ANALYZING THE EUROPEAN MARKET OF INTEREST RATE SWAP INDICES

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The interest rate risk is the most important risk that derives from the OTC transactions, taking into consideration both the notional amounts and the market value of the financial derivatives that relies on interest rate contracts. Open positions on interest rate derivatives represents more than 75% of the OTC market. In the European banking market interest rate swaps prices are strongly dependent on the interbank interest rates. In this paper we want to analyze the behavior of the Eoniaswap indices and their impact on the interest rate swaps between banks.
Key words: interest rate risk, Eoniaswap, volatility, impulse response functions
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1. Introduction

Financial derivatives became in the last decade the most dynamic segment of the financial industry, offering multiple benefits to investors. Simultaneously, the rapid growth of the financial derivatives market has generated seriously controversies regarding the risks associated with these instruments. Interest rate risk remains the most important risk that derives from the OTC transactions, taking into consideration both the notional amounts and the market value of the financial derivatives that relies on interest rate contracts. Also, the largest share in this category is hold by swap contracts, which represent more than 75% of the OTC market.

The underlying asset of the interest swap contracts is directly linked with the interest rates evolution on the interbank market. In the European banking system, the interest rates swaps that have the Eonia interbank rate as underlying asset constitutes the most liquid market from the Eurozone interbank markets. Eoniaswap rates are the most used instruments in speculation and hedging the interest rate risk that derives from the banks' assets and liabilities indexed to Euribor. Also, is a very good indicator of the market anticipations regarding the short and long term evolution of the swap rates during the transactions.

Liquidity problems registered on the international financial markets have caused an increase in the volatility of the swap rates, especially after September 2008 and also in the spread between these and the monetary policy rate of the European Central Bank (ECB). By reflecting the market anticipations of the future monetary policy rate during the maturity of the swap contract, all the Euribor deviations form the monetary policy rate established by ECB is reflected in the interest swaps rates evolution.

Open positions on interest rate financial derivatives totally amount 478 milliard thousand USD in June 2010. OTC derivatives on interest rates constitutes 82% of the total notional values of the financial derivatives traded in 2010 and 75% of their gross market value (Table 1).

Table 1. The structure of financial derivatives traded on OTC markets (mil. USD)

Type of contract	Notional values		Gross market values	
	June2007	June 2010	June2007	June 2010
Foreign exchange derivatives	57.604	62.933	1.613	3.158
Interest rate derivatives	381.537	478.093	6.730	18.508
Equity derivatives	9.518	6.868	1.212	7.968
All commodities derivatives	8.255	3.273	656	492
Credit derivatives	51.095	31.416	906	1.708
Other derivatives	78	72	1	12
Total value	507.907	582.655	11.118	24.673

Source: Bank for International Settlements, 2011

Focusing on the European interbank market, we have analyzed the behavior of Eoniswap rates in comparison with the overnight borrowing interest rate. Section 2 provides the literature review. Section 3 presents the evolution of the Eoniaswap market. Section 4 analyze the transmission of volatility through the interbank markets and section 5 concludes.

2. Literature review

A vast range of studies have concentrated on the factors that determines banks to use financial derivetives and also on the relationship between financial derivatives and banking risks. One of the most representative studies are those of Brewer, Minton and Moser (2000), Gunther and Siems (2002), Kim and Koppenhaver (1992) and Sinkey and Carter (1994), which demonstrate that the probability of banks to enter into financial derivatives transactions depends on their dimension, their traditional commercial activity, their equity rate, but also the interest rate gap and net interest rate spread. Regarding the impact of the financial derivatives trading on the exposure of banks to market risk Chaudhry and Reichert (2002), Shanker (1996) and Venkatachalam (1996) highlight that some financial instruments are efficient in reducing the interest rate risk, while Choi and Elyasiani (1997) highlight the role of the financial derivatives in reducing the foreign exchange risk.

From a financial supervision perspective, financial derivatives present important challenges both for banks and for supervisors, due to the difficulty of managing and regulating the trading activities in comparison with the traditional banking activities. Culp and Mackay (1994) state that given the exposure of OTC derivatives to credit risk an adequate level of capital adequacy is an essential condition for trading on OTC markets. On the other side, Peek and Rosengren (1997) suggest that undercapitalized banks are more likely to be active in derivatives markets. Similarly, Gunther, Hooks and Robinson (1997) state that undercapitalized banks are more predisposed that others to open positions on OTC markets.

Regarding the management of the positions held on financial derivatives, Stulz (2006) highlights that both commercial and investment banks have developed methods that permit an efficient risk management taking into account the capital needed to ne held in order to absorb unexpected shocks. Stress testing and Value at Risk models are the most used by financial institutions to estimate the market risk associated with the financial derivatives portfolio, but don't work properly all the time because they are strongly dependent on the degree of liquidity registered on the markets.

