.82%	-2.011	YES
7	7/5/2016	-0.75%	-0.607	NO	-9.37%	-1.789	NO
6	7/4/2016	-1.68%	-1.357	NO	-8.62%	-1.694	NO
5	7/1/2016	0.76%	0.619	NO	-6.95%	-1.407	NO
4	6/30/2016	0.10%	0.081	NO	-7.71%	-1.613	NO
3	6/29/2016	0.01%	0.005	NO	-7.81%	-1.691	NO
2	6/28/2016	1.74%	1.411	NO	-7.82%	-1.756	NO
1	6/27/2016	-2.48%	-2.008	YES	-9.56%	-2.235	YES
0	6/24/2016	-8.74%	-7.077	YES	-7.08%	-1.729	NO
-1	6/23/2016	2.57%	2.082	YES	1.66%	0.424	NO
-2	6/22/2016	-0.09%	-0.074	NO	-0.91%	-0.247	NO
-3	6/21/2016	-0.36%	-0.293	NO	-0.82%	-0.236	NO
-4	6/20/2016	0.87%	0.701	NO	-0.46%	-0.141	NO
-5	6/17/2016	3.14%	2.541	YES	-1.33%	-0.439	NO
-6	6/16/2016	-0.73%	-0.594	NO	-4.46%	-1.617	NO
-7	6/15/2016	1.22%	0.988	NO	-3.73%	-1.511	NO
-8	6/14/2016	-1.44%	-1.166	NO	-4.95%	-2.315	YES
-9	6/13/2016	-1.19%	-0.962	NO	-3.51%	-2.010	YES
-10	6/10/2016	-2.32%	-1.881	NO	-2.32%	-1.881	NO

Picture 2.15.
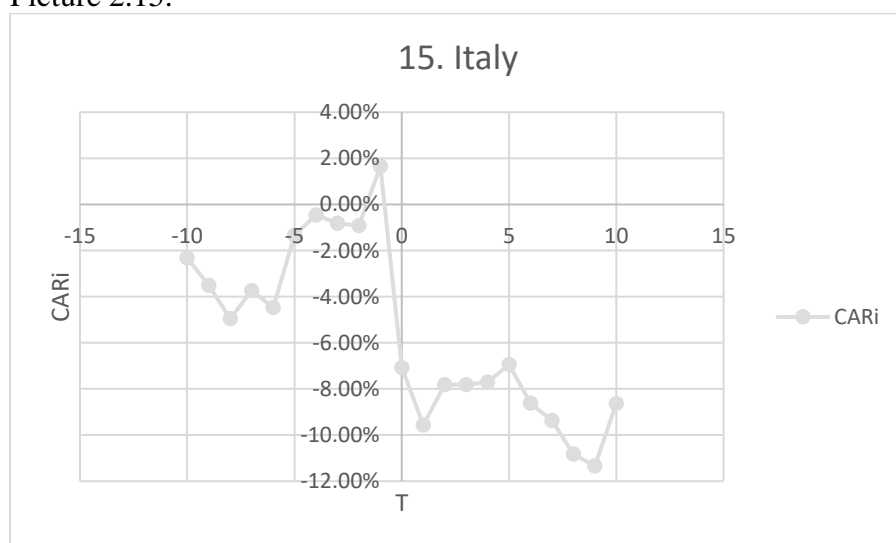
Table 2.16.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-1.59%	-0.745	NO	CARi (-3, -1)	-1.87%	-0.677	NO
CARi (-2, +2)	-3.11%	-1.126	NO	CARi (-5, -1)	-1.40%	-0.508	NO
CARi (-3, +3)	-3.16%	-0.968	NO	CARi (-10, -1)	-3.70%	-1.341	NO
16. Latvia							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	-0.23%	-0.188	NO	-4.33%	-0.765	NO
9	7/7/2016	0.44%	0.358	NO	-4.09%	-0.742	NO
8	7/6/2016	0.66%	0.535	NO	-4.54%	-0.843	NO
7	7/5/2016	-2.01%	-1.627	NO	-5.20%	-0.993	NO
6	7/4/2016	1.47%	1.189	NO	-3.19%	-0.627	NO
5	7/1/2016	0.59%	0.477	NO	-4.66%	-0.943	NO
4	6/30/2016	-0.25%	-0.204	NO	-5.25%	-1.098	NO
3	6/29/2016	0.03%	0.026	NO	-4.99%	-1.081	NO
2	6/28/2016	0.07%	0.055	NO	-5.02%	-1.129	NO
1	6/27/2016	-1.44%	-1.167	NO	-5.09%	-1.191	NO
0	6/24/2016	0.05%	0.038	NO	-3.65%	-0.893	NO
-1	6/23/2016	-0.20%	-0.162	NO	-3.70%	-0.948	NO
-2	6/22/2016	-1.58%	-1.282	NO	-3.50%	-0.946	NO
-3	6/21/2016	-0.09%	-0.069	NO	-1.92%	-0.550	NO
-4	6/20/2016	0.25%	0.203	NO	-1.83%	-0.562	NO
-5	6/17/2016	0.22%	0.175	NO	-2.08%	-0.689	NO
-6	6/16/2016	-1.34%	-1.089	NO	-2.30%	-0.833	NO
-7	6/15/2016	-0.42%	-0.338	NO	-0.96%	-0.387	NO
-8	6/14/2016	0.27%	0.216	NO	-0.54%	-0.252	NO
-9	6/13/2016	-0.33%	-0.264	NO	-0.81%	-0.462	NO
-10	6/10/2016	-0.48%	-0.389	NO	-0.48%	-0.389	NO

Picture 2.16.
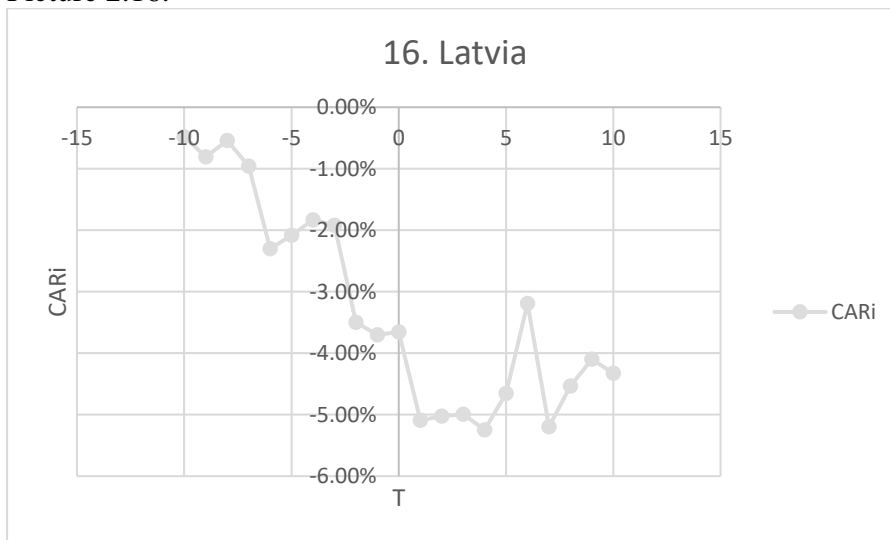
Table 2.17.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-1.22%	-1.677	NO	CARi (-3, -1)	-0.19%	-0.198	NO
CARi (-2, +2)	-0.87%	-0.927	NO	CARi (-5, -1)	-0.02%	-0.017	NO
CARi (-3, +3)	-0.28%	-0.249	NO	CARi (-10, -1)	-0.45%	-0.483	NO
17. Lithuania							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	0.55%	1.306	NO	2.02%	1.045	NO
9	7/7/2016	0.78%	1.846	NO	1.47%	0.778	NO
8	7/6/2016	0.08%	0.186	NO	0.69%	0.375	NO
7	7/5/2016	0.81%	1.924	NO	0.61%	0.341	NO
6	7/4/2016	0.48%	1.130	NO	-0.20%	-0.116	NO
5	7/1/2016	-0.40%	-0.938	NO	-0.68%	-0.402	NO
4	6/30/2016	0.26%	0.626	NO	-0.28%	-0.172	NO
3	6/29/2016	0.68%	1.626	NO	-0.54%	-0.346	NO
2	6/28/2016	0.33%	0.794	NO	-1.23%	-0.810	NO
1	6/27/2016	-1.65%	-3.927	YES	-1.56%	-1.072	NO
0	6/24/2016	0.54%	1.293	NO	0.09%	0.064	NO
-1	6/23/2016	-0.11%	-0.271	NO	-0.45%	-0.341	NO
-2	6/22/2016	0.02%	0.039	NO	-0.34%	-0.270	NO
-3	6/21/2016	-0.09%	-0.212	NO	-0.36%	-0.300	NO
-4	6/20/2016	-0.01%	-0.032	NO	-0.27%	-0.240	NO
-5	6/17/2016	0.18%	0.439	NO	-0.25%	-0.247	NO
-6	6/16/2016	-0.83%	-1.964	YES	-0.44%	-0.466	NO
-7	6/15/2016	-0.07%	-0.163	NO	0.39%	0.461	NO
-8	6/14/2016	0.19%	0.450	NO	0.46%	0.626	NO
-9	6/13/2016	0.04%	0.094	NO	0.27%	0.448	NO
-10	6/10/2016	0.23%	0.540	NO	0.23%	0.540	NO

Picture 2.17.
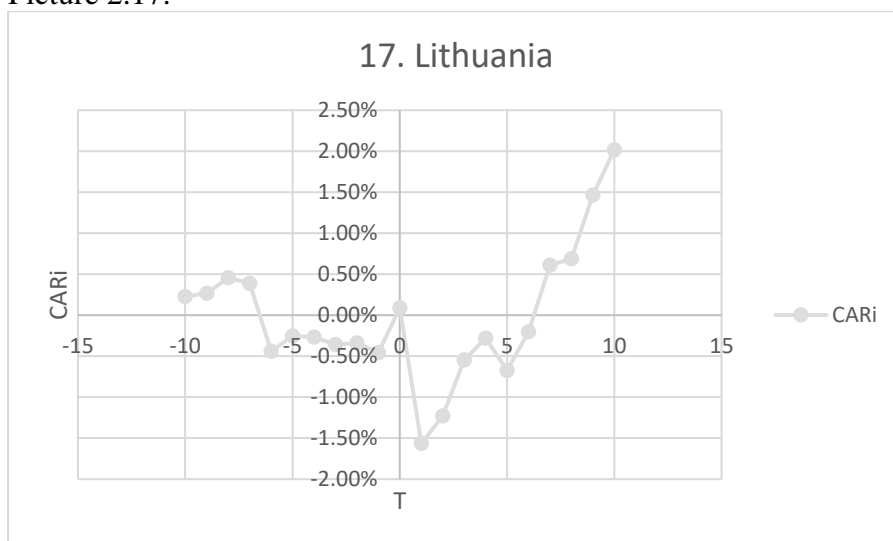
Table 2.18.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-5.43%	-2.593	YES	CARi (-3, -1)	0.93%	0.343	NO
CARi (-2, +2)	-3.88%	-1.434	NO	CARi (-5, -1)	3.00%	1.108	NO
CARi (-3, +3)	-5.37%	-1.680	NO	CARi (-10, -1)	2.55%	0.943	NO
18. Luxembourg							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	-0.47%	-0.391	NO	-2.03%	-0.366	NO
9	7/7/2016	-1.38%	-1.144	NO	-1.55%	-0.287	NO
8	7/6/2016	-0.77%	-0.638	NO	-0.17%	-0.033	NO
7	7/5/2016	-1.80%	-1.488	NO	0.60%	0.117	NO
6	7/4/2016	2.60%	2.149	YES	2.40%	0.481	NO
5	7/1/2016	3.95%	3.265	YES	-0.20%	-0.041	NO
4	6/30/2016	-0.39%	-0.326	NO	-4.15%	-0.885	NO
3	6/29/2016	0.11%	0.088	NO	-3.75%	-0.829	NO
2	6/28/2016	0.93%	0.765	NO	-3.86%	-0.885	NO
1	6/27/2016	-4.01%	-3.317	YES	-4.78%	-1.142	NO
0	6/24/2016	-3.32%	-2.748	YES	-0.77%	-0.193	NO
-1	6/23/2016	1.90%	1.573	NO	2.55%	0.667	NO
-2	6/22/2016	0.63%	0.519	NO	0.65%	0.178	NO
-3	6/21/2016	-1.60%	-1.325	NO	0.02%	0.006	NO
-4	6/20/2016	-0.57%	-0.470	NO	1.62%	0.507	NO
-5	6/17/2016	2.64%	2.180	YES	2.19%	0.740	NO
-6	6/16/2016	-0.27%	-0.219	NO	-0.45%	-0.165	NO
-7	6/15/2016	1.47%	1.217	NO	-0.18%	-0.075	NO
-8	6/14/2016	-1.28%	-1.060	NO	-1.65%	-0.789	NO
-9	6/13/2016	-0.05%	-0.038	NO	-0.37%	-0.216	NO
-10	6/10/2016	-0.32%	-0.268	NO	-0.32%	-0.268	NO

