How difficult is to raise money in turbulent times?

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Abstract

This paper analyses the development of bank long-term funding over the last 13 years in Europe, US and Japan. We collected information on banks' long-term debt issuance for the years 2000-2012. Our sample includes all bond issues by banks headquartered in Europe, United States and Japan. We document the impact of the subprime crisis and the subsequent sovereign crisis on the volume, frequency, nature of instrument and cost of bank debt issuance practices.
In particular, systemic crises deeply impacted on the cost and availability of bank long-term funding, with different effects depending on the issue's main features and the issuing bank main business model characteristics. The macro conditions of the country in which banks operate starts to become relevant since 2011, at the onset of the EU sovereign debt crisis, though differences among nationalities are appreciated by the market even before. Indeed, markets did not fully appreciate the evaluation of credit risk made by rating agencies and did not price the bonds accordingly to their rating class.

Keywords. *long-term funding; bank balance sheet; bank business models; financial crises*
JEL codes. *G01; G21; G28*

1. Introduction

Banks finance themselves with a variety of sources, with different maturities and credit risk characteristics. Heavy reliance on short-term, wholesale funding in the years preceding the financial crisis, a distinctive characteristic of the OTD business model in banking, turned out to be a source of subsequent problems.

The subprime crisis and the collapse of the OTD business model, the ensuing regulatory reforms (Basel III) with new liquidity requirements have highlighted the growing importance for banks to rely more on stable, long-term funding sources. However, the financial crisis has led to a repricing of risks, with important effects on the demand side in the markets of long-term debt financing instruments. The supply side is more eager to issue long-term debt than the willingness (or interest) of the demand side to absorb it. Moreover, at least for Euro area intermediaries, issuance and pricing behaviour has also been affected by the tensions in the markets of government debt.

The aim of this paper is to analyse the development of bank long-term funding over the last 13 years (2000-2012) in Europe, US and Japan. In particular, we investigate the following questions: a) how deeply systemic crises (subprime, sovereign crisis) impacted on the cost and availability of bank long-term funding?; b) were such effects tied to the issue's characteristics – maturity, rating, volume – or to the issuing bank main specific characteristics – for instance, business model or were they mainly dependent on the macro conditions of the country in which these banks operate?

In order to answer these questions, we collected information on banks' long-term debt issuance for the years 2000-2012. Our sample includes all bond issues by banks headquartered in Europe, United States and Japan. We document the impact of the subprime crisis and the subsequent

sovereign crisis on the volume, frequency, nature of instrument and cost of bank debt issuance practices.

The analysis is based on a newly constructed database created using DCM Analytics by Dealogic**.** Our dataset includes detailed information on about 128,000 debt issuances by banks headquartered in France, Germany, Italy, Norway, Spain, Sweden, Switzerland, the United Kingdom, the United States and Japan, during 2000–2012. The dataset represents 80% of all issues in the above mentioned countries.

For the purpose of the paper's analysis, the data are divided into a pre-crisis period (2000–2007), a subprime crisis period (2008–2009) and a sovereign crisis period (2010–2012). The database's panel structure facilitates a focus on cross-country and cross-business models differences.

After a review of the relevant literature (section 2), we start focusing on the evolution of long-term funding practices both in uneventful and crisis periods (section 3) while we focus on the cost of issuance in section 4 to investigate how deeply the financial crises have impacted on this important aspect of long-term funding. Section 5 concludes.

2. Review of literature

The financial market turmoil that emerged in the second half of 2007, the severe global financial crisis subsequent to the collapse of Lehman Brothers in September 2008, the unfolding of the financial crisis in the euro area into a sovereign debt crisis are amongst the recent developments that have led to important changes in bank funding models and patterns. Two main trends are nowadays visible around the world, in particular in Europe/euro area: a higher cost of funding (both short and long term); a different structure of liabilities, characterized by a sensible reduction of senior unsecured debt issuance and wholesale funding and an increasing portion of secured funding. Overreliance on certain types of wholesale funding was a contributing factor to

the global financial crisis: nowadays banks have a lower dependence on wholesale markets and are increasingly dependent on customer deposits. This is a clear-cut and global change in funding patterns with respect to the pre-crisis period, though some geographical differences are notable. Indeed, Euro area banks are less able to attract new customer deposits, since their economies were hit to a greater extent by financial, real and sovereign debt crises; their recourse to central banking funding increased considerably in order to replace their higher pre-crisis dependency on wholesale funding.

Such changes have inspired an increasing array of academic and institutional studies, mainly empirical, highlighting the relevance of liability side issues, beyond bank capital concerns. Thereby, not only capital adequacy is under scrutiny, but the whole structure of bank liabilities is analyzed and assessed. In fact, despite adequate capital ratios, many banks were faced with funding difficulties; moreover, strains in funding markets led to massive interventions by national and supranational authorities as liquidity providers.

In sum, research on bank funding structures concentrates on four main themes:

i. the relationship between bank funding patterns and financial stability/financial integration (EC, 2012; IMF, 2013; Le Leslè, 2012; Yorulmzer, 2014; ECB, 2011; 2012);
ii. the likely effect of key regulatory initiatives on bank funding structures (IMF, 2013; Le Leslè, 2012).
iii. the impact of the crisis on bank funding costs (CGFS 2011; Cardillo and Zaghini, 2012; Bongini and Patarnello, 2012);
iv. the analysis of funding cost advantaged deriving to (some) banks benefiting from implicit, yet valuable, government guarantees (Schich and Lindh, 2012; Schich and Aydin, 2014; Cariboni et al., 2103; Zaghini, 2013).

Studies are mainly focused on European banking systems, as funding risk has been one of the main problems of Euro area banks since the starting of the sovereign debt crisis.

Are bank funding structures relevant to financial stability? The answer is positive, according to a study by the IMF (2013), which examined the relationship between bank funding characteristics and bank distress for broad range of emerging and advanced economies from 1990 through 2012. The results support the view that overall banking-sector stability requires that banking structures be stable, diversified and involve less leverage. Limiting mismatch between loans and deposits, i.e. reducing the reliance on wholesale funding, is also important. Higher reliance on short-term debt, in particular in the form of wholesale debt, is associated with an increase in bank distress. Lower level of leverage and a higher diversification of funding sources contribute to bank stability.

Since the crisis began, most banks have altered their funding structures to make themselves less vulnerable: decreasing reliance on interbank and wholesale funding and a shift towards more stable funding is thought to contribute to overall stability. However, policy concerns arise on account of the increasing reliance on secured lending, which in turn increases the level of asset encumbrance. A predominance of secured or collateralized funding may pose limits to bank lending activity and have an impact on the composition of assets on banks' balance sheets going forward (ECB, 2012).

Recent regulatory reforms prompted by the crisis and aimed at directly change bank funding structures and loss-sharing rules across funding instruments[1] tend to reinforce a preference for liquid assets and a reinforcement of asset encumbrance that would persistently affect banks'

[1] See for instance, some aspects of Basel III liquidity regulations or contents of EMIR, the OTC derivatives reform, which encourage participants of OTC markets to place collateral either with derivatives counterparties or with a formal CCP, both of which will receive preferential treatment in the event of resolution.

asset holdings and their funding strategies (IMF, 2013; ECB, 2012).

These reforms are likely to also impact the future cost of bank funding, already hardly hit by the financial crisis and the spillover of the sovereign debt crisis. In particular, some regulatory-driven changes to funding structures (i.e. more equity) combined with the reallocation of losses upon bank failure among debt-holders (i.e. bail-in of creditors in resolution or depositor preference in liquidation) can produce changes of bank funding costs which cannot be easily anticipated. On the one hand, a larger loss-absorbing buffer makes debt safer and potentially cheaper. On the other hand, bail-in powers and the possible introduction of depositor preference laws, combined with high levels of asset encumbrance, magnify the expected losses that unsecured debt-holders will suffer in the event of a bank failure and will likely drive upwards the cost at issuance of this class of debt instruments.

As a matter of fact, banks' funding costs have faced a steady and substantial rise since 2009. Not only secured and unsecured debt spread have increased, due to perceived higher bank's probability of default and ensuing expected losses, but also the price of retail deposits have been driven upwards by increased competition in the household segment of retail deposit markets which have made this source of funding more expensive than before. Besides, the linkages between sovereigns and home banking systems affect significantly banks' cost of funding. Cardillo and Zaghini (2012) and Zaghini (2013), analyzing the cost of bank bond at issuance, over the years 2006-2011, for a sample of US, euro area and UK banks, show that in crisis periods the effects of a deterioration in (perceived) sovereign creditworthiness spill over to home banks. In a similar vein, the CGFS paper (2011) analyzed the impact of sovereign risk on the cost of bank funding for a sample of 534 unsecured fixed-rate senior bonds from 114 banks in 14 advanced economies, for the years 2006 and 2010. The main insight of the study is that in

normal times the characteristics of the sovereign have virtually no effect on the cost of funding, which is instead closely related to issue-specific and bank-specific factors. In crisis time, however, a large part of the spread at launch on bank bonds – nearly 30% – reflects the conditions of the sovereign. This percentage increases to 50% for countries for which concerns over public finance conditions are most pronounced. Such results imply a significant funding cost advantage for those banks residing in countries with sovereigns of high creditworthiness.

Indeed, the issue of implicit guarantees for bank debt has received much attention since the onset of the global financial crisis. An implicit guarantee represents the expectation by market participants of future bail-outs upon failure of the beneficiary institution. It is "implicit" because the provider of the guarantee does not have to commit to bailing out the firm. In the case of banks, (unwilling) providers of such guarantees are governments and public authorities in general, given the potential disruptive effects of bank failures. Implicit guarantees imply a funding cost advantage for beneficiary banks: this in turn is conducive to competitive distortions and can have important consequences for firms' risk-taking decisions since beneficiary banks could be induced to take on too much risk (which makes the use of the guarantee, and taxpayers money, more likely). Implicit guarantees also imply an undesirably close link between the value of bank and sovereign debt, including potential negative feedback effects from the value of sovereign debt to the value of bank debt and viceversa (Schich and Lindh, 2012).

The TBTF status is a well-known type of implicit guarantee and its positive effects of bank funding costs – for those banks deemed to be to big to fail- are well documented (Ueda and Di Mauro, 2012, aggiungi altri) prior and after the onset of the crisis.

Policymakers have announced their intentions to restrict the value of implicit bank debt guarantees and an increasing number of studies is nowadays concentrating on the issue of how to

measure the value of such guarantee and also formulate a policy response to limit it, while considering the effect of recent regulatory reforms (i.e. the G-SIFIs additional capital requirements) on the value of the guarantee itself. According to Schich and Aydin's report (2014), the estimated funding costs advantages can amount to about USD 10 billion on an annual basis for banking sectors in some jurisdictions and in many cases they are estimated to represent the equivalent of 1% of domestic GDP; in crisis situations, this value could rise to close to 3% of domestic GDP. Schich and Lindh (2012) and Schich and Kim (2012) suggest that the value of the implicit guarantee depends positively on the creditworthiness of the sovereign where the bank is headquartered and on the size of the bank. Cariboni et al. (2013) extend the set of possible drivers to include bank business models that could play a role in the size of the guarantee. Indeed, more inter-connected banks that hold a larger proportion of net loans to banks in their total assets benefit from a higher value of the guarantee; the same hold true for those banks that rely more on wholesale markets for funding.

3. Sample and long term funding patterns

The analysis is based on a newly constructed database created using DCM Analytics by Dealogic. We collect information on about 128,000 debt issuances by banks headquartered in France, Germany, Italy, Norway, Spain, Sweden, Switzerland, United Kingdom, United States and Japan during 2000-2012. The dataset contains data on the issuance and maturity dates, the nature of the instrument (MBA, ABS, plain vanilla, covered bonds,..), the coupon structure, the placement technique, the market of issuance, the issue rating, and the issuance yield and/or price. We aggregate the issues on the basis of the issuer parent and selected banks who represents the 80% of total deal value.

Table 1 shows the distribution of issues per year and per country.

(Table 1 here)

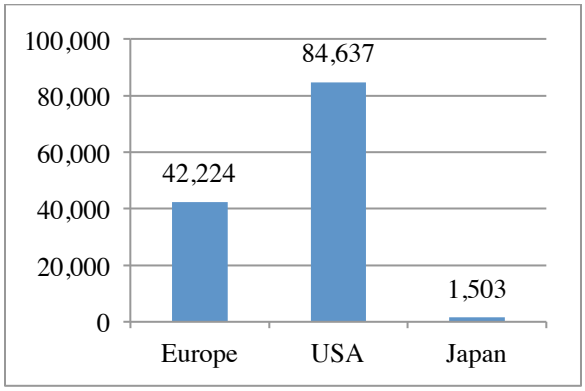
In this section we describe the main patterns of bank long-term funding considering three different areas: Europe (Italy, Spain, France, Germany, UK, Switzerland, Norway and Sweden), USA and Japan.

Issues are mainly concentrated in the US. During the subprime crises US banks reduced the use of long term funding instruments whereas European banks increased them. An opposite behaviour is observable during the sovereign crisis.

Figures below show that US banks' number of issues of long-term funding instruments doubles that of their European peers; whereas Japanese banks made a limited number of issues. Considering the trend from 2000 to 2012 we observe that US issues fell since the subprime crisis in favour of European issues. The reverse is true with the onset of the sovereign crisis.

By focusing the attention on European countries , we can note that most of the issues were made by German banks (32.17%), followed by UK banks (29.98%), Franch (13.37%) and Italian financial institutions (7.59%). The lower number of issues refers to banks of the Baltic Region (Norway and Sweden).

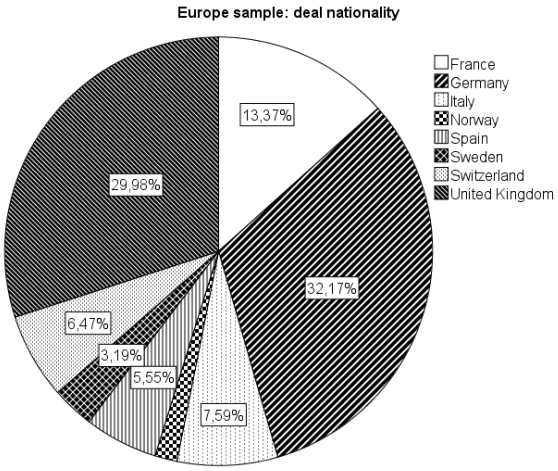
Total Issues (number) 2000-2012



Source: Dealogic database, own calculations

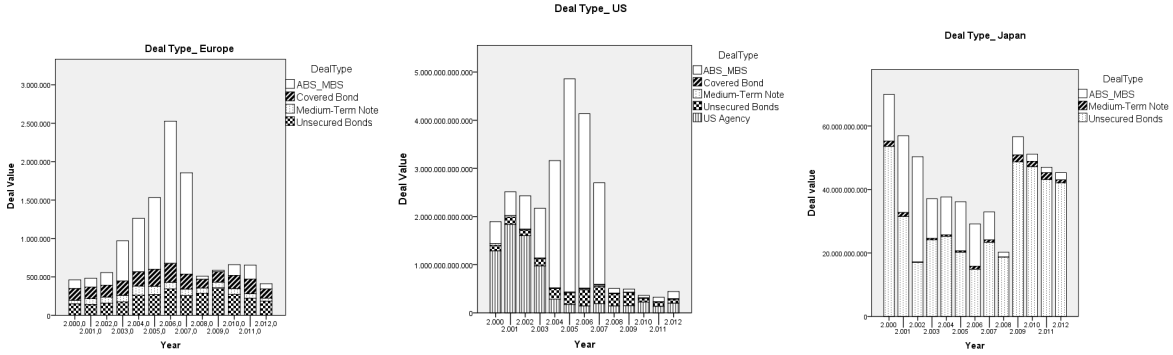
Issues distribution from 2000 to 2012

Source: Dealogic database, own calculations



Source: Dealogic database, own calculations

Since the subprime crisis the total deal value of issues decreased dramatically in Europe and in the US, whereas it increased in Japan



The trend in the total deal value shows that since the subprime crisis European and US banks reduced their use of long-term funding instruments. In particular, this was due to a strong resizing of securitisation activities (ABS/MBS). European banks witnessed a faster recovery than their US peers, in the form of issuance of covered bonds and medium term notes; however, in

2011 with the burst of the sovereign crisis, total deal values decreased to a level lower than in 2008.

For our purposes it is interesting analyze whether the use of this form of financing changed before and after the crises under investigation. Table 2 reports the mean average total deal value respectively for: a) the uneventful period (2000-2007), b) the subprime crisis (2008-2009) period and c) the sovereign crisis (2010-2012) period. During the two crises the mean value halved. In the US this contraction is much evident, with shrinkage of about 80% during the subprime crisis followed by a further reduction during the sovereign crisis. Japanese and European issues followed a similar pattern with respect to the subprime crisis period. However, the total deal value increased for Japanese banks during the sovereign crisis and remained fairly constant for European banks.

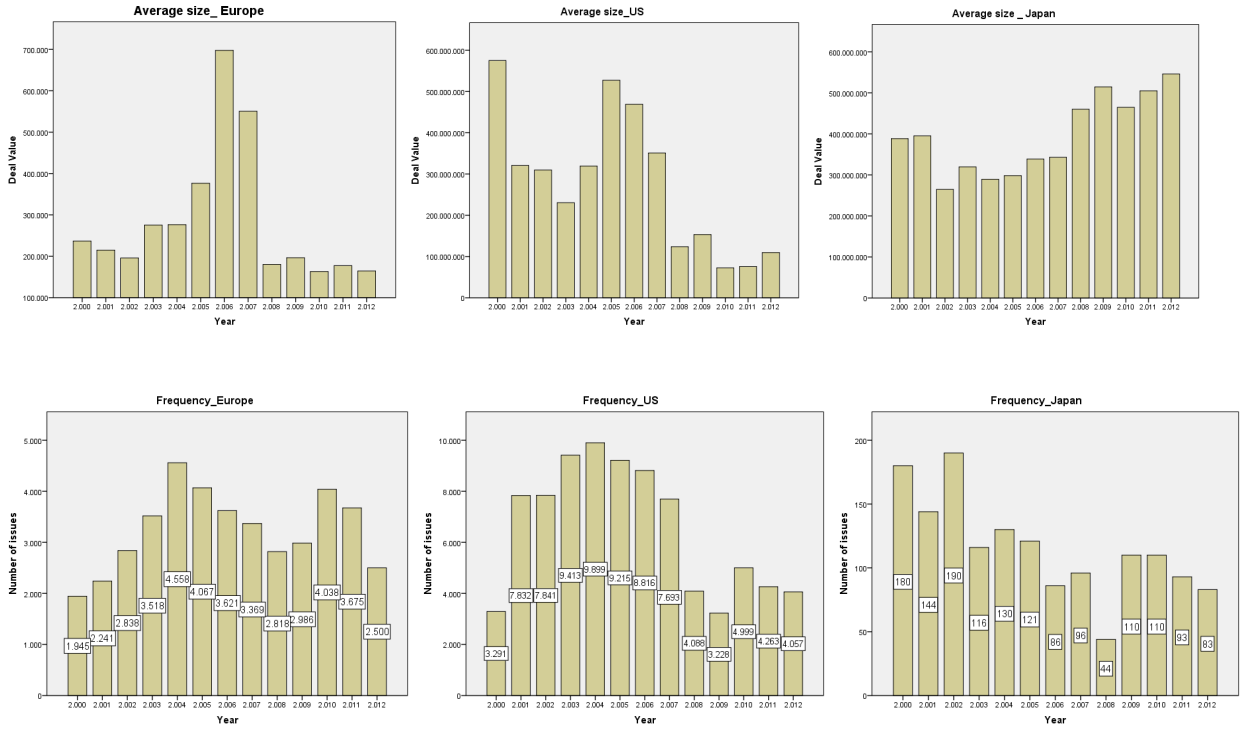
Norwegian, Swedish and French banks have increased the use of long term funding instruments during the crises. In France in particular, banks increased the use of unsecured bonds and covered bonds. In Norway, the increase of bond issuance was primarily driven by covered bonds with a contraction in unsecured issues. However, during the second phase of the crisis, such unsecured issues returned to rise. The growth of bonds issued by Swedish banks mainly refers to the increase in unsecured bond in both crises, while covered bonds were mainly used during the sovereign crisis. On the contrary, in Italy, Germany and Spain banks deeply reduced their use of long term funding instruments since 2007. ABS and MBS issues almost disappeared or faced a strong resizing, after 2007. In Italy during the subprime crisis, banks increased the issues of unsecured bond, whereas the use of this type of instrument decreased starting from 2010 and it has been, partially, substituted by the use of covered bonds. In Germany and Spain, the downtrend in bond issuance is very strong, for both unsecured and covered bonds. Finally,

British banks represent a third group, characterized by an initial decrease in the volume of issues (during the subprime crisis) followed by a subsequent increase during the sovereign crisis. Last but not least, Swiss issuers increased the total deal value during the subprime crisis (compared to uneventful period), and enjoyed a steady issue pattern during the sovereign crisis.

