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The effect of ECB's quantitative easing on credit default swap instruments in Central and Eastern Europe

Lucian Liviu Albu[a], Radu Lupu[a], Adrian Cantemir Călin[a]*, Oana Cristina Popovici[b]

[a]Institute for Economic Forecasting, Casa Academiei, Calea 13 Septembrie no.13, 5th district , Bucharest, 050711, Romania
[b]The Bucharest University of Economic Studies, Piata Romană no.6, 1st district, Bucharest, 010374, Romania

Abstract

This paper focuses on the quantitative easing policies launched by the European Central Bank (ECB), analysing their effects on the dynamics of a series of five-year sovereign credit default swap instruments that belong to seven Central and Eastern European States. In an econometric event study setup that follows the methodology developed in Albu et al. (2014), we calibrate an ARMA - GARCH model and analyse the abnormal and squared abnormal returns for each CDS instrument. The results indicate that the quantitative easing events issued by the European Central Bank have a significant effect on the evolution of the analysed sovereign credit default swap instruments.

Keywords: quantitative easing; credit default swap, European Central Bank; credit risk;

1. Introduction

Here introduce the paper, and put a nomenclature if necessary, in a box with the same font size as the rest of the paper. The paragraphs continue from here and are only separated by headings, subheadings, images and formulae. The section headings are arranged by numbers, bold and 10 pt. Here follows further instructions for authors.

* Corresponding author. Tel.: 004021.318.81.06; fax: 004021.318.81.48.
E-mail address: cantemircalin@ipe.ro

The recent economic crisis highlighted the weaknesses of the financial markets causing an enormous wave of uncertainty and economic distress. This financial turmoil was reflected into the wider economy, hindering its health and normal evolution.

In this turbulent context, central banks had to intervene in order to respond to the financial meltdown and restore a state of economic functionality. The initial action was to reduce the level of the interest rates in order to encourage a defrosting of the system that would consequently lead to investing, consuming and borrowing. As these rates approached their lower bounds, the central banks had to pursue less conventional monetary measures in order to be able to ensure the stability of the financial system. This unconventional set of monetary policies is generally known as quantitative easing (QE) and was inspired from the experience of Japan's deflationary period.

As well as other major central banks, the European Central Bank had to resort to such unconventional measures in order to maintain monetary flows and market stability. Szczerbowicz (2012) studies the unconventional monetary policies used by the ECB and concludes that the quantitative easing initiatives can be divided in three main categories: exceptional liquidity measures, purchases of assets and collateral easing.

The purpose of this paper is to build on our initial work and investigate the influence of the quantitative easing policies of the ECB on a series of seven 5 year-sovereign credit default swaps belonging to countries from Central and Eastern Europe.

2. Related literature:

Given the unprecedented scale at which quantitative easing was used to counteract the negative issues that derived from the economic crisis, these unconventional policy measures became the target of a rapidly expanding literature consisting in empirical evaluations of their effects on various aspects of the financial markets. This new wave of academic interest navigates in general around four main central banks: Federal Reserve, The Bank of Japan, The Bank of England and the European Central Bank.

Doh (2010), Gagnon et al. (2011), and D'Amico et al (2012) focus on the Federal Reserve's Large Scale Asset Purchase Programs and find that this quantitative easing policy has a significant effect on: decreasing term premia in long-term bond yields, reducing long term interest rates and lowering long term Treasury yields. Hancock and Passmore (2011) and Stroebel and Taylor (2012) investigate the Federal Reserve's mortgage-backed securities purchase program, while Krishnamurthy and Vissing-Jorgensen (2011) focus on the entire "QE1" and "QE2" programs.

The Japanese quantitative easing was also analysed in studies like Oda and Ueda (2007) or Bowman et al. (2011). The former uses a macro-finance approach and reports some evidence of lowered interest rates, though the results on portfolio rebalancements are found not to be significant. On the other hand, Bowman et al. (2011) observe a powerful effect of the Bank of Japans liquidity injection is credit flow growth.

Joyce et al. (2010) focuses on the Bank of England's large scale asset purchases and observe that it is successful in lowering guild prices with about 100 basis points. Breedon et al. (2012) examine the British QE policies issued in the 2009-2010 interval and report a solid influence on the bond market.

The literature concerning the quantitative easing policies of the European Central Bank is also extensive.

Beirne et al. (2011) assess the impact of the covered bond purchase program. In a study on both the primary and the secondary bond market, the authors find that the program was successful in lowering market term rates, easing of funding conditions, encouraging credit expansion and improving market liquidity.

Peersman (2011) studies the effects of unconventional monetary policy actions on the Euro area economy, proving evidence on their capability of influencing the economic activity and inflation. In an extensive study on the influence of the ECB's unconventional monetary policies conducted during the 2007-2012 interval on government borrowing costs, Szczerbowicz (2012) finds that only the sovereign bond purchases, covered bond purchases and three year refinancing operations were successful in diminishing borrowing costs.