Picture 2.18.
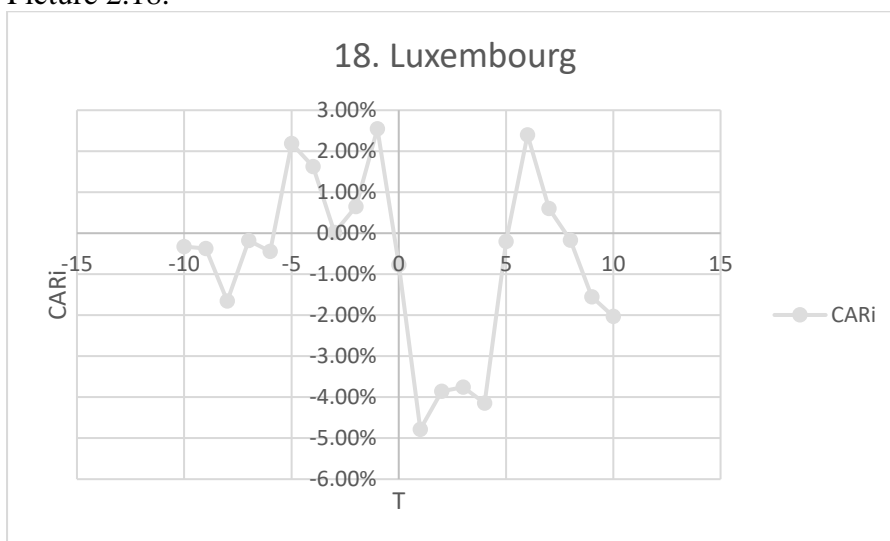
Table 2.19.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-0.25%	-0.369	NO	CARi (-3, -1)	0.66%	0.743	NO
CARi (-2, +2)	0.99%	1.118	NO	CARi (-5, -1)	0.81%	0.918	NO
CARi (-3, +3)	1.23%	1.175	NO	CARi (-10, -1)	1.02%	1.144	NO
19. Malta							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	-0.23%	-0.579	NO	2.14%	1.176	NO
9	7/7/2016	-0.10%	-0.254	NO	2.37%	1.334	NO
8	7/6/2016	0.15%	0.366	NO	2.47%	1.427	NO
7	7/5/2016	-0.10%	-0.260	NO	2.32%	1.380	NO
6	7/4/2016	-0.09%	-0.236	NO	2.43%	1.483	NO
5	7/1/2016	0.35%	0.880	NO	2.52%	1.588	NO
4	6/30/2016	0.58%	1.466	NO	2.17%	1.413	NO
3	6/29/2016	0.00%	0.011	NO	1.59%	1.071	NO
2	6/28/2016	1.24%	3.111	YES	1.59%	1.108	NO
1	6/27/2016	-0.08%	-0.210	NO	0.35%	0.255	NO
0	6/24/2016	-0.58%	-1.465	NO	0.43%	0.330	NO
-1	6/23/2016	0.41%	1.035	NO	1.02%	0.809	NO
-2	6/22/2016	0.01%	0.028	NO	0.60%	0.508	NO
-3	6/21/2016	0.24%	0.598	NO	0.59%	0.528	NO
-4	6/20/2016	0.19%	0.475	NO	0.36%	0.339	NO
-5	6/17/2016	-0.03%	-0.083	NO	0.17%	0.172	NO
-6	6/16/2016	0.22%	0.546	NO	0.20%	0.226	NO
-7	6/15/2016	0.25%	0.642	NO	-0.02%	-0.020	NO
-8	6/14/2016	0.07%	0.165	NO	-0.27%	-0.394	NO
-9	6/13/2016	-0.31%	-0.777	NO	-0.34%	-0.599	NO
-10	6/10/2016	-0.03%	-0.070	NO	-0.03%	-0.070	NO

Picture 2.19.
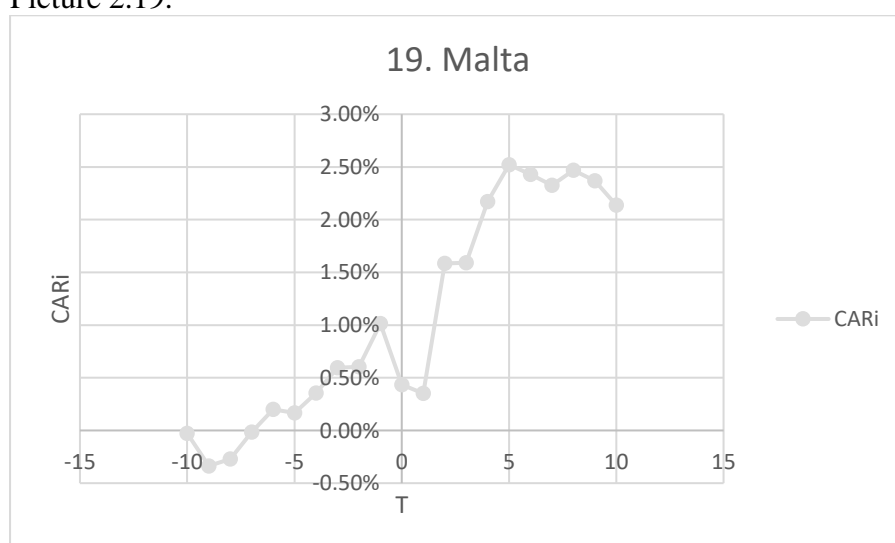
Table 2.20.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-2.75%	-2.040	YES	CARi (-3, -1)	1.67%	0.958	NO
CARi (-2, +2)	-2.10%	-1.203	NO	CARi (-5, -1)	4.08%	2.343	YES
CARi (-3, +3)	-0.94%	-0.458	NO	CARi (-10, -1)	0.70%	0.401	NO
20. Netherlands							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	0.55%	0.706	NO	-2.83%	-0.794	NO
9	7/7/2016	0.40%	0.513	NO	-3.38%	-0.971	NO
8	7/6/2016	-1.27%	-1.631	NO	-3.78%	-1.114	NO
7	7/5/2016	-0.53%	-0.685	NO	-2.51%	-0.760	NO
6	7/4/2016	-0.84%	-1.083	NO	-1.98%	-0.616	NO
5	7/1/2016	0.76%	0.974	NO	-1.14%	-0.364	NO
4	6/30/2016	0.02%	0.025	NO	-1.89%	-0.628	NO
3	6/29/2016	1.02%	1.312	NO	-1.91%	-0.656	NO
2	6/28/2016	0.06%	0.083	NO	-2.94%	-1.045	NO
1	6/27/2016	-1.74%	-2.227	YES	-3.00%	-1.112	NO
0	6/24/2016	-1.97%	-2.522	YES	-1.27%	-0.490	NO
-1	6/23/2016	0.95%	1.215	NO	0.70%	0.284	NO
-2	6/22/2016	0.59%	0.761	NO	-0.25%	-0.106	NO
-3	6/21/2016	0.13%	0.167	NO	-0.84%	-0.381	NO
-4	6/20/2016	1.95%	2.507	YES	-0.97%	-0.470	NO
-5	6/17/2016	0.46%	0.590	NO	-2.92%	-1.532	NO
-6	6/16/2016	-0.09%	-0.115	NO	-3.38%	-1.942	NO
-7	6/15/2016	-0.17%	-0.221	NO	-3.29%	-2.114	YES
-8	6/14/2016	-1.61%	-2.072	YES	-3.12%	-2.313	YES
-9	6/13/2016	-0.29%	-0.368	NO	-1.51%	-1.368	NO
-10	6/10/2016	-1.22%	-1.566	NO	-1.22%	-1.566	NO

Picture 2.20.
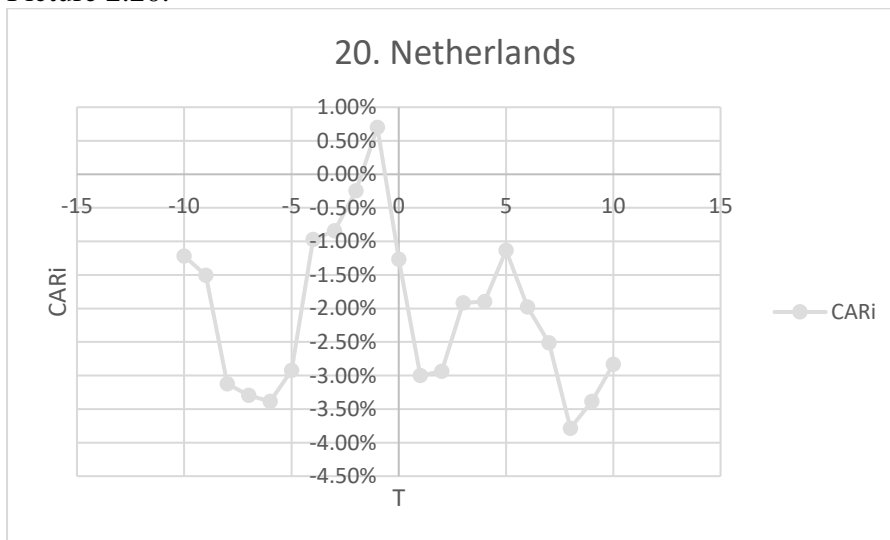
Table 2.21.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-3.63%	-1.760	NO	CARi (-3, -1)	3.06%	1.148	NO
CARi (-2, +2)	-0.94%	-0.352	NO	CARi (-5, -1)	6.08%	2.281	YES
CARi (-3, +3)	-1.82%	-0.578	NO	CARi (-10, -1)	2.14%	0.805	NO
21. Poland							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	-0.77%	-0.644	NO	-6.01%	-1.101	NO
9	7/7/2016	1.26%	1.059	NO	-5.24%	-0.984	NO
8	7/6/2016	-0.83%	-0.700	NO	-6.51%	-1.253	NO
7	7/5/2016	-0.32%	-0.268	NO	-5.67%	-1.122	NO
6	7/4/2016	-1.51%	-1.265	NO	-5.35%	-1.090	NO
5	7/1/2016	-1.21%	-1.018	NO	-3.85%	-0.807	NO
4	6/30/2016	0.10%	0.087	NO	-2.63%	-0.570	NO
3	6/29/2016	-0.76%	-0.635	NO	-2.74%	-0.614	NO
2	6/28/2016	0.58%	0.491	NO	-1.98%	-0.461	NO
1	6/27/2016	-0.75%	-0.631	NO	-2.57%	-0.621	NO
0	6/24/2016	-3.96%	-3.321	YES	-1.81%	-0.459	NO
-1	6/23/2016	1.08%	0.904	NO	2.14%	0.569	NO
-2	6/22/2016	2.11%	1.770	NO	1.07%	0.298	NO
-3	6/21/2016	-0.13%	-0.108	NO	-1.04%	-0.309	NO
-4	6/20/2016	1.90%	1.594	NO	-0.91%	-0.290	NO
-5	6/17/2016	1.12%	0.940	NO	-2.81%	-0.964	NO
-6	6/16/2016	-1.83%	-1.536	NO	-3.93%	-1.476	NO
-7	6/15/2016	0.72%	0.605	NO	-2.10%	-0.883	NO
-8	6/14/2016	-1.12%	-0.938	NO	-2.82%	-1.368	NO
-9	6/13/2016	-0.17%	-0.144	NO	-1.71%	-1.013	NO
-10	6/10/2016	-1.54%	-1.288	NO	-1.54%	-1.288	NO

