UNIVERSITÀ CATTOLICA DEL SACRO CUORE
Dipartimento di Economia e Finanza

Working Paper Series

The impact of ECBs conventional and unconventional monetary policies on European banking indexes returns

Salvatore Perdichizzi

Working Paper n. 59

May 2017

The impact of ECBs conventional and unconventional monetary policies on European banking indexes returns

Salvatore Perdichizzi
Università Cattolica del Sacro Cuore

Working Paper n. 59
May 2017

Dipartimento di Economia e Finanza
Università Cattolica del Sacro Cuore
Largo Gemelli 1 - 20123 Milano – Italy
tel: +39.02.7234.2976 - fax: +39.02.7234.2781
e-mail: dip.economiaefinanza@unicatt.it

The impact of ECBs conventional and unconventional monetary policies on European banking indexes returns

Salvatore Perdichizzi*

May 16, 2017

Abstract

This paper investigates how conventional and unconventional monetary policies announcements affect European banking indexes returns through an event-study analysis. We use data of 11 European banking indexes for the periods 1999-2015. We examine the state dependency of such effects and focus on the surprise elements of policy changes derived from the Euribor futures market. Overall, we find a positive relation between the unexpected changes in the ECBs reference rate and European banking indexes returns. We also discover that the effect is stronger during the financial crisis, especially during the sovereign debt crisis. Moreover, we identify a positive relation between the announcements of unconventional policies and the European banking indexes returns , particularly where the banking system was more risky such as Spain, France and Italy but with a low degree of magnitude than expected. Hence, the Euro banks reactions to monetary policies announcements seem to be more relevant through conventional measures with respect to non-conventional ones.

JEL CLASSIFICATION: G01, G014, G018, E44, E52.
Keywords: Banking,Conventional and Unconventional Monetary Policy, Interest rate, ECB.

Acknowledgement

This research was supported by the Department of Economics and Finance at UCSC. I thank Prof. Kenneth N. Kuttner (Chair Robert F. White Class of 1952 Professor of Economics, Williams College) for assistance with methodology and for comments that greatly improved the manuscript. I would also like to show my gratitude to Prof. Andrea Monticini for sharing their pearls of wisdom with me during the course of this research. Also, I thank 2 anonymous reviewers for their so-called insights. I am also immensely grateful to Prof. Andrea Boitani (Full Professor UCSC), Prof. Matteo Manera (Full Professor, University of Milan - Bicocca) and Prof. Lorenzo Cappellari (Full Professor, UCSC) for their comments on an earlier version of the manuscript, although any errors are mine own and should not tarnish the reputations of these esteemed persons.

*Department of Economics and Finance, Catholic University of Sacred Heart, via Necchi 5, 20123 Milan, Italy email:salvatore.perdichizzi@unicatt.it. and Department of Management, University of Bologna, Italy. Email: salvator.perdichizzi@unibo.it

1 Introduction and a review of the literature

The impact of monetary policy on stocks prices has been a topic of great interest to policymakers and market participants. This is for microeconomic reason, such as to evaluate the substitution and income effects on market agents, and to assess the transmission mechanism of monetary policy. Since the financial crisis began in 2007, central banks worldwide have performed a series of monetary policies measures: either conventional or unconventional. The ultimate goal of monetary policy interventions implemented during the crisis has been restore monetary stability and thus reestablish the stability of financial and banking system. To face the crisis, the central banks reduced their key policy interest rates to unprecedented low levels. Furthermore, to overcome the malfunctioning of the interbank market, they facilitated with a number of non-standard policies, as monetary easing and liquidity provision. The literature on the effect of monetary policies throughout the years could be divided into two main areas. The first has dealt on the relationship between monetary policies and the relevant macroeconomic variables, such as interest rates and / or inflation; the second analyzed the impact of monetary policies on financial markets. The literature on financial markets is segmented between those who focus on equity portfolios equi-distributed or stock indexes, others that analyze the impact on different industries and others investigate the impact on the banking system (which are the main actors of the transmission mechanism of monetary policy). Generally it is found that market interest rates are positively related to changes in the federal funds rate target. Short-term interest rates are more responsive than long-term interest rates to such changes (Cook and Hahn 1989, Thornton 1998; Kuttner 2001). Furthermore, it was found an inverse relationship between general stock market returns and monetary policies shocks. There are several comprehensive reasons why an unexpected funds rate increase may leads to a decline in stock prices: it may be associated with a decrease in expected future dividends, a rise in the future expected real interest rates used to discount those dividends, or an increase in the expected excess returns (e.g., the equity premiums) associated with holding stocks. The literature may be divided into a set of articles that show a strong stock returns respond to surprise changes in federal funds rate and into another set of articles that examine how monetary policy has asymmetric impact on stock returns with asymmetries linked to firm characteristics (sector, size, capital intensity, and financial constraints) or macroeconomic conditions. The first set pass through Thorbecke (1997). He uses a VAR system that includes monthly equity returns, output growth, inflation, and the federal funds rate. He discovers that monetary policy shocks, measured by orthogonalized innovations in the federal funds rate, have a greater impact on smaller capitalization stocks, this is in line with the hypothesis that monetary policy affects firms access to credit (Gertler & Gilchrist, 1993). He finds that expansionary monetary policy exerts a large and statistically significant positive effect on monthly stock returns. Patelis (1997) and Lastrapes (1998) have also found a positive relation between the expansionary monetary policy and stock market returns. Patelis (1997) examines whether some portion of the observed predictability in excess US stock returns can be attributed to shifts in the monetary policy stance. Following Fama and French (1989) (they employ the long-horizon regression methodology, using two sets of explanatory variables: monetary policy variables and financial variables), Patelis explains that monetary policy indicators are significant predictors of excess stock returns, that are relate to the financial propagation mechanism (Bernanke & Gertler, 1989) and to the credit channel of monetary policy transmission (Bernanke & Gertler, 1995). Jensen and Johnson (1995) also find that monetary policy developments are associated with patterns in stock returns. Rigobon and Sack (2004) used the policy shocks that take place on certain dates such as the days of FOMC and documented a positive linkage between expansionary monetary policies and stock movements. Cassola e Morana (2004) use a co-integrated VAR system including real GDP, inflation, real M3 balances, short term interest rate, bond yield, and real stock prices in order to examine the transmission mechanism of monetary policy in the Euro area. Their results from impulse response analysis indicate that a permanent positive monetary shock has a temporary positive effect on real stock prices. Others as Jensen, Mercer and Johnson (1996) found that stock return is higher in tight monetary policy regime than expansionary monetary policy regime. Bernanke and Kuttner (2005) follow a more traditional event-study approach where they control directly for certain kinds of information jointly influencing monetary policy and stock return. They show that an unexpected 25-basis point cut in the federal funds target rate leads to a one percent increase in the level of stock prices on average. Policymakers recognize that the stock market is an important conduit of monetary policy that can be used to influence real economic activity. Stock prices affect the real economy through a number of channels. Fluctuations in stock prices affect the firms' cost of capital and their capacity to raise new capital and invest. Another channel is the wealth effect of stock prices on consumption and economic growth. According to them, such a policy action elicits a positive response because it favorably affects the future dividend streams, reduces the discount rate and increases the equity market premium. This line of study has been extended to foreign stock markets, as globalization and the technological revolution have made the global markets tightly interlinked with each other. The other set of articles examine how monetary policy has asymmetric impacts on stock return begin with Kaul (1987). He showed that the relations among monetary policy, inflation, and stock return could be either positive or negative depending on whether monetary policy is pro-cyclical or counter-cyclical. McQueen and Roley (1993) find that in periods of strong economic growth the stock market responds significantly to

news about prices and real activity. Conover, Jensen, and Johnson (1999) find that stock returns, in twelve OECD countries over the period 1956-1995, are generally higher in expansive local monetary environments than they are in restrictive environments. As in Jensen and Johnson (1995) and Jensen et al. (1996), the monetary policy proxy used by Conover et al. (1999) is a dummy variable based on discount rate changes. Jensen et al. (1996) show that this categorization of monetary regimes effectively differentiates US monetary conditions. Ehrmann and Fratzscher (2004) find that more financially constrained firms are strongly influenced by surprise changes of monetary policy. Guo (2004) reports that smaller firms' returns are strongly influenced by monetary policy compared to larger firms, and recession makes this differential even larger. Du (2006) found that changes in money supply and its consequential inflation could have different effects on stock returns during different monetary policy regimes. Empirical results showed a positive relation among money supply, inflation and stock return during pro-cyclical monetary policy regime. The relation becomes negative during counter-cyclical monetary policy regime. Andersen et al. (2007) find that good economic news tend to have negative effect on stock market in economic expansion and positive effect in recession. Andersen et al. (2007) do not find a significant state dependence in the reaction of stock market to monetary news. Chen (2007) points out that monetary policy has a larger effect on stock returns in bear markets then in bull markets. He argues that this asymmetric reaction could be explained by cyclical fluctuations in the level of financial constraints faced by firms. Perez-Quiros and Timmermann (2000) confirm is results. Garg (2008) conducted an empirical research about the effects of changes in federal fund rate on stock prices in different sectors. His work showed that stock prices and interest rate move in the same direction, indicating an expansionary monetary policy might deteriorate stock performance. Basistha and Kurov (2008) argue that stocks' reaction to monetary news is stronger in recessions and in tight credit market conditions than in expansion. They provide evidence that the state dependence in the stock market's response to monetary news is consistent with the credit channel of monetary policy transmission. Kurov (2010) finds that monetary policy shocks have strong influence on market participants' sentiment, and this impact is even stronger in a bear stock market. Jansen and Tsai (2010) showed that monetary policy shocks in bear market is large, negative, and statistically significant. In the international context, Wongswan (2009) has found that a hypothetical 25 basis points Fed rate cut elicits a response of 0.5 to 2.5 percent increase in foreign equity price indices. In the same line Ehrmann and Fratzscher (2009), Hausman and Wongswan (2011) state that foreign equity returns respond positively to unanticipated interest rate cut by Fed. They attribute the cross-country variation in responses to the level of financial market integration and the degree of exchange rate flexibility of the country. Banks are an import part of the monetary policy transmission channel. Two streams of literature emphasize the relationship between banks performance and monetary policies. A strand of literature has focused on the relation between monetary policy shocks and bank profitability through income and balance sheet channel. Others, on the relation between bank stock prices and monetary policy. Demirg-Kunt and Huizinga (1999) outline that high real interest rates are associated with higher interest margins and profitability, especially in developing countries where deposits frequently pay below-market interest rates. Albertazzi and Gambacorta (2009), find a significant relationship between net interest rate income and the yield curve slope. Memmel (2011) discovers that maturity transformation contributes to bank income and exposes banks to interest rate risk, which varies systematically with the slope of the yield curve. Bolt et al (2012) obtain similar results using bank-level data and allowing for asymmetrical effects over the business cycle. Only few studies have specifically focused on the impact of interest rates on bank profitability. Alessandri and Nelson (2014) establish a positive long-run link between the level and slope of the yield curve and bank profitability in the United Kingdom. C. Borio, L. Gambacorta and B. Hofmann (2015) find a positive relationship between the level of short-term rates and the slope of yield curve and bank profitability. The authors suggest that the positive impact of interest rate structure on net interest income dominates the negative one on loan loss provisions and on non-interest income. In addition, they find that the effect is stronger when the interest rate level is lower and the slope is less steep. Recalling that commercial banks play an instrumental role in the transmission of monetary policy through financial market. Due to the interest rate sensitivity of assets and liabilities, bank stock returns seem to be particularly responsive to changes in the federal funds rate target. Bae (1990), Kwan (1991), Akella and Greenbaum (1992), and Lumpkin and OBrien (1997) analyzed how vary the reaction of bank stock returns to interest rate changes depending on the maturity transformation. Although using a variety of different measures of maturity transformation, the general conclusion reached is that a greater asset-liability mismatch is associated with a greater sensitivity of bank stock returns to interest rate changes. Bank equity prices and bank equity returns, depend on both common and bank-specific factors (e.g., Madura and Schnusenberg 2000; Cooper et al., 2003; Castrn et al., 2006; Fiordelisi and Molyneux, 2010). The existing literature on bank stock returns and federal funds rate target changes suggests that the effects of federal funds rate target changes on bank stock returns vary across banks, depending on specific bank characteristics. For the U.S. banking industry, there are different pre-crisis studies finding an inverse relationship between the soundness of banks and their sensitivity to monetary policy shocks, and hence providing evidence in favor of market discipline. Yin et al. (2010) present a detailed discussion of how interest rate changes may affect bank equity returns. Not only

interest rate changes influence the interest margin, also, it affects the loan demand, the value of guarantees provided by debtors, and on their ability to repay the loan. Recalling how banks stock returns respond to monetary policy not only reflects its impact on bank performance, but is also a barometer for the effectiveness of monetary policy in regulating the economy. They find an inverse relationship between bank stock returns and federal funds rate target changes. More importantly, they point out that bank stock returns only respond to surprise changes in the federal funds rate target. Moreover, banks with higher liquidity ratios are less sensitive to monetary policy interventions than banks experiencing liquidity tensions (Yin and Yang (2013)). More in detail, the authors concentrate on the amount of non-deposit finding. Since it is excluded from deposit insurance, wholesale founding is more sensitive to changes in the credit risk profile of borrowers and to the interest rate environment. Results show that high capitalization, liquidity and market power generally tend to smooth the effects of a change in policy interest rates. Surprisingly, while there are several studies dealing with the effect of monetary policy interventions on bank stock returns, there are only two empirical analyses (Fiordalisi et al. 2014, Ricci 2015) including the financial crisis and focusing on the Eurozone. In addition, there is no evidence, in the literature, on the joint impact of conventional and unconventional ECB's policies announcements in the Eurozone. Consequently, while there are some empirical evidence about the impact of interest rate decisions on bank equity returns, there are no findings on the European Banking sector (only Eurozone), from the existence of European Central Bank neither during the various crisis periods. Accordingly, this paper is the first who investigates the announcement effect of conventional and unconventional monetary policy on the European banking sector (from 1 January 1999 to 14 September 2015) by distinguishing its four stages: 1) the U.S. sub-prime crisis (from 1 June 2007 to 31 December 2009), 2) the European sovereign debt crisis (1 October 2009 to 14 September 2015), 3) the first phase of European sovereign debt crisis (1 October 2009 to 31 October 2011), 4) the second phase of European sovereign debt crisis (1 November 2011 to 14 September 2015). Specifically, we selected a wide set of monetary policy announcements between January 1999 and September 2015. The different sub-periods have been selected exogenously. With regard to the beginning and the end of the US sub-prime crisis, we followed the indications of the Business Cycle Dating Committee of the National Bureau of Economic Research[1]. The European debt crisis erupted in the wake of the Great Recession (U.S. sub-prime crisis) around late 2009, and was characterized by an environment of overly high government structural deficits and accelerating debt levels. We decide to differentiate the US sub-prime crisis with respect to the Eurozone crisis that erupted at the end of 2009 since several Eurozone member states (Greece, Portugal, Ireland, Spain) were unable to repay or refinance their government debt or to bail out over-indebted banks under their national supervision without the assistance of third parties like other Eurozone countries, the European Central Bank (ECB), or the International Monetary Fund (IMF). The European debt crisis has experienced several stages. In the paper, we decided to consider two different sub-periods. The first from 1 October 2009 to 31 October 2011 and the second from 1 November 2011 until September 2015. The European Central Bank in April and July 2011 raised the referenced interest rate by a total of 50 basis points. From November 2011, the ECB realized that it was in progress the greatest economic crisis in Europe as the negative economic data has depicted, for that reason it has again carried out an expansionary monetary policy. For these reasons, we decided to investigate which are the different impacts of conventional and non-conventional policies in the two different sub-periods of the European sovereign debt crisis[2]. We estimate the European Banks stocks reaction around their announcements. In this framework, the analysis aims to answer at the following question. (1) Which are the effect of ECB monetary policy on the large banks of EU? (2) Are there any changes during the different crisis periods? Which are the Countries mostly affected? (3) What it is the effect of unconventional policies during the different crisis periods? Which are the countries mostly affected?

2 Data and Methodology

In this section, we explain our empirical methodology. In Subsection 2.1,we describe our data. In Subsection 2.2, we present our empirical model, which enables the estimation of conventional and unconventional monetary policies effects.

2.1 Data

Our data cover the period from January 1999 to September 2015. The number of conventional policy event is 231. Our data set comprises monetary policies indicators (both surprise and expected components), index returns for the European banks (EuroStoxx Bank), Euro country banks specific indexes and two types of dummy variables (ECB

[1]In this case, they determine the period of recession from December 2007 (IV) - June 2009 (II), as the macroeconomic data as well as employment and output gap, return to the levels before crisis in the last quarter of 2009, we decided to consider the 2009 entirely.

[2]Let us consider how break of the first period the last increase in the ECB reference rate and the latter start with the cut in the ECB reference rate from November 2011

announcement dummy and unconventional monetary policy dummy). Table 1 presents a statistical summary for the absolute value of expected and unexpected changes. The unexpected interest rate component is defined as the deviations from the 3-month Futures Euribor rate at time t and the 3-month Future Euribor at time *t-1* ($News_t$ = *f.Euribor*$_{m,t}$ - *f.Euribor*$_{m,t-1}$). In addition, the expected interest rate component, E_ECB, is define as the deviations from the actual target changes (Δ ECB reference rate) on day of the ECB announcement and the surprise component ($E\_ECB = \Delta R - News_t$; where E_ECB represents the expected component and ΔR represents the actual target rate changes (by ECB) on the announcement day).
The mean expected change is 1.4 basis points, compared to 0.08 basis points for the unexpected change. In addition, the standard deviation of the expected change is 0.173, whereas that for the unexpected change is only 0.054. If we consider the different sub-periods the mean and the standard deviation changes as a follow. During the Great Recession, the expected change mean is 4.7 basis points, compared to 0.21 basis points for unexpected change. The standard deviation is 0.53 for the expected change, while is 0.165 for the unexpected change. During the first phase of sovereign debt crisis, the mean expected change is 2.3 basis points, as for unexpected change is 0.36 basis points (the s.d. is 0.089 for unexpected change and 0.053 for expected change). Finally, during the second phase of sovereign debt crisis the mean expected change is 4.2 basis points, distinguished to 0.09 basis points for the unexpected change. (the s.d. is 0.024 for unexpected change and for 0.11 expected change). Table 2 shows a statistical summary for the European banking index return (EuroStoxx Bank) and the bank indexes returns that make up the EuroStoxx bank index. The figure 1 presents the histogram for the European banking indices returns. In general, EuroStoxx bank index mean is -1.5 basis points and standard deviation is 1.88. Throughout the Great Recession, the EuroStoxx bank index mean return the decrease to -5.77 basis points and standard deviation increase to 2.33. Vice versa, if we consider the first phase of the sovereign debt crisis the mean index return is -14.13 basis points and the standard deviation increase to 2.45 respect to Great Recession. Moreover, during the second phase of sovereign debt crisis the mean return became positive 2.2 basis points and its standard deviation decrease to 1.92. We immediately note that during the various crisis periods the mean and the standard deviation of expected and unexpected changes of ECB's policy rate and the indexes returns of European banking varies across time.

2.2 Methodology

The efficient markets hypothesis implies that, because financial markets are forward looking, only the unexpected portions of monetary policy change should influence asset prices and it should do so very quickly (Fama, 1970). Therefore, any study of monetary policy must decompose actions into expected and unexpected portions; that decomposition depends on market perceptions of Central bank objectives, procedures, and communications. The large literature has used two main methods to study the effects of monetary shocks on macroeconomic variables and stock prices: vector auto-regressions (VARs) and studies of high-frequency monetary shocks on asset prices. The VARs methodology offer the advantage of directly studying the effects of monetary policy shocks on key variables-prices, output, and employment-rather than indirectly studying them through their effects on asset prices. That is, VAR analysis requires controversial identification assumptions to identify simultaneous causality because time aggregation of data to lower frequencies- such as the monthly or quarterly data used in VAR analysis - generally produces simultaneous causality in economic data even if there is unidirectional causality at very high frequencies. It is far easier to identify the effect of high-frequency (e.g. daily) monetary shocks on asset prices. If monetary policy instrument and market expectations for its value are known, then it is possible to characterize the impact of monetary policy shocks-deviations from expectations - on asset prices, which react quickly to news and transmit monetary policy to the economy. When a central bank makes a discrete change to policy, the monetary surprise changes expectations immediately- by definition - and it is easy to determine the effects of such surprises on asset prices, which inform us about the transmission of all monetary policy. Kuttner (2001) claims that federal funds futures offer three advantages over other procedures to identify expectations of monetary policy: (i) Futures require no model; (ii) futures data are not revised and so there is no data vintage problem; and (iii) futures do not entail an errors-in-variables problem as do VARs. Some would criticize the use of regressions to determine the effect of changes in the federal funds target on the grounds that the effect of the announcement change on asset prices is measured only over one day (monetary policy event) - or a few days - and might be temporary. Such criticisms are misplaced. Because uncertainty about asset prices usually rises with the forecast horizon, no one can know the long-term effects of any event on asset prices. The efficient markets hypothesis implies that the market's best guess must have been that the effects of the rate target change would persist. Otherwise, expectations of a temporary impact of a policy announcement would create a risk-arbitrage opportunity for investors to bet on the reversal of the policy's effects. The approach to measuring the impact of Central Bank policy on the stock market is to calculate the market's reaction to rate target changes on the day of the change. The market may of course also react to the lack of a change in the rate target, if a change had been anticipated. Because this approach involves looking at the response to specific events, it might be described as an event-study style of analysis.

For the purpose of this paper, the relevant sample of events is defined as the union of all days when the rate target was changed, and days corresponding to ECB meetings. In this paper, the methodology follows a modified methodology implemented by Bernanke and Kuttner (2005) and corrects for the joint response bias as Thornton (2009, 2013) has shown in its studies. Specifically, it uses the market based measure on all days as a latent variable. The latent variable accounts for the relationship between asset prices and the market-based measure of monetary policy shocks on days when there are no unexpected policy actions. The methodology permits one to identify the marginal effect of monetary policy shocks relative to non-monetary policy shocks. The methodology is simple to employ, requires a simple identifying assumption, and is easily modified to account for the effects of other newsworthy events, such as the market's reaction to other headline news. To estimate the monetary policy effects, we use European banking price indexes as the dependent variable. Equation (1) is estimated using the OLS approach on time series data.

$$\begin{aligned} Return_t = \alpha_0 + \beta_1 News_t + \beta_2 ECBAnnouncement + \\ \beta_3 News_t * ECBAnnouncement + \beta_4 E\_ECB * ECBAnnouncement + \\ \beta_i \sum_{i=1}^{3} Return_{t-i} + \beta_8 QE\_ABS\_CCPP\_COLL + time\ effects + \mu_t \end{aligned} \tag{1}$$

where $Return_t$ is the daily return of the European banking index[3](source Thomson DataStream). The surprise interest rate changes, $News_t$ is defined as the changes in the implied 3-month Euribor rate on the ECB's meeting day, *t*, relative to the previous day, *t-1*. i.e.: $News_t$ = *f.Euribor*$_{m,t}$ - *f.Euribor*$_{m,t-1}$; where *f.Euribor*$_{m,t}$ - *f.Euribor*$_{m,t-1}$ represents the discrepancy between the futures spot rate at day t and the prevailing rate at the day before the announcement, *t-1*. In general, we can interpret the futures price at time *t-1* as the conditional expectation (conditioned with respect to the information set I) of the spot rate (r) at the maturity date (m)[4] . The basic idea is that futures prices reflect market expectations of future policy rates. Therefore, changes of futures prices in response to a monetary policy announcement imply that markets were surprised. We use continuous three-month Euribor futures rates as Bernoth and von Hagen (2004) show that these rates are a reliable predictor for the ECB's policy rates. The sample period under investigation is January 1999-September 2015, yielding 231 ECB meetings; the source of Euribor futures prices is Thomson DataStream. Moreover, we define the expected changes in interest rate E_ECB as the actual changes minus the surprise: $E\_ECB = \Delta R - News_t$; where E_ECB represents the expected component of target changes, and ΔR is the actual target rate changes (by ECB) on day t. $ECBAnnouncement$ is a dummy variable that takes value 1 when the ECB announce a conventional policy (interest rate target). The variable for unconventional measures ($QE\_ABS\_CCPP\_COLL$) is a dummy variable that takes value 1 when the ECB announces an unconventional policy (ABS purchase program, providing liquidity, corporate bond purchase program and QE), 0 otherwise. At its press conferences, the ECB announces its policy decisions. We use these dates for the conventional and unconventional monetary policies announcements. It would be useful to give an intuition of what unconventional means exactly in the European context. For our purpose, we classify as unconventional monetary policy interventions as follows:

- the announcement of the longer-term refinancing operations (LTRO);
- the announcement of asset eligible as a collateral in Eurosystem credit operation (COLL);
- the announcement of covered bond purchase program (CBPP) start on the 7/05/2009; (CBPP2) 06/10/2011; (CBPP3) 15/10/2014;
- the announcement of Outright monetary transaction (OMT)
- the announcement of Asset back securities purchase program (ABSPP)
- the announcement of Public sector purchase program (PSPP)
- the announcement of expansion asset purchase program (Quantitative easing (QE)).

