Crisis Resolution: Next Steps

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A. Introduction

The debate over how to manage and resolve crises in emerging markets, underway now for the better part of a decade, reached a climax at the Spring Meetings of the International Monetary Fund and the World Bank here in Washington a month ago. Agreement was reached to push ahead with the contractual approach to smoothing the process of sovereign debt restructuring by promoting the further introduction of collective action clauses into bond contracts, while continuing to study the statutory approach and in particular the IMF's Sovereign Debt Restructuring Mechanism (SDRM).[2] These decisions were shaped by Mexico's successful launch at the end of February of a $1 billion Eurodollar bond, subject to New York law but featuring collective action clauses, at spreads that were if anything slightly tighter than those on its previously-issued New York law bonds.[3] Mexico then followed up in April with two additional issues also including collective action clauses, and Brazil issued a $1 billion Eurobond including these same provisions later in the month. These events put paid to the view that investors would not accept bonds that included collective action clauses and that the governments of emerging markets would be unwilling to issue them for fear

[2] Collective action clauses specify procedures for selecting a bondholder's representative and enumerate his responsibilities, include majority enforcement clauses in which the litigation decision must be made by a requisite fraction of the bondholders (say, 25 per cent), and require that all funds thereby recovered be distributed in proportion to the principal amount. They specify the share of the bondholders whose vote suffices to amend payment terms like the timing and amount of principal and interest. Changes endorsed by the specified majority are then binding on all bondholders. Traditionally, bond subject to English law include collective action clauses, while bonds subject to New York law do not. Thus, the immediate challenge for the contractual approach is to introduce collective action clauses into bonds issued under New York law. The SDRM would involve an international treaty obligation empowering a qualified majority of all creditors to agree on the binding terms of a structuring offer, to assign seniority to new money, and to create a dispute resolution forum to allocate voting rights and tabulate the results. See Krueger (2002).

[3] There were a few prior instances of governments issuing bonds in New York with collective action clauses prior to Mexico, such as Lebanon and Qatar in 2000 and Egypt in 2001. But because these issues were small and their issuers did not figure prominently in the Emerging Market Bond Index (EMBI), their cases attracted little notice.

higher borrowing costs. They galvanized the debate by demonstrating the feasibility of contractual innovation.

It is tempting for officials and analysts to congratulate themselves on a job well done and turn to other topics. But the process of improving how we go about sovereign debt restructuring, much less the larger task of making the world a safer financial place, is still far from complete. It remains to be seen how many other emerging markets will follow Mexico and Brazil's examples. And, while collective action clauses provide mechanisms for coordinating the creditors holding an individual bond issue, they do not offer a means of coordinating the creditors holding different issues. Recall that Argentina had more than 80 separate sovereign bonds in the market at the time of its December 2001 default. Thus, it cannot be taken for granted that the addition of these provisions to individual loan contracts will significantly facilitate creditor coordination and smooth debtor-creditor negotiations.

Above all, there remains the question of how much can be expected of these improvements in sovereign debt restructuring procedures. Contractual clauses specifying how restructuring will be initiated, how the creditors will be represented, when legal action can be initiated, and under what circumstances a change in the financial terms of a bond agreed to by a qualified majority of the creditors will be binding on dissidents are only limited changes to the status quo. Even those limited changes would have applied only to a subset of recent crises.[4] Most fundamentally, there is Guillermo Ortiz's critique that the official community directs too much attention to building better morgues. It

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[4] On the relevance of recent reform proposals to these crises, see Mussa (2002). We return to this below.

should devote more effort in this view to preventing crises and to promoting capital transfer from rich to poor economies than to cleaning up after crises when they occur.

In this paper we consider what remains to be done in terms of strengthening the crisis resolution process. After reviewing the development of the debate, we present a theoretical framework for analyzing the collective action problem. We next enumerate the issues that remain to be addressed by the contractual approach: the difficulty of coordinating creditors across bond issues (the aggregation problem), the incentives for adoption (in particular, whether emerging markets with sub-investment grade ratings will be discouraged from adopting CACs by the prospect of higher borrowing costs), the challenge posed by the inherited stock of bonds (the transition problem), and the risk that the entire initiative may be undermined by asset substitution and market migration. We then ask why there has not been faster progress in getting these new contractual provisions into the market. In concluding, we return to the question of how much can be accomplished through these improvements to crisis resolution processes and to how they fit into the larger architecture debate.

B. The Evolution of the Debate

It is sometimes said that the debate over crisis resolution was initiated by the Mexican crisis, which highlighted the existence of collective-action problems in decentralized securities markets. In fact, the debate goes back further, to Raffer's (1990) proposal for an international insolvency procedure designed along the lines of Chapter 9 of the U.S. bankruptcy code, to Oeschsli's (1981) proposal to empower the IMF to carry out in the sovereign context many of the responsibilities of the bankruptcy court under

Chapter 11 of the U.S. code, and to Ohlin's (1976) argument for the creation of an "institution of honourable bankruptcy." These authors were all responding in some sense to the difficulty of restructuring defaulted debts, to the adverse impact this had on creditors and debtors alike, and to the uncomfortable implications for the IMF.

Still, the debate took a new turn with the Brady Plan, the resumption of lending to developing countries through the bond market, and the Mexican crisis, which demonstrated the downside of securitized finance. These events prompted Hurlock's (1995) proposal for the U.S. and U.K. to close their courts to rogue creditors, Macmillan's (1995) scheme for the introduction into bond covenants of sharing clauses and thresholds for litigation, and Eichengreen and Portes' (1995) proposal to promote the more widespread use of collective action clauses and to create a bondholders council to address the creditors' collective action problem.

These authors differed in their motivations. Hurlock and Macmillan emphasized the threat of disruptive litigation by rogue creditors.[5] Eichengreen and Portes, in contrast, were concerned with problems of creditor coordination more generally and argued the need for majority structuring provisions and a standing committee of bondholders to facilitate restructuring even in the absence of disruptive litigation.[6] They emphasized the need for alternatives to large scale rescue operations, a la Mexico, which were unlikely to be either feasible as a response to future crises, given limited the resources of the international financial institutions, or desirable, given problems of moral hazard.

[5] Which remains the preoccupation of recent studies such as Roubini and Setser (2003).

[6] The difference probably both reflects that the first set of studies was already underway before the Mexican crisis and that those studies emerged from the legal community.

The first official contribution to this debate was the report of the G-10 Deputies (Group of Ten, 1996), written in response to the call at the Halifax Summit for further review of alternatives for the more orderly resolution of sovereign debt crises. The report concluded that encouragement should be given to the use of standstills by authorizing the IMF to lend to countries that suspend payments (that the Fund should be able to "lend into sovereign arrears," as it was eventually authorized to do by its Executive Board and the Interim Committee in response to this recommendation). It endorsed the more widespread use of contractual clauses providing for the collective representation of debt holders, for qualified majority voting on changes in financial terms, and for clauses requiring that amounts recovered from the debtor be shared among all issue holders.

This G-10 report established the terms of subsequent discussions but in the short run elicited only an inconclusive debate. Then came the Asian crisis of 1997-8. The Asian crisis pointed up the inadequacy of official resources relative to rapidly expanding international financial markets, again highlighting the need for other mechanisms for resolving crises. The report of the Group of Twenty Two working group on international liquidity crises (G-22 1998) echoed the case for collective action clauses. The G-7 then placed the issue on its work program for reforming the international financial system with the goal of reaching a consensus by the Cologne Summit in 1999. That consensus (G-7 1999) endorsed the more widespread use of collective action clauses and for the first time urged G-7 governments to consider including them in their own debt instruments. In 1999 U.S. Treasury Secretary Summers endorsed their more widespread utilization, as did the Executive Board and the International Monetary and Financial Committee of the IMF in a series of reports and communiqués.

But translating these words into deeds turned out to be difficult. Table 1 (reproduced from IMF 2003, p.58) shows that the share of new issues by emerging markets that included the relevant contractual provisions remained stagnant, even falling. Spokesmen for the creditor community repeatedly warned that the more widespread adoption of collective action clauses would be perceived as a serious erosion of creditor rights (Institute of International Finance 1996). Some worried that requiring the more widespread use of collective action clauses would limit the demand for emerging market bonds and "generally inhibit market access for those emerging market countries implementing correct reform policies" (Rhodes et al. 1999, p.2). More apocalyptically they warned of "a prohibitive increase in borrowing costs at a time when trillions of dollars are needed for infrastructure finance…" (Folkerts-Landau 1999, p.2). Officials of emerging-market countries similarly regarded the initiative with skepticism, reflecting fears that the new provisions would raise the cost of borrowing.