Picture 2.21.
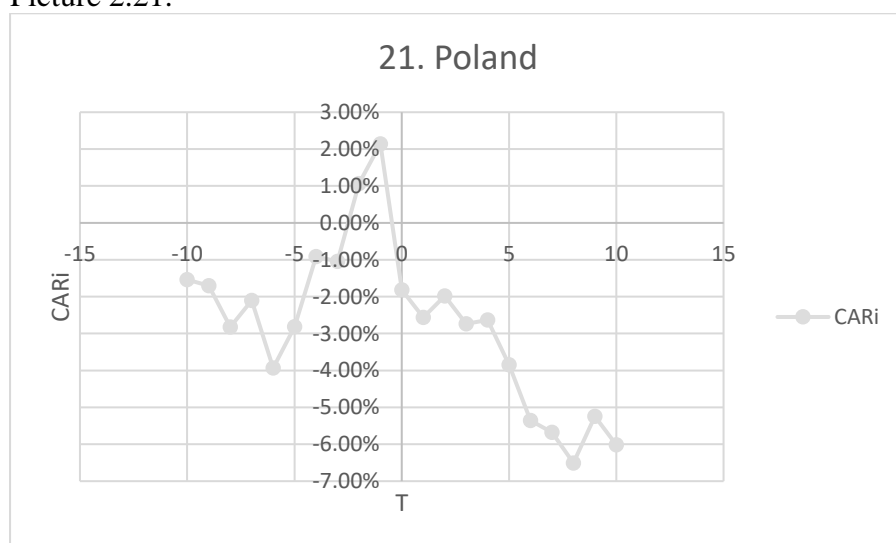
Table 2.22.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-4.27%	-2.374	YES	CARi (-3, -1)	-0.55%	-0.235	NO
CARi (-2, +2)	-2.99%	-1.287	NO	CARi (-5, -1)	3.24%	1.396	NO
CARi (-3, +3)	-4.18%	-1.521	NO	CARi (-10, -1)	-2.16%	-0.931	NO
22. Portugal							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	0.53%	0.509	NO	-6.73%	-1.414	NO
9	7/7/2016	0.73%	0.706	NO	-7.26%	-1.563	NO
8	7/6/2016	-0.68%	-0.653	NO	-8.00%	-1.765	NO
7	7/5/2016	-1.73%	-1.668	NO	-7.32%	-1.660	NO
6	7/4/2016	0.10%	0.097	NO	-5.59%	-1.304	NO
5	7/1/2016	0.94%	0.905	NO	-5.69%	-1.368	NO
4	6/30/2016	-0.83%	-0.795	NO	-6.63%	-1.646	NO
3	6/29/2016	0.17%	0.160	NO	-5.80%	-1.492	NO
2	6/28/2016	1.12%	1.074	NO	-5.97%	-1.592	NO
1	6/27/2016	-1.19%	-1.145	NO	-7.08%	-1.968	YES
0	6/24/2016	-3.73%	-3.588	YES	-5.89%	-1.710	NO
-1	6/23/2016	0.64%	0.620	NO	-2.16%	-0.659	NO
-2	6/22/2016	0.17%	0.161	NO	-2.81%	-0.901	NO
-3	6/21/2016	-1.36%	-1.308	NO	-2.98%	-1.013	NO
-4	6/20/2016	1.91%	1.836	NO	-1.62%	-0.588	NO
-5	6/17/2016	1.88%	1.812	NO	-3.53%	-1.385	NO
-6	6/16/2016	-0.71%	-0.687	NO	-5.41%	-2.328	YES
-7	6/15/2016	-0.20%	-0.190	NO	-4.70%	-2.259	YES
-8	6/14/2016	-1.83%	-1.758	NO	-4.50%	-2.499	YES
-9	6/13/2016	-1.54%	-1.481	NO	-2.67%	-1.817	NO
-10	6/10/2016	-1.13%	-1.089	NO	-1.13%	-1.089	NO

Picture 2.22.

22. Portugal
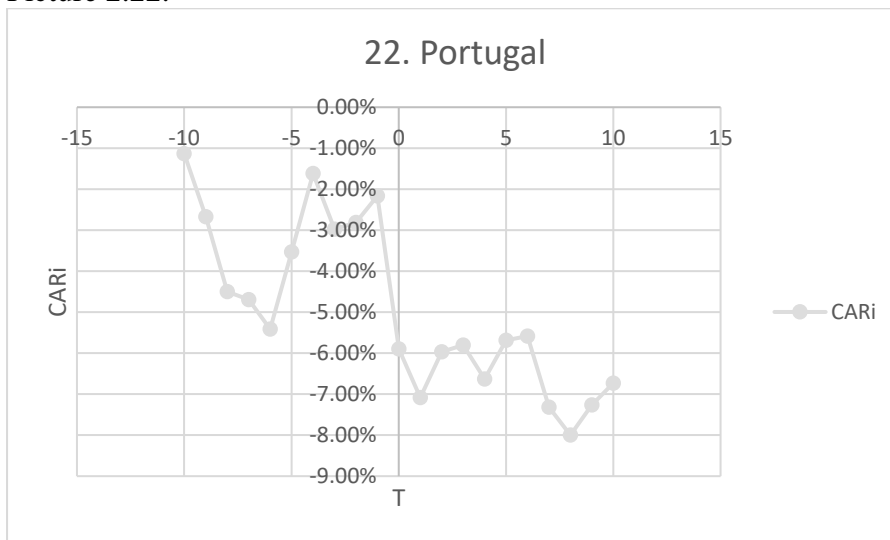
Table 2.23.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-1.75%	-1.094	NO	CARi (-3, -1)	0.24%	0.115	NO
CARi (-2, +2)	0.70%	0.341	NO	CARi (-5, -1)	-0.10%	-0.050	NO
CARi (-3, +3)	0.94%	0.387	NO	CARi (-10, -1)	-0.11%	-0.055	NO
23. Romania							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	-0.27%	-0.290	NO	0.11%	0.025	NO
9	7/7/2016	0.46%	0.504	NO	0.37%	0.090	NO
8	7/6/2016	-0.87%	-0.945	NO	-0.09%	-0.023	NO
7	7/5/2016	0.61%	0.660	NO	0.78%	0.199	NO
6	7/4/2016	0.17%	0.186	NO	0.17%	0.045	NO
5	7/1/2016	0.23%	0.255	NO	0.00%	0.000	NO
4	6/30/2016	-0.83%	-0.899	NO	-0.24%	-0.066	NO
3	6/29/2016	0.23%	0.248	NO	0.59%	0.172	NO
2	6/28/2016	1.97%	2.141	YES	0.36%	0.110	NO
1	6/27/2016	0.78%	0.846	NO	-1.61%	-0.504	NO
0	6/24/2016	-2.27%	-2.468	YES	-2.39%	-0.781	NO
-1	6/23/2016	-0.25%	-0.274	NO	-0.11%	-0.039	NO
-2	6/22/2016	0.48%	0.518	NO	0.14%	0.050	NO
-3	6/21/2016	0.01%	0.013	NO	-0.34%	-0.130	NO
-4	6/20/2016	-0.57%	-0.616	NO	-0.35%	-0.144	NO
-5	6/17/2016	0.23%	0.247	NO	0.22%	0.096	NO
-6	6/16/2016	-0.79%	-0.862	NO	-0.01%	-0.005	NO
-7	6/15/2016	1.19%	1.295	NO	0.78%	0.425	NO
-8	6/14/2016	0.23%	0.255	NO	-0.41%	-0.257	NO
-9	6/13/2016	0.61%	0.660	NO	-0.64%	-0.495	NO
-10	6/10/2016	-1.25%	-1.359	NO	-1.25%	-1.359	NO

Picture 2.23.
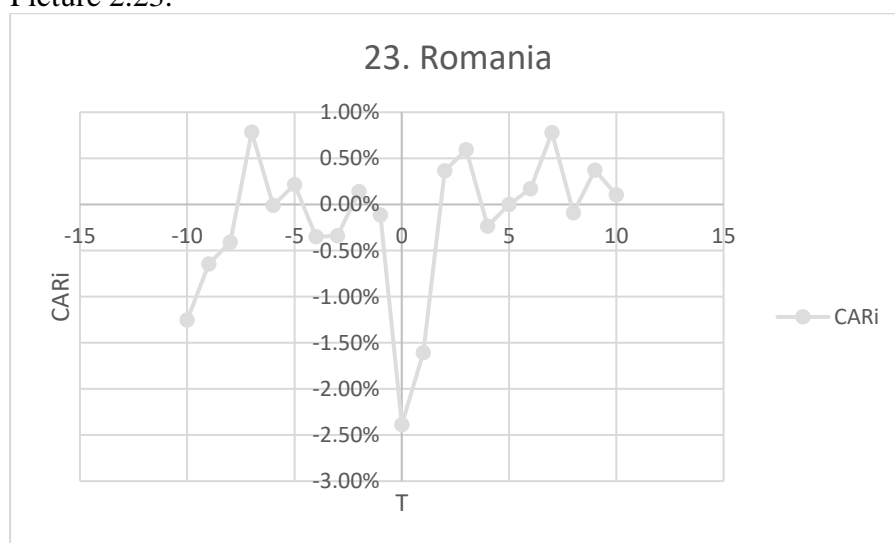
Table 2.24.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	1.61%	0.891	NO	CARi (-3, -1)	1.19%	0.513	NO
CARi (-2, +2)	1.21%	0.521	NO	CARi (-5, -1)	1.62%	0.695	NO
CARi (-3, +3)	0.71%	0.256	NO	CARi (-10, -1)	-2.99%	-1.284	NO
24. Slovakia							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	-1.20%	-1.150	NO	-5.99%	-1.255	NO
9	7/7/2016	1.35%	1.298	NO	-4.79%	-1.029	NO
8	7/6/2016	-2.48%	-2.379	YES	-6.14%	-1.354	NO
7	7/5/2016	-0.07%	-0.068	NO	-3.66%	-0.830	NO
6	7/4/2016	-0.08%	-0.079	NO	-3.59%	-0.838	NO
5	7/1/2016	-0.08%	-0.078	NO	-3.51%	-0.844	NO
4	6/30/2016	0.04%	0.043	NO	-3.43%	-0.851	NO
3	6/29/2016	-0.13%	-0.122	NO	-3.47%	-0.892	NO
2	6/28/2016	-0.32%	-0.309	NO	-3.35%	-0.892	NO
1	6/27/2016	-0.05%	-0.052	NO	-3.03%	-0.840	NO
0	6/24/2016	0.01%	0.014	NO	-2.97%	-0.861	NO
-1	6/23/2016	1.65%	1.582	NO	-2.99%	-0.908	NO
-2	6/22/2016	-0.07%	-0.071	NO	-4.63%	-1.484	NO
-3	6/21/2016	-0.38%	-0.364	NO	-4.56%	-1.549	NO
-4	6/20/2016	-0.19%	-0.180	NO	-4.18%	-1.518	NO
-5	6/17/2016	0.61%	0.589	NO	-3.99%	-1.566	NO
-6	6/16/2016	-1.97%	-1.897	NO	-4.61%	-1.979	YES
-7	6/15/2016	0.33%	0.315	NO	-2.63%	-1.264	NO
-8	6/14/2016	-2.85%	-2.741	YES	-2.96%	-1.642	NO
-9	6/13/2016	-0.07%	-0.069	NO	-0.11%	-0.073	NO
-10	6/10/2016	-0.04%	-0.034	NO	-0.04%	-0.034	NO

Picture 2.24.
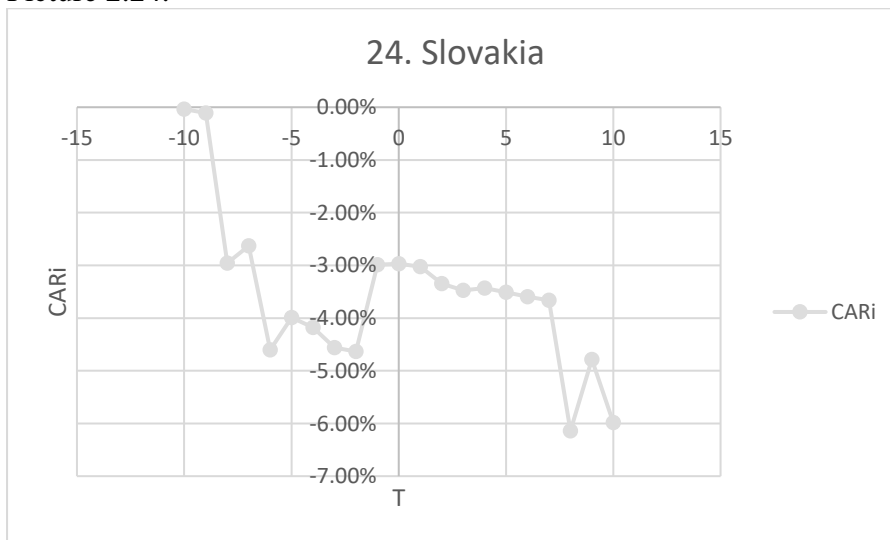
Table 2.25.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-1.48%	-1.268	NO	CARi (-3, -1)	1.06%	0.705	NO
CARi (-2, +2)	0.24%	0.157	NO	CARi (-5, -1)	1.93%	1.284	NO
CARi (-3, +3)	-0.44%	-0.248	NO	CARi (-10, -1)	0.70%	0.466	NO
25. Slovenia							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	-0.46%	-0.689	NO	1.83%	0.592	NO
9	7/7/2016	-0.34%	-0.505	NO	2.29%	0.760	NO
8	7/6/2016	0.93%	1.382	NO	2.63%	0.896	NO
7	7/5/2016	2.04%	3.035	YES	1.70%	0.595	NO
6	7/4/2016	-0.09%	-0.130	NO	-0.34%	-0.124	NO
5	7/1/2016	0.62%	0.928	NO	-0.26%	-0.096	NO
4	6/30/2016	-0.08%	-0.120	NO	-0.88%	-0.338	NO
3	6/29/2016	-0.45%	-0.665	NO	-0.80%	-0.318	NO
2	6/28/2016	0.67%	0.988	NO	-0.35%	-0.146	NO
1	6/27/2016	-0.25%	-0.368	NO	-1.02%	-0.437	NO
0	6/24/2016	-1.47%	-2.188	YES	-0.77%	-0.345	NO
-1	6/23/2016	0.24%	0.361	NO	0.70%	0.330	NO
-2	6/22/2016	1.05%	1.558	NO	0.46%	0.227	NO
-3	6/21/2016	-0.23%	-0.343	NO	-0.59%	-0.310	NO
-4	6/20/2016	0.74%	1.106	NO	-0.36%	-0.201	NO
-5	6/17/2016	0.13%	0.190	NO	-1.10%	-0.669	NO
-6	6/16/2016	-0.77%	-1.137	NO	-1.23%	-0.818	NO
-7	6/15/2016	0.22%	0.321	NO	-0.47%	-0.346	NO
-8	6/14/2016	-0.74%	-1.100	NO	-0.68%	-0.585	NO
-9	6/13/2016	-0.25%	-0.370	NO	0.06%	0.062	NO
-10	6/10/2016	0.31%	0.458	NO	0.31%	0.458	NO

