

Melniss 2003(2), 2005 (1)

Preliminary outline

Latest version

The Effects of the EMU on the Primary Market for International Bonds

Arie Melnik
Dept. of Economics
University of Haifa
Haifa 31905
ISRAEL
amelnik@econ.haifa.ac.il

Doron Nissim
Graduate School of Business
Columbia University
New York, NY 10027
USA
dn75@columbia.edu

We wish to thank Alec Crystal, Giovanna Nicodano and Dylan Thomas for their helpful comments. Special thanks are due to Mark N. Cutis, Amos Rubin, and Constantine Thanassulas for their detailed description of the workings of the primary market for international bonds. Maela Giofre' and Karen Simhony provided excellent research assistance. Financial assistance from the Zimmerman Foundation is gratefully acknowledged. We are, of course, responsible for the remaining errors.

The Effects of the EMU on the Primary Market for International Bonds

Abstract

We compare the issuance costs of Eurobonds before and after the completion of the Economic and Monetary Union (EMU) in 2002. We find that the introduction of the euro has significantly reduced the issue cost of euro-denominated bonds compared with bonds denominated in the legacy currencies. The reduction in issue cost was due primarily to a decrease in undrepricing (the difference between the market price after trading commences and the offering price). Underwriter fee has declined substantially after the EMU, but that decline was offset by an increase in the underwriter spread (the difference between the offering price and the guaranteed price to the issuer), leaving total underwriter compensation unchanged. The EMU is also associated with significant reductions in bond maturity and syndicate size, consistent with its expected effects on liquidity and issue costs in the Eurobond market.

The Effects of the EMU on the Primary Market for International Bonds

1. Introduction

On January 1999, a new currency, the euro, was created with the aim of replacing the currencies of twelve European countries. Since January 2002, the euro is used also for daily transactions in the European union. With the creation of the euro, the dollar has a potential rival for the role of leading international currency. Several authors studied the possible international role of the euro. Rose and van Wincoop (2001), Frankel and Rose (2002) and Glick and Rose (2002) noted that the euro should have a strong favorable impact on real trade flows between countries in Europe. These authors generally agree that the euro is likely to become a major international currency. However, their focus is on the role of the euro in real trade and as a possible reserve currency. The implication of the new currency for debt markets has not been fully explored.

In the financial sector, the creation of the euro had a direct impact on the cost of capital by reducing the currency risk premium. According to De Santis and Gerard (1998) currency risks constitute a significant part of the total systematic risk. Hence, with financial integration, the overall cost of capital in the EMU countries should decrease. The possible direct effects of the European Monetary Union (EMU) on financial markets have attracted some attention from academic researchers. Smith and Walter (2000) discuss the expected impact of the Euro on the money and bond markets. Sentana (2002) reports a small decrease in the cost of capital. With respect to the debt market, Santos and Tsatsaronis (2002) found that the introduction of the euro currency caused a significant reduction of bond underwriting fees.

In the past, issuers of debt preferred the USD, because of lower transaction cost and greater liquidity. The importance of broad and more liquid secondary market is also mentioned by Kool (2000). Therefore, with increasing size and the integration of European bond markets, debt issuers will shift market share towards debt that is denominated in euros (f.n.1). The ongoing discussion implies that a more liquid market should provide an advantage to bond issuers by offering a lower issuing cost and thus a lower cost of capital. In this context, it is interesting to examine the impact of various currency denominated assets on the cost of issuing debt in the international market.

Raising debt capital through global offerings can increase firm value by increasing the heterogeneity of the investor's base. As noted, it can also add value by adding liquidity. If international capital markets are somewhat segmented, global bond offering may help the issuing firms to reduce their cost for three reasons. First, there may exist foreign clientele buyers who are willing to pay a higher price for bonds that offer the benefit of the global diversification potential. Second, increased competition in the global debt market may reduce the agency problem associated with new bond issues. Third, if domestic demand is not elastic, issuing bonds to foreign investors can reduce the pricing pressure in the domestic market.

In this paper, we focus on the issuance cost of debt securities. The adoption of the euro probably reduced the degree of "home bias" which influenced European investors before the integration (f.t.2). With this in mind we extend the literature on the cost of issuing debt securities. Specifically, we make an extended comparison of debt issuance costs before and after the establishment of the EMU. In particular, we examine three components of issue costs: underwriter fee, underwriter spread and underpricing. We also compare the issuance costs of the new euro denominated public debt to dollar denominated public debt in the post-EMU period.

Our analysis suggests that both underwriter's fees and the spread appear to be the main determinants of bond issuance costs. For the pre-EMU period we document some critical differences between the issue costs of bonds denominated in different currencies. The cost of issuing dollar denominated bonds was significantly lower than issuance cost in the other currencies. Another significant result is that bond issuance cost declined after the introduction of the euro, compared to the average cost of issuance in the major legacy currencies. We also document that, in both periods, there is a trade-off among cost components. In absolute size, however, the trade-off declined after the introduction of the euro currency.

The rest of the paper proceeds as follows. In the next section we briefly survey some recent developments in the Eurobond market. This section is followed by a description of institutional arrangements in the primary bond market. Section 4 defines the main variables in the analysis and how they are measured in this study. Section 5 contains descriptive statistics of our samples before and after the introduction of the euro. In section 6 we present empirical results in reference to the various cost components and how they relate to issue characteristics. Section 7 contains the summary of the results.