The resulting lack of progress, occurring against the backdrop of continuing crises (Russia, Ukraine, Brazil, Ecuador, Pakistan, Turkey), led some to consider approaching the problem from the other end. To the extent that creditors and perhaps also debtors might be reluctant to accept the addition of restructuring-friendly provisions to their loan contracts because they preferred to receive IMF assistance – which the Fund would feel compelled to extend so long as workouts remained inefficient and costly – the solution was to limit IMF lending and therefore to sharpen the incentive for market participants to pursue alternatives. Thus, the task force of the Council on Foreign Relations (1999) recommended that the Fund should adhere to its normal lending limits of 100 per cent of quota in a year and 300 per cent of quota over the life of a program, except in rare

instances where the stability of the global financial system was threatened.[7] The Bank of Canada and Bank of England (2001) similarly recommended clear presumptive limits on IMF lending. The Meltzer Commission (2000) proposed that the IMF should limit the kind of countries that qualified for assistance.

Unfortunately, this approach essentially assumed a solution to the IMF's time-consistency problem. It assumed that the Fund could credibly commit not to intervene on behalf of a country whose only alternative might be a disruptive, costly, and disorderly workout. Others argued that the predominant direction of causality ran from first creating socially acceptable alternatives to IMF bailouts by adopting restructuring-friendly contractual provisions and from there to limiting IMF rescues.

So the debate stood in the summer of 2001, when Argentina's crisis erupted. Argentina pointed up the dilemma created by the absence of a viable alternative to IMF assistance. The most revealing turn of events came in August 2001 when the IMF and its shareholder governments agreed to provide the country with an additional $8 billion of assistance. There were serious doubts at this late date that Argentina's debt was sustainable, but there were also widespread fears, borne out in the event, that a default would be highly disruptive. The IMF earmarked $3 billion to be brought forward from later disbursements to support a voluntary, market-based operation to improve Argentina's debt profile—in effect, for a restructuring designed to reduce the country's immediate debt-servicing obligations. Frustratingly, however, no one could figure out how to use that $3 billion. Collective action problems made it difficult to obtain the

[7] This idea that the adoption of firm lending limits will encourage a more friendly reception for proposals for restructuring-friendly contractual provisions remains a theme in the subsequent writings of Morris Goldstein (2003), who held the pen for the Council's report.

participation of creditors in a voluntary restructuring. Investors were reluctant to agree to a restructuring precisely because it was voluntary; they preferred to wait and see whether the multilaterals would provide additional assistance. In the end, the official community saw no alternative but to lend, because doing nothing and thereby forcing the country into a messy and difficult restructuring risked endangering Argentina's neighbors and a fragile international financial system. At the same time, officials feared that this action only put off necessary institutional and political reform. Fischer (2002, p.37) summarized the lesson as follows. "Under present circumstances, when a country's debt burden is unsustainable, the international community—operating through the IMF—faces the choice of lending to it, or forcing it into a potentially extremely costly restructuring, whose outcome is unknown."

These were the events that brought forth Krueger's proposal for a Sovereign Debt Restructuring Mechanism in November 2001. The SDRM initiative aligned the IMF with those calling for alternatives for dealing with sovereign debt crises. Faced with the possibility of a more radical solution, market participants embraced collective action clauses as the lesser of evils. In April 2002, a special committee of the Institute of International Finance endorsed their broad-based use (IIF 2002). It is hard to imagine that this organization of institutional investors, which for years had vehemently opposed the more widespread use of collective action clauses, would have done such a dramatic about face in the absence of Krueger's initiative. In June, six creditor organizations then issued a report acknowledging that CACs were a useful component of sovereign debt

restructuring (EMCA et. al. 2002) and suggesting the form that model clauses might take.[8]

Canada, the members of the European Union, and Switzerland agreed to lead by example, but the most dramatic development on this front was Mexico's issuance of a $1 billion Eurobond in New York, underwritten by J.P. Morgan and Goldman Sachs, that included a majority restructuring provision permitting financial terms to be altered with the approval of bondholders holding 75 per cent of the principal.[9] Mexico then issued two more bonds in April with collective action clauses, together amounting to $2.5 billion, and Brazil followed later that month with a $1 billion issue in New York that also included collective action clauses (though requiring an 85 percent qualified majority to change payment terms rather than the 75 percent that applies to the Mexican bonds and is typically used for bonds issued under UK law). We expect to see additional emerging-market bonds including collective action clauses issued in New York by the time this paper is published. Thus, we may eventually have a real time test of whether the more widespread use of collective action clauses will make the world a safer financial place.

C. Theory

We use a simple theoretical model of sovereign debt to analyze whether collective action clauses can raise welfare and to suggest observable differences in the pricing of loan contracts with these provisions. In the full model, in the appendix, debt repayments are restricted by the willingness of the debtor government to pay to avoid penalties for

[8] In September the G-10 (2000) also issued a report describing a set of model clauses. Roubini and Setser (2003, p.9) summarize how the G-10 and EMCA draft clauses differ from one another.

default. The model expresses willingness to pay in terms of the equilibrium present value (in expectation) of repayments that are time consistent for the debtor.

If collective action clauses reduce the power of holdout creditors and ease sovereign debt restructuring, then the probability of default can rise because the incentives for debtor discipline diminish. Our model incorporates this effect by allowing the debtor government to have information about its willingness to pay that is unknown to its lenders. Specifically, we assume that the government is better informed than foreigners about the political feasibility of raising revenues from the private sector or of implementing contractionary macroeconomic policies to facilitate debt repayment. With moral hazard, foreign creditors only know a range for the government's willingness to pay, given mutually observable fundamentals such as current output, the level of indebtedness, and the terms of trade. The wider is this range, the greater is the moral hazard. Foreign creditors also face risk regarding future observable fundamentals.

As a starting point, we compare the renegotiation of a single bond with CACs to a single bond without them (which has unanimous action clauses, or UACs, instead), in circumstances where the debtor's willingness to pay is less than the outstanding debt obligation (following Kletzer 2003). In this case, any holder of a bond without CACs can gain by being the last to agree to a restructuring (or by filing a lawsuit after agreement is reached), holding out for a larger share of the settlement than received by other bondholders. If all the other bondholders agree, a small bondholder can succeed as a holdout in equilibrium. The others will all be better off paying the holdout's demand. Because any bondholder can be a holdout, competition to be last leads to a war of

[9] We discuss the pricing of this issue below.

attrition and to delay of agreement in equilibrium. This delay reduces the present value of the debt since the expected present value of the amounts that the government is willing to repay does not rise over time. The majority of bondholders can avoid costly delay and raise their return by giving more than a pro rata share of the ultimate settlement to holdouts.

With collective action clauses, a qualified majority can change payment terms, and the changes it votes are binding on any dissenting minority. So long as the holdouts' share of the debt is less than one minus the size of a qualified majority, a minority of bondholders cannot successfully hold up the debt restructuring.

Differences in interest rate spreads on the two types of bonds reflect the interplay between ease of restructuring and probability of default. In the absence of moral hazard, the probability of default is identical under different governing laws, but bonds with CACs will display lower spreads since collective action reduces delays in restructuring. But bonds with collective action clauses are also subject to greater moral hazard in the presence of asymmetric information and, hence, are subject to a higher probability of default. In the appendix, we describe an incentive compatible equilibrium for our sovereign debt model and identify the mechanism through which collective action clauses in combination with moral hazard raise the probability of default. With asymmetric information, the debtor government has an incentive to default and to seek debt restructuring even though it is actually willing to pay the debt as contracted. We observe that this incentive is dampened by the presence of unanimous action clauses, since the long delays associated with debt restructuring impose costs on debtor countries above and

beyond the eventual debt repayment.[10] These costs to the debtor provide additional sanctions for default; UACs therefore act as commitment devices. In contrast, the disincentives to default are less when the debt is held in bonds with CACs, since restructuring is speedily accomplished. Thus, the probability that the debtor defaults is higher when bonds include CACs than when they do not.[11]

The importance of asymmetric information about the true capacity of the government to meet its debt obligations will vary by debtor country and government. While we cannot observe the extent of information asymmetries, it seems reasonable that an increase in information asymmetry and, hence, the degree of moral hazard, should contribute to a lower credit rating for the country. Thus, for low-rated countries, our model predicts that the higher moral hazard and probability of default when bonds include CACs could more than offset the benefits of restructuring, resulting in wider spreads than without collection action provisions. As credit quality improves, this premium will gradually disappear and bonds including CACs will pay lower spreads, reflecting the shorter period of time spent agreeing to the restructuring.[12]

The model also predicts that the spread differential for bonds with CACs over bonds without them will initially widen as fundamentals deteriorate. In other words, with asymmetric information, worse fundamentals raise the probability of default more for bonds with CACs because of moral hazard. The difference in spreads between U.K. and

[10] Delays in debt restructuring create significant social costs. Following default, capital does not return and growth is lowered until the renegotiations are sorted out.

[11] However, when the country does default, the return to creditors is lower for U.S. law bonds than for U.K. law bonds. Ex ante, therefore, the value of the debt may be higher or lower under U.K. than under U.S. governing law. This implies that the effect of governing law on the amount lent ex ante is ambiguous.

[12] In fact, this is what we find in the empirical analysis below.

U.S. bonds rises as fundamentals approach a critical level. If fundamentals then continue to worsen beyond that threshold, for very high probabilities of default, the spread differential for bonds with CACs relative to bonds without them will begin to narrow because the probability of default for bonds with CACs can get no worse, while the probability of default for bonds with UACs continues to rise; consequently, the interest spread for bonds with CACs relative to bonds with UACs can turn negative.

