# “Impact of declining interest rates on European primary bond market”


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# IMPACT OF DECLINING INTEREST RATES ON EUROPEAN PRIMARY BOND MARKET

## Abstract

The aim of this paper is to examine the growing popularity of debt financing in European based subjects. The development of issued volume was examined on the sample of 9,293 public debt offerings denominated in EUR issued between 30th November 2007 and 30th November 2016 and the impact of declining market interest rates on primary bond market was explored. More than 7.666 trillion EUR of debt were analyzed and the results indicate that despite low interest rates, the volume of issued bonds does not increase over time. Decline of interest rates only compensates slow economic growth as well as increasing global market and political risks.

**Keywords** bond, interest rates, public offering, swap

**JEL Classification** E43, E44, E58

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## INTRODUCTION AND LITERATURE REVIEW

Initial public debt offerings can be considered not only as the complex global investment topic, but also as a corporate finance phenomenon. They starts with the decision of a particular issuer to access the public market. The entity contemplating a public bond offering must usually be well known, perceived as stable and sufficiently transparent to potential investors. Companies whose bonds are traded on a public market must be credible and complete the due diligence, the legal and financial audit. In addition, during the period their bonds are traded, issuers have information commitments with respect to investors, supervisory authorities, rating agencies and to the relevant market makers. Based on this information, each company with publicly traded debt is more subjected to criticism, and even a small incident is immediately reflected in the market price of its obligations. Entering the debt market, however, raises interest not only in case of potential investors, but also in case of the general public, thus makes the process of debt offering also a kind of advertising. Issuing companies who have decided to undergo the process, seek to obtain financial sources they need for their development. The advantage of public offering compared to syndicated bank loans or direct investment is that using this form of financing, the issuer might receive a significantly higher amount

of money and at the same time the resulting funds are not purposefully bounded (Fabozzi, 2007). The major drawback of the public debt offering is the costs of the project. Even though the one-time costs after the issue do not have significant impact on the issuing subject, regular coupons can expose the cash balance of the company. Moreover, the principal amount has to be paid at the maturity as well.

Before the issuing process, it is necessary to deal with the question whether the company is sufficiently known, has adequate credit risk profile and good prospects to attract interest from investors. Account must be taken of the macroeconomic conditions, such as growth, inflation, level of interest rates and of the economy in general. The role of management and cooperating banks is to ensure that the time to enter the market is right (Fabozzi, 2007). After the management decision starts the implementation phase. Company chooses the issue manager (leading book runner/book leader) and carries out a legal and financial due diligence. As an issue manager are usually selected investment banks, who are dealers and market makers. In any case, it must be a financial institution which has experience with implementation issues and actively operates on the bond market. Fee for the issue manager is prearranged and either represents a percentage of issue, or is the difference between purchasing and reoffer price in case that the manager purchases obligations for a from the issuing entity and reoffers them to the public at a higher price.

Analyzing the primary bond market, Blackwell and Kidwell (1988) focused on the cost differences between public debt sales and private placements for a sample of public utility offerings. The costs comprised of flotation costs, agency costs, and the costs of searching the market. They argued that companies minimized the cost of issuing securities by selecting the market providing the lowest transaction costs. Ke et al. (2007) examined the bonds at the initial public offerings for the Taiwan Stock Exchange. Their results indicated that R&D expenditures were primarily positively related to issuing straight bonds and future growth opportunities to convertible bonds for electronic firms. They also found that electronic firms experienced a significant negative stock price response surrounding the announcements of the bond IPO.

Following survey by Dutordoir et al. (2014), Li et al. (2016) focused on the share price movement following convertible bond offering made by financial institutions. Their outcomes suggested that the cumulative return over the three day period around convertible bond offering was 1.41 percentage higher than that for non-financial institutions. Author argue that since financials are intensively regulated, the market is less likely to assume that the issuance of convertible bond by financials signals information that are overvalued. Similar results were obtained by Dann and Mikelson (1984) who suggested that convertible debt offerings convey unfavorable information about the issuing firms, but the specific nature of such information remained unidentified. Cai and Zhu (2016) investigated the long term and short term share price reactions to US and non-US bond offerings. Matching 399 corporate bonds issued by foreign firms with 399 US domestic bonds for the period of 1989–2013, they found that bonds domiciled in a country with better institutional quality experience less negative returns.