Insert here Table 2

The average size of issues dropped after the subprime crisis whereas the frequency of issues decreased during the subprime crisis and increased in the sovereign crisis)

The trend of the total deal value can be explained by two components: average size of the issue and the frequency of the issue. Table 3 displays the average size of the issue in the three periods under investigation, whilst Table 4 exhibits the average frequency of the issues. The average size of issues of US and European banks decreased during the two crises analyzed: a drop in the frequency of issues during the subprime crisis was followed by an increase during the sovereign crisis. Japanese banks, on the contrary, show a different behavior with a growing average size of the issues in the years of crisis reaching in 2012 a value of about 450 millions euro. In terms of frequency of issuance Japanese banks reacted differently to the two crises. During the first crisis the number of issuance decreased, and then increased during the second crisis.



Amongst European banking systems different patterns can be traced. As said before, Norwegian, Swedish and French banks increased the use of long term funding instruments, while also increasing the frequency of issues and the average size of deal value. On the contrary, the average size of issues for German and Spanish banks decreased during the two crises analyzed; however their behavior in terms of frequency of issues is different. In Germany the number of issues decreases steadily during both crises. Spanish banks faced a drop in the frequency of issuance in the first wave of the financial crisis; since then, frequency remained fairly constant.

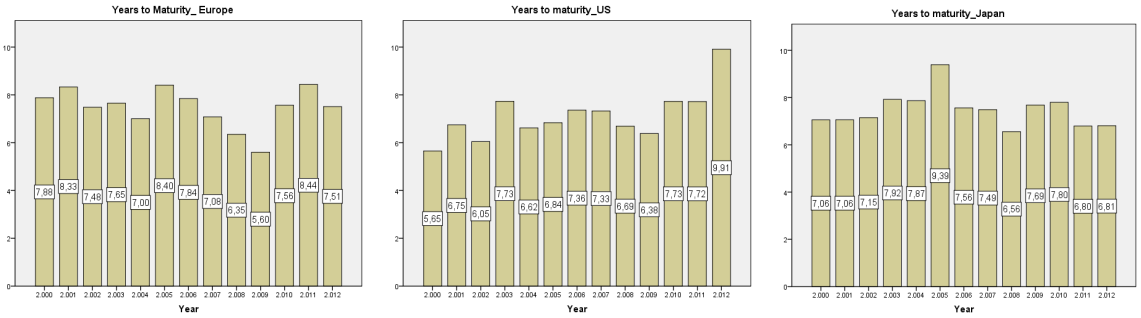
In Switzerland, during the subprime crisis banks issued bonds with an higher size and a lower frequency compared to the uneventful period. Finally, Italian banks maintained the average size of bond issuance fairly constant during the crises, with only a significant reduction in 2008. The sovereign crises changed the banks behavior: deal size decreased while deal frequency

increased.. In the UK, from an average size of more than 1 billion euro in 2007 we end up with value of about 250 million euro five years later. The size of issuance decreased dramatically during the two crises, while the number of issuances decreased during the first crisis and afterwards increased (with an average value higher than in the uneventful period).

Insert Tables 3 and 4 here

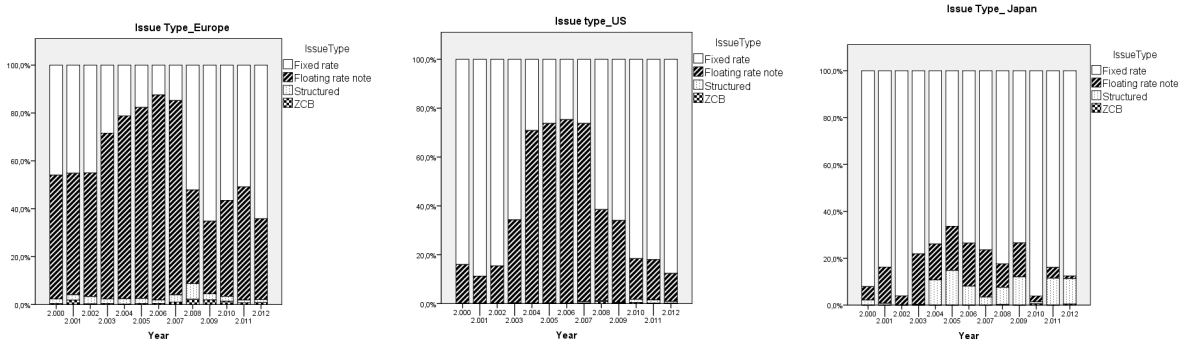
In Europe and the US, the maturity of long-term funding decreased during the subprime crisis and increased during the sovereign crisis.

The crises could affect banks' long term financing also in terms of maturity of the instruments issued. In Europe and USA we see a live contraction of the maturity during the subprime crisis and then a recovery during the sovereign crisis. On the contrary Japanese banks didn't' change the maturity of their long term funding instruments in the periods under investigation. In Italy starting from the subprime crisis, we notice a slight decline in average maturity compared to the previous period. In France and Germany average maturity remains constant in the period of observations, though French banks slightly increased the maturity of issuance during the sovereign crisis. In Spain, the average maturity is halved compared to the pre-crisis period. In Switzerland the average maturity of issuance decreased in the subprime crises period, increased since the sovereign crisis in 2010 and 2011 and then declined further. We observe a similar behavior in Sweden and Norway, whit a drop in 2008 compared to the previous years, and then a rise during the sovereign crisis. British banks reduced the maturity of their bond issuance during the subprime crisis and then recovered during the sovereign crisis



Since the onset of the two crises, US and European banks turned to fixed rate issues.

In this section we analyze, for each country, the different type of issue, divided in: Fixed rate, Floating Rate, Structured and zero coupon bond (ZCB). In general, we observe that in all countries analyzed, with the exception of Japan, the financial crises had an important effect on floating rate issues, which dramatically drop in favor of fixed rate issues.

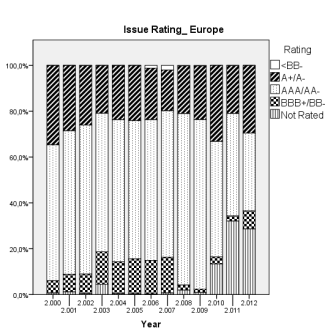


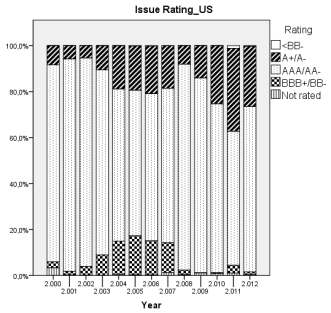
US and European issues seem to have a better quality (in term of ratings) than Japanese issues. The sovereign crisis, in Europe, had a strong impact on rating worsening.

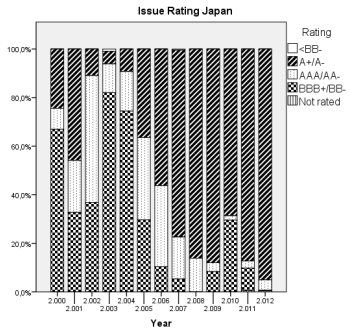
To analyze the issue rating we divide the rating considering the Basel categories: AAA/AA- (high credit quality); A+/A- (strong payment capacity), BBB/BB- (vulnerability); less than BB-

(Risky) an Not rated. In Europe during the subprime crisis the issues are mainly "high credit quality", with the sovereign crisis they become for over 30% Not rated and "Strong payment capacity". In US starting from the subprime crisis issues are in prevalence "high credit quality" or "strong payment capacity", and the percentage of "Risky issues decreases compared to uneventful period. In Japan after the subprime crisis there is an evident improvement of credit quality for new issue, they are mainly A+/A- and "high credit quality", the beginning of sovereign crisis increases the number of Risky issues.

In Italy the first crisis increases the number of "high credit quality" issues and determine a decrease of "vulnerable" issues, with the second crisis the percentage of "Not rated" and "Risky issue" increase dramatically. The deterioration of the credit rating in French issues is less evident than in Italy. During the crises there is a light decrease of "highest quality", an increase in "strong payment capacity" issues ad a very few increase in "Not rated". In Spain the strongest effect on the credit quality is evident during the sovereign crisis where the percentage of "Not rated" increased and the "high quality issue" downturn to "strong payment capacity". Also in Germany the effect of sovereign crisis is strong. We observe a reduction on the "high quality" issue, and an increase in the "strong payment capacity" and "Not rated" issues. In Switzerland we have a different impact during the two crises. Starting from the subprime crisis high quality issue are substituted by rating A+/A-. Whereas, during the sovereign crisis increase dramatically the number of "Not rated". In Norway, Sweden and UK the subprime crisis improve the rating of issue and the major part became high quality. With the sovereign crisis the situation change and we observe an increase also in the number of not rated issue.







In Europe the crisis didn't affect the choice of market where bonds are issued. In the US since the subprime crisis there is a strong turn from domestic markets to foreign and euro markets. The latter became a market of interest for Japanese banks since the sovereign crisis.

The presence of international tensions might also influence the type of market of issuance chosen by banks. American banks in the uneventful period concentrated the issues in domestic market, starting from the first crisis they address over the 50% of issues to foreign market.

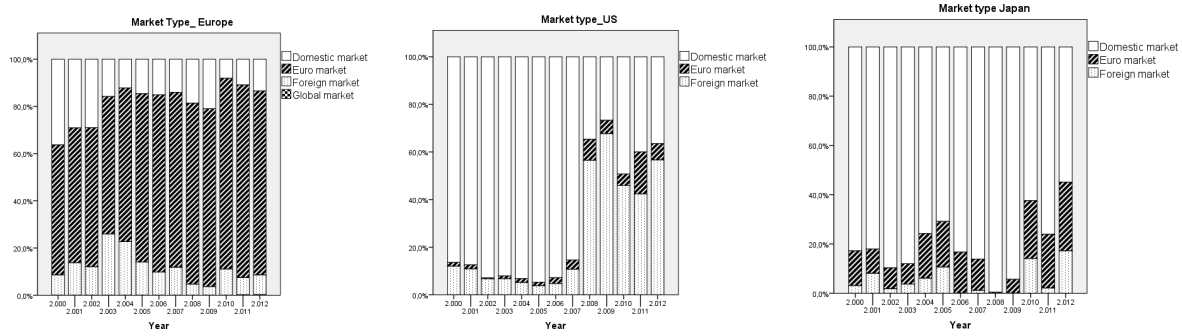
Historically, issues on domestic market have characterized Japan. Starting from the sovereign crisis Euro-market and foreign market issuance increase, representing about 40% of total issues.

In Europe the crisis seemed to not affect the choice of the market where to issue bonds, tough with some differences between countries.

In Italy and France, 90% of bonds were issued on the euro-market. This market has had a slight decrease during the subprime crisis and back to reach very significant value in sovereign crisis. In Spain during the subprime years there has been a reduction on euro-market issuance compared to the past in favor of domestic market. This trend has gradually deteriorated and during the sovereign crisis, the euro market represented the 80% of total issues. In Germany the two crises analyzed do not seem to cause changes in the choice of market of issuance. The issues are divided between domestic market and Euro-market with a slight prevalence of the latter. We

observe that the sovereign crisis also gave breath to the domestic market that recovers respect to foreign and euro-market.

In Sweden, issues on Euro-market outnumber others market and this feature is further exacerbated by the crises. In Norway the euro-market collect the 80% of total issue, while since the subprime crisis period we observe a slight increase in domestic market compared to pre crisis period. British banks show a stable access to euro-market, whereas after the crises a share of foreign market issues is substituted by domestic market.



4. The cost of bonds at issuance

Complementing the descriptive analysis above, an econometric exercise can provide additional insight into crises-related changes in bank debt issuance and issuance practices. In particular, we concentrate on the cost of bond at issuance, over the years 2006-2012. We consider both floating rate issues and fixed rate issues (and ZCB).

Considering the period of the analyses (2006-2012), we started with an initial set of 16,601 floating rate bonds by 1,916 of financial institutions pertaining to 70 bank holding companies (parents). Among these, we selected those with a rating or explicitedly “not rated”, ending up with 14,343 bond issues pertaining to 65 bank holding companies. Similarly, with regards to

fixed rate bonds (and ZCB), we started with 40,855 issues by 1,310 of financial institutions and pertaining to 68 bank holding companies and end up with 16,282 bond issues pertaining to 66 bank holding companies.[2]

The cost at issuance of bank bonds[3] is connected, in the first place, to the characteristics of the issue itself, namely: issuance maturity and size, rating and accompanying guarantees, either private – from the parent bank, for instance - or public – typically from the Sovereign -. The cost of bonds could also reflect the characteristics of the parent bank: size, rating, capital adequacy, interbank market exposure, systemic relevance or type of business model chosen for its intermediation activity. In particular we distinguish among OTD and OTH bank business models via a principal component analysis. Finally, the cost could be influenced by the strength and soundness of the sovereign (CGFS, 2012).

In order to evaluate the contribution of these variables during the years under investigation, we run an OLS regression, for each sample year.

Given that financial statement information is received by the market with a time lag, the parent bank's financial data refer to the year previous to the issue.

As said before, bank business models are evaluated via a principal component analysis which considers the typical ratios that are analyzed in the growing literature that, since the onset of the

[2] We have discarded the issues made by the US Federal Home Loan Bank, given the specificities of such a state-owned agency.

[3] As the risk-free component of the financing cost is to be eliminated, we followed two procedures according to whether the issue was a floating rate issue or a fixed rate issue. In the former case, the risk-free component is easily detectable since floating bonds are priced via a spread over a common benchmark (either the Libor or the Euribor): the market measure of the risk of debt issuance is simply the spread at issuance. In the case of fixed rate issues, on the contrary, the market measure of the risk of bank debt needs to be extrapolated from the bond yield at issuance. This was done subtracting from the value of the coupon the fixed rate of the asset swap contract with same maturity and currency. However, the variability induced by such procedure in our data refrained us from using such a cleaned variable. Therefore, we used the coupons and introduced country dummies (fixed effects) to take into consideration inhomogeneity in baseline risk-free assets.

subprime crisis, have studied the main characteristics of the OTD and OTH models in banking. In particular, we considered the following characteristics: risk (loan loss reserves over gross loans); profitability (ROA and ROE); liquidity (liquid assets over deposits; liquid assets over total borrowings); efficiency (Cost to income ratio); funding gap (loans over deposits; loans over total borrowings); relevance of traditional intermediation activity (loans over total assets; net inter margin over total operating income). We also considered bank funding patterns via the interbank ratio, which proved to be a third important component by itself and therefore it was considered as an explanatory variable in our regression.

Table 5 reports the results of the principal components analysis run for each year under examination. We indicate in bold variables more representative in each principal component and the relative sign.

Insert Table 5 here

The first component is clearly related to the "new" model of bank intermediation known as "originate-to-distribute" business model, characterized by a lower incidence of loans over total assets and a higher incidence of liquid assets, probably thanks to a securitization activity which also provides the needed liquidity and reduced the need to raise new deposits and/or new borrowings. The revenue structure of such a model is also characterized by a lower relevance of net interest margin over total operating income. The second component concerns bank profitability: it describes banks with higher ROA and ROE, higher efficiency and lower credit risk. The two latter ratios contribute to increase overall profitability.

Tables 6 and 7 report regression results for each year under study, separately considering floating and fixed rate instruments. Figures 1 to 4 explore the relationship between some variables of interest and the explanatory variable over the time span under investigation. It is clearly evident

that since the beginning of the subprime crisis the premium paid on longer maturities increased steadily with a pronounced effect on those issues in 2009, where also a reduction in maturities is also evident for floating issues, for which the series stops at 20 years, instead of 30 years. In more recent years (2012) the steepness of the yield curve is returning to values similar to the pre-crisis periods (2006).

As expected, the spread over AAA bonds increases as the issue rating decreases; this is particular evident for floating rate issues in those classes just below investment grade (from BB+ and B+) during the worst period of the subprime crisis (2008). Similarly in 2011, at the height of the sovereign debt crisis, bonds with rating in the area of BBB+ and BBB- where the most hit by an increase in the risk premium required by the market. For instance, a floating rate issue rated BBB in 2006 was paying 62 bps over AAA bond; in 2008 such a spread widened to 236 bps and to 359 in 2011. Such a likely relationship is less evident in fixed rate issues. In fact, its seems as if markets did not fully appreciate the evaluation of credit risk made by rating agencies and did not price the bonds accordingly to their rating class.

Similarly, when it comes to the rating of the parent bank, it seems that markets do not always consider it as relevant in influencing the cost of bonds. Issue rating *paribus*, it does not always hold true that the lower the rating of the parent, the higher the cost at issuance.

Country ratings do not influence the cost of floating rate bank bonds until 2011, when they start to exert a negative influence for those financial institutions headquartered in countries with sovereigns rated below AAA. In case of a sovereign rated AA+, it would cost the issuing bank a higher charge of 149 bps. We also found significant country-effects in the fixed rate bonds regressions starting from 2007. For instance, from 2008 till 2011 all European banks with the same rating of German banks faced higher long-term funding costs.

The dummy variable "guarantee" analyzes the effect of a specific contractualized support to the issue: in 2009 and 2011 such a support is significantly different from zero and can be measured in an average reduction in the issuance premium of around 78 and 27 bps respectively for floating rate issues. For fixed rate issues, it starts to be relevant in 2010 (especially if it is in the form of a public guarantee).

We now focus on two important characteristics of the parent bank: its size and systemic relevance. Too-big-to-fail banks are supposed to enjoy a lower cost of debt (implicit subsidy), given their special status. Such a result is confirmed by our data only during the period 2007-2009. In 2012, on the contrary, larger banks, measured by total assets, paid higher premiums with respect to their smaller peers. Starting from 2011, in fact, the positive effect of the implicit guarantee is limited to Sifis, i.e. those financial institutions that in 2011 the FSB recognized as systemically important after applying the criteria set out by the BCBS to detect such institutions.

Capital adequacy (both considering a measure of regulatory adequacy and the inverse of the leverage ratio) exerts its positive effects on the cost of borrowing only after 2011.

The interbank position does not seem to be informative for the pricing of bonds, apart from 2011 with two contrasting effects depending on whether the issue is floating or fixed rate.

Profitability is negatively associated with the premium paid on bonds: a higher profitability reduces the cost at issuance.

Finally, our measure of business model captures the effect of the different orientation of the bank towards the OTD business model. For fixed rate issues, it shows a negative sign for all the period under investigation apart from the years when such a model was under scrutiny and criticized. In fact in 2008 and 2009 banks with an OTD business model paid higher premiums on their long-term funding.

5. Conclusions

This paper analysed the development of bank long-term funding over the last 13 years in Europe, US and Japan. We collected information on banks' long-term debt issuance for the years 2000-2012. Our sample includes all bond issues by banks headquartered in Europe, United States and Japan.

We document the impact of the subprime crisis and the subsequent sovereign crisis on the volume, frequency, nature of instrument and cost of bank debt issuance practices.

In particular, systemic crises (subprime, sovereign crisis) deeply impacted on the cost and availability of bank long-term funding, with different effects depending on the issue's main features and the issuing bank main business model characteristics. The macro conditions of the country in which banks operate starts to become relevant since 2011, at the onset of the EU sovereign debt crisis, though differences among nationalities are appreciated by the market even before. Indeed, markets did not fully appreciate the evaluation of credit risk made by rating agencies and did not price the bonds accordingly to their rating class.