These differences in the performance characteristics of the two types of bonds can allow for welfare-improving debt swaps when the probability of default becomes large (holding the extent of the information asymmetry constant), as illustrated by the current Uruguay situation. Consider a country with a modest degree of information asymmetry and fundamentals that place it midway in the credit rating spectrum. Bonds with UACs may command a lower spread because country commitment to avoid default has value and the expected cost to the country and to creditors of renegotiation delays is small because the probability of default is limited. Therefore, bonds with UACs might be chosen initially in equilibrium. But if fundamentals deteriorate further, the spread on bonds with UACs relative to bonds with CACs can become positive. In this case, a debt swap into bonds with CACs can increase the present value of the debt to the bondholders without any additional cash and increase debtor welfare even though it makes ex post renegotiation of the bonds certain. This is with correct pricing of the bonds with CACs, so that bondholders have rational expectations about the subsequent restructuring.

Are collective action clauses sufficient? Majority action clauses can eliminate the ability of the holders of a small share of a single bond issue to delay its renegotiation by holding out for a larger settlement. If a country has many different bonds with CACs in

the market, however, any single bond might be a small enough share of the total debt so that its qualified majority can hold out for a larger than pro rata share in the overall debt restructuring. Typically, a large number, if not all, of the bond issues will be potential holdouts. If the qualified majorities of all the other bonds agree to a restructuring, then the holders of the remaining bond issue can gain by holding out. The qualified majorities of other bonds each have the same incentive to hold out, so that agreement is delayed in equilibrium and bondholders are worse off in the aggregate than if they all agreed to a debt restructuring. The appendix describes the resulting coordination game, which has the payoff matrix of a prisoners' dilemma. The payoffs when the qualified majority of each bond agrees to a pro rata restructuring are higher for every bondholder than the Nash equilibrium in which every qualified majority votes against immediate restructuring.

The coordination game between holders of various issues implies that aggregation can be a problem even with collective action clauses and that additional contractual innovation might be necessary to cross-issue coordination. One possibility would be the adoption of a "code of conduct" that specifies the expected behavior of bondholder representatives in the event of default and renegotiation. Another could be the adoption of covenants that allow a qualified majority of the holders of all bond issues to vote on the terms of restructuring in the event of default, rather than the qualified majority of the holders of each individual bond issue.[13]

The two-step approach to debt restructuring proposed by J.P. Morgan, presently being pursued by Uruguay, seeks to implement this method of avoiding the problem of

[13] Consistent with this intuition, in the UK, the majority needed to restructure corporate debt in the event of bankruptcy is lower for an adjourned meeting of bondholder representatives than for the first meeting.

coordination across many bond issues. When default becomes probable, a swap into collective action clause bonds that carry a common majority action clause can be welfare improving for both bondholders and the debtor, as discussed above. The outstanding bonds can be swapped for bonds that differ with respect to maturity and other terms, while the common majority action clause resolves the aggregation problem in the event of renegotiation. Our model implies that the swap may require little or no injection of funds from official sources in order to be successful, even though it can increase the probability of renegotiation, and even though this increase is anticipated by creditors. This result is most likely to obtain when the debtor has experienced a sufficiently adverse event (like the impact of Argentina's default on Uruguay's public finances), in which a swap that facilitates renegotiation can benefit the debtor and its creditors alike.

Implications for transition. We consider how the interest spread on a bond with CACs is affected by the proportion of debt that currently lacks them. This case is relevant for asking whether the existence of UAC bonds in the market creates inertia that discourages the issuance of new bonds with collective action clauses. With some probability, a bond with CACs can be successfully renegotiated by the debtor even though the government repays the outstanding stock of UAC bonds in full, avoiding the penalty of delay. The size of this effect depends on the degree of moral hazard. This implies that the interest spread for a bond issued with CACs relative to the spread for bonds with UACs rises with the share of the outstanding debt that features UACs. It also explains why the transition from UAC bonds to CAC bonds may exhibit inertia, especially in the case of sub-investment-grade credits. The probability that the debtor country will be able to restructure the bond with CACs without renegotiating the debt

with UACs decreases if moral hazard is absent. This suggests that the interest spread differential for the minority share of CAC bonds relative to UAC bonds should be smaller the higher is a debtor country's credit rating.[14] In turn, this explains why the inertia to which we referred to above should be less for investment-grade credits. We find empirical support for these predictions below.

Do investors have an incentive to take bonds with UACs when most debt is held in bonds with CACs? This case is worth considering in order to address the possibility that progress in introducing collective action clauses into the market could be reversed subsequently. We consider it in the appendix by allowing a small share of the outstanding debt to be issued as a single UAC bond with the remaining debt held as bonds with CACs. If individual holders of the UAC bond can gain by holding out, then restructuring of the UAC bond will be subject to costly delays, potentially increasing the penalty for default. However, the holders of the collective action clause bonds need not wait for the holders of the unanimous action clause bond to join negotiations to reach an agreement. If the debtor's cost of delay is proportional to the debt that remains in default, then the debtor and the holders of the bonds with CACs have incentives to reach an agreement without them. The holders of the UAC bonds suffer the costs of delaying settlement due to holding out while the holders of the bonds with CACs take advantage of moving first. The probability of default may decrease, but this affects the returns to both types of bonds equally. The bonds with UACs are disadvantaged rather than advantaged as a larger share of the debt is held in bonds with CACs. Put another way, this argument implies that the interest spread on bonds with UACs relative bonds with

[14] Again, this prediction is borne out by the empirical analysis below.

CACs should rise with the share of outstanding debt that includes CACs. This should reassure those worried that progress in introducing CACs may be reversed subsequently. We find support for this prediction in the empirical analysis below.

D. Evidence

This theoretical analysis in hand, we now turn to issues that remain to be addressed by the contractual approach.

a) Aggregation

Collective action clauses are structured to facilitate coordination by the holders of a specific bond issue by making a qualified majority vote to change the financial terms of that issue binding on all holders, whether they vote positively or not. This limits the danger that holdouts will refuse to accept the change in terms and will have to be bought out at a higher price, thereby reducing the resources available to service the debts of the majority and causing the agreement to unravel. But such provisions are bond specific: they do not provide mechanisms for coordinating the holders of separate sovereign issues. One can imagine that the same free-rider problem that could lead agreement by the holders of an individual bond to unravel might arise when creditors holding one or more of a government's multiplicity of separate sovereign issues similarly refuse to agree.

The severity of this problem is unclear. Most emerging market sovereigns have only a handful of issues in the market. Ukraine had five and Ecuador had six at the time of their respective defaults. On the other hand, Argentina had more than 80 separate sovereign issues outstanding. Even in cases like this, however, one can imagine

mechanisms—information sharing, a code of conduct, the formation of bondholders committees, and super-collective action clauses (which provide for a binding qualified majority vote across separate issues)—through which investors could be coordinated.

If aggregation is costly, then investors will presumably demand a premium in order to hold claims on an issuer who has multiple instruments in the market, especially when there is a significant likelihood that its obligations may have to be restructured. It should therefore be possible to test for the presence of a significant aggregation problem using evidence on the pricing of international bonds. We use data from Capital Bondware on bonds placed internationally by the governments of emerging market economies between 1991 and 2000.[15] Our dependent variable is the launch spread, defined as the yield to maturity at time of issue minus the yield on a low-risk bond of comparable maturity.[16] The key explanatory variable is the number of separate issues that the sovereign already has in the market at the time a new bond is launched.[17]

As controls we use the standard vector of explanatory variables utilized in previous studies of emerging-market bonds: these include characteristics of the issue (its amount, its maturity, whether it bears a fixed or floating rate), characteristics of the issuer (the continent on which it is located, its credit rating, its recent growth rate, the volatility of its exports, its reserves to short-term debt ratio, and its ratio of domestic credit to

[15] This empirical analysis is drawn from Eichengreen and Mody (2003). In principal, this is the universe of new sovereign issues in the period since the developing-country bond market started up again in the wake of the Brady Plan, although in practice the number of observations is slightly smaller than that universe, reflecting problems of missing data.

[16] The definition of the latter depends on the currency in which the emerging-market bond is issued; it is a U.S. treasury bond for U.S. dollar-denominated bonds, a UK government bond for sterling-denominated issues, a Japanese government bond for yen-denominated issues, and so forth.

[17] We calculate this by cumulating new issues and removing earlier issues as they are retired.

GDP), and characteristics of the global financial environment (the ten-year U.S. Treasury rate, the U.S. high-yield spread, and the volatility of the Emerging Market Bond Index during the quarter the bond was issued). We include the country's debt/GNP ratio to be sure that our measure of the number of separate sovereign issues is not simply picking up the level of indebtedness of the country.

The coefficient on the number of separate sovereign issues (the "multiplicity premium") is reported in the first column of Table 2.[18] We do see evidence of an aggregation problem. The coefficient on number of bonds is positive and statistically significant at standard confidence levels. The point estimate suggests that distributing the same amount of debt among an additional ten bonds would raise spreads on the tenth bond by about 2 per cent, or about 8 basis points.