2. Recent Developments in the Eurobond Market

A Eurobond, or an international bond, is a debt instrument issued by a corporation or a government agency outside any specific national jurisdiction. Essentially, it is issued in several markets at the same time. The Eurobond market was fairly small in the mid-70's, when total annual value of new issues was about 20 billion dollars. It grew rapidly during the 80's and in 1989 the nominal value of all new issues reached 212 billion dollars. The market size for new bond issues quadrupled during the 90's. It exceeded the 800 billion dollars in 1997 and 1,500 billion dollars in 2002. (f.n.3)

Originally, the main borrowers in the Eurobond market were international agencies, sovereign governments of developed countries and major banks. After the mid-80's, high quality corporate borrowers also entered the markets and in the mid-90's, they became dominant. According to Anouk, De Ceuster and Polfiet (2002), the Eurobond market grew very rapidly during the 1990's. For example, some 1200 issues, with face value of \$170 billion, were sold in the primary market in 1990. Ten years later close to 3500 issues, worth almost \$860 billion, were introduced. This market is now the world's biggest source of long term funds.

Most of the bonds are issued by entities from highly developed countries such as USA, UK, Netherlands, Japan, France and Germany which together account for about 60% of the total nominal value of new issues. International agencies, such as the IBRD, EBRD and the European Investment Bank, collectively issue around 10% of the total value (f.n.4). The remaining 30% are issued by firms and political units from other countries. Since the introduction of the euro currency, in 1999, the market share of European issuers grew considerably.

The secondary market for Eurobonds has grown considerably. It operates through standard clearing systems that produce low costs transaction execution. All rating agencies are rating Eurobonds on a routine basis. The continuous coverage of the rating agencies and existence of a liquid market help to reduce the credit risk during the life of the bonds. In general, the credit quality of all Eurobonds is very high, in the AAA to A range. Only 4.2% of the issues received a BBB rating at the time of issue and an additional 0.6% was ranked at BB of equivalent.

The underwriting function is always performed by international financial institutions, but they usually hold only limited amounts of the bond that they acquire. Most are placed with smaller banks and many non-bank investors, such as insurance companies, mutual funds, pension

funds, corporations and wealthy individuals. For these investors, international bonds offer an alternative to domestic bonds and a substitute for bank certificates of deposit.

3. The Primary Market

During the 1980's, 62% of the new Eurobonds were issued for a period of close to 10 years and 22% were for longer term. During the 1990's, maturities were shortened.(f.n.5). By the year 2000 most bonds were issued for five to seven years. As for types, Eurobonds are primarily straight coupon bonds (74%). The remaining bonds are floating rate notes (20%), Zero coupon bonds (2%) and equity linked or convertible bonds (4%). Shorter maturities require more frequent use of the primary market. This, in turn, explains part of the observed increase in the volume of new issues as well as the gradual reduction in the cost of new issues.

Straight coupon eurobonds are generally purchased from the issuer by syndicates of investment banks that are formed specially for underwriting purposes on a case by case basis (f.n.6). The lead bank (also called the "arranger" or "book-runner") draws up the agreement and collects a management fee (f.n.7). The fee, in turn, is shared with other syndicate members. The members purchase the issue according to an agreed sharing formula at the underwritten price. At the issue date they resell it to their customers at a potentially different price that depends on market conditions. The participation fees are usually allocated in similar proportions. The lead bank negotiates conditions with the borrower. It prepares a "term-sheet" or "information memorandum" about the issue that is circulated to potential syndicate participants (f.n.8). It also prepares, with the customer, the necessary bond issue documentation.

As noted by Melnik & Plaut (1996), Eurobonds markets are characterized by a "flat" syndicate structure. Usually there is one arranging (lead) bank. Occasionally, there are two or three co-arrangers. The other members are: "regular" members or "managers". Any bank may

operate in some syndicate as an "arranger" (leader) and in others as a "regular" (follower) member. In practice the number of active members (who participate on a regular basis) was about 200 in the second half of the 1990s. The number of participants in a given syndicate may range from 2 to 47. As expected, the size of the syndicate is positively correlated with the size and the risk of the issue.

The lead bank serves as an agent for both the client and the other syndicate members. It handles the clearing arrangements regarding the collection and distribution of the periodical interest payments and principal redemption. When the syndication terms are agreed, each member has an obligation to pay for his allotment. Each can then market his share of the issue either to "book registered" customers or to "the market". Formally, all risks are assigned to syndicate members in proportion to their share of the issue. For straight bond, syndication members carry a standard underwriting risk. If they can not sell the entire issue, they have to carry parts of it in their own books until the entire allocation is sold. The credit risks associated with bond holdings are borne, of course, by the end investors that hold them in their portfolios.

It is important to note that the elimination of several important currencies, such as the German Mark and French Franc and the introduction of a new currency also coincided with two changes in the industrial structure of the market. First, before the introduction of the euro, corporations willing to issue bonds in a foreign market had to select a syndicate with sales expertise in the currency of that country. Many local banks often used to join underwriting syndicates in order to enhance its specific currency marketing capabilities. Consequently each syndicate had, on the average, more underwriters. A common currency requires less reliance on local expertise and therefore many non-international (local) underwriters left the debt issue market. Second, the noticeable reduction in the number of active underwriters is also the result of

mergers and acquisitions in the industry. During the five-year period from 1997 to 2001 there were close to fifty major mergers in the industry (f.n.9). As a result of both trends the number of bond underwriters declined significantly.