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Table 1 _ Issues distribution (country and year)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total issues
Europe	1,945	2,241	2,838	3,518	4,558	4,067	3,621	3,369	2,818	2,986	4,038	3,675	2,500	42,224
France	126	179	336	374	517	466	569	589	520	428	518	575	440	5,637
Italy	264	204	277	177	217	241	301	363	451	292	179	153	82	3,201
Germany	1,051	1,277	1,243	1,355	1,579	1,517	982	947	729	962	859	622	494	13,617
Spain	96	82	133	181	179	267	413	359	120	127	181	141	63	2,342
Switzerland	55	71	100	89	311	190	140	83	116	89	663	533	290	2,730
Norway	12	33	43	47	29	45	73	63	77	29	92	76	89	708
Sweden	50	62	67	90	80	95	62	57	88	156	153	194	193	1,347
UK	291	383	639	1,205	1,646	1,246	1,081	908	717	903	1,393	1,381	849	12,642
USA	3,291	7,832	7,841	9,413	9,899	9,215	8,816	7,693	4,088	3,228	4,999	4,263	4,057	84,635
Japan	180	144	190	116	130	121	86	96	44	110	110	93	83	1,503
														128,362

Source: Dealogic database, own calculations

Table 2 The annual average of total deal value

	Uneventful period	Subprime crisis	Sovereign crisis
Europe	€ 1,205,019,399,013.14	€ 547,226,065,753.50	€ 573,911,078,310.68
France	€ 58,576,521,245.75	€ 98,941,292,775.00	€ 102,033,440,933.67
Italy	€ 81,641,737,765.38	€ 71,794,122,101.00	€ 44,380,995,594.67
Germany	€ 202,422,889,779.13	€ 91,157,582,622.00	€ 56,420,397,889.67
Spain	€ 175,920,113,563.75	€ 48,484,494,780.50	€ 43,901,256,787.00
Switzerland	€ 24,801,543,082.00	€ 32,197,309,025.00	€ 32,194,456,478.67
Norway	€ 6,175,703,275.25	€ 13,814,049,970.50	€ 20,554,869,211.33
Sweden	€ 13,351,685,485.50	€ 38,055,640,947.00	€ 49,420,215,482.00
UK	€ 642,129,204,816.38	€ 152,781,573,532.50	€ 225,005,445,933.67
USA	€ 2,981,937,003,841.88	€ 499,803,531,271.00	€ 376,182,275,510.33
Japan	€ 43,748,959,968.38	€ 38,420,441,361.50	€ 47,803,136,556.33

Source: Dealogic database, own calculations

Table 3 The Average size of issuance

	Uneventful period	Subprime crisis	Sovereign crisis
Europe	€ 368,549,726.3	€ 188,568,596.1	€ 168,582,515.9
France	€ 144,797,399.34	€ 205,454,765.77	€ 200,513,569.62
Italy	€ 317,943,897.99	€ 207,342,694.88	€ 316,526,928.30
Germany	€ 166,236,256.24	€ 108,502,477.68	€ 87,012,492.51
Spain	€ 712,490,904.63	€ 389,621,969.94	€ 354,250,510.26
Switzerland	€ 234,166,446.01	€ 307,598,147.03	€ 68,959,226.88
Norway	€ 144,549,140.87	€ 288,217,460.91	€ 241,115,630.21
Sweden	€ 195,023,898.80	€ 320,412,903.02	€ 273,197,377.10
UK	€ 629,354,201.37	€ 185,430,004.84	€ 180,125,852.56
USA	€ 387,800,531.08	€ 138,375,543.64	€ 85,845,478.55
Japan	€ 329,682,833.22	€ 487,276,709.73	€ 505,264,451.59

Source: Dealogic database, own calculations

Table 4 The mean value of frequency

	Uneventful period	Subprime crisis	Sovereign crisis
Europe	3269.63	2902.00	3404.33
France	394.50	474.00	511.00
Italy	255.50	371.50	138.00
Germany	1243.88	845.50	658.33
Spain	213.75	123.50	128.33
Switzerland	129.88	102.50	495.33
Norway	43.13	53.00	85.67
Sweden	70.38	122.00	180.00
UK	924.88	810.00	1207.67
USA	8000.00	3658.00	4439.67
Japan	132.88	77.00	95.33

Table 5 Principal component analysis

	Comp.1 (Business Model)	**Comp.2 (Profitability)**
Loan Loss Reserves/Gross Loans	0.096	**-0.231**
Return On Average Assets (ROA)	-0.187	**0.830**
Return On Average Equity (ROE)	-0.202	**0.838**
Cost To Income Ratio	0.482	**-0.856**
Net Loans / Tot Assets	**-0.971**	0.367
Net Loans/Deposits and Short Term Funding	**-0.831**	0.016
Net Loans / Total Deposits and Borrowing	**-0.938**	0.384
Liquid Assets/ Deposits and Short Term Funding	**0.794**	-0.465
Liquid Assets/Total Deposits and Borrowing	**0.853**	-0.234
Net Interest Income / Operating Income	**-0.384**	-0.082

Table 6 OLS regression results for floating rate instruments

	2006				2007			
	Estimate	Std. Error	t value	Pr(>|t|)	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	61.223	92.970	0.659	0.511	-315.700	93.890	-3.362	0.001 ***
SPratingIssueAA+					-7.341	25.380	-0.289	0.772
SPratingIssueAA	24.230	5.328	4.548	0.000 ***	22.360	5.402	4.139	0.000 ***
SPratingIssueAA-	6.376	6.458	0.987	0.324	10.440	8.175	1.277	0.202
SPratingIssueA+	-0.007	7.497	-0.001	0.999	18.220	7.340	2.483	0.013 *
SPratingIssueA	21.031	5.074	4.145	0.000 ***	32.870	6.457	5.091	0.000 ***
SPratingIssueA-	50.250	13.187	3.811	0.000 ***	33.980	14.940	2.275	0.023 *
SPratingIssueBBB+	23.773	21.421	1.110	0.268	39.220	21.910	1.790	0.074 .
SPratingIssueBBB	62.095	6.364	9.758	< 2e-16 ***	72.120	6.600	10.927	< 2e-16 ***
SPratingIssueBBB-	79.122	12.435	6.363	0.000 ***	105.100	13.030	8.070	0.000 ***
SPratingIssueBB+					249.300	30.840	8.085	0.000 ***
SPratingIssueBB	272.789	9.428	28.934	< 2e-16 ***	305.100	11.320	26.958	< 2e-16 ***
SPratingIssueBB-	257.752	18.463	13.961	< 2e-16 ***	310.900	25.330	12.275	< 2e-16 ***
SPratingIssueB	546.277	18.180	30.048	< 2e-16 ***	489.700	22.000	22.258	< 2e-16 ***
SPratingIssueB-					647.000	43.400	14.908	< 2e-16 ***
SPratingIssueCC					351.900	43.540	8.083	0.000 ***
SPratingIssueCCC-					229.400	30.960	7.409	0.000 ***
SPratingIssueNot rated					116.800	25.140	4.645	0.000 ***
Rating.parentAA	-59.265	12.386	-4.785	0.000 ***	-4.386	8.181	-0.536	0.592
Rating.parentAA-	-44.193	12.244	-3.609	0.000 ***	-2.064	6.952	-0.297	0.767
Rating.parentA+	-40.617	13.199	-3.077	0.002 **	-18.070	10.850	-1.666	0.096 .
Rating.parentA	-41.292	14.731	-2.803	0.005 **	14.090	9.981	1.411	0.159
Rating.parentA-	-50.250	12.107	-4.150	0.000 ***	7.100	13.660	0.520	0.603

Rating.parentBBB+								
Rating.parentBBB-								
Rating.parentB+								
country.ratingAA+								
country.ratingAA								
country.ratingAA-	-24.203	21.926	-1.104	0.270	-14.180	19.660	-0.721	0.471
country.ratingA+					31.830	11.760	2.706	0.007 **
country.ratingA								
country.ratingBBB+								
YearsToMaturity	0.769	0.392	1.962	0.050 .	2.427	0.522	4.653	0.000 ***
YearsToMaturity2	-0.012	0.006	-1.926	0.055 .	-0.042	0.009	-4.468	0.000 ***
GuarantTRUE	-3.230	7.843	-0.412	0.681	10.640	6.866	1.549	0.122
PubGuarantTRUE	-5.788	20.052	-0.289	0.773	-5.340	31.960	-0.167	0.867
Sifi	9.201	13.778	0.668	0.505	-47.230	10.970	-4.306	0.000 ***
lag.Log.TA	1.250	3.922	0.319	0.750	14.620	4.605	3.175	0.002 **
lag.Total.Capital.Ratio...	-3.096	3.690	-0.839	0.402	6.403	1.603	3.994	0.000 ***
lag.Equity...Tot.Assets...	-0.821	1.891	-0.434	0.665	-2.239	2.090	-1.071	0.284
lag.Interbank.Ratio...	-0.008	0.043	-0.186	0.852	0.008	0.041	0.184	0.854
Business.Model	0.060	0.097	0.614	0.540	0.120	0.049	2.432	0.015 *
Profitability	-0.037	0.842	-0.044	0.965	0.783	0.488	1.604	0.109

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 35.68 on 511 degrees of freedom
(3867 observations deleted due to missingness)
Multiple R-squared: 0.8063, Adjusted R-squared: 0.7957
F-statistic: 75.99 on 28 and 511 DF, p-value: < 2.2e-16

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 42.92 on 644 degrees of freedom
(1577 observations deleted due to missingness)
Multiple R-squared: 0.761, Adjusted R-squared: 0.748
F-statistic: 58.58 on 35 and 644 DF, p-value: < 2.2e-16

	2008				2009			
	Estimate	Std. Error	t value	Pr(>|t|)	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	271.924	232.404	1.170	0.243	-430.467	202.608	-2.125	0.034 *
SPratingIssueAA+	-4.593	31.955	-0.144	0.886	-13.191	36.931	-0.357	0.721
SPratingIssueAA	-14.228	16.229	-0.877	0.381	5.049	25.869	0.195	0.845
SPratingIssueAA-	13.420	15.577	0.862	0.389	0.026	19.377	0.001	0.999
SPratingIssueA+	-0.194	20.289	-0.010	0.992	29.232	17.224	1.697	0.090 .
SPratingIssueA	134.054	18.890	7.097	0.000 ***	43.003	17.891	2.404	0.017 *
SPratingIssueA-	102.966	50.100	2.055	0.040 *	80.121	34.301	2.336	0.020 *
SPratingIssueBBB+	689.179	94.972	7.257	0.000 ***	121.014	95.824	1.263	0.207
SPratingIssueBBB	235.216	33.374	7.048	0.000 ***				
SPratingIssueBBB-								
SPratingIssueBB+	1039.179	94.972	10.942	< 2e-16 ***				
SPratingIssueBB	159.617	67.731	2.357	0.019 *				
SPratingIssueBB-	95.235	95.200	1.000	0.318				
SPratingIssueB								
SPratingIssueB-								
SPratingIssueCC								
SPratingIssueCCC-	334.036	96.901	3.447	0.001 ***				
SPratingIssueNot rated	871.391	95.284	9.145	< 2e-16 ***	363.660	44.142	8.238	0.000 ***
Rating.parentAA	75.593	20.603	3.669	0.000 ***	96.675	64.986	1.488	0.138
Rating.parentAA-	50.566	21.659	2.335	0.020 *	11.976	62.639	0.191	0.848
Rating.parentA+	19.949	22.798	0.875	0.382	9.517	63.120	0.151	0.880
Rating.parentA	-68.508	26.868	-2.550	0.011 *	-48.607	63.866	-0.761	0.447
Rating.parentA-					-119.938	71.334	-1.681	0.093 .
Rating.parentBBB+					-193.530	111.511	-1.736	0.083 .
Rating.parentBBB-								
Rating.parentB+								
country.ratingAA+					-35.167	31.915	-1.102	0.271

country.ratingAA									
country.ratingAA-	-76.699	69.358	-1.106	0.269		74.211	61.717	1.202	0.230
country.ratingA+	-27.923	19.009	-1.469	0.143		12.402	26.158	0.474	0.636
country.ratingA									
country.ratingBBB+									
YearsToMaturity	3.548	1.815	1.954	0.051	.	14.967	2.584	5.792	0.000	***
YearsToMaturity2	-0.074	0.045	-1.638	0.102		-0.218	0.066	-3.321	0.001	***
GuarantTRUE	18.625	13.188	1.412	0.159		-78.722	14.982	-5.254	0.000	***
PubGuarantTRUE	-12.601	25.604	-0.492	0.623		55.373	20.375	2.718	0.007	**
Sifi	43.452	16.754	2.594	0.010	**	-26.255	20.484	-1.282	0.201	
lag.Log.TA	-17.637	10.077	-1.750	0.081	.	15.496	9.532	1.626	0.105	
lag.Total.Capital.Ratio...	4.714	4.252	1.109	0.268		7.550	4.492	1.681	0.094	.
lag.Equity...Tot.Assets...	-0.116	3.052	-0.038	0.970		1.779	3.212	0.554	0.580	
lag.Interbank.Ratio...	-0.025	0.085	-0.293	0.770		0.184	0.156	1.182	0.238	
Business.Model	-0.200	0.220	-0.909	0.364		-0.336	0.271	-1.241	0.215	
Profitability	-0.654	1.144	-0.572	0.568		-0.920	0.401	-2.295	0.022	*

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 91.3 on 432 degrees of freedom
(162 observations deleted due to missingness)
Multiple R-squared: 0.532, Adjusted R-squared: 0.4995
F-statistic: 16.37 on 30 and 432 DF, p-value: < 2.2e-16

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 83.56 on 420 degrees of freedom
(64 observations deleted due to missingness)
Multiple R-squared: 0.4402, Adjusted R-squared: 0.4029
F-statistic: 11.8 on 28 and 420 DF, p-value: < 2.2e-16

	2010				2011			
	Estimate	Std. Error	t value	Pr(>|t|)	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	65.931	183.103	0.360	0.719	74.840	140.900	0.531	0.595
SPratingIssueAA+	10.743	70.024	0.153	0.878	-116.600	70.450	-1.655	0.098 .
SPratingIssueAA	22.132	23.530	0.941	0.347	45.700	16.950	2.696	0.007 **
SPratingIssueAA-	-0.549	17.748	-0.031	0.975	22.750	12.720	1.788	0.074 .
SPratingIssueA+	29.419	14.740	1.996	0.046 *	39.460	10.420	3.788	0.000 ***
SPratingIssueA	-39.524	17.601	-2.245	0.025 *	69.640	12.190	5.713	0.000 ***
SPratingIssueA-	-43.897	38.516	-1.140	0.255	-24.640	45.490	-0.542	0.588
SPratingIssueBBB+	-39.374	33.084	-1.190	0.234	41.210	20.080	2.052	0.040 *
SPratingIssueBBB	-79.754	84.342	-0.946	0.345	359.200	75.620	4.750	0.000 ***
SPratingIssueBBB-					234.100	51.710	4.527	0.000 ***
SPratingIssueBB+								
SPratingIssueBB					228.100	74.020	3.081	0.002 **
SPratingIssueBB-								
SPratingIssueB								
SPratingIssueB-								
SPratingIssueCC								
SPratingIssueCCC-								
SPratingIssueNot rated	30.654	15.222	2.014	0.044 *	10.480	9.411	1.114	0.266
Rating.parentAA								
Rating.parentAA-	16.116	23.295	0.692	0.489	-7.935	16.960	-0.468	0.640
Rating.parentA+	15.824	25.383	0.623	0.533	8.934	16.110	0.554	0.579
Rating.parentA	85.058	27.218	3.125	0.002 **	2.267	18.070	0.125	0.900
Rating.parentA-	37.839	35.429	1.068	0.286	-34.410	24.940	-1.380	0.168
Rating.parentBBB+	184.330	55.085	3.346	0.001 ***	-17.000	33.220	-0.512	0.609
Rating.parentBBB-					34.870	74.430	0.468	0.640

Rating.parentB+								
country.ratingAA+					149.100	26.110	5.710	0.000 ***
country.ratingAA	-17.277	22.842	-0.756	0.450	8.091	50.540	0.160	0.873
country.ratingAA-	41.050	28.687	1.431	0.153	49.430	24.000	2.059	0.040 *
country.ratingA+	28.491	21.450	1.328	0.185	23.710	15.870	1.494	0.135
country.ratingA					138.100	24.350	5.673	0.000 ***
country.ratingBBB+								
YearsToMaturity	2.300	1.322	1.740	0.082 .	6.804	1.108	6.141	0.000 ***
YearsToMaturity2	-0.022	0.026	-0.857	0.392	-0.098	0.026	-3.735	0.000 ***
GuarantTRUE	-10.842	13.705	-0.791	0.429	-27.210	12.930	-2.105	0.036 *
PubGuarantTRUE	-0.647	70.628	-0.009	0.993				
Sifi	-21.888	15.518	-1.410	0.159	-27.550	12.870	-2.141	0.033 *
lag.Log.TA	4.314	8.497	0.508	0.612	5.756	6.487	0.887	0.375
lag.Total.Capital.Ratio...	-1.529	2.211	-0.692	0.489	-8.059	1.249	-6.453	0.000 ***
lag.Equity...Tot.Assets...	-5.775	2.866	-2.015	0.044 *	-0.006	2.256	-0.003	0.998
lag.Interbank.Ratio...	0.018	0.072	0.243	0.808	-0.251	0.077	-3.281	0.001 **
Business.Model	0.069	0.163	0.426	0.670	0.300	0.117	2.557	0.011 *
Profitability	2.350	0.768	3.059	0.002 **	-0.034	0.751	-0.045	0.964

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 82.1 on 757 degrees of freedom
(116 observations deleted due to missingness)
Multiple R-squared: 0.1213, Adjusted R-squared: 0.08879
F-statistic: 3.732 on 28 and 757 DF, p-value: 6.015e-10

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 69.46 on 805 degrees of freedom
(118 observations deleted due to missingness)
Multiple R-squared: 0.3846, Adjusted R-squared: 0.3602
F-statistic: 15.72 on 32 and 805 DF, p-value: < 2.2e-16

	2012			
	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	-567.331	264.0368	-2.149	0.032206 *
SPratingIssueAA+				
SPratingIssueAA	151.729	69.74728	2.175	0.030132 *
SPratingIssueAA-	48.85356	23.39584	2.088	0.037362 *
SPratingIssueA+	97.71107	20.45958	4.776	2.44E-06 ***
SPratingIssueA	66.67776	18.46168	3.612	0.000339 ***
SPratingIssueA-	23.03985	39.41466	0.585	0.55915
SPratingIssueBBB+	126.0713	28.37541	4.443	1.12E-05 ***
SPratingIssueBBB				
SPratingIssueBBB-	223.8375	96.89795	2.31	0.021349 *
SPratingIssueBB+	223.8375	96.89795	2.31	0.021349 *
SPratingIssueBB				
SPratingIssueBB-				
SPratingIssueB				
SPratingIssueB-				
SPratingIssueCC				
SPratingIssueCCC-				
SPratingIssueNot rated	28.56369	15.4299	1.851	0.064813 .
Rating.parentAA				
Rating.parentAA-	-145.207	36.05229	-4.028	6.64E-05 ***
Rating.parentA+	-153.508	32.23782	-4.762	2.61E-06 ***
Rating.parentA	-179.084	31.72937	-5.644	2.98E-08 ***
Rating.parentA-	-117.568	43.31443	-2.714	0.006903 **
Rating.parentBBB+	-70.472	39.15875	-1.8	0.072603 .
Rating.parentBBB-	-175.896	80.47811	-2.186	0.029369 *
Rating.parentB+	-170.848	64.44402	-2.651	0.008313 **

country.ratingAA+	57.77158	15.5574	3.713	0.000231 ***
country.ratingAA				
country.ratingAA-	-12.4186	52.87626	-0.235	0.814425
country.ratingA+				
country.ratingA	100.487	99.34082	1.012	0.312316
country.ratingBBB+	-71.0352	43.6008	-1.629	0.103984
YearsToMaturity	7.84076	2.2615	3.467	0.000578 ***
YearsToMaturity2	-0.11639	0.05037	-2.311	0.021316 *
GuarantTRUE	15.48833	31.24662	0.496	0.620368
PubGuarantTRUE				
Sifi	5.53196	19.73853	0.28	0.779409
lag.Log.TA	25.21618	12.09171	2.085	0.037609 *
lag.Total.Capital.Ratio...	0.64831	3.11519	0.208	0.835238
lag.Equity...Tot.Assets...	5.19945	5.36084	0.97	0.332633
lag.Interbank.Ratio...	0.16346	0.13999	1.168	0.243566
Business.Model	-0.761	0.24271	-3.135	0.001831 **
Profitability	-3.63615	1.24648	-2.917	0.003714 **

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 93.07 on 439 degrees of freedom
(114 observations deleted due to missingness)
Multiple R-squared: 0.3126, Adjusted R-squared: 0.2656
F-statistic: 6.654 on 30 and 439 DF, p-value: < 2.2e-16