Picture 2.25.
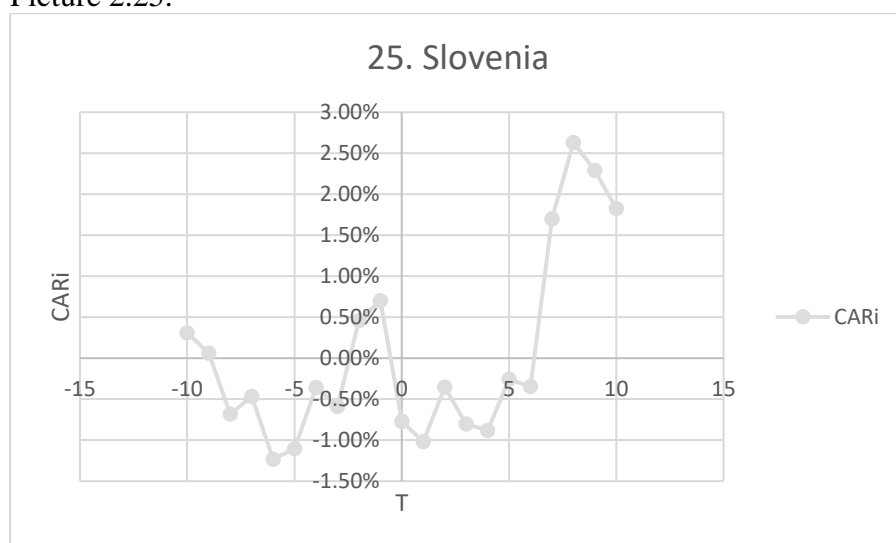
Table 2.26.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-8.46%	-5.258	YES	CARi (-3, -1)	1.52%	0.734	NO
CARi (-2, +2)	-6.47%	-3.116	YES	CARi (-5, -1)	5.12%	2.464	YES
CARi (-3, +3)	-5.49%	-2.234	YES	CARi (-10, -1)	1.78%	0.857	NO
26. Spain							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	1.05%	1.128	NO	-5.63%	-1.323	NO
9	7/7/2016	0.50%	0.536	NO	-6.68%	-1.608	NO
8	7/6/2016	-1.03%	-1.110	NO	-7.18%	-1.772	NO
7	7/5/2016	-1.68%	-1.806	NO	-6.15%	-1.559	NO
6	7/4/2016	-0.09%	-0.093	NO	-4.47%	-1.166	NO
5	7/1/2016	1.43%	1.538	NO	-4.38%	-1.179	NO
4	6/30/2016	-0.58%	-0.621	NO	-5.81%	-1.615	NO
3	6/29/2016	1.46%	1.575	NO	-5.23%	-1.505	NO
2	6/28/2016	1.12%	1.207	NO	-6.70%	-1.999	YES
1	6/27/2016	-0.48%	-0.512	NO	-7.82%	-2.429	YES
0	6/24/2016	-9.12%	-9.819	YES	-7.34%	-2.382	YES
-1	6/23/2016	1.14%	1.223	NO	1.78%	0.606	NO
-2	6/22/2016	0.87%	0.934	NO	0.65%	0.231	NO
-3	6/21/2016	-0.48%	-0.517	NO	-0.22%	-0.085	NO
-4	6/20/2016	1.90%	2.044	YES	0.26%	0.105	NO
-5	6/17/2016	1.70%	1.824	NO	-1.64%	-0.721	NO
-6	6/16/2016	-0.39%	-0.425	NO	-3.34%	-1.606	NO
-7	6/15/2016	1.29%	1.384	NO	-2.94%	-1.583	NO
-8	6/14/2016	-1.54%	-1.661	NO	-4.23%	-2.627	YES
-9	6/13/2016	-0.66%	-0.712	NO	-2.68%	-2.043	YES
-10	6/10/2016	-2.02%	-2.177	YES	-2.02%	-2.177	YES

Picture 2.26.
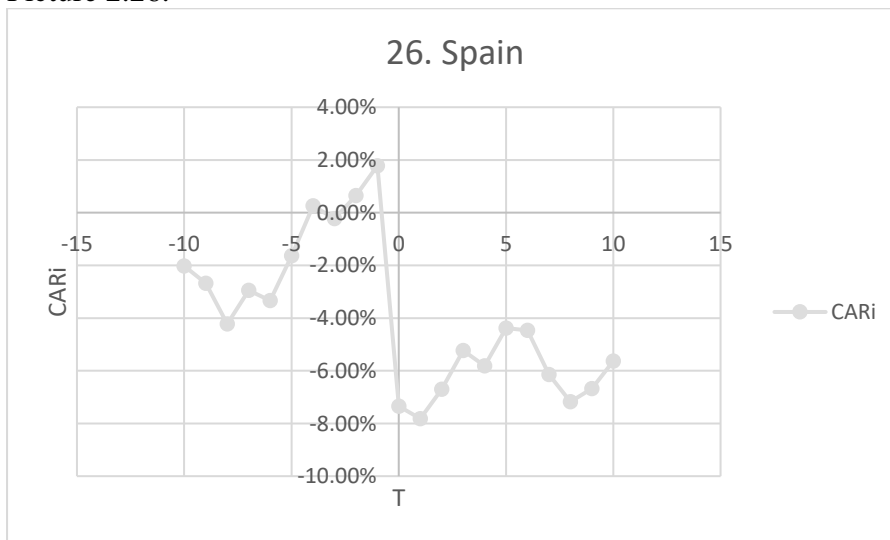
Table 2.27.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-4.99%	-2.961	YES	CARi (-3, -1)	0.66%	0.302	NO
CARi (-2, +2)	-2.85%	-1.310	NO	CARi (-5, -1)	4.02%	1.850	NO
CARi (-3, +3)	-2.34%	-0.909	NO	CARi (-10, -1)	0.95%	0.437	NO
27. Sweden							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	0.39%	0.405	NO	-3.26%	-0.731	NO
9	7/7/2016	0.56%	0.579	NO	-3.65%	-0.840	NO
8	7/6/2016	-0.63%	-0.643	NO	-4.21%	-0.994	NO
7	7/5/2016	-1.69%	-1.740	NO	-3.59%	-0.870	NO
6	7/4/2016	-1.14%	-1.177	NO	-1.90%	-0.473	NO
5	7/1/2016	1.34%	1.379	NO	-0.75%	-0.194	NO
4	6/30/2016	-0.05%	-0.050	NO	-2.09%	-0.556	NO
3	6/29/2016	0.61%	0.629	NO	-2.04%	-0.562	NO
2	6/28/2016	1.19%	1.226	NO	-2.66%	-0.758	NO
1	6/27/2016	-8.90%	-9.160	YES	-3.85%	-1.142	NO
0	6/24/2016	4.11%	4.226	YES	5.06%	1.569	NO
-1	6/23/2016	-0.19%	-0.194	NO	0.95%	0.309	NO
-2	6/22/2016	0.95%	0.974	NO	1.14%	0.390	NO
-3	6/21/2016	-0.10%	-0.104	NO	0.19%	0.070	NO
-4	6/20/2016	2.24%	2.299	YES	0.29%	0.114	NO
-5	6/17/2016	1.13%	1.162	NO	-1.94%	-0.816	NO
-6	6/16/2016	-1.93%	-1.990	YES	-3.07%	-1.413	NO
-7	6/15/2016	1.55%	1.598	NO	-1.14%	-0.585	NO
-8	6/14/2016	-1.07%	-1.100	NO	-2.69%	-1.598	NO
-9	6/13/2016	0.23%	0.239	NO	-1.62%	-1.179	NO
-10	6/10/2016	-1.85%	-1.906	NO	-1.85%	-1.906	NO

Picture 2.27.
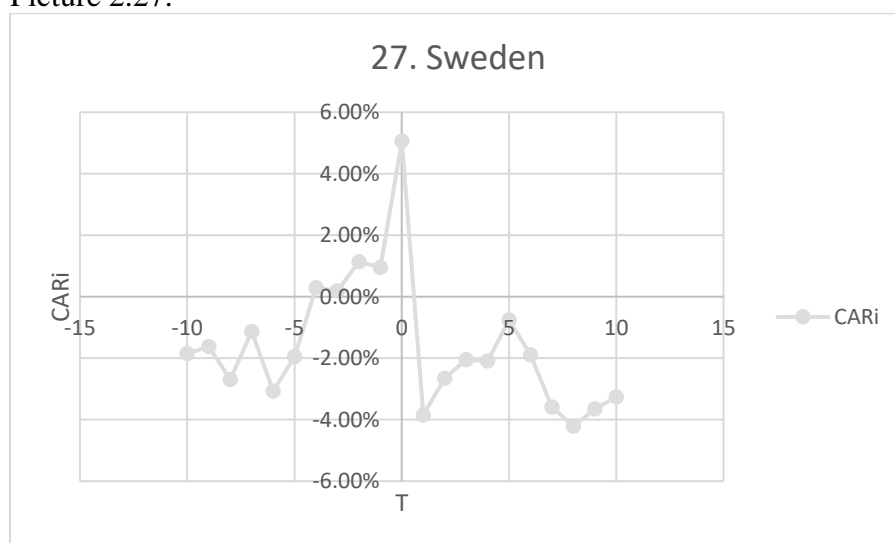
Table 2.28.

		tCARi	SIGN?	Robustness		tCARi	SIGN?
CARi (-1, +1)	-8.15%	-6.163	YES	CARi (-3, -1)	1.30%	0.762	NO
CARi (-2, +2)	-5.35%	-3.131	YES	CARi (-5, -1)	6.07%	3.551	YES
CARi (-3, +3)	-3.35%	-1.659	NO	CARi (-10, -1)	3.89%	2.280	YES
28. United Kingdom							
T	Date	ARi	tARi	SIGN?	CARi	tCARi	SIGN?
10	7/8/2016	0.14%	0.182	NO	-2.41%	-0.689	NO
9	7/7/2016	0.38%	0.497	NO	-2.55%	-0.747	NO
8	7/6/2016	-1.33%	-1.740	NO	-2.93%	-0.881	NO
7	7/5/2016	-0.31%	-0.409	NO	-1.60%	-0.495	NO
6	7/4/2016	-0.82%	-1.069	NO	-1.29%	-0.410	NO
5	7/1/2016	0.77%	1.009	NO	-0.47%	-0.155	NO
4	6/30/2016	-0.49%	-0.635	NO	-1.24%	-0.421	NO
3	6/29/2016	2.05%	2.686	YES	-0.76%	-0.266	NO
2	6/28/2016	1.88%	2.461	YES	-2.81%	-1.021	NO
1	6/27/2016	-4.03%	-5.270	YES	-4.69%	-1.773	NO
0	6/24/2016	-4.56%	-5.970	YES	-0.67%	-0.263	NO
-1	6/23/2016	0.43%	0.566	NO	3.89%	1.612	NO
-2	6/22/2016	0.93%	1.212	NO	3.46%	1.511	NO
-3	6/21/2016	-0.06%	-0.074	NO	2.54%	1.174	NO
-4	6/20/2016	3.48%	4.549	YES	2.59%	1.283	NO
-5	6/17/2016	1.29%	1.686	NO	-0.88%	-0.472	NO
-6	6/16/2016	0.27%	0.355	NO	-2.17%	-1.271	NO
-7	6/15/2016	0.36%	0.474	NO	-2.44%	-1.598	NO
-8	6/14/2016	-1.35%	-1.770	NO	-2.80%	-2.118	YES
-9	6/13/2016	-0.32%	-0.417	NO	-1.45%	-1.343	NO
-10	6/10/2016	-1.13%	-1.482	NO	-1.13%	-1.482	NO