3. Data and methodology

The econometric approach is based on two types of data. The first type consists of daily closing prices for five-year sovereign credit default swaps belonging to the following central and eastern European countries: Romania,

Bulgaria, Austria, Ukraine, Hungary, Poland and Russia. The data was collected from the Bloomberg platform and covers a period ranging from January 2005 to June 2013. The second type of input data is represented by a series of calendaristic data representing the announcement dates of eight events of quantitative easing belonging to the European Central Bank.

The research methodology follows the modelling context presented in Albu et al. (2014) by calibrating an ARMA (1, 1) – GARCH (1, 1) model for a period of 101 days.

$$R_{t+1} = pR_t + q\varepsilon_t + \varepsilon_{t+1}, \varepsilon_{t+1} \sim N(0, \sigma_{t+1})$$

$$\sigma_{t+1}^2 = \omega + \sum_{i=1}^{p} \alpha_i R_{t+1-i}^2 + \sum_{j=1}^{q} \beta_j \sigma_{t+1-j}^2$$

Where $\alpha + \beta < 1$

The next step requires the calculation of the variances on the basis of the error terms obtained by computing the differences to the returns. For each event, the model narrows an event window of 41 days (20 days before the event and 20 after) and then conducts predictions of the variances accordance to the GARCH model.

In a symmetric approach to that of our anterior study (Albu et al. (2014)), we focused on obtaining abnormal returns (the difference between the returns predicted by the ARMA-GARCH model and the returns obtained in each event window) and squared abnormal returns (which consist on the difference between the variances predicted by the ARMA-GARCH model and squared returns obtained in the 41 day window of each event).

The model computes the values of t test, using the estimated variance for the two categories of abnormal returns.

The present analysis focuses on the study of the dynamics of the abnormal and squared abnormal returns obtained for the event windows for the eight quantitative easing policies.

4. Results

The quantitative easing events issued by the European Central Bank have an important effect on the Romanian CDS quotations. Figure 1 shows the evolution of the average values of the t test for abnormal returns for the event period of the eight cases of quantitative easing policies belonging to the ECB. On average, this influence is statistically significant in 34 of the 41 days considered in this analysis. If until the announcement moment of an event, the evolution is fluctuating, on average on the day of the launch of a new policy the values drop substantially. The negative nature of the abnormal returns, for the Romanian sovereign CDS instrument and this decrease indicates the fact that the instrument is perceived as less risky. This effect remains constant towards the end of the analysis period.
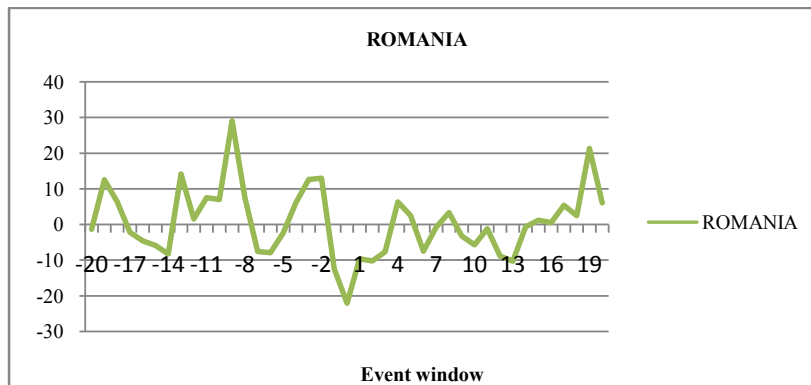

Fig. 1: The average evolution of the values of the t test for abnormal returns – Romania

The evolution of the values of the squared abnormal returns shows an opposite tendency, the eight events of quantitative easing leading only to a small increase of uncertainty in the just evaluation of the CDS instrument and thus to an increase in volatility.

The case of Bulgaria is similar to that of Romania. The results show significant values from a statistical point of view in 37 of the 41 days for the abnormal returns. After an inconclusive evolution during the first 20 days before the announcement of the events (-20,0), marked by sudden expansions and contractions, the average effect of the QE policies on the Bulgarian CDS instrument consists in a drop of the degree of credit risk specific to the financial instrument. This tendency is shown in Figure 2.
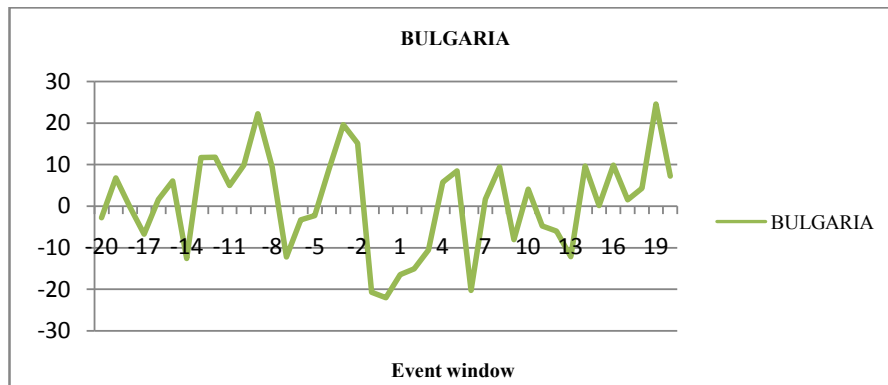

