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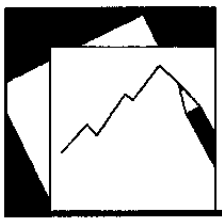

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Bond Restructuring and Moral Hazard: Are Collective Action Clauses Costly?

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Bond Restructuring and Moral Hazard: Are Collective Action Clauses Costly?

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Abstract

Many official groups have endorsed the wider use by emerging market borrowers of contract clauses which allow for a qualified majority of bondholders to restructure repayment terms in the event of financial distress. Some have argued that such clauses will be associated with moral hazard and increased borrowing costs. This paper addresses this question empirically using primary and secondary market yields and finds no evidence that the presence of collective action clauses increases yields for either higher- or lower-rated issuers. By implication, the perceived benefits from easier restructuring are at least as large as any costs from increased moral hazard.

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I. Introduction

There has been substantial discussion in recent years about the problems that arise when sovereign debtors have trouble meeting their obligations. For borrowers, financial distress can be extremely costly, in terms of the domestic adjustment that may be required to keep servicing their obligations after adverse shocks, or in terms of the costs of subsequent exclusion from international financial markets if they default. Given that default is costly for both borrower and creditor, it has been argued that international securities issued by sovereigns should include contractual terms that make restructuring of repayment terms more feasible.

Bond contracts with "collective action clauses" generally include clauses that allow for a qualified majority of bondholders (typically representing at least 75 percent of the outstanding bonds) to change the terms of a bond contract, including its repayment terms, without the unanimous consent of all bondholders. It is argued that the use of these and other related clauses could facilitate the resolution of problems that arise when sovereigns are unable to meet their obligations. The resulting restructuring of obligations could move the framework for dealing with financial distress in sovereigns closer to the framework that applies to corporate borrowers in domestic markets whereby restructuring of obligations can be negotiated, even—generally with the approval of the courts—when some creditors are unwilling to restructure their claims. As Buchheit (1998, p.13) expresses it "Sovereign debtors do not enjoy the benefit of bankruptcy laws, their own or anyone else's, hence the proposal for replicating certain important features of a bankruptcy regime by means of contractual provisions in the underlying debt instruments."[2]

"British-style" bonds issued in the euromarket under English governing law almost invariably contain collective action clauses (CACs). However, around three quarters of all internationally issued bonds (excluding Brady bonds) of sovereign and quasi-sovereign emerging market borrowers are currently issued under formats and governing laws (most notably New York, but also including German and Japanese) for which CACs are not customary. For example, "American-style" international bonds typically do not include contractual provisions allowing qualified majorities to modify the payment terms of a bond and to impose these modifications on minority holders. Further, these bonds provide few contractual limitations on the ability of individual bondholders to initiate and benefit from legal action on their claims. Given that ownership of eurobonds is generally spread widely,

[2] See, e.g,, Gertner and Scharfstein (1991) for an analysis of the impact of domestic bankruptcy frameworks on debt renegotiation and the underinvestment problem.

restructuring under these terms may be difficult and could lead to litigation, loss of value, and perhaps even loss of market access for other borrowers.[3]

The possibility of wider use of CACs for sovereign borrowers appears to have been first raised by Eichengreen and Portes (1995) and Greenwood and Mercer (1995). It has since been endorsed by a number of international groups including the G-7, G-10 and G-22 groups of countries, although most of these endorsements have noted that the evolution of contractual arrangements for international bonds (including the possible adoption of CACs) should be a market-driven process. CACs have also been endorsed by an independent task force of eminent persons (including many well-known financial market participants) of the Council on Foreign Relations (1999). Some parts of the private sector have, however, been less enthusiastic and have argued that making restructuring easier will make it happen more often—i.e. that it will result in moral hazard.[4] Here, it should be stressed that we are referring to the moral hazard between the lender and the borrower, rather than the potential additional moral hazard involving the international financial institutions. Whereas CACs may aggravate the first form of moral hazard, they presumably mitigate the second form—if restructuring is easier, the private sector can deal better with the prospect of default, reducing the pressure for bailouts from the international financial institutions.

Despite the debate over the possible benefits of CACs, there is only limited evidence on the question of how they might affect borrowing costs, and whether the benefits of more orderly restructuring might outweigh the possible effects of moral hazard. Theory provides little guidance on which effect should dominate in the pricing of bonds. The only formal model dealing with CACs is by Dooley (2000) who provides a simple model with standard assumptions about sovereign borrowers—namely that they cannot be forced to repay, and collateral or other monitoring arrangements are impossible. Dooley shows that lenders should protect their interests by making default costly (e.g., in terms of output loss) and using contractual terms that make renegotiation as difficult as possible.[5] In reality, bonds with CACs are more common than might be predicted by such a model. One explanation might be that there must be costs to seeking restructuring that induce borrowers to repay when they are able to repay, similar to the costs of default (reputational costs, loss of market access, output losses) that encourage repayment in the seminal models such as Eaton and Gersovitz (1981), Bulow and Rogoff (1989), and Atkeson (1991).

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[3] However, as discussed in Section VII, evidence from recent sovereign restructurings suggests that concerns over the difficulties involved in restructuring American-style bonds may be overstated.

[4] See Dixon and Wall (2000) and IPMA/G10 (2000) for further details on private sector views.

[5] A related model by Chowdhry (1991) shows that international loans should occur in syndicates of large numbers of banks, with sharing and cross-default clauses. Selective defaults to individual banks are then no longer possible, and the costs of default become much larger, so voluntary defaults are discouraged.

Fortunately, empirical analysis can shed light on the issue, since a substantial proportion of international bonds already incorporate CACs. This paper presents some new evidence on whether and how these clauses affect bond yields. The main innovation of the paper is that it is the first to do a systematic study of the secondary market yields of a large sample of bonds. Secondary market data allow the researcher to analyze the pricing of a large number of existing bonds at particular points in time, including before and after different events that may have caused a reassessment of the costs and benefits of bond contracts that include CACs. By analyzing yields at a particular point in time, we obviate the need to also model the changing overall level of yields as is necessary with primary market data for different issuance dates over a long period of time. In addition, primary market data might be more subject to selectivity or endogeneity problems, so the researcher may essentially be required to attempt to model both the supply and demand curves for bonds. Thus, secondary market data may be a more straightforward way to investigate the impact—if any—of CACs on bond yields. Nonetheless, for comparison with some earlier studies, we also estimate equations using primary market data, adding several additional relevant variables which substantially improve the fit of such equations.

To summarize our results, we find no evidence to support the proposition that the use of English governing law in bond contracts—a proxy for CACs—increases borrowing costs for lower-rated issuers. The point estimates for the impact of English governing law on borrowing costs for both high- and low-rated borrowers are almost always negative, but are often not statistically significantly different to zero. The effects are quite small compared with those in a widely cited set of papers by Eichengreen and Mody (2000a,b,c). Our results therefore appear consistent with conventional wisdom in the financial markets where international bonds are issued and traded, with most market participants being unaware of this aspect of the legal documentation of the bonds that they buy and sell. Hence, we conclude that the perceived benefits of lower restructuring costs associated with CACs are at least as large as any costs from increased moral hazard.

The rest of the paper is organized as follows. Section II provides a brief description of the nature of CACs and their use in bonds issued under different governing laws. In Section III, we review the previous literature on the impact of governing law on bond yields. In Section IV, we use secondary market yield spread data to assess the impact of governing law on yield spreads in both mid-1998 and mid-2000. This exercise can potentially indicate if the market's assessment of the attractiveness of CACs changed as a result of the Russian crisis and the subsequent eurobond renegotiations of Pakistan, Ukraine and Ecuador—events which may have removed the perception that eurobonds had sufficient seniority that default or restructuring was not a realistic possibility. In Section V, we estimate the impact of governing law on yield spreads using primary market yield data. Section VI examines the effect on our estimates of alternative methods of correcting for possible endogeneity in the use of CACs. We present our conclusions in Section VII.

II. Review of the Nature and Use of Collective Action Clauses

A. Legal Background on Governing Law for International Bonds

Numerous international groups have recently suggested the inclusion of "collective action clauses" in the contract terms of international sovereign bonds. These clauses allow for:

- collective representation—procedures for bondholders to organize and designate a representative to negotiate on their behalf with the debtor;
- qualified majority voting—which enables changes to be made in the terms of a bond contract without the unanimous consent of bondholders, and thus prevent a small number of dissident bondholders from blocking an agreement beneficial to the majority; and
- sharing among bondholders—which requires bondholders to share the proceeds of litigation against a debtor with all other creditors, thus reducing the incentive for individual creditors to take independent legal action against the debtor.

CACs are seen by many as potentially helpful in facilitating restructuring and in preserving value that could be lost in the event of default. Nonetheless, some market participants argue that facilitating restructuring will make it more likely to occur, and that this will outweigh benefits to bondholders from higher recovery rate from restructuring rather than default.

The majority of international bonds are issued with contractual terms that specify English or New York law as the governing laws. British-style bonds typically include Trust Deeds or Fiscal Agency Agreements in their legal terms. Both frameworks allow for a qualified majority of bondholders to agree to a modification of the terms of the bond and for such changes to be binding on all bondholders.

In the United States, CACs were typically also included in bonds prior to the 1930s. However, in the aftermath of the Great Depression, there was concern about abuses by corporate insiders who had enacted changes to the terms of bond contracts to the detriment of minority bondholders. Subsequently, for bonds that fall under its purview, the Trust Indenture Act (TIA) has in effect prohibited any involuntary reduction in the claims of bondholders (with the exception of those that occur in formal bankruptcy proceedings).[6] The TIA applies to corporate borrowers, both domestic and foreign when they make public issues in the U.S.. However, it does not apply to foreign sovereign issuers, nor to private issues by domestic or foreign entities. As Buchheit (2000, p.21) states "There is no reason why ...

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[6] However, Buchheit and Gulati (2000) describe a way for a qualified majority to force changes to payment terms on a dissenting minority, namely by proposing changes to the other terms of the bond that would make the bond less attractive for any holdout creditors, thereby effectively forcing potential holdouts into agreeing to a proposed restructuring (or exchange). Such "exit amendments" were used in the restructuring of Ecuador's sovereign external debt in 2000.

majority action clauses could not be included in foreign sovereign bonds issued under the laws of U.S. jurisdictions." However, in practice, almost all such bonds issued in the U.S. market have contained such terms.

Among other governing laws often used in international issues, Japanese and German law bonds do not typically include CACs, while those issued under Luxembourg law do. In the case of German law, the possibility of the inclusion of such terms in bonds issued by nonresident borrowers has until recently been unclear, and has been cited as the reason why such bonds issued in the German market have not contained these provisions. However, a recent statement by the Federal Government (German Finance Ministry (2000)) clarified that nonresident borrowers could include clauses permitting the reduction or postponing of interest and principal payments, providing such actions occurred in good faith (i.e., were not designed to serve to the detriment of particular bondholders).

B. Data on the Governing Law of International Bond Issues

Although there are no available data on the presence or absence of CACs in international bonds, there are data are on the governing law that applies to the contractual terms of bonds, and this is almost always indicative of the nature of the contract terms. We first present some summary data on the governing law of international bonds issued by emerging market borrowers based on a sample from Capital Data's Bondware database of fixed and floating rate bonds issued by all borrowers from emerging markets (excluding offshore centers) in international markets between January 1990 and August 2000. To simplify the task of presenting some summary statistics, we concentrate on issues in those currencies for which there were at least 10 issues.[7] This yields a sample of 2452 bonds and floating rate notes. In Table 1 we show the distribution of bonds by currency and by governing law.

