Do multi-market offerings lower the cost of capital? Evidence from global bonds*

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Current version: October 2002

Abstract. This paper examines the impact of global bond offerings on a firm's cost of capital, issuing costs (gross spreads) and shareholder wealth. Global bonds are very large bond offerings placed simultaneously in the U.S. and Eurobond markets at the same price and are unique in that they are fungible across international markets. Using a sample of 87 global bond issues made by U.S. firms over the period 1996-2001, we find evidence that suggest that firms are able to lower their cost of (debt) capital by issuing these multi-market securities, and that this benefit is associated with the increased liquidity and lower issuing costs of these instruments. We also document that the stock price reaction to the announcement of global bond issuance is positive and significant, while comparable domestic and Eurobonds issues by U.S. firms over the same time period are associated with zero changes in shareholder wealth. Overall, our findings suggest that the issuance of global securities is associated with significant benefits.

* We thank Rene Stulz as well as seminar participants at Texas A&M University for helpful suggestions. We especially thank Susan Chaplinsky for suggestions that have improved the quality of the paper.

1. Introduction

As barriers to international capital flows have decreased, the resulting integration of the world's financial markets has initiated a host of financial innovations. In particular, the trend of creating new securities tailored for investors outside a firm's home country has captured the interest of practitioners and academics alike. Perhaps the most well known of these is the American Depositary Receipt (ADR), a security that allows firms to list their equity shares on foreign exchanges. In addition, cross-border corporate debt securities such as Yankee and 144a bonds have also emerged as an important innovation in international corporate finance. As a testament to these instruments' importance, a large and diverse literature has developed relating cross listings of equity and debt to market segmentation, information disclosure, investor protections, market microstructure and most recently, corporate governance. In general, these new securities trade in the foreign market, while the firm's existing securities continue to trade in the home market. However, a new breed of cross-border securities has recently emerged. These "Global" securities are engineered so that one security can trade in multiple markets without restrictions. The most prevalent of these new instruments, Global bonds, are debt instruments that are sold simultaneously in multiple markets at the same offer price. That is, they are similar to domestic public corporate debt except that they can trade easily in markets around the world.[1] While the first issuance of a global bond by a non-financial U.S. firm was in 1996, over $100 billion has been raised to date.[2]

In this paper, we pursue several objectives. First, we examine the impact of Global bonds on the cost of (debt) capital. We exploit the unique fungiblity of Global bonds to provide direct evidence on the impact that market imperfections, such as illiquidity, have on a firm's borrowing costs. Second, we use our Global bond data to provide new evidence on the costs (gross spreads) of issuing multi-market securities relative to domestic issues. Finally, we examine the impact that global bond issuance has on shareholder wealth.

[1]Even more recent is the development of Global Registered Shares (GRS). A GRS is similar to an ordinary share except that investors can trade it on various stock exchanges around the world in many currencies. Currently, there are 4 GRS programs trading around the world. For a detailed study of DaimlerChrysler's GDS, see Karolyi (2000).

[2] The World Bank issued the first global bond in 1989.

Using a sample of 87 global bonds issued by U.S. firms over the 1996-2001 time period, we find that both the borrowing costs and the issuing costs of global bonds are significantly lower than that for similar U.S. domestic bonds. We also find that both the bid-ask spread and the frequency of zero return days for global bonds are lower than that of domestic bonds, which is consistent with the hypothesis that global bonds enjoy greater liquidity than their pure domestic counterparts. Our findings suggest that firms are able to lower their cost of (debt) capital by issuing these multi-market securities, and that this benefit is associated with the increased liquidity and lower issuing costs of these instruments. Finally, we document that the stock price reaction to the announcement of global bond issuance is positive and significant, while comparable domestic and Eurobonds issues by U.S. firms over the same time period are associated with zero changes in shareholder wealth. Overall, our findings suggest that issuing global securities is associated with significant benefits.

Multi-market security offerings can be rationalized by the existence of market imperfections. A number of papers (see, e.g., Chaplinsky and Ramchand (2000a), Miller (1999), Foerster and Karolyi (1999), Errunza and Miller (2000), Foerster and Karolyi (2000), Kim and Stulz (1988)) examine the impact of international market imperfections such as transactions cost, information costs, taxes and government restrictions, on stock prices. In general, the approach of these papers has been to identify potential ways by which financial instruments, such as multi-market Equity Offers, American Depositary Receipts (ADRs) and Eurobonds, mitigate or exploit potential market imperfections. These studies have documented evidence consistent with the hypothesis that these instruments alleviate market imperfections, resulting in a higher stock price for issuers. Although the focus of the above papers has been to analyze whether mitigating market imperfections results in lower cost of capital for firms, the empirical approach adopted has often been to examine the stock price reaction to the announcement (or listing) of these financial instruments. Stock price reaction studies, however, confront a joint hypothesis problem, since a positive stock price reaction may be consistent with multiple theories. For example, Stulz (1999) argues that the documented positive stock price reaction to the announcement of an ADR may indicate lower cost of capital for issuers *or* higher cash flows (i.e. signaling quality). Hence, by analyzing stock price reactions, prior

studies have provided only indirect evidence on the impact of market imperfections on the cost of capital.

Global bonds, however, provide a unique opportunity to examine the impact of market imperfections on the cost of debt since the borrowing costs of issuers can be analyzed. Global offers, by mitigating the impact of market imperfections, can potentially increase the price obtained by the issuer and thereby lower the cost of capital. We provide evidence on the potentially lower cost of capital for global issuers by comparing the at-issue yields of global bonds to domestic bonds, using standard bond pricing models. Thus, we are able to provide direct evidence on whether global bonds, by mitigating market imperfections, result in lower borrowing costs and hence lower the cost of debt to issuers. It is important to note that this approach of comparing yields on securities issued in two different markets has been used in papers (Kidwell, Marr, and Thompson (1985), Finnerty and Nunn (1985)) that have attempted to examine the benefits of eurobond issuance by U.S. firms. However, Kim and Stulz (1988) point out that having a lower yield in the eurobond market does not necessarily imply a net benefit to a U.S. firm, since there are likely to be differences in non-interest costs in the two markets that offset any interest benefits. These differences include issuance procedures (registration and disclosure requirements tend to be more stringent and costly for U.S. domestic debt relative to eurobonds), flotation costs (different gross spreads maybe charged by underwriters in different markets) and indentures (eurobonds generally have fewer restrictive bond covenants than U.S. domestic bonds). Because of these differences, direct comparisons of the cost of (debt) capital across markets have been problematic.

In the case of global bonds, however, comparison of at-issue yields can be used to provide evidence of differences in cost of debt, since the non-interest costs of global and domestic bond issuance are similar. This is because issuance procedures, flotation costs and indentures are uniform across global and domestic bond issuance. Hence, using global bonds, one can conclude that different at-issue yields in the global and domestic markets imply different cost of debt to issuers in these markets. This is an important advantage of using global bonds for examining the impact of market imperfections on the cost of (debt) capital.

We also analyze gross spread data of global and domestic bond issuance to provide new evidence on the relative cost of issuing corporate bonds in different markets. In the Eurobond market, a portion of the reported gross spread may be passed on to large investors in the form of rebates (Kim and Stulz (1988)). Thus, the reported gross spread for Eurobonds is actually an upper bound estimate of true gross spreads. Hence, even if the reported gross spread in the Eurobond market is higher than that in the Domestic bond market, the true gross spreads, after considering rebates, is not necessarily so. Since information on rebates is not available, the comparison of true issue costs (gross spreads) in the Eurobond and Domestic bond markets is virtually impossible. While the relative costs of issuance between the world's two largest bond markets is of obvious interest to academics and practioners alike, this rebating procedure has precluded an answer to this important question[3]. Since global bonds are placed in the U.S. and Eurobond markets, there is a possibility of rebating in the global bond market. However, if evidence is found that reported global bond gross spreads are lower than the reported domestic bond gross spreads, then one can be confident that the true global gross spreads are lower than the true domestic bond gross spread. Therefore, this paper has the potential to provide new evidence on the relative true gross spreads of corporate bond issuance in the domestic and global bond markets. This analysis of issuing costs of global bonds relative to domestic bonds also helps identify other potential benefits of global issuance. In fact, underwriters and the financial press often cite lower gross (underwriting) spreads as a benefit of global bond issuance.[4]

To identify other potential benefits of multi-market security issuance, we investigate the liquidity of global bonds. We focus our discussion of liquidity in terms of both longer trading hours and lower transactions cost. Global bonds are typically traded in different international markets and since the time zones of these markets do not perfectly overlap, the trading hours for global bonds is potentially longer than that for domestic bonds. Longer trading hours are facilitated by the fact that the clearing and settlement systems for global bonds are set-up to handle cross-market transactions

[3] Relative cost of issuance in different markets is useful for studying issues like the effects of market structure of underwriters on underwriter fees.
[4] Euromoney, July 30, 1999.

efficiently[5]. The longer trading hours of global bonds is an advantage since ideally, investors would like to have the option to sell or buy bonds if an event occurs that suddenly makes their position too risky or makes some bonds very attractive.[6] In addition, global bonds are typically very large bond issues (average size: $ 1 billion) since they are placed in multiple markets and the financial press suggests that global bonds, by virtue of their large size, are liquid instruments.[7] To directly examine the transactions cost aspect of liquidity of global bonds relative to domestic bonds, the bid-ask spreads for global and domestic bonds and the frequency of non-zero daily returns using the average of daily bid and ask price quotes are analyzed.

Finally, we investigate the impact of global bond issuance on shareholder wealth. In addition to measuring any benefits to shareholders from the issuance of global bonds, our findings add to research that examines the wealth effects of issuing securities outside a firm's domestic market. For domestic debt securities, Eckbo (1986) finds that on average straight debt offerings by U.S. firms have non-positive price effects. However, Kim and Stulz (1988) find a positive market reaction to Eurobond offerings issued by U.S. firms during their sample period. They argue that this is consistent with a clientele effect wherein there is a sudden increase in demand for certain kinds of securities. Therefore, our stock price analysis allows us to further ascertain the benefits of global bonds by comparing the shareholders wealth effects of global securities to both pure U.S. and pure Eurobond offerings.

This paper is organized as follows. Section 2 describes the institutional features of a global bond offering and the clearing and settlement procedures for global bonds. Section 3 discusses how global bonds may benefit issuers and investors relative to domestic bonds. Section 4 describes the global and domestic bond samples and provides some characteristics of the issuers. Section 5 discusses various econometric issues addressed in this paper. Section 6 compares the yield spreads and gross (underwriting) spreads of global and domestic bonds and investigates the sources of benefits to global

[5] See "The Rise of Global Bonds", Financial Market Trends, June 1994 and "The Global Conundrum", Euromoney, January 1992.

[6] We spoke to investment bankers at UBS-Warburg and Lehman Brothers who cite longer trading hours of global bonds as an important advantage. According to investment bankers, after the Latin American and Asian crises, investors have been demanding bonds with longer trading hours so that they can sell or buy bonds soon after deciding to.

issuance. Section 7 examines the liquidity of global bonds as well as other potential explanations for the lower cost of borrowing on global bonds. Section 8 analyses the stock price reaction to the announcement of global bond issuance. Section 9 provides some discussion on the costs associated with global bond issuance. Section 10 discusses some of the additional tests that were conducted. Section 11 concludes.

2. A Primer on Global Bonds

Global bonds are relatively new financial instruments. The first global bond was issued by the World Bank in 1989 and the first corporate global bond was issued in 1996. As of 2001, over $100 billion has been raised via these instruments by U.S. corporations. Global bonds have several defining features: First, they are engineered in such a way that the one security can trade in multiple markets without restrictions. Second, they are sold simultaneously in multiple markets, such as the U.S. and Euro market, at the same offer price. Third, they are extremely large offerings that are often offered in multiple tranches of differing size and maturity.

U.S. firms are most prevalent issuers in the corporate global bond market, and account for 70% of the issues.[8] Appendix A provides information on a sample global bond issue made by Wal-Mart. This issue was comprised of three tranches issued on August 5th, 1999 that raised a total of 5.750 billion USD. One tranche was a two year bond that raised 1.250 billion USD, another was a 5 year bond that raised 1.250 billion USD, and the third tranche was a 10 year bond that raised 3.250 billion USD. Wal-Mart mentioned that almost the entire bond issue was placed with institutional investors in the U.S., Europe, Asia, and the Middle-East, with less than 1% placed with high net worth individuals. News articles relating to the bond issue mention the liquidity of the proposed bond issue as a key feature of the securities.

Table 1 provides a descriptive comparison of domestic bonds, eurobonds and global bonds on a number of dimensions. Since part of the issue is placed in the U.S., global bond offers must be registered with the Securities and Exchange Commission

[7] See "The Rise of Global Bonds", Financial Market Trends, June 1994.
[8] Source: Securities Data Company

(SEC)[9]. The marketing of a global bond issue is similar to that of a domestic bond issue. A syndicate of underwriters, usually comprising of underwriters with a strong presence in the targeted market places, undertakes the marketing of the issue. Often, the syndicate manager for the international portion of a global offer is the international affiliate of the domestic book manager. The issuer, often in consultation with the lead manager, appoints members of the underwriting syndicate. By law, the offer price must be the same for the domestic and non-U.S. tranches.

2.1. Clearing and Settlement Procedures for Global Bonds

Global bonds are book-entry bonds, which means that investors will not be entitled to receive physical delivery of the bonds in paper form. The book-entry system is used because it eliminates the need for physical movement of securities certificates and enables simultaneous electronic book-entry delivery against payment, thus eliminating the risk from lack of simultaneous transfers of securities and cash.

Figure 1 provides a schematic of the trading and clearing procedures of global bonds. Each global bond is deposited with the Depository Trust Company (DTC) and is registered in the name of DTC or DTC's nominee. Purchasers of global bonds in the U.S. may do so only through DTC, while purchasers of global bonds in Europe can do so only through Clearstream or Euroclear. Because DTC is the only registered owner of the bonds, Clearstream and Euroclear buy and sell global bonds through their respective U.S. depositaries.