We identify 19 announcements as unconventional policies. The time-line of the announcements is shown in Table 12. Clearly, not all announcements should be expected to be as relevant and therefore to produce the same (or even significant) quantitative effects. What we will see further is that the impact of unconventional policy, changes according to both the various sub periods considered and when we analyze individual euro area countries.

[3]We use EuroStoxx Bank price index for all Europe bank system. Therefore, we estimated the same regression for ten banking indexes, which make up the EuroStoxx bank index. (Austria, Belgium, Spain, France, Germany, Greece, Ireland, Italy, Netherlands, and Portugal).

[4]E($r_m|I_{t-1}$)=$f_{m,t-1}$ and E($r_m|I_t$)=$f_{m,t}$

Finally, as Thornton (2009) and Monticini, Peel and Vaciago (2011) suggest we introduce the futures measure of news for every day ($News_t$ = *f.Euribor*$_{m,t}$ - *f.Euribor*$_{m,t-1}$) to correcting for the joint-response bias (Thornton (2013)). Since the dependent variable is an equity index return, it might be possible that estimates are bias if is present an arch effect. Due to this possibility in the residual variance we implement two different GARCH (1,1) model of Engle (1982) and Bollerslev (1986) (the first specification assume a Gaussian errors, the second one assume that errors follow a Student's t distribution) as in Equation(2)[5].

$$\begin{aligned} Return_t = \alpha_0 + \beta_1 News_t + \beta_2 ECBAnnouncement + \\ \beta_3 News_t * ECBAnnouncement + \beta_4 E\_ECB * ECBAnnouncement + \\ \beta_i \sum_{i=1}^{3} Return_{t-i} + \beta_8 QE\_ABS\_CCPP\_COLL + \mu_t \end{aligned} \tag{2}$$

$$\sigma_t^2 = \alpha_0 + \alpha_1 \mu_{t-1}^2 + \alpha_2 \sigma_{t-1}^2 \tag{3}$$

where σ_{t-1}^2 represents the conditional volatility and μ_{t-1}^2 is the volatility news (squared error arising from an autoregressive (AR) conditional mean equation). The benefit of the GARCH model is that a high-order ARCH may have a more parsimonious GARCH representation that is much easier to identify and estimate. This is particularly true since all the coefficients in the variance equation must be positive. Moreover, to ensure that the variance is finite, all characteristic roots of variance equation must lie inside the unite circle.

3 Results

In this section, we show our empirical results. In Subsection 3.1, we present the results for the EuroStoxx Bank index return. In Subsection 3.2, we exhibit the results for ten banking indices, which make up the EuroStoxx bank index.

3.1 EuroStoxx Bank index return

This section focuses on the direct impact of monetary policy on EuroStoxx Bank index return. Before analyzing different monetary policy effects in the various crisis period, we first estimate the average impact of monetary policy on EuroStoxx bank index return in the whole sample (1/1/1999 - 14/9/2015). To estimate the average impact of monetary policy by using data on EuroStoxx bank index return, we estimate a time series regression as in equations (1) and (2). The empirical results are reported in Tables 3, 4 and 5. Due to the significant non-normality and serial correlation in the residuals, the standard errors for the OLS estimates are obtained by employing a heteroscedasticity and autocorrelation consistent covariance matrix (HAC) which is recommended by Newey and West for regressions applied to time series data. The empirical results show that an unexpected change in ECB rate target has a significant impact on the EuroStoxx bank index return. On average, an unexpected increase of 100 basis point in the ECB rate target leads to an increase of 9.31 basis points in the one-day holding period return on EuroStoxx bank index. If equity markets are efficient, expected policy changes are reflected in prices and only unanticipated policies will affect stock prices. Curiously, the expected change has a significant influence on the Euro Stoxx Bank index return. This might result by the high volatility that hit the banking sector during the sub-prime mortgage crisis and the sovereign debt crisis. Since the dependent variable is an equity index, it might be possible that estimates are bias if is present an arch effect. Due to the significant arch effect in the residual variance I implement two different GARCH estimates (the first specification assume a Gaussian errors, the second one assume that errors follow a Student's t distribution). Table 4 reports the first GARCH specification. The average impact is still positive and statistical significant but with a low degree of magnitude (an unexpected increase of 100 basis points in the ECB reference rate leads to an increase of 4.2 basis points in the announcement day). Moreover, Table 5 reports the second GARCH specification. Even, the average impact of unexpected announcement is positive and statistical significant. Widely, a one per-cent surprise increase in the policy rate leads to an increase in the index of almost 4.53 basis points, which is economically significant. These results imply that the European banking system and market participants perceive positively the announcements of an increase in interest rates by ECB. Under general conditions, the increase of policy rate may have different effects. On one hand, there is the net interest income effect and on other hand, there is the non-interest income effect. In the case of net interest income, at least three mechanisms are relevant: the deposit effect, the quantity effect and the dynamic effect. The deposit effect derives from the fact that bank deposits are priced as a markdown

[5]The same regression is estimated including time effects. The results do not change. The estimates are available on request.

on market rates, reflecting some oligopolistic power of the bank system (Freixas and Rochet (1997)). If there is some oligopolistic power a tightening monetary policy will increase net interest income. The changes in the market rates will also have a quantity effect. The demand for loans is more elastic to interest rates respect to deposit (where is inelastic) as in Klein-Monti (1972) model. If the loan demand is elastic to changes in the lending rate and the deposit supply is inelastic respect to changes in the deposit rate the increase in the policy rate has a positive effect in the net interest income. Finally, the dynamic effect influence the net interest income in two ways. The first is related to lags in price adjustment, reflecting some oligopolistic power of the banking system. Typically, the adjustment takes place within one year. The second form is related to accounting practice. Every benefit from new loans is covered by expected losses. This mean that extending new loans could raise profitability temporarily, since losses materialize few years later where the loans became non-performing. As another consequence, the interest margin might erode in this case. In the case of non-interest income, there are at least two significant effects: on securities, on fees and commission. On balance, a higher interest rate could lead to lower non-interest income and abate the positive effect that it had on net interest income. An increase in the policy rate will generate losses on banks' securities portfolios. The losses will depend from the accounting convention; in fact, if the securities are in the trading book the losses will affect directly the income statement. However, if they are treated as held to maturity, they have an impact only when they are released. Fees and commissions represent the majority of total non-interest income. They come from different business, ranging from lending and deposit activity as credit lines and transactions services. Furthermore, they are related more to investment-banking type activities as trading, M&A and market making. It is very difficult to establish an explicit link between them and the policy rate. On average, a higher interest rate might reduce the income component (Rajan (2005), Albertazzi and Gambacorta (2009)). In this case, it seems that interest income effect overweight the non-interest income effect.

Table 7 - Bank Balance Sheet	
$Loans_{i,t}$	$Deposits_{i,t}$
$Securities_{i,t}$	$WholesaleFunds_{i,t}$
	$Equity_{i,t}$

The relation will be clear after the example. In Table 7 there is a reduce form of bank balance sheet. In the asset side, there are loans and securities, in the liabilities side there are deposits, wholesale funds and equity. The loan rate is r_L, the deposit rate is r_D and r is the interbank market rate[6]. Banks can borrow on a competitive market by deposit market or wholesale market. The supply of deposit is inelastic respect to the deposit rate r_D (deposit effect); hence, the responsiveness of deposit to ECB rate target becomes low. Conversely, the supply of wholesale fund is sensitive respect to interbank rate r. As mentioned earlier, the demand for loans and its rate r_L, is more elastic to interest rates respect to deposit. In this environment, a policy rate increase has a positive impact in the net interest income (quantity effect), as such $\Delta L_{t+1} r_{L,t+1} > \Delta D_{t+1} r_{D,t+1} + \Delta WF_{t+1} r_{t+1}$[7] . Moreover, a policy rate increase generate losses on bank securities portfolios. The losses depend from the accounting convention but is useful to assume that all securities are discounted at the same interest rate r_t. The expected value at time *t+1* is equivalent to $E(S_{t+1}) = \frac{S_t}{(1+(r_t+\Delta r_{t+}))} \leq S_t$(securities effect) [8] . From empirical results, emerge that during normal times in the Euro(pean) banking system interest income effect dominates non-interest income effect. It seems reasonable that market power will leads banks to quote lower deposit rates and higher rates on loans but it is not obvious that the devaluation of securities overweight the loan effect. Therefore, EuroStoxx bank index is composed mainly by commercial banks that provides services, such as accepting deposits, giving loans and basic investment products (savings accounts and certificates of deposit). The commercial banks are different respect to investment banking; theirs activities includes underwriting, acting as an intermediary between an issuer of securities and the investing public, facilitating mergers and other corporate reorganizations, and acting as a broker for institutional clients. The investment bank provide the large part of their liabilities by short-term wholesale funds. The short-term wholesale funds have been rolled frequently, therefore are more sensitive to the change in the interest rate target (Huang and Ratnovski (2011) studied the "Dark side" of wholesale funds. They showed that short-term wholesale funds are aggressive lending that compromise credit quality and limited market discipline). The European banking sector seems anchored to classical credit business and prefers deposit funding rather wholesale funding; hence, the loan's positive effect exceeds the negative ones. This emerges from the positive reaction that market participants have during the announcement of a tightening monetary policy. In formula $\Delta L_{t+1} r_{L,t+1} > \Delta D_{t+1} r_{D,t+1} + \Delta WF_{t+1} r_{t+1} + \Delta S_{t+1}$ [9]. Due to the great financial crisis, we investigate if

[6]It is useful to assume that the Central Bank policy rate is equivalent to interbank rate r.

[7]Where, $r_{L,t+1} = r_{L,t} + \Delta r_{t+}$, where Δr_{t+} is the change in the Central Bank policy rate; $\Delta D_{t+1} r_{D,t+1} \approx 0$ and $r_{D,t+1} = (r_{D,t+1} + r_{t+}) = r_{D,t}$ (if the interest rate increases the interest rate on deposit doesn't react because the banks have some oligopolistic power (Freixes and Rochet (1997)). Finally, $r_{t+1} = r_t + \Delta r_{t+}$.

[8]Usually the discount rate is equal to $r_t + \Delta r_{t+}$ + equity premium. In this framework, it is useful to suppose that equity premium is equivalent across banks.

[9]$\Delta L_{t+1} r_{L,t+1} + \Delta S_{t+1} > \Delta D_{t+1} r_{D,t+1} + \Delta WF_{t+1} r_{t+1}$ but $\Delta S_{t+1} = E(S_{t+1}) - S_t < 0$.

there are breaks in the relation between the return of European banks and the ECB's monetary policy announcements. Accordingly, we re-estimate equations (1) and (2) for four different periods: (Subprime Crisis 1/7/2007-31/12/2009; All Sovereign Debt Crisis; 1/10/2009 - 14/9/2015; First Sovereign Debt Crisis 1/10/2009 -31/10/2011; Second Sovereign Debt Crisis 1/11/2011 - 14/9/2015). The second column of Tables 3, 4 and 5 reports the results obtained from estimating equations (1) and (2) considering the Sub-prime crisis (1/7/2007 - 12/31/2009). The average impact of unexpected changes in the ECB rate target is still positive and statistical significant. However, with differing degrees of magnitude. On average, an unexpected increase of 100 basis points in the ECB rate target during the crisis seems to leads an increase of 18.65 basis points in the one-day holding period return on EuroStoxx bank index. Conversely, in the whole sample the effect is lower 9.31 basis point. Due to the significant arch effect in the residual variance, we implement the same GARCH estimation as in the total sample. For both GARCH specification, the average impact is still positive and statistical significant but with a higher degree of magnitude compared to the same estimates for the total sample. An unexpected increase of 100 basis points in the ECB reference rate leads to an increase of 9.80/12.34 basis points in the announcement day. The results highlight the increased sensitivity of European banking system during the great financial crisis. This confirms the hypothesis that market participants perceive negatively a constant cut in Central bank's policy rate. Furthermore, the steady decline in interest rates could be a sign that financial crisis is still in progress. The magnitude of the return responses is also outstanding; the positive response to the shock during the crisis was at least twice times greater than the positive response documented before. The European sovereign debt crisis began at the end of 2009, when the peripheral Eurozone member states of Greece, Spain, Ireland, Portugal and Cyprus were unable to repay or refinance their government debt, or bail out their beleaguered banks without the assistance of a third institutions. The third column of Tables 3, 4 and 5 reports the results obtained from estimating equations (1) and (2) considering the sovereign debt crisis (1/10/2009 - 14/9/2015). The empirical analysis does not suggest any relationship between the EuroStoxx bank index return and our variables of interest. All the methodologies implemented confirmed these results. Additionally, both the F and χ^2 test does not reject the null hypothesis that all the slopes of dependent variables are zero. It seems curious that during the sovereign debt crisis neither the conventional and unconventional policies announcements do not have any effects on EuroStoxx bank index. It is likely that the announcements effects of conventional and unconventional policies vary across the different sovereign debt crisis phases. The fourth column of Tables 3, 4 and 5 reports the results obtained from estimating equations (1) and (2) considering the early part of sovereign debt crisis (1/10/2009 - 31/10/2011). The results indicate that unconventional monetary policies announcements have a positive significant effect on EuroStoxx bank index return during the first part of sovereign debt crisis. On October 6, 2011, the Governing Council of the European Central Bank had decided to launch a new covered bond purchase programme (CBPP). The programme had the following modalities: - purchases for an intended amount of 40 billion; - purchases have the capacity to be conducted in the primary and secondary markets and carried out by means of direct purchases; - purchases begin in November 2011 and are expected to be completed by the end of October 2012. On average, the announcement of CBPP by ECB leads to an increase of 2.81 basis point in the one-day holding period return on EuroStoxx bank index. While, an unexpected increase in the ECB policy rate does not have any effect on the EuroStoxx bank index during the early sovereign debt crisis period. It seems reasonable that the purchase announcement of sovereign debt securities (in primary and secondary markets) by ECB had a positive impact on European banking index returns. In the assets of all European banks, there were a percentage of sovereign debt securities (considered risk-free before the crisis). Once the market perceives as risky these securities, their value decreases due to an increase in the risk premium required by the market. Hence, the ECB decision to buy bonds in the primary and secondary market has limited the continuous fall of securities values in the Euro banks portfolio by supporting demand. Ultimately, the last columns of Tables 3, 4 and 5 report the results obtained from estimating equations (1) and (2) considering the second part of sovereign debt crisis (1/10/2011 - 14/9/2015). This period might be regarded as the tangible time of Euro-zone crisis. After having raised interest rates during the first months of 2011, the ECB realized that it was in progress the greatest economic crisis in Europe as the negative economic data in the euro area has depicted. The average impact of unexpected monetary policy announcement during the deep European sovereign debt crisis is positive and statistically significant [10]. The sensitivity of the banking system raise sensibly compared to previously estimates. Indeed, the coefficient of unexpected interest rate surprise changes from the previous 9.31 B.P. to 31.46 B.P. (on average), with HAC specification. While, for GARCH specification the coefficient of surprise changes from 4.2 B.P. to 30.98 B.P. (on average). The magnitude of return responses is also noteworthy; the positive response to the shock during the second part of sovereign debt crisis was at least three times greater than the positive response documented before. In fact, the different response, before and after the crisis, are economically and statistically significant for each econometric methodologies implemented. A possible explanation is that a decrease in interest rates was signaling worsening prospects for the financial system and the macro economy. Hence, investors

[10]The OLS estimates with HAC S.E. and the first GARCH specification GARCH are statistically significant. Conversely, the second GARCH specification is not statistically at 10% but at 16%.

fled the stock market liquidating their positions to hoard cash or cash-like instruments, reduce their risk exposure and meet margin calls. During the deep sovereign debt crisis, ECB has implemented only easy policies, further ECB has embarked unconventional ones (ABS purchase program, providing liquidity, corporate bond purchase program and QE). Generally, ECB's monetary policy announcement has a positive influence on the European banks since the positive effect on interest income (due to the increase of the range between interest income and expenses) exceeds the negative one on non-interest income. Hence, the banks reactions to monetary policy announcement seems to be more relevant through conventional measures with respect to non-conventional ones. The announcement effect of unconventional policies have played a significant role only during the first part of Sovereign debt crisis. More precisely, the Euro(pean) banking system has reacted positively to the announcement of a second covered bond purchase program.

4 Cross Country analysis

From the banks' index analysis, a positive relationship between the announcement of both conventional and unconventional policies and the European banks index returns arises. One of the research questions aims to know whether within the Eurozone there are different "financial behavior" among various banking systems and conventional and unconventional monetary policies announcements. Therefore, we estimated the same regression for ten banking indexes, which make up the EuroStoxx bank index.[11]

4.1 Austria

In this case, we shall use the Austria banks price index, in order to verify if results are matched with the ones of the European bank index. Generally, the unexpected interest rate announcement of ECB does not have any impact on the Austrian banking system. This result is confirmed by all the econometric methodologies implemented. The result does not change, even analyzing the various sub-periods. The Austrian banking system did not seem sensible to the conventional/unconventional monetary policies announcements. One of the possible reason is the core business of the Austrian banking system, which is not focus on European country but on the CESEE area. In the recent years, profits were increasingly concentrated in the Czech Republic and Slovakia as well as Russia and Turkey, which are subject to higher volatility. Regarding on the future, due to international issues, this peculiarity may have negative impacts (i.e. negative shocks, due to a sustained increase of the probability of default in country where the Austrian banking system is mainly concentrated).

4.2 Belgium

Here, we refer on the FTSE Belgium banks price index. Tables 10, 11 and 12 shows the results. The empirical evidence displays a positive relationship between the Belgium banking index return and the unexpected interest rate announcement by ECB. The result is not confirmed in GARCH specifications. In the latter case, there is no evidence to state (begin sure), that there is a relation among the Belgium bank index return and the announcement of conventional monetary policy by ECB. The 2, 3, 4 and 5 columns of Tables 10, 11, and 12 show the results on the sub-periods. Considering the Sub-prime crisis, seems there is a positive relation between the Belgium bank index return and the unexpected interest rate change by ECB. This is confirmed by 2/3 methodologies involved. If we consider the first period of sovereign debt crisis, the unexpected announcement of interest rate changes by ECB did not have effects on the Belgium bank index return; while the announcement of unconventional policy (asset purchase program on the primary and secondary market) is positive and statistically significant. Indeed, if we consider the second period of crisis, only the announcement of monetary policy by ECB have a positive effect on the Belgium bank index return.

4.3 Spain

The index in this case is the FTSE Spain Bank price index. Commonly, the unexpected announcement of the interest rate changes by ECB has a positive effect on the Spain bank index return. The 2, 3, 4 and 5 columns of Tables 13, 14, and 15 show the results. The results reveal that during the Great Depression, the relation remain positive and statistical significant with a higher degree of magnitude than before[12]. Indeed, if we consider the first part of sovereign debt crisis, only the unconventional policies have a positive and statistical significant effect on the Spain bank index return; while on the second part of the sovereign debt crisis neither conventional and unconventional policies seem to be significant.

[11] Austria, Belgium, Spain, France, Germany, Greece, Ireland, Italy, Netherlands, and Portugal.
[12] This empirical evidence is confirmed only in the last GARCH specification.

4.4 France

The referred index for the French banking system is the EuroNext Cac banks price index. Tables 16, 17 and 18 show the results. Generally, the unexpected announcement of an increase of the ECB policy rate has a positive and statistical significant effect on the France bank index return. On average, the French banking system reacts positively to an increase in the ECB's reference rate. This might imply that the French banking system could be addicted from the classic banking business. This result is confirmed by all the econometric methodologies implemented. Observing the various sub-periods the results change. During the Sub-prime crisis, it seems not to be a relation between unconventional monetary policies announcement and the French banking index return, while the effect of conventional policy is still positive and statistical significant. An unexpected rate target increase by 100 basis points implies an increase of French banking index return by 25.44 basis points (14.59/18.46 B.P. GARCH specifications) with respect to 10 basis points (5.70/5 B.P. GARCH specifications) of the previous estimation. Vice versa, if we consider the total period of the Sovereign debt crisis, only the announcement of unconventional policies result to have a positive and statistical significant effect on the French bank index return. The 4 and 5 columns of Table 16, 17 and 18 exhibit results during the first and second phase of sovereign debt crisis. During the first phase, the unconventional policies announcements, such as the CBPP on primary and secondary market, results positive and statistically significant. This implies that the announcement of the CBPP program "guarantee" on the market that the Euro Sovereign debt securities, on the Banks' portfolios, will not decrease in value as their demand will be sustained by ECB. Finally, in the second phase of sovereign debt crisis, the unexpected change in ECB's reference rate has a positive effect on the French bank index return however with a more sensibility than the periods before the crisis.

4.5 Germany

The index for the German banking system is the DAX (XETRA) banks price index. Tables 19, 20 and 21 displays the results. The empirical evidence shows a positive relationship between the unexpected announcement of an increase in the ECB's reference rate and the German bank index return. The 2, 3, 4 and 5 columns of Tables 19, 20 and 21 present the results for the various sub periods analyzed. During the Sub-prime crisis the relation is confirmed, however, the response of the German banking system increases respect to the previous period. An unexpected increase by 100 basis points of the ECB reference rate implies an increase of German banking index return by 27.46 basis points (13.90/15.71 B.P. GARCH specifications) with respect to the 12.84 basis points (5.38 B.P. GARCH specification) of the previous estimation. Columns 4 and 5 of Table 19, 20 and 21 show the estimations results during the first and the second phase of sovereign debt crisis. The results obtained are coherent with estimations on the European banking index (EuroStoxx Bank index). During the first phase, the announcement of unconventional policies is positive and statistically significant; while in the second phase the announcement of conventional policies is positive and statistical significant. Even in those estimations, we observe that the degree of magnitude has substantially increased with respect to previous periods. On average, an unexpected increase by 100 basis point of the ECB reference rate implies an increase of the German banking index return of 37.38 (41.84/40.06 B.P. GARCH specifications) basis points with respect to the 12.84 basis points (5.38 B.P. GARCH specification) of the total sample estimation.

4.6 Greece

The index is the FTSE Athex banks price index. Regarding the estimates of the Greek banking index, we consider unbiased only the ones made up with the second GARCH specification that results the one most consistent and robust. Table 24 shows the results obtained considering the total sample. The empirical evidence noticed a positive relation between the unexpected interest rate announcement of ECB and the Greek banking index return. The second column of Table 24 considers the period of the Great Recession. In this case, the relation is not statistical significant. The fourth and fifth columns of Table 24 exhibit the results during the first and the second phase of sovereign debt crisis. The announcement effect of unconventional policies seems to be negative and statistical significant. This result is coherent since the CBPP was aimed only for securities, which had a minimum rating of BBB-. Greek bonds had a "junk" rating and their were not considered by the ECB purchase program. This would be one of the reason why the market "punished" the Greek banking system. Finally, in the second phase of the sovereign debt crisis only conventional policies are positive and statistical significant, with a higher degree of magnitude than the previous estimates (53.15 basis points).

4.7 Ireland

The Irish index is the ISEQ price index. The econometric approaches made up through other specifications do not give a clear representation among the announcements of conventional and unconventional monetary policies by the ECB and the Irish financial index return. The univocal aspect that it is clear from the estimates made up is the positive relation between the announcements of unconventional policies and the ISEQ financial index return during the first phase of sovereign debt crisis. The announcement causes an increase of 3.89 basis points of the Irish financial index return during the day of the announcement (2.92/4.55 B.P. GARCH specifications).

4.8 Italy

The referred index for the Italian banking system is the FTSE Italy banks price index. Tables 28, 29 and 30 show the results obtained. The empirical analysis shows that an unexpected increase of the ECB reference rate has a positive and statistical significant effect on the Italian banking index return. Generally, the Italian banking system reacts positive to an increase of ECB policy rate; this may imply that Italian banking system is still addicted to the traditional banking business. By analyzing the various sub-periods the results change. During the Sub-prime crisis, the relation is confirmed, anyway, the Italian banking system response increases significantly. On average, an unexpected increase by 100 basis points of ECB reference rate implies an increase of the Italian banking index return by 10.89 basis points (11.11/11.89 B.P. GARCH specifications) with respect to 8.30 basis points (4.78 B.P. GARCH specification) of the previous estimation. The 4 and 5 columns of Table 28, 29 and 30 exhibit the results of estimates during the first and the second phase of the sovereign debt crisis. During the first phase, the announcement of unconventional policies, in particular the covered bond purchase program on the primary and secondary markets, seems to have a positive and statistical significant effect on the Italian banking system. This indicates that the announcement of CBPP ensures to the market that securities of the Banks' portfolio will not decrease in value. Finally, in the second period of sovereign debt crisis, only the announcement of conventional policies had a positive impact on the Italian baking index return but with a degree of magnitude higher than the previous estimations.