Table 1. Emerging Market Bond Issuance by Currency and Governing Law, 1990-August 2000

	Governing law											
Currency	**English**	**New York**	**Japan**	**German**	**Luxem.**	**Swiss**	**HK**	**Austria**	**Span.**	**Ital.**	**Other**	**Total**
UK pound	17	2	0	0	0	0	0	0	0	0	0	19
U.S. dollar	752	812	0	3	8	0	5	0	0	0	60	1614
Yen	94	11	249	0	2	0	0	0	0	0	0	355
Dmark	27	5	0	142	9	0	0	0	0	0	0	182
Euro	79	23	0	42	6	0	0	0	0	3	1	152
Swiss franc	0	1	0	0	0	16	0	0	0	0	0	17
HK dollar	27	1	0	0	0	0	10	0	0	0	1	38
Austr. sch.	5	0	0	0	0	0	0	13	0	0	0	18
Span. Peseta	0	0	0	0	0	0	0	0	11	0	0	11
Italian lira	30	16	0	0	0	0	0	0	0	0	2	46
Total bonds	1031	871	249	187	25	16	15	13	11	3	64	2452

Source: Capital Data's Bondware database.

[7] The reason why the number of governing law observations (2485) is slightly larger than the number of bonds (2452) is that Bondware shows 33 bonds as having two governing laws.

With one exception, the data show that the use of governing law is highly correlated with the currency of a bond issue. The exception is English law, which is used for bonds of many different currencies, including U.S. dollar issues. However, those bonds issued under New York law—the other most commonly used governing law—are overwhelmingly denominated in U.S. dollars. Further, other governing laws that are used less frequently are often only seen on bonds issued in a particular currency. In this sample of bonds, for example, Japanese, Swiss, Austrian and Spanish governing laws are used only on bonds issued in those respective currencies. Further, German governing law is used almost exclusively on bonds issued in marks or euros.

Examining the data by the type or market of issue yields other (sometimes related) patterns in the use of particular governing laws. In the floating rate note (FRN) market, for example, 80 percent of all issues in the sample are under English governing law. Distinct patterns are also apparent in the bond market (i.e., excluding FRNs), when issues are divided into euromarket issues, global bonds, Yankee bonds, and other foreign bonds issued into particular markets.[8] For example, among foreign bonds, Samurai and Matador bonds in the sample are issued exclusively under Japanese and Spanish governing laws respectively, while Dragon bonds (issued into the Asian market) are essentially all under English law, despite being denominated in dollars. Further, almost all Yankee bonds are issued under New York governing law. In addition, global bonds have also been issued almost exclusively under New York governing law. However, dollar eurobonds are split almost equally between English and New York governing law, with very few bonds issued under other governing laws. That is, in many cases, the governing law used in a bond issue would appear to be very strongly associated with the sector where issuance occurs.

Governing law is also partly explained by the nationality of the securities house or houses that underwrite the bond issue. To investigate this, we examined data from Bondware data on the nationality of the lead manager(s) of 715 fixed-rate dollar eurobonds issued under English or New York governing law. The data provide evidence that U.S. firms (defined to include the London operations of U.S. firms) are less likely than non-U.S. firms to issue dollar eurobonds with English governing law. In particular, only 38 percent of issues arranged by U.S. houses were issued under English governing law, while 64 percent of issues arranged by non-U.S. houses were under English governing laws, and 56 percent of bonds arranged by mixed U.S./non-U.S. teams were issued under English governing law.

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[8] Eurobonds are bonds issued by an international syndicate into different markets, without falling under the jurisdiction of any particular country. Because they are not registered with the Securities and Exchange Commission (SEC), they cannot be sold to the U.S. public until they have become "seasoned", typically 40 days after their issue. "Foreign" bonds are sold into particular national markets from issuers domiciled outside that market. The most prominent type are Yankee bonds which are issued by foreign issuers in the U.S. market, registered with the SEC, and directed primarily (but not exclusively) at U.S. investors. Global bonds are a hybrid, issued in different markets, and designed to trade and settle in the euromarket, U.S. market, and other foreign markets.

Based on the above data, it is clear that governing law and the presence or absence of CACs are substantially correlated with a number of other variables. The question arises as to whether the governing law used is substantially an outcome of other decisions, or whether the decision to issue with or without CACs or under a particular governing law is a primary decision for issuers. Discussions with market participants would suggest that the former explanation offers a closer approximation to reality than the latter. According to market participants, the issuance process typically begins with a borrower approaching a substantial number of securities firms to seek proposals for a bond issue. Depending on its debt management policies, the borrower may give guidance about its preferred market, currency and maturity of financing, or it may simply request the firms to find the cheapest appropriate financing. The investment houses will make proposals based on the general conditions in different markets (euro, Yankee, Samurai, etc.) and the likely demand for securities issued by this specific borrower in those markets. Its proposal may also reflect the preexistence of a security which can be "reopened" or of an umbrella borrowing agreement such as an medium term note program. It may also reflect the costs or problems involved in meeting the regulatory and disclosure requirements for issuance into particular markets. The governing law that is either implicit or explicit in the proposal will frequently be determined as the one that is conventional for that sector of the market that is proposed or the one that is already contained in the existing documentation for that borrower. In other cases, where no specific governing law is implied by these factors, the governing law might be the one that is contained in the "boilerplate" documentation that the investment house (or its legal counsel) typically use.

The relevant point for the analysis that follows is that governing law is quite highly correlated with other variables. When testing for whether governing law has an impact on borrowing costs, it will be important to control for these other variables so that one does not mistakenly attribute any impact from these other factors on yields to governing law and the use or absence of CACs. However, it should also be noted that (as is shown in Appendix II) the governing law that is used is far from fully explained by observable factors such as those discussed above, so it should still be possible to get estimates of the effects (if any) of CACs and these other factors on borrowing costs.

III. Existing Literature on the Impact of Governing Law on Borrowing Costs

The question of whether it might be desirable or feasible to encourage wider use of CACs is clearly related to the way investors view bonds with such clauses. For example, if investors require a higher yield on such bonds, issuers might be reluctant to incur the additional cost involved in including such terms in their borrowing contracts. But if investors do not demand a premium for holding these bonds or are willing to hold them at lower yields, then official calls for their wider use might be effective.

There is, however, little firm evidence on the question of how investors view such bonds, although there is substantial opinion from different parts of the official and private sectors. Two simple analyses have been conducted by Petas and Rahman (1999) and Dixon and Wall (2000) by comparing the sovereign bonds of a few countries with outstanding bonds issued

under New York and English. Petas and Rahman (1999) show that the secondary market yields on different bonds issued by three sovereigns (Kazakhstan, the Philippines, and Turkey) suggest—if anything—a higher valuation for English law bonds. They concluded that (as of early 1999) markets remained unaware in the difference in governing laws. Dixon and Wall (2000) compare bonds of similar maturity and liquidity characteristics issued under different governing law by six countries and conclude that the choice of governing law had no systematic effect on yields, and that any yield differences were small.

An alternative approach that has been used by Tsatsaronis (1999) and Eichengreen and Mody (2000a,b,c) is to use data on yield spreads on a large sample of bonds at the time of issuance. The study by Tsatsaronis (1999) is based on a sample of 263 sovereign bonds (194 from emerging market sovereigns) and uses OLS regressions of the primary market yield spread on a number of explanatory variables associated with the bond. He finds no statistically significance in yields on bonds issued under different governing laws, but finds that a dummy variable for whether or not the bond was registered with the SEC for sale into the United States is significant. Together with the currency of the issue being significant in explaining spreads, his results point to where and how the bond is sold being significant in its pricing.

More comprehensive studies of the possible impact of governing law on spreads are provided by Eichengreen and Mody (2000a,b,c). These authors use a sample of up to around 2400 bonds from 1991 to the end of 1999. The dependent variable in their equations is the log of the spread, and they include variables for global economic conditions, issuer characteristics, bond characteristics, and dummies for governing law (New York, English, and "other"). Eichengreen and Mody focus on the impact of issuing under English versus New York governing law. When the entire sample of bonds is included, Eichengreen and Mody (2000a) find the coefficient on the English law variable to be insignificant. However, when they correct for possible endogeneity and selection bias and allow for the impact of governing law on borrowing costs to differ across credit rating levels (proxied by country ratings from Institutional Investor), they find larger and statistically significant results. In particular, in Eichengreen and Mody (2000b) the use of English law is estimated to increase borrowing costs for borrowers with poor credit ratings (below 50 on the II scale) by 150 basis points while lowering them by 53 basis points for borrowers from high credit ratings (above 50 on the II scale).[9] Further, although they do not provide results for the exact impact in basis points, the regression coefficients in Eichengreen and Mody (2000c, Table 5) suggest even larger impacts. For very highly rated borrowers (above 70 on the II scale), the implied impact from using English governing law is a 105 basis point cut in spreads from 130 to 25 basis points.[10] For very low rated borrowers (below 30 on the II scale), the implied impact is a 390

[9] We estimate that the Institutional Investor rating ranges used by Eichengreen and Mody correspond to the following Moody's ratings scales: 0-30, B2 or worse; 30-50 Baa3-B1; 50-70, A1-Baa2; 70-100, Aa3 or better. A chart comparing the different ratings is available upon request.

[10] The regression coefficients (of 1.054 and –1.654) for the lowest-rated and highest-rated borrowers in their Table 5 imply that English governing law increases the spread by about

(continued...)

basis point increase from 210 to 600 basis points. It need hardly be said that these estimated impacts are very large.

Eichengreen and Mody interpret their results as showing that markets perceive little moral hazard when the more highly rated emerging market borrowers include CACs in their bonds, and that they value the flexibility that CACs may offer in the extremely unlike event that a restructuring is necessary. By contrast, they argue that lower rated borrowers are perceived to increase moral hazard when they include CACs which increases their borrowing costs, more than offsetting the benefits from easier restructuring. It is noteworthy that their cutoff point between higher- and lower-rated borrowers corresponds to a rating above the standard investment grade cutoff. Hence, if these results are robust, they imply that even some emerging markets with relatively good credit ratings—low investment rate ratings or stronger noninvestment grade ratings—would pay higher spreads when their bonds are issued under English law and with CACs. That is, on their face, the results of Eichengreen and Mody would not seem favorable for most emerging market borrowers.

IV. Using Secondary Market Data to Estimate the Impact of Governing Law

We see three key advantages to using secondary market yield data in analyzing if the presence of CACs (proxied by the governing law of the bonds) is associated with differences in the pricing of bonds. First, the question of whether governing law has an impact on bond yields is essentially a question of the relative valuation of different bonds at a particular point in time. However, studies that examine the yield spreads on bonds at issuance over long periods of time are required to explain the overall movement of absolute yields spreads over time as well as the relative valuation of bonds of different characteristics. Indeed, there is presumably much more variation in overall spreads over time than there is difference in yields on bonds with different governing laws. For example, the variation in the yield spread on JP Morgan's EMBI index between its highest and lowest points over 1991-2000 is over 1500 basis points, which is far larger than previous estimates of the impact of governing law. Our preferred solution to this problem is to use secondary market yields at snapshots in time, which obviate the need to model the overall level of spreads.

Second, it may be the case that investors (and issuers) have only begun to focus on governing law quite recently, in the wake of the Russian crisis and the debt restructurings of Ukraine, Pakistan and Ecuador. Hence, the impact of governing law on yields may have changed, and snapshots of secondary market yields at different points in time may be the only way to properly identify any such changes, at least until a large sample of post-crisis primary issues are available. Third, as we discuss further in Section VI, when spreads are measured long after the actual issue there may be fewer problems of potential endogeneity of the choice of governing law or of sample selection related to the issuance decision.