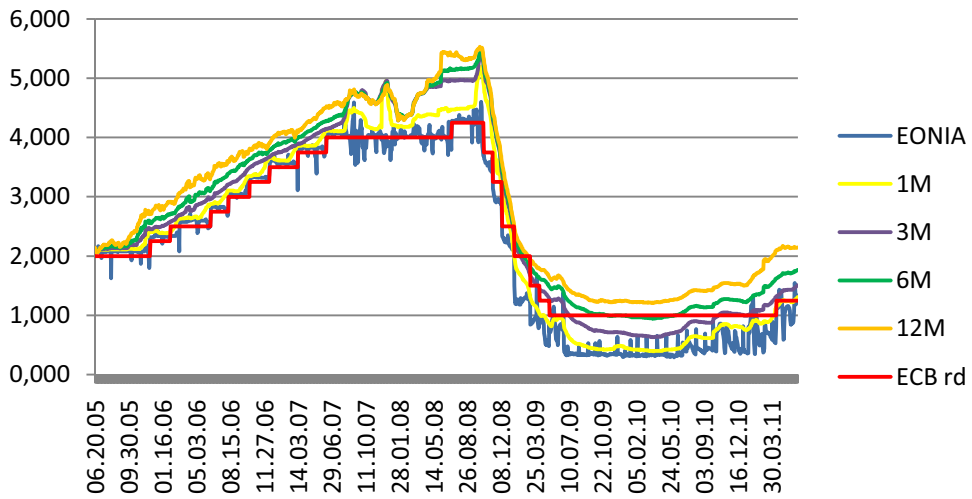
Kotomin et al. (2008) using the Libor rates for 11 currencies, suggested that the liquidity preference at the end of year or trimester is the main factor that influences the behavior of interest rates on short term. Prati et al. (2003) have analyzed the daily evolution of the overnight borrowing interest rates for a series of highly industrialized countries like Canada, Great Britain and others from Eurozone over a period of 16 years, demonstrating that the intervention style of

the central banks plays an essential role in modelling the empirical characteristics of interest rates on short term.

3. The evolution of the Eoniswap market

Since the introduction of the euro, the transformation of numerous national markets into a unique one has offered a great opportunity for developing new reference indices for the monetary market, like Euribor for unsecured lending or Eurepo for secured lending. This approach has lead to a more homogeneous and integrated swap market in the Eurozone. Eoniaswap, the representative index for this market has been launched with the aim of developing new products in order to manage the interest rate risk that affects the banks' portfolios of assets and liabilities. A study of ECB (2007) states that swaps that have as an underlying asset the overnight interbank offered rate Eonia form the most liquid interbank market from the Eurozone, because of their very frequent usage in speculating and hedging the interest rate risk that affects the assets and liabilities indexed by Euribor. Also, it permits to analyze the spread between the swap rates and the monetary policy rate. In an interest rate swap contract one part pays a fixed rate (the swap rate) and the other one pays a variable rate (the average of Eonia rate registered during the maturity of the swap contract).

Figure 1: Euribor and the monetary policy rate of the European Central Bank



Source: authors' prelucrations

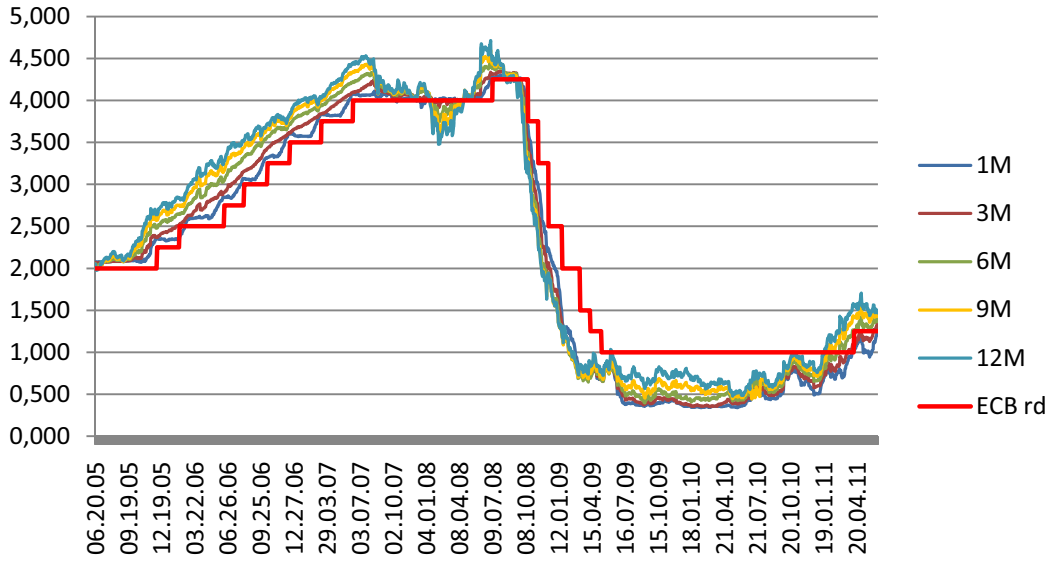
Nautz and Offermanns (2008) have analyzed the transmission of volatility through the European monetary markets from Eonia rate to the long term interest rates in the 2004-2006 period, finding that the Basel II regulatory framework have reduced the volatility of all monetary market interest rates. Also, the Eonia fluctuations are caused by the long term gap between 3 month Euribor and ECB's monetary policy rate. Linzert and Schmidt (2008) highlight that the positive difference between Eonia and the ECB's monetary policy rate is due to a long term high level of the former. Hassler and Nautz (2008) found that the persistency of the swap rates volatilities increases with maturity.