Global bonds may be traded as home market instruments in both the Eurobond and U.S. domestic markets. Trading between DTC participants would be settled just like in the case of U.S. domestic bonds. For trading between Clearstream and/or Euroclear participants, settlement would occur in fashion similar to the case of conventional eurobonds except that the transaction is routed through the DTC.

[9] In all global issues with a U.S. component, the SEC had required that 100% of the issue be registered with the SEC. This was as a precaution in case the entire issue was placed in the U.S. or the entire issue after initial placement flowed back into the U.S. However, the SEC made a decision in September 1993 to allow registration of only the portion placed in the U.S. and some margin for flow back from the Eurobond market. This could reduce the registration fees for global issues significantly and further lower the fixed cost of a global issue.

Cross-market trades (a U.S. investor trading with a Eurobond investor) in global bonds can occur and the trading and settlement systems are set-up to handle such transactions. The U.S. investor conducts the transaction through his DTC depositary while the Eurobond investor uses the DTC depositary of Clearstream or Euroclear. The U.S. investor will receive credit for any bonds purchased or cash for any bonds sold, on the DTC settlement date. For Eurobond investors, however, because of time zone differences, credits of global bonds purchased or cash for any bonds sold, will be received the business day following the DTC settlement date. Hence, another important advantage of global bonds appears to be that global bonds may be traded across markets at lower cost relative to domestic bonds, since the clearing and settlement systems for global bonds are set-up to handle cross-market trades. More comprehensive details on the clearing and settlement procedures for global bonds are provided in Appendix B.

3. How Global Bonds Can Potentially Reduce the Impact of Market Imperfections

To understand how global offers can reduce the impact of market imperfections, we compare global and domestic bond issues by U.S. firms. [10] Foreign investors can invest in bonds issued by a U.S. firms in 3 ways: The can (1) purchase global bonds, (2) purchase U.S. domestic bonds directly on a secondary exchange, or (3) purchase bonds in the U.S. domestic primary market. If from the perspective of foreign investors, global bond offers provide no additional advantage relative to acquiring bonds directly from the U.S., global bonds are not likely to enhance the demand for a firm's bonds. Alternatively, if a global bond reduces the cost to foreign investors of acquiring a U.S. firm's debt securities, they could attract a higher price relative to a domestic bond due to the increased demand. The demand curve for a typical bond is likely to be downward sloping in the presence of market imperfections. A global bond, if it reduces the impact of market imperfections, will shift the demand curve to the right, thereby increasing the equilibrium price for the bonds.

A number of market imperfections have been discussed in the international finance literature. A brief discussion is given on how global bonds can reduce the impact

[10] We follow Chaplinsky and Ramchand (2000a) who make analogous arguments in their paper on global equity offerings.

of these market imperfections and thus increase the value of global bonds relative to domestic bonds.

3.1 Liquidity

There are several potential advantages of global bonds relating to liquidity. These include longer trading hours, lower transactions cost for both domestic and foreign investors, size of issue and a more diverse investor base.

If global bonds are more liquid than other corporate bonds, then this should lower the cost of transacting in global bonds compared to a less liquid domestic bond for *both* foreign and U.S. investors. Amihud and Mendelson (1986) develop the liquidity hypothesis in the context of an asset pricing model in which gross returns are an increasing and concave function of bid-ask spreads, a proxy for liquidity. This suggests that liquidity affects asset prices because investors require compensation for bearing transaction costs. Amihud and Mendelson (1986, 1989) find support for their model by finding that common stocks with lower liquidity yielded significantly higher average returns, after controlling for risk and other factors. To test whether liquidity is priced in the bond markets, Amihud and Mendelson (1991) compare the yields on treasury notes and treasury bills with less than 6 months to maturity. For these maturities, both securities are similar short-term, single payment (discount) instruments generating the same underlying cash flows and have identical risk. The liquidity of treasury bills is however higher. Consistent with the hypothesis that investors pay more for liquid securities, Amihud and Mendelson (1991) find that yields on treasury bills are lower than that on treasury notes. Hence, if global bonds are more liquid than domestic bonds, investors may be willing to pay more for them since they incur lower transactions cost.

Another advantage of global bonds is longer trading hours since they can be typically traded in several international markets in different time zones. Hence, a U.S. investor can sell his bonds in a European market even after regular trading hours in the U.S. market. This is possible since the clearing and settlement systems for global bonds are set-up to handle such cross-market transactions efficiently. Longer trading hours would seem to be a desirable feature for investors since they allow the option of being able to trade a bond almost round-the-clock. In fact, Amihud and Mendelson (1991), in

their study of 6-month treasury bills and treasury notes, find that even after accounting for both the bid-ask spread and the brokerage fees, the yield to maturity on notes is higher than the yield on bills of same maturity. This implies that investors are willing to pay a yield concession for the option to liquidate their holdings before maturity at lower costs. The option to trade bonds at lower cost and during longer trading hours is likely to be especially valuable when there is high volatility in bond markets. In view of the Latin American and Asian crises in the 1990s, investors may place increased value on global bonds that have these options. In fact, the World Bank states that global bonds offer the opportunity to trade "…large volumes in any time zone at tight bid-offer spreads".[11]

3.1.1 Transactions Cost

Global bonds are designed to trade and settle like home market instruments from the investors' perspective. That is, Eurobond investors can trade and settle global bonds like they would Eurobonds, while U.S. investors can trade and settle global bonds like they would U.S. domestic bonds. For example, a Eurobond investor can use the same account with one of the European clearing houses (Clearstream or Euroclear) for settling transactions of both global bonds and eurobonds. If however, a Eurobond investor wants to trade in a pure U.S. domestic bond, he would have to open an account with a broker/dealer who has an account with the DTC to execute the trade. To the extent that this lowers transactions cost for global bonds relative to U.S. domestic bonds, Eurobond investors may place a higher value on global bonds.

3.2. Taxes

Taxes can affect the relative value of securities sold in different market places (Kim and Stulz (1988)) since investors' are concerned with their after-tax returns. From a foreign investor's perspective, the U.S. withholding tax is not a factor since it is not applicable to foreign investors who purchase a U.S. global bond or a U.S. domestic bond. Global bonds are designed to be bearer like securities when placed in non-U.S. markets while U.S. domestic bonds are registered instruments. Consequently, foreign investors have to disclose their identities to obtain withholding tax waiver in the case of domestic

[11] www.worldbank.org/debtsecurities

bonds. As Kim and Stulz (1988) highlight, Eurobond investors display a strong preference for bearer type securities that preserve the anonymity of the investor. Hence, to the extent that Eurobond investors value their anonymity, they may be more likely to invest in global bond offers than in U.S. domestic bond offers. However, the anecdotal evidence suggests that institutional investors dominate the global bond market. To these investors, preserving anonymity is not likely to be a concern.[12]

From an issuer's perspective, there may be tax incentives that determine the choice of issuing globally or issuing exclusively in the domestic market. Tax incentives have been found to influence where U.S. multinationals locate their interest deductions worldwide (Newberry and Dhaliwal (2000)). The tax jurisdiction within which interest expenses on bonds are deducted is determined by the location of the issuing entity. Hence, if the Japanese subsidiary of a U.S. company issues a global bond, the interest deductions can be used against revenues of the Japanese subsidiary. Since, all the global and domestic bonds analyzed in this paper are issued by U.S. entities and none by foreign subsidiaries of U.S. firms, tax incentives from an issuer's standpoint, are not likely to play any role in the decision to issue globally in our sample of firms. Therefore, from both investors' and issuers' viewpoints, taxes are unlikely to be a factor in the decision to issue globally in our sample.

3.3. Information Costs

Merton (1987) relaxes the assumption of equal information to all investors in the standard CAPM model. In his model, investors purchase only the securities they know about. Since investors are not fully diversified, some amount of firm specific risk is priced. In his model, firms would be able to reduce their cost of capital by increasing their investor base. Global bonds, since they involve conducting road shows in foreign markets, have the potential to reduce the cost of information acquisition for foreign investors. Also, global securities help foreign investors to identify bonds of interest from the entire universe of potential bond investments. Hence, it is likely that global bonds reduce information costs to foreign investors. Also, Welch (1992) builds a model where under conditions of greater information asymmetries, investors make their purchase

[12] Wall Street Journal, June 9, 1989.

decisions based less on their own information and more on the actions of other investors. In the case of global bonds, the securities are being sold at the same price to U.S. and foreign investors. Even if foreign investors are less informed, they are less likely to exact a penalty for being less informed since they are purchasing the bonds at the same price as supposedly more informed U.S. investors. Hence, a global bond, by design of the instrument, may mitigate information problems for less informed investors and increase the firm's investor base. However, it is important to note that since global bond issuers tend to be well-known companies, information asymmetry may be low compared to other firms.

3.4. Government Restrictions on Ownership

There may be some advantages to global bond offers compared to U.S. domestic offers if there are less government restrictions for foreign investors to invest in global bonds compared to U.S. domestic bonds. This is unlikely to be a factor since frequent purchasers of global securities are investors from U.K., Canada and Japan who typically have not been restricted in their ability to purchase U.S. domestic securities (Chaplinsky and Ramchand (2000a)).

3.5. Market Conditions

If indeed domestic and foreign markets are segmented due to some of the above factors, global bond issuance is a way to overcome this segmentation and enables issuers to effectively access both foreign and domestic investors. This can provide global issuers with valuable flexibility since they can take advantage of strong demand in any of the targeted markets by adjusting allocation of securities among the targeted markets. This option can be especially valuable since global bond offers are typically very large issues and issuers may have to pay a higher yield, due to increasing placement costs (price pressure effects), if it targets only the domestic market at a time when market conditions are not strong. Therefore, the large size of global bonds and hence liquidity, is likely to be a result of their ability to be placed in multiple markets at favorable terms.

4. Issue and Issuer Characteristics

4.1. Data Selection and Issue Characteristics

In this study, we examine global bond issuance by U.S. firms. We do this because U.S. firms comprise the majority of the global bond market and since for comparison purposes, we require data on domestic bond issuance. Domestic bond markets in almost all countries outside the U.S. are less developed and there is little data available on non-U.S. domestic bond issues needed for comparison purposes. An additional advantage of examining issuance of only U.S. firms is that we can control for country-specific factors like macro-economic factors, information disclosure norms, investor protection laws and tax incentives of issuers.

The sample consists of all straight investment grade, fixed rate coupon, U.S. dollar denominated bond offerings, issued by non-financial U.S. firms, in the global bond market, from January 1, 1996 to March 20, 2001. There are 87 global bond issues in the sample. In addition to these 87 issues, there was also one non-investment grade global issuer that was excluded.[13] For comparison purposes, data on domestic bond issuance by non-financial U.S. firms is also collected. The data on global bond and domestic bond issues is obtained from Securities Data Company (SDC) New Issues Database and Bloomberg.

The sample period starts in 1996 with the first global bond issuance by a non-financial U.S. firm. Only U.S. dollar denominated offerings are included, since global bond issuance of U.S. firms are almost all U.S. dollar denominated. We consider only fixed rate coupon bonds, the vast majority of global issues, to facilitate the comparison of borrowing costs across markets. Finally, since the global bond sample consists of only investment grade bonds, only investment grade domestic bonds are chosen to form the comparison sample.

Table 2 provides information on aggregate global bond issuance by non-financial U.S. firms. The entire population of global bonds, using the data filters employed in this

[13] Federal-Mogul is the issuer. The reason for excluding Federal-Mogul is to ensure a more homogenous sample in terms of credit quality since non-investment grade bonds forms a very small percentage of global issuance. In addition, Federal-Mogul had a contaminating story of possible financial distress around the date of issuance.

paper, consists of 90 global bonds that have raised approximately 94 billion U.S. dollars. As mentioned earlier, three non-investment grade bonds by one issuer were excluded. Therefore, the sample used in this paper consists of all investment grade global bond offerings by non-financial U.S. firms.

Table 3 provides statistics on sample global bonds and domestic bonds. As can be seen from the table, global bond issuance has picked up since 1998 and there have been 15 global bond issues through the first three months of 2001. The global bond sample consists of 87 bonds while the domestic bond sample consists of 1932 bonds. The maturity and rating distributions of the global bond and domestic bond samples are similar. Examination of the issue size distributions of global bonds and domestic bonds, however, suggests important differences, with global issues tending to be much larger than domestic issues. This highlights the need to control for differences in issue characteristics of the two samples in our analyses. This and other econometric issues addressed in this paper are discussed in Section 5.

An interesting feature of global bonds is that they are often issued in multiple tranches. That is, a firm issues global bonds of different maturities on the same issue date. A potential reason for issuing multiple tranches could be to target different investor bases so as to make selling the global issue less costly, since placing a large bond offering of a single maturity may be difficult. Table 4 provides information on tranches of global bond issuances. Ten firms issued 2 bonds on the same date (20 bonds), 10 firms issued 3 bonds on the same date (30 bonds), 1 firm issued 4 bonds on the same date (4 bonds) and 33 firms issued one bond (33 bonds). In only a few cases was there a non-U.S. currency tranche or a floating rate tranche. To facilitate comparison with domestic bonds in our analyses of yield and gross spreads, we treat each bond issue, even when it is part of a multi-tranche issuance, as a separate observation. This may result in lack of independence among some observations in the sample. This econometric issue and how it is addressed in this paper is discussed in Section 5.