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180 percent for the former group and decreases the spread by 80 percent for the latter group. The estimates in the text here are based on the average spread levels shown in their Table 3 (and exclude the impact of an interaction dummy for the presence of an IMF program).

A. Data

We use data on secondary market spreads provided by Merrill Lynch from the Merrill Lynch Global Index database. The Merrill Lynch Indices in principle include all sovereign bonds with face value equivalent to $300 million outstanding and all corporate bonds with over $100 million outstanding. The yields data are based on actual or indicative price quotes from dealers in the market, and the bonds included are almost all ones for which several of the large international banks publish daily price quotes. We define emerging markets broadly, focusing on issuer from countries rated below Aa3/AA-, including some lower-rated industrial countries such as Greece, and Israel (but also including corporates from Singapore). Our sample includes only bonds with a remaining maturity of at least one year. We include bonds issued in dollars and in major European currencies. Since the coverage of non-dollar issues for mid-1998 is less than complete, we supplemented the Merrill Lynch data with yield data from Bloomberg in cases where we could verify the comparability of the data. The sample includes eurobonds, global bonds and yankee bonds, but not Brady bonds. Our data for yield spreads is calculated as the (bid) yield on the security less the yield on the corresponding mature market government security of similar currency and maturity.

For brevity of presentation, we focus on secondary market yields on two particular dates: June 30, 2000 and June 30, 1998. For June 2000, our sample includes 488 bonds (74 percent of which are denominated in dollars) with composite ratings of CCC1 or better.[11] For June 1998, we have a sample of 296 bonds (80 percent of which are dollar bonds) with composite ratings of CCC2 or better, with this date selected to provide evidence on the pricing of bonds prior to the Russian crisis and the bond restructurings of Pakistan, Ecuador and Ukraine. The samples consist only of fixed rate bonds (i.e., no floating rate notes), and due to the Merrill Lynch index inclusion criteria is a far more homogeneous sample than the larger samples used in previous studies using primary market data. The sample includes bonds issued under New York, English and German law and we focus on the yield spread of English law bonds relative to New York law bonds (the latter represent a majority of the samples). The sample includes 113 English law bonds in June 2000 and 64 English law bonds in June 1998.

B. Methodology

Initially, we use simple OLS regression and we follow some earlier studies using primary market data (e.g., Kamin and von Kleist (1999) and Eichengreen and Mody (2000a,b,c)) by defining our dependent variable as the log of the yield spread. Our explanatory variables include a range of measures for issuer characteristics and bond characteristics, taken mainly

[11] The composite rating (as used by both Merrill Lynch and Bloomberg) is defined as the average of the Moody's and Standard and Poor's ratings, with a bias towards the lower rating. We focus on bonds with composite ratings above default levels, so that our results are not driven by bonds that are in default. Yields on the latter are in no way representative of yields paid by those borrowers that still have market access: bonds close to default may provide some information on the pricing of different legal terms, but the impact is probably best addressed via case studies (see, e.g., Lipworth and Nystedt (2000)).

from the Bondware database. Many of these variables have been used in earlier studies. A full listing of the variables is shown in Tables 2 and 3. The regression model is summarized by

$$\log(S_i) = \alpha + \beta_1 D_{CAC,i} + \mathrm{B}_2\mathrm{X}_{2,i} + \mathrm{B}_3\mathrm{X}_{3,i} + \varepsilon_i \ , \qquad (1)$$

where D_{CAC} is a dummy variable that takes the value 1 for bonds with CACs, and β_1 is the coefficient of ultimate interest. In addition, X_2 and X_3 contain two sets of control variables; issuer characteristics and bond characteristics respectively, and the associated vectors B_2 and B_3 contain the corresponding parameter estimates.

We include several variables for issuer characteristics that are similar to those used by other authors. These include regional or country dummies, and dummies for the type of issuer—public or corporate, as opposed to sovereign. For our credit risk measure—the most important variable in terms of explanatory power—we use the composite credit rating for each particular bond for the particular date in question. Variables for the characteristics of the bond include the size of the issue outstanding, the remaining maturity of the bond in years, the modified duration of the bond, the currency of issue, and dummies for whether the issue was a private placement, or contained put or call options. For the June 2000 sample, we also include the bid-ask spread for each bond as a proxy for the liquidity of each bond.[12] We also include dummy variables for subordinated or collateralized bonds (while recognizing that any effects may already be captured in the credit ratings variable). We include some additional variables in an attempt to control for the investor class at which the bond is targeted. These include dummy variables for the market of issue, with dummies for global or yankee issues (with euromarket issues as the "default"), and dummy variables for the nationality of the lead manager(s) for the bond issue and for whether the bond was issued only in bearer form. Finally, although the information in Bondware is incomplete, we include dummies for whether or not the bond is registered with the SEC for sale in the United States and whether it is eligible for sale in the United States under Rule 144a.

Our strategy was to first work towards finding an equation that appeared to fit the data well for the two sample dates, and then to see if borrowing law added explanatory power and if the estimated coefficients were robust to a wide range of specification changes. We spent considerable time checking the data for errors, and correcting where necessary.

The specification changes we use to address the robustness of our results are as follows. Starting with our basic model, we then add simple governing law dummy variables for English and German governing law, with New York governing law as the omitted law

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[12] Bid-ask spread data were obtained from JP Morgan and were available for 306 bonds in the sample. We fitted an equation to explain the bid-ask spreads for these bonds and then used the parameters from this equation to obtain predicted values for the missing spreads. Bid-ask spread data for mid-1998 were not available.

(Model 1). In our next specification (Model 2), we follow Eichengreen and Mody (2000a,b,c) by including dummies indicating whether English law bonds are issued by high or low rated borrowers, where the cut-off is determined by the median rating.[13] The inclusion of separate dummies based on credit ratings is intended to provide an assessment of whether the valuation of CACs differs for lower rated borrowers who might be viewed as more likely to seek a restructuring of payment terms.

In our third specification (Model 3), we add a number of additional variables. While many of these have not been included in previous studies, our motivation in including many of them is to include variables that might possibly be determinants of governing law and might impact upon yields, so that we can be more certain that the estimated coefficients on the governing law variables are not simply picking up the effect of other variables that have separate impact on yields. Several of these variables are proxies for the way that the bond is sold and the investor base that is targeted. Given our fairly large samples, we preferred to err on the side of including too many control variables rather than too few: accordingly we retain all the control variables in our equation regardless of significance levels.

Our fourth specification (Model 4) sequentially omits the five bonds with the largest residuals in an attempt to check the possibility of our estimates being driven by just a few outliers or by any remaining errors in the data.[14] In our fifth specification (Model 5), we attempt to account for the likelihood that yields on large issues contain more information than those of small issues, because they are generally traded more actively. Accordingly, we use weighted least squares with weights based on the size of the issue.[15] Our sixth specification (Model 6) excludes corporate bonds, since the focus on CACs is on their use for sovereign borrowers, where there is a possible need to attempt to replicate the type of procedures for dealing with financial distress that are available (for corporates) in most national bankruptcy frameworks.[16]

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[13] Throughout the paper, we estimate only a single equation for all bonds, rather than estimating separate equations for the high- and low-rated samples (as Eichengreen and Mody do for most of their results). We do so to maintain our sample size. However, we have estimated many of the specifications using separate samples and obtained similar results.

[14] Least median of squares regression might have been preferable but was infeasible given the large size of the regression.

[15] To be precise, we treated all issues over $1 billion as notionally equal to $1 billion. We then took the square root of this capped amount as the weight. This weighting scheme seemed a reasonable tradeoff between simply using the straight amount (which implied very large differences in weights) and log weights (which implied only small differences in weights).

[16] We included an additional model in an earlier draft of this paper using a different dependent variable. Although we use the log spread specification for consistency with earlier work, an alternate specification may be more appropriate, since for bonds with very low spreads the log of the spread approaches negative infinity. The alternative is to transform the

(continued...)

C. Results

To conserve space, we focus on the coefficient estimates for the English governing law variables (see Table 4). However, detailed parameter estimates for the basic equations (Models 2 and 3) are provided in Tables 2 and 3. Tests for significance are all based on heteroskedasticity-consistent standard errors.

For June 2000, we obtained a basic equation for log spreads with an adjusted R-squared of 0.765. Most of the explanatory variables took the expected sign, and the impact of declining credit quality is to increase yields close to monotonically. When we added dummies for English and German law neither is close to statistical significance (Model 1 in Table 4). Our next specification (Model 2) allows for the possibility of different impacts from the inclusion of collection action clauses for bonds of different credit ratings. Our cut-off point (between Ba1 and Ba2) corresponds to a lower cut-off than is effectively used by Eichengreen and Mody (2000a,b,c) (between Baa2 and Baa3), which should increase the likelihood that we will be able to capture any increase in spreads that results when low rated borrowers use English governing law. The results with the separate dummies are substantially different. In particular, the use of English governing law by higher rated borrowers is associated with higher yields than equivalent issues under New York law, while the use of English law by lower rated borrowers is associated with lower spreads than under New York law, with both results statistically significant.

However, when we make further specification changes the magnitude and significance of the coefficient estimates for English governing law generally fall. The specification with additional control variables yields a higher adjusted R-squared of 0.794, but reduces the magnitude and significance of the English governing law parameters: only the coefficient for low rated issuers is significant (Model 3). When we exclude those five bonds with the five largest residuals to ensure that our results are not excessively affected by just a few bonds (Model 4) or use weighted least squares to ensure that our results are not driven by smaller bonds that may have less accurate pricing (Model 5), we obtain slightly smaller estimates for both English law parameter estimates, though the estimate for low-rated bonds remains statistically significant. When we exclude corporate issues so as to concentrate on sovereign (and public) borrowers (Model 6), we find that governing law is no longer significant for either high- or low-rated bonds.

For the June 1998 data, we obtain somewhat different results, although the relatively small sample size suggests caution against overinterpreting our results. Our basic model, without governing law, yields an adjusted R-squared of 0.698 for the 296 bonds in the sample. When we add dummy variables for English and German governing laws (Model 1), we obtain a

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dependent variable to be the log of the yield less the log of the benchmark yield (i.e., the difference of the logs rather than the log of the differences). This alternative functional form yields parameter estimates which are not directly comparable with the log spread specification, but the results (available upon request) are fully consistent with the results presented here.

statistically significant negative impact on yields for bonds under English governing law. When we allow for different impacts for bonds with different credit ratings (Model 2), we obtain quite different effects. The estimates imply no impact on yields from governing law for the low-rated issuers but a substantial reduction in spreads for higher-rated issuers using English governing law. However, the magnitude of the latter coefficient is substantially reduced and its significance disappears when we add the extra control variables which bring the adjusted R-squared of the equation up to 0.750 (Model 3). In addition, the coefficients on both the English law groups fall and remain insignificant when we omit the five bonds with the largest residuals (Model 4). Moreover, both English governing law variables remain insignificant when we use weighted least squares to give greater weight to larger bonds (Model 5). When we omit corporate bonds from the sample, there are only 51 English law bonds remaining, so rather than estimating two coefficients on English governing law, we estimate a single coefficient which is again statistically insignificant (Model 6).

The mixed statistical results in Table 4 make it somewhat difficult to summarize them. However, one general result is that as we move away from the basic model (Model 2) that allows for different impacts on high- and low-rated bonds, the statistical significance of our results is largely eliminated. The changes that are made to the subsequent models (Models 3-6) arguably all go towards a better specification, so we are inclined to think that the significance of the results in Model 2 is largely spurious. If we pool the estimates for both years, the median parameter estimates for the English law variables for the higher- and lower-rated issues are –0.02 and –0.05 respectively. If we then take the median standard error, we would conclude that these median estimates were nowhere near statistically significant. And any implied effects on borrowing costs are very small. Based on the median yield spreads for the high-rated samples (240 basis points in mid-1998 and 210 basis points in mid-2000) the implied reduction in borrowing costs is no more than 5 basis points. For the low-rated samples, the median spreads (430 basis points in mid-1998 and 520 basis points in mid-2000) imply a reduction in borrowing costs of only about 25 basis points. These impacts are clearly far smaller than those estimates obtained by Eichengreen and Mody.