Picture 2.28.
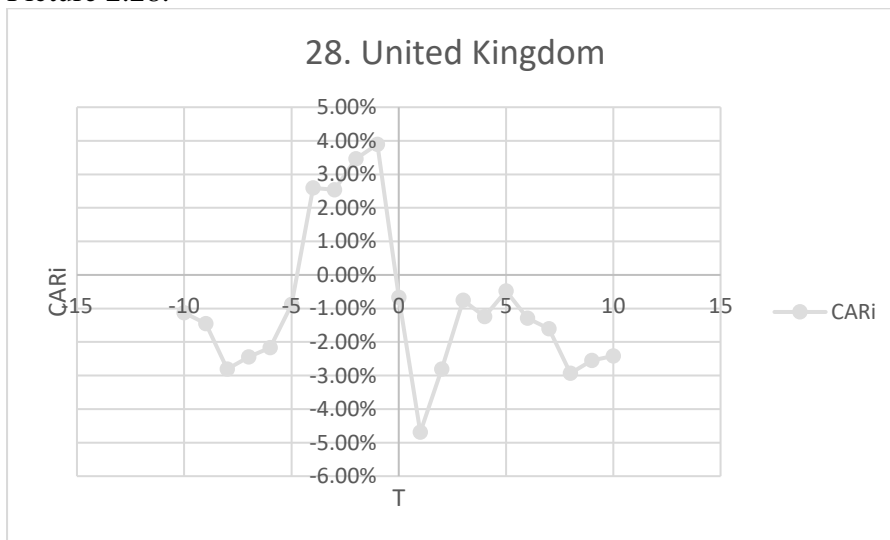
9.3 CROSS SECTIONAL (EU FOCUSED)

Table 3.1.

		tCAARi	SIGN?	Robustness		tCAARi	SIGN?
CAARi (-1, +1)	-4.39%	-2.640	YES	CAARi (-3, -1)	0.86%	0.402	NO
CAARi (-2, +2)	-2.82%	-1.312	NO	CAARi (-5, -1)	2.80%	1.303	NO
CAARi (-3, +3)	-2.69%	-1.059	NO	CAARi (-10, -1)	-0.28%	-0.128	NO
European Union							
T	Date	AARi	tAARi	SIGN?	CAARi	tCAARi	SIGN?
10	7/8/2016	0.20%	0.209	NO	-4.17%	-0.947	NO
9	7/7/2016	0.27%	0.277	NO	-4.37%	-1.017	NO
8	7/6/2016	-0.44%	-0.459	NO	-4.63%	-1.107	NO
7	7/5/2016	-0.66%	-0.684	NO	-4.19%	-1.029	NO
6	7/4/2016	-0.29%	-0.304	NO	-3.54%	-0.893	NO
5	7/1/2016	0.69%	0.717	NO	-3.24%	-0.845	NO
4	6/30/2016	-0.10%	-0.109	NO	-3.93%	-1.058	NO
3	6/29/2016	0.24%	0.250	NO	-3.83%	-1.066	NO
2	6/28/2016	1.05%	1.098	NO	-4.07%	-1.175	NO
1	6/27/2016	-2.26%	-2.353	YES	-5.12%	-1.540	NO
0	6/24/2016	-2.59%	-2.696	YES	-2.86%	-0.899	NO
-1	6/23/2016	0.46%	0.477	NO	-0.28%	-0.091	NO
-2	6/22/2016	0.52%	0.540	NO	-0.73%	-0.255	NO
-3	6/21/2016	-0.11%	-0.119	NO	-1.25%	-0.461	NO
-4	6/20/2016	0.88%	0.918	NO	-1.14%	-0.448	NO
-5	6/17/2016	1.05%	1.097	NO	-2.02%	-0.859	NO
-6	6/16/2016	-0.92%	-0.953	NO	-3.07%	-1.431	NO
-7	6/15/2016	0.42%	0.437	NO	-2.16%	-1.123	NO
-8	6/14/2016	-0.94%	-0.979	NO	-2.58%	-1.549	NO
-9	6/13/2016	-0.55%	-0.577	NO	-1.64%	-1.205	NO
-10	6/10/2016	-1.08%	-1.127	NO	-1.08%	-1.127	NO

Picture 3.1.
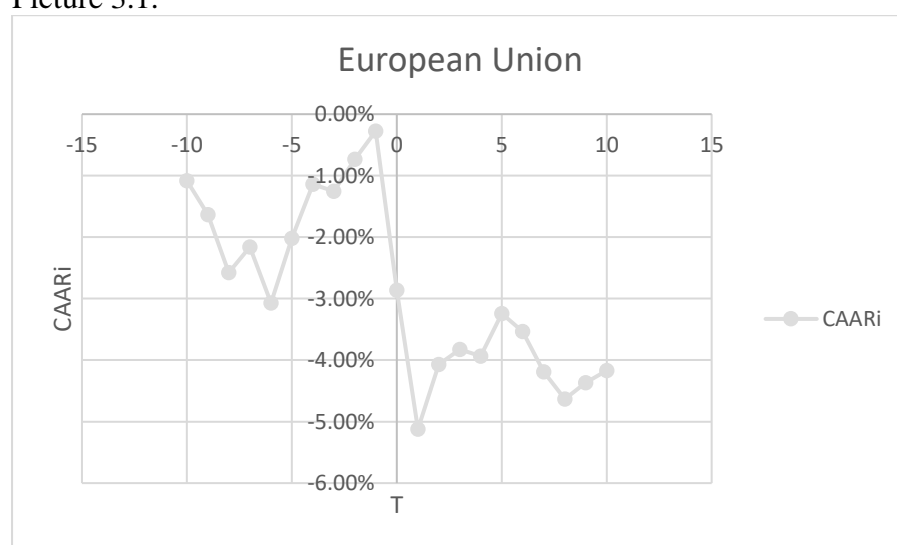
Table 3.2.

		tCAARi	SIGN?	Robustness		tCAARi	SIGN?
CAARi (-1, +1)	-4.25%	-2.538	YES	CAARi (-3, -1)	0.85%	0.392	NO
CAARi (-2, +2)	-2.72%	-1.259	NO	CAARi (-5, -1)	2.68%	1.238	NO
CAARi (-3, +3)	-2.67%	-1.042	NO	CAARi (-10, -1)	-0.43%	-0.199	NO
EU Less UK							
T	Date	AARi	tAARi	SIGN?	CAARi	tCAARi	SIGN?
10	7/8/2016	0.20%	0.210	NO	-4.23%	-0.955	NO
9	7/7/2016	0.26%	0.271	NO	-4.43%	-1.026	NO
8	7/6/2016	-0.41%	-0.422	NO	-4.70%	-1.115	NO
7	7/5/2016	-0.67%	-0.692	NO	-4.29%	-1.046	NO
6	7/4/2016	-0.27%	-0.282	NO	-3.62%	-0.908	NO
5	7/1/2016	0.69%	0.709	NO	-3.35%	-0.866	NO
4	6/30/2016	-0.09%	-0.094	NO	-4.03%	-1.077	NO
3	6/29/2016	0.17%	0.179	NO	-3.94%	-1.090	NO
2	6/28/2016	1.02%	1.059	NO	-4.11%	-1.181	NO
1	6/27/2016	-2.19%	-2.269	YES	-5.14%	-1.535	NO
0	6/24/2016	-2.52%	-2.602	YES	-2.95%	-0.919	NO
-1	6/23/2016	0.46%	0.475	NO	-0.43%	-0.141	NO
-2	6/22/2016	0.50%	0.521	NO	-0.89%	-0.306	NO
-3	6/21/2016	-0.12%	-0.120	NO	-1.39%	-0.509	NO
-4	6/20/2016	0.79%	0.812	NO	-1.28%	-0.499	NO
-5	6/17/2016	1.04%	1.081	NO	-2.06%	-0.871	NO
-6	6/16/2016	-0.96%	-0.992	NO	-3.11%	-1.437	NO
-7	6/15/2016	0.42%	0.436	NO	-2.15%	-1.111	NO
-8	6/14/2016	-0.93%	-0.957	NO	-2.57%	-1.534	NO
-9	6/13/2016	-0.56%	-0.582	NO	-1.64%	-1.202	NO
-10	6/10/2016	-1.08%	-1.118	NO	-1.08%	-1.118	NO

Picture 3.2.
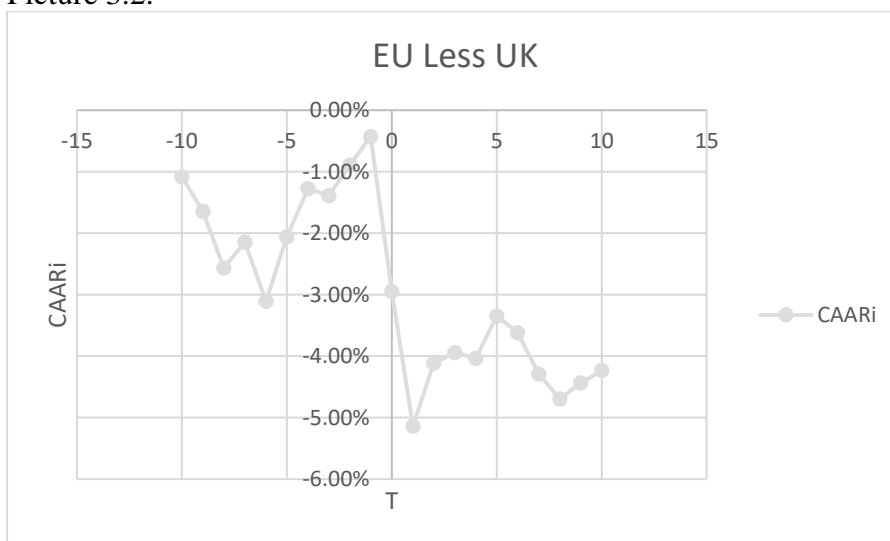
Table 3.3.

		tCAARi	SIGN?	Robustness		tCAARi	SIGN?
CAARi (-1, +1)	-4.80%	-2.789	YES	CAARi (-3, -1)	0.86%	0.387	NO
CAARi (-2, +2)	-3.45%	-1.553	NO	CAARi (-5, -1)	2.88%	1.295	NO
CAARi (-3, +3)	-3.27%	-1.245	NO	CAARi (-10, -1)	-0.44%	-0.198	NO
Eurozone							
T	Date	AARi	tAARi	SIGN?	CAARi	tCAARi	SIGN?
10	7/8/2016	0.42%	0.427	NO	-4.95%	-1.087	NO
9	7/7/2016	0.11%	0.108	NO	-5.37%	-1.209	NO
8	7/6/2016	-0.46%	-0.465	NO	-5.48%	-1.265	NO
7	7/5/2016	-0.95%	-0.952	NO	-5.01%	-1.190	NO
6	7/4/2016	-0.23%	-0.229	NO	-4.07%	-0.994	NO
5	7/1/2016	0.87%	0.874	NO	-3.84%	-0.967	NO
4	6/30/2016	-0.14%	-0.142	NO	-4.71%	-1.225	NO
3	6/29/2016	0.31%	0.311	NO	-4.57%	-1.230	NO
2	6/28/2016	0.97%	0.981	NO	-4.88%	-1.362	NO
1	6/27/2016	-2.32%	-2.339	YES	-5.85%	-1.701	NO
0	6/24/2016	-3.09%	-3.111	YES	-3.53%	-1.072	NO
-1	6/23/2016	0.61%	0.619	NO	-0.44%	-0.140	NO
-2	6/22/2016	0.37%	0.377	NO	-1.05%	-0.354	NO
-3	6/21/2016	-0.13%	-0.131	NO	-1.43%	-0.509	NO
-4	6/20/2016	0.84%	0.846	NO	-1.30%	-0.494	NO
-5	6/17/2016	1.18%	1.186	NO	-2.14%	-0.879	NO
-6	6/16/2016	-0.95%	-0.955	NO	-3.32%	-1.494	NO
-7	6/15/2016	0.19%	0.192	NO	-2.37%	-1.193	NO
-8	6/14/2016	-0.96%	-0.971	NO	-2.56%	-1.488	NO
-9	6/13/2016	-0.67%	-0.677	NO	-1.59%	-1.136	NO
-10	6/10/2016	-0.92%	-0.929	NO	-0.92%	-0.929	NO