4.2. Characteristics of Global and Domestic Issuers

Kim and Stulz (1988) show that Eurobond issuers tend to be household names. These firms tend to be large, quality firms with well-known brand names. Since global

bonds issued by U.S. firms are placed in the Eurobond as well as the domestic market, one would expect that firms with lower selling costs in the Eurobond market would decide to issue global bonds. Hence, one may expect that similar firms issue eurobonds and global bonds. Also, one would expect that global bond issuers are large firms since they need to have large debt capacities. Appendix C lists the names of global bond issuers in our sample. Indeed, a typical global bond issuer resembles a typical Eurobond issuer with most issuers being well known companies. Panel A of Table 5 provides data on global and domestic bond issuers' characteristics such as total assets, market value of equity, leverage, profitability, Q-ratio and interest coverage. Based on medians, global issuers have about five times the assets and about eight times the market value of equity of domestic issuers, over the sample period. The median global issue size ($ 995 mill.) is about 6.5 times the median domestic issue size ($ 150 mill.). [14] However, as a proportion of market value of equity, the median global offer is similar to the median domestic offer. Consistent with being high quality firms, global issuers have higher q-ratios. The mean market and book leverage ratios of global and domestic issuers are similar although the median leverage ratios of global issuers are lower. The dividend yields of global issuers are significantly lower than that of domestic issuers while the median coverage ratio is higher for global issuers. As mentioned earlier, in our analyses, we treat different bond issues on the same date by a firm as separate observations. To check whether this is influencing the reported sample statistics, we redo them after treating all bond issues by a firm on the same date, as part of a single issue. These results, which are similar to that in Table 5 Panel A, are reported in Table 5 Panel B.

The characteristics reported in Table 5 suggest that the typical global issuer and offer are much larger than the typical domestic issuer and offer. This suggests the need to control for differences in issue and issuer characteristics of the two samples in our analyses. There is a possibility that the decision to issue globally may be endogenously determined and we control for this in our analyses. The approach used in this paper, to control for potential endogeneity in the decision to issue globally, is discussed next.

[14] The domestic sample used in Table 5 is smaller than that used in Table 3. The loss of some observations is because the data set used in Table 5 is obtained by merging the issue data from Table 3 and financial data from Compustat. The characteristics of the domestic sample used in Table 3 and Table 5 are, however, very similar.

5. Econometric Issues

Because global bonds can potentially reduce the impact of market imperfections and thus increase investor demand, they may be able to command a higher price than comparable domestic bonds. This would predict that issuing global bonds would result in a lower cost of capital, *ceteris paribus.* To provide evidence of differences in borrowing costs between global and domestic bonds, we examine differences in at-issue yields using a pooled sample of global and domestic bonds. To do so, however, a few econometric issues need to be addressed. First, there is the possibility of lack of independence between bonds that are issued by the same firm on the same date. Second, the decision to issue globally may be endogenously determined by issuer and issue related characteristics, such as issuer and issue size. These econometric issues and the approaches adopted to control for them are discussed next.

5.1. Controlling for potential lack of independence of bond issues in multi-tranche issuances

Estimation using OLS assumes that observations are uncorrelated. If some observations are correlated due to the treatment of multi-tranche as single issues, OLS is still unbiased and consistent. However, the standard errors of OLS are no longer correct. To control for this, in all our analyses, we adopt a variation of the standard robust estimator of variance (Huber (1967), White (1980)), developed by Rogers (1993), to compute robust standard errors. This procedure takes into account the possibility that observations within clusters may not be independent. We specify that bond issues by an issuer on the same date are part of the same cluster. [15]

The formula for the standard robust estimator of variance is

[15] We also formed clusters based on issuer. That is, all issues by the same firm are considered part of the same cluster. The results using this cluster classification were similar to that using the cluster classification based on issuer-issue date. We also created a dummy variable that was equal to 1 when an observation was part of a multi-tranche offer and 0 otherwise. The results were similar when this dummy variable was included in the yield and gross spread analyses.

$\hat{Z} = \hat{V}\left(\sum_{j=1}^{N} u_j' u_j\right)\hat{V}$ where $\hat{V} = \left(\partial^2 \ln L/\partial\beta^2\right)^{-1}$ is the conventional estimator of variance and u_j is the contribution from the *j*th observations to the scores $\partial \ln L/\partial\beta$.

In the above formula, observations are assumed to be independent. If however, observations denoted by *j* are not independent but they can be divided into M groups G_1, G_2, ……., G_M that are independent, then the robust estimator of variance is

$\hat{Z} = \hat{V}\left(\sum_{k=1}^{M} u_k^{(G)\prime} u_k^{(G)}\right)\hat{V}$ where $u_k^{(G)}$ is the contribution of the *k*th group to the scores $\partial \ln L/\partial\beta$.

Hence, for the case where observations within clusters are not independent, the application of the robust variance formula involves using a different decomposition of $\partial \ln L/\partial\beta$, namely $u_k^{(G)}$, k=1,……M rather than u_j, j=1,……,N.

5.2. Controlling for potential endogeneity in the decision to issue globally

Table 5 suggests that global issuers are several times larger, in terms of their mean and median assets and market value of equity, than domestic issuers. There are also other issuer characteristics that are significantly different between the two samples. Also, as noted earlier, global issues tend to be much larger than domestic issues. Hence, it is possible that the decision to issue globally is endogenously determined. That is, global issuers may be a non-random sample of issuers that choose to issue globally because it is beneficial to do so. In the presence of endogeneity, results obtained using OLS, assuming an exogenous global dummy variable, are biased. Hence, tests are conducted to control for potential endogeneity in the decision to issue globally.

The econometric problem faced here is similar to the treatment effects model that considers the effect of an endogenously chosen binary treatment on another endogenous continuous variable, conditional on two sets of independent variables. We follow Maddala (1983) who derives the maximum likelihood estimator for the treatment effects model.

Treatment effects model using maximum likelihood estimator

We provide below a brief description of the treatment effects model using the maximum likelihood estimator. The primary regression equation of interest is

$y_j = \beta x_j + \delta z_j + \varepsilon_j$ where y_j correspond to yield spreads or gross spreads, x_j correspond to all the regressors used in the bond pricing model , and z_j corresponds to the global dummy variable. The binary variable z_j, is assumed to stem from an unobservable latent variable

$z_j^* = \gamma w_j + u_j$ where w_j are considered potential determinants of the decision to issue globally.

The decision to issue globally is made according to the rule

$$z_j = \begin{cases} 1, \textit{if } z_j^* > 0 \\ 0, \textit{otherwise} \end{cases}$$

where ε and *u* are bi-variate normal with mean zero and covariance matrix

$$\begin{bmatrix} \sigma & \rho \\ \rho & 1 \end{bmatrix}$$

The direction of the bias of the OLS estimates of the coefficient of the endogenous binary variable z_j, would depend on the sign of ρ, the covariance between ε and u. If ρ is positive, the OLS coefficient of the global dummy will be biased upwards. If ρ is negative, the OLS coefficient of the global dummy will be biased downwards.

The treatment effects model consists of a regression model and a treatment (selection) equation and these are jointly estimated using full maximum likelihood. The treatment effects model's regression and treatment (selection) equations' specifications are given in Section 6.1. The treatment effects model is implemented using a pooled sample of all investment grade global and domestic bonds issued by non-financial U.S. firms from January 1996 to March 2001.

This estimation procedure ensures that the estimate of the coefficient of the global dummy variable is consistent, by controlling for potential endogeneity in the decision to issue globally. Using the robust variance estimator discussed in Section 5.1, we also

control for the potential lack of independence between bonds of a firm issued on the same date. Issue size measures are included in both the yield equation and selection (treatment) equation to control for issue size differences between the global and domestic samples. Hence, the treatment effects model with robust variance estimates attempts to control for the econometric issues that arise in our sample.

6. Testing for Benefits of Global Bonds

6.1. Comparing borrowing costs of global and domestic bond issuers

The treatment effects model is implemented using the entire pooled sample of investment grade global and domestic bonds issued by non-financial U.S. firms, from January 1996 to March 2001, after merging with financial data from Compustat.

To test for the impact of global bond issuance on cost of debt, we adapt the pricing model specification used by a number of previous studies to our treatment effects model. Studies that use this specification include Ederington (1975), Kidwell, Marr, and Thompson (1985), Blackwell and Kidwell (1988), and Chaplinsky and Ramchand (2000b). These studies suggest that the yield on new issues of public debt is determined by default risk, the maturity of the issue, issue size, the presence of call provisions, and general economic conditions at the time of the sale. We examine the impact of global issuance on borrowing costs using multiple regression models that employ at-issue yield spread as the dependent variable. The dependent variable, YIELD SPREAD, is defined as the offering yield-to-maturity (on the net proceeds of the offer, after total managers' fees) in excess of the yield of matched maturity treasuries.[16] When a treasury bond of same maturity is not available, we interpolate between the two closest maturity treasury matches. The test variable of interest is the global bond dummy variable. Robust standard errors are calculated after allowing for possible lack of independence between issues on the same date by a firm in all our analyses. The treatment effects model's regression and treatment (selection) equations' specifications are given below.

[16] We also constructed yield spread variables using yield on same *duration* treasuries instead of yield on *same* maturity treasuries. The results were unchanged.

Regression Model

$$YLDSPD_i = \beta_0 + \beta_1 GLOBAL + \beta_2 I_{(Aaa)} + \beta_3 I_{(Aa1)} + \beta_4 I_{(Aa2)} + ...\beta_{10} I_{(Baa2)} + \beta_{11} I_{(Baa3)}$$
$$+ \beta_{12}\ LN(MATURITY) + \beta_{13} LN(PROCEEDS) + \beta_{14} RISKPREMIUM$$
$$+ \beta_{15} CALLPROVISION + \beta_{16} SUBSIDIARY$$
$$+ \beta_{17} Year1996 + \beta_{18} Year1997 .....\beta_{22} Year2001 + \beta_{23} SIC1.. + \beta_{29} SIC8$$

Treatment Equation Model

$$GLOBAL = \alpha_0 + \alpha_1 ASSETS + \alpha_2 LN(PROCEEDS) + \alpha_3 (PROCEEDS/ASSETS)$$
$$+ \alpha_4 (DEBT/ASSETS) + \alpha_5 COVERAGE + \alpha_6 ROA + \alpha_7 QRATIO$$
$$+ \alpha_8 DIVYIELD + \alpha_9 ISSUYEAR$$

The Control variables are defined as follows:

YLDSPD: The yield spread is calculated as the difference between the at-issue yield for the debt offer and the yield of a Treasury bond with matched maturity.

GLOBAL: The test variable is a dummy variable that is equal to 1 when the bond is a global bond and 0 otherwise.

$\boldsymbol{I_{(Aaa)}}$ **,** $\boldsymbol{I_{(Aa1)}}$ **,** $\boldsymbol{I_{(Aa2)}}$ **,** $\boldsymbol{I_{(Aa3)}}$ **,** $\boldsymbol{I_{(A1)}}$ **,** $\boldsymbol{I_{(A2)}}$ **,** $\boldsymbol{I_{(A3)}}$**,** $\boldsymbol{I_{(Baa1)}}$ **,** $\boldsymbol{I_{(Baa2)}}$ **,** $\boldsymbol{I_{(Baa3)}}$: Indicator variables denoting the Moody's rating of the issue. For example, $\boldsymbol{I_{(Aaa)}}$ is Equal to 1 if rated Aaa; 0 otherwise, $\boldsymbol{I_{(Aa1)}}$ is equal to 1 if rated Aa1; 0 otherwise, and so on.

LN(MATURITY): The natural logarithm of the issue's years to maturity.

LN(PROCEEDS): The natural logarithm of the dollar size of the net proceeds of the bond issue in $ millions.

RISK PREMIUM: The difference between the Moody's Aaa seasoned corporate bond yield index and the composite Treasury yield on the offer date.

CALL PROVISION: Indicator variable denoting the presence of a call provision: CALL PROVISION equals 1 if the issue is callable; 0 otherwise.

SUBSIDIARY: This is a binary variable indicating that the issuing firm is a financial subsidiary of a public firm. SUBSIDIARY equals 1 if the issuer is a subisdiary firm; 0 otherwise.

YEAR1996, YEAR1997, YEAR1998, YEAR1999, YEAR2000 and YEAR2001: Indicator variables denoting the year of the bond issue. YEAR1996 is equal to 1 if bond

issue was in 1996; 0 otherwise, Year1997 is equal to 1 if bond issue was in 1997; 0 otherwise, and so on.

SIC1, SIC2, SIC3, SIC4, SIC5, SIC7 and SIC8: Indicator variables denoting the 1-digit SIC code of the issuer. SIC1 equal to 1 if 1-digit SIC code of the issuer is 1; 0 otherwise, SIC2 equal to 1 if 1-digit SIC code of the issuer is 2; 0 otherwise, and so on.

ASSETS: The total assets of the bond issuer in $ millions.

PROCEEDS/ASSETS: This is the ratio of the proceeds from the bond issue to the total assets of the bond issuer.

DEBT/ASSETS: The ratio of total debt to total assets of the bond issuer.

COVERAGE: This is operating income before depreciation divided by interest expense.

ROA: This is operating income before depreciation divided by total assets.

QRATIO: This is computed as the ratio of (long term debt + debt in current liabilities + liquidating value of preferred stock + market value of equity) to total assets.

DIVYIELD: This is the ratio of the annual dividends paid to the market value of equity of the issuer.

ISSUYEAR: This gives the year of the bond issue.

The control variables for the regression model account for differences in credit rating, maturity of issue, size of the issue, market risk premium, whether the issue has a call provision, year of issuance, industry of issuer and the subsidiary status of the firm. Because these variables have been used in previous studies, only a limited discussion is provided. We expect to find that the yield spread is negatively related to the quality of bond rating. The maturity of the issue is included to control for any term structure effects in the default premium. The size of the issue may be important if larger offerings have more public information than smaller issues, and therefore have less uncertainty. Also, large offerings may enhance future liquidity and hence may have lower yields. The variable RISK PREMIUM is defined as the yield spread between the Moody's Aaa seasoned corporate bond yield index and the composite Treasury yield index and is included to control for general economic conditions at the time of the sale. From the bondholder's perspective, bonds that are callable have prepayment risk. Therefore, we expect that callable bonds will have higher yield spreads. Some bonds are issued by

financial subsidiaries of industrial companies with the proceeds being passed onto the parent. Since not all these bond issues are explicitly guaranteed by the parent, the market may demand higher yields from a bond issued by a financial subsidiary than if it were issued by the parent directly. To control for this possibility, we add a SUBSIDIARY dummy variable and predict a positive sign for its coefficient. The year dummies are included to control for general time effects in yields. The 1-digit SIC dummies are included to control for industry effects in yields.