This effect is not large, but its impact is quite a bit larger for countries with low credit ratings. This is intuitive: if our variable is really picking up costs of aggregation that come into play during restructuring negotiations, then it should have the largest effect on the obligations of countries whose perceived probability of having to restructure is high. It should have the largest effect, in other words, on countries with poor credit ratings.

Measuring credit quality using *Institutional Investor* country ratings, which range from 0 (worst credit) to 100 (best credit), we now allow the effect of the number of outstanding bonds to differ by rating, distinguishing three credit-rating groups on the

[18] The full set of results is available from the authors on request. These estimates correct for sample selectivity, reflecting the fact that not all potential borrowers are in the market at all times, by estimating a two-equation system of the decision to borrow and the spread, using maximum likelihood. Reassuringly, equations for the spread estimated by ordinary least squares are essentially identical for present purposes.

Institutional Investor scale: 0-35, 36-50, and 51-100. The estimated effects, in the second column of Table 3, confirm that the largest multiplicity premium is demanded of countries with the lowest credit ratings (0-35). For countries with intermediate ratings (36-50), in contrast, the effect is of the same order as the full-sample estimates reported before. For countries with relatively high credit ratings (above 50), the coefficient for the number of separate bond issues turns negative. Arithmetically, the relatively small positive coefficient on number of issues for the sample as a whole is thus an average of a large positive effect for the lowest rated countries, a small positive effect for countries with intermediate ratings, and a negative effect for the highest rated countries. Economically, this presumably reflects the interaction of two offsetting forces. Having an additional debt instrument in the market complicates future restructuring negotiations; this is the dominant factor for low-rated issuers, for whom the likelihood of future restructuring is high, and for whom this factor consequently carries considerable weight. At the same time, continuing interaction with the market builds reputation and can be taken as a sign of a country's commitment to maintain its good credit; this effect dominates for high-rated issuers.

We can also ask whether aggregation costs vary as a function of whether or not an issue includes collective action clauses. The answer, shown in Table 3, is no. There is no indication that the presence or absence of collective action clauses significantly conditions the perceived costs of aggregation. That we do not find significant differences in the "multiplicity premium" as a function of whether or not a country's bonds have collective action clauses suggests that the latter may not be enough, by themselves, to solve problems of cross-issue aggregation.

One can imagine responding to these findings in different ways. One possible response is that a multiplicity premium of 8 basis points for the sample as a whole is not enough to lose sleep over. Aggregation difficulties are minor compared to other factors that elevate borrowing costs for emerging markets. At the other extreme, one might worry about the significantly larger multiplicity premium affecting countries with low credit ratings and advocate the use of "super-collective-action clauses"—for provisions in each bond issue that provide for a binding supermajority vote of not just holders of that issue but other issues also. The challenge then would be to get these untested provisions into the market and gain investor acceptance. Adding a super-collective-action clause could not proceed on a bond-by-bond basis. Rather, all issues would have to be converted simultaneously, which is likely to be possible only for actual or potentially distressed debtors, like Argentina and Uruguay, that are contemplating exchanging all their outstanding debt instruments for new ones (which could then include these provisions). J.P. Morgan (2002) has advanced a proposal for dealing with these challenges. In the first stage, investors holding international bonds and other credit instruments would exchange their claims for new ones. The new instruments would preserve repayment terms but provide for aggregation across issues in the second stage, which would involve the negotiation and acceptance of restructuring terms.

The challenge, obviously, is to induce participation in the first stage. Investors holding bonds with strong covenants might be reluctant to surrender them. They might worry that the debtor could "water the stock" by, for example, converting government debt held by the central bank in stage one. As always, there would be option value to

waiting. To induce participation, Morgan suggests relying on exit consents.[19] But while Ecuador used exit consents to induce high levels of participation, subsequent changes in bond documentation may make doing so more difficult.

As we write, an experiment with this approach is underway. Uruguay, which has a debt problem as a result of the crisis in neighboring Argentina, is seeking to exchange its global bonds. The new bonds will include super-collective-action clauses allowing changes in financial terms if 75 per cent of an issue agrees or if 85 per cent of all series and 66.66 of each affected series agree. Exit consents are being used to encourage participation. Our theoretical analysis above suggests that under Uruguay's circumstances (when a country has experienced a large negative credit event not of its own making) a high level of participation will be welfare improving and, in particular, that it has the potential to raise the value of debt for creditors. It will be interesting to observe how this offer is received by the markets.

Yet another solution would be to rely on information sharing and procedural conventions to encourage holders of different issues to coordinate on the cooperative equilibrium, as discussed in Section C above. Communication and information sharing reduce the scope for strategic behavior by creditors that may result in their selecting the noncooperative equilibrium. (Think, as discussed above, of the classic prisoners' dilemma, in which the noncooperative equilibrium depends on the inability of the prisoners to communicate.) A code of conduct leading to common procedures and a bondholders committee where information can be pooled may then limit opportunistic behavior.

[19] It is also suggested that up-front cash payments be tendered for participation.

This in fact is how the official community and the markets have approached the issue of cross-issue coordination. EMCA (2002) and Taylor (2002a,b) have emphasized the desirability of engagement and initiation clauses which would specify the actions the sovereign and investors would take in the event of a credit default. In Taylor's (2002a, p.2) words, engagement and initiation clauses would "provide for *early dialogue, coordination and communication among creditors* and a sovereign and limit disruptive legal action" (emphasis added). The Bank of France has similarly suggested a code of conduct for sovereign debt restructuring, which can be understood in part as a set of procedures and conventions to encourage information sharing and standardized procedures.[20] The Bank's code includes nine main principles: (1) early engagement with creditors, (2) fair information sharing among all interested parties, (3) fair representation of all creditors, (4) an expeditious and cooperative process, (5) comparable treatment among creditors, (6) fair burden sharing between debtor and creditor, (7) good-faith negotiation, (8) preservation of the debtor's financial situation, and (9) rapid restoration of financial stability. While the code would not be legally enforceable, it still would provide some useful structure and guidance for negotiations.

The Eichengreen-Portes (1995) idea of a New York Club, popularized by Hubbard (2002) and Kroszner (2003), is another mechanism whereby creditor coordination might be encouraged through information sharing and repeated interaction. Miller (2003) cites spokesmen for the creditor community as arguing that what creditors want are collective action clauses, a Code of Good Practice, and a forum for negotiations

[20] In contrast, the Institute of International Finance has proposed a code of conduct that mainly enumerates requirements for the debtor and says little about the making of credible commitments by the creditors.

as a tripartite approach to facilitating orderly restructuring without creating moral hazard or unpredictability.[21] Others are skeptical that a code of conduct could help investors coordinate on the good equilibrium. Roubini and Setzer (2003) write, "No matter what the code aims to do, particular attention needs to be given to the set of incentives that will lead all parties to have an interest in abiding by a non-binding code. In theory, adherence to the code during the restructuring could be a condition for creditors' final agreement on restructuring terms. However, this raises obvious problems of time consistency." This, of course, is simply the distinction between a situation in which one ends up in the noncooperative equilibrium with probability one, in which case a code is useless, and a situation with multiple equilibria, where a code can help investors coordinate on the better equilibrium. And, as shown in the appendix, the conditions under which multiple equilibria exist are quite general.

b) Borrowing Costs

The most prominent worry—or at least the one that has received the most scholarly attention—is that creditors might regard collective action clauses as weakening their rights, rendering it more costly for emerging markets to borrow. Qualitative evidence is not very helpful in settling this debate. Those who are skeptical that collective action clauses will significantly affect borrowing costs observe that these provisions have not often been referred to by market participants. Those who suspect the existence of an

[21] Debtors evidently appreciate this need, although they place the emphasis on the uses of case-specific committees, as opposed to a standing forum. Thus, Argentina, in an early 2003 communication with the bondholders, suggested that as it proceeds with meetings and consultations, would want to work with its creditors to put together a number of "coordination groups" to design the ultimate restructuring proposal. Membership in the group would depend on ability of a member to speak for a group of investors, willingness to abide by confidentiality, and "the contribution that such a potential member may offer to a constructive dialogue" (Government of Argentina 2003).

effect, on the other hand, can cite instances where market participants have commented on their presence (see UBS Warburg 2003 for a recent example). They can observe that the existence of an effect depends only on an awareness on the part of the marginal investor.

Quantitatively, the issue has been studied by Eichengreen and Mody (2000a,b) and Becker, Richards and Thaicharoen (2000), using data on primary market (launch) spreads. Neither study supports warnings that collective action clauses would increase borrowing costs across the board. But Becker, Richards and Thaicharoen find no significant impact of the presence or absence of collective action clauses in their overall sample of new issues. Eichengreen and Mody distinguish bonds by the credit rating of the issuer and find that the presence of collective action clauses reduces spreads for issuers with investment grade ratings but widens spreads for sub-investment-grade credits. Their interpretation emphasizes the tradeoff between the efficiency advantages of more orderly restructuring, which dominates for high quality borrowers who are unlikely to default opportunistically, and the associated moral hazard, which dominates for low-quality borrowers whose motives and response are suspect (just as in the theoretical model of Section C). In addition, they find that the magnitude of the penalty for sub-investment grade borrowers using collective action clauses depends on market sentiment: when the Emerging Market Bond Index (EMBI) is stable, the extent of this penalty is limited. In contrast, when the EMBI is volatile – when investors are particular uncertain about the prospects for emerging bond markets – the penalty is greater, suggesting that investor fear that a broader range of speculative credits may use this uncertainty as cover for opportunistic behavior (see Mody 2003).

