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ECB-CFS RESEARCH NETWORK ON CAPITAL MARKETS AND FINANCIAL INTEGRATION IN EUROPE

SECURITY FUNGIBILITY AND THE COST OF CAPITAL

EVIDENCE FROM GLOBAL BONDS

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In 2005 all ECB publications will feature a motif taken from the €50 banknote.

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ECB-CFS Research Network on
"Capital Markets and Financial Integration in Europe"

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Abstract

This paper examines the potential benefits of security fungibility by conducting the first comprehensive analysis of Global bonds. Unlike other debt securities, Global bonds' fungibility allows them to be placed simultaneously in bond markets around the world; they trade, clear and settle efficiently within as well as across markets. We test the impact of issuing these securities on firms' cost of capital, issuing costs, liquidity and shareholder wealth. Using a sample of 230 Global bond issues by 94 companies from the U.S. and abroad over the period 1996-2003, we find that firms are able to lower their cost of (debt) capital by issuing these fungible securities. We also document that the stock price reaction to the announcement of Global bond issuance is positive and significant, while comparable domestic and Eurobond issues over the same time period are associated with insignificant changes in shareholder wealth.

JEL classification: F3, G1, G3

Keywords: Global bonds; security fungibility; cost of capital; international capital raising

Non-technical summary

This paper examines the potential benefits of security fungibility by conducting the first comprehensive analysis of Global bonds. Global bonds are debt instruments that are sold simultaneously in multiple markets at the same offer price. They are fully fungible in that the identical instrument trades within each market as well as between markets without restrictions. Global bonds are similar to domestic public corporate debt except that they are placed with a diverse international investor base that can easily trade them within and across markets around the world. To accomplish this, new global custody, clearing and settlement procedures have been created to streamline cross-market trading. We examine potential benefits of these fungible securities by studying their impact on firms' cost of capital, issuing costs (gross spreads) and shareholder wealth.

Using a sample of 230 Global bond issues from 94 companies from the U.S. and abroad over the 1996-2003 time period, we find that both the borrowing costs and issuing costs (underwriting spreads) of Global bonds are significantly lower than those of comparable domestic bonds and Eurobonds. Specifically, our results suggest that firms that issue globally are able to lower their borrowing costs by approximately 20 basis points relative to non-Global bonds, ceteris paribus. This result is robust to a number of tests that attempt to control for alternative benchmarks, potential endogeneity in the decision to issue globally as well as issue size and issuer related differences. Our results are consistent with the hypothesis that firms are able to lower their cost of (debt) capital by issuing fungible debt securities that are more liquid, have lower cross-border transactions costs, have longer trading hours and can access a wider investor base.

We also document that the stock price reaction to the announcement of Global bond issuance is positive and significant, while comparable domestic and Eurobond issues by U.S. firms over the same time period are associated with insignificant changes in shareholder wealth. These results suggest that the benefit of global issuance is not being driven by global issuers exploiting temporary differences in the Eurodollar-U.S. interest rate. Overall, our findings suggest that the issuance of globally tradeable securities is associated with significant benefits.

Our study of Global bonds provides, to the best of our knowledge, the first large sample test of the impact of the integration of cross-border clearing and settlement

systems, a process whose benefits are currently under debate. Our finding that Global bonds' fungibility lowers borrowing costs provides evidence that the wave of consolidation and integration of securities clearing and settlement organizations and the call for the creation of a global clearing and settlement solution would indeed have benefits to firms' capital raising activities.

1. Introduction

Although global markets are becoming increasingly integrated, it is still the case that stock and bond trading around the world is largely confined to the market where the security was first issued. A share of IBM that trades on the NYSE is not able to trade on the Tokyo, Frankfurt, or any other exchange. IBM's public debt securities are also cumbersome to trade across borders, since registration, clearing, and settlement are all different for U.S., Euro, and Asian bond markets. In contrast, what if a firm's securities were engineered to achieve maximum tradeability, thereby facilitating placement with an international investor base and easy trading within and across multiple markets around the world? Would firms be able to raise more capital at better rates? In this paper, we examine these questions using a sample of Global bonds, the first widely issued securities that are designed for maximum tradeability.

Global bonds are debt instruments that are sold simultaneously in multiple markets at the same offer price. They are fully fungible in that the identical instrument trades within each market as well as between markets without restrictions. [1] Global bonds are similar to domestic public corporate debt except that they are placed with a diverse international investor base that can easily trade them within and across markets around the world. To accomplish this, new global custody, clearing and settlement procedures were created to streamline cross-market trading. While the first issuance of a Global bond by a non-financial firm was in 1992, over $300 billion has been raised by corporations since their introduction.

Using a sample of 230 Global bond issues from 94 companies from the U.S. and abroad over the 1996-2003 time period, we find that both the borrowing costs and issuing costs (underwriting spreads) of Global bonds are significantly lower than those of comparable domestic bonds and Eurobonds. Therefore, our findings suggest that issuing Global bonds, which have greater liquidity and lower issuing costs than non-Global bonds, reduces the cost of debt capital. We also document that the stock price reaction to the announcement of Global bond issuance is positive and significant, while comparable

[1] All financial contracts with identical terms are not necessarily fully fungible. For example, the stock certificate that represents one share of IBM on the NYSE cannot be used to trade for the certificate that represents one share of IBM on the Tokyo stock exchange. See Gagnon and Karolyi (2003) for additional details on international security fungibility in the context of equities.

domestic and Eurobond issues over the same time period are associated with insignificant changes in shareholder wealth. Overall, our findings suggest that issuing globally tradeable securities is associated with economically significant benefits.

This study contributes to the literature in several ways. First, we examine the potential benefits of a financial instrument that is becoming the customary way for corporations, countries, and supranationals to raise large amounts of funds.[2] Our study of Global bonds also provides, to the best of our knowledge, the first large sample test of the impact of the integration of cross-border clearing and settlement systems, a process whose benefits are currently under debate.[3] Our finding that Global bonds' fungibility lowers borrowing costs provides evidence that the wave of consolidation and integration of securities clearing and settlement organizations and the call for the creation of a global clearing and settlement solution would indeed have benefits to firms' capital raising activities.[4] Finally, our analysis of the shareholder wealth effects of Global, Euro and domestic bond issuance allows us to add to the literature that examines the wealth effects of security issuance by U.S. firms abroad (e.g. Kim and Stulz (1988), Chaplinsky and Ramchand (2000a)).