The treatment equation attempts to control for the propensity of certain firms to issue global rather than domestic bonds. We therefore include firm characteristic variables that were shown earlier to differ across the global and domestic sample. These control variables for the treatment equation account for issuer size (ASSETS), bond issue size (PROCEEDS), size of bond issue relative to issuer size (PROCEEDS/ASSETS), leverage related variables (DEBT/ASSETS and COVERAGE), profitability or quality variables (ROA and Q-Ratio), growth stage of issuer (DIVYIELDS) and year of issue (ISSUYEAR). The results for the treatment effects model are similar when market value related size and leverage measures are added to the treatment equation.

The results of the estimated treatment effects model are reported in Table 6. Table 6 Probit I reports estimates for the treatment equation used to correct for selection bias. We find that the variables often have predicted signs and are significant. For example, we find that firm size and issue size tend to be positively correlated with the decision to issue globally which is consistent with the univariate analyses in Table 3 and Table 5.

The regression coefficient estimates of the treatment effects model, reported in Table 6 Model I, suggest that the borrowing costs of global issuers is 14.6 basis points lower than domestic issuers, ceteris paribus. This provides direct evidence that global bonds lower the cost of capital for issuers, as the structure of the global bond market allows us to interpret lower at-issue yields to imply lower cost of debt. For example, our estimate of borrowing cost savings would predict that for the global issue described in Appendix A, Wal-Mart saved $ 42.8 million on a $ 5750 million issue by issuing global bonds instead of domestic bonds.[17] Furthermore, our finding that global security offerings

[17] The cost saving from each issue (this was a 3 tranche issue) is calculated as the difference in proceeds to Wal-Mart had it offered a yield 14.6 basis points higher than the actual yield.

lower the cost of capital suggest that the positive stock price reaction found in previous studies (Chaplinsky and Ramchand (2000a), Miller (1999), Foerster and Karolyi (1999), Errunza and Miller (2000), Foerster and Karolyi (2000), (Kim and Stulz (1988)) could be, at least in part, driven by a lowering of the cost of capital rather than pure cash flow effects.

The result that capital raised through global bonds costs less to issuers compared to domestic bonds could stem from 1) lower issuing costs for global bonds or 2) investors willing to accept lower yields. We next examine each of these potential explanations in turn.

6.2. Comparing gross (underwriting) spreads of global and domestic bonds

We examine the gross spreads of global bonds relative to domestic bonds for two reasons. One, it will help identify a potential benefit of global issuance that may partly explain the lower borrowing costs on global bonds. Second, the analysis of gross spread data of global and domestic bond issuance will provide new evidence on the relative cost of corporate bond issuance in different markets. Gross spreads are the fees underwriters charge for selling the firms' bond issue. The underwriter prepares the prospectus, organizes road shows and sells the issuers' story to potential investors. While there are other costs relevant to a global issue such as country-specific licensing fees, capital requirements and other compliance costs, gross spreads are likely to represent a significant portion of the costs of making a global offer (Chaplinsky and Ramchand (2000a)). Hence, we use gross spread, defined as the compensation paid to the underwriter for selling the firm's bond issue, as a percentage of the capital raised, to compare the issuing costs of global and domestic bonds. We use a treatment effects model with the specifications described in Section 6.1 using gross spread as dependent variable.

Table 6 Model II shows the regression results. The gross spread for global issues is 0.13 % lower than for domestic issues, ceteris paribus. Hence, one of the explanations for the lower borrowing cost on global bonds is that underwriters charge a lower gross spread for global issues. For example, on a $ 1 billion offer, this amounts to savings of gross (underwriting) fees of $ 1.3 million. This suggests that issuers obtain statistically

and economically significant savings in issuing costs, through the issuance of multi-market debt securities. It may be noted that for this analysis, we use reported gross spread data. As mentioned earlier, there is a practice of rebating in the Eurobond market wherein large investors are offered rebates on the offer price by underwriters. Hence, the reported gross spread may overstate the true gross spread. Since global bonds are placed in the U.S. and Eurobond markets, there is a possibility that rebating also exists for global bonds. However, since our evidence shows that reported global bond gross spreads are lower than the reported domestic bond gross spreads, then we can be confident that the true global gross spreads are lower than the true domestic bond gross spread, even after considering the possibility of rebating. Therefore, this result provides new evidence on relative true gross spreads of corporate bond issuance in the domestic and global bond markets.

6.3. Comparing yield to investors of global and domestic bonds

To examine whether the lower borrowing cost on global issues is driven solely by lower gross spreads, the yield to investors is also studied. We use the same specification described in Section 6.1 except that the dependent variable in this case is the yield spread, defined as the offering yield-to-maturity (on the proceeds of the offer, gross of total managers' fees) in excess of the yield of matched maturity treasuries. Table 6 Model III provides the regression results that suggest that the yield to investors for global bonds is 12.5 basis points lower than domestic bonds, ceteris paribus. Thus, the lower borrowing costs of global issuers does not appear to be driven solely by underwriters charging lower gross spreads for global bonds. A plausible explanation for the lower investor yields on global bonds is higher investor demand or greater liquidity for global bonds. Section 7 examines potential explanations of the lower yields on global bonds.

6.4. Robustness tests

The treatment effects model used in this paper controls for potential endogeneity in the decision to issue globally. It uses a robust variance estimator that also controls for potential lack of independence between bonds of a firm issued on the same date. Hence,

we attempt to control for the econometric issues that arise in our sample. However, we conduct two additional robustness tests that control for issue size and issuer differences.

As an alternate approach to controlling for issue size differences in the global and domestic samples, we exclude all domestic offers that are smaller than the smallest global bond offer ($ 250 million) and then use OLS in Table 7. We find that, after controlling for the bond and issuer characteristics, the yield spread on global bonds is 14.6 basis points lower than that of domestic bonds. The borrowing costs, yields to investors and gross spread results are all robust to this specification in that they are similar to those obtained from the treatment effects model.

In Table 8, we control for issuer related differences by using OLS on a sample of global issues and domestic issues of the same global issuers. This approach attempts to control for any issuer related characteristics not captured in the bond pricing specification used in Section 6 that may influence yields and gross spreads. Using only the domestic bonds of global issuers, we find that the borrowing costs, yields to investors and gross spread results are similar to that obtained from the treatment effects model.

Overall, our results that firms are able to lower their borrowing and issuing costs by issuing global bonds appear robust to alternate tests that control for differences in issue size and issuer characteristics of the domestic and global bond samples.

7. Liquidity of Global Bonds

The larger issue size, longer trading hours, and more efficient clearing and settlement associated with global bonds can potentially increase their liquidity. [18] In this section, we investigate the liquidity of global bonds.

Liquidity has a price dimension (bid-ask spread), a quantity dimension (depth) and a time dimension (trading hours). In bond and stock markets, the market maker serves an important function in the provision of liquidity services. With a liquid asset a market maker is able to more efficiently manage his price risk and inventory holdings due to the regular flow of buy and sell orders. Therefore, the bid-ask spread for more liquid assets is expected to be lower than that for less liquid assets. High depth for an asset indicates higher liquidity since large quantities of the asset can be bought or sold close to

[18] See "Global bonds aim to broaden their scope", Euromoney, June 1993.

the quoted prices. Longer trading hours also suggest greater liquidity since investors can buy or sell securities soon after they decide to.

The finance literature has attempted to measure liquidity using bid-ask spreads (Amihud and Mendelson (1986), Chakravarty and Sarkar (1999), Hong and Warga (2000), Schultz (2000)), trading volumes (Chakravarty and Sarkar (1999)), frequency of daily non-zero returns (Lesmond et al (1999)) and liquidity ratio.[19] For analyzing liquidity, data available for corporate bonds is currently not nearly as good as that for stocks. Complete trading volume data (depth dimension of liquidity) for corporate bonds is currently not available.[20] Hence, we focus on bid-ask spreads and frequency of daily non-zero returns as measures of liquidity for our domestic and global bond samples.

We collect historical daily bid and ask price quotes from Bloomberg, for all investment grade global and domestic bonds issued after 1995 by U.S. non-financial firms. The Bid-Ask spread, defined as BASpread = ((Ask Price–Bid Price)*100)/((Ask Price+Bid Price)/2), is calculated for all available bonds of equal or greater size to the smallest global bond offer. From the daily bid-ask spreads for each bond, we then compute the mean daily bid-ask spread for each bond for a 6-month period after the issue date.[21] We report univariate statistics on mean daily bid-ask spreads for global and domestic bonds in Panel A of Table 9 for the 6-month period. For the global bond sample (79 obs.), the mean (median) of BASpread is 0.324 (0.308) while that of the domestic sample (472 obs.) is 0.409 (0.352). Therefore, we find that the mean and median BASpread of the global sample is significantly lower than that of the domestic sample. Since other factors such as issue size, years to maturity and credit rating can influence bid-ask spreads (Hong and Warga (2000), Chakravarty and Sarkar (1999)), we also analyze the bid-ask spreads in a multivariate framework in Panel B of Table 9. The dependent variable is the mean daily bid-ask spread for each bond using the 6-month period after the issue date[22]. The bid-ask spreads of global bonds are lower by 0.06% than that of domestic bonds, ceteris paribus. Hence, our analyses of bid-ask spreads suggest

[19] The liquidity ratio is an attempt to measure the price impact of trading volume by measuring the ratio of average dollar volume of trading to the average price change during some interval.

[20] One exception is the Fixed Income Pricing System (FIPS) introduced by the Nasdaq Stock Market in 1994 that provides data on complete trading volume and prices for a list of well-traded high yield (junk rated) bonds. Currently, about 55 bonds are part of this list.

[21] The results are similar when we use 1-month, 2-month and 3-month periods.

that global bonds have lower transactions cost and hence are more liquid than domestic bonds.

As an additional measure of liquidity of global and domestic bonds, we also examine the frequency of non-zero daily returns using the average of daily bid and ask price quotes available on Bloomberg.[23] The choice of this variable is motivated by Lesmond et al (1999) who develop a model for estimating transaction costs using the incidence of zero returns. The premise of their model is that if the value of the information signal is insufficient to exceed the costs of trading, then the marginal investor will either reduce trading or not trade, causing a zero return. Thus, the cost of transacting constitutes a threshold that must be exceeded before a security's return will reflect new information. Hence, a security with high transaction costs will have less frequent price movements and more zero returns than a security with low transactions cost. To empirically measure daily returns for bonds, daily bond prices are needed. However, Bloomberg carries only daily bid and ask price quotes and not traded prices. So, to compute daily returns, we use the average of the daily bid and ask price quotes. For each bond, we construct a variable called FREQNONZERO, defined as the ratio of the number of daily non-zero return observations to the total number of daily return observations since the bond was issued. For this computation, zero return observations include observations with zero returns as well as those with missing returns. FREQNONZERO will range from 0 to 1 with 1 indicating that all daily returns were non-zero since a bond was issued. We report univariate statistics of this variable for the global and domestic bond samples in Panel C of Table 9. For the global bond sample (79 obs), the mean (median) of FREQNONZERO is 0.906 (0.969) while that of the domestic sample (466 obs.) is 0.674 (0.745). The difference in means and medians of FREQNONZERO for the global and domestic bond samples, is significant at the 1% level, as reported in Table 11. This suggests, using the Lesmond et al (1999) measure, that global bonds have lower transaction costs than domestic bonds.

[22] The results are similar when we use 1-month, 2-month and 3-month periods.

[23] Bloomberg says it pricing model is proprietary and would not give exact details on factors that determine whether a bond is priced on a particular day. They however revealed that a bond with a large number of pricing contributors was more likely to be priced on Bloomberg.

In additional tests not reported, we examined if our proxies for liquidity were priced in at-issue yields. The results, available from the authors by request, suggest that liquidity, as proxied by bid-ask spreads and frequency of non-zero returns, is not priced in at-issue yields. This result is consistent with Crabbe and Turner (1995) who also find that, using issue size as a liquidity proxy, liquidity is not priced in at-issue yields.[24] A caveat to this result is that a look-ahead bias exists since the proxies for liquidity are constructed using data after the issue date. Another potential concern is that our liquidity proxies are constructed from bid and ask quoted prices.[25] If however, our liquidity proxies accurately measure investor perceptions of bond liquidity at the time of issuance, our results suggest that issuers are not compensated for the additional liquidity of global instruments. Investors, however, appear to benefit from the issuance of global securities since transacting in them is less costly and investors have the option to trade for longer trading hours.

7.1 Other potential explanations for the lower borrowing costs on global bonds

A possible explanation for the lower borrowing costs on global bonds is the fact that global bonds, since they are being sold in multiple markets at the same price, have the potential to increase investor demand relative to domestic bonds. As discussed earlier, this is because global bonds have the potential to reduce the impact of market imperfections and hence attract a larger investor base. Among other things, global bonds can lower information problems for foreign investors who would then be more willing to invest in the issues of a U.S. firm. Also, global issuers are able to allocate the supply of bonds among the targeted markets depending on demand conditions in the different markets. Hence, global issuers are better able to deal with price pressure effects since they have the flexibility of shifting supply among multiple markets. The above factors

[24] Crabbe and Turner (1995) compare the yields of corporate bonds (avg. size $ 265 mill.) and medium term notes (avg. size $ 4 mill.) of 4 frequent issuers GMAC, Ford Motor Credit, General Electric Capital and Merrill Lynch. They assume that issue size determines liquidity of a bond and therefore by comparing yields of issues of different sizes, they provide indirect evidence on whether investors are willing to pay more for more liquid instruments. They find no relation between issue size and yields.

[25] The data source for bid and ask price quotes in Bloomberg is BGN. BGN provides a weighted average of actual dealer quotes after eliminating outlier quotes. Hence, these are not matrix prices that are computed based on prices of similar bonds.

may partly explain the lower cost of borrowing for global issuers. One possible test of the benefits of being able to expand potential investor demand and to shift supply among multiple markets would be to look at the relationship between the percentage of total proceeds that is placed in foreign markets and the cost of borrowing. However, issuers with less elastic demand in the domestic markets may stand to benefit more from shifting supply of bonds to foreign markets than issuers with more elastic demand in the domestic markets. Hence, the benefit of foreign market placement may not be constant across global issuers. If however the demand elasticities of global issuers are the same, introducing the proportion of proceeds placed in foreign markets as a test variable in the yield regressions would be a way of testing the benefits of being able to expand potential investor demand and shift supply among multiple markets. We are however unable to proceed with this test since the data on placement of global bond issues among the multiple markets is not available. The global bond issuers and their investment bankers are not obligated to disclose placement information, which prevented us from gathering this information.