The Euribor rates for different maturities show an increasing trend until the collapse of Lehman Brothers in September 2008, from 2% (2005) to 4% (2008) and a decreasing trend after due to the monetary policy of ECB that aimed to reduce the reference rate for the Eurozone (Figure 1). It should be remarked both an increase in the spread between Eonia and the ECB's monetary

policy rate and the intensification of this spread volatility after September 2008. The explication for this derives from the liquidity surplus in the Eurozone due to BCE's monetary policy conducted in order to reduce the effects of the financial crisis.

Eoniaswap rates with 1 month, 3 months, 6 months, 9 mounts and respective 12 months maturities have registered an evolution similar with Eonia (Figure 2). When an increase in the monetary policy interest rate of ECB is expected Eoniaswap rates with 12 months maturities are larger in comparison with the short term interest rates (1-6 months) because of higher percents expectations of Eonia rate in the future,

Figure 2: Eoniaswap rates and the monetary policy rate of European Central Bank



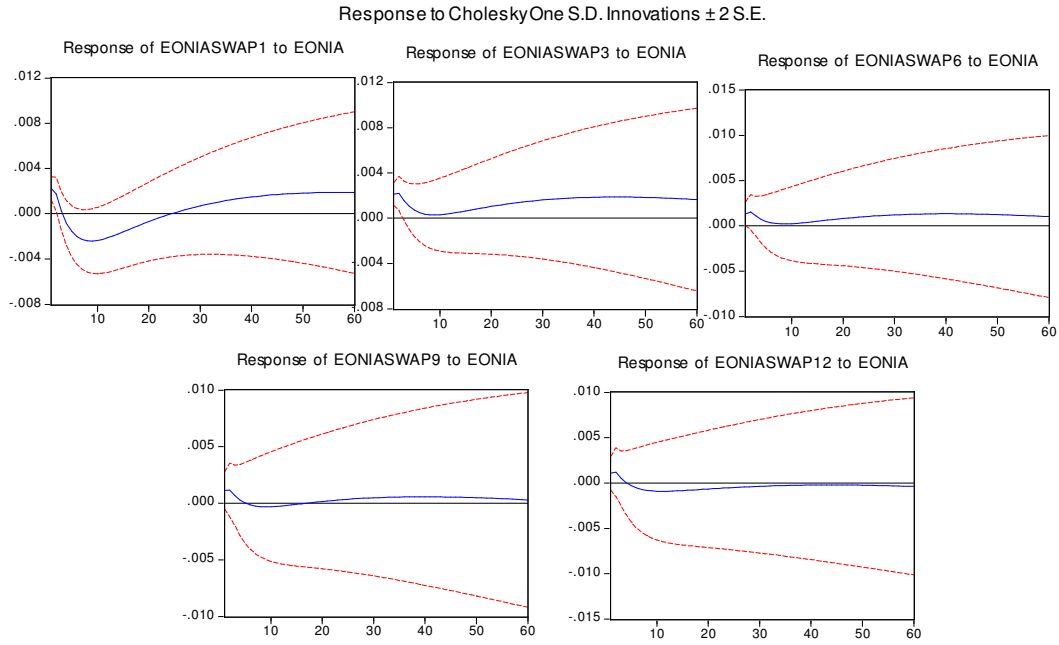
Source: authors' prelucrations

4. The transmission of volatility through the interbank market

Analyzing the impulse-response functions between Eonia and Eoniaswaps at different maturities it can be observed that the imapct of Eonia on the swap rates decrease with the maturity (Figure 3). The graph below illustrates the effect that the modification of Eonia rate variance with one unit has on the swap rates variance.

Eoniaswap rates quickly absorb the shocks from Eonia. None of the interest rates at different maturities give a response greater than 4% to unexpected shocks, neither in the nest 10 days, nor in the next 60 days. Over a longer time horizon these impulses became insignificant. So, the probability of the banks which trade these financial derivatives to obtain profit based on the past information that characterize the overnight interbank market is reduced on long term. They could make profit just on a short term basis.

Figure 3. Impluse-response functions between Eonia and Eoniaswap rates



Source: authors' prelucrations

5. Concluding remarks

Analyzing the Eoniaswap rates behavior in the 20.06.2005-20.06.2011 period and their relationship with the interbank borrowing interest ratewe have seen that the variance of Eoniaswap at different maturitis is influenced by the shocksregistered by the Eonia rate, but these extreme volatilities are quicklu absorbed by the swap prices. These results reflect the difficulties of banks in making profits by trading finacial derivatives with Eoniaswap rates as undelying assets, but on the other side the situation is advantageous for the interest rate risk management, because the future volatility evolution of the swap rates could be estimated based on the past informations.

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