Focusing on the role of underwriters, McKenzie and Takaoka (2013) explored the role of reputation in the relationship between lead underwriters and issuing firms in the corporate bond market in Japan on the sample of straight bonds publicly issued between 25 February 1994 and 31 December 2009. They argue that issuing companies match with the same lead underwriter when the difference of the issuer's reputation and the current reputation of the previous lead underwriter is small which confirmed results of Fernando et al. (2005). The aim of this paper is to describe the recent development of initial public bond offerings and to analyze the impact of low market interest rates on the size of primary debt market in Europe using the sample of EUR denominated issues offered in last decade.

# 1. METHODOLOGY

One of the most commonly used econometric methods for modeling dependent (explaining) variable is the method of ordinary least squares. Despite the simply nature, this technique has been successfully applied in variety of tasks (Dechow et al., 2000; Kraft et al., 2007; Longstaff & Schwartz, 2001). If we consider the formula:

$$Y_i = \beta_0 + \beta_i X_i + u_i, \quad (1)$$

where $X$ is the value of explanatory variable, $Y$ represents the value of explaining variable, $\beta$ is the vector of the model parameters, $u$ defines the residual value vector, and $i$ is a natural number. Dependent variable $Y$ cannot be determined with absolute precision, so we estimate it as $\widehat{Y}_i = \widehat{\beta}_0 + \widehat{\beta}_i X_i$, where $\widehat{Y}_i$ is an estimate of the value of the dependent variable. Residual components $\widehat{u}_i$ can be written as:

$$\widehat{u}_i = Y_i - \widehat{Y}_i = Y_i - \widehat{\beta}_0 - \widehat{\beta}_i X_i = f\left(\widehat{\beta}_0, \widehat{\beta}_1\right). \quad (2)$$

Any residual variation is a function of regression parameters and can be positive as well as negative. Therefore it is suitable to make the sum of squares of the residual components and minimize it ( $n$ is the number of observations):

$$\sum_{i=1}^{n} \widehat{u}_i^2 = \sum_{i=1}^{n} \left(Y_i - \widehat{Y}_i\right)^2 = \sum_{i=1}^{n} \left(Y_i - \widehat{\beta}_0 - \widehat{\beta}_i X_i\right)^2. \quad (3)$$

In matrix form, ordinary least squares estimation of coefficients $\beta$ can be written as $\widehat{\beta} = \left(X^T X\right)^{-1} X^T y$. Under several assumptions (Baltagi, 2011; Wooldridge, 2015), ordinary least squares method is the best linear unbiased estimator.

# 2. RESULTS

In order to explore initial public bond offerings in Europe we examined 9,293 public debt offerings denominated in EUR issued between 30th November 2007 and 30th November 2016. Total amount of issued bonds was slightly above 7.666 trillion EUR. Figure 1 illustrates the volume of issued bonds by particular years of analyzed period.

Despite the remains of mortgage and financial crisis, the largest volume of obligations in examined sample was issued in 2009, in total of 1.08 trillion EUR. 2016 was second with total amount of 913.1 billion EUR. However, if we focus on number of issued bonds depicted on Figure 2, we might see that the significantly higher number of public of-