4.9 Netherlands

The index for this country is the Netherlands banks price index. Generally, the unexpected announcement of the ECB policy rate change has a positive impact on the Netherlands banking index return. The Table 31, 32 and 33 show estimates for the various period analyzed. During the Great Depression, the relation is not statistical significant. In addition, during the the sovereign debt crisis, the announcement of conventional and unconventional monetary policies do not affect the Netherlands banking index returns.

4.10 Portugal

The referred index is the Portugal banks price index. The econometric approaches, made up through other specifications, do not give a clear representation of the relationship between the ECB's announcement of conventional and unconventional policies and the Portugal banking index return. The only aspect, which comes up, is the positive impact of the conventional polices over the all-Sovereign debt crisis and its first phase. The announcement effect shows an increase of 16.63 basis points (15.49/14.47 B.P. GARCH specifications) on the day of the announcement (Sovereign debt crisis); while it increases by 18 basis point (22.95/25.55 B.P. GARCH specifications) if we consider the first phase of sovereign debt crisis. This difference let us to notice that during the first phase the Portuguese banking system sensibility is huge. That result is coherent, since in the first phase, the Portugal banks were the ones most exposed in Europe.

5 Sensitivity analysis

In this section, we test the robustness of our results by changing the model specification. We estimate the following GARCH (1,1) regression model for each European bank indexes:

$$\begin{aligned} Return_t = \alpha_0 + \beta_1 News_t + \beta_2 News_t * ECBAnnouncement + \\ \beta_i \sum_{i=1}^{3} Return_{t-i} + \beta_6 NoChange + \beta_7 RestrictivePolicy \\ + \beta_8 EasyPolicy + \beta_9 QE\_ABS\_CCPP\_COLL + timeeffects + \mu_t \end{aligned} \tag{4}$$

$$\sigma_t^2 = \alpha_0 + \alpha_1 \mu_{t-1}^2 + \alpha_2 \sigma_{t-1}^2 \tag{5}$$

where $QE\_ABS\_CCPP\_COLL$ is a dummy variable that takes the value 1 when the ECB announces unconventional policy, 0 otherwise. Easy policy is a dummy variable that takes the value 1 if ECB cuts the policy interest rate, 0 otherwise. Restrictive policy is a dummy variable that takes the value 1 if the ECB raises the policy interest rate, 0 otherwise. NoChange is a dummy variable that takes the value 1 if the ECB does not change the policy interest rate, 0 otherwise. ECBAnnouncement*News (our variable of interest) is an interaction variable that is useful to observe the effect of *News* during the ECB announcement day. The regression includes the measure of news on all days in order to avoid the possible bias in estimate the ECB news as well as an intercept shift on the announcement days as set out by Thornton (2009, 2013) and Monticini, Peel & Vaciago (2011). Tables 37- 48 reports the results obtained from the robustness test. The results are quite similir as the previous analysis. In addition, the empirical evidence exhibits a negative relation between a cut of ECB reference rate and the EuroStoxx bank index return. Also the interaction variable "ECBAnnouncement*News" remains positive and statistically significant with the same degree of magnitude as the previous estimates. As explained previously, these findings confirm the positive effect of an increase in the interest rate on net interest income; additionally the effect is greater regard the negative one on non-interest income. Overall, an unexpected increase of ECB's reference rate has a positive effect on the EuroStoxx bank index return. An additional motivation arises from the fact that the large part of European banks are commercial banks that built their core business providing credit facilities to its customers. Typically, Commercial banks prefer funding based on deposits and less by wholesale funding that is more sensitive to changes in interest rates (obviously, the refinanced short term funding will increase the cost of interest expenses, conversely the supply of new loans at the adjusted rate will be in smaller quantities and the effect is lagged). To manage this hypothesis, we conduct a cross-country analysis. Tables 39-48 report the results. Empirical analysis figure out that for Italy and Ireland there are a statistical significant relations. If we consider the interaction variable among the announcement of central bank and News, the results are still the same as in the previous methodology[13]. Furthermore, there is a strong evidence that easy policy caused a significant drop in the return of the European bank indexes (Ireland and Italy). Considering the Sub-prime crisis period (01/07/2007 - 31/12/2009), the positive relation is confirmed. Even cross-country analysis confirms previous findings. Analyzing the periods of all sovereign debt crisis and the first part of the crisis there are no main differences compared to previous estimates. It should be noted that for the period before the sovereign debt crisis, easy policy was considered negatively by the market while the restrictive one was not statistical significant. The significant evidence is that neutral monetary policy does not have any impact on banks indexes return before the Sovereign debt crisis. Conversely, during the debt crisis period, the same policies became positive and statistical significant (Belgium, Ireland, Netherlands and Portugal). The reaction to the same announcement may differ depending on the stage of financial crisis. One possible explanation is that investors, in the deepest moment of the turmoil, interpreted these measures as a signal of the crisis' severity. After some months, when many banks started to recover from the most problematic situations, investors may have gained more trust in authority's interventions. Finally, it is interesting to notice that prices' reaction is particularly strong in magnitude for contraction measures, confirming that the whole banking system is nowadays viewed as dependent from monetary policy interventions and central bank funding. For an even more detailed analysis, we consider the period of acute sovereign debt crisis (01/10/2011 - 14/09/2015). The results reinforce the previously ones, confirming that the countries most sensitive to ECB's policies announcements are France, Germany and Italy.

6 Conclusion

In this paper, we investigate the announcement effects of conventional and unconventional policy by ECB on European banks indexes return with an unusual event study approach. Empirical analysis suggests that an increase in ECBs reference rates has a positive impact on European banking indexes returns. Moreover, the relation is also positive in the sub-periods analyzed. Empirical evidence confirms the theoretical positive effect that an increase in interest rate has on net interest income; mainly for commercial banks (the cross-country analysis suggests that the country's more sensitive are the ones where the core business remains the bank credit, such as France, Germany, Italy and Spain). The positive effect appears higher than the potential losses deriving from intermediation margin (non-interest income) where on average a higher interest rate would reduce the bank's asset portfolio value. In addition, we examine the results stability during the different sub-periods. Throughout the financial crisis periods, the European banking sector's sensitivity to ECB monetary policy announcements increases, especially in the acute sovereign debt crisis where the

[13] In Belgium, Spain, France, Germany, Italy and Netherlands there is a positive relationship between the increase in the interest rate and the bank indexes return.

most responsive countries are France, Germany and Italy (it seems that the Spanish banking sector is not influenced by ECB monetary policies. This may result from the fact that in June 2012 the EU injected more than 40 billion euro in the Spanish banking sector). Overall, monetary policy news could affect the European Banking stock performance in the same direction during normal and turbulent times. This leads to argue that a prolonged easy policy might erode the European banks profitability. Additionally, unconventional policy had a positive impact in the country where the Banking system was mostly risky as Spain, France and Italy, but the effect was certainly not what the Eurotower expected. In fact, the announcement effect is still significant but small on impact. The research follows the vast literature which compared "monetary policy" and stock prices, from Patelis (1997), Lastrapes (1998), Cassola and Morana (2004), Bernanke and Kuttner (2005) that found an inverse relations and other as Jensen, Mercer and Johnson (1996), Du (2006), Garg (2008) that found a positive relationship. Others as Basistha and Kurov (2008) found that the reactions of stocks to monetary policy news was much stronger in recession and in tight credit market conditions as we found. At banking level our findings are confirmed by the studies of Demirguc-Kunt and Huizinga (1999), and Albertazzi Gambacorta (2009), Alessandri and Nelson (2014) and C. Borio, L. Gambacorta and B. Hofmann (2015). They found a positive relationship between the level of interest rates and bank profitability. The authors suggest that the positive impact of interest rate structure on net interest income dominates the negative one on loan loss provisions and on non-interest income. This paper is committed to observe the effect of the announcement of conventional and unconventional monetary policies. It would be interesting to extend the research to USA and UK bank system, also utilizing a VAR methodology.

References

[1] Akella, S. R. and S. I. Greenbaum (1992): "Innovations in Interest Rates, Duration Transformation, and Bank Stock Returns," Journal of Money, Credit, and Banking, 1, 27-42.

[2] Albertazzi, U. and L. Gambacorta (2009): "Bank profitability and the business cycle", Journal of Financial Stability, vol. 5, issue 4, 393-409.

[3] Alessandri, P. and B. Nelson (2015): "Simple banking: profitability and the yield curve", Journal of Money Credit and Banking, vol. 47, no 1, 143-75.

[4] Andersen, T., Bollerslev, T., Diebold, F. and C. Vega (2007). "Real-time price discovery in global stock, bond and foreign exchange markets," Journal of International Economics, 73, 251-277.

[5] Bae, S. C. (1990): "Interest Rate Changes and Common Stock Returns of Financial Institutions: Revisited," Journal of Financial Research, 1, 71-79.

[6] Basistha, A., Kurov, A., (2008): "Macroeconomic cycles and the stock market's reaction to monetary policy," Journal of Banking and Finance 32, 2606-2616.

[7] Bernanke, B, and K. Kuttner, (2005), "What Explains the Stock Market's Reaction to Federal Reserve Policy?," Journal of finance, 60, 3, 1221-1257.

[8] Bernanke, B. and Gertler, M., (1989): "Agency Costs, Net Worth, and Business Fluctuations," American Economic Review, American Economic Association, vol. 79(1), pages 14-31, March.

[9] Bernanke, B. and Gertler, M., (1995): "Inside the Black Box: The Credit Channel of Monetary Policy Transmission," C.V. Starr Center for Applied Economics, New York University, Working Papers 95-15.

[10] Bernoth, K., and J. Von Hagen (2004), "Euribor Futures Market: Efficiency and the Impact of ECB Policy Announcements", International Finance, Vol. 7(1), pp. 1-24.

[11] Bollerslev, T., (1986): "Generalized autoregressive conditional heteroskedasticity," Journal of Econometrics, Elsevier, vol. 31(3), pages 307-327, April.

[12] Bolt, W., de Haan, L., Hoeberichts, M., van Oordt, M.R.C. and J. Swank (2012) "Bank profitability during recessions," Journal of Banking and Finance, 36, 2552-2564.

[13] Borio C. and Gambacorta, L. and B. Hofmann, (2015): "The influence of monetary policy on bank profitability," BIS Working Papers 514, Bank for International Settlements.

[14] Cassola, N., and Morana, C., (2004): "Monetary policy and the stock market in the euro area," Journal of Policy Modeling, Elsevier, vol. 26(3), pages 387-399, April.

[15] Castrn, O., Fitzpatrick, T., Sydow, M., (2006): "What drives EU banks stock returns? Bank-level evidence using the dynamic dividend-discount model," European Central Bank, Working Paper Series No. 677.

[16] Chen, S., (2007): "Does Monetary Policy Have Asymmetric Effects on Stock Returns?," Journal of Money, Credit and Banking, 39, 667-688.

[17] Conover, C.M., G.R. Jensen, and R.R. Johnson, (1999), "Monetary environments and international stock returns," Journal of Banking and Finance 23, 1357-1381.

[18] Cook, T. and T. Hahn, (1989), "The Effect of Changes in the Federal Funds Rate Target on Market Interest Rates in the 1970s," Journal of Monetary Economics, November 1989, 24(9), pp. 331-51.

[19] Cooper, M. J., Jackson, W. E. and G. A. Patterson (2003) "Evidence of predictability in the cross-section of bank stock returns," Journal of Banking and Finance, 27, pp. 817-850.

[20] Demergu-Kunt A. and H. Huizinga, (1999): "Determinants of commercial bank interest margins and profitability: Some international evidence," World Bank Economic Review, Vol.13: 379-408.

[21] Du, D., (2006): "Monetary Policy, Stock Returns and Inflation," Journal of Economics and Business 58, 36-54.

[22] Ehrmann, M. and Fratzscher, M. (2009) "Global Financial Transmission of Monetary Policy Shocks," Oxford Bulletin of Economics and Statistics, 71 (6), 739-759.

[23] Ehrmann, Michael and Fratzscher, Marcel, (2004): "Taking stock: monetary policy transmission to equity markets," Working Paper Series 0354, European Central Bank.

[24] Engle, R. F., (1982): "Autoregressive Conditional Heteroscedasticity with Estimates of the Variance of United Kingdom Inflation," Econometrica, Econometric Society, vol. 50(4), 987-1007.

[25] Fama, E. F. and K. R., French, (1989): "Business conditions and expected returns on stocks and bonds," Journal of Financial Economics, Elsevier, vol. 25(1), pages 23-49.

[26] Fiordelisi, F. and P., Molyneux, (2010): "Total factor productivity and shareholder returns in banking," Omega, Elsevier, vol. 38(5), 241-253.

[27] Fiordelisi, F., Galloppo, G., Ricci, O., (2014): "The effect of monetary policy interventions on interbank markets, equity indices and G-SIFIs during financial crisis," Journal of Financial Stability 11, 49-61.

[28] Flannery, M. J., and S., Nikolova. (2004): "Market Discipline of U.S. Financial Firms: Recent Evidence and Research Issues," In Market Discipline across Countries and Industries, ed. William C. Hunter, George G. Kaufman, Claudio Borio, and Kostas Tsatsaronis. Cambridge: The MIT Press: 87-100.

[29] Freixas, X. and J. C. Rochet (1997): "Microeconomics of Banking," Cambridge, MIT Press.

[30] Garg, K., (2008): "The Effect of Changes in the Federal Funds Rates on Stock Markets: A Sector-wise Analysis," Undergraduate Economic Reviews: 4, 1, 2.

[31] Gertler, M. and S., Gilchrist, (1993): "The Role of Credit Market Imperfections in the Monetary Transmission Mechanism: Arguments and Evidence," Scandinavian Journal of Economics, Wiley Blackwell, vol. 95(1), 43-64.

[32] Guo, H., (2004): "Stock prices, firm size, and changes in the federal funds rate target," Q. Rev. Econ. Finance 44, 487-507.

[33] Hausman, J. and Wongswan, J. (2011): "Global asset prices and FOMC announcements," Journal of International Money and Finance, 30, 547-571.

[34] Huang, R. and L., Ratnovski, (2011): "The dark side of bank wholesale funding", Journal of Financial Intermediation, Elsevier, vol. 20(2), 248-263.

[35] Jansen, D., and C. Tsai, (2010): "Monetary Policy and Stock Returns: Financing Constraints and Asymmetries in Bull and Bear Markets," Journal of Empirical Finance, 17, 981-990.

[36] Jensen, G., and R. Johnson, (1996): "Discount Rate Changes and Security Return in the U.S., 1962-1991," Journal of Banking and Finance 19, 1995, pp. 79-95.

[37] Jensen, G., Mercer, J., and R. Johnson, (1996): "Business Conditions, Monetary Policy, and Expected Security Returns", Journal of Financial Economics 40, 213-237.

[38] Kaul, G., (1987): "Stock Returns and Inflation: The Role of Monetary Sector", Journal of Financial Economics, 18, 253-276.

[39] Krueger, J. T., and K. N. Kuttner, (1996):"The Fed Funds Futures Rate as a Predictor of Federal Reserve Policy", Journal of Futures Markets pp. 865-879.

[40] Kuttner, K. N. (2001): "Monetary Policy Surprises and Interest Rates: Evidence from the Fed Funds Futures Market", Journal of Monetary Economics, 47(3), 523-544.

[41] Kwan, S. H. (1991): "Re-examination of Interest Rate Sensitivity of Commercial Bank Stock Returns Using a Random Coefficient Model", Journal of Financial Services Research, 5, 61-76.

[42] Lastrapes, W. D., (1998): "International Evidence on Equity Prices, Interest Rates and Money", Journal of International Money and Finance, 17, 3, 377-406.

[43] Lumpkin, S. A. and J. M. OBrien (1997): "Thrift Stock Returns and Portfolio Interest Rate Sensitivity", Journal of Monetary Economics, 39, 341-357.

[44] Madura, J. and O. Schnusenberg (2000): "Effect of Federal Reserve policies on bank equity returns", Journal of Financial Research, 23(4), 421-447.

[45] McQueen, G., and V. V. Roley (1993): "Stock Prices, News, and Business Conditions", Review of Financial Studies, 6, 683-707.

[46] Memmel, C. (2011): "Banks Exposure to Interest Rate Risk, Their Earnings from Term Transformation, and the Dynamics of the Term Structure", Journal of Banking and Finance, 35, 282-289.

[47] Monticini, A., Peel, D., Vaciago, G., (2011):"The impact of ECB and FED announcements on the Euro interest rates", Economics Letter, 113, 139-142

[48] Newey, W.K., West, K.D., (1987). "A Simple, Positive-Definite, Heteroskedasticity and Autocorrelation Consistent Covariance Matrix", Econometrica, 55, 703-708.

[49] Patelis, A., (1997): "Stock Return Predictability and the Role of Monetary Policy", Journal of Finance 52, 1951-1972.

[50] Perez-Quiros, G., Timmermann, A., (2000):"Firm size and cyclical variations in stock returns," J. Finance 55 (3), 1229-1262.

[51] Rajan, R. (2005): "Has financial development made the world riskier?," NBER Working Paper Series, no 11728.

[52] Ricci, O. (2015): "The impact of monetary policy announcements on the stock price of large European banks during the financial crisis," Journal of Banking and Finance, 52, 245-255.

[53] Rigobon, R., and B. Sack, (2004): "The Impact of Monetary Policy on Asset Prices", Journal of Monetary Economics, 51, 8, 1553-1575.

[54] Thorbecke, W., (1997): "On Stock Market Returns and Monetary Policy", Journal of Finance, American Finance Association, vol. 52(2), 635-654.

[55] Thornton, D. L., (1998): "The information Content of Discount Rate Announcements: What is Behind the announcement effect?", Journal of Banking and Finance, 83-108.

[56] Thornton, D.L., (2009):"The identification of the response of interest rates to monetary policy actions using market-based measures of monetary policy shocks", Federal Reserve Bank of St. Louis Working Paper.

[57] Thornton, D.L., (2013): "The Identification of the Response of Interest Rates to Monetary Policy Actions Using Market-Based Measures of Monetary Policy Shocks", Oxford Economic Papers, 66(1), 67-87.

[58] Wongswan, J. (2009): "The response of global equity indexes to U.S. monetary policy announcements", Journal of International Money and Finance, 28, 344-365.

[59] Yin, H., J., Yang, (2013):"Bank characteristics and stock reactions to federal funds rate target changes", Applied Financial Economics 23, 1755-1764.

[60] Yin, H., Yang, J., W.C., Handorf, (2010) "State dependency of bank stock reaction to federal funds rate target changes", The Journal of Financial Research 33, 289-315.

Appendices

Table 1: Descriptive statistics. The monetary policy statistics are measured only on event days.

Variable	N	Absolute mean (B.P.)	Standard deviation	Variance
Total Period (January 1999 Septmeber 2015)				
News*ECBAnnouncement	231	0.08658	0.054511	0.0029714
E_ECB*ECBAnnouncement	231	1.471861	0.173017	0.029935
CRISIS (June 2007 September 2015)				
News*ECBAnnouncement	97	0.21134	0.053691	0.0028827
E_ECB*ECBAnnouncement	97	4.78866	0.165949	0.027539
Sovereign debt crisis (October 2009-Sept. 2015)				
News*ECBAnnouncement	69	0.07246	0.037173	0.0013818
E_ECB*ECBAnnouncement	69	1.88406	0.112034	0.0125516
First period sovereign debt crisis (October 2009-October 2011)				
News*ECBAnnouncement	25	0.36	0.053396	0.0028511
E_ECB*ECBAnnouncement	25	2.36	0.089519	0.0080136
Second period sovereign debt crisis (November 2011- Sept. 2015)				
News*ECBAnnouncement	44	0.09091	0.024215	0.0005864
E_ECB*ECBAnnouncement	44	4.29545	0.117193	0.0137341

Table 2: Descriptive statistics for European banking indices returns

	Total Period (January 1999 Septmeber 2015)					Crisis (June 2007 September 2015)				
Bank Index	N	Mean (B.P.)	S.D.	Max%	Min%	N	Mean (B.P.)	S.D.	Max%	Min%
Austria	4356	1.782	2.004	14.322	-13.532	2138	-5.209	2.537	14.322	-13.532
Belgium	4356	-2.691	2.593	19.457	-27.184	2138	-5.771	3.318	19.457	-27.184
Spain	4356	-1.207	1.969	19.808	-12.095	2138	-4.561	2.253	19.808	-12.095
France	4356	1.028	2.211	19.243	-14.758	2138	-3.355	2.762	19.243	-14.758
Germany	4356	-1.8296	2.305	18.713	-17.743	2138	-6.737	2.78	18.713	-17.743
Greece	4356	-11.429	3.428	25.559	-35.559	2138	-26.383	4.566	25.559	-35.559
Ireland	4356	-6.67	3.266	24.94	-67.517	2138	-16.54	4.457	24.947	-67.517
Italy	4356	-2.837	2.138	16.87	-13.386	2138	-5.513	2.671	16.871	-13.386
Netherland	4356	-6.653	2.88	15.116	-129.914	2138	-15.162	3.673	15.116	-129.914
Portugal	4356	-6.474	1.896	16.638	-12.605	2138	-15.856	2.555	16.638	-12.605
EuroStoxxBank	4356	-1.543	1.885	17.763	-10.829	2138	-5.778	2.331	17.763	-10.829

Descriptive statistics for European banking indices returns. Cont'

	Sovereign debt crisis (Oct. 2009-Sept. 2015)					First period Sov. debt crisis(Oct. 2009-Oct. 2011)				
Bank Index	N	Mean (B.P.)	S.D.	Max%	Min%	N	Mean (B.P.)	S.D.	Max%	Min%
Austria	1553	-2.801	2.107	12.89	-10.445	543	-11.028	2.347	12.89	-8.875
Belgium	1553	0.578	2.843	19.209	-13.969	543	-19.81	3.143	19.209	-10.766
Spain	1553	-4.344	2.072	19.809	-8.964	543	-11.007	2.441	19.809	-8.917
France	1553	-0.371	2.457	19.244	-14.758	543	-13.052	2.991	19.244	-12.146
Germany	1553	-3.537	2.171	14.429	-8.928	543	-9.967	2.468	14.429	-8.928
Greece	1553	-31.822	5.037	25.559	-35.56	543	-44.464	3.937	25.559	-18.455
Ireland	1553	-10.859	3.304	18.93	-20.604	543	-51.199	4.416	18.93	-20.604
Italy	1553	-3.076	2.615	16.871	-13.386	543	-17.865	2.743	16.871	-10.945
Netherland	1553	-3.872	1.716	11.766	-9.649	543	-9.036	1.441	5.928	-8.795
Portugal	1553	-14.766	2.735	16.638	-12.605	543	-26.147	2.17	12.788	-7.056
EuroStoxxBank	1553	-3.467	2.125	17.764	-9.291	543	-14.131	2.453	17.764	-9.291

Descriptive statistics for European banking indices returns. Cont'

	Second period Sov. debt crisis(Nov. 2011- Sept. 2015)				
Bank Index	N	Mean (B.P.)	S.D.	Max%	Min%
Austria	1010	1.622	1.966	9.008	-10.445
Belgium	1010	11.539	2.664	13.044	-13.969
Spain	1010	-0.762	1.844	9.854	-8.964
France	1010	6.446	2.114	9.656	-14.758
Germany	1010	-0.08	1.994	9.004	-8.726
Greece	1010	-25.025	5.539	23.849	-35.56
Ireland	1010	10.829	2.485	13.004	-10.5
Italy	1010	4.875	2.542	11.202	-13.386
Netherland	1010	-1.096	1.846	11.766	-9.649
Portugal	1010	-8.648	2.994	16.638	-12.605
EuroStoxxBank	1010	2.266	1.925	8.18	-9.185

Figure 1: Figure 1 - Histogram of European banking indexes returns. Total Period (January 1999 Septmeber 2015)