Table 7 OLS regression results for fixed rate instruments

2006

	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	3.563982	22.631910	0.157	0.87496	
DealNationalityGermany	-2.406806	3.600579	-0.668	0.50426	
DealNationalityItaly	3.279085	6.175301	0.531	0.59574	
DealNationalitySpain	-2.855720	1.702396	-1.677	0.09429	.
DealNationalitySweden	0.935183	2.765065	0.338	0.73539	
DealNationalitySwitzerland	-3.201024	4.402164	-0.727	0.46759	
DealNationalityUnited Kingdom	-1.152097	0.843754	-1.365	0.17294	
SPRatingIssueAA+	NA	NA	NA	NA	
SPRatingIssueAA	-0.009705	1.124818	-0.009	0.99312	
SPRatingIssueAA-	-0.956185	1.124595	-0.850	0.39573	
SPRatingIssueA+	-0.665485	1.131634	-0.588	0.55684	
SPRatingIssueA	-0.719844	1.271403	-0.566	0.57161	
SPRatingIssueA-	-0.214745	0.969493	-0.222	0.82482	
SPRatingIssueBBB	0.527218	2.007861	0.263	0.79302	
SPRatingIssueBB-	35.897967	7.051870	5.091	5.68e-07	***
SPRatingIssueB	4.963453	1.580084	3.141	0.00182	**
SPRatingIssueNot rated	-1.590868	1.915936	-0.830	0.40688	
Rating.ParentAA	-0.051305	1.406496	-0.036	0.97092	
Rating.ParentAA-	-0.509809	1.336856	-0.381	0.70316	
Rating.ParentA+	-0.156169	1.476484	-0.106	0.91582	
Rating.ParentA	-0.566216	3.009458	-0.188	0.85087	
Rating.ParentA-	NA	NA	NA	NA	
Rating.ParentNot rated	NA	NA	NA	NA	
Country.RatingA+	NA	NA	NA	NA	
CouponFrequencyQuarterly	4.326061	0.944847	4.579	6.39e-06	***
CouponFrequencySemi-annual	1.723343	0.915786	1.882	0.06064	.
CouponFrequencyAnnual	1.859747	0.919523	2.023	0.04384	*
CouponFrequencyOther	-0.762852	0.887111	-0.860	0.39038	
DealTypeUnsecured Bonds	-0.753784	0.423669	-1.779	0.07603	.

```
DealTypeCovered Bond          -0.393526   0.951885  -0.413  0.67954
DealTypeABS_MBS               -0.693636   1.325104  -0.523  0.60097
YearsToMaturity                0.259864   0.049346   5.266 2.36e-07 ***
YearsToMaturity2              -0.009248   0.001703  -5.430 1.02e-07 ***
Guarantee                     -0.681460   0.318701  -2.138  0.03315 *
PubGuarantee                       NA         NA      NA       NA
I(log(DealValueEuroFace))      0.074308   0.073183   1.015  0.31058
SIFI                           5.152008   4.395355   1.172  0.24189
LOGTA                         -2.054626   3.863704  -0.532  0.59520
Total.Capital.Ratio...         0.682219   1.501979   0.454  0.64994
Equity...Tot.Assets...         0.557055   0.466832   1.193  0.23353
Interbank.Ratio...             0.018414   0.008469   2.174  0.03031 *
Business.Model                       NA         NA      NA       NA
Profitability                        NA         NA      NA       NA
---
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1


Residual standard error: 1.486 on 372 degrees of freedom
  (1374 observations deleted due to missingness)
Multiple R-squared:  0.7004,      Adjusted R-squared:  0.6722
F-statistic: 24.85 on 35 and 372 DF,  p-value: < 2.2e-16


2007

                              Estimate Std. Error t value Pr(>|t|)
(Intercept)                  3.0200840  4.4254473   0.682  0.49522
DealNationalityGermany       0.8669215  0.6013071   1.442  0.14989
DealNationalityItaly         0.2105441  0.5768067   0.365  0.71522
DealNationalitySpain         0.2780788  0.6883273   0.404  0.68636
DealNationalitySweden        0.3151877  0.8151080   0.387  0.69913
DealNationalitySwitzerland   0.6936421  0.9545939   0.727  0.46773
DealNationalityUnited Kingdom  0.2562284  0.7041894   0.364  0.71609
```

SPRatingIssueAA+	0.1685965	0.7882664	0.214	0.83071	
SPRatingIssueAA	0.1245703	0.5045437	0.247	0.80507	
SPRatingIssueAA-	0.3188992	0.5158826	0.618	0.53670	
SPRatingIssueA+	0.6281494	0.5527986	1.136	0.25627	
SPRatingIssueA	0.5897336	0.5298268	1.113	0.26611	
SPRatingIssueA-	0.5871511	0.7566693	0.776	0.43807	
SPRatingIssueB	5.0732960	1.0158739	4.994	7.72e-07	***
SPRatingIssueCCC-	1.1492704	1.9130383	0.601	0.54822	
SPRatingIssueNot rated	2.1920133	1.6200838	1.353	0.17655	
Rating.ParentAA	0.1885580	0.5333107	0.354	0.72379	
Rating.ParentAA-	0.0092988	0.5921079	0.016	0.98748	
Rating.ParentA+	-1.1472291	0.7821528	-1.467	0.14295	
Rating.ParentA	-1.4339072	0.8770703	-1.635	0.10259	
Rating.ParentA-	-1.3281994	1.0267871	-1.294	0.19631	
Rating.ParentNot rated	0.5780599	0.6627577	0.872	0.38344	
Country.RatingA+	NA	NA	NA	NA	
CouponFrequencyQuarterly	1.0609484	0.3754910	2.825	0.00487	**
CouponFrequencySemi-annual	-0.5805320	0.3595592	-1.615	0.10692	
CouponFrequencyAnnual	-0.6483598	0.3807834	-1.703	0.08913	.
CouponFrequencyOther	-5.1586176	0.3797605	-13.584	< 2e-16	***
DealTypeUnsecured Bonds	0.1899562	0.1980232	0.959	0.33780	
DealTypeCovered Bond	0.8394295	0.5313778	1.580	0.11469	
DealTypeABS_MBS	-0.3784219	1.1196587	-0.338	0.73549	
YearsToMaturity	0.2252533	0.0252409	8.924	< 2e-16	***
YearsToMaturity2	-0.0063781	0.0007666	-8.320	5.69e-16	***
Guarantee	-0.2280077	0.2125836	-1.073	0.28389	
PubGuarantee	NA	NA	NA	NA	
I(log(DealValueEuroFace))	-0.0743036	0.0502053	-1.480	0.13939	
SIFI	0.1423275	0.4617273	0.308	0.75800	
LOGTA	0.4137197	0.4713767	0.878	0.38046	
Total.Capital.Ratio...	-0.2172649	0.1497383	-1.451	0.14730	
Equity...Tot.Assets...	0.0971584	0.1456038	0.667	0.50484	
Interbank.Ratio...	0.0003991	0.0021459	0.186	0.85253	
Business.Model	-0.0025893	0.0058215	-0.445	0.65664	
Profitability	-0.0103462	0.0293693	-0.352	0.72475	

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Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1


Residual standard error: 1.371 on 614 degrees of freedom
  (1194 observations deleted due to missingness)
Multiple R-squared:  0.788,      Adjusted R-squared:  0.7745
F-statistic: 58.51 on 39 and 614 DF,  p-value: < 2.2e-16
```

2008

	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	−1.250e+01	4.851e+00	−2.576	0.01011	*
DealNationalityGermany	3.341e−02	7.391e−01	0.045	0.96396	
DealNationalityItaly	−5.580e−01	6.015e−01	−0.928	0.35375	
DealNationalityJapan	−3.176e+00	1.370e+00	−2.318	0.02064	*
DealNationalitySpain	−3.945e−01	1.006e+00	−0.392	0.69492	
DealNationalitySweden	1.235e+00	1.052e+00	1.174	0.24078	
DealNationalitySwitzerland	−1.257e+00	7.000e−01	−1.795	0.07286	.
DealNationalityUnited Kingdom	1.508e−01	9.143e−01	0.165	0.86903	
DealNationalityUnited States	−5.019e−01	4.465e−01	−1.124	0.26123	
SPRatingIssueAA+	−8.232e−01	8.173e−01	−1.007	0.31401	
SPRatingIssueAA	−4.637e−01	5.326e−01	−0.871	0.38412	
SPRatingIssueAA−	−1.193e−01	5.212e−01	−0.229	0.81893	
SPRatingIssueA+	−1.362e−01	5.120e−01	−0.266	0.79037	
SPRatingIssueA	−4.137e−01	5.091e−01	−0.813	0.41662	
SPRatingIssueA−	2.620e−01	9.925e−01	0.264	0.79181	
SPRatingIssueBBB+	−2.457e+00	1.805e+00	−1.361	0.17374	
Rating.ParentAA	1.948e−02	6.232e−01	0.031	0.97507	
Rating.ParentAA−	−2.613e−01	5.904e−01	−0.442	0.65821	
Rating.ParentA+	−6.286e−01	6.372e−01	−0.986	0.32409	
Rating.ParentA	−4.319e−01	6.984e−01	−0.618	0.53644	
Rating.ParentA−	1.493e+00	7.715e−01	1.935	0.05327	.
Rating.ParentBBB+	7.772e−01	1.801e+00	0.432	0.66613	

```
Country.RatingAA                    NA         NA      NA       NA
Country.RatingA+                    NA         NA      NA       NA
CouponFrequencyQuarterly       1.190e+00  3.886e-01   3.061  0.00225 **
CouponFrequencySemi-annual     1.614e-01  3.795e-01   0.425  0.67066
CouponFrequencyAnnual          8.690e-01  3.952e-01   2.199  0.02807 *
CouponFrequencyOther          -3.706e+00  3.873e-01  -9.571  < 2e-16 ***
DealTypeUnsecured Bonds        7.031e-02  2.509e-01   0.280  0.77937
DealTypeCovered Bond          -2.131e-01  5.450e-01  -0.391  0.69589
DealTypeABS_MBS                9.527e-01  6.173e-01   1.543  0.12301
YearsToMaturity                3.259e-01  2.611e-02  12.483  < 2e-16 ***
YearsToMaturity2              -7.963e-03  8.561e-04  -9.301  < 2e-16 ***
Guarantee                      -1.001e-01  1.882e-01  -0.532  0.59483
PubGuarantee                   -1.792e+00  9.891e-01  -1.812  0.07027 .
I(log(DealValueEuroFace))     -9.416e-02  3.924e-02  -2.400  0.01656 *
SIFI                          -9.933e-02  5.527e-01  -0.180  0.85741
LOGTA                          1.438e+00  5.284e-01   2.721  0.00660 **
Total.Capital.Ratio...         2.687e-01  1.277e-01   2.105  0.03552 *
Equity...Tot.Assets...         1.730e-02  1.244e-01   0.139  0.88946
Interbank.Ratio...            -6.805e-04  1.839e-03  -0.370  0.71143
Business.Model                -1.030e-02  6.650e-03  -1.548  0.12182
Profitability                 -4.401e-02  2.051e-02  -2.146  0.03211 *
---
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1


Residual standard error: 1.648 on 1217 degrees of freedom
  (611 observations deleted due to missingness)
Multiple R-squared:  0.7337,      Adjusted R-squared:  0.7249
F-statistic: 83.81 on 40 and 1217 DF,  p-value: < 2.2e-16


2009
```

	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	4.2182940	4.8156653	0.876	0.38133	
DealNationalityGermany	−1.0747625	0.3371852	−3.187	0.00149	**
DealNationalityItaly	−1.1580023	0.4774644	−2.425	0.01553	*
DealNationalityJapan	−3.2001562	1.0515983	−3.043	0.00242	**
DealNationalitySpain	−0.9905624	0.5408875	−1.831	0.06744	.
DealNationalitySweden	−1.1998330	0.4879405	−2.459	0.01415	*
DealNationalitySwitzerland	−0.7777439	1.0543270	−0.738	0.46094	
DealNationalityUnited Kingdom	−0.1354150	0.3177751	−0.426	0.67013	
DealNationalityUnited States	−0.3553053	0.6459396	−0.550	0.58244	
SPRatingIssueAA+	0.5629812	0.5723877	0.984	0.32564	
SPRatingIssueAA	0.7776352	0.4047773	1.921	0.05509	.
SPRatingIssueAA−	0.3311134	0.3670890	0.902	0.36734	
SPRatingIssueA+	0.1578179	0.3797048	0.416	0.67780	
SPRatingIssueA	0.6844215	0.3374330	2.028	0.04287	*
SPRatingIssueA−	1.3878860	0.6821154	2.035	0.04223	*
SPRatingIssueBBB+	1.1709244	0.7213221	1.623	0.10494	
SPRatingIssueBBB	0.6156737	1.3166332	0.468	0.64020	
SPRatingIssueBB−	1.6263547	1.4171418	1.148	0.25148	
SPRatingIssueNot rated	0.5895598	0.3732849	1.579	0.11466	
Rating.ParentAA	−0.6579744	1.0719224	−0.614	0.53951	
Rating.ParentAA−	0.4380600	1.0920939	0.401	0.68844	
Rating.ParentA+	0.5653721	1.0884368	0.519	0.60361	
Rating.ParentA	−0.0668427	1.1088670	−0.060	0.95195	
Rating.ParentA−	−0.4297682	1.1776410	−0.365	0.71526	
Rating.ParentBBB+	1.4547959	2.1713223	0.670	0.50306	
Rating.ParentNot rated	0.6598874	1.2423493	0.531	0.59546	
Country.RatingAA+	NA	NA	NA	NA	
Country.RatingAA	NA	NA	NA	NA	
Country.RatingA+	NA	NA	NA	NA	
CouponFrequencyQuarterly	0.6775322	0.5050078	1.342	0.18012	
CouponFrequencySemi-annual	0.3627361	0.4931416	0.736	0.46222	
CouponFrequencyAnnual	0.3170928	0.5045686	0.628	0.52990	
CouponFrequencyOther	−3.6019453	0.5128937	−7.023	4.82e−12	***
DealTypeUnsecured Bonds	−0.1917219	0.2297434	−0.835	0.40426	

```
DealTypeCovered Bond           0.0541204  0.4007909   0.135  0.89262
DealTypeABS_MBS               -0.8192843  0.7206169  -1.137  0.25593
YearsToMaturity                0.4069633  0.0301064  13.518  < 2e-16 ***
YearsToMaturity2              -0.0105808  0.0009827 -10.767  < 2e-16 ***
Guarantee                      0.1903350  0.2369730   0.803  0.42211
PubGuarantee                  -0.8238835  0.4982317  -1.654  0.09862 .
I(log(DealValueEuroFace))      0.0752489  0.0370557   2.031  0.04263 *
SIFI                           0.3557825  0.3829537   0.929  0.35316
LOGTA                         -0.5691790  0.4988229  -1.141  0.25421
Total.Capital.Ratio...         0.0232449  0.0655039   0.355  0.72279
Equity...Tot.Assets...         0.0471301  0.1026367   0.459  0.64623
Interbank.Ratio...            -0.0003362  0.0026916  -0.125  0.90064
Business.Model                -0.0055334  0.0056756  -0.975  0.32989
Profitability                 -0.0155895  0.0054797  -2.845  0.00456 **
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---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1


Residual standard error: 1.282 on 763 degrees of freedom
  (284 observations deleted due to missingness)
Multiple R-squared:  0.7036,      Adjusted R-squared:  0.6865
F-statistic: 41.16 on 44 and 763 DF,  p-value: < 2.2e-16


2010


                             Estimate Std. Error t value Pr(>|t|)
(Intercept)                -1.573e+01  6.561e+00  -2.397 0.016680 *
DealNationalityGermany     -7.091e-01  3.954e-01  -1.793 0.073187 .
DealNationalityItaly       -7.547e-01  6.460e-01  -1.168 0.242909
DealNationalityJapan       -1.094e-01  2.094e+00  -0.052 0.958346
DealNationalitySpain        2.107e+00  2.059e+00   1.023 0.306526
DealNationalitySweden      -6.028e-01  5.923e-01  -1.018 0.308985
```

DealNationalitySwitzerland	1.186e+00	8.321e-01	1.425	0.154463	
DealNationalityUnited Kingdom	-1.904e-01	5.487e-01	-0.347	0.728635	
DealNationalityUnited States	1.355e+00	9.251e-01	1.465	0.143300	
SPRatingIssueAA	2.621e-01	4.479e-01	0.585	0.558489	
SPRatingIssueAA-	8.804e-02	4.192e-01	0.210	0.833705	
SPRatingIssueA+	2.082e-01	3.941e-01	0.528	0.597395	
SPRatingIssueA	5.190e-01	4.230e-01	1.227	0.220118	
SPRatingIssueA-	2.086e+00	6.170e-01	3.381	0.000747	***
SPRatingIssueBBB+	1.192e+00	5.784e-01	2.061	0.039516	*
SPRatingIssueBBB	1.290e+00	9.215e-01	1.400	0.161746	
SPRatingIssueBB+	5.113e+00	1.557e+00	3.283	0.001057	**
SPRatingIssueBB	4.302e-01	1.525e+00	0.282	0.777902	
SPRatingIssueNot rated	2.010e-01	3.721e-01	0.540	0.589235	
Rating.ParentAA-	1.447e+00	6.116e-01	2.366	0.018153	*
Rating.ParentA+	1.722e+00	5.217e-01	3.300	0.000997	***
Rating.ParentA	7.104e-01	6.278e-01	1.132	0.258051	
Rating.ParentA-	1.149e+00	9.252e-01	1.242	0.214612	
Rating.ParentBBB+	5.141e+00	1.728e+00	2.974	0.002997	**
Country.RatingAA	-1.095e+00	2.311e+00	-0.474	0.635737	
Country.RatingAA-	-1.225e+00	2.249e+00	-0.545	0.586172	
Country.RatingA+	NA	NA	NA	NA	
CouponFrequencyQuarterly	-5.814e-01	3.560e-01	-1.633	0.102673	
CouponFrequencySemi-annual	-9.828e-01	3.072e-01	-3.199	0.001418	**
CouponFrequencyAnnual	-1.721e-01	3.283e-01	-0.524	0.600231	
CouponFrequencyOther	-4.135e+00	3.300e-01	-12.532	< 2e-16	***
DealTypeUnsecured Bonds	-1.284e-01	2.477e-01	-0.518	0.604355	
DealTypeCovered Bond	-3.840e-01	4.269e-01	-0.900	0.368538	
DealTypeABS_MBS	1.242e+00	4.948e-01	2.510	0.012217	*
YearsToMaturity	2.205e-01	2.128e-02	10.359	< 2e-16	***
YearsToMaturity2	-4.784e-03	6.855e-04	-6.979	5.03e-12	***
Guarantee	-2.190e-01	2.078e-01	-1.054	0.292189	
PubGuarantee	-1.851e+00	1.593e+00	-1.162	0.245555	
I(log(DealValueEuroFace))	-1.021e-02	3.018e-02	-0.338	0.735187	
SIFI	-4.970e-01	4.780e-01	-1.040	0.298657	
LOGTA	1.916e+00	7.330e-01	2.614	0.009072	**

```
Total.Capital.Ratio...        -2.038e-02  8.100e-02  -0.252 0.801442
Equity...Tot.Assets...        -2.397e-02  1.192e-01  -0.201 0.840591
Interbank.Ratio...            -3.043e-03  1.977e-03  -1.539 0.123976
Business.Model                -1.069e-02  5.424e-03  -1.972 0.048884 *
Profitability                 -2.509e-02  1.812e-02  -1.384 0.166515
---
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1


Residual standard error: 1.476 on 1135 degrees of freedom
  (394 observations deleted due to missingness)
Multiple R-squared:  0.462,       Adjusted R-squared:  0.4412
F-statistic: 22.15 on 44 and 1135 DF,  p-value: < 2.2e-16
```

2011