The paper is organized as follows: Section 2 describes the institutional features of Global bonds and their clearing and settlement procedures. Section 3 discusses potential benefits and costs of Global bonds relative to domestic bonds. Section 4 describes the Global and benchmark bond samples and provides some characteristics of the issuers. Section 5 compares the yield spreads and gross (underwriting) spreads of Global and comparison bonds to identify benefits to Global bond issuance. Section 6 analyzes the stock price reaction to the announcement of Global bond issuance. Section 7 discusses some of the additional robustness tests that were conducted. Section 8 concludes.

[2] See "The Rise of Global Bonds", Financial Market Trends, June 1994.

[3] The only other security that shares the fungiblity of global bonds is the Global Registered Share (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 only 4 firms with GRS programs. For a detailed study of the first GRS, issued by DaimlerChrysler, see Karolyi (2003).

[4] The *Depository Trust & Clearing Corporation* (DTCC), the world's largest securities clearing and settlement organizations, called for (October 2000) the financial services industry to develop a global clearing and settlement solution to lower costs, improve liquidity, and increase market capacity.

2. A Primer on Global bonds

Global bonds are relatively new financial instruments. In 1988 under the direction of the World Bank's Kenneth Lay, over 125 institutional investors in 16 countries were surveyed on how to improve debt issuance and trading.[5] The results of this survey found that liquidity, investor base and trading convenience were the factors investors most valued. Given the large annual borrowing needs of the World Bank, they undertook the engineering of the Global bond, which entailed extensive legal work to integrate settlement procedures across systems. The first Global bond was issued by the World Bank in 1989, the first corporate Global bond was issued by Matsushita Electric in 1992, and the first U.S. firm's Global bond was issued by Walt Disney in 1996.[6] Global bonds have several defining features. First, they are engineered to be fully fungible securities in that a Global bond can be traded 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.

Since part of the issue is placed in the U.S., Global bond offers must be registered with the Securities and Exchange Commission (SEC).[7] 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.[8]

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[5] See *Mobilizing private savings for development : IBRD and the capital markets* by Kenneth G. Lay, 1994.
[6] Source: Securities Data Company
[7] 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 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 thus 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.
[8] While geographic placement data are generally unavailable, we were able to gather this information for 18 global bonds and find, on average, that approximately 19 percent of the issue is placed outside the United States.

U.S. firms are the most prevalent issuers in the corporate Global bond market, and account for 70% of the issues.[9] Appendix A provides information on a sample Global bond issue made by Wal-Mart. This issue 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.[10]

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 of trade-failures from the lack of simultaneous transfers of securities and cash between sellers and buyers.

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 through Clearstream or Euroclear. Because DTC is the only registered owner of the bonds, Clearstream and Euroclear buy and sell Global bonds through their DTC depositaries, such as JP Morgan Chase.

Global bonds are designed to trade and settle like home market instruments from the investors' perspective. That is, Euro-market 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 Euro-market 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 Euro-market

[9] Source: Securities Data Company
[10] See "Wal-Mart to raise finance for Asda buy" in The Financial Times, July 20, 1999.

investor wants to trade in a pure U.S. domestic bond, he would have to open an account with a new 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, Euro-market investors may place a higher value on Global bonds.

Cross-market trades (a U.S. investor trading with a Euro-market 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 Euro-market investor uses the DTC depositary of Euroclear or Clearstream (JP Morgan Chase). The U.S. investor will receive credit for any bonds purchased or cash for any bonds sold, on the DTC settlement date. For Euro-market investors, because of time zone differences, the 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 cross-border transactions can occur more cost-efficiently relative to domestic bonds since the clearing and settlement systems are integrated for Global bonds.[11] Thus, the integration of clearing and settlement systems accentuates the benefits of fungibility of Global bonds.

3. Potential benefits and costs of globally fungible securities

Previous research has identified various market imperfections, such as information asymmetries, illiquidity, and transactions costs, which exist in financial markets. Issuers and investors can potentially benefit if fully fungible securities, like Global bonds, can partly overcome some of these imperfections. In this section, we highlight some of the potential benefits and costs of Global bonds relative to domestic bonds.

3.1 Liquidity

Global bonds have several features that may increase their liquidity relative to other types of debt instruments. First, they are extremely large offerings and liquidity is often found to be increasing in offer size (Hong and Warga (2000), Fisher (1959)). Second, Global bonds are targeted to a globally diverse investor base, which may result

[11] The main benefit to Euro-market and U.S. investors is that they can use their existing accounts with Euroclear, Clearstream and DTC to undertake cross-border transactions.

in increased divergence of opinion and more incentives to trade (Chen, Hong, Stein (2002), Scheinkman and Xiong (2002)). Finally, Global bonds also have longer trading hours since they can be typically traded in several international markets in different time zones. Therefore, a U.S. investor can sell his bonds in a European market even before regular trading hours in the U.S. market. Longer trading hours would seem to be a desirable feature for investors since they allow a timing option of being able to trade a bond almost around-the-clock. Werner and Kleidon (1996) and Chan, Fong, Kho and Stulz (1996) find that in the case of cross-listed equities, the arrival of information throughout non-trading periods can influence volatility, volume and bid-ask spreads. 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".[12] Therefore, if Global bonds are more liquid than domestic bonds, investors may be willing to pay a higher price, all things equal (Amihud and Mendelson (1986, 1991)).

3.1.1 Cross-border transactions cost

Cross-border trading in Global bonds is enhanced by the integration of clearing and settlement systems in the Euro-market (Clearstream and Euroclear) and U.S. market (DTC). Hence, international investors are likely to find cross-border transactions less costly, in terms of lower brokerage fees and quicker clearing and settlement, for Global bonds relative to domestic bonds.

3.2 Investor base and market conditions

Due to the potential benefits of higher secondary market liquidity, lower cross-border transaction costs and longer trading hours, international investors are likely to find fungible securities attractive. Hence, Global bonds may be an effective way to widen a firm's investor base, which can lower its cost of capital (Merton (1987)). In addition, global issuers can adjust each market's allocation based on investors' tastes and preferences in order to take advantage of their differential demand functions (Stulz and Wasserfallen (1995)). The ability to take advantage of market conditions across countries may be especially valuable for Global bond offers, since they are typically very large issues, which could make placing them in just the domestic market difficult.