Even after the decline, the number of active international underwriters is still fairly large. Close to two hundreds firms regularly participate in the various syndicates that are formed each week. Furthermore, according to Altinkilic and Hansen (2000), economies of scale do exist in the underwriting industry. The increase in the median issue size to five hundred millions in 2002 may be driven by a tendency of the issuers to share the benefits of the decreasing costs.

4. Definition of the Debt Issue Cost

In the underwriting process, of issuing new securities, there are three prices that merit attention. First, as in any underwriting agreement, the syndicate guaranties a given price to the issuer. This price determines the overall amount that the issuer would receive from the lending syndicate on the date of issue. We denote this price by P_I . The second price – often referred to as re-offer price—is the sale price. At this price the underwriters are able to sell the entire issue. We denote this price by P_S . A third price that seems to be relevant is the market price a day or two after trading commences. We denote this price by P_M . In addition to the three prices, we collected data on the underwriters' fee (FEE). In the next section we use these four variables (P_I , P_S , P_M and FEE) to calculate the total issue cost and its components. (f.n.10).

We use these three price variables (P_I , P_S , P_M), together with the underwriter fee (FEE), to calculate the total issue cost and its components. In order to use a standardized scale, we measure the cost components, as well as their total, relative to the market value of the bonds. The total issue cost is written as

$$C_T = C_D + C_I, \text{ where, } C_D = FEE / P_M \text{ and } C_I = (P_M - P_I) / P_M$$

C_D denotes the direct costs and C_I denotes the indirect costs. The indirect costs, C_I , may be further decomposed as follows:

$$C_I = (P_M - P_I) / P_M = (P_S - P_I) / P_M + (P_M - P_S) / P_M$$

The first term represents an indirect payment to the underwriter, referred to as the underwriter spread. The second term represents the implicit cost associated with underpricing. Therefore, total compensation to the underwriter as a percentage of the market value is defined as

$$C_u = FEE / P_M + (P_S - P_I) / P_M = C_D + S$$

In addition to the price and fee information, we obtained data on the issue size (measured as the total nominal face value), and years to maturity. Finally, two other variables are recorded from the contract: credit rating of the issue, and the number of syndicate members.

The way we define the credit quality variable merits further explanation. Bond ratings are issued and maintained on a continuous basis. The rating process of international bond is very similar to that of domestic bond, a description of which is provided by Jewell & Livingston (1999). A small fee is collected from issuers who request rating. An issuer, who pays the fee, may participate in the rating process by making a presentation to the rating firm. The typical fee charged by the rating firms is two basis points of par value (of the issue) for each year (f.n.11).

Corporate bonds are ranked primarily by S&P and Moody's rating. There are a few cases when the rankings are not identical. In these cases we follow the conclusion of Jewell and Livingston (1998) and average them. The issues are then grouped into 5 numerical cells. The top rank (no. 5) includes issues of top quality such as AAA. The second group (rank no. 4) includes the bonds of firms of high quality (e.g. AA+ and AA). The third group (rank no. 3) covers broadly the so-called firms with "strong payment capacities" range (AA- to A+). Low

investment grade issues of "adequate payment capacity" are classified as rank no. 2 (A to A-range). Non-investment grade are classified as rank n. 1 (BBB and below). (f.n.12).

5. Sample Characteristics and Descriptive Statistics

1. Before the EMU

We begin our investigation by comparing the issue costs of dollar denominated bonds with the costs of bonds that were denominated in three of the main legacy currencies that became part of the euro. The currencies are the three most important constituents of the ECU (by weight) other than British pound. (f.n.13). Our first sample covers the period from September 1996 to October 1997. Specifically, we focus here on fixed-coupon bonds that are denominated in four currencies: American Dollars, German Marks French Francs and Dutch Guilders denominated bonds. We sampled 316 issues, which represent approximately 19.65% of all the relevant issues during the sample period. (f.n.14). All issues were placed by large banking syndicates.

We focus on a period that preceded the market integration process mandated by the Maastricht Treaty. The sample period ends a year before the weights in the new currencies were fixed in September 1998. During this sample period, a relative stability existed in the secondary market. It should be pointed out, however, that bond yields and variability still differed between the currencies that we consider. This could indicate that different risk characteristics exist between the various instruments.

Table 1 provides descriptive statistics for the pre-EMU period. The variables can be divided into two groups: issue costs and their components (total costs, underpricing, and underwriter spread) and issue characteristics (maturity, amount, number of underwriters, and credit rating).

The mean size of the dollar denominated bond issues, in the sample, is 345 million dollars. This is significantly larger than the mean size of mark denominated issues (316 million) and that of Guilder denominated bonds (255 millions). Dollar denominated bonds are issued for shorter periods of time than the others. The average quality of issues denominated in dollars has a numerical value of 3.6. The comparable number for the other issues is about the same. Evidently, our sample is skewed towards high quality bonds. This could be due to a process self-selection: only high quality borrowers try to sell their debt in the international market.

The high average credit quality of the issues and the relatively short maturity suggest that the uncertainty associated with the market price of eurobonds is relatively small. Indeed the average issue costs of these securities (measured in percentage from the bonds' market value after trading commences) are very low. The mean (median) of total issues costs is only about 0.32% (0.29%) for fixed rate US dollar denominated bonds. It is 0.56% (0.36%) for German marks denominated issues and 0.56% (0.57%) for French francs denominated issues (f.n.15).