```
                             Estimate Std. Error t value Pr(>|t|)
(Intercept)                 8.1913049  6.4281516   1.274 0.202797
DealNationalityGermany     -1.0058742  0.3585499  -2.805 0.005103 **
DealNationalityItaly       -1.1586233  0.6480207  -1.788 0.074026 .
DealNationalityJapan       -2.8921221  0.5927186  -4.879 1.20e-06 ***
DealNationalitySpain        0.3022665  0.4802589   0.629 0.529213
DealNationalitySweden      -0.9957362  0.4244373  -2.346 0.019130 *
DealNationalitySwitzerland -3.6449111  0.6492466  -5.614 2.43e-08 ***
DealNationalityUnited Kingdom -1.3386087  0.3737773  -3.581 0.000355 ***
DealNationalityUnited States  -0.6790774  0.7501817  -0.905 0.365524
SPRatingIssueAA+            0.4932184  1.0636601   0.464 0.642943
SPRatingIssueAA             1.8597681  0.4253135   4.373 1.33e-05 ***
SPRatingIssueAA-           -0.5886801  0.3935992  -1.496 0.135000
SPRatingIssueA+             0.4253070  0.3761051   1.131 0.258346
SPRatingIssueA              0.0087874  0.3908879   0.022 0.982068
SPRatingIssueA-             1.1952383  0.6435101   1.857 0.063491 .
```

SPRatingIssueBBB+	-0.6261511	0.5383781	-1.163	0.245037	
SPRatingIssueBBB	-0.2362244	0.9386490	-0.252	0.801342	
SPRatingIssueBBB-	1.9187225	0.5521948	3.475	0.000529	***
SPRatingIssueBB+	-0.4140827	1.4682557	-0.282	0.777972	
SPRatingIssueBB	0.0884535	1.4682565	0.060	0.951971	
SPRatingIssueBB-	-0.3922060	1.4682807	-0.267	0.789421	
SPRatingIssueB	-0.1518763	1.0816662	-0.140	0.888359	
SPRatingIssueB-	0.0884535	1.4682565	0.060	0.951971	
SPRatingIssueNot rated	-0.0515522	0.3497946	-0.147	0.882857	
Rating.ParentAA-	1.3142816	0.4626994	2.840	0.004577	**
Rating.ParentA+	1.1740767	0.3844617	3.054	0.002307	**
Rating.ParentA	0.9164912	0.5156486	1.777	0.075751	.
Rating.ParentA-	1.4957807	0.6407375	2.334	0.019728	*
Rating.ParentBBB+	1.7006907	1.2442797	1.367	0.171930	
Rating.ParentNot rated	0.8708069	0.3848004	2.263	0.023805	*
Country.RatingAA+	-0.8062339	0.3029556	-2.661	0.007885	**
Country.RatingAA	NA	NA	NA	NA	
Country.RatingAA-	NA	NA	NA	NA	
Country.RatingA+	NA	NA	NA	NA	
CouponFrequencyQuarterly	-0.4980601	0.3097166	-1.608	0.108061	
CouponFrequencySemi-annual	-1.6294005	0.2615000	-6.231	6.31e-10	***
CouponFrequencyAnnual	-0.9360465	0.2834937	-3.302	0.000988	***
CouponFrequencyOther	-5.0388727	0.2962670	-17.008	< 2e-16	***
DealTypeUnsecured Bonds	-0.2922517	0.2229750	-1.311	0.190201	
DealTypeCovered Bond	-0.6671868	0.3220139	-2.072	0.038476	*
DealTypeABS_MBS	-0.4614855	0.6781970	-0.680	0.496339	
YearsToMaturity	0.2769838	0.0245702	11.273	< 2e-16	***
YearsToMaturity2	-0.0076995	0.0008620	-8.932	< 2e-16	***
Guarantee	-1.0256352	0.2206599	-4.648	3.70e-06	***
PubGuarantee	1.0574055	1.1697530	0.904	0.366192	
I(log(DealValueEuroFace))	-0.0059190	0.0290779	-0.204	0.838733	
SIFI	1.1903791	0.5203412	2.288	0.022321	*
LOGTA	-1.1643840	0.7296886	-1.596	0.110801	
Total.Capital.Ratio...	0.3222941	0.0777681	4.144	3.64e-05	***
Equity...Tot.Assets...	-0.0013431	0.1141906	-0.012	0.990617	

```
Interbank.Ratio...           -0.0012586  0.0020873  -0.603 0.546649
Business.Model               -0.0002338  0.0027711  -0.084 0.932786
Profitability                -0.0291762  0.0185233  -1.575 0.115483
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Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1


Residual standard error: 1.404 on 1259 degrees of freedom
  (428 observations deleted due to missingness)
Multiple R-squared:  0.5018,      Adjusted R-squared:  0.4824
F-statistic: 25.88 on 49 and 1259 DF,  p-value: < 2.2e-16


2012


                              Estimate Std. Error t value Pr(>|t|)
(Intercept)                 -9.4208002  4.6326927  -2.034  0.04228 *
DealNationalityGermany       0.1137264  0.4845550   0.235  0.81449
DealNationalityItaly         1.6508702  1.1813647   1.397  0.16262
DealNationalityJapan        -1.2141491  0.5392377  -2.252  0.02458 *
DealNationalitySpain         2.9433280  1.8648098   1.578  0.11483
DealNationalitySweden       -0.6544330  0.5522936  -1.185  0.23635
DealNationalitySwitzerland  -0.8253419  0.3704467  -2.228  0.02612 *
DealNationalityUnited Kingdom -0.7012853  0.3001459  -2.336  0.01968 *
DealNationalityUnited States  -1.6917472  0.8943876  -1.892  0.05887 .
SPRatingIssueAA+             0.2854280  0.7287058   0.392  0.69538
SPRatingIssueAA             -0.0729503  0.9180875  -0.079  0.93668
SPRatingIssueAA-             1.2677413  0.5377429   2.358  0.01860 *
SPRatingIssueA+             -0.0071158  0.5175607  -0.014  0.98903
SPRatingIssueA              -0.0541067  0.4724782  -0.115  0.90885
SPRatingIssueA-             -0.5674718  0.5704127  -0.995  0.32007
SPRatingIssueBBB+            0.2108042  0.6125873   0.344  0.73083
SPRatingIssueBBB            -1.2034548  1.8952822  -0.635  0.52560
```

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SPRatingIssueBBB-             3.7599138  0.8965905   4.194 3.01e-05 ***
SPRatingIssueBB+              2.2637202  1.5706642   1.441  0.14985
SPRatingIssueNot rated        0.0898369  0.4509861   0.199  0.84215
Rating.ParentA+               0.4284953  0.4259195   1.006  0.31465
Rating.ParentA               -0.1508379  0.3631515  -0.415  0.67798
Rating.ParentA-               0.5916900  0.4314821   1.371  0.17061
Rating.ParentBBB+             0.4781790  0.4845201   0.987  0.32394
Rating.ParentBBB                     NA         NA      NA       NA
Rating.ParentBBB-            -1.1482138  2.1126020  -0.544  0.58691
Rating.ParentBB              -0.2589614  2.2179276  -0.117  0.90708
Rating.ParentNot rated        0.5370778  0.3775017   1.423  0.15515
Country.RatingAA+                    NA         NA      NA       NA
Country.RatingAA              2.0860212  1.0860197   1.921  0.05506 .
Country.RatingAA-                    NA         NA      NA       NA
Country.RatingA              -1.8184750  1.8619549  -0.977  0.32900
Country.RatingBBB+           -1.3029752  1.0356864  -1.258  0.20868
CouponFrequencyQuarterly      1.1577992  0.3939590   2.939  0.00338 **
CouponFrequencySemi-annual    0.3831937  0.2372623   1.615  0.10664
CouponFrequencyAnnual         0.4416609  0.2952212   1.496  0.13498
CouponFrequencyOther         -2.8368845  0.3109994  -9.122  < 2e-16 ***
DealTypeUnsecured Bonds      -0.2821255  0.2586669  -1.091  0.27569
DealTypeCovered Bond          0.0009405  0.3945325   0.002  0.99810
DealTypeABS_MBS               0.5917235  0.6803096   0.870  0.38464
YearsToMaturity               0.1911054  0.0276242   6.918 8.53e-12 ***
YearsToMaturity2             -0.0054186  0.0009868  -5.491 5.15e-08 ***
Guarantee                     0.0606381  0.1933056   0.314  0.75383
PubGuarantee                  2.8701478  2.5752937   1.114  0.26536
I(log(DealValueEuroFace))     0.0255087  0.0337113   0.757  0.44943
SIFI                          0.1260806  0.4186519   0.301  0.76336
LOGTA                         0.6452041  0.4848286   1.331  0.18359
Total.Capital.Ratio...        0.0779743  0.0621031   1.256  0.20959
Equity...Tot.Assets...        0.2809834  0.1477315   1.902  0.05748 .
Interbank.Ratio...            0.0080461  0.0024398   3.298  0.00101 **
Business.Model               -0.0062440  0.0023273  -2.683  0.00743 **
Profitability                -0.0517439  0.0159428  -3.246  0.00121 **
```

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Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1