These differences are important for understanding the obstacles to the more widespread use of collective action clauses. Becker, Richards and Thaicharoen's results suggest that emerging markets have no reason to wait. Eichengreen and Mody also offer no explanation for the reluctance of emerging market governments with investment grade ratings to adopt these new contractual provisions, but they do suggest that countries with lower rates may be deterred by the specter of higher borrowing costs.

The pricing of Mexico's February 2003 bond subject to New York law but including a majority restructuring provision is relevant to this debate, although it cannot resolve it. The bonds, maturing in March 2015, were priced to yield 6.92 per cent, a spread of 313 basis points over 10-year U.S. treasuries. This compares Mexico's 2016 bond, without collective action clauses, which was yielding 7.27 per cent. The Eichengreen-Mody results suggest that a country which has just succeeded in obtaining an investment grade rating (Mexican debt was rated BBB-, its lowest investment grade rating, by Standard & Poor's, and Baa2, one step above the lowest investment grade, by Moody's) should have enjoyed a discount on bonds with collective action clauses of about 25 basis points. The actual discount was 35 basis points. But 35 basis points is a small enough difference for Becker, Richard and Thaicharoen to also claim that the pricing of Mexico's bond is consistent with their findings: given the limited number of Mexican issues in the market, minor differences in the duration of different issues, and the nonlinear relationship between duration and spreads ("convexity"), it is hard to know whether 35 basis points is significantly different from zero.[22]

[22] Spread differentials on Mexico's subsequent bond issues are similarly small and do little to further clarify the issue.

Brazil's $1 billion issue in late April, also subject to New York law but including collective action clauses, is potentially informative because Brazil was the first speculative grade issuer to take this step. (Brazil had a B2/B+ rating.) However, Brazil's bond included an 85 per cent majority restructuring provision, which places the threshold about halfway between the standard unanimous and majority action provisions, damping any potential impact on spreads. Our theoretical model suggests that as we move from a 75 percent to an 85 qualified majority, the majority must be twice as patient to prevent holdouts from expecting that they have a reasonable shot at receiving more than a pro rata share of the settlement and by thus creating incentives for holdouts to generate an impasse in debt restructuring. Hence, an 85 percent majority provision, while helpful for collective action, may not go far enough, especially when during the period when investors are left holding a highly uncertain asset. [23] In addition, sentiment favored emerging bond markets at the time of Brazil's issue; capital flows were relatively abundant. As noted, in previous work (and new results presented below), we find that the effect of collective action clauses on spreads is limited by such conditions.[24]

Gugliatti and Richards (2003) provide additional evidence from the secondary market, using Merrill Lynch Global Index data. Using information for 31 January 2003,

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[23] This follows the EMCA model clauses. Also, provisions for so-called deceleration clauses maintain incentives for holdouts to litigate. In addition, volatility in emerging market bonds was low at the time of issue, and capital flows to emerging markets were relatively abundant. As noted elsewhere in this paper, we consistently that the effect of collective action clauses on spreads for borrowers of Brazil's credit quality is limited by such conditions.

[24] Market commentary suggests that the Brazilian authorities were quite adept at timing their bond issue to capitalize on this fact (see J.P. Morgan, *Emerging Markets Today*, April 11, 2003). Opinions of the pricing of this issue differ. Some observers detect no difference at all from comparable Brazilian bonds without CACs. Others (e.g. Credit Suisse/First Boston *Emerging Markets Sovereign Strategy Daily*, 30 April, p.2) detect a spread penalty of 10-15 basis points maximum, which is consistent with our earlier econometric results.

they regress the log of the ratio of the yield on the emerging market bond relative to the yield on a corresponding mature market bond on the country credit rating, the duration of the bond, issue size, a dummy variable for whether the issue is dollar denominated, and a dummy variable for the inclusion of collective action clauses, along with various interaction terms.[25] While they find that collective action clauses are associated with smaller spreads for high-rated issuers and higher spreads for low-rated issuers. as in their earlier analysis, they report that neither impact is statistically significant.

We estimate the same model for three points in time across which conditions in emerging markets differed: 12 April 2002, when the EMBI spread was at a local trough; 30 September 2002, when it was at a local peak; and 31 January 2003, this being the date also considered by Gugliatti and Richards. Ratings are coded on a scale from 1 to 18, 1 being A1, the highest rating in the sample, and 18 being CC3, the lowest.[26] We use Merrill Lynch's option-adjusted spread, which is based not just on the difference between the bond in question and a benchmark bond in the same currency but also takes into the implications of the yield curve in discounting future cash flows.[27]

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[25] The authors omit issuers rated below B-/B3 and issues not in U.S. dollars or major European currencies. Data on credit ratings is from Standard & Poor's and Moody's, while information on governing laws is mainly from Bondware.

[26] Thus, a higher number implies a worse rating, a convention we have adopted from Gugliatti and Richards to make our results comparable to theirs. The rating used here is a Merrill Lynch composite based on both Moody's and Standard & Poor's. When the rating is available from both agencies for that particular bond, a simple arithmetic average is taken. When there is information from only one agency, the "composite" is the rating of that one agency. When no information is available on the bond itself, the country's foreign-currency long-term sovereign rating is used.

[27] Conversations with market participants convince us that this is the measure of secondary market spreads relied on by the markets and thus the measure most appropriate for the current analysis. This difference in the definition of the dependent variable is one conceivable reason why our results differ from Gugliatti and Richards', although in practice the two measures of spreads are highly correlated with one another. We also use another measure of spread used by market participants (the spread based off the swap curve) and find virtually identical results to those presented here.

Table 4 shows that bonds featuring collective action clauses have tighter spreads when issued by borrowers with superior credit ratings. The spread then widens as the credit quality of the issuer falls. This is precisely the pattern we found in our earlier analysis of launch spreads, which used an entirely different data set. Both effects (both the coefficient for the presence of CACs and its interaction with credit quality) are statistically significant for the second and third cross sections. The results for the first cross section are essentially the same, except that one of the two coefficients just misses significance at the 90 per cent confidence level.

Along with these cross-section estimates, we also report results for a panel of five dates, the three noted above together with two prior dates, 6 September 2000 and 2 November 2001 (which were the just prior local trough and local peak of the EMBI spread, respectively). We control for unobserved country characteristics that may affect the spreads on all bonds of that country. In Table 4, we first present a random-effects model, which picks up both the cross-section and time-series variation. The coefficients on both the presence of CACs and their interaction with credit quality differ significantly from zero at the 95 per cent confidence level, and both have the anticipated signs. In the fixed effects model, the same is again true, albeit at the 90 per cent confidence level. The point where the price premium on bonds with collective action clauses turns to a discount is approximately where the credit quality index falls to 11 (equivalent to a rating of BB2).

A potential concern is that extreme observations, those for countries and periods when creditworthiness is very low, may be driving these results.[28] We therefore dropped bonds with ratings below B from the sample. The results, in the final column of Table 4,

[28] Recall that Gugliatti and Richards omit these low-rated issues.

are essentially unchanged, except that the interaction term in the fixed-effects model is now significantly different from zero at the 95 percent confidence level.

Our earlier analysis of launch spreads suggested that the point on the credit-quality scale at which the spread on discount for bonds with collective action clauses becomes a premium (spreads are wider for bonds with CACs than bonds without them) depends on the state of the markets: when the markets are less skeptical or uncertain about emerging market debt, they apply a penalty for collective action clauses to a narrower range of issuers. The present analysis of the secondary market points in the same direction. On 30 September 2002, when the EMBI spread was at a local peak and the daily volatility of the EMBI in the previous month had been extremely high, the discount turned to a premium at roughly 11 on our credit quality scale (which is the same point as in the pooled regressions). In contrast, on 12 April, 2002, when the EMBI spread was at a local trough and volatility in the previous month had been much lower, indicating that sentiment favored emerging market bonds, the point where the premium turns to a discount shifted all the way to the least creditworthy C-rated category.[29] This is consistent with our theoretical model, which suggests that except in periods of particularly favorable sentiment toward emerging market bonds, uncertainty about borrower motives (and about the risk of moral hazard) worsens the terms for bonds with collective action clauses.

[29] Note that the earlier analysis of launch spreads focused on the effects of EMBI volatility, where here we chose our dates of analysis by the level of the EMBI. In practice the two measures of market sentiment are quite highly correlated, as suggested in the text. Think for example of the contrast between late 2002, when the markets were uncertain about the intentions of the future Brazilian government and the EMBI spreads were both high and relatively volatile, in comparison with mid 2003, when reassurance about Lula's intensions led to both a decline in spreads and in the volatility of the index.