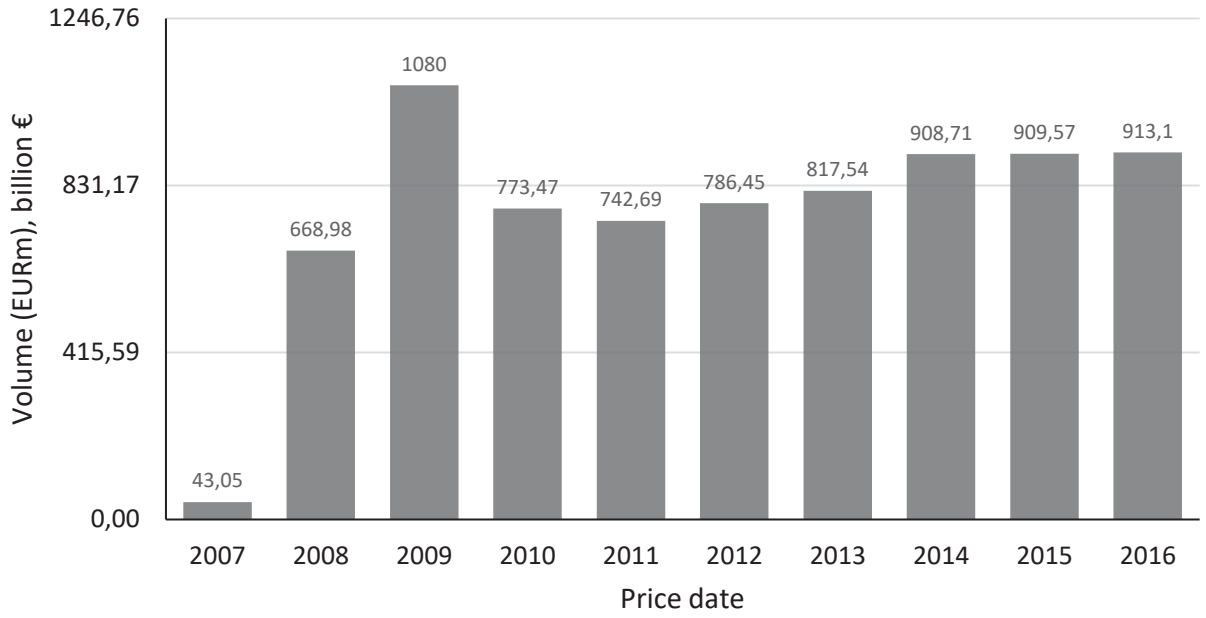


**Figure 1.** Volume of issued bonds by year

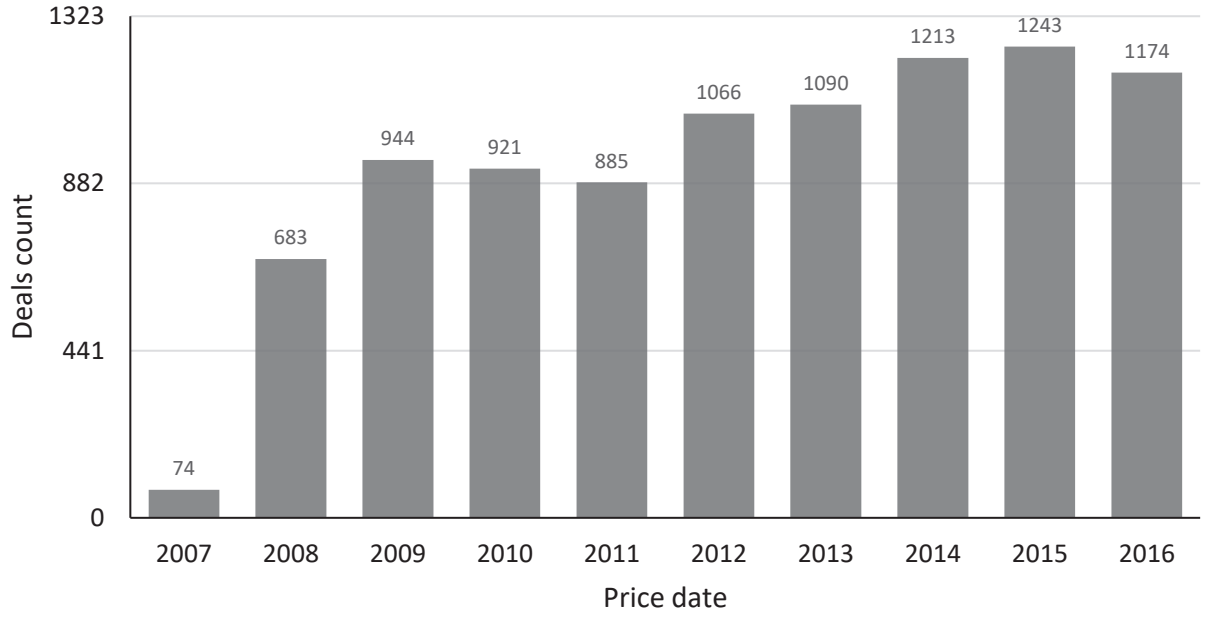


**Figure 2.** Number of issued bonds by year

ferings was issued in 2015. It indicates that issues with larger nominal volume were offered in 2009.