Residual standard error: 1.414 on 928 degrees of freedom
  (471 observations deleted due to missingness)
Multiple R-squared:  0.4449,     Adjusted R-squared:  0.4162
F-statistic: 15.49 on 48 and 928 DF,  p-value: < 2.2e-16
```

Figure 1 Floating rate bonds: the relationship between the cost at issuance and maturity

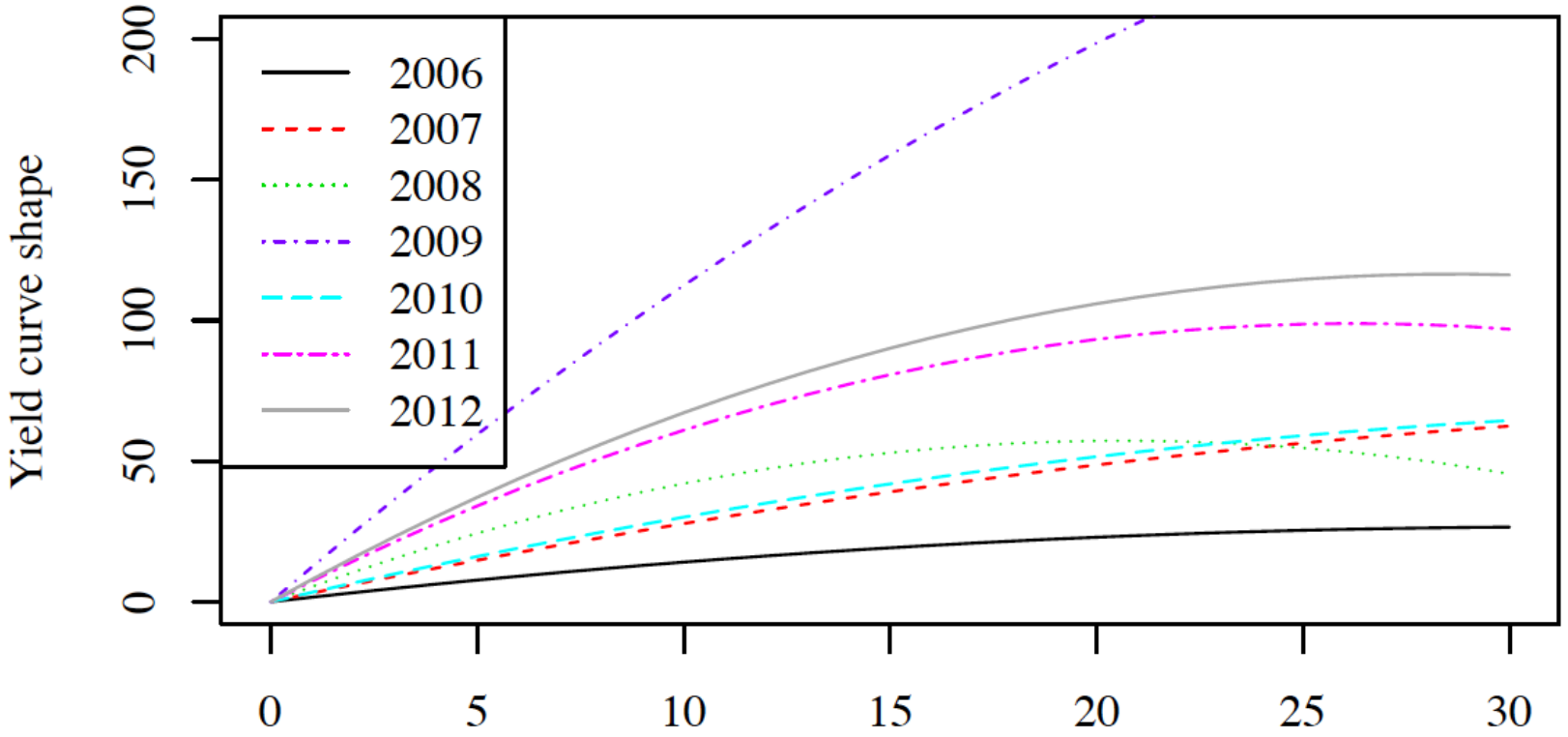


Figure 2 Fixed rate bonds: the relationship between the cost at issuance and maturity

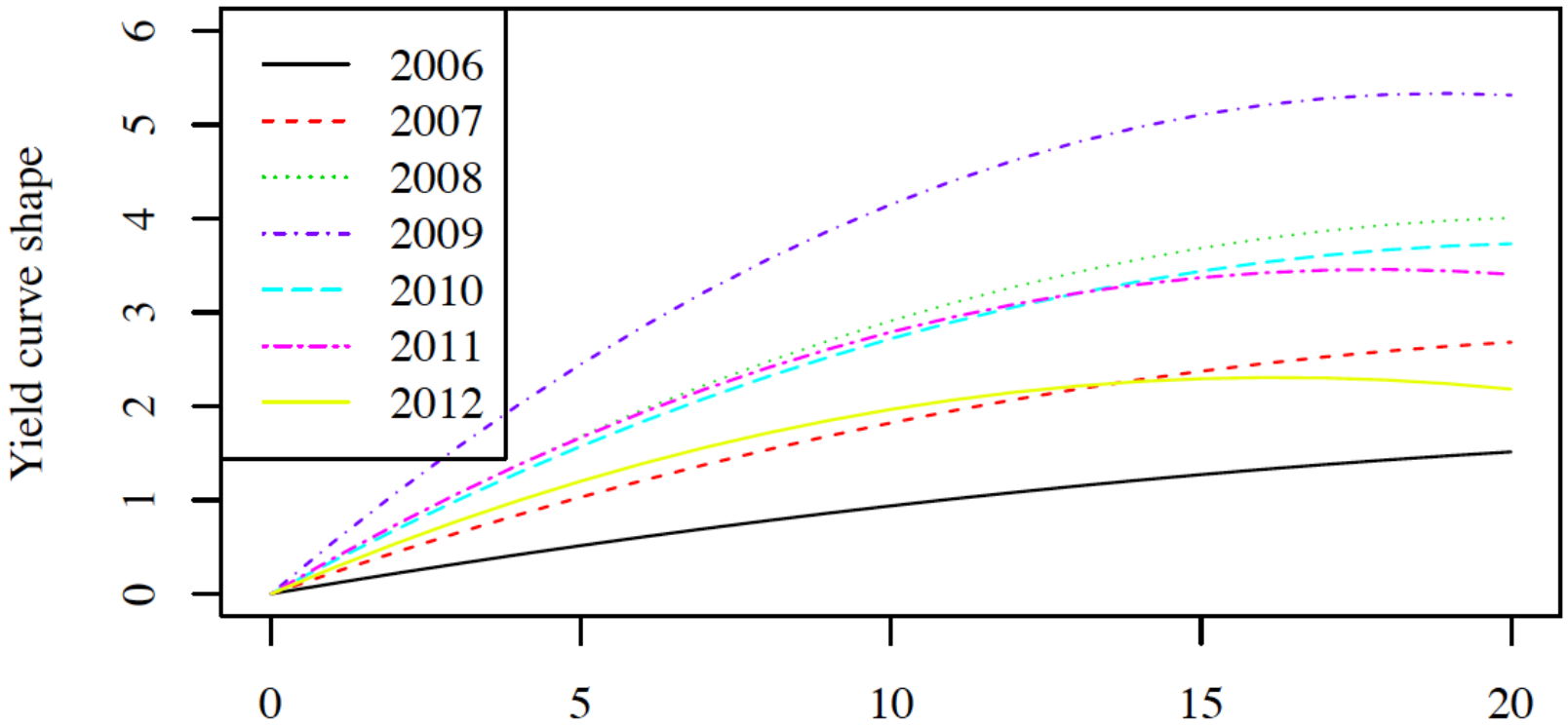


Figure 3 Floating rate bonds: the relationship between the cost at issuance and issue rating

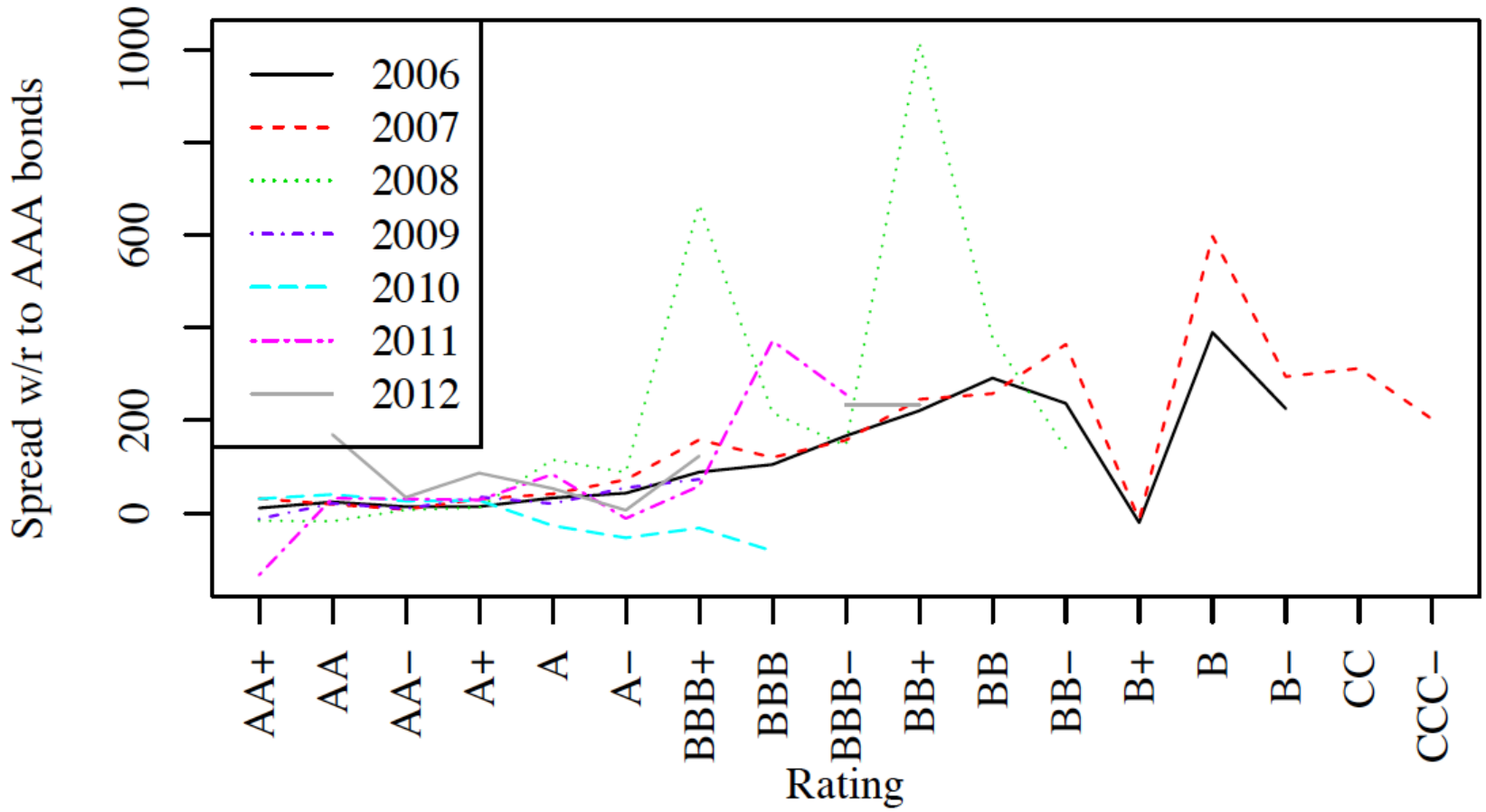
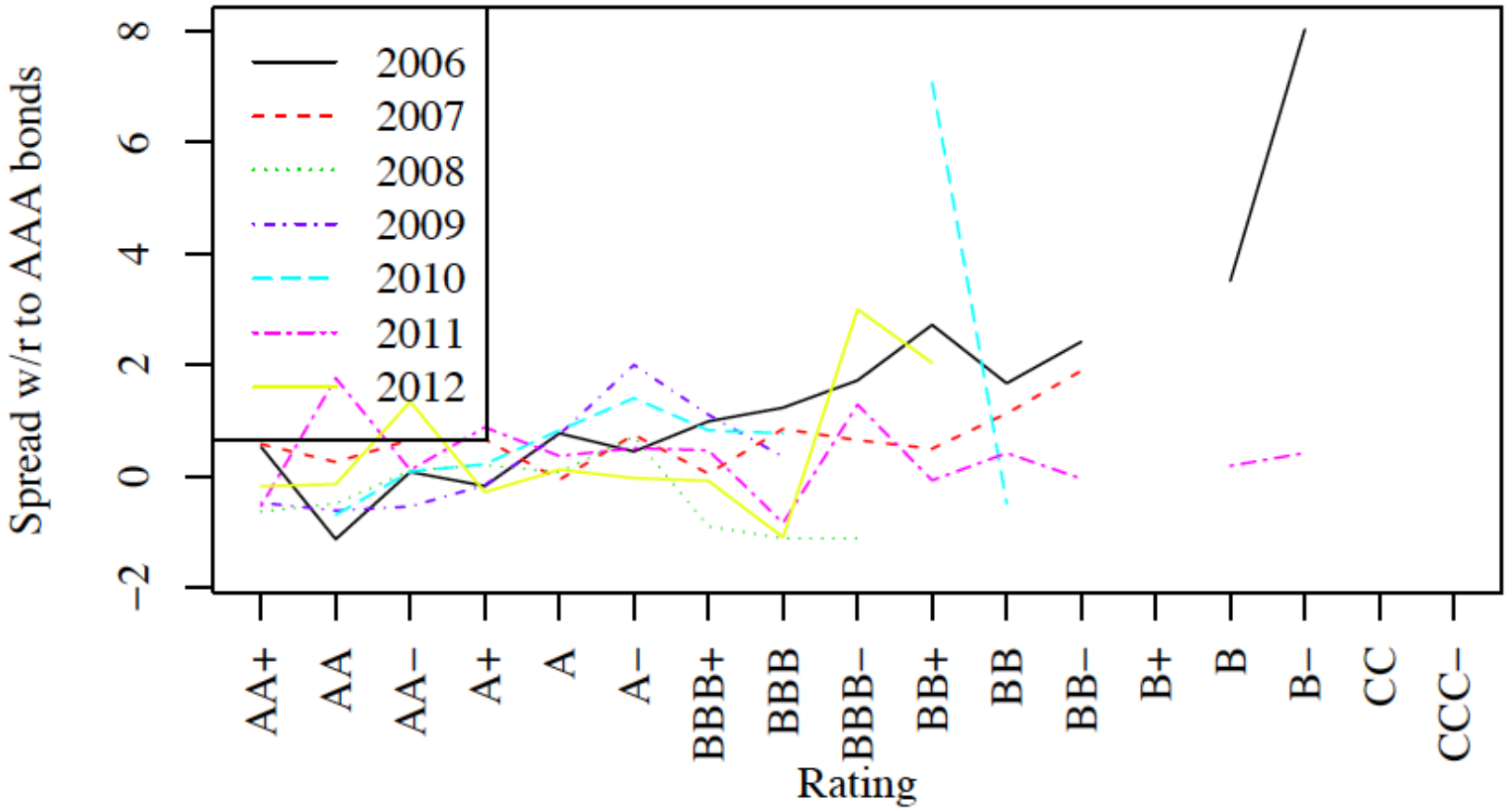
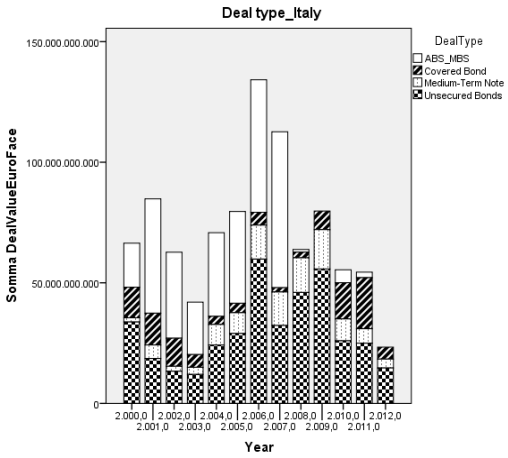
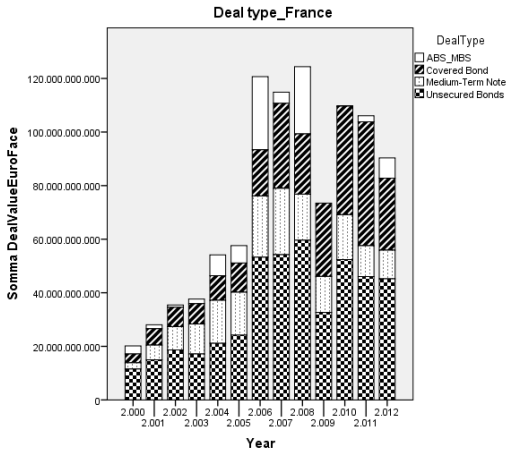


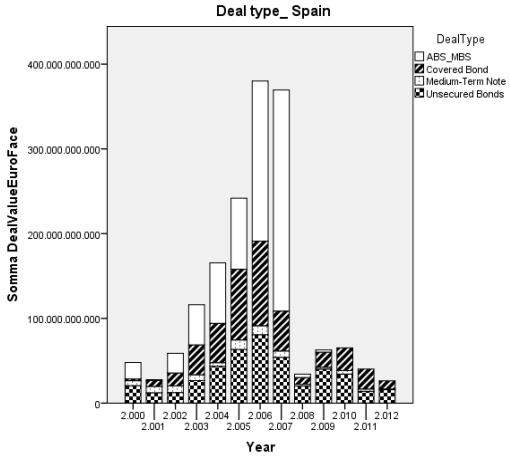
Figure 4 Fixed rate bonds: the relationship between the cost at issuance and issue rating

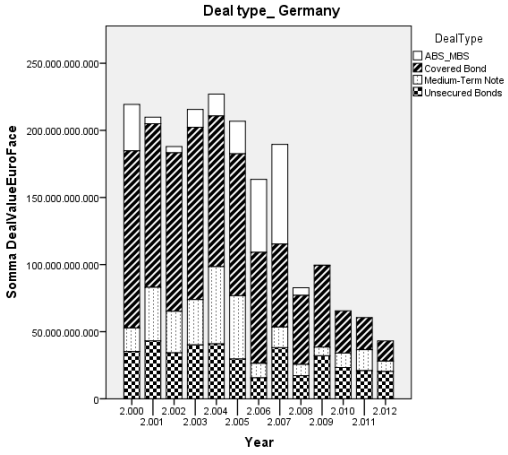


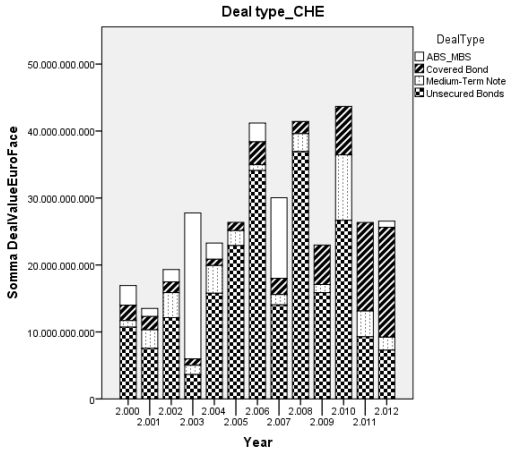
Issue deal value and deal type

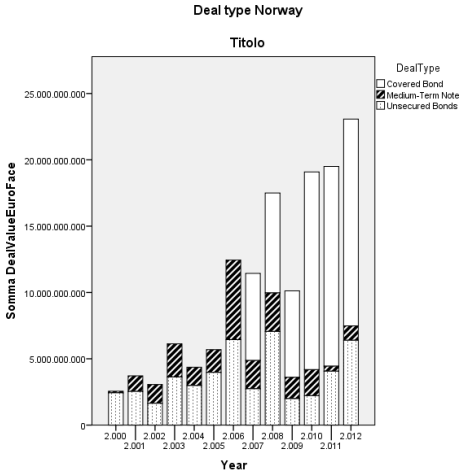


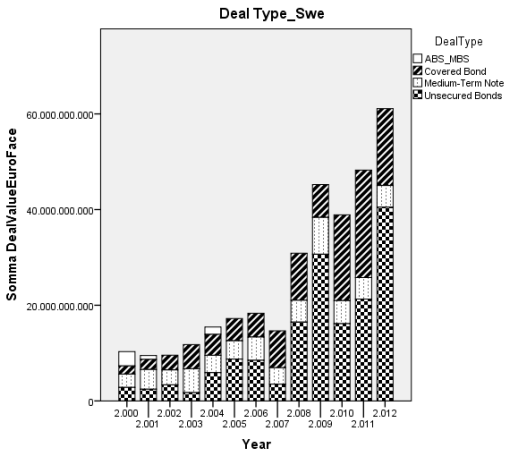


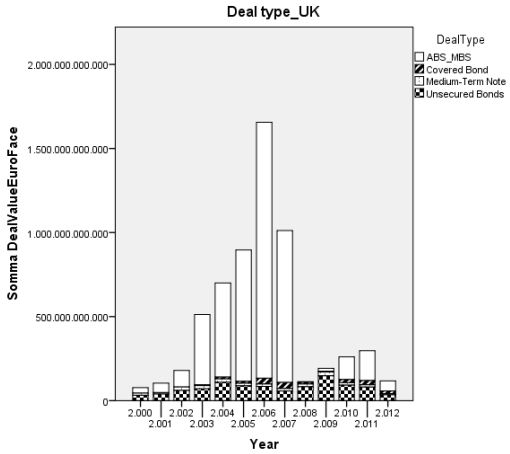




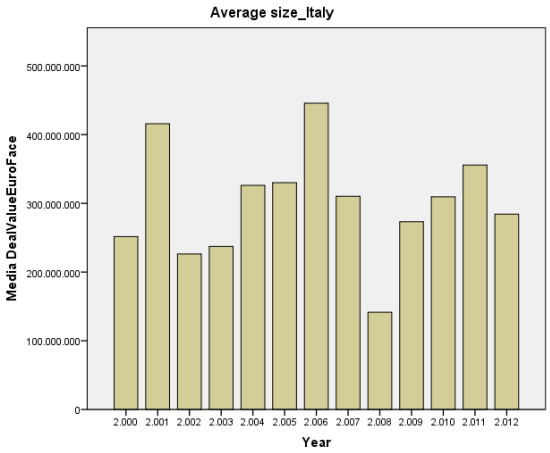


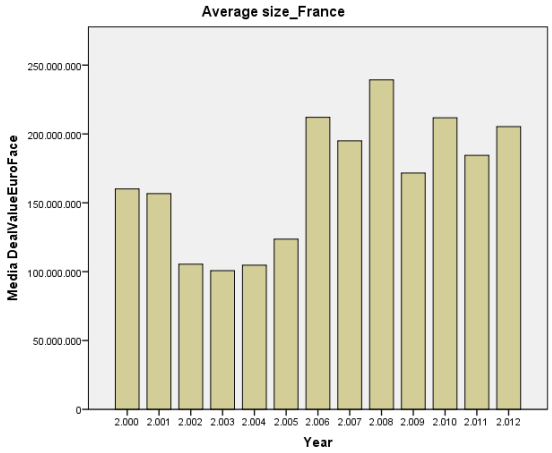


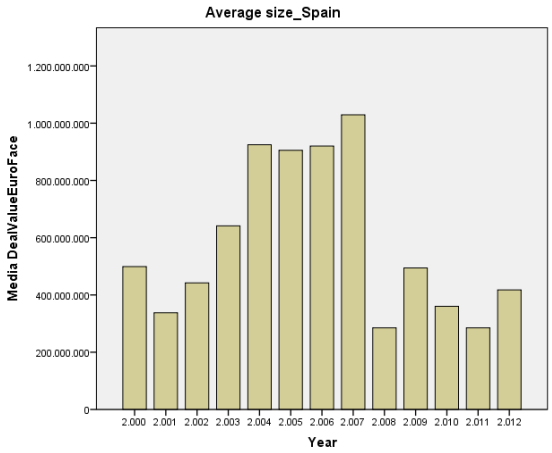


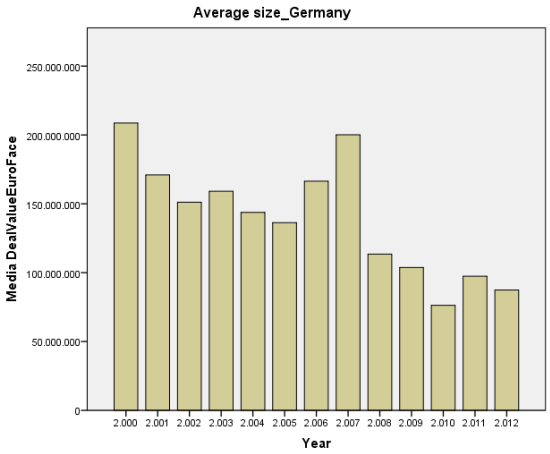


The average size of issuanc





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200.000.000
150.000.000
100.000.000
50.000.000
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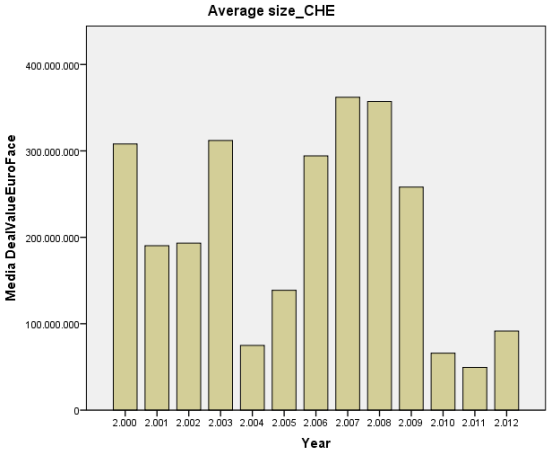
2.000 2.001 2.002 2.003 2.004 2.005 2.006 2.007 2.008 2.009 2.010 2.011 2.012
Year


Average size_CHE
Media DealValueEuroFace
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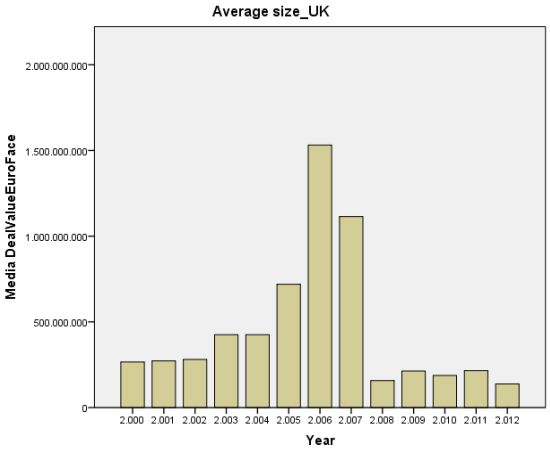
300.000.000
200.000.000
100.000.000
0
2.000 2.001 2.002 2.003 2.004 2.005 2.006 2.007 2.008 2.009 2.010 2.011 2.012
Year


Average size_UK
Media DealValueEuroFace
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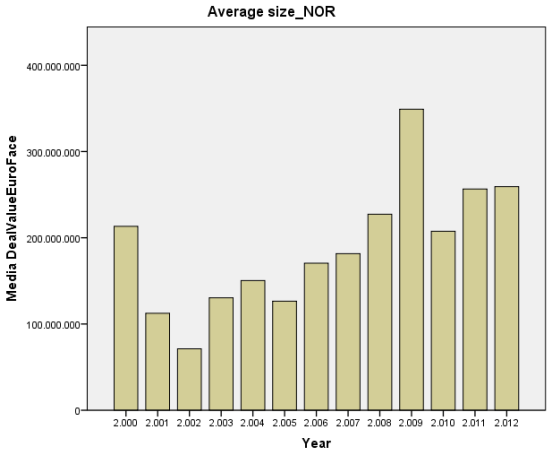
1.500.000.000
1.000.000.000
500.000.000
0
2.000 2.001 2.002 2.003 2.004 2.005 2.006 2.007 2.008 2.009 2.010 2.011 2.012
Year


Average size_NOR
Media DealValueEuroFace
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300.000.000
200.000.000
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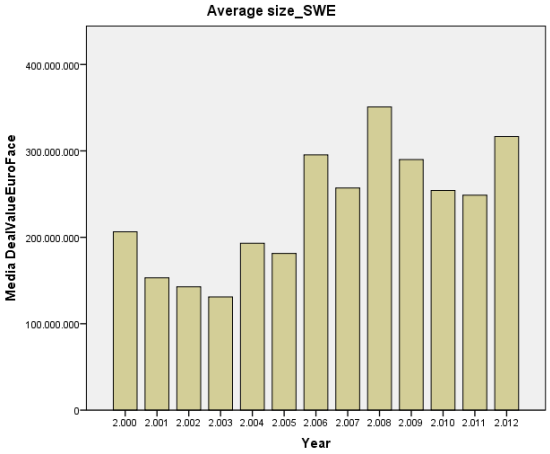
0
2.000 2.001 2.002 2.003 2.004 2.005 2.006 2.007 2.008 2.009 2.010 2.011 2.012
Year


Average size_SWE
Media DealValueEuroFace
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300.000.000
200.000.000
100.000.000
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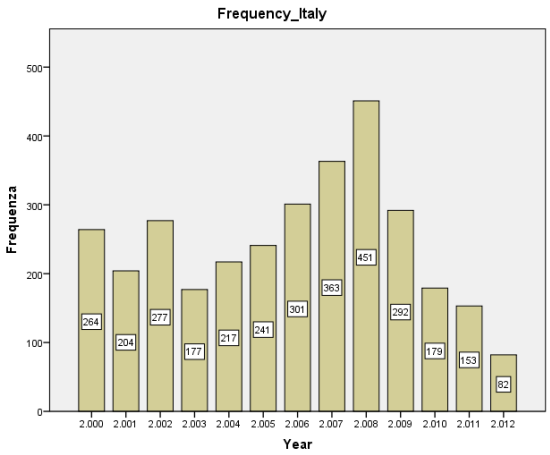
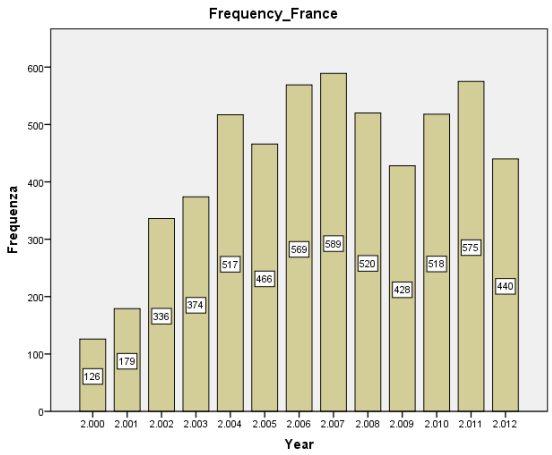
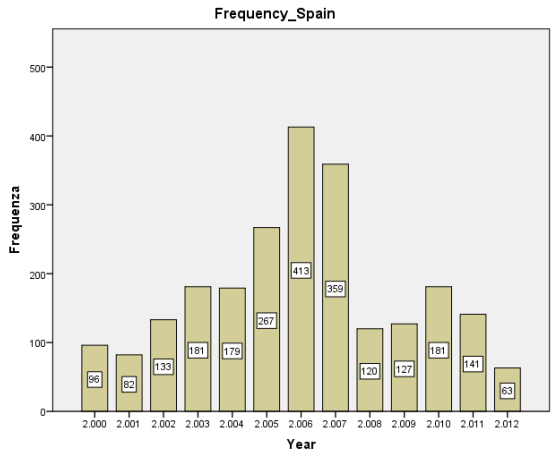
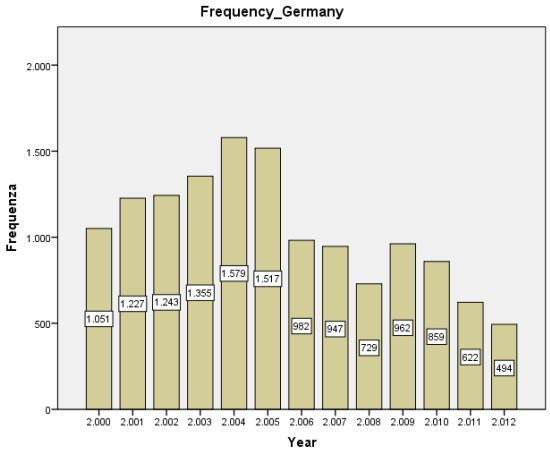