[12] www.worldbank.org/debtsecurities

3.3 Issuing costs (gross spreads)

The issuing costs (gross spreads) in different bond markets may differ depending on factors like underwriter competition and economies of scale. Global bonds, given their large size, may induce greater competition between underwriters as well as offer economies of scale to underwriters. Hence, even if there are no other advantages to Global bonds like higher liquidity, issuers would prefer to issue Global bonds if it results in lower issuing costs since it lowers the issuers' cost of capital. High reputation underwriters are prominent players in the Global bond market, which is consistent with a positive relation between market share and reputation (Dunbar (2000)).

3.4 Costs of Global bond issuance

The fact that pure domestic issuance is still adopted by a large number of firms suggests that there are costs to global issuance that may offset some of the benefits. For example, a key determinant of selling costs in a foreign market is likely to be the visibility and reputation of an issuer.[13] On the other hand, a firm without any global presence may have to incur significant selling costs in order to attract foreign investors which would make a global issue less attractive. In untabulated results, we find that over 45% of U.S. Global bond issuers had previously issued Eurobonds. This suggests that global issuers tend to be firms that are likely to have lower selling costs in Euro-markets.

Incremental fixed 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, complying with the regulatory requirements of foreign markets, exchange listing requirements and costs associated with the linking of foreign market clearing houses (ClearStream and Euroclear) and the Depository Trust Company (DTC) to allow efficient clearing and settlement for cross-border trades of Global bonds.[14] Therefore, the optimal size of a global issue may have to be large enough to generate financing cost savings (lower gross spreads and lower cost of capital) that offset these higher costs. The mean (median) Global bond in our sample is 0.914 billion USD (0.695 billion USD). This

[13] The literature on Eurobonds suggests that traditionally Eurobond investors were attracted to issuer firms that were well known with significant overseas operations (see, e.g., Kidwell, Marr and Thompson (1985)).
[14] 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.

observed large global issue size lends some support to the argument that there exist significant costs in the global issuance process.

4. Issue and Issuer Characteristics

4.1 Data selection and issue characteristics

The sample consists of all straight investment grade, fixed-rate coupon, U.S. dollar-denominated bond offerings, issued by non-financial firms in the Global bond market from January 1, 1996 to September 20, 2003. There are 230 Global bond issues in the sample, of which 179 were issued by U.S. firms and 51 issued by non-U.S. firms. In addition to these 230 issues, there was also one non-investment grade U.S. global issuer that was excluded.[15]

We benchmark the sample of U.S. firms' Global bonds in two ways. First, we compare the borrowing costs of Global bonds issued by U.S. companies to domestic bonds issued by U.S. companies. An advantage of this approach is that issuance procedures, flotation costs and indentures are uniform across Global and domestic bond issuance. A potential drawback of this benchmark is that while there are no restrictions to prevent foreign investors from holding domestic corporate bonds, the investor base is likely to be U.S. based, which could render fungibility less important. Therefore, we examine a second benchmark that consists of Eurobond issues by U.S. firms. Since both Eurobonds and Global bonds are targeted to non-U.S. investors, fungibility is likely to be the key difference in the bonds. The potential limitations of the Eurobond comparison sample are that there are relatively fewer Eurobonds issued in the sample period and that the relative yields could be influenced by differences in issuance procedures (registration and disclosure requirements tend to be more stringent and costly for Global bonds 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 Global bonds).

To benchmark the Global bonds of non-U.S. firms, we gather data on bonds issued in the U.S. market by foreign firms (also known as Yankee bonds). Yankee bonds

[15] 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, it was announced around the date of issuance that Federal-Mogul was in financial distress.

are a natural benchmark since their characteristics are similar to Global bonds (e.g., registration, disclosure requirements, covenant provisions), target similar investors, but differ in fungibility since Yankees are placed solely in the U.S. public bond market.[16]

The data on Global bonds, Eurobonds, Yankee bonds and domestic bond issues is obtained from Securities Data Company (SDC) New Issues Database and Bloomberg. We only include fixed-coupon rate U.S. dollar-denominated offerings, which comprise the vast majority of global issues, to facilitate the comparison of borrowing costs. Finally, since the Global bond sample consists of only investment grade bonds, only investment grade comparison bonds are chosen to form the benchmark samples.

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 the sales of global issues less costly, since placing a large bond offering of a single maturity may be difficult. In our sample, for the issues by U.S. firms, 80 firms issued 1 bond on the same date (80 bonds), 28 firms issued 2 bonds on the same date (56 bonds), 13 firms issued 3 bonds on the same date (39), and 1 firm issued 4 bonds on the same date (4 bonds). For Global bonds from non-U.S. firms, there were 37 issues done in a single tranche (37 bonds), 4 issues done in double tranches (8 bonds) and 2 issues done in triple tranches (6 bonds). 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 5.1.1.

Table 1 provides sample statistics for Global bonds and the benchmark domestic bonds, Eurobonds and Yankee bonds. As can be seen from the table, Global bond issuance has steadily increased since the beginning of the sample period. There are 179 Global bonds issued by U.S. firms and 51 Global bonds issued by non-U.S. firms. The U.S. domestic bond, Eurobond, and Yankee bond samples consists of 2231, 62, and 143 bonds, respectively. Examination of the issue characteristics of Global bonds and comparison bonds, however, suggests important differences. For example, global issues

[16] See Miller and Puthenpurackal (2002) for an analysis of the Yankee bond market.

tend to be much larger than benchmark issues, and less frequently contain call provisions. In addition, we note differences in distributions of credit ratings, maturities and 1-digit sic industry groups (not tabulated) between the various samples. This highlights the need to control for issue characteristics in our analyses.

4.2 Characteristics of Global and non-Global Issuers

Kim and Stulz (1988) show that Eurobond issuers tend to be large, well-known firms with a global presence. They tend to have products sold world-wide, have strong brand names and have production plants in many countries. This suggests that Eurobond issuers are those with lower foreign selling costs. Since Global bonds are partly placed in the Eurobond market, one may expect that similar firms issue Eurobonds and Global bonds. Also, one would expect that Global bond issuers have large debt capacities since Global bonds tend to be large. Consistent with this notion, the typical Global bond issuers are well known companies and about 45% of global issuers had a prior Eurobond offering. Also, about 48% of global issuers have at least 1 foreign exchange listing. To the extent these firms are already recognized by international investors, global issuers are likely to have lower selling costs in foreign markets than their pure domestic counterparts.