Figure 3 presents the volume of offerings by global regions. As supposed, most of EUR denominated issues were offered by entities with domicile in Western Europe, followed by North American subjects. More than 768 billion EUR were borrowed in Western Europe, while less than 125 billion EUR in North America. If we look closer at particular countries, Germany leads with 171 billion EUR in 2016, France is second with 158 billion EUR and US based entities are third with 108 billion EUR.

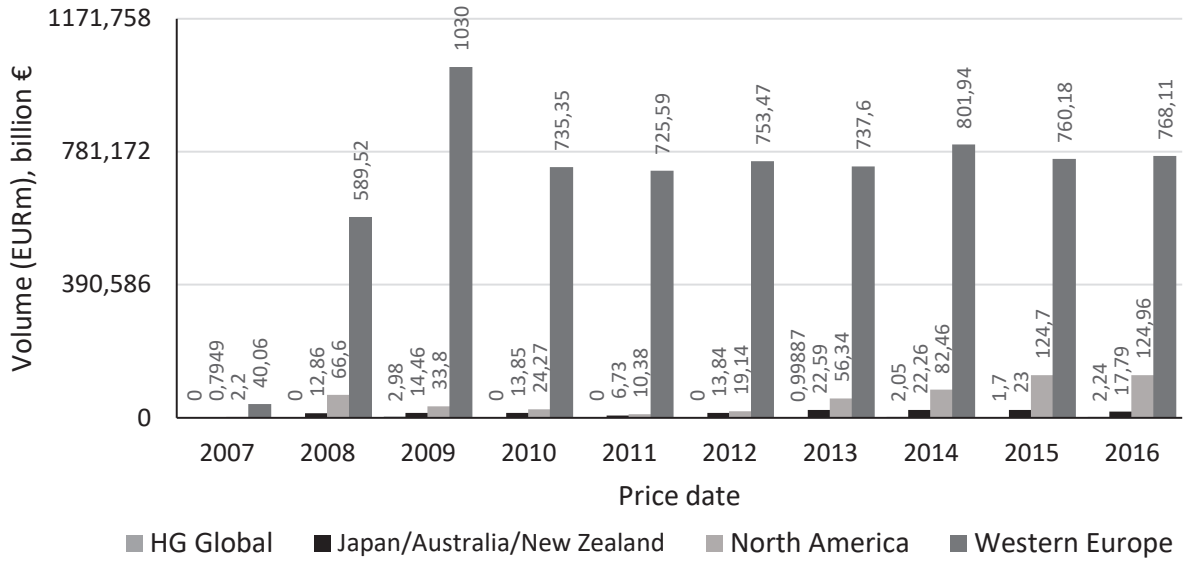


**Figure 3.** Volume of issued bonds by region

Table 1 presents the TOP 20 leading investment banks and financial companies which ran the issues in examined period. Almost 7.5% of overall issued volume of bonds denominated in EUR between 30th November 2007 and 30th November 2016 was led by BNP Paribas. It is worth to notice that even though Table 1 summarizes leading positions in case of particular deals, most of banks were also involved in other offerings as second or third book runner. Investors can therefore through these TOP underwriting banks participate on even larger portion of primary debt market. The market share of individual banks might reflect their reputation among issuing subjects, since issuers seek successful underwriters who increase the probability of public placement at as low costs as possible. Total of 180 financial companies led examined 9,293 public debt offerings as leading book runner. Average size of a deal was 825 million EUR.

To analyze the impact of low market interest rates on the size of primary debt market denominated in EUR, we examined issued volume in every month between 30th November 2007 and 30th November 2016, i.e. total of 109 months. Average monthly volume of the offered debt was 70.34 billion EUR.

Consequently, we explored the impact of average value of 10 year interest swap denominated in EUR using ordinary least squares. Figure 4 depicts the historical development of 10 year EUR interest rate swap in given period between 2007 and 2016. We might see that in the peak of the financial crisis, the 10 year EUR swap was slightly above 5%, however, in September 2016 it was multiple times at 0,26%. Due to the unprecedented expansive monetary policy of European Central Bank, which gradually decreased interest rates to boost the fragile European economy and inflation to 2% target, we might have expected that market subjects would utilize low interest rates to borrow cheap money on debt markets. Table 2 presents the results of ordinary least (OLS) squares where monthly volume of issued bonds was the dependent variable and average monthly value of interest rate swap was the independent variable.