8. Stock Price Reaction Analyses

In this analysis, we compare the announcement effects of issuing global bonds to the announcement effects of issuing in only in the Euro or U.S. domestic markets. Since global bonds are placed in both the domestic and Eurobond markets, a part of our previous results may be the result of Kim and Stulz's (1988) clientele hypothesis in which firms can exploit temporary differences in the Euro/U.S. interest rates. To test whether the benefits to global bonds are driven by the clientele hypothesis, we examine the stock price reaction to the announcement of eurobonds issued by U.S. firms in a similar time period as the global bond sample. Also, to make sure the results we document are not an artifact of the firms and time period rather than domestic vs. global issuance, we also analyze the stock price reactions to announcements of domestic bond issuance by U.S. firms that issued global bonds or eurobonds.

Global bond issuance is often done in different tranches on the same day and hence, the number of unique announcement dates is smaller than the number of global bond issues. We used Lexis-Nexis and Bloomberg to obtain announcement dates and

check for contaminating stories around that date. This procedure resulted in 34 global bond announcement dates. Using a similar procedure, we obtain 78 Eurobond announcement dates and 140 domestic bond announcement dates.

Table 10 provides various statistics on the global bond, eurobond and domestic bond samples used in the event studies. Data is provided on the time distribution of the announcement dates, the credit rating distribution, uses of proceeds and summary statistics for all the three samples.[26]

To measure abnormal returns, we estimate a market model for each firm using daily returns. As a proxy for the market return, we use the S&P 500 index. Abnormal returns are then averaged across firms to form the average abnormal return. Tests of significance are conducted using standardized abnormal returns (Brown and Warner, 1985). We report results for the 3-day window (-1 to +1) like in Chaplinsky and Ramchand (2000a) and Miller (1999). As robustness tests, abnormal returns using the mean-adjusted and market-adjusted benchmarks are also reported.

The event study results are reported in Table 11 Panel A. We find that the mean abnormal stock price reaction, CAR(-1,+1), to the announcement of global issuance is 1.71% (median 0.66%) and is statistically significant at the 1% level. The sign-rank test is significant at the 5% level. These results hold after using the market-adjusted and mean adjusted benchmarks. The stock price reaction to the announcement of domestic bonds issued by global or eurobond issuers after 1994 is, however, not significantly different from zero, consistent with Eckbo (1986). We also find that the stock price reaction to the announcement of eurobond issuance by U.S. firms is not significantly different from zero for both the 1988-2000 and 1995-2000 sample periods. This suggests that the positive stock price reaction to the announcement of global issuance is not driven by the clientele hypothesis. This result is also consistent with Kim and Stulz (1988) who find no significant reaction to the announcement of eurobond issuance in the later part of their sample. In Table 15 Panel B, we also report a difference in mean test of CAR (-1,+1) for the three samples. The CAR(-1,+1) for the global bond sample is, as expected, larger than that of the domestic and eurobond sample, and is significant at the 10% level.

[26] Use of proceeds for Eurobonds is unavailable from Securities Data Company (SDC).

The positive stock price reaction to the announcement of global issuance suggests that issuers benefit from issuing global bonds. Any attempt to examine the cross-sectional variation of the abnormal returns is, however, constrained by the small sample size. However, in results not reported, we further examined two potential explanations for the positive stock price reaction. The first is the *lower borrowing cost hypothesis*. The earlier yield analyses suggest that issuers are able to raise debt capital at lower costs through global bonds than through domestic bonds. Given the size of the typical global bond, cost savings is likely to be substantial. These cost savings may get reflected in the stock price on announcement of the global bond issuance. To test this hypothesis, we construct a GAIN variable, to capture potential interest cost savings, in the following manner. The secondary market yield for U.S. corporate debt indices corresponding to each global bond offer was obtained from Bloomberg, after matching on credit rating, maturity and industry.[27] Hence, each global bond has a matching corporate bond index. The yield on the matching corporate bond index, on the issue date of the global bond, is used as the benchmark yield for that bond. We then compute the funds that would have been raised if the global issuer had issued at the benchmark yield, instead of the actual global bond yield.[28] We then compute the difference of the amounts raised at the two yields as the amount raised at the actual yield less amount raised at the benchmark yield. This difference is then expressed as a percentage of the market value of the issuer at the announcement date.[29] This ratio is the GAIN variable. The stock price reaction, CAR(-1,+1), is then regressed on the GAIN variable. The results suggest no relation between CAR(-1,+1) and GAIN. This evidence, however, must be viewed with caution due to the small sample size and the fact that the F-statistics of most models reported are insignificant.

[27] Bloomberg provides time series data of secondary market yields for various corporate bond indices. It also provides indices that are constructed by credit rating, maturity and industry. We use the Bloomberg corporate bond index, that most closely matches each global bond, as a benchmark. The yield of the benchmark corporate bond index, on the issue date of the matching global bond, is used as the benchmark yield for that global bond. We interpret this benchmark corporate bond index yield, in our analyses, as the yield at which the global issuer would have been able to raise funds, had it not issued a global bond.

[28] If the benchmark yield is higher than the actual global bond yield, the issuer would have gained by issuing the global bond. Conversely, if the benchmark yield was lower than the actual global bond yield, the issuer would have lost by issuing the global bond.

[29] We also used market value at the issue date and the results were similar.

The second potential explanation for the positive stock price reaction is the *investor recognition hypothesis*. If global bonds increase investor recognition, especially foreign investor recognition, then by Merton's (1987) argument, firms may be able to lower their cost of capital. This may be impacted in the stock price on announcement of the global bond issuance. To test this hypothesis, we follow Chaplinsky and Ramchand (2000a) and construct a variable that is equal to the percentage increase in the number of shareholders.[30] The number of shareholders is collected from Compustat for the nearest year-end before and after the issue. We then test whether a larger percentage increase in shareholders is correlated with a larger stock price reaction. We lose some observations since this item is not available for all observations and we exclude observations where an equity issue took place in the same year as the global bond issue. The stock price reaction, CAR(-1,+1), is then regressed on the percentage increase in shareholders (%CHGHOLDERS). The results suggest no relation between CAR(-1,+1) and %CHGHOLDERS. Again, the findings must be viewed with caution due to the small sample size and the fact that the F-statistics of most models reported are insignificant.

9. Costs of Global Bond Issuance

Our results have so far documented a number of benefits associated with global bond issuance. These consist of both a lower cost of borrowing and lower issuing costs (gross spread), as well as higher liquidity. Hence, one may ask why don't all firms issue globally? The fact that pure domestic issuance is still adopted by a large number of firms suggests that there are costs to global issuance. Some of the costs of global issuance are likely to be issuer dependent. For example, a key determinant of selling costs in a foreign market is likely to be the visibility and reputation of an issuer. If an issuer is a well-known firm with a global presence (products, production plants etc.), it is likely to be able to attract foreign investors without incurring significant selling costs.[31] On the other hand, a firm without any global presence may have to incur significant selling costs in order to attract foreign investors. This would make a global issue less attractive to such

[30] Ideally, one would have liked to use a measure of increase in foreign shareholders. This information is however not available. Information on the actual placement of global bonds in the foreign and domestic markets is also not available.

an issuer. In general, incremental costs associated with a global issuance relative to a pure domestic issuance would include road shows and selling of the global issue in foreign markets, appointing an investor relations firm in the foreign market, complying with the regulatory requirements of foreign markets, exchange listing requirements and some costs associated with the linking of foreign market clearing houses (ClearStream and Euroclear) and the Depositary Trust Company (DTC) to allow efficient clearing and settlement for cross-border trades of global bonds.[32] If there are significant incremental costs associated with global issuance relative to domestic issuance, the optimal size of a global issue would have to be large enough to generate financing cost savings that offset these costs. After considering all tranches in a global bond issue of an issuer on a particular date, the total global bond issue has a mean size of $ 1690 million and a median size of $ 1200 million. The observed large total global issue sizes lend some support to the argument that there exist significant costs in the global issuance process.

Another potential explanation for the large global issue sizes is that the price-pressure effects for issues of this size are likely to be severe if only the domestic market were targeted. This would result in a higher cost of borrowing to the issuer. Hence, the benefit of a global bond of being able to expand investor demand and shift supply among markets would be greatest for very large issues. Both the significant incremental cost of global issuance or price pressure effects arguments predict that only firms with very high debt capital raising requirements would find global bond issuance attractive, which is what we observe.

10. Additional Tests

We conduct some additional tests to further investigate some of the issues discussed in the paper.[33]

For the stock price reaction analyses, we compute the potential interest cost savings in a number of different ways. First, instead of using a benchmark yield of the

[31] The literature on Eurobonds suggests that eurobond investors are attracted to issuers that are household names.

[32] Although no incremental information may be required relative to SEC requirements, the issuer would likely have to provide the information in a different format as required by the regulatory authorities in the foreign market. This may result in some additional administrative costs. Almost all global bonds are listed on the OTC (U.S.) and Luxembourg or London Exchanges.

most similar corporate bond index obtained from Bloomberg, we use predicted yields of global bonds as a benchmark. The predicted yields are computed using regression coefficients obtained from a sample of domestic bonds. Hence, we obtain a predicted yield for each global issue if it had been issued in the domestic market. The results obtained using either benchmark are similar. We also compute the potential interest cost savings on the entire long-term debt of the global issuer. The idea here is that the stock market may anticipate the lower cost of refinancing the entire existing long-term debt of the global issuer. Using both benchmark yields, we compute the interest cost savings on the entire long-term debt of the global issuer and not only on the global issue. The results do not change.

For the liquidity analyses, we also examined whether the bid-ask spread of existing domestic debt of global issuers changes once the global bond is issued. There are two hypotheses with opposite predictions. If the liquidity of a security depends on the issuer rather than the specific issue, then the bid-ask spread of existing domestic debt issues may decrease after a firm issues globally. That is, a firm may acquire a reputation of quality by issuing globally and this benefit may accrue to all its outstanding securities. On the other hand, investors wanting exposure to a firm's debt, will more likely purchase the new liquid global security and have less interest in the firm's old existing debt securities. This may cause the bid-ask spread of existing domestic debt to rise after a global issue. Our analyses suggest that the bid-ask spreads of existing domestic debt do not change significantly after a global issuance.

11. Conclusion

This paper examines the impact of global bond offerings on a firm's cost of capital, issuing costs and shareholder wealth. The results suggest that issuers are able to borrow at 15 basis points lower using global bonds relative to domestic bonds, ceteris paribus. This is consistent with the hypothesis that firms are able to lower their cost of (debt) capital by issuing multi-market debt securities that mitigate market imperfections and expand investor demand. The lower cost of borrowing is partly explained by lower gross spreads for global bonds. We find that the gross (underwriting) spreads for global

[33] We thank Rene Stulz for suggesting these additional tests.

bonds is about 0.12% lower than that of domestic bonds, ceteris paribus, which is both statistically and economically significant. Hence, through the issuance of multi-market securities, firms are able to lower the fees paid to underwriters. We also find that the yields to investors for global bonds are about 12 basis points lower than that for domestic bonds. Hence, the lower cost of borrowing result is only partly explained by lower gross spreads. A possible explanation for the lower investor yields on global bonds is that global bonds expand investor demand and global issuers are better able to manage price pressure effects since they can shift supply among markets.

To identify other potential benefits of global issuance and to identify other factors that may explain the lower borrowing cost on global bonds, we also study the liquidity of global bonds. Univariate and multivariate analyses of bid-ask spreads of global and domestic bonds suggest that global bonds are more liquid instruments than domestic bonds. Global bonds also have longer trading hours since they are typically traded in multiple international markets in different time zones. Longer trading hours are facilitated by the fact that the clearing and settlement systems for global bonds are set-up to handle cross-market transactions efficiently. Overall, the above findings suggest that enhanced liquidity and longer trading hours are important benefits of global securities.

The stock price reaction to the announcement of global bond issuance is also analyzed and found to be positive and significant, suggesting that the shareholders of global bond issuers benefit from issuing global bonds. The positive stock price reaction to global bond offerings appears to be consistent with recent research on securities issues outside a firm's domestic market. Overall, we find that global bond offerings are associated with significant benefits.

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APPENDIX A

Wal-Mart's Global Issue

Issuer Name: Wal-Mart

Issue Date: August 5, 1999

Bond Issue Details: Three Tranche Issuance

US $ 1250 million 2 year bond
US $ 1250 million 5 year bond
US $ 3250 million 10 year bond

Purpose of Issue: The proceeds from the global issue is to be used for refinancing the short-term borrowing used for acquiring Asda, a U.K. retail chain.

Cited Advantages: The news articles relating to this story mention Wal-Mart's high name recognition and the liquidity of the proposed bond issue, as key features of securities, bond investors in different markets are interested in.

Placement of Bond: Information obtained from Wal-Mart indicates that the bonds were placed in the U.S., Europe, Asia and the Middle-East.

Investor Base: Wal-Mart mention that almost the entire bond issue was placed with institutional investors (money managers, pension funds, banks/trust and insurance companies) with less than 1% placed with high net worth individuals.

APPENDIX B

Clearing and Settlement Procedures for Global Bonds

In almost all cases, global bonds are book-entry bonds. This means the actual purchasers of the notes will not be entitled to have the notes registered in their names and will not be entitled to receive physical delivery of the notes in paper form. The book-entry system, which is also the system through which most publicly traded common stock is held in the U.S., is used because it eliminates the need for physical movement of securities certificates. It also enables simultaneous electronic book-entry delivery against payment, thus eliminating the risk from lack of simultaneous transfers of securities and cash.