Picture 3.3.
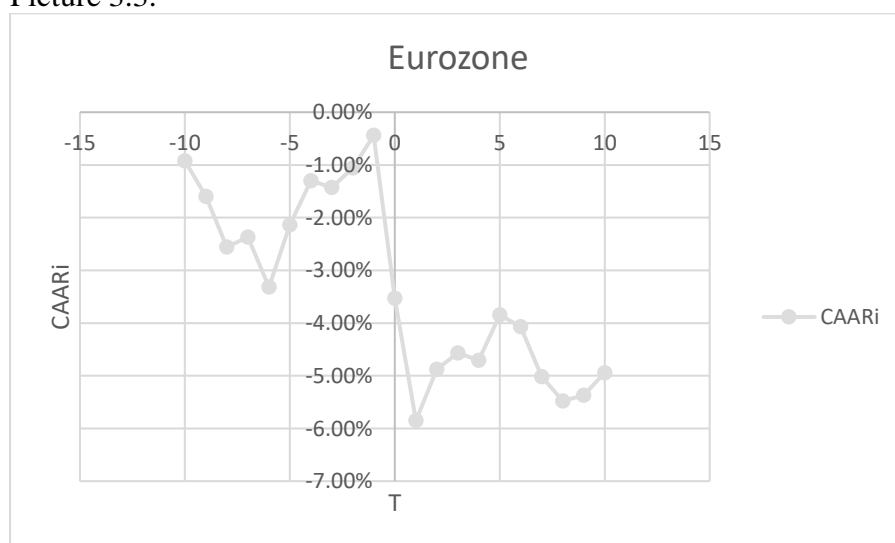
Table 3.4.

		tCAARi	SIGN?	Robustness		tCAARi	SIGN?
CAARi (-1, +1)	-3.53%	-2.298	YES	CAARi (-3, -1)	0.87%	0.439	NO
CAARi (-2, +2)	-1.48%	-0.746	NO	CAARi (-5, -1)	2.63%	1.327	NO
CAARi (-3, +3)	-1.47%	-0.625	NO	CAARi (-10, -1)	0.07%	0.037	NO
Non-Eurozone							
T	Date	AARi	tAARi	SIGN?	CAARi	tCAARi	SIGN?
10	7/8/2016	-0.27%	-0.306	NO	-2.52%	-0.621	NO
9	7/7/2016	0.60%	0.678	NO	-2.25%	-0.568	NO
8	7/6/2016	-0.40%	-0.447	NO	-2.85%	-0.738	NO
7	7/5/2016	-0.05%	-0.052	NO	-2.46%	-0.653	NO
6	7/4/2016	-0.43%	-0.484	NO	-2.41%	-0.659	NO
5	7/1/2016	0.31%	0.351	NO	-1.98%	-0.559	NO
4	6/30/2016	-0.03%	-0.031	NO	-2.29%	-0.668	NO
3	6/29/2016	0.09%	0.105	NO	-2.27%	-0.683	NO
2	6/28/2016	1.23%	1.382	NO	-2.36%	-0.738	NO
1	6/27/2016	-2.12%	-2.396	YES	-3.58%	-1.167	NO
0	6/24/2016	-1.53%	-1.728	NO	-1.46%	-0.496	NO
-1	6/23/2016	0.13%	0.144	NO	0.07%	0.026	NO
-2	6/22/2016	0.82%	0.929	NO	-0.05%	-0.021	NO
-3	6/21/2016	-0.08%	-0.091	NO	-0.88%	-0.350	NO
-4	6/20/2016	0.97%	1.093	NO	-0.80%	-0.340	NO
-5	6/17/2016	0.79%	0.893	NO	-1.77%	-0.814	NO
-6	6/16/2016	-0.85%	-0.955	NO	-2.56%	-1.291	NO
-7	6/15/2016	0.90%	1.018	NO	-1.71%	-0.965	NO
-8	6/14/2016	-0.89%	-1.005	NO	-2.61%	-1.702	NO
-9	6/13/2016	-0.30%	-0.343	NO	-1.72%	-1.374	NO
-10	6/10/2016	-1.42%	-1.600	NO	-1.42%	-1.600	NO

Picture 3.4.
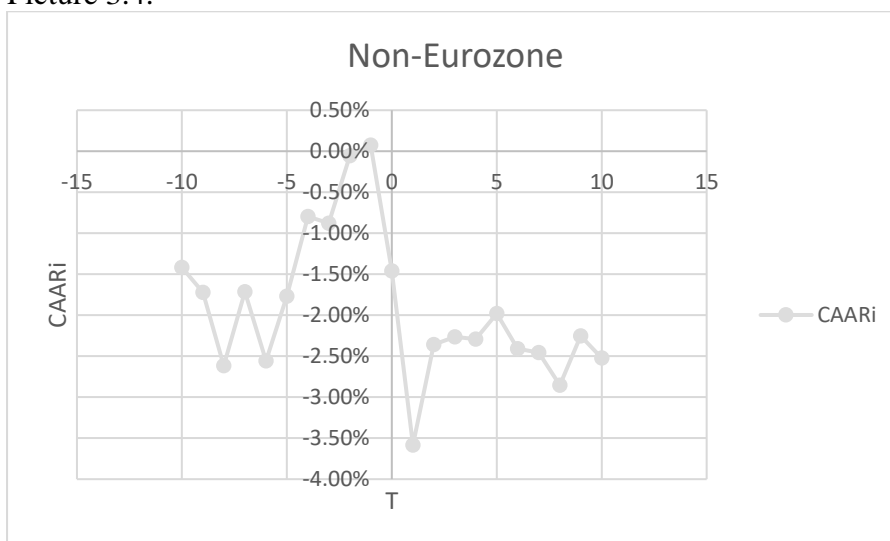
Table 3.5.

		tCAARi	SIGN?	Robustness		tCAARi	SIGN?
CAARi (-1, +1)	-9.70%	-4.238	YES	CAARi (-3, -1)	1.59%	0.539	NO
CAARi (-2, +2)	-7.48%	-2.533	YES	CAARi (-5, -1)	5.58%	1.889	NO
CAARi (-3, +3)	-7.09%	-2.027	YES	CAARi (-10, -1)	-0.60%	-0.204	NO
PIIGS							
T	Date	AARi	tAARi	SIGN?	CAARi	tCAARi	SIGN?
10	7/8/2016	1.01%	0.766	NO	-10.44%	-1.724	NO
9	7/7/2016	0.30%	0.226	NO	-11.45%	-1.938	NO
8	7/6/2016	-0.69%	-0.520	NO	-11.75%	-2.040	YES
7	7/5/2016	-1.66%	-1.257	NO	-11.06%	-1.973	YES
6	7/4/2016	-0.79%	-0.598	NO	-9.40%	-1.725	NO
5	7/1/2016	1.13%	0.854	NO	-8.61%	-1.629	NO
4	6/30/2016	-0.46%	-0.348	NO	-9.74%	-1.903	NO
3	6/29/2016	0.37%	0.281	NO	-9.28%	-1.877	NO
2	6/28/2016	1.67%	1.266	NO	-9.65%	-2.026	YES
1	6/27/2016	-3.11%	-2.351	YES	-11.32%	-2.474	YES
0	6/24/2016	-7.62%	-5.764	YES	-8.22%	-1.875	NO
-1	6/23/2016	1.02%	0.775	NO	-0.60%	-0.144	NO
-2	6/22/2016	0.54%	0.409	NO	-1.63%	-0.411	NO
-3	6/21/2016	0.03%	0.021	NO	-2.17%	-0.580	NO
-4	6/20/2016	1.38%	1.041	NO	-2.19%	-0.628	NO
-5	6/17/2016	2.61%	1.977	YES	-3.57%	-1.103	NO
-6	6/16/2016	-1.34%	-1.015	NO	-6.18%	-2.093	YES
-7	6/15/2016	-0.15%	-0.111	NO	-4.84%	-1.832	NO
-8	6/14/2016	-1.19%	-0.902	NO	-4.69%	-2.052	YES
-9	6/13/2016	-1.49%	-1.124	NO	-3.50%	-1.875	NO
-10	6/10/2016	-2.02%	-1.527	NO	-2.02%	-1.527	NO

Picture 3.5.

Table 3.6.

		tCAARi	SIGN?	Robustness		tCAARi	SIGN?
CAARi (-1, +1)	-3.24%	-2.168	YES	CAARi (-3, -1)	0.70%	0.366	NO
CAARi (-2, +2)	-1.80%	-0.935	NO	CAARi (-5, -1)	2.19%	1.138	NO
CAARi (-3, +3)	-1.73%	-0.761	NO	CAARi (-10, -1)	-0.20%	-0.106	NO
European Union Less PIIGS							
T	Date	AARi	tAARi	SIGN?	CAARi	tCAARi	SIGN?
10	7/8/2016	0.02%	0.028	NO	-2.80%	-0.710	NO
9	7/7/2016	0.26%	0.300	NO	-2.83%	-0.734	NO
8	7/6/2016	-0.39%	-0.449	NO	-3.09%	-0.822	NO
7	7/5/2016	-0.44%	-0.508	NO	-2.70%	-0.738	NO
6	7/4/2016	-0.18%	-0.213	NO	-2.26%	-0.636	NO
5	7/1/2016	0.59%	0.688	NO	-2.08%	-0.603	NO
4	6/30/2016	-0.03%	-0.032	NO	-2.67%	-0.800	NO
3	6/29/2016	0.21%	0.245	NO	-2.64%	-0.820	NO
2	6/28/2016	0.92%	1.068	NO	-2.85%	-0.919	NO
1	6/27/2016	-2.07%	-2.407	YES	-3.77%	-1.264	NO
0	6/24/2016	-1.50%	-1.736	NO	-1.70%	-0.595	NO
-1	6/23/2016	0.34%	0.389	NO	-0.20%	-0.075	NO
-2	6/22/2016	0.51%	0.597	NO	-0.54%	-0.208	NO
-3	6/21/2016	-0.14%	-0.168	NO	-1.05%	-0.432	NO
-4	6/20/2016	0.77%	0.898	NO	-0.91%	-0.398	NO
-5	6/17/2016	0.71%	0.829	NO	-1.68%	-0.797	NO
-6	6/16/2016	-0.82%	-0.955	NO	-2.40%	-1.244	NO
-7	6/15/2016	0.54%	0.629	NO	-1.57%	-0.913	NO
-8	6/14/2016	-0.89%	-1.028	NO	-2.12%	-1.418	NO
-9	6/13/2016	-0.35%	-0.408	NO	-1.23%	-1.009	NO
-10	6/10/2016	-0.88%	-1.020	NO	-0.88%	-1.020	NO

Picture 3.6.
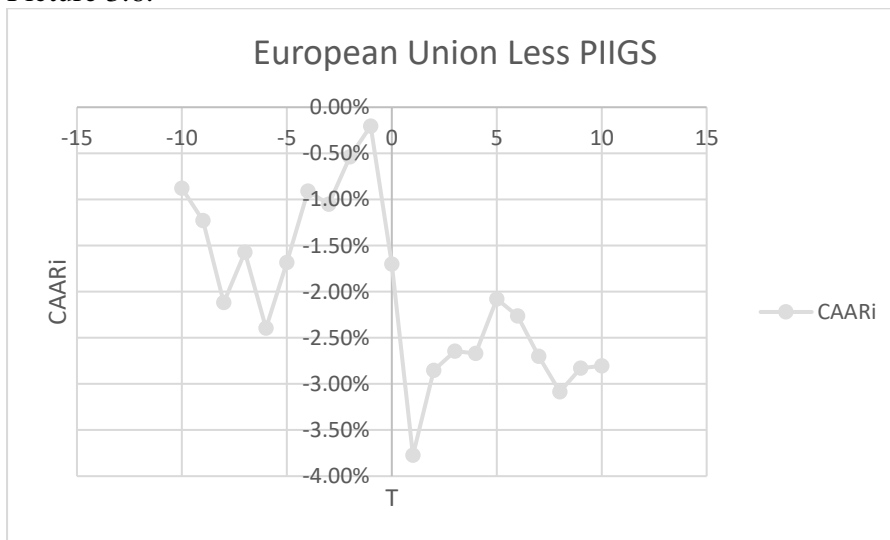
9.4 CROSS SECTIONAL (SMALLER UNIONS FOCUSED)

Table 4.1.