Based on estimated coefficient sign obtained results suggest that increasing value of interest rate swap declines the monthly volume of issued debt. However, the coefficient of determination is very low, therefore presented model does not explain the data well and is not too significant. Independent variable is not very significant as well.

**Table 1.** TOP 20 leading investment banks

| No | Bond Issuer | Total EUR (milion) | Deals | Share |
|---|---|---|---|---|
| 1 | BNP PARIBAS | 572,617.77 | 2454 | 7.49% |
| 2 | DEUTSCHE BANK | 558,355.68 | 2325 | 7.30% |
| 3 | HSBC | 520,034.92 | 2059 | 6.80% |
| 4 | BARCLAYS | 508,135.95 | 1893 | 6.64% |
| 5 | SOCIETE GENERALE | 428,917.39 | 1817 | 5.61% |
| 6 | CREDIT AGRICOLE | 390,065.76 | 1673 | 5.10% |
| 7 | JP MORGAN | 386,339.60 | 1602 | 5.05% |
| 8 | UNICREDIT GROUP | 351,302.82 | 1786 | 4.59% |
| 9 | NATWEST MARKETS | 286,140.91 | 1228 | 3.71% |
| 10 | NATIXIS | 277,912.49 | 1385 | 3.63% |
| 11 | CITIGROUP | 275,620.16 | 1198 | 3.60% |
| 12 | GOLDMAN SACHS | 271,966.45 | 1026 | 3.56% |
| 13 | CREDIT SUISSE | 244,106.86 | 925 | 3.19% |
| 14 | UBS | 221,442.97 | 853 | 2.90% |
| 15 | COMMERZBANK | 197,289.49 | 1088 | 2.58% |
| 16 | BAML | 193,426.93 | 1007 | 2.53% |
| 17 | MORGAN STANLEY | 176,495.05 | 658 | 2.31% |
| 18 | DZ BANK | 146,897.06 | 828 | 1.92% |
| 19 | LBBW | 145,089.94 | 855 | 1.90% |
| 20 | SANTANDER | 130,859.45 | 698 | 1.71% |

**Figure 4.** Value of 10 year interest rate swap in EUR

To validate the assumptions of ordinary least squares we verified the homoskedasticity using Breusch-Pagan test with test statistic: LM = 0,748134 and p-value = P(Chi-square(1) > 0,748134) = 0,387068. To validate linear specification we performed RESET test with test statistic: F(2, 105) = 0,656316 and p-value = P(F(2, 105) > 0,656316) = 0,520874. In both cases we cannot reject the null hypotheses (heteroskedasticity not present and adequate linear specification). Normality of residuals was also tested with test statistic: Chi-square(2) = 14,5247 and p-value = 0,00070146. Therefore we can reject the null hypothesis of normally distributed residuals and ordinary least squares method is not unbiased estimator. Distribution of residuals is showed on Figure 5.

To enhance the performance of the model, we fitted the data using generalized least squares, but with no significant improvement. Presumably, an additional variable might eliminate the limitations of presented model. In either case we might conclude that on explored sample of primary bond offerings was not found any impact of low market interest rates on monthly volume of issued debt. The expansive monetary policy of European Central Bank did not result into massive corpo-

**Table 2.** OLS results

| Variable | Coefficient | Std. Error | t-ratio | p-value |
|---|---|---|---|---|
| *Const* | 71825.1 | 2190.52 | 32.79 | 1.23 E–57 |
| *SWAP* | –620.453 | 974.946 | –0.6364 | 0.5259 |
| **Results** | | | | |
| *Mean dependent variable* | 70630.1 | *S.D. dependent var* | | 11744.95 |
| *Sum of squared residuals* | 1.48 E+10 | *S.E. of regression* | | 11777.44 |
| *R-squared* | 0.003771 | *Adjusted R-squared* | | –0.00554 |
| *F(1, 107)* | 0.405002 | *P-value (F)* | | 0.525876 |
| *Schwarz criterion* | –1175.415 | *Akaike criterion* | | 2354.829 |