Fig. 2: The average evolution of the values of the t test for abnormal returns - Bulgaria

The analysis on the squared abnormal returns shows significant positive values for the event day. As in the case of Romania, the effect of the announcement of quantitative easing policies generates uncertainty in the optimal evaluation of the financial instrument.

Credit risk deriving from the dynamics of abnormal returns in the case of Hungary is greatly influenced by the QE policies of the ECB. The results are statistically valid for 38 of the 41 days of the event window. The information existing in the market prior to the launch of a certain policy triggers an important degree of volatility for the abnormal returns, with a consistent growth in the last three days before the launch of the event (to significant positive values). In spite of this momentum, in the case of Hungary, the contraction of the abnormal returns on the event day generates the greatest reduction of the perception on credit risk which is on average 30% higher than in the case of Romania or Bulgaria. The magnitude of this reduction in the 0 day (event day) does not also lead to a decreasing tendency of the rest of the event window, investors seeking greater returns for covering risk especially in the (+18; +20) interval.

These tendencies are confirmed by the evolution of the average results for the t test for the squared abnormal returns. These indicate the presence of market uncertainty related to the future evolution of the Hungarian sovereign CDS instrument during the (-3, 0) interval, on the day of the announcement of the policy launch and in the (18, 20) interval. The results for Hungary are present in Figure 3.
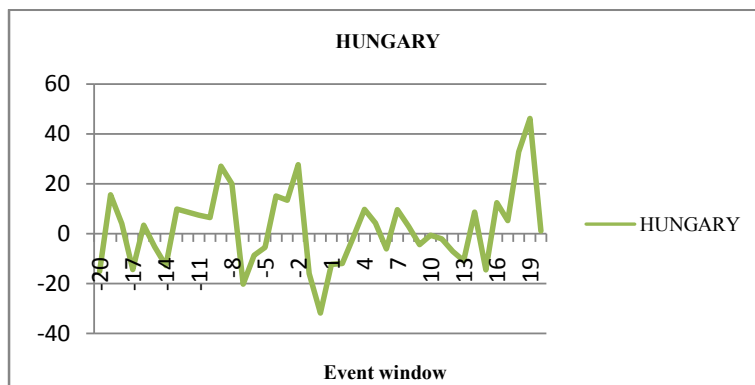

Fig. 3: The average evolution of the values of the t test for abnormal returns – Hungary

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From a statistical point of view, the quantitative easing events influence the evolution of the abnormal returns for Ukraine in 37 of the 41 days of the event window.

In this case, the results show a rise in positive abnormal returns in the 20 day interval before the launch of a certain policy. This rise is above all the other increases in the perception on risk recorded in this analysis. The average values from the event day suggest a powerful drop of the abnormal returns which is maintained in the first days after the launch. The (2, 20) interval is marked by oscillations which are accompanied by a similar evolution of the squared abnormal returns. Figures 3 and 4 show the evolution of the abnormal returns for Ukraine and Austria.
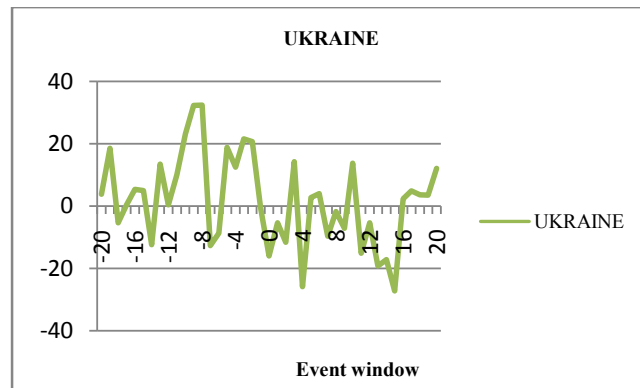