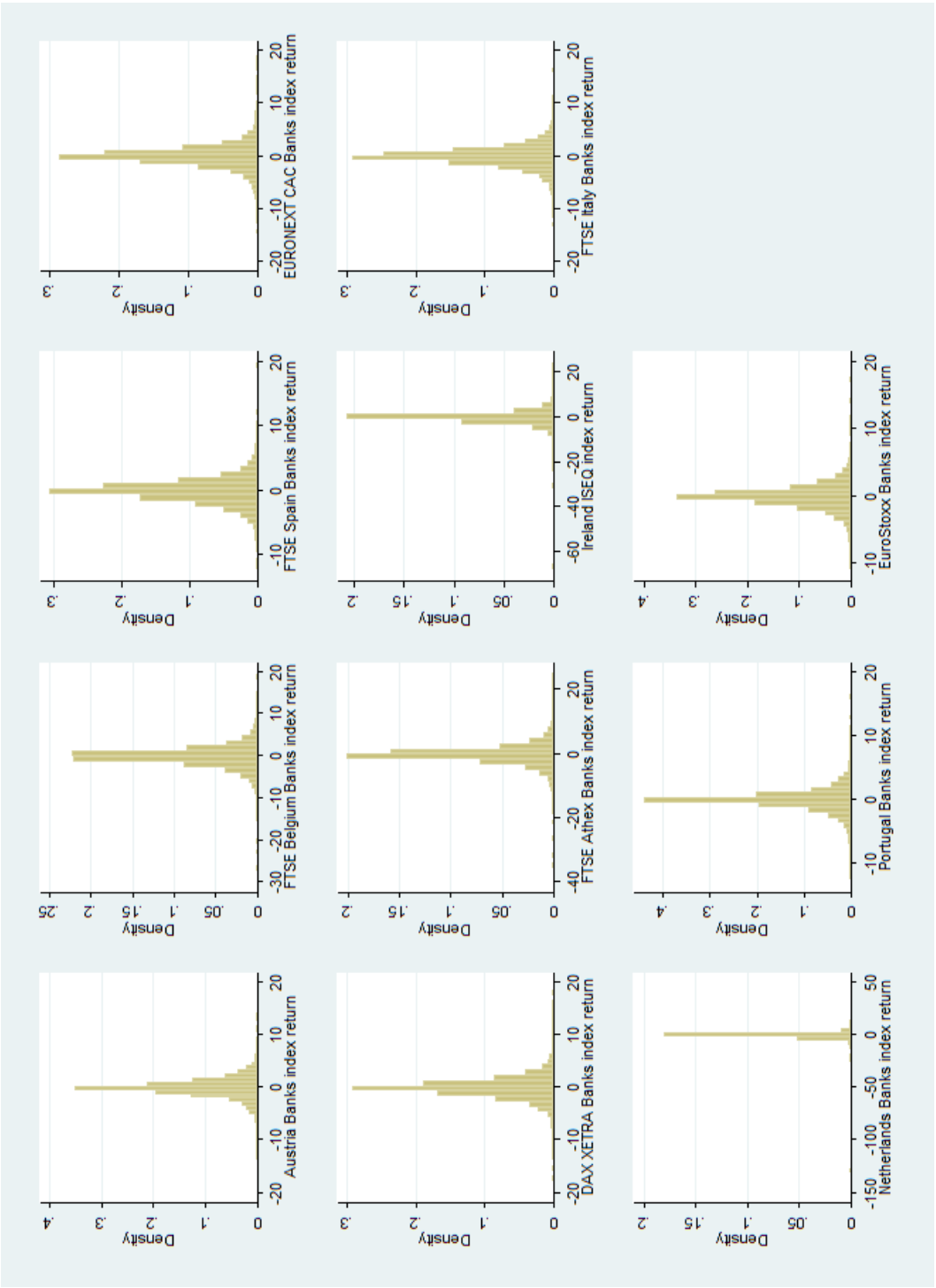

Figure 2: Table 3: Unconventional Policies Announcements

Date	Program	ECB announcements
15/10/2008	COLL, LTRO, FOR	The Governing Council of the European Central Bank (ECB) today decided on the following measures: 1) The list of assets eligible as collateral in Eurosystem credit operations will be expanded with this expansion remaining into force until the end of 2009. 2) As from the operation settling on 30 October 2008 and until the end of the first quarter in 2009, the provision of longer-term refinancing by the Eurosystem will be enhanced as set out below. 3) The Eurosystem will start offering US dollar liquidity also through foreign exchange swaps.
07/05/2009	LTRO, CBPP	The Governing Council of the European Central Bank has today decided to conduct liquidity-providing longer-term refinancing operations (LTROs) with a maturity of one year. The Governing Council of the European Central Bank (ECB) has today decided that the European Investment Bank (EIB) will become an eligible counterparty in the Eurosystems monetary policy operations on 8 July 2009. As of this date, the EIB will have access, if and when appropriate for its treasury management, to the Eurosystems open market operations and standing facilities through the Banque centrale du Luxembourg under the same conditions as any other counterparty.
04/06/2009	CBPP	Following-up on its decision of 7 May 2009 to purchase euro-denominated covered bonds issued in the euro area, the Governing Council of the European Central Bank (ECB) decided upon the technical modalities today. These modalities are as follows: 1) The purchases, for an amount of EUR 60 billion, will be distributed across the euro area and will be carried out by means of direct purchases. 2) The purchases will be conducted in both the primary and the secondary markets.
06/10/2011	LTRO, CBPP	The Governing Council of the European Central Bank (ECB) has today decided to launch a new covered bond purchase programme (CBPP2). ECB announces details of refinancing operations from October 2011 to 10 July 2012.
03/11/2011	CBPP	Further to its decision of 6 October 2011 to launch a new covered bond purchase programme (CBPP2), the Governing Council of the European Central Bank (ECB) decided today upon the technical modalities of the programme: 1) The purchases of euro-denominated covered bonds issued in the euro area, for an intended nominal amount of EUR 40 billion, will be distributed across the euro area and will be carried out by the Eurosystem by means of direct purchases. 2) The purchases will be conducted in both the primary and the secondary markets. 3) In order to be qualified for purchase under the programme, covered bonds must: - 3.1 be eligible for use as collateral in Eurosystem credit operations.
09/02/2012	COLL	The Governing Council of the European Central Bank (ECB) has approved, for the seven national central banks (NCBs) that have put forward relevant proposals, specific national eligibility criteria and risk control measures for the temporary acceptance of additional credit claims as collateral in Eurosystem credit operations.
22/06/2012	COLL	In addition to the ABSs that are already eligible for use as collateral in Eurosystem operations, the Eurosystem will consider the following ABSs as eligible: 1) Auto loan, leasing and consumer finance ABSs and ABSs backed by commercial mortgages (CMBSs) which have a second-best rating of at least single A in the Eurosystems harmonised credit scale, at issuance and at all times subsequently. These ABSs will be subject to a valuation haircut of 16%. 2) Residential mortgage-backed securities (RMBSs), securities backed by loans to small and medium-sized enterprises (SMEs), auto loan, leasing and consumer finance ABSs and CMBSs which have a second-best rating of at least triple B [2] in the Eurosystems harmonised credit scale, at issuance and at all times subsequently. RMBSs, securities backed by loans to SMEs, and auto loan, leasing and consumer finance ABSs would be subject to a valuation haircut of 26%, while CMBSs would be subject to a valuation haircut of 32%.
26/07/2012	OMT	Draghi's London speech (the ECB is ready to do whatever it takes to preserve the euro.")

Continued on next page

Figure 3: Table 3:– continued from previous page

– continued from previous page

Date	Program	ECB announcements
27/08/2012	OMT	OMT Outright Monetary Transactions
06/09/2012	OMT, COLL	Technical features of Outright Monetary Transactions and Measures to preserve collateral availability
18/06/2013	ABSPP	ECB further reviews its risk control framework allowing for a new treatment of asset-backed securities
04/09/2014	ABSPP	ECB modifies loan-level reporting requirements for some asset-backed securities ABS
02/10/2014	ABSPP CBPP3	ECB announces operational details of asset-backed securities and covered bond purchase programmes
15/10/2014	CBPP3	ECB announces CBPP3, third covered bond purchase programme
19/11/2014	ABSPP	ECB decision on the implementation of the asset purchase program-backed securitizations. ABS
22/01/2015	QE	ECB announces expanded asset purchase programme: Quantitative easing
04/03/2015	QE PSPP	ECB announces the public sector purchase programme (Quantitative easing)
18/03/2015	ABSPP QE	ECB announces new condition for Quantitative easing and asset-backed securities purchase programme
03/09/2015	QE	The ECB increases the upper limit for buying sovereign european securities from 25% to 33% (Quantitative easing)

Figure 4: Table 4: Eurostoxx Banks Index

Regression - Table 4

	(1) Eurostoxx	(2) Eurostoxx	(3) Eurostoxx	(4) Eurostoxx	(5) Eurostoxx
EUROSTOXXBANKSReturn					
EUROSTOXXBANKSReturn1	**0.047****	0.026	0.037	0.045	0.012
	(0.021)	(0.043)	(0.033)	(0.058)	(0.036)
EUROSTOXXBANKSReturn2	-0.023	-0.015	-0.045	**-0.092***	-0.003
	(0.022)	(0.043)	(0.031)	(0.047)	(0.036)
EUROSTOXXBANKSReturn3	**-0.051****	-0.079	**-0.064****	**-0.089***	-0.047
	(0.023)	(0.056)	(0.030)	(0.046)	(0.041)
ECBAnnouncement	-0.130	-0.259	0.064	-0.030	0.240
	(0.146)	(0.505)	(0.324)	(0.609)	(0.403)
NEWS	**-8.863*****	**-12.146*****	-3.022	-6.674	5.327
	(1.405)	(2.818)	(4.847)	(6.983)	(4.688)
NEWS *ECBAnnouncement	**9.310****	**18.652****	6.071	2.874	**31.467***
	(3.786)	(9.441)	(10.143)	(11.403)	(17.511)
E_ECB*ECBAnnouncement	**2.192***	**6.204****	1.251	0.570	3.548
	(1.218)	(2.859)	(2.575)	(3.325)	(3.854)
QE_ABS_CBPP_COLL	0.790	-2.703	**1.342***	**2.812****	0.959
	(0.831)	(2.522)	(0.793)	(1.253)	(0.882)
Const.	0.067	-0.280	0.108	0.042	0.053
	(0.149)	(0.620)	(0.326)	(0.541)	(0.582)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
R^2	4.2%	12.8%	2.2%	4.00%	2.8%
DW	1.99	1.99	2	2.02	1.98
P-value (F)	0.00%	0.00%	49.7%	4%	9%
LM autocorrelation test	0.04	0.258	0.057	0.05	0.002
Arch test	0.00%	0.00%	0.00%	9.00%	0.00%
Normality test	0.00%	0.00%	0.00%	0.00%	0.00%

Notes: Regression output for EuroStoxx Banks index. The regression model is given by Equation (1). All regressions are estimated with HAC consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 5: Table 5: Eurostoxx Banks Index Garch specification (1)

Regression - Table 5

	(1) Eurostoxx	(2) Eurostoxx	(3) Eurostoxx	(4) Eurostoxx	(5) Eurostoxx
EUROSTOXXBANKSReturn					
EUROSTOXXBANKSReturn1	0.023	**-0.080****	0.014	0.022	0.002
	(0.016)	(0.040)	(0.027)	(0.051)	(0.035)
EUROSTOXXBANKSReturn2	-0.015	**-0.065****	-0.039	**-0.090****	-0.007
	(0.016)	(0.032)	(0.027)	(0.045)	(0.032)
EUROSTOXXBANKSReturn3	**-0.033****	-0.026	**-0.054****	**-0.093****	-0.041
	(0.016)	(0.033)	(0.027)	(0.043)	(0.040)
ECBAnnouncement	0.027	-0.580	0.375	0.307	0.465
	(0.094)	(0.545)	(0.273)	(0.492)	(0.333)
NEWS *ECBAnnouncement	**4.206***	**9.803****	3.743	2.532	**30.989****
	(2.238)	(4.651)	(7.732)	(8.453)	(15.328)
E_ECB*ECBAnnouncement	0.116	**3.888****	-0.608	1.849	0.744
	(0.665)	(1.651)	(1.479)	(3.538)	(2.426)
NEWS	**-4.306*****	**-11.733*****	-1.466	-5.281	5.523
	(0.789)	(1.302)	(2.911)	(4.147)	(5.172)
QE_ABS_CBPP_COLL	0.029	-1.119	0.310	**2.676*****	0.015
	(0.906)	(1.783)	(0.851)	(0.903)	(0.880)
Const	0.014	-0.187	0.151	0.418	-0.161
	(0.103)	(0.464)	(0.304)	(0.587)	(0.711)
GARCH					
alpha(1)	**0.093*****	**0.094*****	**0.079*****	**0.146*****	**0.041*****
	(0.014)	(0.023)	(0.025)	(0.050)	(0.012)
beta(1)	**0.905*****	**0.888*****	**0.901*****	**0.848*****	**0.945*****
	(0.013)	(0.024)	(0.028)	(0.040)	(0.016)
alpha(0)	**0.016*****	**0.095*****	**0.087****	**0.103***	**0.043***
	(0.005)	(0.034)	(0.036)	(0.060)	(0.023)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.017	0.81	0.00	0.096
AIC	15826	2882	6513	2421	4120
BIC	16107	3005	6695	2550	4277
Log Likelihood	-7869	-1413	-3222	-1180	-2028

Notes: Regression output for EuroStoxx Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 6: Table 6: Eurostoxx Banks Index Garch specification (2)

Regression - Table 6

	(1) Eurostoxx	(2) Eurostoxx	(3) Eurostoxx	(4) Eurostoxx	(5) Eurostoxx
EUROSTOXXBANKSReturn					
EUROSTOXXBANKSReturn1	0.021	0.002	0.019	0.047	-0.012
	(0.015)	(0.039)	(0.026)	(0.047)	(0.031)
EUROSTOXXBANKSReturn2	-0.017	-0.013	-0.025	-0.063	-0.007
	(0.015)	(0.040)	(0.025)	(0.043)	(0.031)
EUROSTOXXBANKSReturn3	**-0.032****	-0.056	**-0.043***	**-0.078***	-0.019
	(0.015)	(0.044)	(0.025)	(0.042)	(0.032)
ECBAnnouncement	0.030	-0.100	**0.455***	0.326	0.555
	(0.092)	(0.338)	(0.269)	(0.502)	(0.351)
NEWS*ECBAnnouncement	**4.532****	**12.344*****	4.888	3.609	27.341
	(2.283)	(5.140)	(8.111)	(9.601)	(19.729)
E_ECB*ECBAnnouncement	0.600	5.028	-0.425	1.103	1.019
	(0.684)	(3.850)	(1.600)	(3.273)	(3.855)
NEWS	**-4.18*****	**-8.807*****	-1.745	-6.618	7.087
	(0.792)	(2.505)	(3.593)	(6.482)	(4.810)
QE_ABS_CBPP_COLL	0.814	-0.320	0.882	**2.836*****	0.625
	(0.670)	(1.089)	(0.594)	(0.981)	(0.545)
Const	0.106	0.010	0.013	0.224	-0.213
	(0.097)	(0.485)	(0.297)	(0.539)	(0.585)
GARCH					
alpha(1)	**0.084*****	**0.111*****	**0.061*****	**0.103*****	**0.043*****
	(0.011)	(0.032)	(0.015)	(0.037)	(0.012)
beta(1)	**0.916*****	**0.882*****	**0.922*****	**0.879*****	**0.944*****
	(0.010)	(0.027)	(0.018)	(0.035)	(0.016)
alpha(0)	**0.011*****	0.075	**0.066****	**0.118***	0.041
	(0.004)	(0.046)	(0.028)	(0.063)	(0.025)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.35	0.00	0.089
AIC	15652	9081	6461	2410	4081
BIC	15679	9154	6643	2539	4238
Log Likelihood	-7795	-4527	-3196	-1175	-2008

Notes: Regression output for EuroStoxx Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 7: Table 8: Austria Banks Index

Regression - Table 8

	(1) Austria	(2) Austria	(3) Austria	(4) Austria	(5) Austria
AUSTRIADSBANKSReturn					
AUSTRIADSBANKSReturn1	**0.053****	0.033	**0.048***	0.034	0.040
	(0.023)	(0.047)	(0.028)	(0.050)	(0.034)
AUSTRIADSBANKSReturn2	**-0.053***	**-0.087***	-0.050	**-0.132****	0.003
	(0.029)	(0.052)	(0.033)	(0.052)	(0.040)
AUSTRIADSBANKSReturn3	**-0.041***	-0.069	-0.040	-0.062	-0.031
	(0.023)	(0.048)	(0.030)	(0.056)	(0.036)
ECBAnnouncement	-0.049	-0.079	0.088	0.199	0.139
	(0.149)	(0.760)	(0.270)	(0.599)	(0.307)
NEWS	**-5.624*****	**-13.287*****	0.696	-3.609	**9.627***
	(1.434)	(3.296)	(3.786)	(5.207)	(5.501)
NEWS *ECBAnnouncement	2.678	1.700	5.404	6.125	8.101
	(4.169)	(11.157)	(7.150)	(9.692)	(13.883)
E_ECB* ECBAnnouncement	0.089	2.536	-0.302	-0.903	0.467
	(1.515)	(4.290)	(1.852)	(3.377)	(2.830)
QE_ABS_CBPP_COLL	-0.006	-3.476	0.593	0.225	0.493
	(0.853)	(4.171)	(0.543)	(1.192)	(0.608)
Const.	-0.042	-0.595	-0.123	-0.353	0.053
	(0.162)	(0.664)	(0.381)	(0.547)	(0.624)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
R^2	2.6%	12.2%	2%	4.8%	2.8%
DW	2	2	1.99	1.99	1.99
P-value (F)	0.00%	0.03%	14.62%	0.00%	8.15%
LM autocorrelation test	0.56	0.907	0.035	0.009	0.009
Arch test	0.00%	0.00%	0.00%	0.00%	0.00%
Normality test	0.00%	0.00%	0.00%	0.00%	0.00%

Notes: Regression output for Austria DS Banks index. The regression model is given by Equation (1). All regressions are estimated with HAC consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 8: Table 9: Austria Banks Index Garch specification (1)

Regression - Table 9

	(1) Austria	(2) Austria	(3) Austria	(4) Austria	(5) Austria
AUSTRIADSBANKSReturn					
AUSTRIADSBANKSReturn1	**0.034****	0.005	0.036	0.020	0.043
	(0.017)	(0.042)	(0.029)	(0.050)	(0.034)
AUSTRIADSBANKSReturn2	**-0.028***	-0.045	-0.035	-0.069	0.000
	(0.016)	(0.041)	(0.028)	(0.047)	(0.035)
AUSTRIADSBANKSReturn3	**-0.044*****	-0.041	-0.043	-0.051	-0.030
	(0.016)	(0.043)	(0.026)	(0.046)	(0.032)
ECBAnnouncement	0.033	−0.230	0.063	-0.035	0.234
	(0.098)	(0.615)	(0.239)	(0.424)	(0.278)
NEWS*ECBAnnouncement	1.406	9.658	2.736	-1.100	15.699
	(1.966)	(7.400)	(7.108)	(7.502)	(16.023)
E_ECB*ECBAnnouncement	-0.401	1.897	-0.202	-2.141	1.893
	(0.847)	(4.775)	(2.208)	(2.642)	(4.075)
NEWS	**-1.583****	**−11.161****	1.135	-1.165	**9.358***
	(0.776)	(2.912)	(2.640)	(3.201)	(5.398)
QE_ABS_CBPP_COLL	0.133	−1.335	0.347	0.085	0.344
	(0.722)	(2.595)	(0.670)	(0.890)	(0.651)
Const	**0.080*****	−0.923	0.008	-0.004	-0.006
	(0.022)	(0.645)	(0.050)	(0.083)	(0.061)
GARCH					
alpha(1)	**0.078*****	**0.127***	**0.052****	**0.103*****	**0.021***
	(0.017)	(0.069)	(0.024)	(0.032)	(0.013)
beta(1)	**0.915*****	**0.849*****	**0.922*****	**0.892*****	**0.960*****
	(0.019)	(0.078)	(0.036)	(0.030)	(0.025)
alpha(0)	**0.030****	0.276	0.106	0.061	0.060
	(0.012)	(0.214)	(0.070)	(0.044)	(0.053)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.001	0.484	0.00	0.20
AIC	16729	3093	6548	2360	4192
BIC	16812	3226	6618	2416	4256
Log Likelihood	-8351	−1516	-3261	-1167	-2083

Notes: Regression output for Austria DS Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 9: Table 10: Austria Banks Index Garch specification (2)

Regression - Table 10

	(1) Austria	(2) Austria	(3) Austria	(4) Austria	(5) Austria
AUSTRIADSBANKSReturn					
AUSTRIADSBANKSReturn1	0.019	-0.011	0.022	0.026	0.018
	(0.015)	(0.041)	(0.027)	(0.047)	(0.032)
AUSTRIADSBANKSReturn2	**-0.030****	-0.053	-0.028	-0.053	-0.016
	(0.014)	(0.044)	(0.025)	(0.046)	(0.032)
AUSTRIADSBANKSReturn3	**-0.027***	-0.031	-0.022	-0.027	-0.020
	(0.014)	(0.043)	(0.024)	(0.044)	(0.029)
ECBAnnouncement	0.000	-0.001	0.020	-0.082	0.146
	(0.092)	(0.763)	(0.236)	(0.459)	(0.287)
NEWS*ECBAnnouncement	0.847	7.569	3.988	1.106	14.537
	(1.612)	(8.673)	(6.142)	(7.741)	(16.867)
E_ECB*ECBAnnouncement	-0.179	0.267	-0.785	-1.627	0.965
	(0.609)	(6.561)	(1.944)	(2.801)	(4.434)
NEWS	-1.051	**-10.949****	0.611	-1.380	6.812
	(0.797)	(2.810)	(2.486)	(3.797)	(5.097)
QE_ABS_CBPP_COLL	0.403	-0.268	0.467	0.436	0.347
	(0.761)	(1.988)	(0.750)	(0.895)	(0.749)
Const	**0.059*****	-0.891	0.014	0.000	0.011
	(0.019)	(0.582)	(0.044)	(0.070)	(0.055)
GARCH					
alpha(1)	**0.075*****	**0.108***	**0.052*****	**0.091*****	**0.037****
	(0.013)	(0.058)	(0.013)	(0.028)	(0.015)
beta(1)	**0.925*****	**0.870*****	**0.933*****	**0.900*****	**0.945*****
	(0.013)	(0.068)	(0.018)	(0.030)	(0.023)
alpha(0)	**0.018****	0.259	**0.062***	0.069	0.064
	(0.007)	(0.218)	(0.032)	(0.050)	(0.048)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.01	0.46	0.01	0.01
AIC	16449	3075	6464	2347	4136
BIC	16532	3207	6533	2403	4200
Log Likelihood	-8211	-1507	-3219	-1160	-2055

Notes: Regression output for Austria DS Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 10: Table 11: FTSE Belgium Banks Index

Regression - Table 11

	(1) Belgium	(2) Belgium	(3) Belgium	(4) Belgium	(5) Belgium
FTSEBELGIUMBANKSReturn					
FTSEBELGIUMBANKSReturn1	**0.108*** **	**0.122** **	0.053	0.027	0.049
	(0.028)	(0.054)	(0.040)	(0.070)	(0.046)
FTSEBELGIUMBANKSReturn2	-0.006	0.013	-0.045	-0.085	-0.015
	(0.026)	(0.052)	(0.034)	(0.053)	(0.041)
FTSEBELGIUMBANKSReturn3	**-0.060** **	**-0.092** *	**-0.059** *	**-0.102** *	-0.040
	(0.025)	(0.050)	(0.033)	(0.052)	(0.041)
ECBAnnouncement	0.010	0.440	0.335	0.234	0.493
	(0.215)	(1.078)	(0.433)	(0.753)	(0.571)
NEWS	**-8.992*** **	**-20.581*** **	-1.604	-8.175	**11.705** *
	(2.017)	(6.236)	(5.790)	(8.097)	(5.996)
NEWS*ECBAnnouncement	**13.409** **	**35.951** **	7.914	12.723	20.404
	(6.105)	(14.179)	(11.246)	(14.235)	(17.488)
E_ECB*ECBAnnouncement	3.132	7.283	2.734	2.057	4.099
	(2.254)	(6.775)	(2.162)	(4.085)	(3.327)
QE_ABS_CBPP_COLL	1.066	-0.298	1.150	**4.326** **	0.772
	(1.084)	(5.514)	(0.820)	(1.954)	(0.921)
Const.	0.072	0.458	0.373	0.611	-0.907
	(0.190)	(0.951)	(0.528)	(0.856)	(1.053)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
R^2	4.5%	12.6%	3.1%	4.6%	4.5%
DW	1.99	2	1.99	2	2
P-value (F)	0.00%	0.10%	9.12%	0.00%	0.63%
LM autocorrelation test	0.727	0.852	0.195	0.025	0.00
Arch test	0.00%	0.00%	0.00%	0.00%	0.00%
Normality test	0.00%	0.00%	0.00%	0.00%	0.00%

Notes: Regression output for FTSE Belgium Banks index. The regression model is given by Equation (1). All regressions are estimated with HAC consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 11: Table 12: FTSE Belgium Banks Index Garch specification (1)