Each global bond is deposited with the Depository Trust Company (DTC) and is registered in the name of DTC or DTC's nominee. The registration of the global bonds in the name of DTC does not affect beneficial ownership (recipient of interest payments and finally principal) and is performed merely to facilitate subsequent transfers. Purchasers of global bonds in the U.S. may hold interests in the bonds only through DTC as direct participants (entities that have DTC accounts) or indirect participants (entities that transact through other entities that have DTC accounts). Purchasers of global bonds in Europe can hold interests in the bonds only through Clearstream or Euroclear if they are direct or indirect participants.

Because DTC is the only registered owner of the global bonds, Clearstream and Euroclear hold positions through their respective U.S. depositaries, who in turn hold positions on the books of DTC. All distributions of principal and interest on global bonds are made to DTC by the issuer. DTC then immediately credits the accounts of its participants on its book-entry registration and transfer system. Payments by participants to beneficial owners of global bonds are then done in accordance with existing practices.

Global bonds may be traded as home market instruments in both the Eurobond and U.S. domestic markets. Trading between DTC participants would be settled just like in the case of U.S. domestic bonds, in immediately available funds, using DTC's same-day funds settlement system. Similarly, for trading between Clearstream and/or Euroclear participants, settlement would occur, just like in the case of conventional eurobonds, in

accordance with the applicable rules and operating procedures of Clearstream and Euroclear, in immediately available funds.

Cross-market transfers (a Eurobond investor trading with a U.S. investor) between persons holding directly or indirectly through DTC, on the one hand, and directly or indirectly through Clearstream or Euroclear participants, on the other, will be effected through DTC, in accordance with DTC's rules, on behalf of Clearstream or Euroclear by their U.S. depositaries. However, such cross-market transactions would require delivery of instructions to Clearstream or Euroclear by the counterparty in that system in accordance with its rules and procedures and within its established deadlines, European time. Then, Clearstream or Euroclear will, if the transaction meets its settlement requirements, deliver instructions to its U.S. depositary to take action to effect final settlement on its behalf by delivering or receiving notes in DTC, and making or receiving payment in accordance with normal procedures for same-day funds settlement applicable to DTC. Because of time zone differences, credits of notes received in Clearstream or Euroclear from a cross-market transaction, will occur the business day following the DTC settlement date. Similarly, cash received in Clearstream or Euroclear as a result of a sale to a DTC participant will be received with value on the DTC settlement date, but will be available in the relevant Clearstream or Euroclear cash account only as of the business day following settlement in DTC. From the point of view of the DTC participant in a cross-market trade, it is exactly the same as with any trade with a DTC participant since the DTC participant is settling with a U.S. depositary of Clearstream or Euroclear. The above discussion suggests that global bonds may be traded across markets at lower cost relative to domestic bonds, since the clearing and settlement systems are set-up to handle cross-market trades for global bonds

APPENDIX C

List of Non-Financial U.S. firms that have issued Global Bonds

Alcoa Inc
American Standard Inc
AT&T Corp
Boeing
CenturyTel Inc
Coca-Cola Co
DaimlerChrysler Corp
Delphi Automotive Systems Corp
Dow Chemical Co
Duke Energy
EI du Pont de Nemours and Co
Electronic Data Systems Corp
Federal-Mogul Corp
Ford Motor Co
General Motors Corp
Hertz Corp
Hewlett-Packard Co
Honeywell International Inc
Lucent Technologies Inc
Motorola Inc
Philip Morris Cos Inc
Phillips Petroleum Co Inc
Procter & Gamble Co
Royal Caribbean Cruises Ltd
SBC Communications Inc
Sears Roebuck & Co
Sprint Corp.
TCI Communications Inc
Viacom Inc
Visteon Corp
Wal-Mart Stores Inc
Walt Disney Co
WorldCom Inc
Time Warner AOL

Figure I – Trading and Clearing of Global Bonds

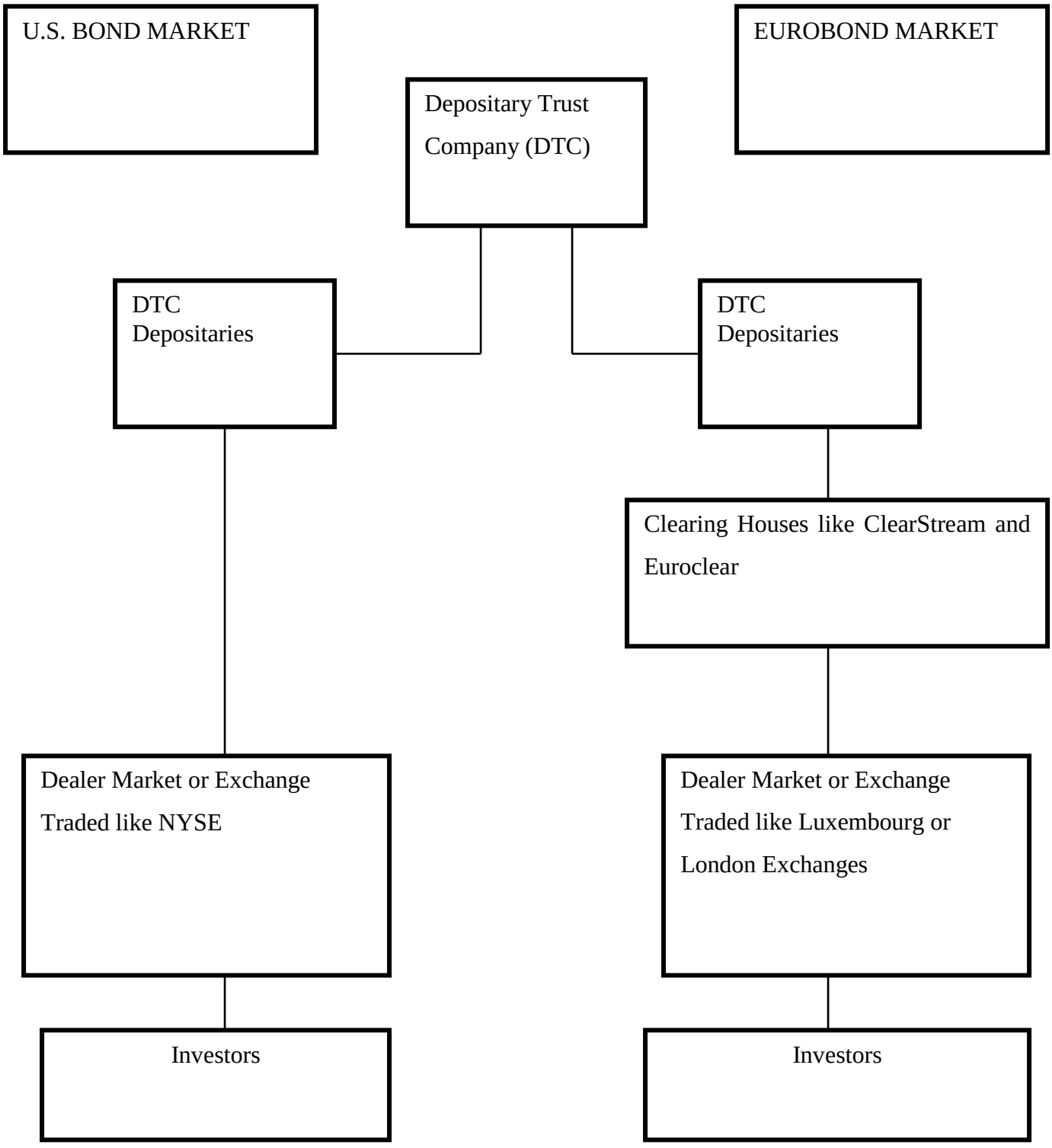

TABLE 1

Relative Comparison of Domestic bonds, Eurobonds and Global Bonds of U.S. firms

Domestic bonds are issued, underwritten and traded in the U.S. market. Eurobonds are underwritten by an international syndicate and traded outside of any one domestic bond market. Global bonds are a hybrid, designed to trade and settle in both the Domestic and Eurobond market.

	U.S. $ Domestic Bond	U.S. $ Eurobond	U.S. $ Global Bond
Trading and Listing	Trading mainly in the U.S. dealer market with some bonds listed and traded on the NYSE and AMEX.	Trading mainly in the European dealer market with some Eurobonds listed and traded on Luxembourg or London Exchanges.	Trading in both the U.S. and European dealer markets which increases the number of trading hours of global bonds. Some bonds are listed and traded on NYSE or AMEX and Luxembourg or London Exchanges.
Clearing and Settlement	Domestic bonds settle through the DTC or Fedwire. To trade in a domestic bond, an investor must have a DTC account or have an account with a dealer who has a DTC account.	Eurobonds settle through Clearstream or Euroclear. To trade in a Eurobond, a Eurobond investor must have a Clearstream (or Euroclear) account or have an account with a dealer who has a Clearstream (or Euroclear) account. To trade in a U.S. domestic bond, a Eurobond investor must also have an account with the DTC or have an account with a dealer who has a DTC account.	Global bonds settle through Clearstream, Euroclear and DTC. A U.S. investor trades and settles global bonds in the same way he would a domestic bond. Eurobond investors are also able to use their accounts with Clearstream and Euroclear to settle global bond transactions.
Investor Base	Mainly targeted at U.S. investors. Eurobond investors can buy domestic bonds but transacting in them is less efficient relative to global bonds as discussed above. Also, a number of institutional investors require a listing on a local exchange to be able to invest in a bond. Since most U.S. domestic bonds are not listed on a european exchange, this would rule out a number of european institutional investors	Mainly targeted at Eurobond investors in Europe, Asia, and Middle East. SEC regulation allows U.S. investors to buy Eurobonds only 40 days (seasoning period) after the bond has been issued. Although U.S. investors can buy Eurobonds after 40 days, historically U.S. investors have not been major players in the Eurobond Market.	Targeted at both U.S. and Eurobond investors. Investors from both markets can buy the bonds without any restrictions and can trade the bonds across markets. Hence, global bonds have the largest potential investor base.

Table 1 continued

	U.S. $ Domestic Bond	U.S. $ Eurobond	U.S. $ Global Bond
Issue Size	Usually of size less than $ 350	The size of eurobonds has been increasing over the years but they are, on average, smaller than domestic bonds.	Large bond offerings typically over $ 1 billion in size.
Information disclosure and registration requirements	Issuer complies with SEC information disclosure and registration requirements.	Issuer complies with the disclosure requirements and regulations in the countries the bonds are being sold in. These are typically lower than SEC requirements.	Issuer complies with SEC information disclosure and registration requirements as long as part of the issue is being placed in the U.S. market.
Fixed costs	Costs associated with compliance with SEC and exchange requirements; Costs associated with selling (road shows) in U.S. market; Costs associated with structuring the bonds to clear through the DTC.	Costs associated with compliance with regulations in the countries the bonds are being sold in. These are typically lower than SEC requirements; Costs associated with compliance with exchange requirements; Costs associated with selling (road shows) in Eurobond market; Costs associated with structuring the bonds to clear though ClearStream and/or Euroclear.	Costs associated with compliance with SEC requirements as well as those of other countries the bonds are being sold in; Costs associated with compliance with exchange requirements in multiple markets; Costs associated with selling (road shows) in multiple markets; Costs associated with structuring the bonds to clear though DTC, ClearStream and/or Euroclear. Hence, global bonds are likely to have a higher establishment and maintenance costs than other bonds.

Based on financial press

Secondary market liquidity	Fair	Poor	Good
Reported Issuing costs (gross spreads)	Medium	Medium	Low

TABLE 2

Aggregate Global Bond Issuance by U.S. industrial and utility firms during the period January 1, 1996 to March 20, 2001.

This table presents data on aggregate issuance of global bonds by non-financial U.S. firms. The first global bond was issued by a non-financial U.S. firm in 1996. Rows labeled Fixed rate, $ U.S., indicate fixed rate coupon bonds that are $ U.S. denominated. Rows labeled Others indicate non-fixed rate coupon bonds and/or non-$ U.S. denominated bonds. Separate issuance figures are provided for industrial and utility firms. Figures in parentheses indicate number of issues. The source of the data is *Securities Data Company* New Issues Database.

Period	# of issues	Total Issuance ($ mill.)	% investment grade	% fixed rate debt	% $ US	Global issues by Industry ($ mill.)	
						Industrial	Utility
1996-1998							
Fixed rate, $US	21	21,579	85.7	100	100	14,752 (16)	6,827 (5)
Others	-	-	-	-	-	-	-
1999-2001							
Fixed rate, $ US	69	71,902	98.6	100	100	53,511 (53)	18,492 (17)
Others	20	14,192	85	65	30	12,692 (19)	1,500 (1)
TOTAL 1996-2001							
Fixed rate, $ US	90	93,481	95.6	100	100	68,262 (69)	25,319 (22)
Others	20	14,192	85	65	30	12,692 (19)	1,500 (1)

TABLE 3

Descriptive statistics for global and domestic bond samples

The sample consists of all investment grade global and domestic, fixed rate coupon, U.S.$ bonds issued by non-financial U.S. firms in the U.S. market from 1/1/96 to 03/20/01. Since all sample global bonds are investment grade, only investment grade domestic bonds are chosen to form the comparison sample. Domestic bonds are issued, underwritten and traded in the U.S. market, while global bonds are designed to trade and settle in both the Domestic and Eurobond markets. The ratings in Panel B are Moody's ratings with Aaa indicating the highest quality. Figures in parentheses in Panel C are the 10th, 25th, 50th, 75th and 90th percentiles for issue size and years to maturity.