The total costs of issue are lower for USD issuers compared with non-USD issuers. The differences in underwriter fee are large and significant. For example, the average fee for German mark issues is 0.95 percent higher than the average fee for USD issues. The average underwriter spread for the four sub-samples is in the -0.69 to -1.54 percent range. The mean spread is negative for USD denominated bonds. It is also negative for each of the other currencies. In fact, the spreads are more negative for the non-USD issues. As a result, the differences in total issues costs between the USD bonds and the non-USD bonds are substantially smaller than the corresponding differences in underwriter fee.

For dollar denominated bonds, the mean underpricing is close to zero. For the other currencies, the mean underpricing is positive. The two main cost-components, fee and spread,

are negatively related. For example, for dollar issues the spread is negative on average (-0.69) because the guaranteed price to the issuer is set to be above the sale price. The mean underwriter's fee is about 1.03% so the net cost is 0.32%. The results for the other currencies are not very different.

2. After the EMU

The second sample covers most of 2002, after the euro replaced the twelve constituent currencies in all public and private transactions. The sample includes 199 observations: 83 issues of USD denominated bonds and 115 of euro denominated issues (f.n.16). Overall, the number of issues in the market for 2002 was about the same as it was in 1997. Each issue, however, was much larger, on the average, so the overall amount in 2002 is significantly larger than it was in 1997. During 2002 the number of euro denominated issues was very close to that of USD denominated issues.

Table 2 provides descriptive statistics for the post-EMU period. As can be seen the size of the dollar denominated bond issues is about twice as large as it was before the EMU was launched. Clearly, recent issues are much larger in size. This trend is even more pronounced in the case of euro denominated issues. Their median size is close to that of USD denominated issues. The mean size, of 600 millions euros per issue, is much larger compared with that of the past constituent currencies (see Table 1). The large increase in size explains part of the sharp decline in issuance cost that occurred after the introduction of the euro. The high average credit quality of international bond issues remains the same in the two periods. It is also almost the same for USD denominated issues and for euro denominated issues. Maturity is also very similar for both USD and euro denominations.

Total issue costs decline for USD denominated issues in comparison with the situation that prevailed before the EMU. By contrast, the total cost of issue for euro denominated bonds declined markedly after the introduction of the euro: it is now about the same for euro and for USD denominated issues. The difference in cost components, however, still exists. Specifically, there are statistically significant lower underwriter fee values. Euro denominated bonds carry lower fee. The average fee, of 0.42%, is about the same as the fee mentioned by Santos and Tsatsaronis (2002) for the year 2001. The spreads are different as well. The average underwriter spread for USD denominated issues is -0.27 while the spread for Euro denominated issues is significantly lower (-0.05). The mean underpricing in the post-EMU sample is close to zero. This is true for both types of issues. Evidently, the International bond market is highly efficient and underwriters do offer the bonds at a price that is very close to the expected market price.

The two main cost components, fee and spread, are still negatively related in the post-EMU sample. Their relative size, however, is smaller than it used to be in 1997. These results provide further support to the hypothesis, of Melnik and Nissim (2003), that underwriters determine the two cost components (the fee and the spread) strategically. For fixed rate bond issues, spread, is negatively correlated with fee (f.n.17). This suggests that there is a trade-off between the fee and the guaranteed price to the issuer (which determines the spread). That is, the price guaranteed to the issuer is set above its expected market value on average. It may indicate a “strategic” behavior of underwriters: they determine the two components of compensation so that one component compensates for the other.

To sum up, the above statistics indicate that the structure of issue costs, and in particular underwriter’s compensation, is different in size but not in substance. Both compensation components are important: the fee is positive and large and the guaranteed price is set well above

the expected market value resulting in large negative spread. The other values - total costs, maturity, amount, number of underwriters and credit quality - are about the same for both types of bonds. It indicates that the integration of the European capital markets had a very strong impact on the cost of debt for non-USD issuers: the cost of issue declined significantly as a result of the introduction of the euro currency.

6. Empirical Results

Previous studies that dealt with debt issue costs in the US market found that they are negatively related to credit quality. There are three possible explanations for the negative relation between issue costs and credit quality. First, in cases when credit risk is comparatively high, it is more difficult to estimate the correct sale price. Hence, fees should increase with credit risk to compensate for this effect. Second, high quality bonds are less expensive to sell because of the existence of more liquid secondary markets for them. This may be attributed to regulations that require many financial institutions to hold only investment grade bonds. Third, if the issuer eventually defaults the underwriter may suffer damage to his reputation. A higher price for riskier bonds is required to compensate for that (fn 18).

Table 3 presents the results of regressing the total issue costs and its components (i.e. fee, spread and underpricing) on two issue characteristics: time to maturity and credit quality. In Panel A the results for 1997 are displayed. The coefficients on years to maturity are positive but are mostly insignificant. The coefficient on the debt quality variable, DQ, is, by and large, negative and in several cases also significant. This indicates that issue costs are indeed increasing in credit risk. Examination of the components' regression reveals that the positive differences in underwriting fees (and the negative differences in spread) between non-USD issues and USD issues are not due strictly to differences in issue characteristics (f.n.19).

In the underpricing regression, none of the issue characteristics is significant. However, consistent with the positive mean underpricing of the non-USD currencies and the close to zero mean underpricing for USD issues, the coefficients on the currency dummies are positive and significant. This result indicates that the underpricing of non-USD issues is driven primarily by the currency denomination and not by issue characteristics (f.n. 20).