		tCAARi	SIGN?	Robustness		tCAARi	SIGN?
CAARi (-1, +1)	-4.74%	-2.927	YES	CAARi (-3, -1)	1.12%	0.535	NO
CAARi (-2, +2)	-3.55%	-1.701	NO	CAARi (-5, -1)	3.50%	1.676	NO
CAARi (-3, +3)	-3.32%	-1.342	NO	CAARi (-10, -1)	0.81%	0.388	NO
BENELUX							
T	Date	AARi	tAARi	SIGN?	CAARi	tCAARi	SIGN?
10	7/8/2016	0.32%	0.347	NO	-3.65%	-0.853	NO
9	7/7/2016	-0.27%	-0.287	NO	-3.97%	-0.952	NO
8	7/6/2016	-0.99%	-1.063	NO	-3.71%	-0.910	NO
7	7/5/2016	-1.17%	-1.253	NO	-2.71%	-0.685	NO
6	7/4/2016	0.32%	0.345	NO	-1.54%	-0.401	NO
5	7/1/2016	1.77%	1.895	NO	-1.87%	-0.500	NO
4	6/30/2016	-0.01%	-0.013	NO	-3.64%	-1.005	NO
3	6/29/2016	0.74%	0.793	NO	-3.62%	-1.037	NO
2	6/28/2016	0.67%	0.717	NO	-4.36%	-1.296	NO
1	6/27/2016	-2.95%	-3.159	YES	-5.03%	-1.556	NO
0	6/24/2016	-2.89%	-3.097	YES	-2.08%	-0.673	NO
-1	6/23/2016	1.11%	1.186	NO	0.81%	0.274	NO
-2	6/22/2016	0.51%	0.549	NO	-0.30%	-0.106	NO
-3	6/21/2016	-0.50%	-0.539	NO	-0.81%	-0.307	NO
-4	6/20/2016	0.96%	1.028	NO	-0.31%	-0.124	NO
-5	6/17/2016	1.42%	1.523	NO	-1.27%	-0.554	NO
-6	6/16/2016	-0.38%	-0.406	NO	-2.69%	-1.288	NO
-7	6/15/2016	0.50%	0.538	NO	-2.31%	-1.237	NO
-8	6/14/2016	-1.42%	-1.521	NO	-2.81%	-1.739	NO
-9	6/13/2016	-0.44%	-0.476	NO	-1.39%	-1.055	NO
-10	6/10/2016	-0.95%	-1.016	NO	-0.95%	-1.016	NO

Picture 4.1.
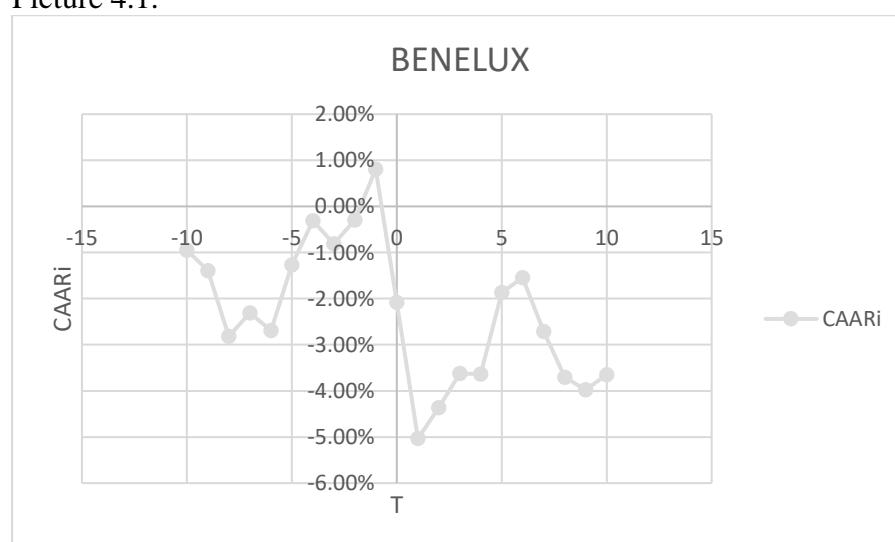
Table 4.2.

		tCAARi	SIGN?	Robustness			
CAARi (-1, +1)	-1.31%	-0.910	NO	CAARi (-3, -1)	-0.53%	-0.285	NO
CAARi (-2, +2)	-1.06%	-0.573	NO	CAARi (-5, -1)	-0.81%	-0.437	NO
CAARi (-3, +3)	-0.58%	-0.262	NO	CAARi (-10, -1)	-2.52%	-1.360	NO
BALTIC							
T	Date	AARi	tAARi	SIGN?	CAARi	tCAARi	SIGN?
10	7/8/2016	0.08%	0.093	NO	-1.45%	-0.382	NO
9	7/7/2016	0.28%	0.334	NO	-1.53%	-0.412	NO
8	7/6/2016	0.43%	0.522	NO	-1.80%	-0.499	NO
7	7/5/2016	-0.34%	-0.412	NO	-2.24%	-0.636	NO
6	7/4/2016	0.63%	0.762	NO	-1.90%	-0.555	NO
5	7/1/2016	0.09%	0.107	NO	-2.53%	-0.762	NO
4	6/30/2016	-0.05%	-0.058	NO	-2.62%	-0.815	NO
3	6/29/2016	0.59%	0.706	NO	-2.57%	-0.828	NO
2	6/28/2016	0.48%	0.581	NO	-3.15%	-1.055	NO
1	6/27/2016	-1.55%	-1.867	NO	-3.64%	-1.266	NO
0	6/24/2016	0.43%	0.523	NO	-2.09%	-0.759	NO
-1	6/23/2016	-0.19%	-0.233	NO	-2.52%	-0.962	NO
-2	6/22/2016	-0.24%	-0.285	NO	-2.33%	-0.936	NO
-3	6/21/2016	-0.10%	-0.120	NO	-2.09%	-0.892	NO
-4	6/20/2016	-0.32%	-0.386	NO	-1.99%	-0.908	NO
-5	6/17/2016	0.04%	0.046	NO	-1.67%	-0.823	NO
-6	6/16/2016	-1.35%	-1.634	NO	-1.71%	-0.923	NO
-7	6/15/2016	-0.43%	-0.516	NO	-0.36%	-0.215	NO
-8	6/14/2016	0.16%	0.190	NO	0.07%	0.050	NO
-9	6/13/2016	0.20%	0.236	NO	-0.09%	-0.073	NO
-10	6/10/2016	-0.28%	-0.339	NO	-0.28%	-0.339	NO

Picture 4.2.
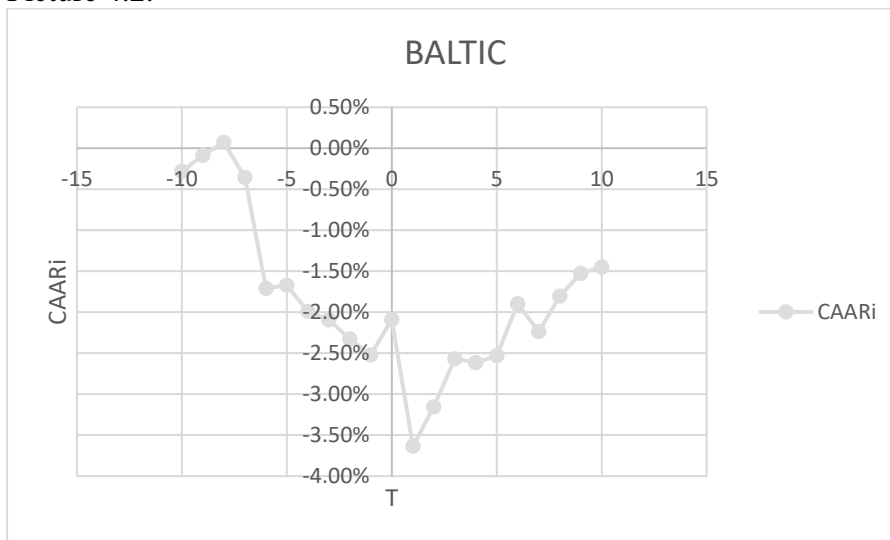
Table 4.3.

		tCAARi	SIGN?	Robustness		tCAARi	SIGN?
CAARi (-1, +1)	-3.43%	-2.101	YES	CAARi (-3, -1)	0.71%	0.336	NO
CAARi (-2, +2)	-1.28%	-0.607	NO	CAARi (-5, -1)	2.76%	1.310	NO
CAARi (-3, +3)	-0.72%	-0.288	NO	CAARi (-10, -1)	-1.24%	-0.590	NO
NORDIC							
T	Date	AARi	tAARi	SIGN?	CAARi	tCAARi	SIGN?
10	7/8/2016	0.35%	0.374	NO	-3.12%	-0.721	NO
9	7/7/2016	0.70%	0.745	NO	-3.47%	-0.823	NO
8	7/6/2016	-0.87%	-0.927	NO	-4.17%	-1.015	NO
7	7/5/2016	-1.45%	-1.539	NO	-3.30%	-0.824	NO
6	7/4/2016	-0.71%	-0.755	NO	-1.85%	-0.475	NO
5	7/1/2016	1.47%	1.556	NO	-1.13%	-0.301	NO
4	6/30/2016	0.07%	0.074	NO	-2.60%	-0.712	NO
3	6/29/2016	0.78%	0.827	NO	-2.67%	-0.757	NO
2	6/28/2016	1.23%	1.309	NO	-3.45%	-1.015	NO
1	6/27/2016	-6.00%	-6.364	YES	-4.69%	-1.434	NO
0	6/24/2016	2.56%	2.714	YES	1.32%	0.421	NO
-1	6/23/2016	0.01%	0.010	NO	-1.24%	-0.417	NO
-2	6/22/2016	0.92%	0.975	NO	-1.25%	-0.443	NO
-3	6/21/2016	-0.22%	-0.233	NO	-2.17%	-0.814	NO
-4	6/20/2016	1.49%	1.576	NO	-1.95%	-0.782	NO
-5	6/17/2016	0.57%	0.601	NO	-3.44%	-1.489	NO
-6	6/16/2016	-1.66%	-1.756	NO	-4.01%	-1.900	NO
-7	6/15/2016	0.92%	0.971	NO	-2.35%	-1.246	NO
-8	6/14/2016	-1.86%	-1.968	YES	-3.27%	-1.999	YES
-9	6/13/2016	0.07%	0.075	NO	-1.41%	-1.056	NO
-10	6/10/2016	-1.48%	-1.569	NO	-1.48%	-1.569	NO

Picture 4.3.
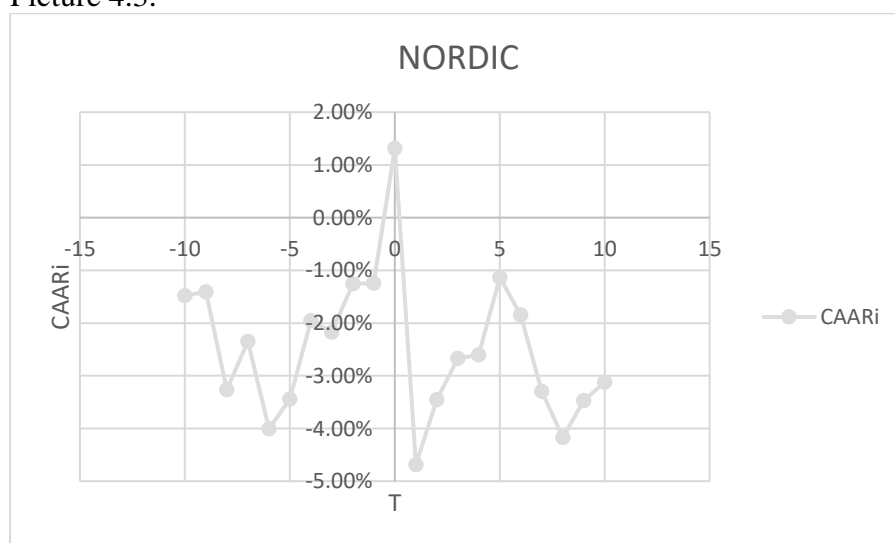
Table 4.4.

		tCAARi	SIGN?	Robustness		tCAARi	SIGN?
CAARi (-1, +1)	-11.10%	-7.863	YES	CAARi (-3, -1)	0.93%	0.512	NO
CAARi (-2, +2)	-8.41%	-4.615	YES	CAARi (-5, -1)	5.59%	3.066	YES
CAARi (-3, +3)	-7.28%	-3.376	YES	CAARi (-10, -1)	1.84%	1.009	NO
BRITISH ISLES							
T	Date	AARi	tAARi	SIGN?	CAARi	tCAARi	SIGN?
10	7/8/2016	0.37%	0.453	NO	-8.07%	-2.160	YES
9	7/7/2016	0.59%	0.720	NO	-8.44%	-2.315	YES
8	7/6/2016	-1.31%	-1.606	NO	-9.03%	-2.540	YES
7	7/5/2016	-1.28%	-1.565	NO	-7.72%	-2.231	YES
6	7/4/2016	-1.12%	-1.377	NO	-6.44%	-1.916	NO
5	7/1/2016	1.34%	1.649	NO	-5.32%	-1.631	NO
4	6/30/2016	-0.29%	-0.352	NO	-6.66%	-2.110	YES
3	6/29/2016	1.55%	1.899	NO	-6.38%	-2.090	YES
2	6/28/2016	1.79%	2.202	YES	-7.92%	-2.696	YES
1	6/27/2016	-6.74%	-8.274	YES	-9.72%	-3.441	YES
0	6/24/2016	-4.81%	-5.904	YES	-2.97%	-1.100	NO
-1	6/23/2016	0.46%	0.559	NO	1.84%	0.713	NO
-2	6/22/2016	0.89%	1.097	NO	1.38%	0.566	NO
-3	6/21/2016	-0.42%	-0.511	NO	0.49%	0.212	NO
-4	6/20/2016	3.37%	4.139	YES	0.91%	0.420	NO
-5	6/17/2016	1.28%	1.572	NO	-2.47%	-1.236	NO
-6	6/16/2016	-0.70%	-0.856	NO	-3.75%	-2.057	YES
-7	6/15/2016	0.28%	0.342	NO	-3.05%	-1.872	NO
-8	6/14/2016	-1.38%	-1.694	NO	-3.33%	-2.359	YES
-9	6/13/2016	-0.77%	-0.943	NO	-1.95%	-1.691	NO
-10	6/10/2016	-1.18%	-1.448	NO	-1.18%	-1.448	NO

Picture 4.4.