Regression - Table 12

	(1) Belgium	(2) Belgium	(3) Belgium	(4) Belgium	(5) Belgium
FTSEBELGIUMBANKSReturn					
FTSEBELGIUMBANKSReturn1	**0.041****	0.020	0.018	0.077	-0.008
	(0.017)	(0.054)	(0.028)	(0.050)	(0.036)
FTSEBELGIUMBANKSReturn2	-0.000	-0.009	-0.029	-0.060	-0.015
	(0.016)	(0.056)	(0.026)	(0.046)	(0.032)
FTSEBELGIUMBANKSReturn3	-0.020	-0.021	-0.042	-0.059	-0.038
	(0.016)	(0.079)	(0.026)	(0.048)	(0.041)
ECBAnnouncement	0.018	0.924	0.568	0.003	**0.842****
	(0.096)	(0.665)	(0.356)	(0.675)	(0.388)
NEWS*ECBAnnouncement	2.268	**20.876***	6.796	12.256	24.101
	(2.262)	(12.664)	(10.215)	(11.493)	(16.738)
E_ECB*ECBAnnouncement	0.380	6.974	1.167	5.712	3.075
	(0.837)	(10.069)	(1.378)	(4.005)	(2.343)
NEWS	**-2.965*****	**−13.669****	0.593	-6.014	11.456
	(0.948)	(3.584)	(4.345)	(5.897)	(7.461)
QE_ABS_CBPP_COLL	0.012	0.345	-0.255	**3.451****	-0.662
	(0.767)	(3.507)	(0.724)	(1.567)	(0.808)
Const	**0.050****	−0.471	0.063	-0.093	**0.119***
	(0.020)	(1.206)	(0.054)	(0.105)	(0.065)
GARCH					
alpha(1)	**0.121*****	**0.328***	**0.102*****	**0.185****	**0.047****
	(0.021)	(0.192)	(0.036)	(0.089)	(0.022)
beta(1)	**0.882*****	**0.671****	**0.880*****	**0.775*****	**0.943*****
	(0.019)	(0.320)	(0.043)	(0.112)	(0.026)
alpha(0)	**0.021*****	0.670	**0.125***	0.448	0.040
	(0.008)	(2.189)	(0.075)	(0.368)	(0.029)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.38	0.00	0.01
AIC	17536	3310	7191	2661	4541
BIC	17612	3442	7261	2717	4604
Log Likelihood	-8756	-1625	-3582	-1317	-2257

Notes: Regression output for FTSE Belgium Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 12: Table 13: FTSE Belgium Banks Index Garch specification (2)

Regression - Table 13

	(1) Belgium	(2) Belgium	(3) Belgium	(4) Belgium	(5) Belgium
FTSEBELGIUMBANKSReturn					
FTSEBELGIUMBANKSReturn1	**0.051*** **	0.052	0.020	**0.096** **	-0.021
	(0.016)	(0.046)	(0.028)	(0.048)	(0.033)
FTSEBELGIUMBANKSReturn2	-0.001	-0.002	-0.025	-0.054	-0.009
	(0.015)	(0.042)	(0.025)	(0.045)	(0.032)
FTSEBELGIUMBANKSReturn3	-0.018	-0.047	-0.029	-0.047	-0.008
	(0.015)	(0.037)	(0.025)	(0.045)	(0.033)
ECBAnnouncement	-0.003	0.493	**0.599***	-0.208	**0.893** **
	(0.093)	(0.532)	(0.338)	(0.673)	(0.366)
NEWS*ECBAnnouncement	1.146	5.778	9.290	16.140	14.536
	(1.933)	(9.033)	(12.732)	(13.098)	(17.737)
E_ECB*ECBAnnouncement	0.630	2.643	1.345	5.713	3.001
	(0.907)	(7.927)	(1.454)	(3.585)	(2.567)
NEWS	**-2.505*** **	**-9.850*** **	-0.211	-9.471	**15.216** **
	(0.769)	(2.988)	(4.489)	(8.285)	(6.343)
QE_ABS_CBPP_COLL	0.651	0.628	0.115	**3.686** **	-0.202
	(0.681)	(3.192)	(0.719)	(1.704)	(0.855)
Const	**0.054*** **	0.687	0.054	-0.116	0.105
	(0.019)	(0.595)	(0.052)	(0.098)	(0.064)
GARCH					
alpha(1)	**0.127*** **	**0.236** **	**0.104** **	**0.177** **	**0.046***
	(0.020)	(0.097)	(0.044)	(0.075)	(0.027)
beta(1)	**0.878*** **	**0.793*** **	**0.883*** **	**0.793*** **	**0.948*** **
	(0.018)	(0.074)	(0.049)	(0.093)	(0.029)
alpha(0)	**0.022*** **	0.200	0.105	0.382	0.026
	(0.007)	(0.180)	(0.077)	(0.321)	(0.026)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.40	0.00	0.01
AIC	17396	3263	7165	2647	4517
BIC	17479	3396	7235	2702	4581
Log Likelihood	-8685	-1601	-3569	-1310	-2245

Notes: Regression output for FTSE Belgium Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 13: Table 14: FTSE Spain Banks Index

Regression - Table 14

	(1) Spain	(2) Spain	(3) Spain	(4) Spain	(5) Spain
FTSESPAINBANKSReturn					
FTSESPAINBANKSReturn1	0.023	0.012	0.054	0.073	0.026
	(0.022)	(0.049)	(0.038)	(0.069)	(0.037)
FTSESPAINBANKSReturn2	**-0.039***	-0.024	**-0.071*****	**-0.117*****	-0.033
	(0.021)	(0.051)	(0.026)	(0.042)	(0.033)
FTSESPAINBANKSReturn3	**-0.047****	-0.071	-0.033	-0.046	-0.022
	(0.021)	(0.052)	(0.026)	(0.042)	(0.035)
ECBAnnouncement	-0.108	-0.310	-0.007	0.009	0.012
	(0.161)	(0.484)	(0.329)	(0.665)	(0.399)
NEWS	**-8.496*****	**-10.619*****	-1.679	-4.040	3.879
	(1.396)	(2.672)	(4.897)	(7.126)	(3.912)
NEWS*ECBAnnouncement	**8.497****	9.901	3.329	4.290	11.065
	(3.948)	(8.351)	(9.458)	(12.449)	(15.361)
E_ECB*ECBAnnouncement	1.828	**5.215****	1.518	1.441	2.327
	(1.241)	(2.455)	(2.387)	(2.917)	(3.427)
QE_ABS_CBPP_COLL	0.766	-1.934	1.263	**2.263***	1.093
	(0.774)	(2.180)	(0.794)	(1.358)	(0.899)
Const.	-0.008	-0.384	0.152	0.275	0.037
	(0.172)	(0.604)	(0.312)	(0.556)	(0.474)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
R^2	3.4%	10.6%	2%	3.7%	2.1%
DW	1.98	1.99	2	2	1.99
P-value (F)	0.00%	0.02%	4.54%	0.00%	44%
LM autocorrelation test	0.061	0.138	0.022	0.03	0.095
Arch test	0.00%	0.00%	0.00%	0.00%	0.00%
Normality test	0.00%	0.00%	0.00%	0.00%	0.00%

Notes: Regression output for FTSE Spain Banks index. The regression model is given by Equation (1). All regressions are estimated with HAC consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 14: Table 15: FTSE Spain Banks Index Garch specification (1)

Regression - Table 15

	(1) Spain	(2) Spain	(3) Spain	(4) Spain	(5) Spain
FTSESPAINBANKSReturn					
FTSESPAINBANKSReturn1	0.007	0.001	0.032	0.045	0.020
	(0.016)	(0.042)	(0.030)	(0.059)	(0.032)
FTSESPAINBANKSReturn2	**-0.029***	−0.017	**-0.054****	**-0.092***	−0.029
	(0.016)	(0.045)	(0.027)	(0.047)	(0.032)
FTSESPAINBANKSReturn3	-0.025	**−0.076***	-0.025	-0.047	−0.004
	(0.016)	(0.040)	(0.028)	(0.046)	(0.034)
ECBAnnouncement	0.016	0.112	0.276	0.072	0.376
	(0.100)	(0.373)	(0.246)	(0.484)	(0.300)
NEWS *ECBAnnouncement	**4.286***	10.694	3.905	6.204	16.648
	(2.693)	(7.562)	(7.772)	(10.160)	(13.663)
E_ECB*ECBAnnouncement	0.059	3.477	-0.555	2.695	0.111
	(0.832)	(3.289)	(1.485)	(2.639)	(2.080)
NEWS	**-4.921*****	**-7.063*****	-2.420	-7.096	4.453
	(0.835)	(2.243)	(2.845)	(4.402)	(4.152)
QE_ABS_CBPP_COLL	0.301	0.375	0.375	**1.928***	0.054
	(0.900)	(0.722)	(0.749)	(1.115)	(0.786)
Const	**0.044****	−0.377	0.000	-0.064	−0.001
	(0.021)	(0.754)	(0.048)	(0.089)	(0.053)
GARCH					
alpha(1)	**0.098*****	**0.146*****	**0.088*****	**0.151****	**0.046*****
	(0.015)	(0.047)	(0.030)	(0.064)	(0.014)
beta(1)	**0.899*****	**0.853*****	**0.885*****	**0.817*****	**0.934*****
	(0.013)	(0.036)	(0.034)	(0.059)	(0.020)
alpha(0)	**0.025*****	0.063	0.120**	0.250	0.060*
	(0.008)	(0.040)	(0.053)	(0.154)	(0.033)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.06	0.36	0.00	0.49
AIC	16582	2711	6460	2434	4027
BIC	16665	2843	6530	2490	4091
Log Likelihood	-8278	−1325	-3217	-1204	−2000

Notes: Regression output for FTSE Spain Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 15: Table 16: FTSE Spain Banks Index Garch specification (2)

Regression - Table 16

	(1) Spain	(2) Spain	(3) Spain	(4) Spain	(5) Spain
FTSESPAINBANKSReturn					
FTSESPAINBANKSReturn1	0.007	-0.017	0.037	0.068	0.018
	(0.015)	(0.038)	(0.026)	(0.046)	(0.032)
FTSESPAINBANKSReturn2	**-0.025***	-0.009	-0.037	-0.057	-0.025
	(0.015)	(0.041)	(0.025)	(0.043)	(0.031)
FTSESPAINBANKSReturn3	-0.019	-0.055	-0.019	-0.044	0.000
	(0.015)	(0.042)	(0.024)	(0.040)	(0.032)
ECBAnnouncement	0.095	0.026	0.322	0.072	0.421
	(0.100)	(0.302)	(0.224)	(0.382)	(0.313)
NEWS*ECBAnnouncement	**5.239***	**13.260*****	4.787	10.074	13.594
	(3.155)	(3.891)	(9.515)	(11.107)	(16.808)
E_ECB*ECBAnnouncement	0.575	3.658	-0.298	2.597	0.229
	(0.979)	(2.502)	(2.002)	(2.131)	(3.210)
NEWS	**-5.071*****	**-7.395*****	-1.814	-7.694	4.063
	(0.936)	(2.295)	(3.254)	(6.744)	(3.961)
QE_ABS_CBPP_COLL	0.608	-0.075	0.717	**2.317****	0.440
	(0.561)	(0.831)	(0.497)	(1.078)	(0.494)
Const	**0.044****	-0.291	-0.014	-0.116	0.014
	(0.019)	(0.493)	(0.043)	(0.085)	(0.051)
GARCH					
alpha(1)	**0.086*****	**0.111*****	**0.066*****	**0.083****	**0.055*****
	(0.010)	(0.032)	(0.015)	(0.039)	(0.015)
beta(1)	**0.912*****	**0.887*****	**0.914*****	**0.876*****	**0.925*****
	(0.010)	(0.027)	(0.020)	(0.054)	(0.021)
alpha(0)	**0.018*****	0.052	**0.088****	0.229	**0.065***
	(0.006)	(0.038)	(0.038)	(0.155)	(0.037)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.06	0.34	0.00	0.40
AIC	16430	2690	6377	2404	3983
BIC	16512	2822	6447	2460	4047
Log Likelihood	-8202	-1315	-3175	-1189	-1978

Notes: Regression output for FTSE Spain Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 16: Table 17: EuroNext CaC Banks Index

Regression - Table 17

	(1) France	(2) France	(3) France	(4) France	(5) France
EURONEXTCACBANKSReturn					
EURONEXTCACBANKSReturn1	**0.038***	0.010	0.026	0.009	0.018
	(0.021)	(0.039)	(0.035)	(0.057)	(0.040)
EURONEXTCACBANKSReturn2	-0.011	0.005	-0.020	-0.038	0.009
	(0.028)	(0.048)	(0.045)	(0.068)	(0.046)
EURONEXTCACBANKSReturn3	**-0.065****	-0.043	**-0.106*****	**-0.131****	-0.087
	(0.026)	(0.054)	(0.037)	(0.054)	(0.055)
ECBAnnouncement	-0.100	-0.405	0.231	0.280	0.340
	(0.163)	(0.619)	(0.338)	(0.637)	(0.406)
NEWS	**-10.290*****	**-14.632*****	-4.550	-9.652	6.032
	(1.610)	(3.587)	(5.572)	(8.133)	(5.854)
NEWS*ECBAnnouncement	**10.025****	**25.242****	4.124	0.698	**43.198****
	(4.693)	(10.359)	(11.531)	(11.049)	(17.762)
E_ECB*ECBAnnouncement	1.702	4.712	-0.146	-0.284	2.487
	(1.518)	(4.391)	(2.653)	(3.973)	(3.267)
QE_ABS_CBPP_COLL	1.065	**-3.685***	**1.763****	**5.131*****	1.175
	(0.914)	(2.050)	(0.826)	(1.322)	(0.867)
CONST.	0.191	-0.203	0.158	-0.020	-0.053
	(0.187)	(0.842)	(0.372)	(0.647)	(0.783)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
R^2	4%	11.4%	3.1%	5.1%	4.5%
DW	2	2	1.99	2	1.99
P-value (F)	0.00%	0.07%	7.24%	0.00%	0.00%
LM autocorrelation test	0.169	0.67	0.576	0.232	0.00
Arch test	0.00%	0.00%	0.00%	0.00%	0.00%
Normality test	0.00%	0.00%	0.00%	0.00%	0.00%

Notes: Regression output for EuroNext Cac Banks index. The regression model is given by Equation (1). All regressions are estimated with HAC consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 17: Table 18: EuroNext CaC Banks Index Garch specification (1)

Regression - Table 18

	(1) France	(2) France	(3) France	(4) France	(5) France
EURONEXTCACBANKSReturn					
EURONEXTCACBAKSReturn1	0.019	0.011	0.010	0.031	0.015
	(0.016)	(0.041)	(0.028)	(0.051)	(0.044)
EURONEXTCACBANKSReturn2	-0.021	-0.040	-0.015	−0.041	0.002
	(0.016)	(0.040)	(0.025)	(0.043)	(0.032)
EURONEXTCACBANKSReturn3	**-0.047*****	-0.056**	**-0.068****	**−0.092****	-0.088
	(0.016)	(0.040)	(0.027)	(0.045)	(0.058)
ECBAnnouncement	0.120	−0.083	**0.503***	0.442	**0.624***
	(0.115)	(0.510)	(0.294)	(0.602)	(0.339)
NEWS*ECBAnnouncement	**5.708****	**14.597***	0.907	−6.609	**40.195*****
	(2.876)	(7.919)	(9.140)	(10.807)	(14.329)
E_ECB*ECBAnnouncement	-0.259	3.826	-1.296	1.351	0.208
	(0.921)	(4.726)	(1.051)	(4.809)	(1.276)
NEWS	**-5.563*****	**-11.328*****	0.403	−3.929	5.165
	(1.250)	(2.510)	(3.126)	(4.383)	(6.421)
QE_ABS_CBPP_COLL	0.301	−1.218	0.347	**4.307*****	-0.078
	(0.906)	(1.287)	(0.885)	(1.221)	(0.948)
Const	**0.052****	−0.180	0.036	−0.039	0.049
	(0.021)	(0.875)	(0.048)	(0.092)	(0.056)
GARCH					
alpha(1)	**0.084*****	**0.135*****	**0.078*****	**0.148****	**0.040*****
	(0.014)	(0.045)	(0.022)	(0.059)	(0.011)
beta(1)	**0.910*****	**0.859*****	**0.911*****	**0.848*****	**0.950*****
	(0.014)	(0.037)	(0.024)	(0.056)	(0.013)
alpha(0)	**0.027*****	**0.127***	**0.058****	0.133	**0.027***
	(0.009)	(0.071)	(0.029)	(0.100)	(0.015)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.00	0.00	0.00
AIC	16981	3044	6675	2543	4149
BIC	17064	3177	6745	2599	4213
Log Likelihood	-8477	-1492	-3324	−1258	-2061

Notes: Regression output for EuroNext Cac Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 18: Table 19: EuroNext CaC Banks Index Garch specification (2)

Regression - Table 19

	(1) France	(2) France	(3) France	(4) France	(5) France
EURONEXTCACBANKSReturn					
EURONEXTCACBANKSReturn1	0.018	-0.004	0.018	0.058	-0.015
	(0.015)	(0.041)	(0.026)	(0.046)	(0.032)
EURONEXTCACBANKSReturn2	-0.024	-0.023	-0.009	-0.032	0.009
	(0.015)	(0.038)	(0.024)	(0.042)	(0.031)
EURONEXTCACBANKSReturn3	**-0.041*** **	-0.052**	**-0.058** **	**-0.083***	-0.037
	(0.015)	(0.040)	(0.026)	(0.043)	(0.033)
ECBAnnouncement	0.121	-0.098	**0.508***	0.225	**0.660** **
	(0.109)	(0.491)	(0.289)	(0.575)	(0.320)
NEWS*ECBAnnouncement	**5.013***	**18.446***	2.357	-4.685	**33.689** **
	(3.123)	(10.140)	(9.332)	(11.485)	(14.778)
E_ECB*ECBAnnouncement	-0.062	7.629	-1.172	0.879	0.289
	(1.033)	(7.634)	(1.016)	(3.949)	(1.274)
NEWS	**-4.779*** **	**-10.092*** **	-0.445	-5.916	8.167
	(0.811)	(2.425)	(3.610)	(6.269)	(5.526)
QE_ABS_CBPP_COLL	1.028	-1.108	**1.079***	**4.467*** **	0.694
	(0.697)	(1.548)	(0.612)	(1.291)	(0.573)
Const	**0.054*** **	0.300	0.030	-0.061	0.052
	(0.020)	(0.603)	(0.046)	(0.089)	(0.055)
GARCH					
alpha(1)	**0.078*** **	**0.111*** **	**0.069*** **	**0.120*** **	**0.044*** **
	(0.010)	(0.041)	(0.017)	(0.044)	(0.013)
beta(1)	**0.918*** **	**0.882*** **	**0.920*** **	**0.869*** **	**0.947*** **
	(0.011)	(0.035)	(0.019)	(0.042)	(0.016)
alpha(0)	**0.023*** **	0.127	**0.052** **	0.139	0.028
	(0.007)	(0.082)	(0.025)	(0.086)	(0.019)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.00	0.00	0.00
AIC	16831	3027	6634	2529	4107
BIC	16914	3159	6703	2585	4170
Log Likelihood	-8402	-1483	-3304	-1251	-2040

Notes: Regression output for EuroNext Cac Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 19: Table 20: Dax Banks Index

Regression - Table 20

	(1) Germany	(2) Germany	(3) Germany	(4) Germany	(5) Germany
DAXBANKSXETRAReturn					
DAXBANKSXETRAReturn1	**0.046***	0.041	0.031	0.033	0.007
	(0.027)	(0.058)	(0.030)	(0.047)	(0.038)
DAXBANKSXETRAReturn2	-0.039	**-0.102***	-0.020	-0.053	0.005
	(0.029)	(0.054)	(0.037)	(0.062)	(0.039)
DAXBANKSXETRAReturn3	-0.032	-0.045	**-0.071****	**-0.138****	-0.029
	(0.030)	(0.067)	(0.035)	(0.062)	(0.041)
ECBAnnouncement	-0.169	-0.238	0.041	-0.219	0.361
	(0.170)	(0.706)	(0.298)	(0.541)	(0.371)
NEWS	**-12.262*****	**-18.475*****	-5.692	**-10.576***	5.477
	(1.853)	(4.232)	(4.234)	(5.933)	(4.578)
NEWS*ECBAnnouncement	**12.845*****	**27.060***	11.868	6.573	**37.381****
	(4.942)	(14.063)	(9.529)	(8.976)	(15.864)
E_ECB*ECBAnnouncement	**3.410****	**9.432****	2.209	1.402	**5.077***
	(1.695)	(4.087)	(2.555)	(2.207)	(2.724)
QE_ABS_CBPP_COLL	0.696	-3.031	**1.296***	1.507	0.920
	(0.951)	(4.279)	(0.675)	(1.051)	(0.742)
Const.	0.030	-1.090	0.021	-0.480	0.254
	(0.194)	(0.945)	(0.365)	(0.584)	(0.645)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
R^2	4.9%	14.6%	2.5%	6.8%	3%
DW	1.99	1.99	1.99	2	1.99
P-value (F)	0.00%	0.00%	18.00%	0.00%	0.00%
LM autocorrelation test	0.01	0.21	0.12	0.039	0.012
Arch test	0.00%	0.00%	0.00%	0.00%	0.00%
Normality test	0.00%	0.00%	0.00%	0.00%	0.00%

Notes: Regression output for DAX XETRA Banks index. The regression model is given by Equation (1). All regressions are estimated with HAC consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 20: Table 21: Dax Banks Index Garch specification (1)

Regression - Table 21

	(1) Germany	(2) Germany	(3) Germany	(4) Germany	(5) Germany
DAXBANKSXETRAReturn					
DAXBANKSXETRAReturn1	**0.030***	-0.045	0.037	**0.076***	0.026
	(0.016)	(0.043)	(0.026)	(0.045)	(0.036)
DAXBANKSXETRAReturn2	-0.003	-0.067	-0.010	-0.006	-0.005
	(0.015)	(0.042)	(0.025)	(0.044)	(0.031)
DAXBANKSXETRAReturn3	-0.020	**-0.079***	-0.031	**-0.094****	-0.017
	(0.016)	(0.047)	(0.027)	(0.046)	(0.042)
ECBAnnouncement	0.135	–0.008	0.392	0.233	**0.588***
	(0.116)	(0.396)	(0.245)	(0.416)	(0.309)
NEWS*ECBAnnouncement	4.221	**13.903****	8.978	4.180	**41.846*****
	(2.670)	(6.533)	(7.635)	(7.029)	(13.431)
E_ECB*ECBAnnouncement	-0.134	5.214	1.180	1.561	**3.428***
	(0.939)	(4.282)	(2.457)	(2.076)	(1.965)
NEWS	**-5.431*****	**-7.212*****	-1.905	-4.786	3.039
	(0.923)	(2.284)	(2.714)	(3.557)	(5.174)
QE_ABS_CBPP_COLL	0.396	0.722	0.388	**1.586****	0.070
	(0.793)	(1.656)	(0.783)	(0.734)	(0.806)
Const	0.026	-0.046	-0.033	-0.047	-0.031
	(0.023)	(0.043)	(0.046)	(0.086)	(0.056)
GARCH					
alpha(1)	**0.089*****	**0.141*****	**0.058*****	**0.088****	**0.043*****
	(0.014)	(0.033)	(0.014)	(0.035)	(0.013)
beta(1)	**0.905*****	**0.858*****	**0.930*****	**0.911*****	**0.946*****
	(0.014)	(0.025)	(0.016)	(0.037)	(0.016)
alpha(0)	0.905	**0.096***	**0.049****	0.041	0.036
	(0.010)	(0.052)	(0.023)	(0.051)	(0.022)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.55	0.00	0.01
AIC	17332	3108	6496	2359	4153
BIC	17415	3240	6566	2415	4217
Log Likelihood	-8653	-1524	-3235	-1166	-2063

Notes: Regression output for DAX XETRA Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 21: Table 22: Dax Banks Index Garch specification (2)

Regression - Table 22

	(1) Germany	(2) Germany	(3) Germany	(4) Germany	(5) Germany
DAXBANKSXETRAReturn					
DAXBANKSXETRAReturn1	**0.033****	-0.032	**0.044***	**0.084***	0.019
	(0.014)	(0.041)	(0.025)	(0.044)	(0.031)
DAXBANKSXETRAReturn2	-0.005	-0.053	-0.004	-0.004	0.001
	(0.015)	(0.041)	(0.025)	(0.044)	(0.031)
DAXBANKSXETRAReturn3	-0.022	-0.044	-0.030	**-0.085***	-0.000
	(0.015)	(0.047)	(0.027)	(0.047)	(0.034)
ECBAnnouncement	0.123	-0.063	**0.425***	0.210	**0.602***
	(0.108)	(0.368)	(0.246)	(0.432)	(0.310)
NEWS*ECBAnnouncement	**5.381****	**15.718*****	10.651	4.088	**40.065*****
	(2.640)	(5.951)	(7.679)	(6.455)	(13.986)
E_ECB*ECBAnnouncement	0.685	**8.225***	1.818	0.681	**4.113****
	(0.852)	(4.897)	(2.630)	(1.689)	(1.609)
NEWS	**-4.741*****	**-10.811*****	-2.452	-5.387	4.406
	(0.900)	(2.858)	(3.116)	(4.634)	(4.860)
QE_ABS_CBPP_COLL	0.949	1.479	0.888	**1.606****	0.565
	(0.628)	(1.238)	(0.638)	(0.628)	(0.610)
Const	0.033	-0.180	-0.026	0.628	-0.011
	(0.021)	(0.641)	(0.045)	(0.081)	(0.055)
GARCH					
alpha(1)	**0.085*****	**0.130*****	**0.051*****	**0.077*****	**0.040*****
	(0.012)	(0.037)	(0.012)	(0.027)	(0.013)
beta(1)	**0.912*****	**0.874*****	**0.938*****	**0.920*****	**0.953*****
	(0.012)	(0.028)	(0.013)	(0.031)	(0.015)
alpha(0)	**0.024*****	0.096	**0.041****	0.043	0.027
	(0.008)	(0.074)	(0.020)	(0.049)	(0.021)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.58	0.00	0.01
AIC	17179	3081	6471	2350	4133
BIC	17262	3213	6540	2406	4197
Log Likelihood	-8576	-1510	-3222	-1162	-2053