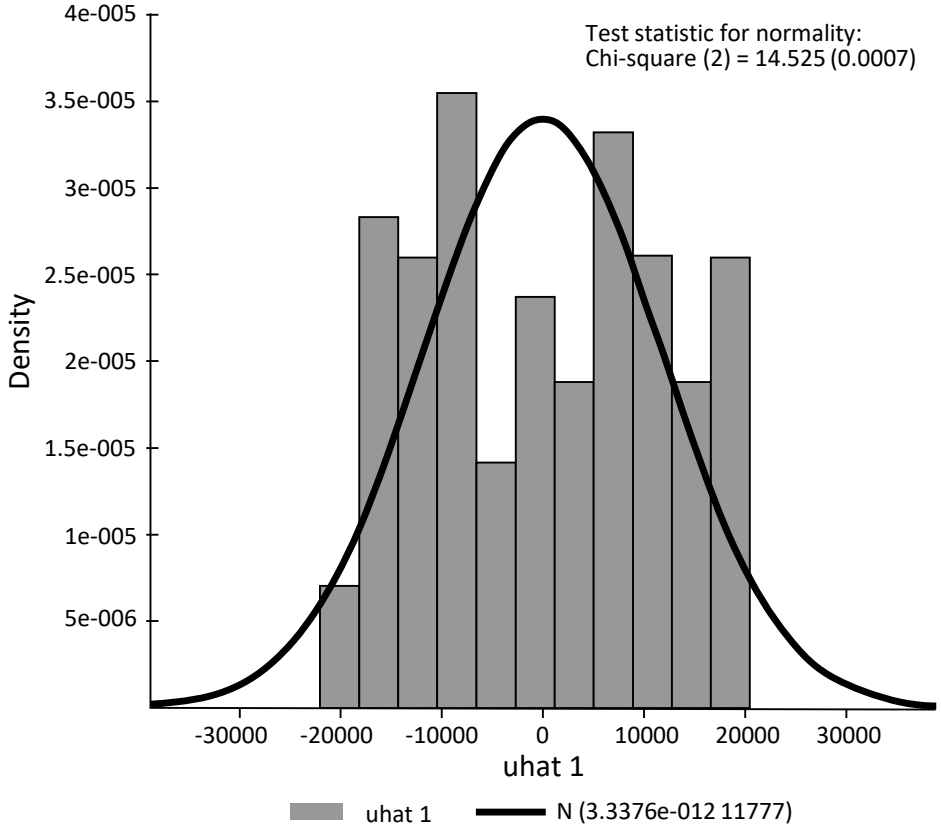


**Figure 5.** Distribution of ordinary least squares residuals

rate and government borrowings denominated in EUR, when the volume of issued debt in 2016 grew only by 18% compared to 2010 while market interest rates in terms of 10 year EUR interest rate swap declined by 81 in the same period. These nonstandard measures presented by central banks at best countervail sluggish economic growth and market risks.

## CONCLUSION

Public debt offerings are popular form of funding not only for governments and supranational agencies, but also for companies. The subject which considers a public bond issue must have stable credit profile and be transparent to potential investors, supervisory authorities, rating agencies and other stakeholders.

The goal of this work was to explore the increasing prevalence of EUR denominated bonds. More than 7.666 trillion EUR of debt were analyzed consisting of 9,293 public debt offerings issued between 30th November 2007 and 30th November 2016. We aimed at the evolution of primary bond market in EUR and focused on the impact of declining market interest rates on bond offerings. The largest volume of obligations in examined sample was issued in 2009, in total of 1.08 trillion EUR, however, significantly higher number of offerings was issued in 2015. Most of EUR denominated issues were offered by entities with domicile in Western Europe, followed by North American subjects. More than 82% of overall issued EUR bonds between 30th November 2007 and 30th November 2016 were led by TOP 20 financial institutions.

Our results of ordinary least squares method suggest that in spite of low interest rates, the volume of issued bonds does not significantly increase over time. Monetary policy of central banks only compensates weak global economy, inflation below 2% target and systematic risks.

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