Panel B of table 3 contains the same regression for 2002. Again, for both USD denominated bonds and euro denominated bonds, total costs are negatively related to credit quality. Both components, fee and spread are also negatively related to credit quality, however, in the case of euro denominated bonds not significantly. In the case of USD denominated bonds, fee is negatively (and significantly) related to maturity and spread is positively related to it. In the case of euro denominated bonds, maturity appears to have no impact on total cost or any of its components.

As noted, in both periods, underwriter fee is an important explanatory variable for underwriter spread (negative relation) even after controlling for issue characteristics. This could be an indication of strategic pricing by underwriters. To examine whether this trade-off between the fee and the spread holds, we regress the spread, on the fee and the issue characteristics for each of the three currencies separately. We also run a regression with all the observations allowing for currency dummies. **Table 4** presents the results. The coefficient on underwriter fee is negative and significant in all the regressions. That is, the trade-off between the fee and the spread exists both for USD denominated bonds and non-USD denomination currencies as well.

In the 2002 sample the fee coefficient is similar/different in the USD and euro denominations to the extent that the market for non-USD Eurobonds is smaller and less liquid than the market for USD denominated bonds, underwriters are likely to form larger syndicates

when selling non-USD bonds. To examine this conjecture, we regress the number of underwriters on each currency denomination and on issue characteristics. **Table 5** presents the results. As expected, the issues' amount is significantly and positively related to the number of underwriters. The effect of other issue characteristics, however, is generally insignificant.

7. Summary and Conclusions

This study investigates and compares the issuance costs of Eurobonds denominated in USD and European currencies before and after the completion of the EMU in 2002. We find that the introduction of the euro has reduced the issue cost of euro-denominated bonds compared with bonds denominated in the legacy currencies. The reduction of issue cost is due primarily to the drastic reduction of underpricing. After the introduction of the EMU, there was a substantial reduction in the underwriter fee of euro-denominated bonds and a similar increase in the underwriter spread. The net effect on underwriter compensation was rather small. The strong trade-off between the fee and the spread, which has been documented for USD-denominated bonds in the pre-EMU period, existed for bonds denominated in the legacy currencies as well, and continues to exist after the EMU both for USD and euro-denominated bonds. However, the average spread is now substantially less negative and the average fee is smaller.

The EMU has also changed the characteristics of euro-denominated issues, particularly maturity and syndicate size. These changes are consistent with the expected effects of the EMU on the liquidity, investor base and transactions costs of euro-denominated bonds.

References

- Allen, David S. Robert E. Lamy and Rodney G. Thompson, 1990. "The Shelf Registration of Debt and Self-Selection Bias". Journal of Finance 45, 275-288.
- Altinkilic, Oya and Robert S. Hansen, 2000. "Are There Economies of Scale in Underwriting Fees? Evidence of Rising External Financing Costs". Review of Financial Studies 13, 191-218.
- Anouk, Claes, Marc J. De Ceuster and Ruud Polfliet, 2002. "Anatomy of the Eurobond Market: 1980-2000". European Financial Management, 8, 373-386.
- Berger Allen N., Rebecca Demsetz and Philip Strahan, 1999, "The Consolidation of the Financial Service Industry: Causes, Consequences and Implications for the Future", Journal of Banking and Finance, 23, 135-194.
- Datta, Sudip, Mai Iskandar-Datta, and Ajay Patel, 1999. "Bank Monitoring and the Pricing of Corporate Public Debt", Journal of Financial Economics, 51, 435-449.
- De Santis, Giorgio, and Bruno Gerard, 1998. "How Big is the Premium for Currency Risk?", Journal of Financial Economics, 49, 375-412.
- Erb, Claude B., Campbell R. Harvey and Tadas E. Viskanta, 1996, "Political Risk, Economic Risk and Financial Risk". Financial Analysts Journal 52, 29-46.
- Frankel, Jeffery, and Andrew Rose, 2002. "An Estimate of the Effect of Common Currencies on Trade and Income", Quarterly Journal of Economics, 117, 437-466.
- Glick, Reuven, and Andrew Rose, 2002. "Does A Currency Union Affect Trade? The Time-Series Evidence", European Economic Review, 46, 1125-1151.
- Hansen, Robert L. and Paul Torregrosa, 1992, "Underwriter Compensation and Corporate Monitoring", The Journal of Finance, 67, 1537-1555.
- Hartmann, Philipp, Angela Maddaloni and Simone Manganeli, 2003, "The Euro-Area Financial System: Structure, Integration and Policy Initiatives", Working Paper no. 230, European Central Bank
- Helwege, Jane and P. Kleinman, 1998. "The Pricing of High-Yield Debt IPO's", Journal of Fixed Income, 8, 61-68.
- Heston, Steven L. and K. Geert Rouwenhorst. "Does Industrial Structure Explain the Benefits of International Diversification", Journal of Financial Economics, (August 1994), 3-27.
- Jewell, Jeff and Miles Livingston, 1998, "Split Ratings, Bond Yields and Underwriter Spreads". Journal of Financial Research 21, 185-204.

Jewell, Jeff and Miles Livingston, 1999. "A Comparison of Bond Ratings from Moody's, S&P and Fitch". Salomon Center Monograph, New York University.

Kool, Clemens J. M., 2000. "International Bond Markets and the Introduction of the Euro", Federal Reserve Bank of St. Louis Review, 82, 41-56.