Table 2 provides data on Global and benchmark bond issuers' characteristics such as total assets, market value of equity, leverage, profitability, Q-ratio and interest coverage. This financial data is obtained from Compustat and Worldscope and the items reported are for the latest financial year prior to the issue date. Comparing U.S. firms that issue Global bonds to U.S. firms that issue pure domestic bonds, based on medians, U.S. global issuers have about four times the assets and about six times the market value of equity of U.S. domestic issuers. The median global issue size ($ 699 mill.) is over 3 times the median domestic issue size ($ 198 mill.).[17] However, as a proportion of market value of equity, the median global offer is smaller than 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

[17] The samples in Table 2 are smaller than those in Table 1 since some observations are lost during the merging of issue data with Compustat data. The characteristics of the samples in Table 1 and Table 2 are, however, similar.

significantly lower than that of domestic issuers while the median coverage ratio is higher for global issuers. While Table 2 also shows that the characteristics of U.S. firms that issue Global bonds are more similar to U.S. firms that issue Eurobonds, the average Global bond issuing firm remains larger than its Eurobond issuing counterpart.

Comparing non-U.S. firms that issue global bonds to non-U.S. firms that issue Yankee bonds, again we see that Global bond issuers are larger in size, issue proceeds, and Q-ratio. 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 recalculate (not tabled) the sample statistics after treating all bond issues by a firm on the same date as part of the same issue and find similar results.

The characteristics reported in Table 2 show 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 the issuer as well as issue characteristics of the two samples in our analyses. In addition, it raises the possibility that the decision to issue globally may be endogenously determined.

5. Testing for Benefits of Global Bonds

Fungible securities like Global bonds can potentially command a higher price than comparable domestic bonds due to higher liquidity, lower gross spreads, lower cross-border transactions costs and a wider investor base. This would predict that firms can lower their cost of capital by issuing fungible securities like Global bonds, ceteris paribus.

5.1 Comparing yields of Global bonds and domestic bonds issued by U.S. firms

To investigate whether global issuance lowers the cost of debt, our first set of tests examines the differences in at-issue yield spreads using a pooled sample of Global bonds and domestic bonds issued by U.S. firms. To do so, however, a few econometric issues need to be addressed. First, there is the 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.

5.1.1 *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 issues as independent 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.[18] 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. [19]

5.1.2 *Controlling for potential endogeneity in the decision to issue globally*

Since there are significant differences in the characteristics of global issuers and issues relative to domestic issuers and issues, 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.

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.[20]

[18] As an alternative to this robust variance estimator, we also employed a random firm effects estimation procedure and obtained similar results.

[19] 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. Further details on the calculation of the robust estimator of variance are available from the authors upon request.

[20] See Reese and Weisbach (2002) and Doidge, Karolyi and Stulz (2004) for an application of the treatment effects model for firms cross listing in the United States.

5.1.3 Treatment effects model using maximum likelihood estimator

The primary regression equation of interest is

$$y_j = \beta x_j + \delta z_j + \varepsilon_j \tag{1}$$

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

$$z_j^* = \gamma w_j + u_j \tag{2}$$

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-information maximum likelihood. The use of a treatment effects model with a robust variance estimator allows us to control for potential endogeneity in the decision to issue globally and the lack of independence between bonds of a firm issued on the same date. We implement this model using the entire pooled sample of investment grade Global and domestic bonds

issued by non-financial U.S. firms, from January 1996 to September 2003, after merging with financial data from Compustat.

To test whether Global bond issuance lowers the 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 et al. (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. Our measure of the yield spread, YLDSPD, is defined as the offering yield-to-maturity (on the proceeds of the offer, after deducting total managers' fees) in excess of the yield on same-maturity treasuries.[21] 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.

Regression Model

$$\begin{aligned} YLDSPD &= \beta_0 + \beta_1 GLOBAL + \beta_2 I_{(Aaa)} + \beta_3 I_{(Aa1)} + \beta_4 I_{(Aa2)} + ...\beta_{10} I_{(Baa2)} + \beta_{11} I_{(Baa3)} \\ &+ \beta_{12}\ LN(MATURITY) + \beta_{13} LN(PROCEEDS) + \beta_{14} RISKPREMIUM \\ &+ \beta_{15} CALLPROVISION + \beta_{16} SUBSIDIARY \\ &+ \beta_{17} Year1996 + \beta_{18} Year1997 .....\beta_{22} Year2001 + \beta_{23} SIC1.. + \beta_{29} SIC8 \\ &+ \beta_{30} \lambda \end{aligned} \qquad (3)$$

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

Treatment Equation Model

$$GLOBAL = \alpha_0 + \alpha_1 ASSETS + \alpha_2 LN(PROCEEDS) + \alpha_3 (PROCEEDS/ASSETS) + \alpha_4 (DEBT/ASSETS) + \alpha_5 COVERAGE + \alpha_6 ROA + \alpha_7 QRATIO + \alpha_8 DIVYIELD + \alpha_9 ISSUYEAR \quad (4)$$

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 subsidiaries of industrial companies with part of 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 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.

5.1.4 Relative borrowing costs of Global and domestic bonds of U.S. firms

The results of the estimated treatment effects model are reported in Table 3. Table 3 Probit I reports estimates for the treatment equation used to correct for selection bias. We note 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 2.

The regression coefficient estimates of the treatment effects model, reported in Table 3 Model I, suggest that the borrowing costs on Global bonds is 20.7 basis points lower than domestic bonds, ceteris paribus. This provides direct evidence that Global bonds lower the cost of debt capital for issuers. We are able to interpret lower at-issue yields to imply lower cost of debt since the non-interest costs, such as restrictiveness of bond covenants, of Global bonds are similar to that of domestic bonds. Thus, firms that issue Global bonds, a fully fungible instrument, appear to obtain statistically and economically significant savings in their cost of capital. It also provides (indirect) evidence that investors value Global bonds because of their higher liquidity, lower cross-border transactions costs and longer trading hours. Further, it is interesting to note that our findings are consistent with market participants' perception of the economic impact of Global bonds. For example, in Euromoney (December 1993) the World Bank's Kenneth Lay states that before using the Global bond structure, the World Bank was paying 10 basis points over U.S. agencies for straight debt. Using the Global bond structure, the World Bank is paying around 8 basis points lower than U.S. agencies. He also cites liquidity and a wider and more diverse investor base as reasons for this savings.