To dismiss these results as spurious it is not enough to say that the inclusion or exclusion of CACs is a matter of market convention. That would explain a set of zero coefficients, but not the systematic pattern we obtain in both primary and second markets. In addition, the skeptic would need to come up with an unobserved characteristic of some high-rated countries that further enhanced their credit worthiness (reducing their borrowing costs) and also encouraged them to borrow in London and Luxembourg, and another unobserved characteristic of some low-rated borrowers that similarly enhanced their credit worthiness and simultaneously encouraged them to borrow in New York, Frankfurt or Tokyo. The skeptic would also have to explain what omitted shift variable leads us to consistently find, using two different data sets, that investors penalize a wider range of speculative issuers for using collective action clauses in periods investor when sentiment is less favorable toward emerging market bonds.

Having obtained the same results on two entirely different data sets, we continue to believe that the use of collective action clauses will if anything reduce funding costs for investment-grade issuers, for whom investors welcome the existence of mechanisms to facilitate orderly restructuring. There is still the possibility that they will raise funding costs for speculative credits, although the extent of this effect appears to depend on market conditions. Thus, our new results go some way toward reconciling previous studies of the primary market, some of which found that speculative borrowers face higher funding costs when using collective action clauses (Eichengreen and Mody 2000a,b) but another of which (Becker, Richards and Thaicharoen 2000) did not, since we find that the point where this penalty kicks in varies with market sentiment, and when sentiment is particularly favorable this turning point can be located quite low on the

credit quality scale. And, to the extent that any penalty depends on market conditions, other measures that work to limit market volatility may make the use of collective action clauses attractive even for sub-investment grade countries.[30]

c) The Transition Problem

The transition problem is that more than two-thirds of the emerging market debt presently in the market lacks collective action provisions, and that even if these clauses were included in all new issues going forward, the better part of a decade might have to pass before existing bonds with unanimous action provisions matured and were retired (IMF 2002).

Roubini and Setser (2003) suggest that this concern is overdrawn. An additional ten years is not an unreasonable period to complete a process that has already been debated for a decade. Russia, Ukraine and Lithuania already use English law in their dollar-denominated bonds. Argentina could introduce clauses into 10 to 20 per cent of the stock of emerging market bonds if it included these provisions in its restructuring bonds (as the IMF will no doubt encourage it to do). And, as we have seen, other countries like Uruguay might do similarly even in the absence of default. The prospect of major Brady swaps by countries like Brazil, which are already on the markets' radar screen, would be another vehicle for introducing clauses in to many of the remaining bonds. It would also be possible to expedite the process with a broad-based debt exchange, as analyzed by Group of Thirty (2002).

[30] Even if they do not, the theoretical analysis suggests that an attempt to lower costs through the use of unanimous action clauses may add subsequent costs that redound unfavorably on the issuer. Thus, why such borrowers remain reluctant to make use of collective action clauses is an interesting issue; we address it below.

As explained in Section C, in the absence of a broad-based exchange, investors asked to take up new issues with collective action provisions might worry that their instruments were effectively less senior than the existing stock of claims with unanimous action provisions. Because bonds with CACs are easier to restructure, they may be restructured more frequently or on less favorable terms. Thus, there may be some reluctance to accept new instruments with collective action clauses when there is an existing stock of instruments that omits them.

Mexico's Eurobond issue featuring collective action clauses, in the presence of a large inherited stock of debt that does not include them, suggests that this problem is unlikely to be serious. We can provide further evidence by considering pricing in the primary market generally.[31] We therefore extend the Eichengreen and Mody (2000a,b) analysis of launch spreads by constructing an independent variable that measures the share of the existing stock of bonds that includes the relevant contractual provision and interacting it with the governing law on the new issue.[32] Table 5 shows the results. Overall, the spread on a new bond with CACs is not higher when the existing stock of debt is predominantly UAC bonds (see column 1)—consistent with the Mexican example cited above. However, when we distinguish issuers by credit quality we do we see an effect. Issuers with the lowest credit quality, who are presumably most likely to

[31] The primary market being the relevant one since we are talking about the incentives to take up new issues.

[32] As above, we include as controls a vector of characteristics of the issue (its amount, its maturity, whether it bears a fixed or floating rate), characteristics of the issuer (its debt/GNP ratio, the continent on which it is located, its credit rating, its recent growth rate, the volatility of its exports, its reserves to short-term debt ratio, and its ratio of domestic credit to GDP), and characteristics of the global financial environment (the ten-year U.S. Treasury rate, the U.S. high-yield spread, and the volatility of the Emerging Market Bond Index during the quarter the bond was issued).

restructure, do incur higher costs from issuing bonds with CACs when the existing stock is predominantly UAC bonds This result is what one would predict on the basis of Section C above. In contrast, there is no evidence of this effect for better credits (which explains why we did not obtain it in the first column).

We obtain a similar result when we analyze the impact of a large stock of bonds with CACs on the spread on a newly-launched UAC issue. The coefficient on the share of debt with CACs in the existing stock is positive for sub-investment grade issuers, but zero for investment-grade credits. It could be that holders of UAC bonds presumably fear that they will be left hanging when a government restructures the vast majority of its debt using majority action provisions. Again, this is the prediction of the theoretical analysis in Section C above.

d) Asset Substitution and Market Migration

Finally there is the possibility that investors not enamored of collective action clauses might substitute bank loans or other credit instruments for bonds if renegotiation-friendly provisions are added to the latter. However, our evidence from the primary and secondary markets does not support the view that investors will find these provisions repulsive and substitute away from them. The danger that bond flotations might migrate from markets where collective action clauses are required by regulation or statute to markets where they were not seems exaggerated, for the same reason. In addition, most issuers now prefer to issue global bonds – bonds that meet registration requirements in all major markets – in order to maximize the size of the potential customer base. From this

point of view, it seems unlikely that the use of clauses in the New York market would cause the market to migrate into unregistered securities or illiquid locales.[33]

E. Why the Reluctance to Adopt?[34]

We reserve until later the question of whether the more widespread use of collective action clauses will in fact significantly reduce the frequency and severity of crises. But the official community, for its part, evinces little doubt that this innovation would at least be a step in the right direction. This makes the failure of official rhetoric to promote progress a source of frustration. What explains the failure of investors and issues to embrace bonds with these provisions more rapidly? And what does their reluctance to do so in the past imply for the future?[35]

The absence of collective action clauses from bonds issued in the United States is a long-standing phenomenon. The need for bondholder coordination first attracted attention in the 19th century, when large corporations relying on external finance first appeared on the economic scene.[36] The railroads that linked the overseas regions of recent European settlement to the rest of the world were the largest such corporations; they relied most heavily on debt finance, and they had to overcome many of the same challenges as infrastructure projects and infrastructure finance in modern-day emerging

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[33] Roubini and Setser (2003), pp.24-25.

[34] This section builds on Eichengreen (2003).

[35] The simplest explanation would of course be that neither debtors nor creditors view such innovation as desirable. Creditors fear that it would erode their rights, while debtors fear that it would raise their borrowing costs. But, to repeat, we saw in the previous section, there is little support for this in the data.

[36] A case can be made that the East Asian trading companies of earlier centuries anticipated this financial form, but these equity partnerships were typically wound up following completion of the voyage for which they had been formed. Consequently, inefficient liquidation was not an issue.

markets (see Eichengreen 1996). The combination of widely disbursed bond holdings and high costs of liquidation made it inefficient to allow a single creditor or a small minority of creditors to force a railroad to liquidate (since track and related investments typically had greater economic value in place than salvage value). The same was true, then as now, of a variety of industrial corporations. In England, a market solution was found in the introduction of majority action clauses into bonds starting in the 1870s. These clauses, like those in English-law bonds today, allowed a super-majority of the bondholders to agree to reduce the amount due under a bond and rendered their decision, when ratified by a vote of the specified majority, binding on all bondholders, including any who had not endorsed the change.

This contrasts with the situation in the United States, where collective action clauses were never widely utilized and investors instead relied on the courts to avoid inefficient liquidation. The explanation may lie in the exceptionally convoluted capital structure of U.S. corporations, especially railroads, which made it difficult to implement the English-style market-based approach (Skeel 2002). Another possibility is that bonds including collective action clauses may not have been regarded as unconditional promises to pay under the terms of the U.S. Negotiable Instruments Act. Whatever the reason, before World War I, most U.S. corporate insolvencies were reorganized through a court-led procedure known as "equity receivership." Once the U.S. Congress amended the Bankruptcy Act in the 1930s to facilitate supervision of corporate reorganizations by a bankruptcy judge, they proceeded under the familiar Chapter 11 (and other chapters) of the U.S. Bankruptcy Code.

Thus, even at its height, in the 1930s, the practice of including English-style collective action clauses in bond contracts extended to only perhaps 10 per cent of U.S. corporate bonds. The Trust Indenture Act of 1939 gave the U.S. approach official sanction. William O. Douglas, influential member and chair of the Securities and Exchange Commission, saw collective action clauses as allowing corporate and Wall Street insiders to take advantage of small bondholders in corporate reorganizations, which were not infrequent events in the 1930s.[37] The result was the Trust Indenture Act, which included a Section 316(b) that prohibited reductions in amounts due under a publicly-issued corporate bond without the consent of each and every bondholder. This restriction was feasible, in the sense that it did not lead to a spate of inefficient liquidations, because of U.S. bankruptcy law allowed the courts to substitute for the missing provisions.