	Global Bonds		**Domestic Bonds**	
Panel A: By offering year				
	Number	Percentage (%)	Number	Percentage (%)
1996	2	2.30	270	13.98
1997	2	2.30	405	20.96
1998	14	16.09	613	31.73
1999	30	34.48	366	18.94
2000	24	27.59	204	10.56
2001	15	17.24	74	3.83
Total	87	100	1932	100
Panel B : Rating Distribution				
	Number	Percentage (%)	Number	Percentage (%)
Aaa	-	-	23	1.19
Aa1	-	-	19	0.98
Aa2	7	8.05	30	1.55
Aa3	4	4.60	72	3.73
A1	20	22.99	288	14.91
A2	19	21.84	342	17.70
A3	13	14.94	324	16.77
Baa1	10	11.49	317	16.41
Baa2	12	13.79	324	16.77
Baa3	2	2.30	193	9.99
Total	87	100	1932	100
Panel C: Summary Statistics				
Issue Size ($ mill)	1068.5 (500, 500, 1000, 1400, 1750)		187.2 (10.2, 32.6,150, 250, 400)	
Years to Maturity	11.2 (5, 5, 10, 10, 30)		12.5 (3, 5, 10, 15, 30)	
% Investment Grade	100.0 %		100.0 %	
% of Issues with Call Provisions	50.3 %		34.8 %	
% of issues with Sinking funds	-		-	
% of issues with subordinated debt	-		0.16 %	

Table 3 Continued.

Panel D: Maturity Distribution

	Global Bonds		Domestic Bonds	
	Number	Percentage (%)	Number	Percentage (%)
0 - 2.99 years	2	2.30	169	8.75
3 – 4.99 years	5	5.75	219	11.34
5 – 6.99 years	25	28.74	269	13.92
7 – 9.99 years	15	17.24	263	13.61
10 – 14.99 years	25	28.74	518	26.81
15 – 19.99 years	-	-	30	1.55
20 – 24.99 years	2	2.30	90	4.66
25 – 29.99 years	1	1.15	41	2.12
>= 30 years	12	13.79	333	17.24
Total	87	100	1932	100

Panel E: Issue Size Distribution (millions)

	Number	Percentage (%)	Number	Percentage (%)
0 – 249.99	-	-	1354	70.08
250 - 499.99	2	2.30	410	21.22
500 – 699.99	26	29.89	110	5.69
700 – 999.99	10	11.49	42	2.17
1000 – 1299.99	23	26.44	13	0.67
1300 – 1599.99	14	16.09	2	0.10
1600 – 1999.99	5	5.75	1	0.05
>= 2000	7	8.05	-	-
Total	87	100	1932	100

Panel F: Industry Distribution (By SIC CODES)

	Number	Percentage (%)	Number	Percentage (%)
SIC < 2000	2	2.30	101	5.23
1999 <SIC <3000	7	8.05	368	19.05
2999 <SIC <4000	28	32.18	377	19.51
3999 <SIC <5000	27	31.03	637	32.97
4999 <SIC <6000	13	14.94	228	11.80
6999 <SIC <8000	10	11.49	181	9.37
SIC > 8000	-	-	40	2.07
Total	87	100	1932	100

SIC<2000 include Oil and Gas extraction and Mining
1999<SIC<3000 include Food and Drink Products, Tobacco and Chemicals
2999<SIC<4000 include Primary metals, Industrial and Computer Equipment, and Autos
3999<SIC<5000 include Communications and Energy
4999<SIC<6000 include Durable goods and General merchandise stores
6999<SIC<8000 include Business Services, Auto services, Amusement and Recreation
SIC>8000 include Health, Legal, Educational and Social services

TABLE 4

Details on tranches of sample global bond issuances

In a multi-tranche issuance, a firm issues bonds of different maturities on the same date. Panel A indicates that 33 firms issued a single bond, 10 firms issued two bonds on the same date, 10 firms issued three bonds on the same date and 1 firm issued 4 bonds on the same date. Panel B gives the actual maturities of bonds that were part of multi-tranche issuances. Panel C denotes the number of global bonds that included a foreign currency tranche. Panel D denotes the number of global bonds with floating rate tranches.

Panel A: Multi-tranche global bond offers (fixed rate coupon U.S.$)

Number of tranches	Number of global bond issuances
1	33
2	10
3	10
4	1

Panel B: Maturity distribution for multi-tranche global bond offers

Maturities	Number of global issuances
5, 10 years	9
10, 30 years	1
2, 5, 10 years	1
3, 6, 10 years	1
5, 10, 20 years	2
5, 10, 30 years	5
7, 10, 30 years	1
3, 5, 7, 30 years	1

Panel C: Global bond offers with non-U.S. $ tranche

Number of foreign currency tranches	Number of global bond issuances
0	85
1	1
2	1

Panel D: Global bond offers with floating rate coupon tranche

Number of floating rate coupon tranches	Number of global bond issuances
0	82
1	5

TABLE 5

Selected financial characteristics of firms issuing global and domestic bonds in 1996-2001

Domestic bonds are issued, underwritten and traded in the U.S. market, while global bonds are designed to trade and settle in both the Domestic and Eurobond markets. The Compustat items reported are for the latest financial year prior to the issue date. The first row gives the means and number of observations while the second row gives medians. ASSETS is total assets in millions of dollars; PROCEEDS is the proceeds from bond issue in millions of dollars; MVE is market value of equity in millions of dollars; PROCEEDS/MVE is proceeds from the issue divided by market value of equity; PROCEEDS/ASSETS is proceeds from the issue divided by ASSETS; ROA is operating income before depreciation divided by ASSETS; Q-RATIO is (long term debt + debt in current liabilities + liquidating value of preferred stock + market value of equity) / ASSETS; DIV_YLD is the annual dividends paid / market value of equity; MKTLEV is (long term debt + debt in current liabilities) / market value of equity; BOOKLEV is (long term debt + debt in current liabilities) / book value of equity; DEBT_ASSETS is (long term debt + debt in current liabilities) / ASSETS; COVERAGE is operating income before depreciation divided by interest expense; YFMAT is the years to maturity of the bond issue. The last column gives p-values for t-test of the difference in means (first row) and p-values from the Wilcoxon signed rank test (second row). In Panel A, all bond issues, even when part of a multi-tranche issuance, are treated as separate observations. In Panel B, all bond issues by a firm on the same date (multi-tranche), are treated as part of a single issue. ** indicates significance at the 5% level while * indicates significance at the 10% level.

Panel A: Sample statistics of global and domestic issuers and issues where each tranche is treated as a separate observation

Variable	Global Bond Offers	Domestic Bond Offers	P-value
ASSETS ($ mill.)	66473.4 (87)	15396.0 (1608)	0.00 **
	32113.0	6050.5	0.00 **
PROCEEDS ($ mill.)	1063.0 (87)	185.5 (1622)	0.00 **
	995.1	149.6	0.00 **
MVE ($ mill.)	59513.2 (87)	14984.8 (1512)	0.00 **
	42173.3	5358.8	0.00 **
PROCEEDS /MVE (%)	3.83 (87)	4.47 (1512)	0.35
	2.09	2.38	0.81
PROCEEDS /ASSETS (%)	3.52 (87)	3.73 (1607)	0.52
	2.68	2.01	0.02 **
ROA (%)	15.67 (87)	15.24 (1566)	0.52
	13.59	14.39	0.55
Q-RATIO	1.730 (86)	1.480 (1501)	0.04 **
	1.537	1.146	0.02 **
DIV_YLD (%)	1.65 (86)	2.02 (1476)	0.03 **
	1.19	1.72	0.06 *
MKTLEV	0.564 (87)	0.514 (1503)	0.54
	0.187	0.346	0.01 **
BOOKLEV	1.180 (84)	1.376 (1601)	0.61
	0.629	0.965	0.03 **
DEBT_ASSETS	0.302 (87)	0.339 (1600)	0.02 **
	0.268	0.326	0.00 **
COVERAGE	11.10 (87)	10.02 (1561)	0.23
	10.05	6.73	0.00 **
YFMAT (years)	11.23 (87)	12.39 (1622)	0.23
	9.99	10.00	0.91

Panel B: Sample statistics of global and domestic issuers and issues where all bond issues by a firm on the same date are treated as part of a single issue

Variable	Global Bond Offers	Domestic Bond Offers	P-value
ASSETS ($ mill.)	72411.0 (55)	13763.8 (1139)	0.00 **
	36147.0	5816.0	0.00 **
PROCEEDS ($ mill.)	1681.5 (55)	261.6 (1150)	0.00 **
	1198.3	199.0	0.00 **
MVE ($ mill.)	60332.3 (55)	13607.3 (1060)	0.00 **
	45869.2	5111.3	0.00 **
PROCEEDS /MVE (%)	6.06 (55)	6.38 (1060)	0.84
	2.77	3.27	0.99
PROCEEDS /ASSETS (%)	5.57 (55)	5.38 (1139)	0.83
	3.17	2.75	0.26
ROA (%)	15.77 (55)	15.38 (1107)	0.65
	13.59	14.36	0.63
Q-RATIO	1.765 (54)	1.464 (1054)	0.07 *
	1.511	1.164	0.11
DIV_YLD (%)	1.78 (54)	2.02 (1036)	0.29
	1.29	1.73	0.31
MKTLEV	0.662 (55)	0.535 (1054)	0.26
	0.217	0.354	0.24
BOOKLEV	1.284 (55)	1.420 (1135)	0.81
	0.797	0.951	0.87
DEBT_ASSETS	0.334 (55)	0.344 (1134)	0.65
	0.289	0.328	0.29
COVERAGE	10.55 (55)	9.94 (1105)	0.59
	9.90	6.48	0.01 **

TABLE 6

Multivariate tests for global issuer effects in borrowing costs, yields to investors and gross spread, controlling for endogeneity

Regression estimates of yield spreads and gross spread on bond characteristics, market conditions and the global bond test variable. The treatment effects model, using full maximum likelihood, is used to ensure consistent estimates, in the presence of endogeneity in the decision to issue globally. The treatment effects model consists of a regression model and a treatment (selection) model that are jointly estimated. The sample consists of all investment grade domestic and global, fixed rate coupon, U.S.$ bonds issued by non-financial U.S. firms, in the U.S. market from 1/1/96 to 03/20/01, after merging with financial data from Compustat. To be included in the sample, firms must have compustat data available for the latest financial year prior to the issue date. In Model 1, the left-hand side (LHS) variable is the yield-to-maturity (on the net proceeds of the offer, after total manager's fees) in excess of the yield on similar maturity treasuries. This measures borrowing costs to issuers. In Model II, the LHS variable is the gross spread, measured as the difference between the offered amount and the proceeds to the issuer, expressed as a percentage of the offered amount. In Model III, the LHS variable is the offering yield-to-maturity (on the proceeds of the offer, gross of total manager's fees) in excess of the yield on similar maturity treasuries. This measures yield to investors. The right hand side (RHS) variables used in all the models are listed below. LN(MATURITY) and LN(PROCEEDS) are the natural logarithms of years to maturity and proceeds from the issue, respectively. The variable RISK PREMIUM is defined as the yield spread between the Moody's Aaa seasoned corporate bond yield index and the composite Treasury yield index and is included to control for general economic conditions at the time of the offer. CALL PROVISION is a dummy variable indicating whether the bond is callable. SUBSIDIARY is a dummy variable that indicates that the issuing firm is a financial subsidiary of a public firm. In all regressions, individual rating dummies, single digit sic dummy variables and year dummy variables are included but are not reported. The treatment (selection) equation is a probit model with the GLOBAL dummy variable as LHS variable. GLOBAL takes value 1 for global issues and 0 for domestic issues. The RHS variables used for the treatment model are also listed below. ASSETS is total assets in millions of dollars; PROCEEDS/ASSETS is the proceeds from the issue divided by ASSETS; DEBT_ASSETS is (long term debt + debt in current liabilities) / ASSETS; COVERAGE is operating income before depreciation divided by interest expense; ROA is operating income before depreciation divided by ASSETS; Q-RATIO is (long term debt + debt in current liabilities + liquidating value of preferred stock + market value of equity) / ASSETS; DIV_YLD is the annual dividends paid / market value of equity; ISSUYEAR is the year of bond issue. The reported fit of the selection equation is based on a cut-off equal to the proportion of global bonds in the full sample. P-values (in parentheses) are computed using heteroskedastic consistent variance estimates that also take into account possible lack of independence between issues by the same firm on the same day. * and ** indicate significance at the 1% and 5% levels, respectively.

	Borrowing Cost		Gross Spread		Yields to Investors	
	Probit I	Model I	Probit II	Model II	Probit III	Model III
GLOBAL		-0.1464 **		-0.1311 **		-0.1247 *
		(0.03)		(0.00)		(0.05)
LN(MATURITY)		0.1272 **		0.1971 **		0.1554 **
		(0.00)		(0.00)		(0.00)
LN(PROCEEDS)		0.0173 *		0.0050		0.0154
		(0.07)		(0.34)		(0.10)
RISK PREMIUM		1.5506 **		0.0175		1.5496 **
		(0.00)		(0.78)		(0.00)
CALL PROVISION		0.0290		0.0443 **		0.0244
		(0.29)		(0.00)		(0.37)
SUBSIDIARY		0.0667		- 0.0823 **		0.0943 *
		(0.25)		(0.00)		(0.09)
ASSETS	6.35e-06 *		6.39e-06 *		6.34e-06 *	
	(0.06)		(0.06)		(0.06)	
LN(PROCEEDS)	2.1463 **		2.1307 **		2.1427 **	
	(0.00)		(0.00)		(0.00)	
PROCEEDS/ ASSETS	-13.3328 **		-12.2151 **		-13.1864 **	
	(0.01)		(0.02)		(0.01)	
DEBT/ASSETS	-2.5115 *		-2.2502		-2.4981 *	
	(0.09)		(0.12)		(0.09)	
COVERAGE	-0.0521 **		-0.0466 *		-0.0513 **	
	(0.05)		(0.09)		(0.05)	
ROA	7.8559 **		7.9850 **		7.8123 **	
	(0.00)		(0.00)		(0.00)	
Q-RATIO	-0.0837		-0.1085		-0.0863	
	(0.60)		(0.48)		(0.59)	
DIV YIELD	-20.3505 **		-19.0887 *		-20.1837 **	
	(0.05)		(0.06)		(0.05)	
ISSUEYEAR	0.3613 **		0.3654 **		0.3588 **	
	(0.00)		(0.00)		(0.00)	
RATINGS DUMMIES		Included		Included		Included
SIC DUMMIES		Included		Included		Included
YEAR DUMMIES		Included		Included		Included
INTERCEPT	-735.92 **	-0.8869 **	-744.17 **	0.0077	-730.92 **	-1.0055 **
	(0.00)	(0.00)	(0.00)	(0.89)	(0.00)	(0.00)
Observations		1512		1512		1512
Fit of Probit Model	0.92		0.92		0.92	
Model Chi-Square		2279.9		1903.4		2384.4
		(0.00)		(0.00)		(0.00)