Our finding that global security offerings lower the cost of capital also contributes to the literature that find a positive (or less negative) stock price reaction to international security offerings (Chaplinsky and Ramchand (2000a), Miller (1999), Foerster and Karolyi (1999), Errunza and Miller (2000), Foerster and Karolyi (2000), Kim and Stulz

(1988)). Our result suggests that the documented positive stock price reaction could be, at least in part, driven by a lowering of the cost of capital rather than pure higher future cash flow effects.

5.1.5 Relative issuing costs (gross spreads) of Global and domestic bonds of U.S. firms

We examine the issuing costs (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 5.1.3 using gross spread as the dependent variable.

Table 3 Model II shows the regression results. The gross spread for global issues is 0.16 % 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 $1.6 million. This suggests that issuers obtain statistically and economically significant savings in issuing costs through the issuance of Global bonds. Potential reasons for the lower gross spreads of Global bonds include greater underwriter competition in Global bond issuance given their large size as well as economies of scale given the likely significant fixed costs in the underwriting process. It may be noted that for this analysis, we use the reported gross spread data. Since there is a practice of rebating in the Eurobond market wherein large investors are offered rebates on the offer price by underwriters, 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, our evidence shows that reported gross spreads for Global bonds are lower than the reported gross spreads for domestic bonds, therefore it follows that the true global gross spreads are lower than the true domestic bond gross spread, even after considering the possibility of rebating. Hence, this result provides new evidence on relative true gross spreads of corporate bond issuance in the domestic and Global bond markets.

We also find (untabulated results) that yields to investors (i.e., the yields before subtracting the gross spreads) for Global bonds are lower than those for domestic bonds, ceteris paribus. Hence, the lower cost of borrowing on Global bonds appears to be driven by both lower issuing costs (gross spreads) and by investors willing to accept lower yields on Global bonds due to the benefits of fungible securities.

5.2 Robustness tests

In addition to the use of the treatment effects model with a robust variance estimator, we conduct a number of robustness tests that use alternate controls and benchmarks.

As an additional control for issuer related differences, we benchmark the Global bond issues of U.S. firms to their respective domestic bond issues using OLS. This approach attempts to control for any issuer related characteristics not captured in the bond pricing specification that may influence yields and gross spreads. Models I and II of Table 4 show that employing the domestic bonds of global issuers as benchmarks produces borrowing costs and gross spread results that are similar to that obtained from the treatment effects model.

We also benchmark the sample of Global bond issues by U.S. firms to Eurobond issues by U.S. firms. Table 2 shows that Global bond and Eurobond issuers share relatively similar characteristics compared to the domestic bond issuers. Further, 45% of firms that issued Global bonds had previously issued Eurobonds. However, one characteristics that Global and Eurobonds differ substantially on is offer size (medians of $699 and $299 million, respectively). Therefore, for comparison purposes, we exclude Eurobonds that are smaller than the smallest Global bond ($100 million).[22] Model III of

[22] Comparing with only the Eurobonds issued by global bond issuing firms also yields similar results.

Table 4 suggests the borrowing costs on Global bonds is 42.5 basis points lower than Eurobonds, ceteris paribus. While the magnitude of the coefficient is more than twice than the estimate derived from benchmarking to U.S. domestic bonds, it is likely a result of the higher reported gross spreads for Eurobond issues. Evidence of this is found in Model IV which shows that the gross spreads of Global bonds are 0.46% lower than for Eurobonds. In untabulated results, we also find that after accounting for gross fees investors are still willing to accept a lower return on Global bonds (28.7 basis points). Therefore, when we compare the borrowing costs, gross spreads and yield to investors of Global bonds to Eurobonds, we find consistent results. That is, Global bonds have lower required rates of return than less fungible debt instruments.

Table 4 also presents the results of tests that examine Global bonds issued by non-U.S. firms benchmarked to bonds issued in the U.S. domestic market by non-U.S. firms (Yankee bonds). Model V shows that compared to Yankee bonds, the borrowing costs of Global bonds are 19.9 basis points lower. Although the results for this comparison are statistically less significant (p-value=0.06) and economically smaller than some of our earlier estimates, they are largely consistent with our previous findings. That is, we find that the Global bonds issued by non-U.S. firms also enjoy lower borrowing costs than comparable but less fungible bonds. Further, Model VI shows that the gross spreads of Global bonds are lower than Yankee bonds.

Finally, as an additional approach to control for issue size differences in the U.S. global and domestic samples, we exclude all domestic offers that are smaller than the smallest Global bond offer ($100 million) and then use OLS.[23] In untabulated results, we find that, after controlling for the bond and issuer characteristics, the borrowing costs on Global bonds is 19.9 basis points lower than that of domestic bonds. The borrowing costs and gross spread results are all similar to those obtained from the treatment effects model.

Overall, our results suggest that firms are able to lower their borrowing and issuing costs (gross spreads) by issuing Global bonds. Our results are consistent across U.S. and non-U.S. issuers and are robust to the use of alternate benchmarks. Our estimate of borrowing cost savings would predict that for the global issue described in Appendix

[23] We obtain similar results using other cutoffs such as US$ 150 million, US$ 200 million and US$ 250 million.

A, Wal-Mart saved $ 38.4 million on a $ 5750 million issue by issuing Global bonds instead of domestic bonds.[24]

6. Stock Price Reaction Analyses

To document the change in shareholders' wealth associated with issuing globally traded securities, we measure the stock price reaction to the announcement of U.S. firms' Global bond offerings. We also provide two comparison event studies as benchmarks. The first is the announcement effect of U.S. firms' issuing exclusively in the Eurobond market, a benchmark that represents another international corporate bond offering but does not share the fungibility of Global bonds. This comparison allows us to provide some indirect evidence on whether the stock price reaction to Global bond issuance is explained by Kim and Stulz's (1988) clientele hypothesis in which firms can exploit temporary differences in the Eurodollar/U.S. interest rates.[25] The second is the announcement effect of domestic U.S. corporate bond issuance by U.S. Global bond issuing firms. This comparison allows us to examine if the stock price reaction to Global bond issuance is an artifact of the firms and time period rather than arising from benefits associated with global issuance.

Global bond issuance is often done in different tranches on the same day and hence, the number of unique announcement dates is less 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 72 Global bond announcement dates. Using a similar procedure, we obtain 36 Eurobond announcement dates and 114 domestic bond announcement dates.

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 CRSP Equally Weighted 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).

[24] 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 13.09 basis points higher than the actual yield.
[25] Henderson, Jegadeesh and Weisbach (2003) also document market timing by firms using country level data.