The results for 1998 imply, if anything, that higher-rated borrowers would have benefited from lower yields when borrowing under English law, while the results for 2000 imply, if anything, that these borrowers pay more when borrowing under English governing law. By contrast, the results for 2000 imply that it is the low-rated borrowers that benefit from borrowing under English governing law. This latter result seems at odds with a view that the costs associated with increased moral hazard are larger than any benefits from easier restructuring. In particular, if investors are wary of the moral hazard that results when low-rated borrowers issue bonds with CACs, then one might expect that the bond restructurings by Ukraine, Pakistan and Ecuador in 1999 and 2000 should have increased this wariness, and increased the yield premium that investors require to hold lower rated English law bonds. Our results, however, would suggest otherwise.

V. Using Primary Market Data to Estimate the Impact of Governing Law

As noted above, the time-series variation in nearly a decade of data complicates the task of extracting information about the relative valuation of bonds of different types. Nonetheless, by using primary market data it is possible to use data on a substantially larger number of bonds than are available in databases of secondary market yields, so it may be worthwhile to also use examine primary market data. In doing so, we depart from previous studies by including explanatory variables intended specifically to better account for the time-series variation of yields.

A. Data

We began with a sample of all bonds issued by borrowers domiciled in emerging market countries between January 1991 and September 2000 and included in Bondware. We again define emerging markets broadly, focusing on issuers from countries rated below AA-. We omit all bonds issued in domestic rather than international markets, as well as notes with a maturity of less than one year. We include only those bonds which Bondware lists as straight fixed or floating rate issues, excluding instruments such as convertibles and bonds with warrants. In addition, we excluded bonds included as straight fixed or floating rate issues but which we could identify as having complex coupon payment structures that complicate the calculation of yields and yield spreads: we identified such bonds by searching the Bondware report field for words such as "dual currency", "currency linked", or "hybrid". We omitted these bonds on the grounds that the yields in Bondware are frequently incorrect and because their yields are unlikely to be well explained by simple regressions that cannot take account of the precise structure of their cash flows.[17]

We then omitted all bonds for which we did not have data for governing law or for which there were only a small number of bonds issued under a particular governing law—we include only bonds issued under New York, English, German, Japanese and Luxembourg law. We then also excluded particular currencies for which there were only a small number of bonds issued—we focus on bonds issued in U.S. dollars, Japanese yen, pound sterling, Swiss franc, euro, ECU and the legacy currencies of the euro—most often deutsche mark or Italian lire.

The data for yield spreads in Bondware are far from complete. Indeed, around 50 percent of bonds contain no information in the yield spread field. Following Eichengreen and Mody (2000a,b,c), we attempted to fill in missing values by calculating yield spreads from the reported yield to maturity and from the yield on an industrial country government security of comparable maturity and currency. Similarly, information on credit rating at launch was missing for a large number of bonds and we checked Bloomberg and filled in gaps where

[17] Indeed, our attention to the importance of looking for securities with peculiar cashflows (and frequent apparent errors in the yields reported by Bondware) was prompted by our examining the Bondware and Bloomberg reports for those bonds which had the largest errors in some initial regressions.

issues were indeed rated.[18] In the end, we were required to add additional information for a majority of the bonds in our sample and this allowed substantial checking of data and numerous corrections to the data in Bondware.

Our final sample includes 1520 bonds issued in the currencies and under the governing laws noted above, and for which we have credit rating, spread at launch, and other launch information. Because we require the issue to be rated, and ratings coverage increased through the 1990s, we have a sample that is dominated by more recent bonds, a "sample bias" that we think may be quite appropriate. Our sample also includes a high proportion of the larger issues over the last decade. For example, the average size of the issues included in our sample is about $290 million compared with an average size of only about $100 million for those issues in Bondware for which we were unable to get ratings or yield spread data, or which we excluded based on concerns about data quality.

B. Methodology

We again estimate an equation for the log of the yield spread on emerging market bonds at issuance,

$$\log(S_i) = \alpha + \beta_1 D_{CAC,i} + \mathrm{B}_2 \mathrm{X}_{2,i} + \mathrm{B}_3 \mathrm{X}_{3,i} + \mathrm{B}_4 \mathrm{X}_{4,i} + \varepsilon_i \ , \qquad (2)$$

where the explanatory variables now also include measures of external conditions in the X_4 variable vector, while the other explanatory variables are issuer characteristics, and bond characteristics as discussed for equation (1).[19] For measures of external conditions, we use two variables in addition to Eichengreen and Mody's (2000a,b,c) measures of yields in the U.S. Treasuries market. In particular, since we are interested in explaining as much of the variation in overall yields over time, we include an index of secondary market spreads on existing emerging market bonds, namely the J.P. Morgan EMBI spread. However, since this index is dominated by low-rated issues—for example, Kamin and von Kleist (1999) characterize the EMBI spread as being representative of B-rated issuers—we would ideally also include an index of higher rated emerging market bonds as well. Since there is no good index for the higher-rated segment of the market, we include the yield spread on BBB-rated U.S. corporate debt as a proxy. This can be justified on the grounds that U.S. corporate debt is often viewed as a competitor asset of emerging markets debt, and because movements in the two markets are quite closely related (e.g., see Box 3.3 of IMF (2000)). Thus, we include

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[18] We used the Moody's rating where available, otherwise the Standard and Poor's rating or Fitch IBCA rating. We excluded a few collateralized bonds with ratings with Aa or Aaa ratings, so as to concentrate on bonds rated between A1/A+ and B3/B-.

[19] Since we do not have data on the issuer-specific cost of swapping from floating to fixed rate funding (standard LIBOR swap spread data are for AA-rated banks), the spread measure for floating rate notes is simply the spread over the appropriate LIBOR (or other) index.

two variables that can be viewed as very close proxies for the risk premium on newly issued emerging market bonds.

Many of our explanatory variables are similar to those used by Eichengreen and Mody. However, for our credit risk measure—the most important issuer characteristic—we depart from Eichengreen and Mody's use of macroeconomic variables and the Institutional Investor (II) ratings and use the more standard bond ratings for each individual bond on the day of issue. We also include several additional variables for the characteristics of each bond and which attempt to control for the investor class at which the bond is targeted. These include dummy variables for: the existence of put and call options; for subordinated or collateralized bonds; the market of issue (global, yankee, and samurai markets, with euromarket as the omitted "default"); whether the bond is fungible with earlier issues; and the nationality of the lead manager of the bond issue; and how the bond can be sold into the U.S. market.

As with the secondary market spread data, we again estimate a number of different specifications to assess the robustness of the parameter estimates. First, we include an equation that focuses only issues that have occurred since the start of 1996 and which may be more reflective of current determinants of yields than those issues that occurred as the market for emerging markets bonds was developing in the first half of the 1990s. Second, we attempt to take account of possible problems from including a substantial number of issues with very low yield spreads. These are predominantly floating rate notes with spreads over LIBOR that are unrepresentative of what borrowers would have paid for fixed-rate funding, as well as a few Samurai issues with very low spreads. The potential problem is that these bonds may have an undue influence on the estimates, given that the log of the spread approaches negative infinity as the spread approaches zero. Accordingly, we examine the impact of excluding any bonds with spreads of 50 basis points or less. Third, in addition to a specification that excludes corporate issues, we have an additional specification that also excludes all floating rate issues and all non-dollar issues. This specification represents an attempt to get a set of bonds that is as homogeneous as possible, for a potentially more precise estimate of any impact from governing law.

C. Results

As before, we first estimated a basic model (excluding governing law variables) that appears to fit the data quite well, with an adjusted R-squared of nearly 0.80, comparable with that of Kamin and von Kleist (0.82) and substantially higher than the R-squared of around 0.61 obtained by Eichengreen and Mody (2000a). We attribute our substantially higher explanatory power relative to the latter to the inclusion of some additional relevant variables (notably the EMBI spread, the U.S. BBB corporate spread, and the call dummy) and our more precise risk measure (actual bond ratings), but mainly to our sample which includes numerous data corrections and excludes unrated bonds and those with unusual payment schedules. Most of the explanatory variables take the expected sign, and the impact of declining credit quality is to increase yield monotonically, except between the A1 and A2 categories. To conserve space, we again limit the discussion to the impact of governing law, see Table 5—detailed results for models 2 and 3 are shown in Table 6.

When we add three governing law dummies to the basic equation (English, German, and Luxembourg, with New York governing law as the "base case") we observe a modest increase in adjusted R-squared from 0.797 to 0.801 (Model 1 in Table 5).[20] The coefficient on English governing law is negative and statistically significant. Although this estimate would be consistent with a view that CACs reduce required yields, the dummy variables on the other two governing laws are less consistent with such an inference: German law bonds (which traditionally do not have CACs) have an even larger negative coefficient and Luxembourg law bonds (which normally do have CACs) have a significant positive coefficient. The latter results may, of course, be due to the small sample of bonds with those laws (especially for Luxembourg law where we have only 19 bonds).

In our second specification, we again include dummies indicating whether English law bonds are issued by high or low rated borrowers, using a Ba1/Ba2 cut-off (Model 2). This specification shows essentially no difference for the two groups in the coefficient on English governing law—which remains negative—and is preliminary evidence against low-rated borrowers paying a premium to issue under English law. Our third specification adds a number of further control variables in an attempt to reduce the possibility that our significant negative coefficients on English law are being driven by omitted factors (Model 3). The result of adding these extra variables is to increase the adjusted R-squared to 0.817. The coefficients on the English law dummies become much smaller, both at around -0.05, with only the low-rated dummy remaining statistically significant.

Further specification changes tend to confirm that the coefficients on the English governing law variables are always negative for both high- and low-rated borrowers, but often insignificant. For example, in the specification where we sequentially omit the 20 bonds with the largest residuals (Model 5), the negative coefficient in Model 3 on the lower-rated issues now becomes insignificant. We interpret this as evidence that even in large samples such as this, researchers must be mindful of the possible impact of possible data quality problems in commercial databases. In the case of the specification where we use weighted least squares (Model 6), we obtain a very high weighted R-squared (0.975), the result of larger issues typically having smaller residuals. This is consistent with our expectation that these bonds may contain more useful information on bond pricing and suggests caution in drawing inferences from samples that contain a large proportion of small bonds for which pricing and other information in Bondware may be less accurate or comprehensive. In the case of the specification that omits spreads of 50 basis points or less (Model 7), we obtain a substantially smaller regression standard error, indicating that these low spread issues did have a substantial impact on our estimates, and suggesting caution in the use of the log spread specification or the inclusion of floating rate notes in a study of bond yields. Finally, we note that we obtain quite different parameter estimates when we exclude corporate bonds, floating rate issues and non-dollar issues to focus on a more homogeneous set of bonds (Models 8 and 9). This results suggests the need for caution in including bonds of too many structures.

[20] Since all Japanese law issues in our sample are Samurai bonds (and vice versa) we are unable to include a Japanese law dummy in our sample.

currencies, and governing laws into a single equation, since the empirical determinants of spreads may be quite different.