This history helps to explain why majority action clauses are not included in corporate bonds issued in the United States. But it cannot explain why such provisions are excluded from sovereign bonds, to which the Trust Indenture Act does not apply. Indeed, there would be no rationale for applying it, given the absence of a bankruptcy court to substitute for the missing collective action provisions -- which is of course exactly the problem that the reforms under discussion here are designed to address.

To explain the transfer of this "genetic code" from corporate bonds in the 1930s to sovereign bonds in the 1990s, one must tell a story like the following. Virtually no bonds of foreign sovereigns were issued in New York between the 1930s and the 1980s. The bond market only started up again following the advent of the Brady Plan in 1989.

[37] Douglas advocated this view in a series of articles and books; see for example Douglas (1940).

At that point there were no practicing attorneys in New York with prior experience in drafting sovereign bond covenants. Falling prey to the block-copy command, they simply transferred the template used for corporate bonds.

This history may explain the origins of current practices. But to say that a phenomenon is historically rooted and is not the same as suggesting that it is historically determined. That a practice has historical roots does not mean that it cannot change, even rapidly under some circumstances. Thus, for the absence of collective action clauses from the U.S. market to be a path-dependent (historically-determined) equilibrium requires not only the initial conditions given by this ancient history but also a lock-in mechanism that significantly slows the process of change. Why then, if collective action clauses have attractive features, has change not been faster? Financial markets are hardly slow to innovate; they are criticized for many things but only rarely for their reluctance to develop new financial instruments.

Allen and Gale (1994) suggest five reasons why socially desirable financial innovations may fail to emerge.

- *Product uncertainty*. Investors may be uncertain about the performance characteristics of the new financial instrument – for example, about whether greater ease of restructuring will make restructuring more frequent – causing them to demand a premium in order to hold it. That premium may discourage borrowers from utilizing it. Even if countries can educate investors, convincing them that they are not likely to act opportunistically, doing so may have costs that deter use of the new financial product.
- *Competitive structure of the financial industry.* Some of the costs of designing

the new clauses and educating investors about them will be incurred by the financial firm underwriting the issue. There could be a higher financial cost associated with drafting and marketing new provisions. "[O]ff-the-shelf language costs less," as the IMF (2002, p.10) puts it. Insofar as other firms may be able to quickly enter the market for these instruments, the returns on the initial investment will be competed away. Pioneering the innovation will therefore be unattractive.

- *Coordination problems*. It may be necessary for a number of borrowers to issue these instruments simultaneously for the development of a deep and liquid secondary market on which investors can effectively spread risk. This creates a first-mover problem: individual borrowers have no incentive to internalize these risk-sharing benefits and liquidity effects insofar as these also impact other countries. In addition, the idea that creditors holding bonds with collective action clauses may believe that their instruments are effectively less senior and secure if other bonds of the same issuer lack such provisions may require all creditors to accept the new instruments simultaneously.
- *Implications for systemic stability.* The new instrument may have positive externalities for the stability of the international system. That the costly and disruptive nature of debt restructuring under present arrangements places pressure on the IMF to extend financial assistance, which encourages excessive lending and borrowing in expectation of an official bailout and thereby heightens crisis risk, is an example of such an externality. But individual countries, with only weak incentives to internalize this externality, may display a reluctance to adopt

CACs that is excessive from a social point of view.

- *Political distortions.* To these market failures one may add government failure. Politicians with uncertain prospects of reelection may have higher discount rates and shorter time horizons than society as a whole. Consequently, they may prefer inflexible contractual provisions that reduce costs of borrowing now, tying the debtor government to the mast by creating costs of restructuring that are inefficiently high from a social point of view. Alternatively, creditors may prefer a regime where they are bailed out to one in which debt is restructured, and they may be able to resist the adoption of restructuring friendly rules and regulations that limit the pressure for official assistance (Cohen and Portes 2003).

In the present context, product uncertainty hardly seems like a plausible explanation, given that 30 per cent of the bonds already in the market (those subject to UK law) already include the relevant provisions. Debtors and creditors can reference these loans (as do researchers) when they want to price similar instruments. Similarly, the large amounts of domestic debt issued by the Russian government but held and traded by individual and institutional investors in the United States include collective action clauses, providing another reference point for market participants wishing to resolve product uncertainty.

The fixed costs of innovation and competitive structure of the financial industry similarly strike us as implausible explanations in this context. Off-the-shelf language may cost less, but even if the only language on the shelf in the United States requires unanimous consent, the language of collective action clauses is easily imported from abroad. Insofar as there remain costs of adapting that language to U.S. legal

circumstances, the fixed costs can be shared by encouraging governments and market participants to jointly contribute to their design. In fact, this is what the G-7 and gang of six associations of market participants have done in cooperating on the design of model clauses.

The same point applies to coordination problems. A liquid market in bonds featuring collective action clauses does not have to be created from scratch, since there already exist markets in UK-law bonds and domestic-law Russian bonds. To the extent that some U.S. investors only feel comfortable with bonds subject to U.S. law underwritten by big-name U.S.-based investment banks, the success of Mexico's $1 billion issue of last February represents an important step. From all appearances, the Mexican bonds in question are trading smoothly on the secondary market.

The remaining explanations are probably the ones that matter most. Political distortions (the high discount rates of short-lived governments) can clearly lead myopic politicians to undervalue costly steps that offer benefits only down the road. Similarly, the entire raison d'etre for smoothing procedures for sovereign debt restructuring is that there will be positive implications for systemic stability. In this view, the benefits of the decision by a country to adopt collective action clauses do not accrue exclusively to that country. Other countries will also benefit from a more stable international system if, inter alia, the moral hazard associated with IMF lending is reduced. Investors will apply more rigorous market discipline, and governments will more carefully limit their demand for foreign capital. This will mean fewer crises and less of a tendency for crises to spread contagiously across borders. Of course, whether these reforms will significantly enhance

systemic stability continues to be debated.[38] But, leaving that debate aside for now, the notion that the benefits are systemic, and not merely country specific, is a consistent explanation for why there is a gap between what is socially optimal and privately practiced.

If product uncertainty, fixed costs, and coordination problems are of as limited significance as we have argued here, we should now see collective action clauses work their way into the market in the wake of Mexico's Eurobond issue. This suggests simply waiting to see whether market participants now proceed more rapidly. If they do not, one can imagine offering pecuniary incentives or taking regulatory action, as suggested by Roubini and Setser (2003).[39]

The question is what form such intervention should take. Roubini and Setser suggest that U.S. government should start by arm-twisting the major investment banks. If this doesn't work, the Securities and Exchange Commission could require the use of clauses in SEC registered bonds. Although G-7 governments have embraced the argument for collective action clauses, they remain reluctant to alter securities registration requirements and exemption rules to mandate their use. The role for regulators is traditionally seen as protecting investors from fraud and assuring the integrity of markets, not as reforming the international financial architecture; this may be why officials are reluctant to go down this road. Treasury would presumably have to convince the SEC that majority action provisions provided a crucial protection for

[38] We turn to this question in the next section.

[39] The perspective developed here suggests that such action may be required in any case. If the problem is political distortions or externalities, then the individual incentive to adopt is socially suboptimal. The use

bondholders – not an easy task. If this campaign failed, the Trust Indenture Act could be amended to make the inclusion of collective action clauses a matter of statute rather than regulation.

Other approaches are less promising. Taylor (2002a) has suggested that the adoption of collective action clauses could be encouraged by making this a condition of access to IMF facilities. In the strong version of this proposal, only countries that already incorporated collective action clauses into their international loan agreements would be eligible for IMF loans. However, this is not an effective incentive for the growing class of investment-grade countries that do not contemplate having an IMF program. At a more fundamental level, this approach comes dangerously close to assuming a solution to the IMF's time-consistency problem. The IMF's principal shareholders can aver their reluctance to lend to countries that have not embraced the relevant contractual reforms, but when a crisis looms they will feel pressure to back down and lend to countries whose inflexible loan contracts create a risk that an involuntary restructuring will be difficult, messy and uncertain. Knowing that the IMF has an incentive to disburse anyway, countries will have little incentive to alter their habits.

In the weak version of this proposal, the IMF would lend at preferential interest rates to countries that added CACs to their loan contracts. But when a country is in the throes of a crisis, the interest charge on prospective IMF money is not the first thing on its mind. This approach would also have to surmount legal obstacles. Article V.8(d) of the IMF's Articles of Agreement guarantees comparability of treatment; this obliges the

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of collective action clauses should be subsidized – equivalently, the use of unanimous action clauses should be taxed – to offset the distortion and internalize the externality.

institution to offer all member countries access to individual facilities on comparable terms. It means, among other things, not discriminating in terms of interest charges.