Kroszner Randall and Rajan Raghuram, 1997, "Organization Structure and Credibility: Evidence from Commercial Bank Securities Activities Before the Glass-Steagall Act", Journal of Monetary Economics, 39, 475-517.

Lee, Inmoo, Scott Lochhead, Jay Ritter, and Quanshui Zhao, 1996. "The Costs of Raising Capital". Journal of Financial Research 19, 59-74.

Livingston, Miles, Hugh Pratt, and Charles Mann, 1995. "Drexel, Burnham, Lambert's Debt Issues". Journal of Fixed Income 5, 58-75.

Livingston, Miles and Miller, R., 2000. "Investment Bank Reputation and the Underwriting of Nonconvertible Debt". Financial Management 29, 21-34.

Melnik, Arie and Doron Nissim, 2003. "Debt Issue Costs and Issue Characteristics in the Market for US Dollar Denominated International Bonds", European Finance Review 7, 277-296

Melnik, Arie and Plaut, Steve E., 1996. "Industrial Structure in the Eurocredit Underwriting Market". Journal of International Money and Finance 15, 623-636.

Rose, Andrew, and Eric van Wincoop, 2001. "National Money as A Barrier to Trade: The Real Case for Monetary Union", American Economic Review, 91, 386-390.

Santos, A. C. Joao, and Kostas Tsatsaronis, 2002. "The Cost of Barriers to Entry: Evidence from the Market for Corporate Euro Bonds Underwriting", Mimeo, Federal Reserve Bank of New York, pp. 1-47.

Sentana, Enrique, 2002. "Did the European Monetary Union Reduce the Cost of Capital?", The Economic Journal, 112, 786-809.

Smith, Roy C., and Ingo Walter, 2000. Investment Booking in the Euro-Zone, Pitiman/ Financial Times, London.

Wasserfallen, W. and Wydler, D., 1988. "Underpricing of Newly Issued Bonds: Evidence from the Swiss Capital Market". Journal of Finance 43, 1177-1191.

West, Richard R., 1967. "Determinants of Underwriter's Spread on Tax Exempt Bonds". Journal of Financial and Quantitative Analysis 3, 241-263.

White, H., 1980. "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct test for Heteroskedasticity". Econometrica 48, 817-838.

Endnotes

1. Investment bankers also cite the reduction in price variability (in the secondary market) as another reason for preferring a global issue over a domestic offer.
2. Furthermore, in the European financial markets (before the integration) the bias towards domestic securities was augmented by restrictive regulations. Before the creation of the EMU most European pension funds were constrained, by regulators, to invest no more than 20% of their funds in foreign currencies denominated assets. With the introduction of the euro such restrictions were practically abolished.
3. The statistics in this section were extracted mainly from OECD, Financial Market Trends (various issues) and OECD, Financial Statistics.
4. A detailed description of the market is provided by Anouk, De Ceuster and Polfliet (2002). They constructed summary statistics for the period 1980-2000 using information about 33,025 publicly issued Eurobonds.
5. Another change that occurred during that period had to do with the periodical payment. In the 1980's most bonds paid an annual coupon. Since the mid-nineties semi-annual coupons became the norm. So now, most of the newly issued debt has a somewhat shorter maturity combined with more frequent interest payments.
6. International bonds are often issued in combination with domestic issues. In such case, the lead bank may head two syndicates, or there may be two or more lead underwriters in order to cover the two tranches. In either case, the National Association of Securities Dealers (NASD) requires that the offering price should be the same to all investors regardless of nationalities. Similarly, the international tranche (regardless of the country of origin of the issuer) can not price discriminate between international investors.
7. According to Anouk, De Ceuster and Polfliet (2002) 17% of all Eurobonds are placed by a single bank, the rest are taken up by syndicates. When a syndicate is used for distribution, in over 90% of the cases the issue is coordinated by a single leading bank. In particularly large issues, some of which may exceed two billion dollars in value, two or three banks may share the book-running duties.
8. The "term-sheet" contains a short description of the borrower and an outline of the issue (coupon, maturity, suggested yield, fees, etc.). It also contains summaries of relevant financial statements plans for use of proceeds and agreements to be signed.
9. Some of the most visible mergers were Morgan Stanley with Dean Witter, Bankers Trust with Deutsche Bank, SBC Warburg with UBS, PaineWebber with UBS, Robertson Stephens with Bank America, Bank America with NationsBank, BankBoston with Fleet Financial Group, Oppenheimer with CIBC Wood Gundy, Salomon with Smith Barney, Schrodgers with SSB Holdings, BZW with ABN-AMRO Holding, Donaldson Lufkin & Jenrette with CSFB and JP Morgan with Chase Manhattan Corp.