Notes: Regression output for DAX XETRA Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 22: Table 23: FTSE Athex Banks Index

Regression - Table 23

	(1) Greece	(2) Greece	(3) Greece	(4) Greece	(5) Greece
FTSEATHEXBANKSReturn					
FTSEATHEXBANKSReturn1	**0.086****	0.033	**0.079***	-0.076	**0.103***
	(0.038)	(0.041)	(0.047)	(0.055)	(0.056)
FTSEATHEXBANKSReturn2	-0.030	-0.040	-0.030	**-0.152*****	-0.008
	(0.025)	(0.047)	(0.031)	(0.044)	(0.036)
FTSEATHEXBANKSReturn3	-0.019	-0.035	-0.027	**-0.101****	-0.019
	(0.030)	(0.054)	(0.039)	(0.048)	(0.049)
ECBAnnouncement	-0.022	0.253	-0.274	-0.086	-0.219
	(0.226)	(0.656)	(0.602)	(0.756)	(0.839)
NEWS	**-3.851****	**-8.301****	0.977	-7.000	17.420
	(1.581)	(4.049)	(5.758)	(7.127)	(12.133)
NEWS*ECBAnnouncement	4.909	7.776	-6.800	-3.072	28.331
	(3.628)	(8.643)	(11.376)	(13.096)	(28.410)
E_ECB*ECBAnnouncement	1.323	**5.846****	-7.494	5.757	-6.908
	(1.317)	(2.880)	(4.793)	(9.048)	(5.283)
QE_ABS_CBPP_COLL	-0.690	**-5.482*****	-0.015	**-3.255****	-0.458
	(1.204)	(1.733)	(1.248)	(1.351)	(1.275)
Const.	**0.558****	0.195	0.447	0.725	0.405
	(0.252)	(0.563)	(0.699)	(0.935)	(0.974)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
R^2	2.3%	12.8%	2.3%	6.3%	3.5%
DW	2	2	2	2	1.99
P-value (F)	1.30%	17.00%	37.00%	2.53%	5.44%
LM autocorrelation test	0.074	0.387	0.345	0.029	0.379
Arch test	0.00%	0.00%	0.00%	0.00%	0.00%
Normality test	0.00%	0.00%	0.00%	0.00%	0.00%

Notes: Regression output for FTSE Athex Banks index. The regression model is given by Equation (1). All regressions are estimated with HAC consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 23: Table 24: FTSE Athex Banks Index Garch specification (1)

Regression - Table 24

	(1) Greece	(2) Greece	(3) Greece	(4) Greece	(5) Greece
FTSEATHEXBANKSReturn					
FTSEATHEXBANKSReturn1	**0.077*** **	0.029	**0.053** **	-0.004	**0.069** **
	(0.012)	(0.039)	(0.026)	(0.043)	(0.033)
FTSEATHEXBANKSReturn2	**-0.051*** **	-0.031	**-0.054** **	**-0.132*** **	-0.015
	(0.009)	(0.043)	(0.023)	(0.048)	(0.029)
FTSEATHEXBANKSReturn3	**-0.026*** **	-0.040	-0.024	**-0.089** **	-0.008
	(0.008)	(0.043)	(0.018)	(0.037)	(0.023)
ECBAnnouncement	0.206	0.074	-0.010	0.223	-0.217
	(0.159)	(0.430)	(0.532)	(0.873)	(0.719)
NEWS *ECBAnnouncement	6.037	**9.419***	-1.805	-0.114	26.312
	(4.324)	(5.842)	(24.699)	(32.512)	(42.408)
E_ECB* ECBAnnouncement	0.707	4.424	-3.874	4.891	-5.640
	(1.067)	(3.580)	(5.608)	(15.651)	(9.028)
NEWS	**-4.779*** **	**-8.017*** **	-1.643	**-9.516** **	**12.920** **
	(0.940)	(2.645)	(4.234)	(3.868)	(5.224)
QE_ABS_CBPP_COLL	-0.748	**-4.566** **	0.661	-3.712	0.462
	(0.470)	(2.030)	(0.936)	(3.3e+08)	(1.086)
Const.	-0.043	-0.084	**-0.293*** **	**-0.506*** **	**-0.230***
	(0.034)	(0.569)	(0.104)	(0.166)	(0.134)
GARCH					
alpha(1)	**0.315*** **	**0.136*** **	**0.207*** **	**0.124*** **	**0.223*** **
	(0.011)	(0.036)	(0.021)	(0.035)	(0.028)
beta(1)	**0.685*** **	**0.863*** **	**0.793*** **	**0.876*** **	**0.777*** **
	(0.011)	(0.032)	(0.021)	(0.035)	(0.028)
alpha(0)	**0.333*** **	0.111	**1.008*** **	**0.495***	**1.203*** **
	(0.064)	(0.74)	(0.258)	(0.261)	(0.407)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.18	0.00	0.04
AIC	21696	3000	9148	3010	6114
BIC	21766	3127	9207	3057	6168
Log Likelihood	-10837	-1471	-4563	-1494	-3046

Notes: Regression output for FTSE Athex Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 24: Table 25: FTSE Athex Banks Index Garch specification (2)

Regression - Table 25

	(1) Greece	(2) Greece	(3) Greece	(4) Greece	(5) Greece
FTSEATHEXBANKSReturn					
FTSEATHEXBANKSReturn1	**0.104*** **	0.030	**0.046***	-0.023	**0.058***
	(0.015)	(0.036)	(0.026)	(0.043)	(0.033)
FTSEATHEXBANKSReturn2	-0.026	-0.050	-0.029	**-0.082***	-0.003
	(0.015)	(0.048)	(0.024)	(0.043)	(0.029)
FTSEATHEXBANKSReturn3	0.003	-0.013	0.000	-0.019	0.002
	(0.015)	(0.043)	(0.025)	(0.044)	(0.003)
ECBAnnouncement	0.180	0.030	0.248	0.474	-0.131
	(0.125)	(0.496)	(0.415)	(0.650)	(0.454)
NEWS*ECBAnnouncement	**3.928***	10.806	-1.333	-0.910	**53.159*** **
	(2.242)	(6.763)	(9.108)	(12.829)	(20.556)
E_ECB*ECBAnnouncement	0.969	5.096	**-6.248** **	6.222	**-7.244*** **
	(0.786)	(3.531)	(2.679)	(7.918)	(1.491)
NEWS	**-4.267*** **	**-8.469** **	-3.356	-6.355	6.783
	(1.112)	(3.642)	(4.562)	(6.654)	(10.381)
QE_ABS_CBPP_COLL	-1.148	**-4.355** **	0.180	**-2.689** **	-0.234
	(1.452)	(1.762)	(1.304)	(1.168)	(0.965)
Const	-0.007	0.354	**-0.285*** **	**-0.591*** **	-0.129
	(0.026)	(0.565)	(0.082)	(0.146)	(0.096)
GARCH					
alpha(1)	**0.118*** **	**0.139*** **	**0.181*** **	**0.038** **	**0.263*** **
	(0.027)	(0.041)	(0.039)	(0.015)	(0.076)
beta(1)	**0.886*** **	**0.864*** **	**0.795*** **	**0.958*** **	**0.772*** **
	(0.025)	(0.035)	(0.036)	(0.022)	(0.038)
alpha(0)	**0.058** **	0.135	**1.088*** **	0.113	**1.029** **
	(0.023)	(0.089)	(0.349)	(0.187)	(0.446)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.18	0.00	0.04
AIC	19702	2983	8774	2936	5827
BIC	19785	3115	8843	2992	5891
Log Likelihood	-9838	-1461	-4374	-1455	-2900

Notes: Regression output for FTSE Athex Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 25: Table 26: Ireland Financial Index

Regression - Table 26

	(1) Ireland	(2) Ireland	(3) Ireland	(4) Ireland	(5) Ireland
IRELANDSEFINANCIALISEQPReturn					
IRELANDSEFINANCIALISEQPReturn1	**0.129*** **	**0.143** **	0.061	0.051	0.056
	(0.038)	(0.060)	(0.038)	(0.054)	(0.038)
IRELANDSEFINANCIALISEQPReturn2	0.013	0.039	**-0.057***	-0.077	-0.047
	(0.023)	(0.037)	(0.031)	(0.048)	(0.035)
IRELANDSEFINANCIALISEQPReturn3	-0.011	-0.020	-0.046	-0.074	-0.022
	(0.030)	(0.048)	(0.033)	(0.050)	(0.033)
ECBAnnouncement	0.067	0.390	**0.757***	1.179	**0.856***
	(0.209)	(1.050)	(0.418)	(0.857)	(0.471)
NEWS	**-8.117*****	**-12.958***	-2.848	-4.223	0.712
	(2.384)	(6.753)	(5.669)	(7.505)	(9.060)
NEWS*ECBAnnouncement	**14.087***	20.712	7.627	3.490	15.331
	(7.247)	(19.583)	(10.862)	(11.343)	(20.473)
E_ECB*ECBAnnouncement	**5.896** **	**14.496** **	2.917	-5.522	5.817
	(2.509)	(6.443)	(2.650)	(4.303)	(3.976)
QE_ABS_CBPP_COLL	1.002	-0.628	0.831	**3.890*****	0.548
	(0.748)	(2.536)	(0.807)	(1.302)	(0.880)
Const.	0.186	1.052	-0.772	-1.459	0.354
	(0.264)	(1.937)	(0.692)	(1.277)	(0.709)
N	4353	2138	1553	543	1010
R^2	4.2%	10.4%	3.6%	5%	4.3%
DW	2	2	1.99	2	1.98
P-value (F)	0.00%	0.00%	6.90%	0.02%	5.00%
LM autocorrelation test	0.00	0.00	0.99	0.25	0.00
Arch test	0.00%	0.10%	0.00%	0.00%	0.02%
Normality test	0.00%	0.00%	0.00%	0.00%	0.00%

Notes: Regression output for Ireland ISEQ index. The regression model is given by Equation (1). All regressions are estimated with HAC consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 26: Table 27: Ireland Financial Index Garch specification (1)

Regression - Table 27

	(1) Ireland	(2) Ireland	(3) Ireland	(4) Ireland	(5) Ireland
IRELANDSEFINANCIALISEQPReturn					
IRELANDSEFINANCIALISEQPReturn1	**0.063*** **	**0.101***	0.026	−0.020	0.043
	(0.009)	(0.053)	(0.023)	(0.052)	(0.030)
IRELANDSEFINANCIALISEQPReturn2	**-0.093*** **	-0.078	**-0.072*** **	**-0.126** **	-0.052
	(0.008)	(0.055)	(0.024)	(0.049)	(0.036)
IRELANDSEFINANCIALISEQPReturn3	**-0.056*** **	-0.074	**-0.060*** **	−0.063	-0.019
	(0.006)	(0.046)	(0.021)	(0.043)	(0.033)
ECBAnnouncement	0.103	−0.292	**0.884*** **	**1.831***	**1.029*** **
	(0.109)	(0.729)	(0.326)	(1.112)	(0.384)
NEWS*ECBAnnouncement	**7.949** **	**22.519** **	11.674	−2.951	25.977
	(3.239)	(11.170)	(13.619)	(15.606)	(18.981)
E_ECB*ECBAnnouncement	**2.922*** **	**18.938*** **	3.129	−6.020	**6.055***
	(0.974)	(7.075)	(5.178)	(5.842)	(3.546)
NEWS	**-5.546*** **	**−9.604*** **	0.834	−4.721	2.577
	(0.728)	(3.708)	(2.810)	(5.746)	(3.467)
QE_ABS_CBPP_COLL	**2.532*** **	−4.624	0.726	**2.921***	0.459
	(0.201)	(4.256)	(0.682)	(1.718)	(0.552)
Const.	0.017	2.098**	-0.078	**−1.735***	0.043
	(0.025)	(0.873)	(0.077)	(1.004)	(0.079)
GARCH					
alpha(1)	**0.505*** **	**0.316*** **	**0.217*** **	**0.217** **	**0.113*** **
	(0.013)	(0.068)	(0.024)	(0.089)	(0.023)
beta(1)	**0.495*** **	**0.683*** **	**0.783*** **	**0.546*** **	**0.887*** **
	(0.013)	(0.060)	(0.024)	(0.131)	(0.023)
alpha(0)	**0.237*** **	**0.769** **	0.055	**4.446*** **	0.109
	(0.055)	(0.371)	(0.145)	(1.653)	(0.079)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.00	0.00	0.02
AIC	20734	3694	7952	3126	4684
BIC	20804	3826	8011	3255	4738
Log Likelihood	-10356	-1817	-3965	-1533	-2331

Notes: Regression output for Ireland ISEQ index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 27: Table 28: Ireland Financial Index Garch specification (2)

Regression - Table 28

	(1) Ireland	(2) Ireland	(3) Ireland	(4) Ireland	(5) Ireland
IRELANDSEFINANCIALISEQPReturn					
IRELANDSEFINANCIALISEQPReturn1	**0.070*** **	**0.095** **	**0.062** **	0.035	**0.068***
	(0.016)	(0.043)	(0.029)	(0.044)	(0.035)
IRELANDSEFINANCIALISEQPReturn2	-0.019	0.001	-0.016	-0.020	-0.022
	(0.014)	(0.040	(0.032)	(0.049)	(0.028)
IRELANDSEFINANCIALISEQPReturn3	-0.000	-0.027	-0.003	-0.004	-0.011
	(0.014)	(0.041)	(0.023)	(0.038)	(0.026)
ECBAnnouncement	-0.017	0.378	**0.799** **	0.351	**1.199*** **
	(0.093)	(0.662)	(0.352)	(0.857)	(0.436)
NEWS*ECBAnnouncement	3.297	**15.039** **	2.359	9.273	-0.087
	(2.831)	(7.008)	(13.719)	(10.945)	(32.643)
E_ECB*ECBAnnouncement	1.302	**9.931** **	1.780	1.419	6.927
	(1.157)	(4.627)	(2.295)	(4.517)	(8.172)
NEWS	**-4.086*** **	**-8.671** **	1.043	-6.690	**12.361** **
	(0.956)	(0.662)	(4.180)	(6.079)	(5.968)
QE_ABS_CBPP_COLL	**1.422** **	-0.123	**1.168***	**4.551*** **	0.575
	(0.701)	(2.492)	(0.666)	(0.998)	(0.772)
Const.	**0.050** **	**2.524*** **	-0.070	**-0.627*** **	-0.036
	(0.020)	(0.855)	(0.078)	(0.161)	(0.067)
GARCH					
alpha(1)	**0.068*** **	**0.193** **	0.045	**0.132*** **	**0.218*** **
	(0.014)	(0.088)	(0.115)	(0.048)	(0.065)
beta(1)	**0.934*** **	**0.828*** **	**0.946*** **	**0.725*** **	0.084
	(0.012)	(0.066)	(0.145)	(0.079)	(0.163)
alpha(0)	0.012**	0.498	0.101	**2.950** **	**5.573*** **
	(0.005)	(0.307)	(0.421)	(1.199)	(1.257)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.00	0.50	0.02
AIC	18174	3646	7696	3069	4592
BIC	18257	3779	7766	3124	4655
Log Likelihood	-9074	-1793	-3835	-1521	-2283

Notes: Regression output for Ireland ISEQ index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 28: Table 29: FTSE Italy Banks Index

Regression - Table 29

	(1) Italy	(2) Italy	(3) Italy	(4) Italy	(5) Italy
FTSEITALYBANKSINDEXReturn					
FTSEITALYBANKSINDEXReturn1	0.020	0.029	-0.002	0.008	-0.024
	(0.021)	(0.045)	(0.031)	(0.054)	(0.041)
FTSEITALYBANKSINDEXReturn2	-0.013	-0.012	-0.021	-0.086*	0.021
	(0.022)	(0.046)	(0.030)	(0.049)	(0.035)
FTSEITALYBANKSINDEXReturn3	**-0.049****	**-0.116***	-0.049	-0.064	-0.040
	(0.024)	(0.063)	(0.031)	(0.050)	(0.040)
ECBAnnouncement	-0.257	-0.313	-0.122	-0.367	0.313
	(0.171)	(0.473)	(0.435)	(0.747)	(0.549)
NEWS	**-7.336*****	**-9.842*****	-2.905	-6.508	5.482
	(1.410)	(2.256)	(5.211)	(7.208)	(6.625)
NEWS*ECBAnnouncement	**8.906****	**10.891***	11.074	-1.526	**59.934****
	(3.877)	(6.509)	(16.004)	(16.298)	(29.126)
E_ECB*ECBAnnouncement	**2.956****	**7.789*****	2.183	-3.269	7.419
	(1.259)	(2.409)	(4.727)	(5.467)	(7.393)
QE_ABS_CBPP_COLL	0.847	-2.245	1.381	**3.686****	0.728
	(0.960)	(2.464)	(1.008)	(1.615)	(1.100)
Const.	-0.058	-0.444	0.185	0.119	0.122
	(0.169)	(0.529)	(0.422)	(0.598)	(0.700)
Time Effects	YES	YES	YES	YES	YES
N	4353	2138	1553	543	1010
R^2	2.8%	10.3%	1.5%	3.8%	2.8%
DW	1.99	1.99	1.99	2	1.97
P-value (F)	0.00%	0.20%	96%	0.00%	9.50%
LM autocorrelation test	0.00	0.017	0.026	0.005	0.000
Arch test	0.00%	0.00%	0.00%	0.00%	0.00%
Normality test	0.00%	0.00%	0.00%	0.00%	0.00%

Notes: Regression output for FTSE Italy Banks index. The regression model is given by Equation (1). All regressions are estimated with HAC consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 29: Table 30: FTSE Italy Banks Index Garch specification (1)

Regression - Table 30

	(1) Italy	(2) Italy	(3) Italy	(4) Italy	(5) Italy
FTSEITALYBANKSINDEXReturn					
FTSEITALYBANKSINDEXReturn1	**0.022***	-0.023	-0.006	0.038	-0.029
	(0.013)	(0.040)	(0.027)	(0.046)	(0.037)
FTSEITALYBANKSINDEXReturn2	**-0.016***	-0.003	-0.014	-0.078	0.019
	(0.009)	(0.041)	(0.029)	(0.051)	(0.033)
FTSEITALYBANKSINDEXReturn3	**-0.036*****	**-0.097****	-0.033	-0.038	-0.030
	(0.009)	(0.042)	(0.026)	(0.044)	(0.036)
ECBAnnouncement	-0.141	–0.024	0.284	-0.002	0.594
	(0.107)	(0.434)	(0.329)	(0.461)	(0.437)
NEWS*ECBAnnouncement	**4.781*****	**11.114****	10.222	2.284	**53.889****
	(1.886)	(4.743)	(11.001)	(10.812)	(24.583)
E_ECB*ECBAnnouncement	0.873	**6.165****	0.806	0.017	4.222
	(0.665)	(3.032)	(3.132)	(4.923)	(5.139)
NEWS	**-5.599*****	**–7.190*****	-2.188	-5.832	3.148
	(0.514)	(2.032)	(3.690)	(4.539)	(7.453)
QE_ABS_CBPP_COLL	**0.901*****	0.281	0.478	**3.248*****	-0.011
	(0.199)	(1.585)	(0.987)	(1.060)	(1.024)
Const	0.012	–0.338	0.012	-0.111	0.064
	(0.026)	(0.507)	(0.058)	(0.092)	(0.074)
GARCH					
alpha(1)	**0.253*****	**0.111*****	**0.072*****	**0.136*****	**0.037*****
	(0.015)	(0.033)	(0.021)	(0.044)	(0.011)
beta(1)	**0.746*****	**0.877*****	**0.908*****	**0.852*****	**0.949*****
	(0.015)	(0.030)	(0.025)	(0.040)	(0.016)
alpha(0)	**0.091*****	**0.088***	**0.127****	**0.149***	**0.071***
	(0.034)	(0.051)	(0.056)	(0.082)	(0.042)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.013	0.89	0.00	0.26
AIC	18249	2784	7160	2513	4656
BIC	18320	2919	7230	2569	4720
Log Likelihood	-9113	-1362	-3567	-1243	-2315

Notes: Regression output for FTSE Italy Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 30: Table 31: FTSE Italy Banks Index Garch specification (2)

Regression - Table 31

	(1) Italy	(2) Italy	(3) Italy	(4) Italy	(5) Italy
FTSEITALYBANKSINDEXReturn					
FTSEITALYBANKSINDEXReturn1	0.009	-0.003	-0.011	0.033	-0.047
	(0.015)	(0.039)	(0.026)	(0.045)	(0.033)
FTSEITALYBANKSINDEXReturn2	0.005	0.018	0.003	-0.043	0.019
	(0.015)	(0.041)	(0.026)	(0.048)	(0.032)
FTSEITALYBANKSINDEXReturn3	-0.021	**-0.084****	-0.025	-0.029	-0.018
	(0.015)	(0.042)	(0.025)	(0.042)	(0.032)
ECBAnnouncement	-0.040	-0.116	0.375	0.069	0.702
	(0.098)	(0.481)	(0.339)	(0.496)	(0.486)
NEWS*ECBAnnouncement	3.063	**11.897*****	9.486	4.820	53.479
	(3.024)	(4.540)	(11.145)	(11.217)	(41.855)
E_ECB*ECBAnnouncement	1.211	**6.707*****	0.430	-0.858	5.827
	(0.828)	(2.524)	(4.007)	(5.070)	(12.795)
NEWS	**-3.714*****	**-7.671*****	-3.138	-7.556	6.607
	(0.774)	(2.095)	(4.508)	(6.718)	(6.180)
QE_ABS_CBPP_COLL	0.846	0.066	0.988	**3.572*****	0.547
	(0.943)	(1.427)	(0.962)	(0.973)	(0.887)
Const	**0.046****	-0.110	0.023	-0.116	0.105
	(0.018)	(0.504)	(0.056)	(0.092)	(0.071)
GARCH					
alpha(1)	**0.075*****	**0.094*****	**0.060*****	**0.103*****	**0.039*****
	(0.010)	(0.026)	(0.015)	(0.034)	(0.014)
beta(1)	**0.927*****	**0.894*****	**0.923*****	**0.885*****	**0.948*****
	(0.009)	(0.024)	(0.019)	(0.033)	(0.019)
alpha(0)	**0.006****	0.090	**0.107****	**0.123***	0.075
	(0.003)	(0.057)	(0.048)	(0.070)	(0.052)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.90	0.00	0.15
AIC	16733	2770	7122	2505	4623
BIC	16816	2902	7191	2560	4687
Log Likelihood	-8353	-1355	-3548	-1239	-2298

Notes: Regression output for FTSE Italy Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 31: Table 32: Netherland Banks Index

Regression - Table 32

	(1) NETHERLANDs	(2) NETHERLANDs	(3) NETHERLANDs	(4) NETHERLANDs	(5) NETHERLANDs
NETHERLANDDSBanksReturn					
NETHERLANDDSBanksReturn1	0.022	0.040	**-0.069***	-0.042	**-0.083****
	(0.020)	(0.043)	(0.036)	(0.074)	(0.041)
NETHERLANDDSBanksReturn2	0.064	**0.098*****	0.008	-0.023	0.012
	(0.043)	(0.034)	(0.028)	(0.053)	(0.032)
NETHERLANDDSBanksReturn3	**-0.052****	**-0.065****	**-0.049***	-0.045	-0.055
	(0.021)	(0.028)	(0.029)	(0.058)	(0.035)
ECBAnnouncement	-0.058	-0.416	0.246	-0.051	**0.513***
	(0.159)	(0.782)	(0.200)	(0.298)	(0.287)
NEWS	**-7.501*****	-8.972	1.856	-0.861	7.826
	(2.185)	(5.913)	(2.585)	(2.963)	(5.312)
NEWS*ECBAnnouncement	**9.987****	14.286	0.511	-2.755	8.374
	(4.299)	(10.855)	(5.131)	(5.816)	(12.093)
E_ECB*ECBAnnouncement	**1.858***	**5.285****	-0.028	-2.373	1.523
	(0.996)	(2.431)	(1.261)	(3.197)	(1.765)
QE_ABS_CBPP_COLL	0.395	1.835	0.181	-0.186	0.074
	(0.547)	(1.594)	(0.601)	(0.542)	(0.671)
Const.	0.080	1.091	-0.136	-0.302	-0.270
	(0.170)	(1.313)	(0.242)	(0.272)	(0.427)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
R^2	2.5%	4.5%	02%	2.5%	3.2%
DW	2	2	1.99	2	1.99
P-value (F)	0.00%	0.00%	23%	97%	5.50%
LM autocorrelation test	0.00	0.00	0.136	0.215	0.178
Arch test	99%	100%	0.00%	0.00%	0.00%
Normality test	0.00%	0.00%	0.00%	0.00%	0.00%