2.000 2.001 2.002 2.003 2.004 2.005 2.006 2.007 2.008 2.009 2.010 2.011 2.012
Year

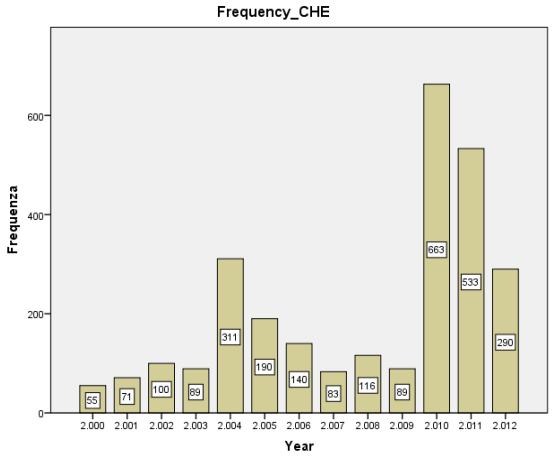
The frequency of issuance

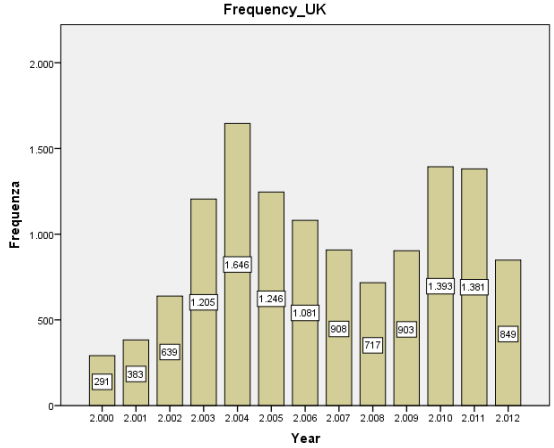


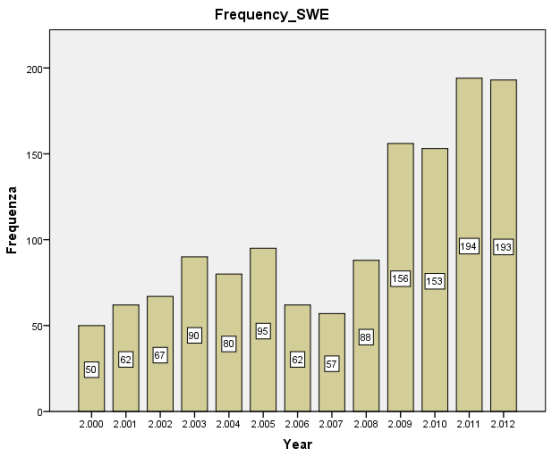


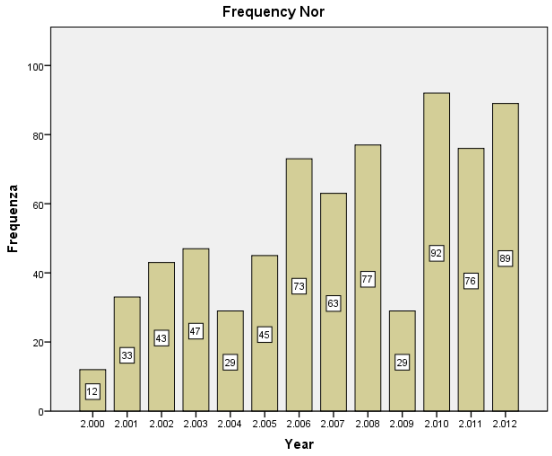




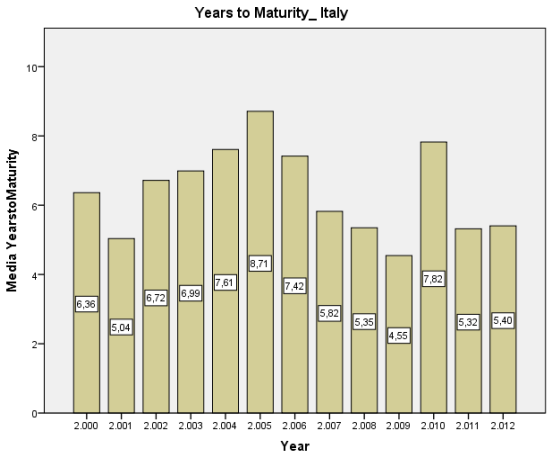


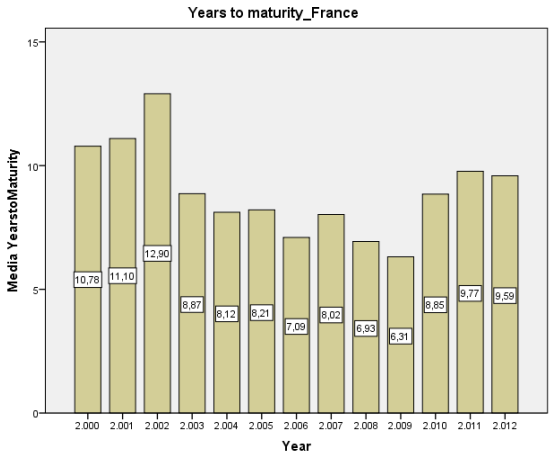


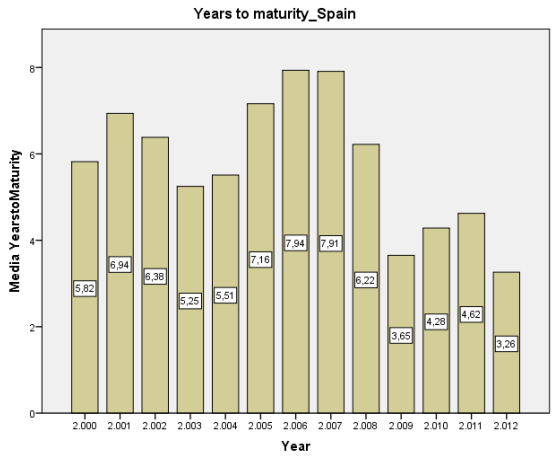


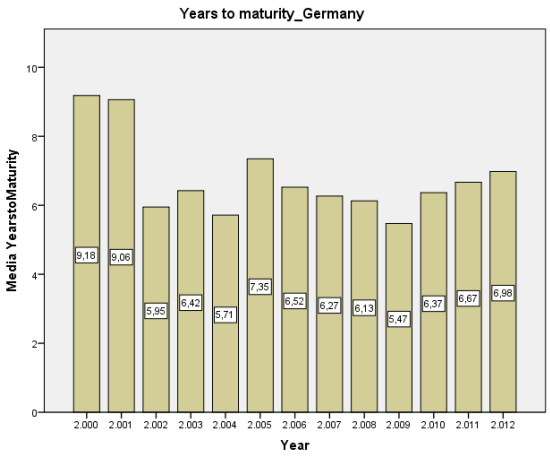


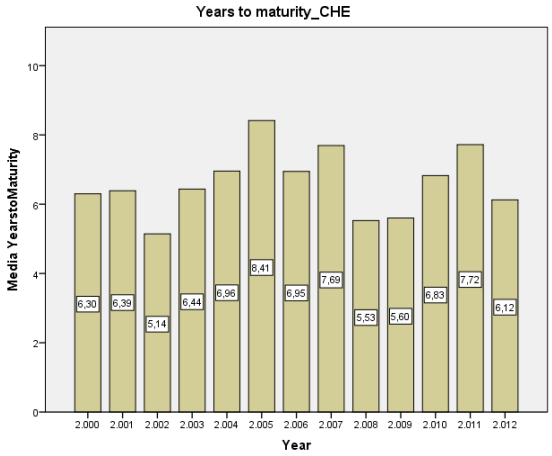
The maturity of instruments

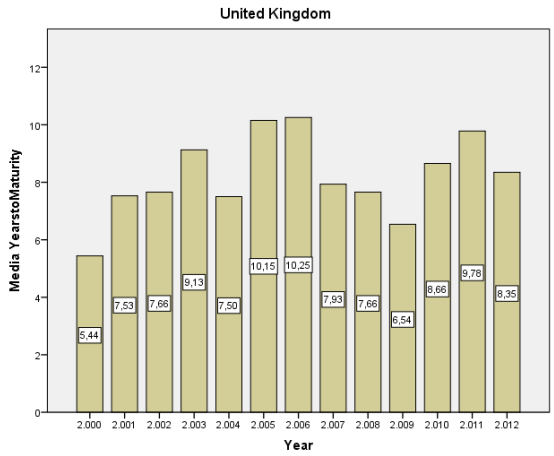


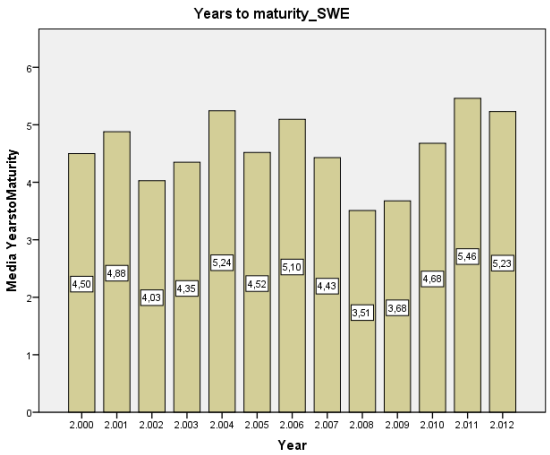


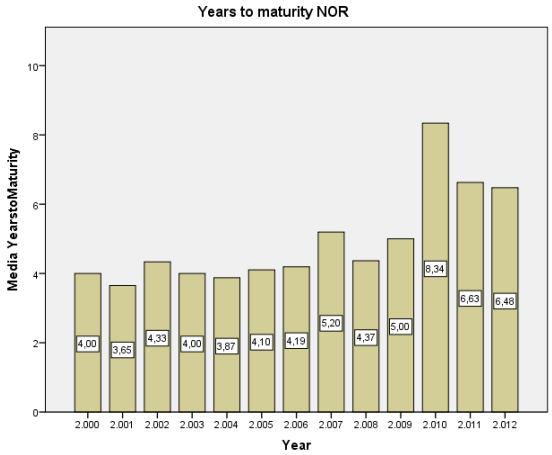



Years to maturity_Germany
Media YearstoMaturity
Year
9,18
9,06
5,95
6,42
5,71
7,35
6,52
6,27
6,13
5,47
6,37
6,67
6,98

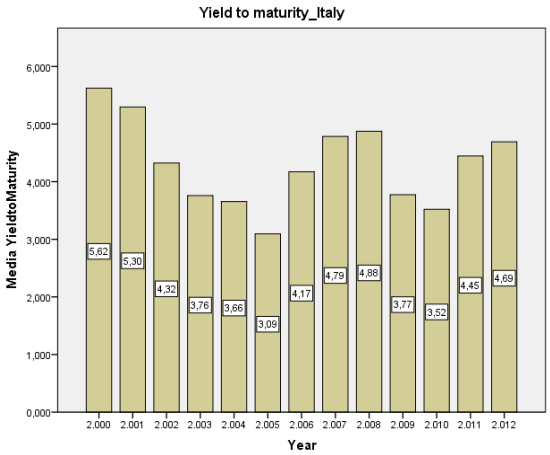

Years to maturity_CHE
Media YearstoMaturity
Year
6,30
6,39
5,14
6,44
6,96
8,41
6,95
7,69
5,53
5,60
6,83
7,72
6,12

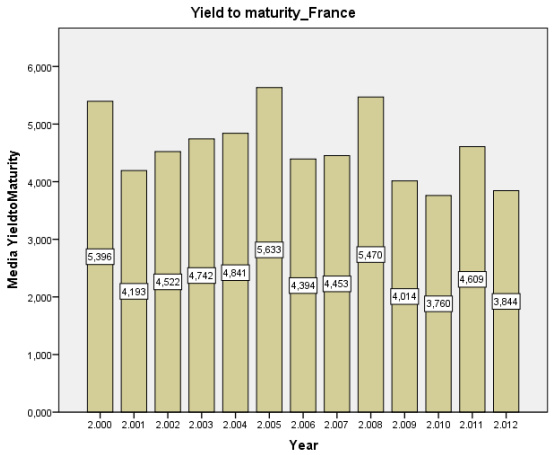

United Kingdom
Media YearstoMaturity
Year
5,44
7,53
7,66
9,13
7,50
10,15
10,25
7,93
7,66
6,54
8,66
9,78
8,35

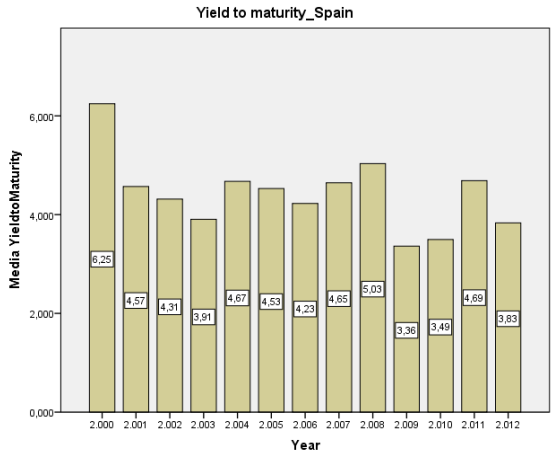


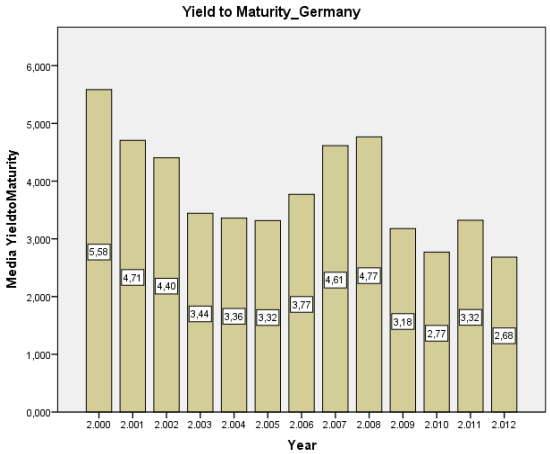


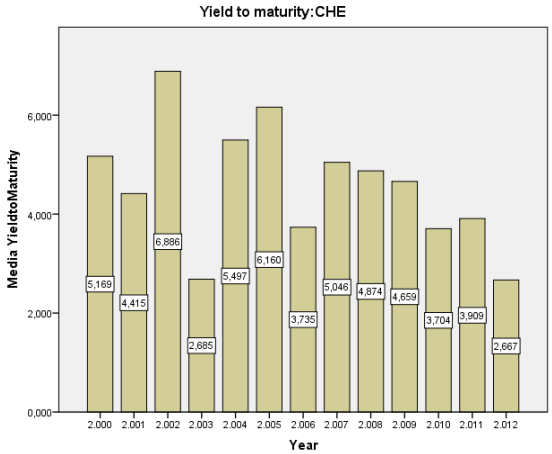
The Yield to Maturity

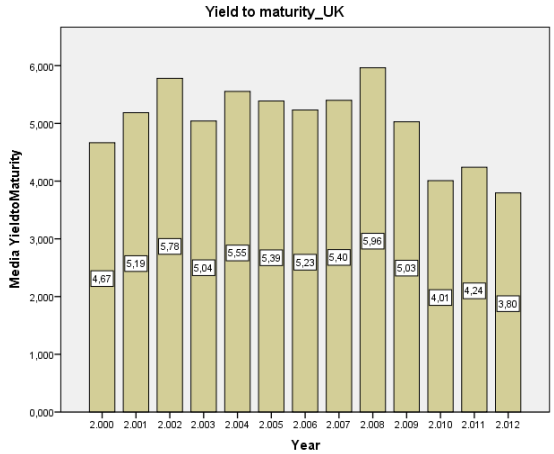


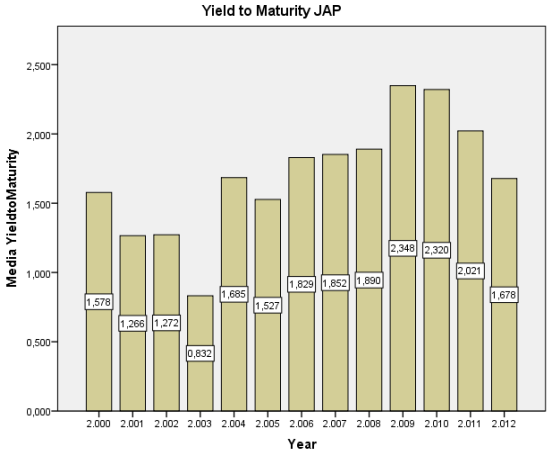


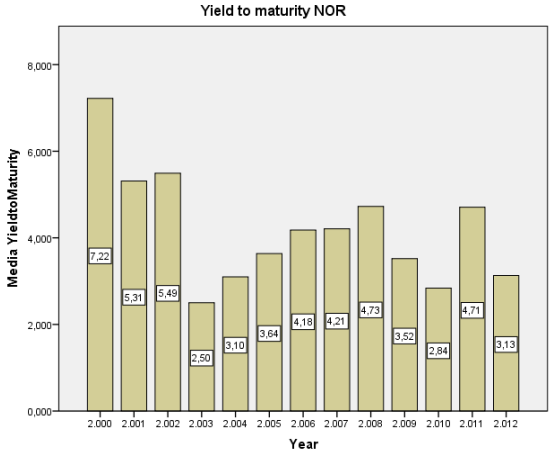


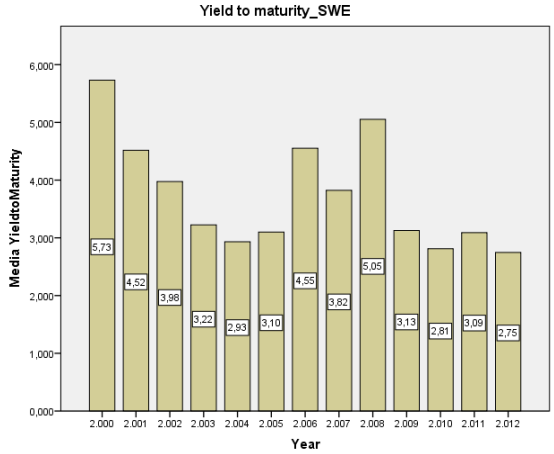

Yield to Maturity_Germany
Media YieldtoMaturity
Year
5,58
4,71
4,40
3,44
3,36
3,32
3,77
4,61
4,77
3,18
2,77
3,32
2,68

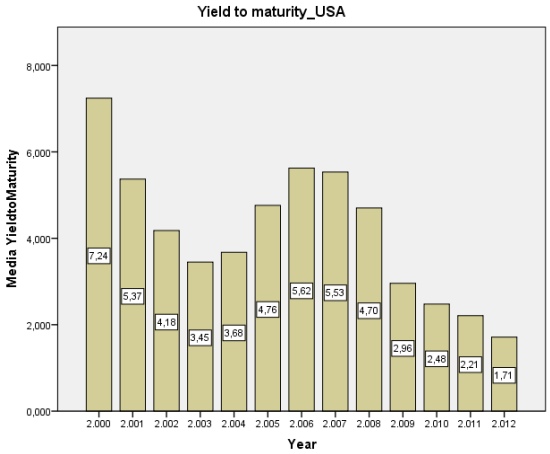

Yield to maturity:CHE
Media YieldtoMaturity
Year
5,169
4,415
6,886
2,685
5,497
6,160
3,735
5,046
4,874
4,659
3,704
3,909
2,667


Yield to maturity_UK
Media YieldtoMaturity
Year
4,67
5,19
5,78
5,04
5,55
5,39
5,23
5,40
5,96
5,03
4,01
4,24
3,80

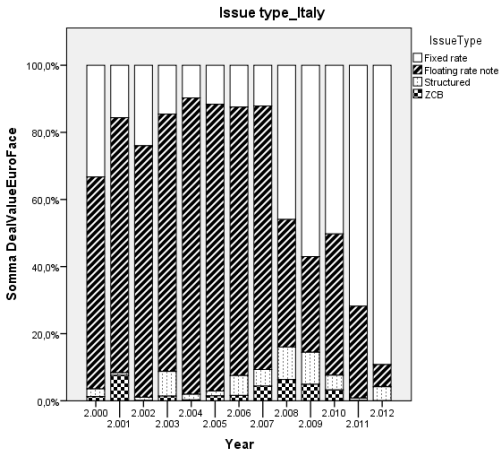

Yield to Maturity JAP
Media YieldtoMaturity
Year
1,578
1,266
1,272
0,832
1,685
1,527
1,829
1,852
1,890
2,348
2,320
2,021
1,678

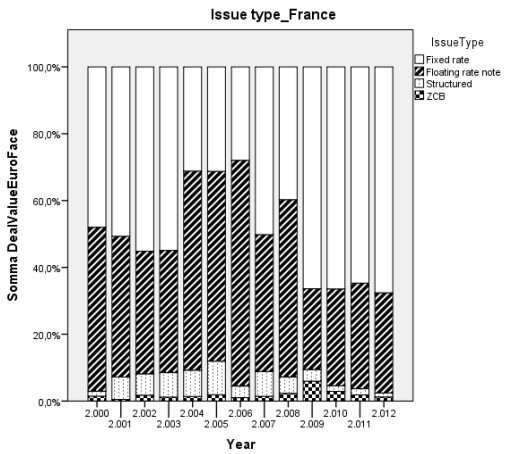

Yield to maturity NOR
Media YieldtoMaturity
Year
7,22
5,31
5,49
2,50
3,10
3,64
4,18
4,21
4,73
3,52
2,84
4,71
3,13

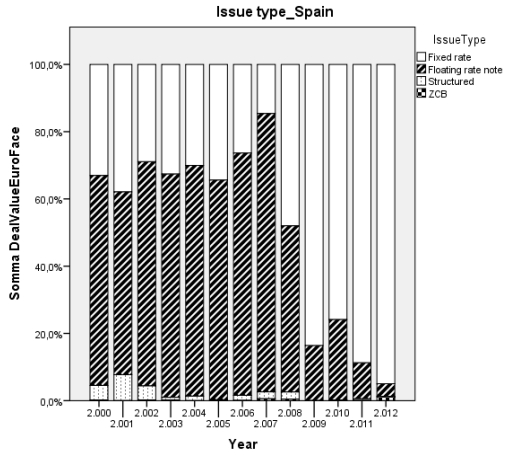

Yield to maturity_SWE
Media YieldtoMaturity
Year
5,73
4,52
3,98
3,22
2,93
3,10
4,55
3,82
5,05
3,13
2,81
3,09
2,75

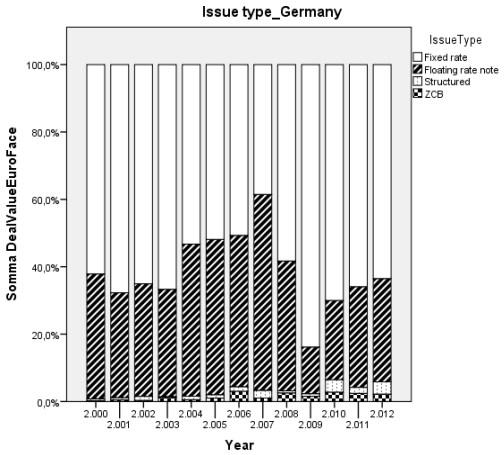


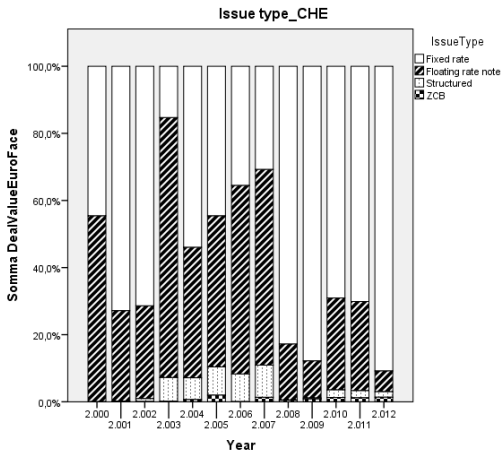
The issue type

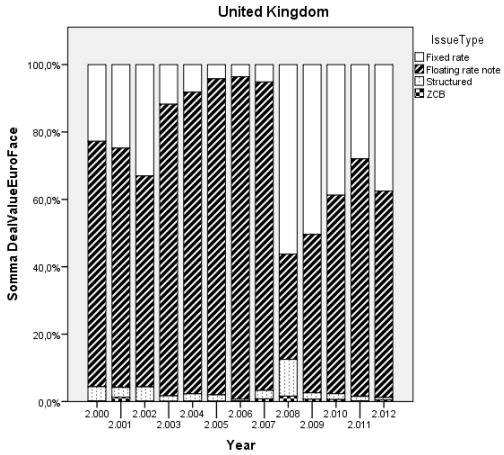


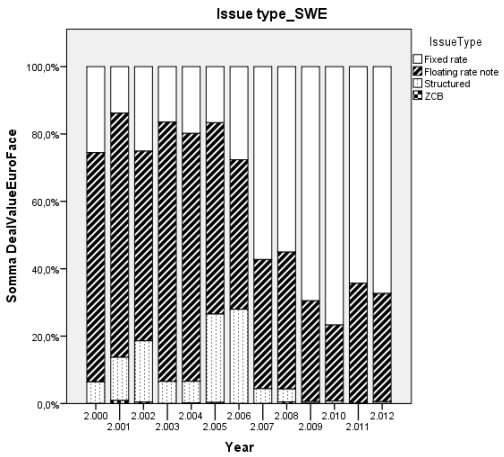


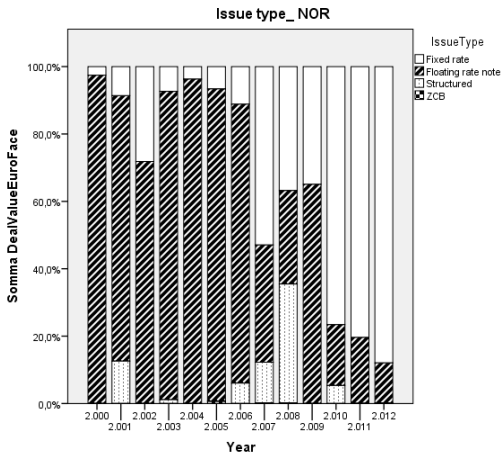



Issue type_Germany
IssueType
Fixed rate
Floating rate note
Structured
ZCB
Somma DealValueEuroFace
100,0%
80,0%
60,0%
40,0%
20,0%
0,0%
2.000
2.001
2.002
2.003
2.004
2.005
2.006
2.007
2.008
2.009
2.010
2.011
2.012
Year

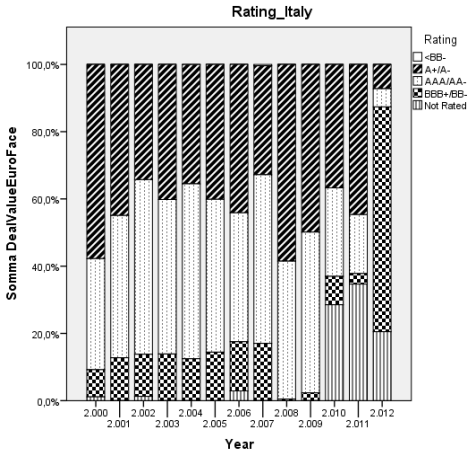

Issue type_CHE
IssueType
Fixed rate