We have presented nine different specifications of the equation including governing law so that readers can choose which specification they find most appropriate and can arrive at their own judgments as to whether governing law has been a significant determinant of yields in primary market issues over the last ten years. Our own interpretation is as follows. With five of the nine specifications showing significant negative coefficients for low-rated borrowers that use English law, we consider our results to be substantial evidence against the proposition that the use of English governing law by these borrowers raises borrowing costs. Further, there seems to be no clear trend for the coefficient for low-rated borrowers to be higher or lower than the coefficient on higher-rated borrowers: the median coefficient for the high-rated issuers is around –0.08 and that for low-rated issuers is about -0.06. Hence, we would conclude that there is no convincing evidence that low-rated borrowers are at a disadvantage relative to higher-rated ones when they use English law.

However, the substantial variability in estimates on the governing law variables leads us to be cautious about making assertions that the use of English governing law actually lowers borrowing costs for emerging market borrowers, either high- or low-rated. In addition, the estimated impacts on yield spreads are arguably not especially large. To illustrate, estimates of coefficients around -0.07 correspond to reductions in spreads of around 12 basis points for the higher rated issues and 30 basis points for the lower rated issues for the average spreads paid by these groups over the last decade—these impacts are substantially smaller in absolute value than the estimates of Eichengreen and Mody (2000a,b,c). In addition, despite the high R-squareds of our equations, we are mindful of the possibility that there are other factors determining yields—probably those relating to the investor base at which an issue is targeted—that are not easily quantified and included in regressions like these. Hence, we prefer to simply draw the conclusion from the primary market data that the use of English governing law (and CACs) does not increase borrowing costs for low-rated (or higher-rated) borrowers. This is consistent with our results from the secondary market data.

VI. The Impact of "Correcting" for Possible Endogeneity

Some readers might be curious as to why our results (from both primary and secondary market data) of modest impacts of CACs on yields differ from those of Eichengreen and Mody (2000a,b,c) who find major impacts from the inclusion of CACs. In part, our different results may relate to four substantial modifications in terms of data samples, risk measures, the inclusion of other explanatory variables, and the use of regressions for the full sample rather than for two or four subsamples—these differences are discussed in Appendix 1. We believe that each of these helps to improve the precision of estimates of the determinants of spreads.

While these are important differences, the major difference is that our results so far have not explicitly taken account of the possible endogeneity of governing law. Eichengreen and Mody suggest that the choice of governing law may be endogenous, with borrowers that

anticipate having to restructure being attracted to English law issuance but investors penalizing these borrowers when they do borrow under English law.[21]

Eichengreen and Mody's decision to correct for endogeneity is based on their view that governing law "is presumably" or "is plausibly" endogenous and is related to the risk of borrowers. This view appears to be based purely on an *a priori* expectation rather any evidence from market participants or market observers. However, they partly justify their assertion that governing law is endogenous by noting that the proportion of bonds issued under New York or English law and the ratio of their yields varies over time and regions (2000a, p.10). Our own view is that this latter observation is exactly what one would expect if—as occurs in practice—certain governing laws are traditional in different sectors of the market, if borrowers from different regions have traditionally gravitated to different sectors (e.g., Mexican borrowers typically go to the Yankee market where CACs are customary), and the "borrowing windows" into these different sectors open and close at different times based on macroeconomic factors.

As discussed in Section IIb, we are somewhat skeptical of the proposition that governing law is an important choice variable that is related to the perceptions by either borrowers or investors about risk and the potential for restructuring the terms of the bond. Instead, there would seem to be strong case for arguing that the governing law that is used is substantially determined by factors such as the currency of issue, the market of issue (euromarket, global, yankee, samurai, etc), and the standard documentation preferred by the investor group that is targeted or used by the law firm or investment bank that is handling the issue. Hence our strategy so far has been to include in our yields equation any variables that could possibly determine either yields or the choice of governing law. This strategy corresponds to identification by controlling for confounding variables (Angrist and Krueger (1999)) and the far higher R-squared in our spreads equation would suggest it has been substantially effective. However, other strategies are possible for controlling for endogeneity, each with potential benefits and costs.[22] We explore two possible other methods in the remainder of this section.

A. The Use of Instrumental Variables

To correct for possible endogeneity, Eichengreen and Mody use an instrumental variables methodology whereby they use a multinomial logit model for the governing law decision and include the fitted value from this equation in the spreads equation. In Appendix II, we loosely replicate their methodology, using the primary market data for 1991-2000. Our instrumental variables endogeneity correction produces coefficients on English governing law that remain

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[21] A further difference is that Eichengreen and Mody correct for selectivity bias in decision to issue or not issue a bond. This does not appear to be a major contributor to difference in our results. We have addressed this issue in an earlier draft of the paper (available upon request).

[22] We thank—without implication for any errors—Joshua Angrist, Mitali Das, Tom Mroz, Patrick Puhani and Joe Terza for advice on correcting for endogeneity.

negative for both high- and low-rated borrowers, implying that the use of English law and CACs is still associated with lower borrowing costs for both groups of borrowers. However, in both cases the parameter estimates are far larger than the OLS estimates, and—we believe—implausibly large based on conventional wisdom of participants in emerging debt markets and the simple observation that many borrowers continue to borrow under New York governing law. Thus, unlike Eichengreen and Mody, we find no evidence that moral hazard factors have a dominant impact on spreads. However, consistent with their work, we find that instrumental variables corrections can result in much larger parameter estimates on the governing law variables.

The fact that we obtain opposite signs to those of Eichengreen and Mody for these large impacts suggests that the results from instrumental variables corrections may be quite fragile. Accordingly, we wonder if the large and variable parameter estimates might be the outcome of correcting for endogeneity when there is actually no (or only very modest) endogeneity. In addition, the lack of exclusion restrictions (i.e., variables that affect governing law but do not affect spreads) in Eichengreen and Mody's correction and the reliance only on the nonlinearity of the logit or probit model for identification may create further problems. The apparent problems with using instrumental variables to correct for possible endogeneity or selection bias in primary market data suggest that alternate approaches might be desirable.

B. Selection via Fixed Effects

Fortunately, the use of secondary market data offers alternative means of correcting for possible endogeneity. One general benefit of secondary market data is the passage of time between the issuance decision and the observation of the yield spread. The typical bond in our sample of spreads in June 2000 was issued around two years earlier. Thus, even if there were some elements of selection bias at the time of issuance, circumstances changed between the time of issuance and June 2000. In particular, restructuring may not have happened in cases where it was expected or feared, and it may have become more likely in cases where it was not expected. Hence, factors that may have implied endogeneity or selection problems at the time of issue should have become less important over time. Equivalently, primary market data reflect the interaction of supply and demand at the time of issuance and may be subject to the standard problems, whereas in the secondary market the supply of bonds is now fixed, so it may be far easier to estimate the way that investors value bonds of different characteristics.

But the secondary market data also allow a very direct way around the endogeneity or selection problem. In particular, our sample of 488 bonds as of June 2000 include 245 bonds issued by borrowers which have bonds that are issued both under English law (i.e., with CACs) and under New York or German laws (i.e., without CACs) in our sample.[23] These

[23] In a few cases where there is clear support from the sovereign (e.g. the Korea Development Bank and the Export Import Bank of Korea), we include quasi-sovereign issuers with their sovereign.

bonds are issued by 29 different borrowers and account for 245, or almost exactly half of the bonds in our sample. They also include most of the largest emerging market sovereign borrowers over the last ten years, and are representative of the full range of the ratings spectrum.[24] If we can control for effects of the other characteristics of the bonds (such as maturity, currency, liquidity, etc) then by including a dummy for each issuer we can directly estimate the impact of governing law on spreads. This corresponds to a fixed effects identification strategy for selection bias (Angrist and Krueger (1999)).[25]

In Table 7, we begin by presenting a basic OLS equation for the 245 bonds from these 29 issuers, estimated with a reduced number of explanatory variables relative to the results in Table 4 due to the smaller sample. This equation suggests that higher-rated issuers pay more when they use English rather than New York governing law, with no difference for lower-rated issuers. When we correct for possible selection bias by adding issuer dummies (and removing many other explanatory variables which are now extraneous), the significance of the effect for the higher rated issuers disappears, but there is now a statistically significant reduction in yield spreads for lower rated issuers when their bonds are issued under English law.

Table 7. Alternative Correction for Possible Endogeneity of Governing Law, Secondary Market Yield Spread Data

(Standard errors shown in parentheses below coefficient estimates)

Description of Specification	**Adjusted R-squared of Yield Equation**	**Coefficient on Higher-rated English Law Issues**	**Coefficient on Lower-rated English Law Issues**
1. No correction	0.808	0.231***	-0.008
		(0.075)	(0.067)
2. Selectivity correction via fixed effects (issuer dummies)	0.888	0.062	-0.107*
		(0.075)	(0.060)

*** and * denote significance at 1 and 10 percent levels, respectively.

While the exact size and sign of the parameter estimates should not be relied on too heavily given the smaller sample size, there are two noteworthy points. First, the corrected estimates imply relatively small impacts on borrowing costs (impacts on spreads of 10 percent or less), as opposed to the larger implied impacts from the instrumental variables corrections. Second, the results in Table 7 are consistent with the results in Appendix II suggesting that no matter

[24] The sovereigns include Argentina, Brazil, China, Croatia, Greece, Hungary, Israel, Kazakhstan, Korea, Lebanon, Mexico, the Philippines, Poland, Russia, South Africa, Slovenia, Turkey and Venezuela.

[25] It can also be thought of as similar to the work of Petas and Rahman (1999) and Dixon and Wall (2000) using 245 bonds (and around 15 control variables) rather than 12 or fewer bonds.

how one corrects for endogeneity, there is no evidence that investors require higher yields when the bonds of lower-rated issuers include CACs.

Thus, an alternative strategy for correcting for endogeneity—and importantly one that does not involve the potential pitfalls of instrumental variables—suggests that there are only modest impacts on yields from the choice of governing law. One possible criticism of this approach is that by focusing on issuers with bonds outstanding both with and without CACs we are looking at those borrowers whose borrowing behavior indicates that there should be no impact. The problem with this explanation is that the borrowers that are included in this group represent about 90 percent of all outstanding sovereign emerging markets debt. Thus, although we cannot rule out that there is some group of sovereign borrowers for which endogeneity is important, it is apparently a fairly small group.

VII. Conclusion

Our study is motivated by the recent interest in the possible greater use of collective action clauses in bond contracts of sovereign emerging market borrowers. It has been argued by many in the official sector that these clauses could be valued by issuers and investors because of the lack of a framework for restructuring payment terms analogous to that in many national bankruptcy systems—in principle these clauses make it easier for borrowers and lenders to agree on debt restructuring and avoid the costs for both that are associated with outright defaults. In response, however, some have argued that making restructuring easier via CACs will make it more likely to happen—that there will be moral hazard. If so, there will be natural reluctance by investors to the wider inclusion of these bonds, and the compulsory use of these terms (which has indeed not been proposed) would result in loss of bond market access for those issuers where moral hazard is a major concern.

The primary innovation in our paper is the use of data for yields for a large sample of bonds traded in the secondary market, thereby avoiding some of the potential problems in using data for yields at the time of primary market issuance. In addition, when we use primary market data, we use a number of alternate modeling strategies which enable us to make inferences based on equations with substantially higher explanatory power than the equations in some previous studies. If we combine all the estimates from the primary market yield data for 1990-2000 and the secondary market yield data for mid-1998 and mid-2000, we obtain median regression estimates that English governing law is associated with a reduction of 5 or 6 percent in yield spreads for both lower and higher rated borrowers. While we hesitate to rely too much on particular estimates, the implied impacts on borrowing costs are only about 10 basis points for higher rated borrowers and about 25 basis points for lower rated borrowers (and we would not be surprised if the inclusion of some other relevant, but harder-to-measure explanatory variables might reduce these impacts even further). The regression coefficients in particular equations are sometimes statistically significant but are more often insignificant.