Notes: Regression output for Netherlands DS Banks index. The regression model is given by Equation (1). All regressions are estimated with HAC consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 32: Table 33: Netherland Banks Index Garch specification (1)

Regression - Table 33

	(1) Netherlands	(2) Netherlands	(3) Netherlands	(4) Netherlands	(5) Netherlands
NETHERLANDDSBanksReturn					
NETHERLANDDSBanksReturn1			**-0.088*** **	-0.027	**-0.108*** **
			(0.032)	(0.059)	(0.038)
NETHERLANDDSBanksReturn2			0.019	-0.034	0.034
			(0.031)	(0.047)	(0.037)
NETHERLANDDSBanksReturn3			0.019	-0.033	-0.025
			(0.031)	(0.049)	(0.038)
ECBAnnouncement			0.215	0.000	**0.534** **
			(0.167)	(0.250)	(0.257)
NEWS*ECBAnnouncement			0.290	1.114	17.457
			(10.018)	(7.510)	(17.935)
E_ECB*ECBAnnouncement			-0.219	-1.498	0.720
			(2.372)	(2.853)	(1.705)
NEWS			1.988	-0.257	5.528
			(2.481)	(2.307)	(5.657)
QE_ABS_CBPP_COLL			-0.237	0.372	-0.167
			(1.019)	(0.738)	(0.658)
Const			**-0.081***	**-0.110** **	-0.056
			(0.041)	(0.054)	(0.066)
GARCH					
alpha(1)			**0.155*** **	**0.192*** **	**0.127***
			(0.056)	(0.068)	(0.067)
beta(1)			**0.744*** **	**0.674*** **	**0.701*** **
			(0.102)	(0.116)	(0.208)
alpha(0)			0.330	**0.290** **	0.600
			(0.181)	(0.136)	(0.536)
N			1553	543	1010
P-value(Chi^2)			0.03	0.65	0.02
AIC			5982	1888	4078
BIC			6052	1943	4142
Log Likelihood			-2978	-931	-2026

Notes: Regression output for Netherlands DS Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 33: Table 34: Netherland Banks Index Garch specification (2)

Regression - Table 34

	(1) Netherlands	(2) Netherlands	(3) Netherlands	(4) Netherlands	(5) Netherlands
NETHERLANDDSBanksReturn					
NETHERLANDDSBanksReturn1			**-0.103*** **	-0.069	**-0.115*** **
			(0.026)	(0.048)	(0.032)
NETHERLANDDSBanksReturn2			0.011	-0.017	0.019
			(0.024)	(0.044)	(0.029)
NETHERLANDDSBanksReturn3			-0.001	0.003	-0.003
			(0.023)	(0.042)	(0.027)
ECBAnnouncement			0.239	0.008	**0.473***
			(0.179)	(0.292)	(0.246)
NEWS*ECBAnnouncement			3.498	1.464	15.516
			(7.328)	(12.639)	(10.695)
E_ECB*ECBAnnouncement			-0.656	-0.180	1.710
			(0.989)	(7.057)	(2.079)
NEWS			-2.529	-1.345	-3.431
			(2.353)	(3.491)	(3.458)
QE_ABS_CBPP_COLL			**0.775***	0.383	0.567
			(0.439)	(1.133)	(0.448)
Const			**-0.073** **	**-0.111** **	-0.048
			(0.032)	(0.044)	(0.045)
GARCH					
alpha(1)			**0.253** **	**0.256** **	**0.216*** **
			(0.125)	(0.112)	(0.076)
beta(1)			**0.575** **	**0.688*** **	**0.338*** **
			(0.266)	(0.135)	(0.123)
alpha(0)			0.734	0.239	**1.813*** **
			(0.649)	(0.161)	(0.478)
N			1553	543	1010
P-value(Chi^2)			0.03	0.68	0.03
AIC			5787	1828	3948
BIC			5851	1884	4012
Log Likelihood			-2881	-901	-1961

Notes: Regression output for Netherlands DS Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 34: Table 35: Portugal Banks Index

Regression - Table 35

	(1) Portugal	(2) Portugal	(3) Portugal	(4) Portugal	(5) Portugal
PORTUGALDSBANKSReturn					
PORTUGALDSBANKSReturn1	**0.089*** **	0.044	**0.088*** **	0.068	**0.094*** **
	(0.025)	(0.047)	(0.030)	(0.053)	(0.035)
PORTUGALDSBANKSReturn2	-0.011	-0.013	-0.014	**-0.105** **	0.011
	(0.022)	(0.040)	(0.029)	(0.044)	(0.036)
PORTUGALDSBANKSReturn3	-0.003	-0.028	-0.016	-0.075	-0.007
	(0.023)	(0.048)	(0.030)	(0.054)	(0.035)
ECBAnnouncement	0.206	-0.247	**0.974** **	0.003	**1.477*** **
	(0.137)	(0.344)	(0.386)	(0.558)	(0.555)
NEWS	**-2.356** **	-3.063	-0.100	-2.353	5.375
	(1.106)	(2.229)	(4.111)	(5.308)	(6.977)
NEWS*ECBAnnouncement	1.746	-6.254	**16.634***	**18.052***	37.996
	(2.724)	(5.287)	(9.094)	(10.579)	(26.488)
E_ECB*ECBAnnouncement	-0.176	-1.649	3.008	**9.936***	4.151
	(0.699)	(1.338)	(2.602)	(5.856)	(3.942)
QE_ABS_CBPP_COLL	0.347	0.877	0.013	0.084	-0.340
	(0.675)	(1.955)	(0.739)	(0.987)	(0.881)
Const.	0.081	**-0.829** **	0.078	0.253	0.097
	(0.125)	(0.391)	(0.328)	(0.512)	(0.738)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
R^2	2.1%	8.6%	2.9%	4.3%	4.4%
DW	1.99	1.99	1.99	2	1.98
P-value (F)	0.58%	0.00%	0.68%	0.02%	2.90%
LM autocorrelation test	0.713	0.14	0.662	0.62	0.121
Arch test	0.00%	0.00%	0.00%	0.00%	0.00%
Normality test	0.00%	0.00%	0.00%	0.00%	0.00%

Notes: Regression output for Portugal DS Banks index. The regression model is given by Equation (1). All regressions are estimated with HAC consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 35: Table 36: Portugal Banks Index Garch specification (1)

Regression - Table 36

	(1) Portugal	(2) Portugal	(3) Portugal	(4) Portugal	(5) Portugal
PORTUGALDSBANKSReturn					
PORTUGALDSBANKSReturn1	**0.084*** **	0.024	**0.104*** **	0.076	**0.107*** **
	(0.017)	(0.046)	(0.028)	(0.046)	(0.035)
PORTUGALDSBANKSReturn2	0.007	0.027	0.013	-0.057	0.053
	(0.017)	(0.049)	(0.026)	(0.042)	(0.033)
PORTUGALDSBANKSReturn3	0.004	−0.028	-0.031	-0.059	-0.021
	(0.017)	(0.047)	(0.027)	(0.046)	(0.035)
ECBAnnouncement	0.008	−0.009	0.643	0.465	**0.820***
	(0.061)	(0.370)	(0.292)	(0.371)	(0.474)
NEWS*ECBAnnouncement	1.261	−4.152	**15.496** **	**22.952*** **	27.886
	(1.473)	(4.700)	(6.549)	(7.415)	(23.195)
E_ECB*ECBAnnouncement	0.148	−1.910	4.949	**13.012*** **	3.848
	(0.317)	(1.586)	(3.023)	(3.668)	(3.408)
NEWS	**-1.135** **	−1.915	-1.488	-2.635	5.276
	(0.450)	(1.528)	(3.083)	(3.702)	(7.658)
QE_ABS_CBPP_COLL	0.789	0.545	0.381	-0.343	0.105
	(1.201)	(1.090)	(1.173)	(0.604)	(1.005)
Const	0.042	**–0.821** **	-0.089	**-0.164** **	-0.052
	(0.016)	(0.407)	(0.056)	(0.078)	(0.085)
GARCH					
alpha(1)	**0.110*** **	**0.171** **	**0.121*** **	**0.143*** **	**0.099*** **
	(0.041)	(0.080)	(0.028)	(0.039)	(0.034)
beta(1)	**0.895*** **	**0.774 *** **	**0.857*** **	**0.828*** **	**0.831*** **
	(0.036)	(0.076)	(0.034)	(0.049)	(0.053)
alpha(0)	**0.011***	**0.246** **	**0.218** **	**0.169***	**0.616** **
	(0.006)	(0.113)	(0.104)	(0.099)	(0.270)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.24	0.00	0.00	0.01
AIC	14985	2514	7318	2292	5016
BIC	15055	2647	7388	2347	5080
Log Likelihood	-7481	-1227	-3646	-1133	-2495

Notes: Regression output for Portugal DS Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 36: Table 37: Portugal Banks Index Garch specification (2)

Regression - Table 37

	(1) Portugal	(2) Portugal	(3) Portugal	(4) Portugal	(5) Portugal
PORTUGALDSBANKSReturn					
PORTUGALDSBANKSReturn1	**0.058*** **	0.022	**0.071*** **	0.064	**0.069** **
	(0.016)	(0.044)	(0.027)	(0.045)	(0.034)
PORTUGALDSBANKSReturn2	-0.002	-0.032	0.009	-0.036	0.032
	(0.015)	(0.042)	(0.023)	(0.042)	(0.029)
PORTUGALDSBANKSReturn3	0.003	-0.017	-0.040	-0.061	-0.028
	(0.015)	(0.043)	(0.025)	(0.046)	(0.030)
ECBAnnouncement	-0.013	-0.338	**0.629** **	0.409	0.807
	(0.050)	(0.315)	(0.310)	(0.370)	(0.506)
NEWS*ECBAnnouncement	0.929	**-6.208***	**14.773** **	**25.550*** **	24.980
	(1.163)	(3.288)	(7.096)	(8.738)	(25.868)
E_ECB*ECBAnnouncement	0.112	-1.576	3.147	**13.113*** **	2.216
	(0.317)	(2.075)	(3.695)	(4.043)	(2.865)
NEWS	**-0.889** **	-0.845	-2.553	-5.680	6.222
	(0.372)	(1.228)	(3.503)	(5.767)	(6.137)
QE_ABS_CBPP_COLL	0.330	0.074	0.266	-0.160	-0.050
	(0.785)	(0.879)	(0.957)	(0.587)	(0.970)
Const	**0.020***	**-0.888** **	**-0.112** **	**-0.181** **	-0.075
	(0.012)	(0.376)	(0.053)	(0.073)	(0.080)
GARCH					
alpha(1)	**0.159*** **	**0.177** **	**0.125*** **	**0.154*** **	**0.092*** **
	(0.029)	(0.075)	(0.025)	(0.042)	(0.028)
beta(1)	**0.865*** **	**0.727*** **	**0.851*** **	**0.811*** **	**0.837*** **
	(0.022)	(0.108)	(0.028)	(0.051)	(0.042)
alpha(0)	**0.009*** **	**0.428***	**0.259*** **	**0.204***	**0.661*** **
	(0.003)	(0.235)	(0.096)	(0.110)	(0.255)
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.18	0.00	0.00	0.02
AIC	14508	2472	7228	2275	4949
BIC	14591	2605	7298	2331	5013
Log Likelihood	-7241	-1206	-3601	-1124	-2461

Notes: Regression output for Portugal DS Banks index. The regression model is given by Equation (2). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 37: Table 38: Sensitivity Analysis - Eurostoxx Banks Index Garch specification (2)

Sensitive analysis Regression - Table 38

	(1) Eurostoxx	(2) Eurostoxx	(3) Eurostoxx	(4) Eurostoxx	(5) Eurostoxx
EUROSTOXXBANKSReturn					
EUROSTOXXBANKSReturn1	0.007	**-0.082****	0.039	0.058	0.025
	(0.013)	(0.040)	(0.027)	(0.051)	(0.032)
EUROSTOXXBANKSReturn2	**-0.042*****	**-0.065****	**-0.049****	**-0.116*****	-0.013
	(0.010)	(0.032)	(0.023)	(0.043)	(0.030)
EUROSTOXXBANKSReturn3	**-0.027****	-0.026	**-0.044***	-0.067	-0.040
	(0.011)	(0.033)	(0.026)	(0.047)	(0.029)
NEWS	**-6.451*****	**-11.521*****	-1.243	**-5.692****	5.290
	(0.475)	(1.315)	(1.613)	(2.389)	(3.400)
NEWS*ECBAnnouncement	**5.193*****	5.654	3.944	0.485	**30.419****
	(1.661)	(4.444)	(7.442)	(11.657)	(13.712)
Nochange	-0.063	-0.691	0.197	0.048	0.425
	(0.119)	(0.588)	(0.264)	(0.582)	(0.313)
RestrictivePolicy	0.207	2.657	0.735	0.572	
	(0.354)	(2557.700)	(2.527)	(3.446)	
EasePolicy	**-0.532****	**-2.354*****	-0.192		-0.862
	(0.262)	(0.801)	(0.625)		(0.667)
QE_ABS_CBPP_COLL	**1.034*****	-0.730	**1.147*****	2.468	**0.931*****
	(0.192)	(1.678)	(0.353)	(3.4e+08)	(0.341)
Const.	0.150	-0.189	0.133	0.019	-0.060
	(0.149)	(0.465)	(0.372)	(0.628)	(0.376)
GARCH					
alpha(1)	**0.260*****	**0.260*****	**0.128*****	**0.129*****	**0.101*****
	(0.018)	(0.051)	(0.022)	(0.049)	(0.024)
beta(1)	**0.740*****	**0.740*****	**0.872*****	**0.871*****	**0.899*****
	(0.018)	(0.051)	(0.022)	(0.049)	(0.024)
alpha(0)	0.046	0.249	0.023	0.047	0.026
	(0.028)	(0.157)	(0.049)	(0.135)	(0.046)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.00	0.00	0.00
AIC	17129	2883	6716	2525	4189
BIC	17403	3011	6892	2646	4336
Log Likelihood	-8522	-1413	-3325	-1235	-2064

Notes: Regression output for EuroStoxx Banks index. The regression model is given by Equation (4). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 38: Table 39: Sensitivity Analysis - Austria Banks Index Garch specification (2)

Sensitive analysis Regression - Table 39

	(1) Austria	(2) Austria	(3) Austria	(4) Austria	(5) Austria
AUSTRIADSBANKSReturn					
AUSTRIADSBANKSReturn1	**0.051*** **	-0.015	**0.055** **	0.037	0.050
	(0.012)	(0.037)	(0.026)	(0.046)	(0.032)
AUSTRIADSBANKSReturn2	**-0.052*** **	**-0.091** **	**-0.056** **	**-0.181*** **	0.003
	(0.011)	(0.036)	(0.022)	(0.038)	(0.029)
AUSTRIADSBANKSReturn3	**-0.019***	-0.037	**-0.043***	-0.050	-0.031
	(0.011)	(0.035)	(0.025)	(0.038)	(0.034)
NEWS	**-3.165*** **	**-12.817*** **	1.039	**-4.444***	**10.529*** **
	(0.497)	(1.512)	(1.879)	(2.344)	(3.608)
NEWS*ECBAnnouncement	2.618	8.527	3.552	1.118	11.185
	(2.576)	(11.986)	(9.515)	(9.715)	(19.183)
Nochange	-0.095	-0.749	0.105	0.039	0.216
	(0.133)	(0.628)	(0.304)	(0.455)	(0.421)
RestrictivePolicy	0.102	**7.727*** **	0.041	-0.103	
	(0.329)	(2.054)	(2.822)	(3.173)	
EasePolicy	0.354	-1.592	0.266		-0.213
	(0.363)	(1.037)	(1.007)		(0.943)
QE_ABS_CBPP_COLL	0.117	0.333	0.534	-0.504	0.482
	(0.291)	(2.783)	(0.492)	(5.3e+07)	(0.481)
Const.	0.018	-0.903	-0.122	-0.143	-0.056
	(0.141)	(0.628)	(0.354)	(0.606)	(0.403)
GARCH					
alpha(1)	**0.239*** **	**0.215*** **	**0.090*** **	**0.193*** **	**0.055*** **
	(0.017)	(0.047)	(0.018)	(0.057)	(0.020)
beta(1)	**0.761*** **	**0.785*** **	**0.910*** **	**0.807*** **	**0.945*** **
	(0.017)	(0.047)	(0.018)	(0.057)	(0.020)
alpha(0)	0.029	**0.494** **	0.010	0.046	0.014
	(0.030)	(0.219)	(0.046)	(0.145)	(0.046)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.03	0.01	0.00
AIC	17726	3143	6712	2460	4251
BIC	18000	3271	6889	2580	4398
Log Likelihood	-8820	-1543	-3323	-1202	-2095

Notes: Regression output for Austria DS Banks index. The regression model is given by Equation (4). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 39: Table 40: Sensitivity Analysis - FTSE Belgium Banks Index Garch specification (2)

Sensitive analysis Regression - Table 40

	(1) Belgium	(2) Belgium	(3) Belgium	(4) Belgium	(5) Belgium
FTSEBELGIUMBANKSReturn					
FTSEBELGIUMBANKSReturn1	**0.048*** **	0.026	**0.070*** **	**0.097** **	**0.056***
	(0.012)	(0.041)	(0.024)	(0.043)	(0.029)
FTSEBELGIUMBANKSReturn2	**-0.017***	-0.005	**-0.039***	**-0.118*** **	-0.003
	(0.010)	(0.033)	(0.023)	(0.045)	(0.029)
FTSEBELGIUMBANKSReturn3	**-0.029*** **	-0.012	**-0.069*** **	**-0.116*** **	**-0.059** **
	(0.010)	(0.037)	(0.023)	(0.039)	(0.027)
NEWS	**-5.680*** **	**-12.877*** **	-0.840	**-5.800** **	**8.522***
	(0.602)	(1.997)	(2.188)	(2.868)	(4.618)
NEWS*ECBAnnouncement	**4.097** **	8.963	5.520	3.286	23.089
	(1.753)	(5.529)	(6.834)	(8.527)	(22.275)
Nochange	0.018	-0.149	**0.572** **	0.137	**1.003** **
	(0.119)	(0.592)	(0.277)	(0.511)	(0.402)
RestrictivePolicy	0.191	0.105	1.407	1.545	
	(0.344)	(1.739)	(4.962)	(6.424)	
EasePolicy	0.377	1.799	0.137		-0.511
	(0.408)	(1.570)	(1.299)		(1.178)
QE_ABS_CBPP_COLL	**0.725*** **	1.136	0.356	2.853	0.064
	(0.240)	(1.854)	(0.453)	(5.7e+05)	(0.471)
Const.	-0.172	0.892	-0.085	0.432	-0.613
	(0.146)	(0.606)	(0.401)	(0.681)	(0.433)
GARCH					
alpha(1)	**0.513*** **	**0.459*** **	**0.348*** **	**0.374*** **	**0.303*** **
	(0.019)	(0.060)	(0.042)	(0.072)	(0.051)
beta(1)	**0.487*** **	**0.541*** **	**0.652*** **	**0.626*** **	**0.697*** **
	(0.019)	(0.060)	(0.042)	(0.072)	(0.051)
alpha(0)	**0.242*** **	0.228	0.191	0.173	0.102
	(0.051)	(0.445)	(0.155)	(0.334)	(0.165)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.00	0.00	0.00
AIC	19063	3358	7452	2729	4743
BIC	19337	3486	7629	2850	4891
Log Likelihood	-9488	-1650	-3693	-1337	-2342

Notes: Regression output for FTSE Belgium Banks index. The regression model is given by Equation (4). All regressions are estimated with robust consistent standard errors The standard errors are provide in parentheses.. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 40: Table 41: Sensitivity Analysis - FTSE Spain Banks Index Garch specification (2)

Sensitive analysis Regression - Table 41

	(1) Spain	(2) Spain	(3) Spain	(4) Spain	(5) Spain
FTSESPAINBANKSReturn					
FTSESPAINBANKSReturn1	-0.006	-0.044	**0.057****	0.080	0.048
	(0.013)	(0.039)	(0.028)	(0.053)	(0.033)
FTSESPAINBANKSReturn2	**-0.067*****	**-0.069****	**-0.089*****	**-0.143*****	**-0.053***
	(0.011)	(0.031)	(0.023)	(0.050)	(0.027)
FTSESPAINBANKSReturn3	**-0.025****	**-0.060***	-0.005	-0.025	0.009
	(0.011)	(0.033)	(0.026)	(0.049)	(0.031)
NEWS	**-5.835*****	**-10.482*****	-1.548	**-5.171****	3.935
	(0.526)	(1.314)	(1.611)	(2.629)	(3.588)
NEWS*ECBAnnouncement	**5.411*****	**8.666****	3.099	3.998	13.790
	(1.806)	(3.781)	(7.596)	(12.284)	(13.759)
Nochange	0.007	-0.282	0.094	-0.073	0.255
	(0.127)	(0.508)	(0.281)	(0.604)	(0.319)
RestrictivePolicy	0.266	-1.756	1.013	0.751	
	(0.310)	(1.405)	(3.009)	(5.670)	
EasePolicy	-0.344	**-2.074****	-0.349		-0.773
	(0.271)	(0.895)	(0.677)		(0.666)
QE_ABS_CBPP_COLL	**1.422*****	-0.460	**1.211*****	2.408	**1.006*****
	(0.220)	(1.417)	(0.384)	(5.2e+06)	(0.357)
Const.	0.108	**-0.928***	0.164	0.145	0.096
	(0.137)	(0.495)	(0.362)	(0.604)	(0.371)
GARCH					
alpha(1)	**0.284*****	**0.398*****	**0.142*****	**0.132****	**0.136*****
	(0.018)	(0.079)	(0.026)	(0.053)	(0.029)
beta(1)	**0.716*****	**0.602*****	**0.858*****	**0.868*****	**0.864*****
	(0.018)	(0.079)	(0.026)	(0.053)	(0.029)
alpha(0)	0.001	0.159	0.006	0.031	0.008
	(0.032)	(0.210)	(0.051)	(0.146)	(0.046)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.00	0.01	0.00
AIC	17596	2830	6638	2523	4100
BIC	17870	2958	6815	2644	4248
Log Likelihood	-8755	-1386	-3286	-1234	-2020

Notes: Regression output for FTSE Spain Banks index. The regression model is given by Equation (4). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 41: Table 42: Sensitivity Analysis - EuroNext Cac Banks Index Garch specification (2)

Sensitive analysis Regression - Table 42

	(1) France	(2) France	(3) France	(4) France	(5) France
EURONEXTCACBANKSReturn					
EURONEXTCACBANKSReturn1	0.014	-0.024	0.027	-0.015	**0.055****
	(0.012)	(0.044)	(0.024)	(0.043)	(0.027)
EURONEXTCACBANKSReturn2	**-0.029*****	**-0.058***	-0.007	-0.050	-0.005
	(0.009)	(0.034)	(0.019)	(0.034)	(0.032)
EURONEXTCACBANKSReturn3	-0.012	0.014	**-0.057****	0.022	**-0.106*****
	(0.010)	(0.033)	(0.025)	(0.042)	(0.023)
NEWS	**-7.298*****	**-14.831*****	0.029	**-5.115***	**7.281****
	(0.574)	(1.508)	(1.890)	(2.619)	(3.665)
NEWS*ECBAnnouncement	**6.247*****	**8.394***	1.010	-8.203	**37.938****
	(1.696)	(4.319)	(9.009)	(12.664)	(16.843)
Nochange	-0.004	**-1.043***	0.285	0.637	0.429
	(0.129)	(0.629)	(0.277)	(0.546)	(0.332)
RestrictivePolicy	0.197	4.472	1.080	1.525	
	(0.313)	(2.3e+08)	(1.741)	(2.395)	
EasePolicy	-0.027	**-1.976***	0.792		-0.138
	(0.290)	(1.076)	(0.938)		(1.004)
QE_ABS_CBPP_COLL	0.082	-1.355	**0.653***	4.524	**0.657***
	(0.250)	(2.185)	(0.383)	(2.4e+06)	(0.378)
Const.	**0.334****	0.072	-0.015	-0.040	-0.273
	(0.135)	(0.524)	(0.410)	(0.633)	(0.408)
GARCH					
alpha(1)	**0.321*****	**0.264*****	**0.252*****	**0.623*****	**0.145*****
	(0.019)	(0.053)	(0.030)	(0.087)	(0.029)
beta(1)	**0.679*****	**0.736*****	**0.748*****	**0.377*****	**0.855*****
	(0.019)	(0.053)	(0.030)	(0.087)	(0.029)
alpha(0)	0.014	0.268	0.059	**1.103*****	0.067
	(0.041)	(0.251)	(0.087)	(0.371)	(0.063)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.01	0.02	0.00
AIC	18325	3146	7036	2692	4322
BIC	18599	3274	7213	2813	4470
Log Likelihood	-9119	-1544	-3485	-1318	-2131

Notes: Regression output for EuroNext Cac Banks index. The regression model is given by Equation (4). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 42: Table 43: Sensitivity Analysis - Dax Banks Index Garch specification (2)