TABLE 7

Multiple regression tests for global issuer effects in borrowing costs, yield to investors and gross spread

OLS regression estimates of yield spreads and gross spread on bond characteristics, market conditions and the global bond dummy variable. The sample consists of all investment grade domestic and global, fixed rate coupon, U.S.$ bonds issued by non-financial U.S. firms, in the U.S. market from 1/1/96 to 03/20/01, that is greater or equal in size to the smallest global bond offer ($ 250 mill.). In Model I, the left-hand side (LHS) variable is the offering yield-to-maturity (on the net proceeds of the offer, after total manager's fees) in excess of the yield on same maturity treasuries. This measures borrowing costs to issuers. In Model II, the LHS variable is the gross spread, measured as the difference between the offered amount and the proceeds to the issuer, expressed as a percentage of the offered amount. In Model III, the LHS variable is the offering yield-to-maturity (on the proceeds of the offer, gross of total manager's fees) in excess of the yield on same maturity treasuries. This measures yield to investors. GLOBAL is a dummy variable that indicates that the issue is a global bond. LN(MATURITY) and LN(PROCEEDS) are the natural logarithms of years to maturity and proceeds from the issue, respectively. The variable RISK PREMIUM is defined as the yield spread between the Moody's Aaa seasoned corporate bond yield index and the composite Treasury yield index and is included to control for general economic conditions at the time of the offer. CALL PROVISION is a dummy variable indicating that the bond is callable. SUBSIDIARY is a dummy variable that indicates that the issuing firm is a financial subsidiary of a public firm. In all regressions, individual rating dummies, single digit sic dummy variables and year dummy variables are included but are not reported. P-values (in parentheses) are computed using heteroskedastic consistent variance estimates that also take into account possible lack of independence between issues by the same firm on the same day. * and ** indicate significance at the 1% and 5% levels, respectively.

	Model I LHS: Borrowing Cost	Model II LHS: Gross Spread	Model III LHS: Yield to Investors
GLOBAL (N=87)	-0.1463 **	-0.1204 **	-0.1218 *
	(0.04)	(0.00)	(0.09)
LN(MATURITY)	0.1675 **	0.2026 **	0.1973 **
	(0.00)	(0.00)	(0.00)
LN(PROCEEDS)	0.0635	0.0014	0.0623
	(0.17)	(0.92)	(0.17)
RISK PREMIUM	1.6652 **	0.0800	1.6567 **
	(0.00)	(0.43)	(0.00)
CALL PROVISION	-0.0033	0.0308 **	-0.0060
	(0.93)	(0.01)	(0.88)
SUBSIDIARY	0.1024 *	-0.0275 *	0.1068 *
	(0.09)	(0.06)	(0.08)
INTERCEPT	-1.2543 **	0.0345	-1.3990 **
	(0.01)	(0.70)	(0.00)
RATINGS DUMMIES	Included	Included	Included
SIC DUMMIES	Included	Included	Included
YEAR DUMMIES	Included	Included	Included
Observations	665	665	665
R^2	0.71	0.57	0.71

TABLE 8

Multiple regression tests for global issuer effects in borrowing costs, yield to investors and gross spread, using only domestic issues of global issuers

OLS regression estimates of yield spreads and gross spread on bond characteristics, market conditions and the global bond dummy variable. The sample consists of investment grade domestic and global, fixed rate coupon, U.S.$ bonds issued by non-financial U.S. firms, in the U.S. market from 1/1/96 to 03/20/01, that is greater or equal in size to the smallest global bond offer ($ 250 mill.). The domestic sample includes only domestic bonds that were issued by global bond issuers from 1/1/196 to 03/20/01. In Model I, the left-hand side (LHS) variable is the offering yield-to-maturity (on the net proceeds of the offer, after total manager's fees) in excess of the yield on same maturity treasuries. This measures borrowing costs to issuers. In Model II, the LHS variable is the gross spread, measured as the difference between the offered amount and the proceeds to the issuer, expressed as a percentage of the offered amount. In Model III, the LHS variable is the offering yield-to-maturity (on the proceeds of the offer, gross of total manager's fees) in excess of the yield on same maturity treasuries. This measures yield to investors. GLOBAL is a dummy variable that indicates that the issue is a global bond. LN(MATURITY) and LN(PROCEEDS) are the natural logarithms of years to maturity and proceeds from the issue, respectively. The variable RISK PREMIUM is defined as the yield spread between the Moody's Aaa seasoned corporate bond yield index and the composite Treasury yield index and is included to control for general economic conditions at the time of the offer. CALL PROVISION is a dummy variable indicating whether the bond is callable. SUBSIDIARY is a dummy variable that indicates that the issuing firm is a financial subsidiary of a public firm. In all regressions, individual rating dummies, single digit sic dummy variables and year dummy variables are included but are not reported. P-values (in parentheses) are computed using heteroskedastic consistent variance estimates that also take into account possible lack of independence between issues by the same firm on the same day. * and ** indicate significance at the 1% and 5% levels, respectively

	Model I LHS: Borrowing Cost	Model II LHS: Gross Spread	Model III LHS: Yield to Investors
GLOBAL BOND (N=87)	-0.1734 **	-0.2042 **	-0.1524 *
	(0.04)	(0.01)	(0.07)
LN(MATURITY)	0.3158 **	0.2630 **	0.3326 **
	(0.00)	(0.00)	(0.00)
LN(PROCEEDS)	0.1076 *	0.0055	0.1094 *
	(0.09)	(0.81)	(0.08)
RISK PREMIUM	1.5847 **	0.2465	1.5615 **
	(0.00)	(0.55)	(0.00)
CALL PROVISION	-0.0610	0.1171 *	-0.0738
	(0.42)	(0.06)	(0.32)
SUBSIDIARY	0.1382	-0.0344	0.1408
	(0.21)	(0.48)	(0.19)
INTERCEPT	-1.5393 **	-0.2504	-1.6740 **
	(0.00)	(0.50)	(0.00)
RATINGS DUMMIES	Included	Included	Included
SIC DUMMIES	Included	Included	Included
YEAR DUMMIES	Included	Included	Included
Observations	149	149	149
R^2	0.82	0.60	0.83

TABLE 9

Bid Ask Spreads for investment grade domestic and global bonds issued by non-financial U.S. firms using the 6-month period after issue date.

Historical daily bid and ask quotes were collected from Bloomberg for all investment grade, fixed rate coupon and U.S. dollar denominated domestic and global bonds issued by non-financial U.S. firms after 1995. The time period for bid-ask spreads used for this analysis is the 6-month period after issue date for each bond. BASpread is defined as ((Ask Price – Bid Price)*100) /((Ask Price + Bid Price)/2). The mean and median for BASpread are reported for the global and domestic bond samples, after excluding all bonds smaller in size than the smallest global bond offer. In Panel A, tests of equality of variance was conducted for all differences in means tests and the corresponding test statistic is computed. The Wilcoxon rank-sum test was used to test for differences in medians. In Panel B, rating dummies and year dummy variables are included but are not reported. P-values (in parentheses) are computed using heteroskedastic consistent variance estimates. In Panel C, the mid-prices (average of bid and ask prices), daily returns are computed for each bond. The frequency of non-zero returns is then computed for each bond. For each bond, FREQNONZERO is defined as (Non-Zero Return Obs/Total Obs) where Non-Zero Return Obs is defined as Total Obs- Missing Return Obs – Zero Return Obs). The mean and median for FREQNONZERO are reported for the global and domestic bond samples, after excluding all bonds smaller in size than the smallest global bond offer. The Wilcoxon rank-sum test was used to test for differences in medians. In all panels, * and ** indicate significance at the 10% and 5% levels respectively.

Panel A.	Global	Domestic	P value of difference in means test	p-value of difference in medians test
	Mean (Median) (Number of Obs.)	Mean (Median) (Number of Obs.)		
BASpread	0.324 (0.308) (79 obs.)	0.409 (0.352) (472 obs.)	0.00 **	0.01 **
Panel B.	LHS: BASpread			
INTERCEPT	-0.3888 (0.59)			
GLOBAL	-0.0620 ** (0.01)			
LN(MATURITY)	0.1272 ** (0.00)			
LN(PROCEEDS)	0.0230 (0.51)			
Observations	551			
R^2	0.11			
Panel C	Global	Domestic	Difference in Means (p-value)	Difference in Medians (p-value)
	Mean (Median) (Number of Obs.)	Mean (Median) (Number of Obs.)		
FREQNONZERO	0.906 (0.969) (79 obs.)	0.674 (0.745) (466 obs.)	(0.00) **	(0.00) **

TABLE 10

Descriptive statistics of Global bond, Eurobond and Domestic bond samples used in stock price reaction analyses

Domestic bonds are issued, underwritten and traded in the U.S. market. Eurobonds are underwritten by an international syndicate and traded outside of any one domestic bond market. Global bonds are a hybrid, designed to trade and settle in both the Domestic and Eurobond market. Only the domestic bonds issued by global or eurobond issuers are included for the domestic sample in this analyses. This table provides details on the bond issues for which announcement dates were obtained. The rating classification in Panel B is based on Moody's rating. In a number of cases for global bond issuance, a firm issues multiple bonds of different maturities and sizes on the same date. The issue size is reported as the sum of all bond issues on the same date. For multi-tranche issuance, the years to maturity is reported as the weighted average maturity with issue size being used as the weight.

	Global Bonds		**Eurobonds**		**Domestic Bonds**	
Panel A: By announcement year						
	Number	(%)	Number	(%)	Number	(%)
1988-1992	-	-	20	27.0	-	-
1993-1995	-	-	33	44.6	29	20.7
1996	1	2.8	2	2.7	23	16.4
1997	1	2.8	5	6.7	15	10.7
1998	5	16.7	8	10.8	47	33.6
1999	13	38.9	3	4.1	20	14.3
2000	10	27.8	3	4.1	6	4.3
2001	4	11.0	-		-	-
Total	34	100	74	100	140	100
Panel B : By Rating Class						
	Number	(%)	Number	(%)	Number	(%)
Aaa	-	-	12	16.2	7	5.0
Aa1-Aa3	5	14.7	41	55.4	30	21.4
A1-A3	22	64.7	18	24.3	91	65.0
Baa1-Baa3	7	20.6	2	2.7	5	3.6
Ba1-Ba3	-	-	-	-	7	5.0
B1-B3	-	-	1	1.4	-	-
Caa	-	-	-	-	-	-
Total	34	100	74	100	140	100

Table 10 Contd.	Global Bonds		Eurobonds	Domestic Bonds	
Panel C: By use of proceeds					
General Corp. Purposes	8	23.6		55	39.3
Refinance debt	13	38.2		43	30.7
General Corp. purpose and refinance debt.	13	38.2		29	20.7
Not available	-	-		13	9.3
Total	34	100		140	100
Panel D: Summary Statistics					
	Mean (Median)		Mean (Median)	Mean (Median)	
Issue Size ($ mill) All Markets	1912.1 (1430)		274.1 (250)	363.2 (300)	
Years to Maturity (years)	11.6 (10.0)		4.9 (5.0)	15.5 (10)	
% Investment Grade	100.0%		98.7 %	95.0%	

TABLE 11

Stock Price Reaction to Global, Eurobond and Domestic Bond Announcements

The samples consist of 34 announcements of global bond offerings made by 24 U.S. firms, 140 announcements of domestic bond offerings made by 43 U.S. firms that have also issued global or eurobonds, and 74 announcements of eurobond offerings made by 39 U.S. firms. The sample periods for the global bond, domestic bond and eurobond samples are 1996-2001, 1995-2000 and 1988-2000, respectively. Abnormal returns are obtained using the market model and parameters are estimated over a 100 day period, from day –125 to –26 relative to the announcement date. The S&P 500 index is used as a proxy for the market portfolio. Cumulative Abnormal Returns for the period –1 to +1, CAR(-1,1), for all the samples are reported in Panel A, with the announcement date as day 0. The results using the market adjusted and mean adjusted models are also presented. The t-statistics and sign rank z statistics are presented in parentheses below. *, ** and *** indicate significance of the *t*-statistic at the 10%, 5% and 1% levels, respectively. Tests of differences in mean CAR(-1,1), using the market model, between the different samples are reported in Panel B. P-values are in parentheses below.

Panel A

	Global Bonds (34 obs)	**Domestic Bonds** (140 obs)	**Eurobonds (1988-2000)** (74 obs)	**Eurobonds (1995-2000)** (36 obs)
Market Model, EW Index				
CAR (-1,1)	1.71% ***	0.29%	0.25%	0.12%
t–statistic	(2.73)	(1.32)	(0.83)	(0.25)
Generalized Sign Rank Test Z stat.	(2.33) **	(1.22)	(0.76)	(-0.21)
Market Adjusted Model, EW Index				
CAR (-1,1)	1.85% **	0.32%	0.24%	0.11%
t–statistic	(2.83)	(1.45)	(0.76)	(0.23)
Generalized Sign Rank Test Z stat.	(1.76) *	(0.93)	(1.60)	(0.97)
Mean Adjusted Model				
CAR (-1,1)	1.68%**	0.29%	0.05%	-0.12%
t–statistic	(2.51)	(1.07)	(0.15)	(-0.21)
Generalized Sign Rank Test Z stat.	(2.13)**	(1.44)	(0.45)	(0.07)

Panel B

	Domestic bonds (140 obs.) (1995-2000)	Eurobonds (36 obs.) (1995-2000)	Eurobonds (74 obs.) (1988-2000)
Global sample (34 obs: 1996-2001)	1.42% *	1.59% *	1.46% *
	(0.08)	(0.07)	(0.08)
Domestic bond sample (140 obs:1995-2000)		0.17%	0.035%
		(0.73)	(0.92)