The event study results are reported in Table 5. We find that the mean abnormal stock price reaction, CAR(-1,+1), to the announcement of global issuance is 1.02% (median 0.72%) and is statistically significant at the 5% level. The sign-rank test is also significant at the 5% level.[26] The stock price reaction to the announcement of domestic bonds issued by global issuers over the same time period, however, is 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 the same time period, which is consistent with the later period results of Kim and Stulz (1988). In Table 5, 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 5% and 10% level, respectively.

Overall, our results suggest that Global bond issuance is associated with a significant increase in shareholder wealth. Further, the positive stock price reaction to the announcement of global issuance does not appear to be driven by global issuers exploiting temporary differences in the Eurodollar/U.S. interest rates, but by benefits associated with the fungibility of Global bonds. While these findings are only suggestive given the small sample size, we also performed an additional analysis in which we estimate the interest cost savings based on the U.S.-Eurodollar interest rate difference and use it as an explanatory variable for the Global bond issuance announcement returns. [27] Consistent with our previous results (and subject to the same caveat of the low power of our test), we do not find support for the clientele hypothesis in explaining the positive benefits to Global bond issuance over our sample period.

7. Additional Tests

A number of additional tests were conducted to examine the liquidity of Global bonds (untabulated). Unfortunately, data for analyzing the liquidity of corporate bonds is not nearly as complete as that for stocks. For example, complete trading volume data

[26] The results are similar using the market-adjusted and mean adjusted benchmarks.
[27] In untabulated tests, we also found that the increase in the number of shareholders (Merton (1987)) did not help explain the observed announcement effects. We thank Rene Stulz for suggesting these tests.

(depth dimension of liquidity) for corporate bonds are currently not available.[28] However, data are available on corporate bond transactions by insurance companies since these companies are required by law to report to the National Association of Insurance Companies (NAIC) their securities transactions on Schedule D filings. We obtain data on U.S. corporate bond transactions of insurance companies from Capital Access International for 1996-2001.[29] As measures of liquidity for our domestic and Global bond samples, we analyze bid-ask spreads taken from Bloomberg and the frequency of daily non-zero returns using the average of daily bid and ask price quotes available on Bloomberg (Lesmond et al (1999)). We also examine the frequency of corporate bond transactions by insurance companies in Global and domestic bonds using data from Capital Access International.

Using 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, we find that for the 6-month period after the issue date, the Global bond sample (79 obs.) mean (median) BASpread, defined as ((Ask Price–Bid Price)*100)/((Ask Price+Bid Price)/2), is 0.32% (0.31%) or 32bp, while that of the domestic sample (472 obs.) is 0.41% (0.35%). Therefore, we find that the mean and median BASpread of the global sample is significantly lower than that of the domestic sample. We also 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 the Global bond sample (79 obs), the mean (median) of FREQNONZERO is 91% (97%) non-zero return days while that of the domestic sample (466 obs.) is 67% (75%) non-zero return days. The difference in means and medians of the frequency of non zero return days for the Global and domestic bond samples is significant at the 1% level. This suggests, using the Lesmond et al (1999) measure, that Global bonds were more frequently traded which we interpret as having lower transaction costs than domestic bonds. We also examine the frequency of corporate bond transactions by insurance

[28] 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 actively-traded high yield (junk) bonds. Currently, about 55 bonds are part of this list (Alexander et al (2000)).

[29] Insurance companies tend to focus on investment grade bonds and hence examining insurance company transactions in our sample bonds, which are all investment grade, is likely to be representative of all transactions in our sample bonds (Hong and Warga (2000)).

companies in Global and domestic bonds using data from Capital Access International from 1996-2001. We calculate the number of transactions (FREQTRAN) in the 6-month period after issue date for each bond. For the Global bond sample (47 obs), the mean (median) of FREQTRAN is 81.68 (69) transactions per 6 months while that of the domestic sample (449 obs.) is 37.63 (33) transactions per 6 months. The difference in means and medians of FREQTRAN for the Global and domestic bond samples is significant at the 1% level. This result also suggests that Global bonds are more liquid than domestic bonds.

Our analyses of various liquidity measures like bid-ask spreads, frequency of non-zero return days and frequency of bond transactions by insurance companies indicate that Global bonds are more liquid and have lower transaction costs than domestic bonds. Hence, higher liquidity appears to be an attractive feature associated with fungible securities.[30]

8. Conclusion

This paper examines the potential benefits of security fungibility by conducting the first comprehensive analysis of Global bonds. These are very large bond offerings placed simultaneously in the U.S. and Eurobond markets at the same price and are fully fungible in that the identical instrument trades within each market as well as across markets without restrictions. We examine potential benefits of these fungible securities by studying their impact on firms' cost of capital, issuing costs (gross spreads) and shareholder wealth.

Using a sample of 230 Global bond issues by 94 companies from the U.S. and abroad over the period 1996-2003, we find evidence that suggest that firms are able to lower their cost of (debt) capital by issuing these fungible securities, and that this benefit is associated with the increased liquidity and lower issuing costs (gross spreads) of these instruments. Specifically, our results suggest that firms that issue globally are able to lower their borrowing costs by approximately 20 basis points relative to non-Global

[30] We also examined if our proxies for liquidity were priced in at-issue yields. Consistent with the U.S.-based results of Crabbe and Turner (1995), we do not find our liquidity proxies are related to the at-issue yield spreads. However, an important caveat is that this test suffers from a look-ahead bias since the proxies for liquidity are constructed using data after the issue date.

bonds, ceteris paribus. This result is robust to a number of tests that attempt to control for alternative benchmarks, potential endogeneity in the decision to issue globally as well as issue size and issuer related differences. Our results are consistent with the hypothesis that firms are able to lower their cost of (debt) capital by issuing fungible debt securities that are more liquid, have lower cross-border transactions costs, have longer trading hours and can access a wider investor base.

We also document that the stock price reaction to the announcement of Global bond issuance is positive and significant, while comparable domestic and Eurobond issues by U.S. firms over the same time period are associated with insignificant changes in shareholder wealth. These results suggest that the benefit of global issuance is not being driven by global issuers exploiting temporary differences in the Eurodollar-U.S. interest rate. Overall, our findings suggest that the issuance of globally tradeable securities is 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 mentions 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.