Sensitive analysis Regression - Table 43

	(1) Germany	(2) Germany	(3) Germany	(4) Germany	(5) Germany
DAXBANKSXETRAReturn					
DAXBANKSXETRAReturn1	0.011	**-0.080****	0.024	-0.005	0.015
	(0.011)	(0.037)	(0.023)	(0.037)	(0.031)
DAXBANKSXETRAReturn2	0.000	**-0.088*****	-0.003	**-0.062***	0.002
	(0.009)	(0.032)	(0.019)	(0.034)	(0.030)
DAXBANKSXETRAReturn3	**-0.039*****	-0.029	**-0.060****	**-0.172*****	-0.039
	(0.009)	(0.028)	(0.024)	(0.038)	(0.027)
NEWS	**-7.883*****	**-16.068*****	-2.751	**-8.455*****	**5.655***
	(0.509)	(1.721)	(1.839)	(2.250)	(3.355)
NEWS*ECBAnnouncement	**5.639****	11.265	6.979	0.148	**29.920****
	(2.295)	(11.673)	(7.554)	(10.752)	(14.061)
Nochange	-0.078	-0.581	0.155	0.055	0.439
	(0.146)	(0.821)	(0.276)	(0.518)	(0.339)
RestrictivePolicy	0.005	1.870	0.606	0.456	
	(0.510)	(5911.920)	(5.043)	(4.067)	
EasePolicy	-0.490	**-3.428****	0.032		-0.449
	(0.302)	(1.387)	(0.534)		(0.636)
QE_ABS_CBPP_COLL	0.431	1.034	**0.741***	1.854	0.602
	(0.275)	(2.001)	(0.395)	(2.9e+06)	(0.411)
Const.	0.196	**-2.774*****	0.220	0.596	-0.054
	(0.159)	(0.530)	(0.367)	(0.591)	(0.382)
GARCH					
alpha(1)	**0.284*****	**0.261*****	**0.160*****	**0.275*****	**0.101*****
	(0.018)	(0.042)	(0.025)	(0.074)	(0.026)
beta(1)	**0.716*****	**0.739*****	**0.840*****	**0.725*****	**0.899*****
	(0.018)	(0.042)	(0.025)	(0.074)	(0.026)
alpha(0)	**0.074***	**0.958*****	0.008	0.029	0.016
	(0.040)	(0.261)	(0.055)	(0.186)	(0.051)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.01	0.00	0.00
AIC	18646	3245	6750	2485	4267
BIC	18920	3373	6926	2605	4414
Log Likelihood	-9280	-1594	-3342	-1214	-2103

Notes: Regression output for DAX Xetra Banks index. The regression model is given by Equation (4). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 43: Table 44: Sensitivity Analysis - FTSE Athex Banks Index Garch specification (2)

Sensitive analysis Regression - Table 44

	(1) Greece	(2) Greece	(3) Greece	(4) Greece	(5) Greece
FTSEATHEXBANKSReturn					
FTSEATHEXBANKSReturn1	**0.048*** **	-0.000	**0.052***	-0.027	**0.063***
	(0.014)	(0.044)	(0.028)	(0.048)	(0.035)
FTSEATHEXBANKSReturn2	**-0.067*** **	**-0.064***	**-0.055** **	**-0.153*** **	-0.014
	(0.010)	(0.035)	(0.024)	(0.051)	(0.031)
FTSEATHEXBANKSReturn3	-0.012	-0.051	-0.029	**-0.117*** **	-0.017
	(0.008)	(0.034)	(0.019)	(0.040)	(0.025)
NEWS	**-5.031*** **	**-8.450*** **	-1.103	**-9.500** **	**13.743** **
	(0.903)	(1.256)	(4.548)	(4.204)	(6.457)
NEWS*ECBAnnouncement	4.516	6.315	-0.879	-2.817	28.722
	(3.347)	(9.398)	(20.498)	(29.177)	(35.033)
Nochange	0.041	-0.189	-0.205	0.669	-0.294
	(0.175)	(0.785)	(0.604)	(0.927)	(0.785)
RestrictivePolicy	0.740	5.206	2.060	2.315	
	(0.796)	(2.0e+05)	(4.682)	(2.753)	
EasePolicy	0.349	**-2.652** **	2.050		1.300
	(0.490)	(1.246)	(1.573)		(1.901)
QE_ABS_CBPP_COLL	-0.218	-3.511	0.582	-3.308	0.455
	(0.447)	(2.446)	(1.028)	(2.2e+05)	(1.209)
Const.	**0.534** **	0.033	0.548	0.902	0.493
	(0.216)	(0.665)	(0.821)	(1.017)	(0.983)
GARCH					
alpha(1)	**0.413*** **	**0.179*** **	**0.229*** **	**0.143*** **	**0.258*** **
	(0.017)	(0.044)	(0.024)	(0.042)	(0.034)
beta(1)	**0.587*** **	**0.821*** **	**0.771*** **	**0.857*** **	**0.742*** **
	(0.017)	(0.044)	(0.024)	(0.042)	(0.034)
alpha(0)	0.077	0.267	**0.928*** **	0.421	**1.140** **
	(0.085)	(0.181)	(0.283)	(0.299)	(0.471)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.01	0.21	0.00	0.04
AIC	21636	3067	9166	3027	6128
BIC	21910	3195	9343	3148	6275
Log Likelihood	-10775	-1505	-4550	-1486	-3034

Notes: Regression output for FTSE Athex Banks index. The regression model is given by Equation (4). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 44: Table 45: Sensitivity Analysis - Ireland Financial Index Garch specification (2)

Sensitive analysis Regression - Table 45

	(1) Ireland	(2) Ireland	(3) Ireland	(4) Ireland	(5) Ireland
IRELANDSEFINANCIALISEQPReturn					
IRELANDSEFINANCIALISEQPReturn1	**0.048*** **	**0.070***	0.008	-0.001	0.032
	(0.010)	(0.042)	(0.024)	(0.044)	(0.030)
IRELANDSEFINANCIALISEQPReturn2	**-0.075*** **	-0.062	**-0.085*** **	**-0.104** **	-0.059
	(0.009)	(0.038)	(0.025)	(0.047)	(0.036)
IRELANDSEFINANCIALISEQPReturn3	**-0.044*** **	**-0.065** **	**-0.064*** **	**-0.088** **	-0.024
	(0.006)	(0.032)	(0.021)	(0.042)	(0.034)
NEWS	**-5.675*** **	**-12.071*** **	0.763	-2.289	4.841
	(0.741)	(2.910)	(2.957)	(5.653)	(4.117)
NEWS*ECBAnnouncement	**5.283***	10.705	8.357	8.921	17.969
	(3.065)	(17.389)	(13.272)	(21.003)	(21.659)
Nochange	0.012	-0.651	**1.008*** **	**1.731** **	**0.888** **
	(0.138)	(1.155)	(0.369)	(0.841)	(0.408)
RestrictivePolicy	0.300	3.036	0.167	-0.047	
	(0.420)	(7.740)	(13.337)	(12.472)	
EasePolicy	**-0.997** **	**-9.764*** **	-0.196		-0.773
	(0.462)	(2.770)	(1.570)		(1.504)
QE_ABS_CBPP_COLL	-0.159	-3.650	0.704	3.321	0.670
	(0.265)	(4.258)	(0.672)	(9541.804)	(0.560)
Const.	-0.041	1.248	**-1.045***	**-2.893*** **	-0.039
	(0.190)	(0.894)	(0.547)	(1.073)	(0.531)
GARCH					
alpha(1)	**0.496*** **	**0.546*** **	**0.223*** **	**0.249*** **	**0.118*** **
	(0.015)	(0.062)	(0.027)	(0.057)	(0.025)
beta(1)	**0.504*** **	**0.454*** **	**0.777*** **	**0.751*** **	**0.882*** **
	(0.015)	(0.062)	(0.027)	(0.057)	(0.025)
alpha(0)	**0.148** **	1.216	0.055	0.136	0.100
	(0.064)	(1.018)	(0.145)	(0.486)	(0.090)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.00	0.55	0.02
AIC	20711	3881	7958	3132	4688
BIC	20985	4009	8134	3252	4836
Log Likelihood	-10312	-1911	-3946	-1538	-2314

Notes: Regression output for Ireland ISEQ index. The regression model is given by Equation (4). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 45: Table 46: Sensitivity Analysis - FTSE Italy Banks Index Garch specification (2)

Sensitive analysis Regression - Table 46

	(1) Italy	(2) Italy	(3) Italy	(4) Italy	(5) Italy
FTSEITALYBANKSINDEXReturn					
FTSEITALYBANKSINDEXReturn1	0.008	**-0.078***	0.004	0.054	-0.019
	(0.014)	(0.042)	(0.027)	(0.050)	(0.032)
FTSEITALYBANKSINDEXReturn2	-0.013	0.005	-0.013	**-0.146*****	0.033
	(0.010)	(0.033)	(0.022)	(0.038)	(0.029)
FTSEITALYBANKSINDEXReturn3	**-0.046*****	**-0.123*****	-0.023	-0.020	-0.021
	(0.009)	(0.032)	(0.024)	(0.040)	(0.029)
NEWS	**-5.426*****	**-10.576*****	-0.833	**-4.554***	6.318
	(0.544)	(1.458)	(1.949)	(2.537)	(3.841)
NEWS*ECBAnnouncement	**3.567****	4.337	8.214	3.941	**49.155*****
	(1.695)	(5.084)	(7.625)	(11.149)	(15.241)
Nochange	-0.167	-0.572	0.143	-0.159	0.478
	(0.128)	(0.567)	(0.303)	(0.570)	(0.394)
RestrictivePolicy	-0.110	1.677	0.127	0.405	
	(0.422)	(3.676)	(2.656)	(2.925)	
EasePolicy	**-0.762*****	**-4.147*****	-0.928		**-1.812*****
	(0.290)	(1.195)	(0.595)		(0.648)
QE_ABS_CBPP_COLL	**0.766*****	-0.177	**1.011****	3.466	**0.737***
	(0.212)	(1.724)	(0.397)	(1.3e+04)	(0.423)
Const.	-0.002	-0.072	0.290	0.071	-0.050
	(0.161)	(0.499)	(0.482)	(0.642)	(0.485)
GARCH					
alpha(1)	**0.276*****	**0.251*****	**0.145*****	**0.229*****	**0.109*****
	(0.018)	(0.055)	(0.021)	(0.065)	(0.022)
beta(1)	**0.724*****	**0.749*****	**0.855*****	**0.771*****	**0.891*****
	(0.018)	(0.055)	(0.021)	(0.065)	(0.022)
alpha(0)	0.071*	0.192	0.100	0.114	0.110
	(0.038)	(0.167)	(0.074)	(0.211)	(0.077)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.03	0.00	0.00
AIC	18257	2901	7344	2620	4741
BIC	18532	3029	7520	2740	4888
Log Likelihood	-9086	-1422	-3639	-1282	-2340

Notes: Regression output for FTSE Italy Banks index. The regression model is given by Equation (4). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 46: Table 47: Sensitivity Analysis - Netherland Banks Index Garch specification (2)

Sensitive analysis Regression - Table 47

	(1) NETHERLANDs	(2) NETHERLANDs	(3) NETHERLANDs	(4) NETHERLANDs	(5) NETHERLANDs
NETHERLANDDSBanksReturn					
NETHERLANDDSBanksReturn1	0.022	0.037	**-0.081*** **	-0.078	**-0.096*** **
	(0.023)	(0.047)	(0.023)	(0.048)	(0.029)
NETHERLANDDSBanksReturn2	0.064	**0.093***	0.019	-0.043	0.031
	(0.049)	(0.048)	(0.027)	(0.049)	(0.034)
NETHERLANDDSBanksReturn3	**-0.053** **	**-0.073** **	-0.026	**-0.094** **	-0.022
	(0.021)	(0.036)	(0.025)	(0.039)	(0.034)
NEWS	**-7.494*** **	-10.633	1.189	-0.081	**4.407***
	(2.102)	(10.143)	(1.534)	(1.836)	(2.413)
NEWS*ECBAnnouncement	**7.977** **	11.148	5.185	5.284	14.839
	(3.859)	(13.171)	(5.731)	(5.663)	(13.951)
Nochange	-0.053	-0.118	0.264	-0.126	**0.581***
	(0.169)	(0.938)	(0.230)	(0.266)	(0.336)
RestrictivePolicy	0.279	0.680	-0.395	-0.492	
	(0.450)	(0.933)	(1.105)	(0.630)	
EasePolicy	-0.685	**-2.586***	0.313		0.284
	(0.505)	(1.443)	(0.814)		(1.409)
QE_ABS_CBPP_COLL	0.435	1.967	-0.152	0.696	-0.175
	(0.558)	(1.972)	(0.304)	(2094.195)	(0.388)
Const.	0.080	1.776	**-0.081*** **	-0.078	**-0.096*** **
	(0.171)	(1.537)	(0.023)	(0.048)	(0.029)
GARCH					
alpha(1)			**0.160*** **	**0.335*** **	**0.120*** **
			(0.024)	(0.078)	(0.028)
beta(1)			**0.840*** **	**0.665*** **	**0.880*** **
			(0.024)	(0.078)	(0.028)
alpha(0)			0.027	0.045	0.040
			(0.035)	(0.080)	(0.047)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
P-value(Chi^2)			0.06	0.54	0.01
P-value(F)	0.00	0.00			
LM autocorrelation test	0.00	0.00			
Arch test	0.99	1.00			
Normality test	0.00	0.00			
DW	2	2			
R^2 adj.	1.4%	1.3%			
AIC	21506	11607	6042	1914	4097
BIC	21557	11653	6106	1961	4151
Log Likelihood	-10744	-5795	-3009	-946	-2038

Notes: Regression output for Netherlands DS Banks index. The regression model is given by Equation (4). All regressions are estimated with robust consistent standard errors. The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis. * p < 0.1, ** p < 0.05, *** p < 0.01

Figure 47: Table 48: Sensitivity Analysis - Portugal Banks Index Garch specification (2)

Sensitive analysis Regression - Table 48

	(1) Portugal	(2) Portugal	(3) Portugal	(4) Portugal	(5) Portugal
PORTUGALDSBANKSReturn					
PORTUGALDSBANKSReturn1	**0.063*** **	0.020	**0.081*** **	0.073	**0.086*** **
	(0.011)	(0.041)	(0.026)	(0.050)	(0.033)
PORTUGALDSBANKSReturn2	-0.009	-0.049	0.029	**-0.105** **	0.059
	(0.009)	(0.044)	(0.027)	(0.046)	(0.037)
PORTUGALDSBANKSReturn3	**0.021*** **	-0.003	-0.024	-0.064	-0.016
	(0.008)	(0.039)	(0.022)	(0.040)	(0.029)
NEWS	**-1.320*** **	**-3.435*** **	-0.109	-2.633	7.340
	(0.391)	(1.076)	(2.679)	(2.389)	(5.676)
NEWS*ECBAnnouncement	1.545	-3.268	12.532	10.389	36.449
	(1.871)	(6.795)	(12.701)	(12.654)	(28.272)
Nochange	-0.065	-0.271	**0.612***	0.529	**1.088***
	(0.082)	(0.584)	(0.369)	(0.521)	(0.570)
RestrictivePolicy	0.088	-1.305	3.589	3.631	
	(0.291)	(1.6e+07)	(3.043)	(2.361)	
EasePolicy	0.313	1.019	0.832		0.184
	(0.333)	(0.828)	(1.302)		(1.731)
QE_ABS_CBPP_COLL	**1.506*** **	0.257	0.506	-0.321	0.253
	(0.163)	(2.141)	(0.491)	(4.9e+05)	(0.652)
Const.	0.036	**-1.208*** **	0.006	-0.063	0.322
	(0.106)	(0.362)	(0.568)	(0.547)	(0.605)
GARCH					
alpha(1)	**0.549*** **	**0.226*** **	**0.192*** **	**0.181*** **	**0.152*** **
	(0.018)	(0.063)	(0.025)	(0.053)	(0.030)
beta(1)	**0.451*** **	**0.774*** **	**0.808*** **	**0.819*** **	**0.848*** **
	(0.018)	(0.063)	(0.025)	(0.053)	(0.030)
alpha(0)	**0.155*** **	0.022	0.049	0.025	0.001
	(0.028)	(0.099)	(0.096)	(0.123)	(0.129)
Time Effects	YES	YES	YES	YES	YES
N	4353	609	1553	543	1010
P-value(Chi^2)	0.00	0.00	0.00	0.08	0.00
AIC	16666	2536	7477	2375	5068
BIC	16742	2664	7653	2496	5216
Log Likelihood	-8321	-1239	-3705	-1160	-2504

Notes: Regression output for Portugal DS Banks index. The regression model is given by Equation (4). All regressions are estimated with robust consistent standard errors.The standard errors are provide in parentheses. Column (1) shows the total sample estimates. Column (2) exhibits the estimates during the subprime crisis. Column (3) presents the estimates during the all-sovereign debt crisis. Column (4) displays the estimates during the first phase of the sovereign debt crisis; finally, the fifth column reflects the estimates during the second phase of the sovereign debt crisis. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.0$

Working Paper del Dipartimento di Economia e Finanza

1. L. Colombo, H. Dawid, *Strategic Location Choice under Dynamic Oligopolistic Competition and Spillovers*, novembre 2013.
2. M. Bordignon, M. Gamalerio, G. Turati, *Decentralization, Vertical Fiscal Imbalance, and Political Selection*, novembre 2013.
3. M. Guerini, *Is the Friedman Rule Stabilizing? Some Unpleasant Results in a Heterogeneous Expectations Framework*, novembre 2013.
4. E. Brenna, C. Di Novi, *Is caring for elderly parents detrimental to women's mental health? The influence of the European North-South gradient*, novembre 2013.
5. F. Sobbrio, *Citizen-Editors' Endogenous Information Acquisition and News Accuracy*, novembre 2013.
6. P. Bingley, L. Cappellari, *Correlation of Brothers Earnings and Intergenerational Transmission*, novembre 2013.
7. T. Assenza, W. A. Brock, C. H. Hommes, *Animal Spirits, Heterogeneous Expectations and the Emergence of Booms and Busts*, dicembre 2013.
8. D. Parisi, *Is There Room for 'Fear' as a Human Passion in the Work by Adam Smith?*, gennaio 2014.
9. E. Brenna, F. Spandonaro, *Does federalism induce patients' mobility across regions? Evidence from the Italian experience*, febbraio 2014.
10. A. Monticini, F. Ravazzolo, *Forecasting the intraday market price of money*, febbraio 2014.
11. Tiziana Assenza, Jakob Grazzini, Cars Hommes, Domenico Massaro, *PQ Strategies in Monopolistic Competition: Some Insights from the Lab*, marzo 2014.
12. R. Davidson, A. Monticini, *Heteroskedasticity-and-Autocorrelation-Consistent Bootstrapping*, marzo 2014.
13. C. Lucifora, S. Moriconi, *Policy Myopia and Labour Market Institutions*, giugno 2014.
14. N. Pecora, A. Spelta, *Shareholding Network in the Euro Area Banking Market*, giugno 2014.
15. G. Mazzolini, *The economic consequences of accidents at work*, giugno 2014.
16. M. Ambrosanio, P. Balduzzi, M. Bordignon, *Economic crisis and fiscal federalism in Italy*, settembre 2014.
17. P. Bingley, L. Cappellari, K. Tatsiramos, *Family, Community and Long-Term Earnings Inequality*, ottobre 2014.
18. S. Frazzoni, M. L. Mancusi, Z. Rotondi, M. Sobrero, A. Vezzulli, *Innovation and export in SMEs: the role of relationship banking*, novembre 2014.
19. H. Gnutzmann, *Price Discrimination in Asymmetric Industries: Implications for Competition and Welfare*, novembre 2014.
20. A. Baglioni, A. Boitani, M. Bordignon, *Labor mobility and fiscal policy in a currency union*, novembre 2014.
21. C. Nielsen, *Rational Overconfidence and Social Security*, dicembre 2014.
22. M. Kurz, M. Motolese, G. Piccillo, H. Wu, *Monetary Policy with Diverse Private Expectations*, febbraio 2015.
23. S. Piccolo, P. Tedeschi, G. Ursino, *How Limiting Deceptive Practices Harms Consumers*, maggio 2015.
24. A.K.S. Chand, S. Currarini, G. Ursino, *Cheap Talk with Correlated Signals*, maggio 2015.
25. S. Piccolo, P. Tedeschi, G. Ursino, *Deceptive Advertising with Rational Buyers*, giugno 2015.

26. S. Piccolo, E. Tarantino, G. Ursino, *The Value of Transparency in Multidivisional Firms*, giugno 2015.
27. G. Ursino, *Supply Chain Control: a Theory of Vertical Integration*, giugno 2015.
28. I. Aldasoro, D. Delli Gatti, E. Faia, *Bank Networks: Contagion, Systemic Risk and Prudential Policy*, luglio 2015.
29. S. Moriconi, G. Peri, *Country-Specific Preferences and Employment Rates in Europe*, settembre 2015.
30. R. Crinò, L. Ogliari, *Financial Frictions, Product Quality, and International Trade*, settembre 2015.
31. J. Grazzini, A. Spelta, *An empirical analysis of the global input-output network and its evolution*, ottobre 2015.
32. L. Cappellari, A. Di Paolo, *Bilingual Schooling and Earnings: Evidence from a Language-in-Education Reform*, novembre 2015.
33. A. Litina, S. Moriconi, S. Zanaj, *The Cultural Transmission of Environmental Preferences: Evidence from International Migration*, novembre 2015.
34. S. Moriconi, P. M. Picard, S. Zanaj, *Commodity Taxation and Regulatory Competition*, novembre 2015.
35. M. Bordignon, V. Grembi, S. Piazza, *Who do you blame in local finance? An analysis of municipal financing in Italy*, dicembre 2015.
36. A. Spelta, *A unified view of systemic risk: detecting SIFIs and forecasting the financial cycle via EWSs*, gennaio 2016.
37. N. Pecora, A. Spelta, *Discovering SIFIs in interbank communities*, febbraio 2016.
38. M. Botta, L. Colombo, *Macroeconomic and Institutional Determinants of Capital Structure Decisions,* aprile 2016.
39. A. Gamba, G. Immordino, S. Piccolo, *Organized Crime and the Bright Side of Subversion of Law*, maggio 2016.
40. L. Corno, N. Hildebrandt, A. Voena, *Weather Shocks, Age of Marriage and the Direction of Marriage Payments*, maggio 2016.
41. A. Spelta, *Stock prices prediction via tensor decomposition and links forecast*, maggio 2016.
42. T. Assenza, D. Delli Gatti, J. Grazzini, G. Ricchiuti, *Heterogeneous Firms and International Trade: The role of productivity and financial fragility*, giugno 2016.
43. S. Moriconi, *Taxation, industry integration and production efficiency*, giugno 2016.
44. L. Fiorito, C. Orsi, *Survival Value and a Robust, Practical, Joyless Individualism: Thomas Nixon Carver, Social Justice, and Eugenics*, luglio 2016.
45. E. Cottini, P. Ghinetti, *Employment insecurity and employees' health in Denmark*, settembre 2016.
46. G. Cecere, N. Corrocher, M. L. Mancusi, *Financial constraints and public funding for eco-innovation: Empirical evidence on European SMEs*, settembre 2016.
47. E. Brenna, L. Gitto, *Financing elderly care in Italy and Europe. Is there a common vision?*, settembre 2016.
48. D. G. C. Britto, *Unemployment Insurance and the Duration of Employment: Theory and Evidence from a Regression Kink Design*, settembre 2016.
49. E. Caroli, C.Lucifora, D. Vigani, *Is there a Retirement-Health Care utilization puzzle? Evidence from SHARE data in Europe*, ottobre 2016.
50. G. Femminis, *From simple growth to numerical simulations: A primer in dynamic programming*, ottobre 2016.
51. C. Lucifora, M. Tonello, *Monitoring and sanctioning cheating at school: What works? Evidence from a national evaluation program*, ottobre 2016.

52. A. Baglioni, M. Esposito, *Modigliani-Miller Doesn't Hold in a "Bailinable" World: A New Capital Structure to Reduce the Banks' Funding Cost*, novembre 2016.
53. L. Cappellari, P. Castelnovo, D. Checchi, M. Leonardi, *Skilled or educated? Educational reforms, human capital and earnings,* novembre 2016.
54. D. Britto, S. Fiorin, *Corruption and Legislature Size: Evidence from Brazil*, dicembre 2016.
55. F. Andreoli, E. Peluso, *So close yet so unequal: Reconsidering spatial inequality in U.S. cities*, febbraio 2017.
56. E. Cottini, P. Ghinetti, *Is it the way you live or the job you have? Health effects of lifestyles and working conditions*, marzo 2017.
57. A. Albanese, L. Cappellari, M. Leonardi, *The Effects of Youth Labor Market Reforms: Evidence from Italian Apprenticeships*; maggio 2017.
58. S. Perdichizzi, *Estimating Fiscal multipliers in the Eurozone. A Nonlinear Panel Data Approach*, maggio 2017.
59. S. Perdichizzi, *The impact of ECBs conventional and unconventional monetary policies on European banking indexes returns*, maggio 2017.