Our results imply that any increase in borrowing costs from increased moral hazard when CACs are used are outweighed by the benefits associated with less costly restructuring. Our results also imply a far smaller impact on yields from CACs than the estimates implied in

some frequently cited work by Eichengreen and Mody (2000a,b,c) and provide no evidence in support of Eichengreen and Mody's finding that lower rated borrowers on average pay a premium of hundreds of basis points for borrowing under English governing law with CACs. The primary reason for the difference with the estimates in Eichengreen and Mody appears to be their use of an instrumental variables technique for correcting for possible endogeneity or selectivity by borrowers in the choice of governing law. By contrast, alternative approaches to correcting for possible endogeneity yield no evidence of large impacts on borrowing costs.

We believe that our conclusion that any impact on borrowing costs from CACs is small is consistent with the conventional wisdom of those people—investors, issuers and lead managers—who actually work in the market for sovereign emerging market bonds. The sell-side research of investment banks appears never to refer to CACs as explaining why yields on particular bonds deviate from fair-value yield curves. The several news services that report in detail on new issues appear never to explain the pricing of a new bond in terms of the presence or absence of CACs. Further, many borrowers switch frequently between governing laws—apparently sometimes without being aware of it—which seems inconsistent with a careful consideration of the benefits of a lower yield versus the ability to easily restructure when it suited them.[26] Finally, bond ratings from ratings agencies do not differ based on governing law—agencies appear never even to consider governing law as a risk factor. In summary, we consider it unlikely that governing law and the presence of CACs could have an average impact of hundreds of basis points without market participants being acutely aware of this effect.[27]

There may, of course, be good reasons for investors and other market participants not to have focused on governing law and the presence or absence of CACs. If moral hazard is indeed small and borrowers do not habitually default on their bonds, then investors indeed do not need to spend much time worrying about the precise legal terms for dealing with financial distress. Indeed, it seems unlikely that making restructuring of bond contracts somewhat easier will have any major impact on the frequency with which countries will seek to reduce their payment obligations. As noted in IMF (2000, p.136), "The restructuring of a country's external debt is a serious step and something most sovereigns only do as a last resort." In particular, seeking the restructuring of payment terms is likely to entail significant costs in terms of market access, albeit costs that are not as large as those following a default. In

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[26] Of 45 emerging markets issuers that we could identify with more than 10 issues over 1990-2000, 35 appeared to have bonds issued both with CACs and without CACs. If the use of CACs really had a large impact on borrowing costs, we would not expect to see issuers shifting between governing laws unless perceptions of the likelihood of possible renegotiation changes both substantially and frequently.

[27] Indeed, a statement in early 1999 by Petas and Rahman (1999, p.78)—emerging markets analysts at a major international bank—provides concrete supporting evidence that market participants have not traditionally focused on governing law and the presence or absence of CACs: "This far, we do not believe that the market has made the distinction between the two different systems of law."

addition, if countries are seriously viewed as potential candidates for default or restructuring it is highly unlikely that they will be able to get financing in the international bond markets in the first place. We would not, of course, argue that the terms of bond contracts never matter, merely that this particular part of the contract does not appear to have a systematic large impact on bond pricing.[28]

Indeed, the experience of some recent sovereign debt exchanges provides further reason why we might expect to see only modest impacts on borrowing costs from the inclusion of CACs in bond contracts.[29] In particular, the recent cases of Pakistan and Ecuador have shown an example where CACs were not invoked when they were present, and another where a sovereign managed to restructure obligations even under contracts that required the unanimous approval of all borrowers. In the first case (Pakistan), it seems quite possible that the presence of CACs may have smoothed the process of obtaining creditors' agreement to carry out a voluntary bond exchange (rather than a restructuring of the existing bond contract). In the second case (Ecuador), although the bond contract required unanimous consent for changes in the bond's payment terms, the contract allowed a simple majority of bondholders to change other terms of the contract. By changing some of these other terms, a simple majority of bondholders was able to make the bond sufficiently unattractive that most potential holdout creditors agreed to a voluntary exchange offer. These two instances show that the actual resolution of cases of financial distress may evolve in ways that make CACs less important in practice than would be suggested by a strict reading of contractual terms. Hence, our finding that the presence or absence of CACs does not have a significant impact on borrowing costs may suggest that the ongoing nature of the relationship between sovereign borrowers and investors means that each group has an incentive to ensure the smooth resolution of financial distress, regardless of the particular contract terms that govern it.

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[28] There is an interesting contrast between our own results—that contract terms concerning restructuring have little impact in bond markets—and those of Esty and Megginson (2001) who find that international loan syndicates appear to be structured with agency and recontracting costs in mind. We conjecture that the difference may reflect: (i) historically, lower-rated emerging market borrowers have had greater access to bank lending than to bond financing; and (ii) international loans have been more subject to restructuring than bonds.

[29] See Dixon and Wall (2000), Lipworth and Nystedt (2000), Frankel and Roubini (2000), IMF (2001), and Moody's (2001) for further discussion on this point.

Table 2. Full Model for Secondary Market Data, June 2000

	Model 2			Model 3		
Variable	**Coef**	**S.E**	**Prob.**	**Coef**	**S.E**	**Prob.**
Issuer Characteristics						
A2	0.700	0.246	0.00	0.491	0.277	0.08
A3	0.646	0.243	0.01	0.496	0.269	0.07
BBB1	0.753	0.230	0.00	0.591	0.258	0.02
BBB2	1.155	0.245	0.00	0.999	0.279	0.00
BBB3	1.206	0.237	0.00	1.065	0.265	0.00
BB1	1.401	0.231	0.00	1.111	0.262	0.00
BB2	1.676	0.220	0.00	1.362	0.244	0.00
BB3	2.090	0.231	0.00	1.714	0.252	0.00
B1	2.045	0.239	0.00	1.807	0.259	0.00
B2	2.044	0.251	0.00	1.911	0.296	0.00
B3	2.303	0.314	0.00	2.163	0.316	0.00
CCC1	2.880	0.258	0.00	2.714	0.280	0.00
Public	-0.053	0.059	0.37	-0.007	0.061	0.91
Corporate	0.110	0.065	0.09	0.095	0.067	0.16
Asian	0.060	0.063	0.34	-0.005	0.067	0.94
Latin	0.166	0.067	0.01	0.211	0.089	0.02
Bond Characteristics						
Log(US dollar amount)	-0.002	0.036	0.96	0.024	0.036	0.50
Years to maturity	0.008	0.002	0.00	0.008	0.002	0.00
Put	-0.293	0.074	0.00	-0.258	0.069	0.00
Call	0.123	0.078	0.12	0.083	0.076	0.27
Duration	0.028	0.013	0.04	0.023	0.014	0.09
DM	-0.287	0.095	0.00	-0.283	0.101	0.01
Lira	-0.243	0.068	0.00	-0.254	0.099	0.01
Euro	-0.246	0.056	0.00	-0.214	0.067	0.00
Other European currencies	-0.183	0.179	0.31	-0.163	0.168	0.33
Market						
Global	0.069	0.056	0.22	0.075	0.085	0.38
Yankee	0.033	0.057	0.56	0.068	0.084	0.42
Log(bid-ask spread)	0.130	0.037	0.00	0.139	0.041	0.00
Private placement	-0.068	0.072	0.35	0.178	0.156	0.25
Law Dummies						
Low-rated UK law	-0.155	0.061	0.01	-0.134	0.063	0.03
High-rated UK law	0.132	0.076	0.08	0.060	0.080	0.45
German law	-0.085	0.088	0.33	-0.140	0.098	0.15
Adjusted R-squared	0.785			0.814		
Number of observations	488			488		

Model 3 has a number of variables in addition to Model 2 that are omitted to conserve space. The variables are country dummies for Argentina, Brazil, Mexico, Philippines, Turkey and S. Korea as well as dummies indicating if a bond was eligible to be sold in the U.S. under Rule 144A, if it was registered with SEC, if it is a bearer bond, subordinated debt, if it is collateralized and finally dummies for US- and European-only bookrunners.

Table 3. Full Model for Secondary Market Data, June 1998

	Model 2			Model 3		
Variable	**Coef**	**S.E.**	**Prob.**	**Coef**	**S.E.**	**Prob.**
Issuer Characteristics						
A2	-0.693	0.227	0.00	-0.840	0.214	0.00
A3	-0.546	0.184	0.00	-0.777	0.174	0.00
BBB1	-0.648	0.144	0.00	-0.958	0.134	0.00
BBB2	-0.694	0.147	0.00	-0.992	0.141	0.00
BBB3	-0.342	0.163	0.04	-0.658	0.155	0.00
BB1	0.047	0.157	0.77	-0.212	0.140	0.13
BB2	0.063	0.146	0.67	-0.056	0.122	0.65
BB3	0.321	0.162	0.05	0.241	0.147	0.10
B1	0.734	0.201	0.00	0.574	0.214	0.01
B2	0.542	0.156	0.00	0.427	0.166	0.01
B3	0.593	0.166	0.00	0.292	0.229	0.20
CCC1	0.607	0.152	0.00	0.400	0.132	0.00
CCC2	1.191	0.269	0.00	0.974	0.268	0.00
Public	0.116	0.059	0.05	0.103	0.058	0.08
Corporate	0.168	0.075	0.03	0.098	0.078	0.21
Asian	0.524	0.100	0.00	0.578	0.113	0.00
Latin	0.210	0.086	0.02	0.482	0.118	0.00
Bond Characteristics						
Log(US dollar amount)	0.127	0.026	0.00	0.113	0.028	0.00
Years to maturity	0.001	0.002	0.58	0.002	0.002	0.36
Put	-0.086	0.096	0.37	-0.089	0.096	0.36
Call	-0.026	0.108	0.81	0.059	0.107	0.58
Non US dollar	-0.074	0.094	0.43	0.192	0.099	0.05
Duration	0.036	0.014	0.01	0.023	0.013	0.09
Market						
Global	-0.185	0.073	0.01	0.016	0.104	0.88
Yankee	0.015	0.064	0.81	0.139	0.100	0.16
Law Dummies						
Low-rated UK law	-0.037	0.068	0.58	0.044	0.070	0.53
High-rated UK law	-0.295	0.113	0.01	-0.135	0.116	0.24
German law	-0.476	0.119	0.00	-0.347	0.113	0.00
Adjusted R-squared	0.74345			0.7828		
Number of observations	296			296		

Model 3 has a number of variables in addition to Model 2 that are omitted to conserve space. The variables are country dummies for Argentina, Brazil, Mexico and S. Korea as well as dummies indicating if the bonds was eligible to be sold in the U.S. under Rule 144A, if they were registered with SEC, if it is a bearer bond and, finally, dummies for US- and European-only bookrunners

Table 4. Estimated Parameters on English Governing Law Variables, Secondary Market Yield Spread Data
(Standard errors shown in parentheses below coefficient estimates)

Model Number and Description of Specification	Adjusted R-squared	Coefficient on Higher-rated English Law Issues	Coefficient on Lower-rated English Law Issues	Adjusted R-squared	Coefficient on Higher-rated English Law Issues	Coefficient on Lower-rated English Law Issues
	June 2000			June 1998		
1. Full sample, basic list of variables, with no differentiation between high and low rated English law bonds	0.765	-0.040 (0.056)		0.714	-0.117* (0.063)	
2. Model 1 plus separate dummies for high and low rated English law bonds	0.770	0.132* (0.076)	-0.155** (0.061)	0.718	-0.295*** (0.113)	-0.037 (0.068)
3. Model 2 plus additional control variables	0.794	0.060 (0.080)	-0.134** (0.063)	0.750	-0.135 (0.116)	0.044 (0.070)
4. Model 3 but excluding 5 largest outliers	0.813	0.052 (0.076)	-0.102* (0.069)	0.799	-0.085 (0.107)	0.011 (0.066)
5. Model 3 but with weighted least squares, based on US$ size of issue (unweighted R-sq in parentheses)	0.879 (0.781)	0.058 (0.071)	-0.117** (0.058)	0.869 (0.728)	-0.124 (0.110)	0.062 (0.071)
6. Model 3, but excluding issues by corporates	0.842	0.003 (0.080)	-0.061 (0.066)	0.781	0.064 (0.095)	