Floating rate note
Structured
ZCB
Somma DealValueEuroFace
100,0%
80,0%
60,0%
40,0%
20,0%
0,0%
2.000
2.001
2.002
2.003
2.004
2.005
2.006
2.007
2.008
2.009
2.010
2.011
2.012
Year

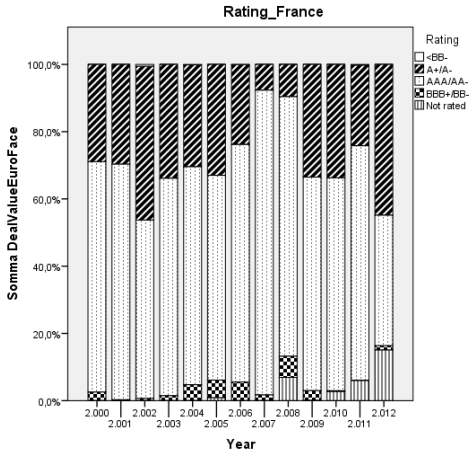

United Kingdom
IssueType
Fixed rate
Floating rate note
Structured
ZCB
Somma DealValueEuroFace
100,0%
80,0%
60,0%
40,0%
20,0%
0,0%
2.000
2.001
2.002
2.003
2.004
2.005
2.006
2.007
2.008
2.009
2.010
2.011
2.012
Year

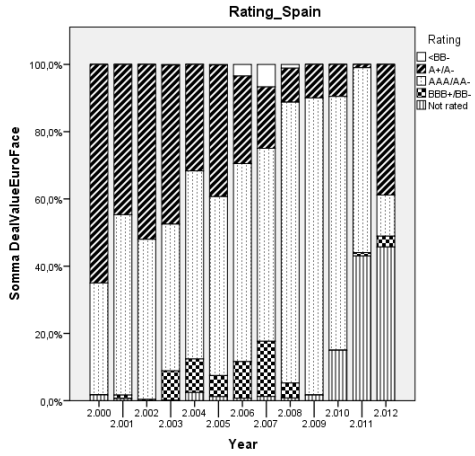


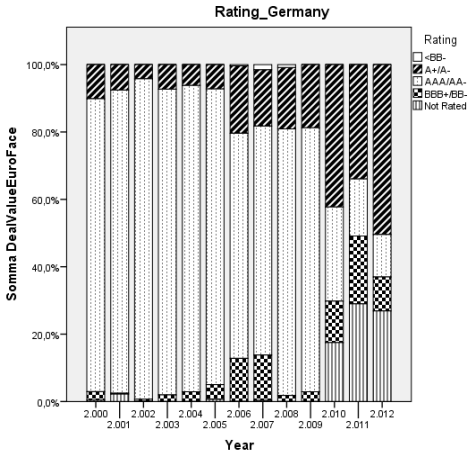


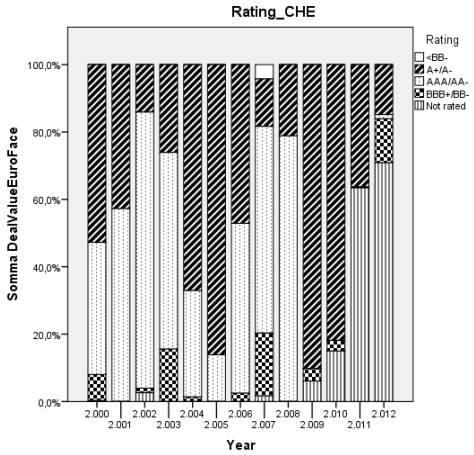
The issue rating

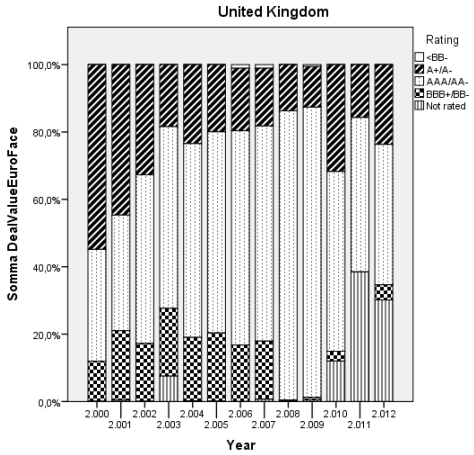


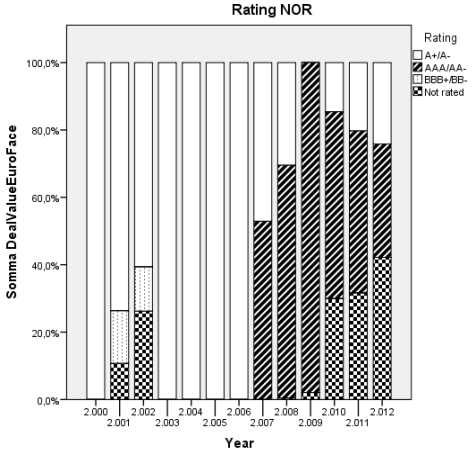


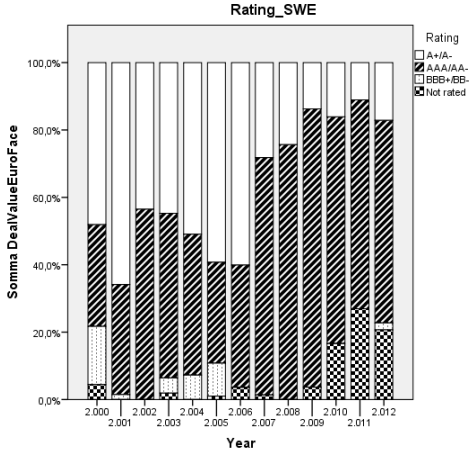




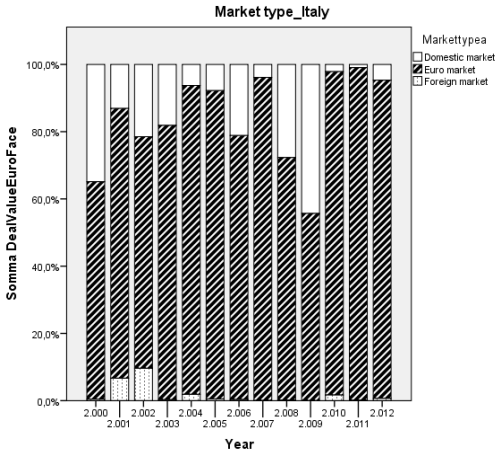


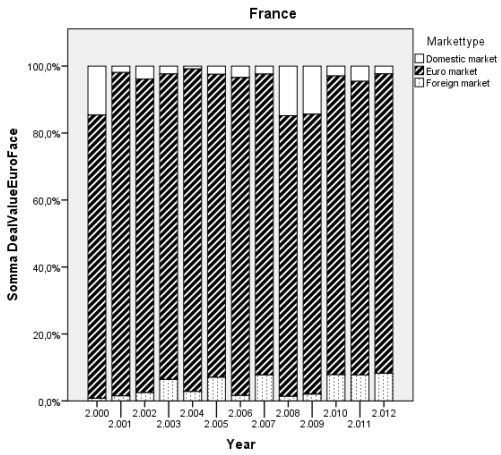


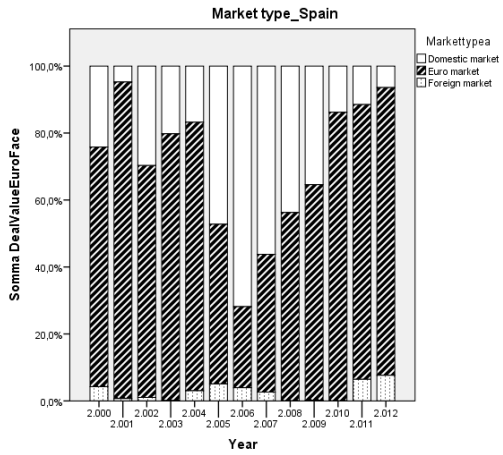


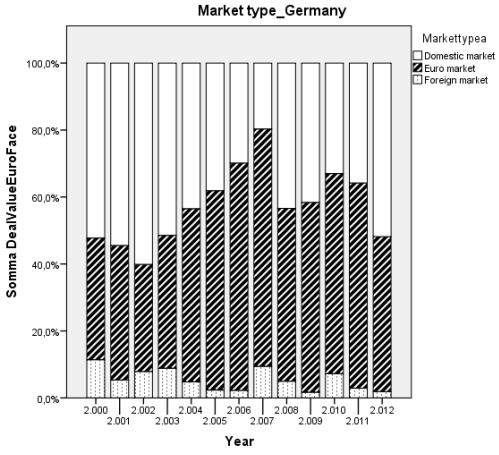


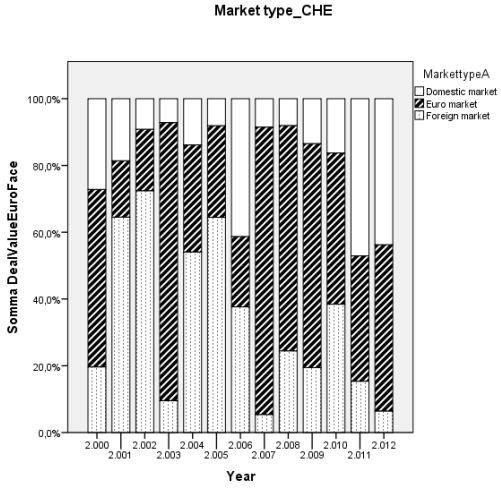
The market of issuance

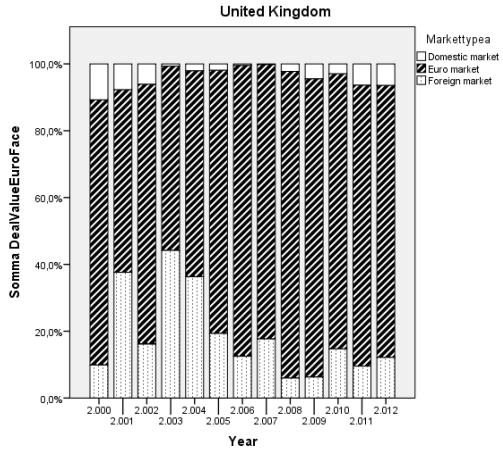

Market type_Italy
Somma DealValueEuroFace
100,0%
80,0%
60,0%
40,0%
20,0%
0,0%
2.000
2.001
2.002
2.003
2.004
2.005
2.006
2.007
2.008
2.009
2.010
2.011
2.012
Year
Markettypea
Domestic market
Euro market
Foreign market

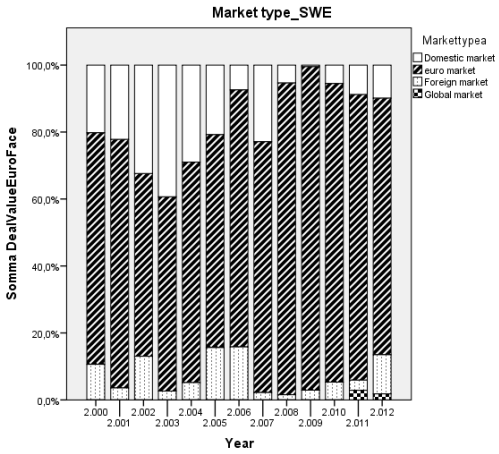

France
Somma DealValueEuroFace
100,0%
80,0%
60,0%
40,0%
20,0%
0,0%
2.000
2.001
2.002
2.003
2.004
2.005
2.006
2.007
2.008
2.009
2.010
2.011
2.012
Year
Markettype
Domestic market
Euro market
Foreign market

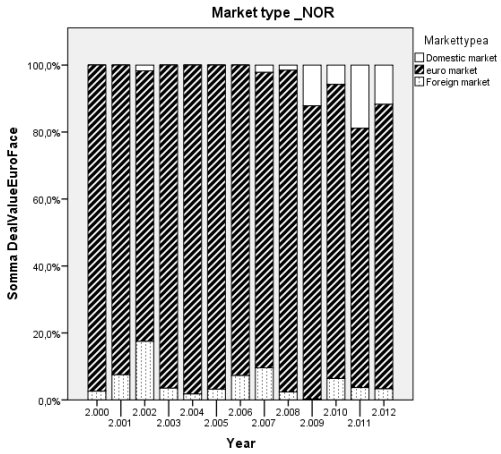

Market type_Spain
Somma DealValueEuroFace
100,0%
80,0%
60,0%
40,0%
20,0%
0,0%
2.000
2.001
2.002
2.003
2.004
2.005
2.006
2.007
2.008
2.009
2.010
2.011
2.012
Year
Markettypea
Domestic market
Euro market
Foreign market


Market type_Germany
Somma DealValueEuroFace
100,0%
80,0%
60,0%
40,0%
20,0%
0,0%
2.000
2.001
2.002
2.003
2.004
2.005
2.006
2.007
2.008
2.009
2.010
2.011
2.012
Year
Markettypea
Domestic market
Euro market
Foreign market


Market type_CHE
Somma DealValueEuroFace
100,0%
80,0%
60,0%
40,0%
20,0%
0,0%
2.000
2.001
2.002
2.003
2.004
2.005
2.006
2.007
2.008
2.009
2.010
2.011
2.012
Year
MarkettypeA
Domestic market
Euro market
Foreign market


United Kingdom
Somma DealValueEuroFace
100,0%
80,0%
60,0%
40,0%
20,0%
0,0%
2.000
2.001
2.002
2.003
2.004
2.005
2.006
2.007
2.008
2.009
2.010
2.011
2.012
Year
Markettypea
Domestic market
Euro market
Foreign market


Market type_SWE
Markettypea
Domestic market
euro market
Foreign market
Global market
Somma DealValueEuroFace
100,0%
80,0%
60,0%
40,0%
20,0%
0,0%
2.000
2.001
2.002
2.003
2.004
2.005
2.006
2.007
2.008
2.009
2.010
2.011
2.012
Year


Market type _NOR
Markettypea
Domestic market
euro market
Foreign market
Somma DealValueEuroFace
100,0%
80,0%
60,0%
40,0%
20,0%
0,0%
2.000
2.001
2.002
2.003
2.004
2.005
2.006
2.007
2.008
2.009
2.010
2.011
2.012
Year