TABLE 1

Descriptive statistics for bonds issued by U.S. and Non-U.S. firms by bond type

The U.S. sample consists of investment grade, fixed rate coupon, U.S.$ denominated Global, domestic and Eurobonds issued by non-financial U.S. firms in the U.S. market from 1/1/96 to 09/20/03. The Non-U.S. sample consists of investment grade, fixed rate coupon, U.S. $ denominated, Global and Yankee bonds issued by non-financial Non-U.S. firms in the U.S. market from 1/1/96 to 09/20/03. Panel A presents the time distribution of bond issues and Panel B presents information on Moody's ratings of sample bonds with Aaa indicating the highest quality. Means and medians (in parentheses) for issue size and years to maturity, and percentage of issues with call provisions are presented in Panel C.

	US Issuers			**Non-US Issuers**	
	Global Bonds	**Domestic Bonds**	**Eurobonds**	**Global Bonds**	**Yankee Bonds**
Panel A: By offering year					
	Number	Number	Number	Number	Number
1996	1	230	3	3	24
1997	3	333	14	1	29
1998	9	485	8	2	30
1999	19	280	9	4	12
2000	19	166	4	11	9
2001	50	273	3	4	24
2002	41	307	15	12	10
2003	37	157	6	14	5
Total	179	2231	62	51	143
Panel B: Rating Distribution					
	Number	Number	Number	Number	Number
Aaa	5	47	3	1	-
Aa1	-	24	4	5	-
Aa2	14	37	3	3	-
Aa3	23	91	5	2	-
A1	21	239	12	3	8
A2	38	365	7	15	17
A3	27	377	2	7	14
Baa1	16	427	7	6	36
Baa2	25	389	17	2	49
Baa3	10	235	2	7	19
Total	179	2231	62	51	143
Panel C: Summary Statistics					
Issue Size ($ mil.)	915	206.57	405.48	929.3	344.6
	(700)	(150)	(300)	(600)	(250)
Years to Maturity	10.79	12.28	10.06	10.82	15.91
	(9.97)	(9.99)	(5.09)	(10.00)	(10.02)
% of Issues with Call Provisions	35.8%	60.0%	67.7%	47.1 %	49.0 %

TABLE 2

Select financial characteristics of U.S. firms issuing Global, domestic and Eurobonds and non-U.S. firms issuing Global and Yankee bonds

Select financial characteristics are reported for non-financial U.S. firms that issue Global, domestic and Eurobonds and for non-U.S. firms that issue Global and Yankee bonds, that are U.S. $ denominated, investment grade, fixed rate coupon bonds, from 1/1/1996 to 9/20/2003. The data is from Compustat and Worldscope and the items reported are for the latest financial year prior to the issue date after removing extreme values. The first row gives the means, the second row gives medians while the third row gives the number of observations in parentheses. ASSETS is total assets; PROCEEDS is the proceeds from the bond issue; MVE is market value of equity; 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.

	U.S. issuers			Non-U.S. issuers	
Variable	Global	Domestic	Eurobond	Global	Yankee
ASSETS ($ mill.)	58683.2	13130.1	27174.5	75364.8	9264.5
	31691.0	6955.0	18293.0	42285.7	5676.6
	(179)	(1659)	(54)	(44)	(123)
PROCEEDS ($ mill.)	910.4	222.3	404.0	926.6	343.1
	699.0	198.8	299.8	596.6	249.8
	(179)	(1659)	(62)	(51)	(143)
MVE ($ mill.)	62375.8	14704.3	46481.1	72721.1	9286.4
	37810.6	6065.5	27539.9	37478.4	4246.3
	(178)	(1659)	(54)	(44)	(44)
PROCEEDS /MVE (%)	3.71	4.79	2.45	3.18	8.40
	1.85	2.61	1.20	2.30	6.56
	(178)	(1659)	(54)	(44)	(123)
PROCEEDS /ASSETS (%)	3.43	3.93	2.20	4.46	6.87
	2.24	2.25	1.12	2.90	5.31
	(179)	(1659)	(54)	(44)	(123)
ROA (%)	14.79	15.49	16.91	13.65	14.38
	14.47	15.00	16.27	11.38	13.55
	(179)	(1659)	(54)	(43)	(121)
Q-RATIO	1.945	1.535	2.165	1.714	1.369
	1.374	1.167	1.639	1.229	1.137
	(178)	(1659)	(54)	(43)	(122)
DIV_YLD (%)	1.74	2.17	2.03	2.04	2.13
	1.34	1.72	2.01	1.93	1.36
	(178)	(1659)	(54)	(40)	(118)
MKTLEV	0.621	0.498	0.393	0.343	0.464
	0.238	0.348	0.224	0.198	0.367
	(178)	(1659)	(54)	(43)	(123)
BOOKLEV	0.750	1.100	1.021	0.675	0.877
	0.640	0.986	0.954	0.697	0.759
	(174)	(1659)	(54)	(43)	(123)
DEBT_ASSETS	0.299	0.325	0.305	0.316	0.336
	0.273	0.325	0.308	0.277	0.307
	(179)	(1659)	(54)	(43)	(123)
COVERAGE	11.61	9.65	12.87	8.575	7.060
	8.11	6.74	9.28	7.279	6.101
	(179)	(1659)	(54)	(43)	(119)
YFMAT (years)	10.79	12.74	10.06	10.82	15.91
	9.97	10.00	5.09	10.00	10.02
	(179)	(1659)	(62)	(51)	(143)

TABLE 3

Multivariate tests for Global issuer effects in borrowing costs and gross spreads, controlling for endogeneity in the decision to issue globally

Regression estimates of yield spreads and gross spreads on bond characteristics, market conditions and the Global bond test variable. The treatment effects model, using full maximum likelihood estimation, 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 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 09/20/03, after merging with financial data from Compustat and removing observations with outlier values. In Model 1, the left-hand side (LHS) variable is the yield-to-maturity (on the net proceeds of the offer, after deducting total managers' 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. 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 is a dummy variable indicating whether the bond is callable. SUBSIDIARY is a dummy variable that indicates that the issuing firm is a subsidiary of a public firm. LAMBDA is the Inverse Mills Ratio used to correct for sample selection bias. In all regressions, individual rating dummies for the Moody's rating of the bond issue, single digit sic dummy variables for the 1-digit SIC code of the issuer, and year dummy variables for the year of the bond issue are included but not reported. For example, $I_{(Aaa)}$ is equal to 1 if the bond issue is rated Aaa; 0 otherwise, SIC1 equal to 1 if the 1-digit SIC code of the issuer is 1; 0 otherwise, YEAR1996 is equal to 1 if bond issue was in 1996; 0 otherwise and so on. 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 10%, 5% and 1% levels, respectively.