***, ** and * denote significance at 1, 5 and 10 percent levels, respectively.

Table 5. Estimated Parameters on English Governing Law Variables, Primary Market Yield Spread Data
(Standard errors shown in parentheses below coefficient estimates)

Model Number and Description of Specification	Adjusted R-squared	Coefficient on Higher-rated English Law Issues	Coefficient on Lower-rated English Law Issues
1. Full sample, basic list of variables, with no differentiation between high and low rated English law issues	0.801	-0.123*** (0.031)	
2. Model 1 plus separate dummies for high and low rated English law issues	0.801	-0.133*** (0.044)	-0.116*** (0.036)
3. Model 2 plus additional control variables	0.818	-0.055 (0.044)	-0.063* (0.036)
4. Model 3 but only including issues since the start of 1996	0.823	-0.059 (0.055)	-0.002 (0.052)
5. Model 3 but excluding 20 largest outliers	0.853	-0.055 (0.042)	-0.028 (0.031)
6. Model 3 but with weighted least squares, based on US$ size of issue (unweighted R-squared in parentheses)	0.974 (0.808)	-0.160*** (0.052)	-0.042 (0.040)
7. Model 3, but excluding issues with spreads of 50 basis points or less	0.774	-0.003 (0.044)	-0.058* (0.034)
8. Model 3, but excluding corporate issues	0.802	-0.106* (0.055)	-0.133*** (0.045)
9. Model 3, but excluding issues by corporates, floating rate issues and nondollar issues	0.839	-0.141* (0.075)	-0.042 (0.048)

***, ** and * denote significance at 1, 5 and 10 percent levels, respectively.

Table 6. Full Model for Primary Market Data

	Model 2			Model 3		
Variable	**Coef**	**S.E**	**Prob.**	**Coef**	**S.E**	**Prob.**
Issuer Characteristics						
A1	4.067	0.340	0.00	3.154	0.352	0.00
A2	3.952	0.342	0.00	2.954	0.353	0.00
A3	4.295	0.332	0.00	3.278	0.346	0.00
BBB1	4.533	0.325	0.00	3.499	0.343	0.00
BBB2	4.659	0.333	0.00	3.610	0.346	0.00
BBB3	5.060	0.329	0.00	3.990	0.339	0.00
BB1	5.361	0.328	0.00	4.384	0.340	0.00
BB2	5.479	0.333	0.00	4.505	0.340	0.00
BB3	5.826	0.326	0.00	4.792	0.338	0.00
B1	5.827	0.335	0.00	4.831	0.343	0.00
B2	5.891	0.334	0.00	4.883	0.345	0.00
B3	6.081	0.344	0.00	5.075	0.350	0.00
Public	-0.064	0.035	0.07	-0.081	0.036	0.02
Corporate	-0.019	0.036	0.61	-0.011	0.039	0.78
Supranational	-0.011	0.081	0.89	-0.116	0.089	0.19
Asian	-0.017	0.037	0.66	0.084	0.052	0.11
Latin	0.003	0.031	0.93	-0.023	0.056	0.68
Bond Characteristics						
Log(US dollar amount)	0.034	0.016	0.04	0.026	0.017	0.12
Years to maturity	0.010	0.002	0.00	0.009	0.001	0.00
Floating rate	-0.681	0.048	0.00	-0.609	0.053	0.00
Put	-0.045	0.089	0.61	-0.030	0.081	0.71
Call	0.194	0.058	0.00	0.139	0.056	0.01
Yen	-0.209	0.049	0.00	-0.096	0.056	0.09
DM	-0.043	0.069	0.54	0.040	0.069	0.57
Euro	0.015	0.042	0.72	0.028	0.046	0.55
Lira	-0.115	0.067	0.09	-0.006	0.067	0.93
Other European currencies	-0.098	0.072	0.17	0.001	0.071	0.99
Market						
Global	0.012	0.039	0.76	-0.040	0.054	0.46
Yankee	0.045	0.039	0.24	-0.003	0.051	0.96
Samurai	-0.107	0.064	0.09	-0.345	0.114	0.00
Private placement	0.138	0.045	0.00	0.124	0.059	0.04
External Conditions						
Log(10 years US yield)	-0.712	0.112	0.00	-0.467	0.112	0.00
Log(Slope of US yield curve)	0.205	0.121	0.09	0.633	0.145	0.00
Log(EMBI spread)	0.188	0.038	0.00	0.265	0.038	0.00
Log(BBB spread)	0.332	0.053	0.00	0.177	0.063	0.01
Law Dummies						
Low-rated UK law	-0.116	0.036	0.00	-0.063	0.036	0.08
High-rated UK law	-0.133	0.044	0.00	-0.055	0.044	0.20
German law	-0.213	0.059	0.00	-0.127	0.057	0.03
Luxembourg law	0.283	0.109	0.01	0.264	0.101	0.01
Adjusted R-squared	0.8012			0.8167		
Number of observations	1520			1520		

Model 3 has a number of variables in addition to Model 2 that are not reported in the table due to space considerations. The additional variables are country dummies for Argentina, Brazil, Chile, China, Columbia, Hungary, Korea, Mexico, Philippines, Thailand, Turkey, and Venezuela. Furthermore, dummies for the following bond characteristics were added: collateralization, sinking funds, bearer bond only, fungible. Finally, the following market characteristics were added: dummies for US, Japanese, and European book runners, registration with SEC, and whether or not a bond was eligible for sale in the U.S. under Rule 144A.

Appendix I. Differences in Methodology Relative to Eichengreen and Mody (2000a,b,c)

In addition to the issue of the treatment of possible endogeneity, there are a number of other differences in our modeling strategy relative to that of Eichengreen and Mody. We focus here on four noteworthy differences.

First, we have substantially different samples. Our initial sample included all issues by emerging markets, but excluding issues in domestic markets and convertible bonds or bonds with warrants. Although Eichengreen and Mody provide no discussion of their sample, we understand that they also excluded such issues, but only these. To limit the heterogeneity of our sample and focus on the more conventional issues, we then excluded all bonds issued in currencies other than U.S. dollars, Japanese yen or major European currencies, and we used separate dummies for most of these. By contrast, Eichengreen and Mody appear to have also included all currencies, with about 15 currencies other than dollars, yen and deutsche mark included in an "Other currencies" dummy variable. Further, we included only those bonds issued under New York, English, German, Japanese and Luxembourg governing laws. By contrast, Eichengreen and Mody appear to have included bonds issued under the governing laws of about 15 further countries or offshore centers. Further, Eichengreen and Mody include all governing laws except English and New York in an "Other governing law" dummy variable.

Our sample is also substantially different to Eichengreen and Mody due to the way that we have dealt with data problems in Bondware. Although Eichengreen and Mody do not mention this, around 50 percent of the bonds in Bondware do not actually contain data for the dependent variable, the yield spread at issuance. Eichengreen and Mody's solution is to infer the spread as the yield to maturity (from Bondware) less a corresponding mature market benchmark yield. We have done the same thing. However, after finding a substantial number of errors in Bondware, we also attempted to check every spread for plausibility—especially those that were imputed—using data and news stories from Bloomberg, and also the report field in Bondware which provides some extra details about the issue and its pricing. For example, we omitted around 40 bonds with complex cash flows (dual currency bonds, index-linked bonds, etc.) where—although Bondware has data for the yield—it is actually virtually impossible to calculate yields or yield spreads: typically the figure in Bondware is the initial coupon rate which does not correspond to the true yield. We also checked spreads for step-up and step-down coupon bonds—there are around 100 in Bondware—where spreads were sometimes misreported. Overall, we found a substantial number of errors in Bondware and corrected or omitted a large number of bonds. Finally, given our use of bond ratings as our risk variable, we also excluded bonds for which we could not obtain ratings data.

The overall result is that Eichengreen and Mody (2000c) include around 2400 bonds while we include 1520 bonds. Based on our sample criteria, our sample is biased towards more conventional issues for which good information exists. The average size of issue include in our sample is about $290 million, versus an average size of about $100 million for those bonds that we omit. Our assessment is that Eichengreen and Mody's decision to include all bonds from Bondware was appropriate in their earlier studies (e.g., Eichengreen and Mody (1998a,b)) that attempted to explain the determinants of bond flows, but we suspect that our decision to focus on

a limited sample of bonds for which accurate yield spread data exist may be more appropriate for answering questions about the precise (and possibly very small) impact of contractual terms on the pricing of bonds.

A second major difference relative to Eichengreen and Mody is in our measure of bond risk. We have used a risk measure (actual credit ratings by Moody's, Standard and Poor's, or Fitch) that is widely used by market participants. By contrast, Eichengreen and Mody use country ratings from Institutional Investor (II) and macroeconomic data as risk measures. We prefer to use rating agencies' measures for several reasons. First, the ratings issued by ratings agencies apply specifically to the risk of particular debt instruments and are the risk measure that is used overwhelmingly by market participants. By contrast, the II ratings are a more general survey measure of country creditworthiness that is not widely used (except by researchers). Second, the ratings agencies' data are more timely in that we know the exact credit rating that applied to a bond on a particular day and was available to market participants on that day. By contrast, the II ratings which are published twice a year (in March and September) are subject to calculation and publication lags.[30] The use of macroeconomic risk variables also raises timing issues. Presumably, one should use the actual estimates for variables that were available at the time of the bond issue—e.g., the consensus forecast for that month—rather than historical data for the previous year, or the actual outturn for the current year which became known only after the bond issue occurred. Third, the II ratings apply to countries and are not measures of credit worthiness for individual issuers—they allow no differentiation between the risk of different issuers in the country, unlike bond ratings which allow corporates to be rated very differently to the sovereign. Fourth, conventional (sovereign) credit ratings have been shown by Cantor and Fitzgerald (1996) to subsume the information in macroeconomic variables: those authors show that credit ratings are highly significant explanators of sovereign spreads, and that eight macroeconomic variables (many of which are similar to those used by Eichengreen and Mody) do not add any explanatory power. Finally, conventional credit ratings also contain information about the risk of a specific security, in that the existence of guarantees, collateralization or subordination may be reflected in ratings above or below other bonds from the same issuer.

Of course, the use of credit ratings means that we are unable to include unrated issues in our sample. However, almost all sovereign issues are rated, and the vast majority of unrated issues are corporate issues, and often quite small in size and more likely to have occurred earlier in the sample period when ratings were less common. Further, these unrated issues are often those with ratings that will deviate most from the sovereign rating, so that the use of II ratings and national macroeconomic data might not be sensible for these bonds anyway. Since proposals for CACs relate mainly to sovereign borrowers, a sample bias toward sovereign bonds and towards larger, more recent, and rated issues may be appropriate.

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[30] The Russian devaluation and domestic default of August 1998 illustrates the timeliness problem of the II ratings. While the three major ratings agencies all cut Russia's debt rating by at least four notches between March and September of 1998, the II ratings were barely changed in this period, and were not sharply reduced until March 1999.