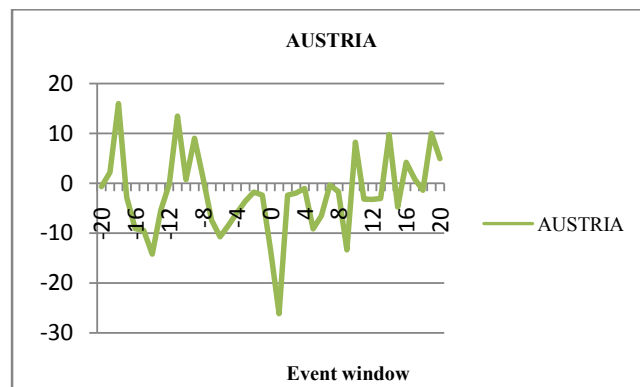Fig. 4: The average evolution of the values of the t test for abnormal returns –Ukraine

Fig.5: The average evolution of the values of the t test for abnormal returns –Austria

In the case of the latter, the results indicate an influence of the quantitative easing initiatives that is statistically valid in 30 out of the 41 days of the event windows for all of the eight events analysed. Unlike Ukraine, in the case of Austria, the last week before the announcement of a new QE measure triggers a fall in the level of the abnormal returns, the instrument being thus considered less risky. This tendency is maintained for the day of the announcement and for the next 10 days. The end of the event window witnesses an expansion of the values of the abnormal returns to positive values. The curve of the abnormal squared returns has three statistically significant positive peaks in the following days: (-18, 1 and 19.)

For Poland the influence of the ECB's QE programs is statistically valid in 35 of the 41 days of the event window. The announcement of a new policy determines a growth of abnormal returns in the (-13, -8) and (-4, -2) intervals. In spite of this fact, the announcement day of a new policy determines a reduction of the risk component in a similar way to Romania and Bulgaria.

The curve of the squared abnormal returns shows two significant positive points in the (-2) and (0) dates. This volatility is given by the sudden shift of perception on the degree of risk implied by the financial instrument. The

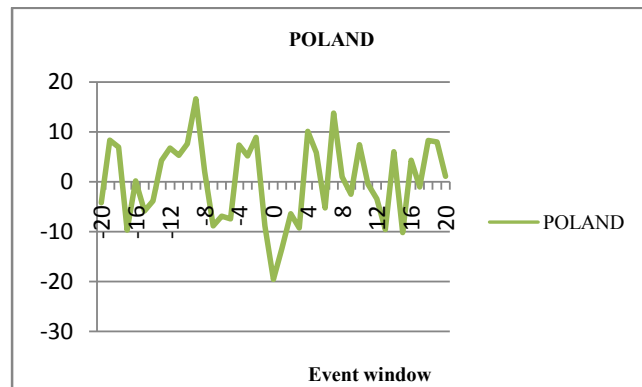evolution of the values obtained for Poland is shown in Figure 6.

Fig. 6: The average evolution of the values of the t test for abnormal returns –Poland

The abnormal returns for the Russian instrument indicate a strong growth tendency in the 20 day period foregoing the announcement day. In spite of this fact, the average value for the announcement day indicates the most important contraction effect in this study. The rest of the event window is also marked by a slight growth of the abnormal returns towards positive values, as depicted by Figure 7.

The curve of the squared abnormal returns shows similarities with the case of Hungary and has a maximum point on the announcement day at a value inferior to that of Hungary.
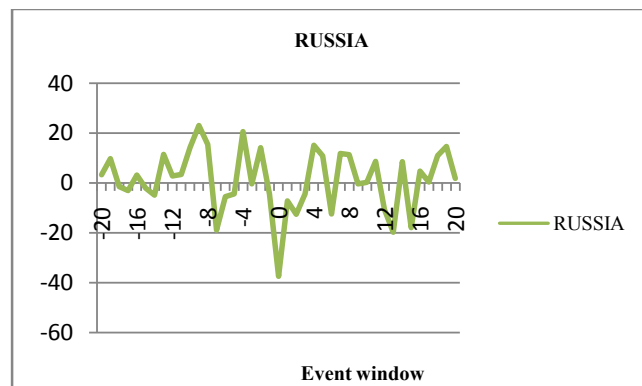

Fig. 7: The average evolution of the values of the t test for abnormal returns –Austria

Conclusions

In spite of a growing literature on the effects of quantitative easing on different aspects of the financial markets, little academic attention was given to credit instruments or credit risk.

This paper tries to fill that gap by analysing the effects of the ECB's QE policies on sovereign credit default swaps.

The results show that these unconventional monetary policies clearly influence the dynamic of the CDS instruments. For the event windows of the eight quantitative easing policies announcements this influence translates into a percentage that ranges from 73.17% to 92.68%.

During the event windows studied, this influence was both negative and positive. However, the data shows that on average all analysed CDS become more risky in the (-11, -8) interval and less risky in the (-1, 3) interval. In general, the squared abnormal returns that indicate the uncertainty existing in the market related to the correct

evaluation of the financial instrument show are positive and accompany the sudden shifts in the sign of the abnormal returns.

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