	Borrowing Cost		Gross Spread	
	Probit I	Model I	Probit II	Model II
GLOBAL		-0.207***		-0.1684***
		(0.01)		(0.00)
LN(MATURITY)		0.0482**		0.1997***
		(0.01)		(0.00)
LN(PROCEEDS)		0.0088		-0.0086
		(0.46)		(0.11)
RISK PREMIUM		0.9488***		0.0658
		(0.00)		(0.12)
CALL		-0.0777**		-0.0182
		(0.02)		(0.22)
SUBSIDIARY		0.3258**		-0.0308
		(0.02)		(0.30)
LAMBDA		0.0107		0.0127
		(0.73)		(0.21)
ASSETS	4.8e-06**		4.3e-06*	
	(0.05)		(0.08)	
LN(PROCEEDS)	1.4255***		1.4309***	
	(0.00)		(0.00)	
PROCEEDS/ ASSETS	-9.4993**		-9.8606**	
	(0.03)		(0.01)	
DEBT/ASSETS	-1.6547**		-1.6388**	
	(0.03)		(0.03)	
COVERAGE	0.0005		0.0007	
	(0.83)		(0.74)	
ROA	-0.0376		0.0210	
	(0.98)		(0.99)	
Q-RATIO	0.1183		0.1211*	
	(0.11)		(0.09)	
DIV YIELD	-5.1410		-5.2342	
	(0.27)		(0.26)	
ISSUEYEAR	0.2178***		0.2204***	
	(0.00)		(0.00)	
RATINGS DUM		Included		Included
SIC DUM		Included		Included
YEAR DUM		Included		Included
INTERCEPT	-444.81***	-0.2137	-449.93***	0.1093*
	(0.00)	(0.14)	(0.00)	(0.08)
Observations	1832	1832	1832	1832
Predictive ability of Probit Model	0.86		0.86	
Model Chi-Square		2197 (0.00)		1759 (0.00)

TABLE 4

Robustness tests for Global bond effects in borrowing costs and gross spreads

OLS regressions are used to estimate the impact of Global bond issuance on borrowing costs and gross spreads. The sample for Models I and II 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 with the domestic sample including only domestic bonds that were issued by Global bond issuers. The sample for Models III and IV consists of investment grade, fixed rate coupon, US$ denominated Eurobonds and Global bonds issued by non-financial U.S. firms. The sample for Models V and VI consists of investment grade, fixed rate coupon, US$ denominated, Yankee and Global bonds issued by non-U.S. firms in the U.S. market. For all samples, the sample period is 1/1/96 to 09/20/03 and only domestic bonds, Eurobonds and Yankee bonds that are greater or equal in size to the smallest Global bond are included. In Models I, III and V, the left-hand side (LHS) variable is the offering yield-to-maturity (on the net proceeds of the offer, after deducting total managers' fees) in excess of the yield on same maturity treasuries. This measures borrowing costs to issuers. In Models II, IV and VI, 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. 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 is a dummy variable indicating that the bond is callable. SUBSIDIARY is a dummy variable that indicates that the issuing firm is a subsidiary of a public firm. PRIVPLAC is a dummy for eurobonds that were privately placed. 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 10%, 5% and 1% levels, respectively.

	US firms: Globals vs Domestic bonds		US firms: Globals vs Eurobonds		Non-US firms: Globals vs Yankees	
	(I) Borrowing Cost	(II) Gross Spread	(III)Borrowing Cost	(IV) Gross Spread	(V) Borrowing Cost	(VI) Gross Spread
GLOBAL	-0.1309**	-0.1215***	-0.4253***	-0.4628***	-0.1996*	-0.1183***
	(0.03)	(0.00)	(0.00)	(0.00)	(0.06)	(0.00)
LN(MATURITY)	0.1934***	0.2601***	0.1861***	0.1156***	-0.0905	0.1727***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.15)	(0.00)
LN(PROCEEDS)	0.1978***	0.0294	0.2411**	-0.0668*	0.0147	0.0124
	(0.00)	(0.12)	(0.01)	(0.05)	(0.89)	(0.35)
RISK PREMIUM	0.7306***	-0.0581	0.5191**	-0.0874	0.3001	-0.0132
	(0.00)	(0.36)	(0.03)	(0.48)	(0.30)	(0.81)
CALL	-0.0266	0.0008	0.0383	-0.0319	-0.1745	-0.0483**
	(0.62)	(0.98)	(0.73)	(0.48)	(0.13)	(0.02)
SUBSIDIARY	0.1172	-0.0926*	-0.1636	-0.3620***	-0.0626	0.0203
	(0.33)	(0.08)	(0.28)	(0.00)	(0.57)	(0.28)
PRIVPLAC	-	-	-0.3270	0.0783	-	-
			(0.15)	(0.71)		
INTERCEPT	-1.6800***	-0.1955	-1.8352***	1.6456***	1.0279	0.2261**
	(0.00)	(0.27)	(0.00)	(0.00)	(0.17)	(0.03)
No. of observations	378	378	240	240	179	179
R^2	0.65	0.56	0.65	0.50	0.72	0.79

TABLE 5
Stock Price Reaction to Global Bond, Eurobond and Domestic Bond Announcements

The samples consist of 72 announcements of Global bond offerings made by 40 U.S. firms, 114 announcements of domestic bond offerings made by 40 U.S. firms that have also issued Global bonds, and 36 announcements of Eurobond offerings made by 25 U.S. firms. The sample period for all the bond samples is 1996-2002. Stock price reactions for announcements in 2003 are not included due to non-availability of CRSP data for 2003. 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 CRSP equally weighted 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 presented with the announcement date as day 0. The z-statistic and sign rank z statistic are presented in parentheses below. *, ** and *** indicate significance of the *z*-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 also reported. P-values are in parentheses below.

	Global Bonds (1996-2002) (72 obs)	**Domestic Bonds** (1996-2002) (114 obs)	**Eurobonds** (1996-2002) (36 obs)	Test of difference between CAR (-1,1) of Global and domestic samples	Test of difference between CAR (-1,1) of Global and Eurobond samples
CAR (-1,1)	1.02% **	0.04%	-0.38%	0.99% **	1.40% *
				(0.04)	(0.07)
Z–statistic	(2.50) **	(0.46)	(-0.90)		
Generalized Sign	(2.06) **	(0.26)	(-1.51)		
Rank Test Z stat.					

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