10. In practice, in addition to the three direct price components, the issuer has to bear also some indirect costs such as accounting, legal, printing etc. We do not have information on the actual magnitude of these costs. In addition to such fixed indirect costs there is also a small "rating maintenance" cost that we do not consider in this study.
11. As noted, the annual fee for "rating maintenance" is two basis points per face value of the issue. This is subject to a basic fixed fee of around \$25 000. This fee usually applies for straight bonds of firms that already have a rated debt outstanding. Higher rates are charged for first time issuers (IPO's). Higher rates are also applicable to complex debt issues (e.g. equity linked, multi currency etc.).
12. In a similar way we rank sovereign debt, most of which is issued by governments of stable western countries. We group sovereign debt into 5 ranking categories by converting the score of rating organizations. A lucid explanation of how sovereign risk ranking is constructed is contained in Erb, Harvey and Viscanta (1996).
13. The designated weights of the ECU basket were 31.9% for the German Mark, 20.3% from the French Franc, 12.5% for the British Pound and 9.9% for the Dutch Guilder. Since the British Pound was not merged into the new currency we do not analyze the cost of pound denominated bonds.
14. The data set was provided by a major investment bank out of the list of "participation offers". We checked the data against the list of new international bond issues that are published weekly by the Financial Times and the Herald Tribune. The lists are almost identical.
15. These figures may be compared with domestic costs of large debt floatation. For example, Lee, Lochhead, Ritter and Zhao (1996) report that the cost of issuing straight bonds (for large issues) is 0.64%. Livingston and Miller (2000), Smith and Walter (2000) and Altinkilic and Hansen (2000) mentioned the existence of economies to scale in issuing debt. The larger scale in the international bond market may explain the big difference in costs.
16. During 2002 there were 642 issues of long term (more than two years) straight bonds denominated in euro. Out of these we sampled 19.6% (i.e. 125 issues). Out of these we deleted 9 issues because of missing data.
17. Front-end fees are paid apparently for two basic reasons: 1) issuers and/or underwriters use fees to add or subtract from the spread, and 2) syndicate members are not a homogeneous group. They perform various functions that require varying compensation rates.
Borrowers may reduce the tax payment by minimizing spreads. Therefore they may offer to pay higher front-end fees (which are tax-deductible immediately) in return for a significant reduction in spreads. Underwriters may prefer fee income in lieu of higher spread because it is certain and their tax obligations are not sensitive to the combination. In addition to the tax motivation of issuers and underwriters, some level of fees is required to compensate different syndicate participants. This is accomplished through the

fee which is certain rather than the uncertain spread. While all syndicate members share in the total fee, they do so unequally. The exact distribution between leader and followers often depends on the difficulty that the bookrunner encounters in marketing the issue to lower-level managers. Having a large pool of fee income to distribute to potential participants is viewed by market partitioners as a flexible tool that the organizing banks may use to increase participation without having to rely on the (uncertain) spread.

18. In fact, some past studies such as Allen, Lamy and Thompson (1990) focus on the spread and found that it is negatively related to the credit rating of the issue and positively to the time to maturity. Other studies place emphasis on underwriter's fees and they find also that fees are positively related to the issue's time to maturity and negatively related to various measures of credit quality. See also Jewell and Livingston (1998) for a discussion of these relationships.
19. Studies by West (1967) and Jewell and Livingston (1998) as well as others have investigated the determinants of direct underwriters fees. These studies generally find that the fees are positively related to the issue's time to maturity and to the existence of call features. They are also negatively related to measures of credit quality.
20. While significant underpricing exist in many equity markets most studies did not detect underpricing in bond markets. More on that can be found in Datta, Iskandar-Datta, and Patel (1999), Wasserfallen and Wydler (1988) and Helwege and Kleiman (1998).

Table 2
Descriptive Statistics for the Post EMU Sample

	U.S. Dollar (N = 83)			Euro (N = 115)			t(Δ)
	Mean	Med	StD	Mean	Med	StD	
COST	0.43	0.26	0.54	0.43	0.33	0.48	0.00
UNDERPR	0.03	-0.01	0.20	0.04	0.00	0.34	0.26
COMP	0.40	0.26	0.45	0.38	0.32	0.35	-0.34
RFEE	0.67	0.35	0.68	0.43	0.33	0.41	-2.86
SPREAD	-0.27	-0.01	0.61	-0.05	0.00	0.51	2.68
MATUR	6.00	5.00	2.54	6.37	5.00	3.65	0.84
AMOUNT	687	500	750	600	440	655	-0.85
UNDERWR	13.4	12.0	6.9	12.1	11.0	5.7	-1.48
DQ	3.52	4.00	1.16	3.40	3.00	0.93	-0.78

Med is the median, StD is the standard deviation, and $t(\Delta)$ is the t-statistic associated with the difference in the mean value of the variable between the European currency bonds and the USD bonds. The issue costs are measured relative to the market value of the issue after trading commences, and are expressed in percentage points. COST is total issue costs. RFEE is the underwriter fee. SPREAD is the indirect component of the underwriter compensation, that is, the difference between the offering price and the price guaranteed to the issuer. COMP is the sum of RFEE and SPREAD. UNDERPR is underpricing, that is, the difference between the market price and the offering price by the underwriter. MATUR is the number of years to maturity on the issue date. AMOUNT is the amount issued in millions of U.S. dollars (for non-USD issues, amount is multiplied by the exchange rate on the date of issue). UNDERWR is the number of underwriters. DQ is a debt quality measure that receives values between 1 and 5, where 5 is the highest grade and 1 is the lowest grade.