BRITISH ISLES

Table 4.5.

		tCAARi	SIGN?	Robustness		tCAARi	SIGN?
CAARi (-1, +1)	-1.36%	-1.159	NO	CAARi (-3, -1)	0.41%	0.273	NO
CAARi (-2, +2)	-0.06%	-0.041	NO	CAARi (-5, -1)	0.55%	0.365	NO
CAARi (-3, +3)	-0.45%	-0.249	NO	CAARi (-10, -1)	0.61%	0.405	NO
BALKANS							
T	Date	AARi	tAARi	SIGN?	CAARi	tCAARi	SIGN?
10	7/8/2016	-0.28%	-0.421	NO	1.16%	0.375	NO
9	7/7/2016	0.35%	0.519	NO	1.45%	0.478	NO
8	7/6/2016	0.21%	0.315	NO	1.09%	0.372	NO
7	7/5/2016	0.90%	1.335	NO	0.88%	0.308	NO
6	7/4/2016	-0.10%	-0.149	NO	-0.02%	-0.007	NO
5	7/1/2016	0.28%	0.409	NO	0.08%	0.030	NO
4	6/30/2016	0.05%	0.076	NO	-0.20%	-0.075	NO
3	6/29/2016	-0.30%	-0.438	NO	-0.25%	-0.098	NO
2	6/28/2016	0.77%	1.134	NO	0.05%	0.020	NO
1	6/27/2016	0.03%	0.037	NO	-0.72%	-0.306	NO
0	6/24/2016	-1.35%	-2.004	YES	-0.74%	-0.331	NO
-1	6/23/2016	-0.03%	-0.041	NO	0.61%	0.286	NO
-2	6/22/2016	0.53%	0.781	NO	0.64%	0.315	NO
-3	6/21/2016	-0.09%	-0.129	NO	0.11%	0.058	NO
-4	6/20/2016	0.10%	0.152	NO	0.20%	0.111	NO
-5	6/17/2016	0.04%	0.054	NO	0.10%	0.058	NO
-6	6/16/2016	-0.27%	-0.402	NO	0.06%	0.039	NO
-7	6/15/2016	0.71%	1.052	NO	0.33%	0.245	NO
-8	6/14/2016	-0.18%	-0.269	NO	-0.38%	-0.324	NO
-9	6/13/2016	0.31%	0.459	NO	-0.20%	-0.207	NO
-10	6/10/2016	-0.51%	-0.752	NO	-0.51%	-0.752	NO

Picture 4.5.
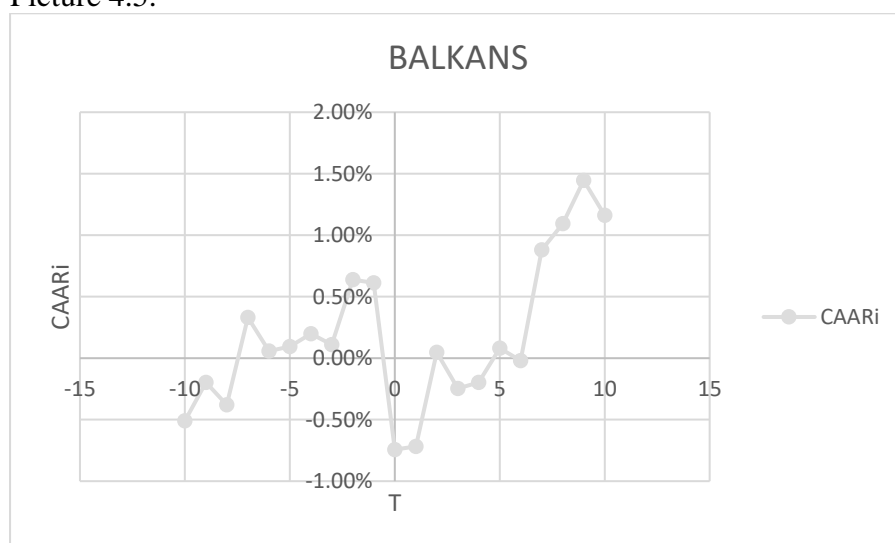
9.5 METRIC EXPLANATION SPECIFICATIONS TESTS

Model Metric Explanation: OLS, using observations 1-27
Dependent variable: CAR (-1, +1)

	Coefficient	Std. Error	t-ratio	p-value	
Const.	0.0248651	0.0105073	2.366	0.0268	**
Debt/GDP	−0.0340382	0.0117764	−2.890	0.0083	***
Openness	−0.485372	0.134661	−3.604	0.0015	***
CARi (-5, +1)	−0.682741	0.193747	−3.524	0.0018	***

Mean dependent var.	−0.042498	S.D. dependent var.	0.036504
Sum squared residuals	0.008377	S.E. of regression	0.019084
R-squared	0.758214	Adjusted R-squared	0.726677
F(3, 23)	24.04180	P-value(F)	2.83e-07
Log-likelihood	70.74313	Akaike criterion	−133.4863
Schwarz criterion	−128.3029	Hannan-Quinn	−131.9450

t (23, 0.025) = 2.069

Variable	Coefficient	95% confidence interval
Const.	0.0248651	(0.00312901, 0.0466011)
Debt/GDP	-0.0340382	(-0.0583995, -0.00967694)
Openness	-0.485372	(-0.763941, -0.206804)
CARi (-5, +1)	-0.682741	(-1.08354, -0.281946)

Restriction sets:
1: b [Debt/GDP] = 0
2: b [Openness] = 0
3: b [CARi (-5, +1)] = 0

Test statistic: F (3, 23) = 24.0418, with p-value = 2.82727e-007

Restricted estimates:

	coefficient	std. error	t-ratio	p-value	
Const.	−0.0424975	0.00702520	−6.049	2.17e-06	***
Debt/GDP	0.000000	0.000000	NA	NA	
Openness	0.000000	0.000000	NA	NA	
CARi51	0.000000	0.000000	NA	NA	

Standard error of the regression = 0.036504

Summary Statistics, using the observations 1 - 27
for the variable uhat1 (27 valid observations)

Mean	Median	Minimum	Maximum
1.1179e-017	-0.0036478	-0.026918	0.036580
Std. Dev.	C.V.	Skewness	Ex. kurtosis
0.017950	undefined	0.37371	-0.85813
5% Perc.	95% Perc.	IQ range	Missing obs.
-0.026145	0.035612	0.030692	0

Test for normality of uhat1:

Doornik-Hansen test = 2.15974, with p-value 0.339639

Shapiro-Wilk W = 0.957251, with p-value 0.319369

Lilliefors test = 0.0990377, with p-value ~= 0.7

Jarque-Bera test = 1.45692, with p-value 0.482652

Auxiliary regression for RESET specification test
OLS, using observations 1-27
Dependent variable: CAR11

	coefficient	std. error	t-ratio	p-value
Const.	−0.00188779	0.0281816	−0.06699	0.9472
Debt/GDP	−0.0143687	0.0304249	−0.4723	0.6416
Openness	−0.146408	0.378187	−0.3871	0.7026
CARi (-5, +1)	−0.510966	0.538410	−0.9490	0.3534
yhat^2	0.544815	16.9230	0.03219	0.9746
yhat^3	48.0446	97.8931	0.4908	0.6287

Test statistic: F = 3.354355,
with p-value = P (F (2,21) > 3.35436) = 0.0544

Augmented regression for Chow test
OLS, using observations 1-27
Dependent variable: CAR11

	coefficient	std. error	t-ratio	p-value	
Const.	0.00269672	0.0149225	0.1807	0.8585	
Debt/GDP	−0.0345263	0.0144124	−2.396	0.0271	**
Openness	0.0909822	0.265532	0.3426	0.7356	
CARi (-5, +1)	−0.905977	0.232045	−3.904	0.0010	***
splitdum	0.0315604	0.0195847	1.611	0.1236	
sd_Debt/GDP	0.00142810	0.0220614	0.06473	0.9491	
sd_Openness	−0.817674	0.303301	−2.696	0.0143	**
sd_CARi(-5, +1)	0.487521	0.352037	1.385	0.1821	

Mean dependent var.	−0.042498	S.D. dependent var.	0.036504
Sum squared residuals	0.005518	S.E. of regression	0.017042
R-squared	0.840727	Adjusted R-squared	0.782048
F (7, 19)	14.32748	P-value(F)	2.27e-06
Log-likelihood	76.37853	Akaike criterion	−136.7571
Schwarz criterion	−126.3904	Hannan-Quinn	−133.6745

Chow test for structural break at observation 14
F (4, 19) = 2.46081 with p-value 0.0804

White's test for heteroskedasticity
OLS, using observations 1-27
Dependent variable: uhat^2

	coefficient	std. error	t-ratio	p-value
Const.	0.000103747	0.000905443	0.1146	0.9101
Debt/GDP	0.000339473	0.00169241	0.2006	0.8434
Openness	0.00310713	0.0168971	0.1839	0.8563
CARi (-5, +1)	0.0110075	0.0167088	0.6588	0.5189
sq_Debt/GDP	−0.000349049	0.000926800	−0.3766	0.7111
X2_X3	−0.00536326	0.0173467	−0.3092	0.7609
X2_X4	0.00598116	0.0151117	0.3958	0.6972
sq_Openness	0.0465027	0.0790760	0.5881	0.5642
X3_X4	−0.185081	0.313300	−0.5907	0.5625
sq_CARi51	−0.0526905	0.182512	−0.2887	0.7763

Unadjusted R-squared = 0.145390

Test statistic: TR^2 = 3.925532,
with p-value = P (Chi-square (9) > 3.925532) = 0.916245
Model 2: OLS, using observations 1-27
Dependent variable: CAR (-1, +1)
Heteroskedasticity-robust standard errors, variant HC1

	Coefficient	Std. Error	t-ratio	p-value	
Const.	0.0248651	0.0110323	2.254	0.0340	**
Debt/GDP	−0.0340382	0.0111040	−3.065	0.0055	***
Openness	−0.485372	0.147905	−3.282	0.0033	***
CARi51	−0.682741	0.171569	−3.979	0.0006	***

Mean dependent var.	−0.042498	S.D. dependent var.	0.036504
Sum squared residuals	0.008377	S.E. of regression	0.019084
R-squared	0.758214	Adjusted R-squared	0.726677
F (3, 23)	25.20603	P-value(F)	1.88e-07
Log-likelihood	70.74313	Akaike criterion	−133.4863
Schwarz criterion	−128.3029	Hannan-Quinn	−131.9450

9.5.1 Overall Results of the Tests:

9.5.1.1 *RESET test for specification -*

Null hypothesis: specification is adequate

Test statistic: $F(2, 21) = 3.35436$

with p-value $= P(F(2, 21) > 3.35436) = 0.0544291$

9.5.1.2 *Chow test for structural break at observation 14 -*

Null hypothesis: no structural break

Test statistic: $F(4, 19) = 2.46081$

with p-value $= P(F(4, 19) > 2.46081) = 0.0804108$

9.5.1.3 *White's test for heteroskedasticity -*

Null hypothesis: heteroskedasticity not present

Test statistic: $LM = 3.92553$

with p-value $= P(\text{Chi-square}(9) > 3.92553) = 0.916245$