Third, we have also included a number of additional explanatory variables relative to Eichengreen and Mody. These include variables that clearly affect yields (e.g. dummies for put and call options, and the overall level of secondary market spreads in emerging markets) as well as a number of other variables which potentially affect yields and are clearly correlated with governing law (e.g., the market of issue—euro, yankee and global) so as to control for omitted variables problems and possibly spurious correlations. The inclusion of these additional variables increases the goodness-of-fit substantially and can potentially yield much more precise estimates of the impact of governing law. Indeed, together with our use of actual credit ratings and a more homogenous (and corrected) dataset, we have an adjusted R-squared of 0.81 in our Model 3, versus 0.61 in Eichengreen and Mody (2000a).

Fourth, we have estimated the impact of governing law using a full sample of all bonds, rather than in two or four subsamples (determined by the II rating for the country in question) as in Eichengreen and Mody. Our decision not to split the sample was based on the expectation that any impact of CACs on yields was likely to be small, so that it was important to keep as large a sample as possible to retain statistical power and avoid spurious results. We account for possible nonlinearity in the impact of risk on yields by including separate dummies for each of the 12 different credit ratings in our sample.

Appendix II. Issues Involving the Use of Instrumental Variables

In Appendix Table 1 we examine the impact of using instrumental variables to correct for the possible endogeneity of governing law using our primary market data. We use an instrumental variables methodology similar to Eichengreen and Mody, albeit with some modifications in the included variables.[31] Whereas Eichengreen and Mody estimate a multinomial logit equation, we concentrate on the 1196 bonds in our sample that were issued under New York or English governing law to reduce the heterogeneity of the sample and accordingly focus on a single choice. We estimate a probit equation for the decision to issue under English governing law (as opposed to New York law):

$$\Pr(D_{CAC,i} = 1 | X_{2,i}, X_{3,i}, X_{4,i}, \Gamma_2, \Gamma_3, \Gamma_4) = \Phi\left(\Gamma_{2,i} X_{2,i} + \Gamma_{3,i} X_{3,i} + \Gamma_{4,i} X_{4,i}\right), \qquad (3)$$

where the variables are defined as in equation (2), and Γ_2, Γ_3, and Γ_4 contain the parameter estimates of the probit. The fitted value from the probit is then included in the spreads equation. As in Eichengreen and Mody, we include the exact same set of control variables in both the probit equation (3) and spreads equation (2). Hence, although the yields equation is identified in a mathematical sense by the nonlinearity of the probit, it is not identified by any exclusion restrictions and it would not be surprising if the resulting estimates in the spread equation are subject to collinearity and other problems.

Appendix Table 1. Examining the Impact of Instrumental Variables Corrections for Possible Endogeneity
(Standard errors shown in parentheses below coefficient estimates)

Model and Endogeneity Correction	Pseudo-R Squared of Gov. Law Equation	Standard Devn. of Gov. Law Variable	Coefficient on Higher-rated English Law Bonds	Coefficient on Lower-rated English Law Bonds
1. No correction (OLS)	n.a.	0.496	-0.084*	-0.033
			(0.046)	(0.037)
2. Using predicted value from basic gov. law equation (similar to Eich. and Mody)	0.294	0.292	-0.599***	-0.456***
			(0.135)	(0.127)
3. Using predicted value from augmented governing law equation	0.542	0.382	-0.260***	-0.200**
			(0.091)	(0.088)
4. Using predicted law (zero/one) from basic governing law equation	0.294	0.489	-0.188***	-0.092***
			(0.053)	(0.047)
5. Using predicted law (zero/one) from augmented governing equation	0.542	0.500	-0.164***	-0.098**
			(0.057)	(0.049)

***, ** and * denote significance at 1, 5 and 10 percent levels, respectively.

[31] An alternative to replacing the actual governing law dummy with its fitted value is to use a Heckman correction. These are closely related approaches and our own estimates suggest that the Heckman correction yields very similar results.

We first show the parameters on the English governing law variable for these bonds using the actual value of that variable (Model 1). We then estimate two probit equations for the governing law of these bonds, and include the predicted value as the explanatory variable, as in Eichengreen and Mody. In the first case (Model 2), the equation for governing law includes variables similar to Eichengreen and Mody's probit equation and has a pseudo R-squared of 0.29 which is quite close to that of 0.35 obtained by Eichengreen and Mody (2000b) in a multinomial equation. In the second case, the probit equation is augmented with variables that are not included by Eichengreen and Mody, but which are intended to capture the market or investor group that was targeted. The variables include the market of issuance (euro, yankee or global), the nationality of the lead manager of the issue, variables for how and if the issue can be sold in the U.S. market, as well as some other issue characteristics including a few country dummies. The resulting probit equation has an R-squared of 0.54.

The increase in R-squared that results from the inclusion of the additional variables in the probit illustrates the importance of the market of issue and the targeted investor group in explaining governing law. Indeed, when these additional variables are included without any of the variables corresponding to those used by Eichengreen and Mody, the pseudo R-squared is as high as 0.48, with the market of issuance variable alone able to achieve an R-squared of 0.28. Furthermore, it is interesting to note that when the 11 credit ratings dummies and 4 market conditions variables are excluded from the augmented governing law model, the R-squared falls only from 0.54 to 0.52. The extremely modest impact of credit ratings suggests that the risk of borrowers is not a major determinant of governing law choice. This represents evidence against the proposition that governing law choices are substantially determined by borrower or investor perceptions about the probability that renegotiation of payment terms may become necessary.

Turning to the spreads equations, we find that the instrumental variables endogeneity corrections of Models 2 and 3 both produce coefficients on English governing law that remain negative for both high- and low-rated borrowers, implying that the use of English law and CACs is still associated with lower borrowing costs for both groups of borrowers. However, in both cases the parameter estimates are far larger than the OLS estimates.

The phenomenon of much larger coefficients after the correction for endogeneity is interesting. It appears to be most extreme when one uses predicted values from a probit equation that has a poor fit (the average value of the English law parameters in Model 2 is 9 times larger than in Model 1) and is less pronounced when one includes additional variables that better explain governing law (in Model 3 the parameters are only 3.9 times larger). Part of the reason for this may be that the fitted values for the governing law variable are no longer distributed as a zero-one variable but are distributed along the zero-one interval, with implications for the standard deviation of the variable. In particular, as the goodness of fit of the governing law equation shrinks, the predicted values move towards the center of the zero-one interval and the standard deviation of the predicted value falls (compare column 1 for Models 1-3). Simply reducing the scale of an explanatory variable of course has no impact on tests for statistical significance, but it may have the effect of blowing up the parameter estimates. One way to avoid this particular problem of the endogeneity correction would be to take the predicted values for the governing law dummy and then redefine as a zero-one dummy based on whether or not the probability of

English law issuance is less than or more than 0.5—this yields a governing law variable with approximately the same standard deviation as the original variable. When we do this with the basic governing law model, the English law parameter estimates are far smaller than before (compare Models 2 and 4). But regardless of how we do the "correction" for endogeneity, the parameter estimates for English governing law remain negative, with no statistically significant difference between high- and low-rated issues. Hence, we find no evidence for Eichengreen and Mody's result that moral hazard factors cause low-rated borrowers to pay higher yields on bonds with CACs than on bonds without these clauses.

It is noteworthy that both our results and those of Eichengreen and Mody suggest modest impacts on spreads from CACs in OLS regressions, but large impacts when instrumental variables are used. In addition, the fact that we obtain opposite signs for these large impacts suggests that the results from instrumental variables corrections may not be robust. Accordingly, we wonder if the large and variable parameter estimates might be the outcome of correcting for endogeneity without good instruments (i.e., variables that affect governing law but do not affect spreads) and when there is actually no (or only very modest) endogeneity.

We can illustrate the possible impacts of these problems via a simple Monte Carlo experiment designed to replicate some of the basic features of the endogeneity correction described above.[32] We specify a simple model where the governing law of 1500 bonds is a zero-one variable determined by 15 randomly generated factors with 15 randomly generated coefficients, with spreads also determined by the same 15 factors and 15 different parameters. Governing law does not enter into the spreads equation, and the error terms in the governing law and spreads equations are not correlated, and their variances are set so as to replicate the R-squareds in Eichengreen and Mody (2000a,b). Further, the standard deviation of the spread variable is set to approximately replicate the standard deviation of the log spread variable in our data. In summary, the true model is that there is no endogeneity, and the true impact of governing law on spreads is zero. For simplicity, we focus on a single governing law variable, without interaction dummies.

The key result of the Monte Carlo simulation is shown in Appendix Figure 1. The two lines show the distribution of the OLS estimate of the impact of governing law on spreads and the instrumental variables estimate that "corrects" for possible endogeneity. The simulations indicate that the estimates that are corrected for endogeneity tend to be much further from the true value of zero than the OLS estimates. The standard deviation of the corrected estimates is nearly eight times larger than the standard deviation of the OLS estimates! Additional Monte Carlo simulations show that this dramatic worsening in the efficiency is based largely on the lack of good instruments, rather than the use of instrumental variables *per se*.[33]

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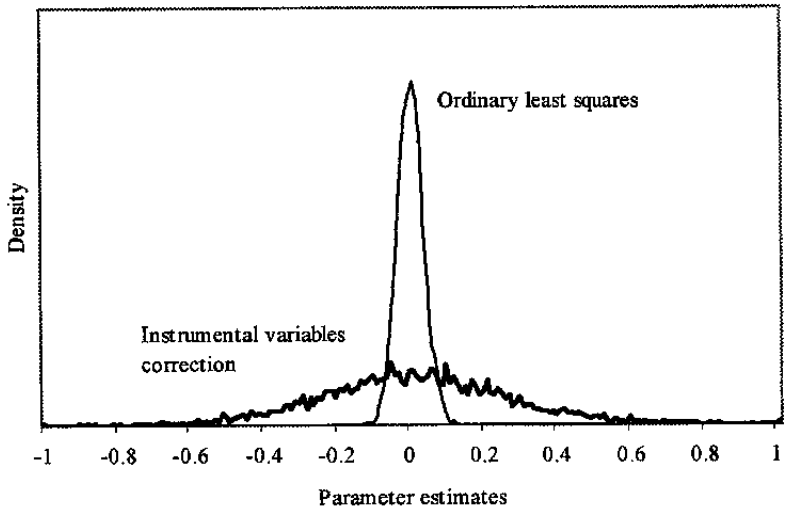
[32] Further details of the simulation are available from the authors upon request.

[33] In particular, there is a much reduced decline in efficiency in simulations when we assume that the 15 variables determining governing law and appearing in the probit are all different to the 15 variables appearing in the spreads equation.

Appendix Figure 1. Parameter Estimates on a Simulated Governing Law Variable



We do not argue that this simple simulation captures all the intricacies of the current example. Further, it was not designed to address the issue of whether it is desirable to correct for endogeneity when it is present and when good instruments are available—clearly if governing law is endogenous, one needs to correct for it and to do so appropriately.[34] Instead, the simulation was designed to explore the consequences of "correcting" for endogeneity using instrumental variables without any exclusion restrictions, in a case where the behavior of those that make their living in financial markets provide no support for the notion that endogeneity is a serious problem. Accordingly, it would appear to provide one possible explanation for the fact that both we and Eichengreen and Mody obtain implausibly large estimates—of different signs—on the governing law variables when we use instrumental variables to correct for possible endogeneity.

[34] Eichengreen and Mody suggest measurement error as a further reason for correcting for endogeneity. The standard example of the lack of correspondence between governing law and CACs is the case of Brady bonds, which have English governing law but for specific historical reasons do not have CACs. In the absence of evidence that this is more pervasive in the Bondware data (which do not include Brady bonds since they were never "issued" in international markets) and that the instruments used have the potential to address the specific type of measurement error present, the use of instrumental variables may make little sense.

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