Table 3
Regressions Examining the Determinants of Issue Costs By Sub-periods

Panel A: Pre-EMU							
Dep. Var.	Intercept	NON\$	MATUR	AMOUNT	DQ	R ²	N
COST	0.545	0.168	0.017	0.160	-0.101	0.071	316
	3.811	2.067	1.367	1.339	-2.829		
UNDERPR	-0.059	0.139	0.005	0.086	-0.005	0.039	316
	-0.540	2.470	0.547	0.786	-0.185		
COMP	0.604	0.029	0.012	0.074	-0.096	0.054	316
	5.413	0.479	1.387	1.033	-3.417		
RFEE	1.964	0.822	0.003	-0.109	-0.254	0.459	316
	13.766	12.457	0.309	-0.839	-6.939		
SPREAD	-1.361	-0.794	0.009	0.183	0.158	0.302	316
	-8.122	-9.479	0.771	1.245	3.736		

Panel B: Post EMU							
Dep. Var.	Intercept	NON\$	MATUR	AMOUNT	DQ	R ²	N
COST	0.912	-0.022	0.002	-0.054	-0.130	0.089	198
	3.609	-0.311	0.164	-1.958	-2.581		
UNDERPR	-0.013	0.014	0.004	-0.020	0.007	0.005	198
	-0.166	0.374	0.537	-1.292	0.428		
COMP	0.924	-0.036	-0.002	-0.034	-0.138	0.147	198
	4.622	-0.662	-0.338	-1.516	-3.409		
RFEE	1.086	-0.253	-0.014	-0.118	-0.070	0.102	198
	5.188	-3.103	-1.622	-2.736	-1.517		
SPREAD	-0.162	0.217	0.012	0.084	-0.068	0.062	198
	-1.250	2.704	1.422	2.137	-2.018		

Heteroscedasticity consistent (White, 1980) t-statistics are reported below the coefficient estimates. The issue costs are measured relative to the market value of the issue after trading commences, and are expressed in percentage points. COST is total issue costs. RFEE is the underwriter fee. SPREAD is the indirect component of the underwriter compensation, that is, the difference between the offering price and the price guaranteed to the issuer. COMP is the sum of RFEE and SPREAD. UNDERPR is underpricing, that is, the difference between the market price and the offering price by the underwriter. NON\$ is a qualitative variable that equals one for issues denominated in a European currency (that is, a legacy currency for the pre-EMU period, or the euro for the post EMU period). MATUR is the number of years to maturity on the issue date. AMOUNT is the amount issued in billions of US dollars (for non-USD issues, amount is multiplied by the exchange rate on the date of issue). DQ is a debt quality measure that receives values between 1 and 5, where 5 is the highest grade and 1 is the lowest grade.

Table 4
Regressions Examining the Trade-off between Underwriter Fee and Spread
The Dependent Variable in Each Regression is the Underwriter Spread (SPREAD)

Panel A: Pre-EMU								
Sample	Intercept	NON\$	MATUR	AMOUNT	DQ	RFEE	R ²	N
USD	0.094		0.039	-0.043	-0.012	-0.886	0.555	201
	0.608		5.808	-0.608	-0.374	-12.054		
legacy	0.765		-0.016	0.023	-0.130	-0.880	0.589	115
	2.717		-1.386	0.183	-2.433	-11.690		
Both	0.359	-0.074	0.011	0.088	-0.064	-0.875	0.656	316
	2.777	-0.944	1.347	1.199	-2.192	-16.804		

Panel A: Post EMU								
Sample	Intercept	NON\$	MATUR	AMOUNT	DQ	RFEE	R ²	N
USD	0.828		-0.002	0.026	-0.174	-0.737	0.684	83
	4.299		-0.139	0.759	-3.652	-6.636		
euro	0.602		0.003	-0.033	-0.069	-0.951	0.566	115
	5.014		0.388	-0.924	-2.277	-12.196		
Both	0.717	0.012	0.000	-0.011	-0.124	-0.809	0.620	198
	5.985	0.285	0.049	-0.510	-3.975	-8.971		

Heteroscedasticity consistent (White, 1980) t-statistics are reported below the coefficient estimates. The issue costs are measured relative to the market value of the issue after trading commences, and are expressed in percentage points. RFEE is the underwriter fee. SPREAD (the dependent variable) is the indirect component of the underwriter compensation, that is, the difference between the offering price and the price guaranteed to the issuer. NON\$ is a qualitative variable that equals one for issues denominated in a European currency (that is, a legacy currency for the pre-EMU period, or the euro for the post EMU period). MATUR is the number of years to maturity on the issue date. AMOUNT is the amount issued in billions of US dollars (for non-USD issues, amount is multiplied by the exchange rate on the date of issue). DQ is a debt quality measure that receives values between 1 and 5, where 5 is the highest grade and 1 is the lowest grade.

Table 5
Regressions Examining the Determinants of Syndicate Size

Sample	Intercept	POST	PRENON\$	POSTNON\$	MATUR	AMOUNT	DQ	R ²	N
Pre-EMU	18.015		4.095		0.145	22.674	-0.544	0.372	259
	8.538		2.917		0.705	6.320	-0.906		
Post EMU	9.443			-0.930	0.224	6.629	-0.549	0.538	198
	7.222			-1.511	2.226	7.914	-1.707		
Both Periods	21.850	-15.247	2.436	-0.801	0.485	9.479	-0.744	0.530	457
	14.356	-15.749	1.703	-1.178	3.269	7.070	-2.098		

The dependent variable is the number of underwriters (UNDERWR). Heteroscedasticity consistent (White, 1980) t-statistics are reported below the coefficient estimates. POST is a qualitative variable that equals one for issues from the post-EMU period. PRENON\$ is a qualitative variable that equals one for issues denominated in a legacy currency. POSTNON\$ is a qualitative variable that equals one for euro-denominated issues. MATUR is the number of years to maturity on the issue date. AMOUNT is the amount issued in billions of U.S. dollars (for non-USD issues, amount is multiplied by the exchange rate on the date of issue). DQ is a debt quality measure that receives values between 1 and 5, where 5 is the highest grade and 1 is the lowest grade.