F. Will These Reforms Make the World a Safer Financial Place?

The most fundamental question for participants in this debate is whether new procedures for resolving sovereign debt crises will significantly enhance the efficiency and stability of international financial markets and the growth and stability of the emerging-market economies that depend on those markets. Our view is that while these provisions are likely to make a difference, they are only one among many needed improvements. The case for them is strongest if their addition to loan agreements is viewed as one of a number of interdependent changes in the broader international financial architecture, none of which is likely to be feasible in the absence of the others.

One criticism is that having collective action clauses in sovereign bonds would have had little impact on most of the major debt crises of the 1990s. In Mexico in 1994-5, the problem was the difficulty of rolling over the *tesobonos* (the country's domestic-law debt) and the international credit lines to Mexican banks (private debt). In Thailand, Korea and Indonesia, the problem was again with credits and loans extended to banks and corporations (private debt). In 1998, the GKOs on which the Russian Government defaulted were domestic-law bonds. On the other hand, Argentina and Uruguay are exactly the sort of cases that could be addressed by the kind of contractual innovations on which the international policy community is concentrating. And it is worth noting that Pakistan and Ukraine had collective action clauses in most of their sovereign bond issues;

while these were not invoked, their presence served to discourage strategic behavior by bondholders.

But the important question is not how many past debt crises would have been affected by the presence of collective action clauses; rather, it is how many future debt crises would play out differently. On the one hand, borrowers and their regulators have learned from past crises about the special risks of short-term debt. It is unlikely that we will see more countries incurring large amounts of short-term foreign-currency indexed or denominated debt by issuing 90 day dollar-linked notes (a la Mexico in 1994) or allowing their banks to borrow 90 day money offshore in dollars (as in Thailand and Korea). Presumably these lessons of the Mexican and Asian crises have been well and painfully learned. Borrowers and regulators appreciate the special risks of short-term funding and the advantages of medium and long-term bonds. This suggests that collective action clauses are likely to be more relevant in the future than the past. That bonds are involved in the cases we are now seeing – Argentina and Uruguay, for example – is consistent with this view.

Working in the other direction is the growing importance of private borrowing. When borrowing is done not by the sovereign but by private enterprises, domestic bankruptcy courts are available to reorganize unsustainable debts. Strategic behavior by rogue creditors can be restrained by a court-imposed standstill and a court-administered composition plan, complete if necessary with the power to cram down restructuring terms on holdouts. There is still a case for collective action clauses. As in the case of 19th century British railways, their presence widens the scope for the consenting adults to agree on the terms of the debt restructuring themselves, rather than relying on the courts.

In emerging markets, where independent judiciaries are weak, this is especially desirable. In addition, when corporations have assets abroad as well as foreign debt issues, they face the danger that rogue creditors may resort to foreign courts to attach those assets, making agreement to restructuring terms correspondingly less attractive to other creditors. These arguments suggest that there is a case for private enterprises borrowing internationally also to use collective action clauses (as private entities borrowing in London already do), although the case for these provisions is perhaps less urgent than in the case of sovereigns, for whom the option of court-led reorganization is not available.

Probably the right way to view the resulting dynamics is that collective action clauses will first become more important for future crises, after which their importance will recede. The move away from short-term funding has been pronounced, in response to the Mexican and Asian crises. The move away from sovereign borrowing will take longer; it presupposes, inter alia, slow but steady progress in privatization, improvements in corporate governance, and measures to strengthen domestic bankruptcy and insolvency procedures.

How much difference would collective action clauses make, even if they became universal, for the stability of international financial markets and the efficiency of outcomes generally? Here it is necessary to distinguish the two rationales for new approaches to sovereign debt restructuring. One is the difficulty of coordinating creditors in decentralized markets, which can lead to litigation, holding out and strategic behavior, rendering market-based restructurings complex, or worse, in the absence of these provisions. The difficulty of coordinating the creditors and of reaching an agreement could then consign the debtor to an extended period when market access is lost and

growth and investment suffer. Market participants point to previous market-based restructurings – Ecuador, Pakistan and Ukraine – and suggest that these worries are exaggerated. Others note that these cases are special: Ukraine's debt was held by a small number of institutional investors, Pakistan had collective action clauses (which it could threaten to use), and Ecuador was able to use exit consents (which may not be possible in the future). Argentina will be a revealing test of this rationale. The government has more than 80 separate bonds in the market. 89 per cent of these (valued at 2001 prices) contain unanimous action clauses (Bratton and Gulati 2002, p.16). If Argentina's restructuring is straightforward, this rationale for collective action clauses will be weakened. If it proves difficult, the campaign for these provisions will gain additional momentum.

Some observers point to Mexico's February 2003 issue including collective action clauses and question whether a provision that results in only a 35 basis point differential could really produce significant changes in market outcomes. For an investment grade country like Mexico, where the perceived probability of default is low, the answer is presumably no. But for other countries with a greater perceived probability of having to restructure, the spread differential would be larger. So, presumably, would be the pecuniary incentives to adjust borrowing and lending behavior, and hence the risk of future crises. To the extent that collective action clauses raise borrowing costs for such countries, they are, in effect, pricing the moral hazard made possible by the existence of asymmetric information. This very fact raises the pressure on countries to increase transparency in ways that ultimately reduce country and systemic risk.

The other way collective action clauses could make a difference is if they reduce the likelihood that the IMF and its principal shareholders will feel less compelled to

extend financial assistance to countries like Argentina in August of 2001, whose debts are already borderline unsustainable, on the grounds that the consequent restructuring would not be so disruptive in the presence of these contractual provisions. Here it is important to distinguish the implications for the crisis country from the implications for the international system. A case can be made that it would have been better even for Argentina itself had the Fund felt able to pull the plug sooner. Reserves would have been higher, the position of the banks would have been stronger, and the government would have retained more political capital when the crisis struck. A failed gamble for redemption would have been avoided. But even more important, arguably, would be the consequences for the international system. Breaking from a pattern of IMF bailouts would encourage more disciplined behavior on both the borrowing and lending sides.

The case is stronger still to the extent that the more widespread utilization of collective action clauses may encourage complementary changes in the international financial architecture. Perhaps the moral hazard associated with IMF lending can be reined in only by clear presumptive limits on the size of IMF packages, but such limits will be credible and time consistent only if the official community first opens up other ways of dealing with crises. Similarly, enhancing the independence of IMF surveillance (calling a spade a spade), as suggested by Balls (2003), may raise the risk that a country will have to restructure by calling attention to its weaknesses; in this case it can be argued that this will be feasible only if mechanisms are first created to smooth the consequent restructurings.

The point is that the international financial architecture is made of up a set of interlocking parts. It is hard to change one without also changing the others. Thus, a

concerted effort to change the provisions of loan agreements may hasten progress on other, complementary changes, which will then work together to make the world a safer financial place.

It is of course on these other changes that reform should focus. Crisis prevention should be at least as high a priority as crisis resolution. Thus, the debate over new procedures for crisis resolution should not be allowed to crowd out the international financial institutions' fundamental work on transparency standards (standards for fiscal, monetary and financial policy transparency), financial sector standards (banking supervision, securities, insurance, and payments systems), and corporate sector standards (corporate governance, accounting, auditing, insolvency, and creditor rights). It should not be allowed to drain energy from the effort to develop domestic financial markets and thereby attenuate the "double-mismatch" problem.

But in the rush to get everything right, it would be a mistake to think that the job of fine tuning contractual provisions is complete. We have yet to see whether a significant number of speculative credits follow investment-grade countries like Mexico in adopting these provisions. Even if they do, countries with low credit ratings may be tempted to require very high qualified majorities and retain other provisions that stymie collective action and encourage holdout litigation. There is no consensus yet on the desirability of super-collective-action clauses or the adequacy of informal substitutes like a standing committee of bondholders, a code of creditor conduct, and J.P. Morgan's two-step approach.

Collective action clauses are only one element of the larger push to change the way the international community responds to crises when they occur. We also need to

figure out how to restructure unsustainable debts without destabilizing banking systems. We also need to refine the role for official finance. These observations are valid and important. At the same time, they do not invalidate our point that these other changes are likely to become more feasible with the adoption of the new contractual provisions that are our focus here.

Table 1. Emerging Markets Sovereign Bond Issuance by Jurisdiction[1]

	2001				2002			
	Q1	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
With CACs[2]								
Number of issuance	14	10	2	10	6	5	2	4
Volume of issuance	5.6	4.9	1.8	2.2	2.6	1.9	0.9	1.4
Without CACs[3]								
Number of issuance	16	17	6	18	17	12	5	10
Volume of issuance	6.7	8.5	3.8	6.2	11.6	6.4	3.3	4.4

[1] Number of issuance is in units. Volume of issuance is in billions of U.S. dollars.
[2] English and Japanese laws.
[3] German and New York laws. However, the Egyptian issuance of $1,500 million out of New York in June 2001 contains CACs and thus reclassified.

Source: Capital Data and IMF (2003).

Table 2. The Aggregation Effect: All Bonds and Differentiated by Credit Quality

Rating Category	**Coefficient on Number of Bonds**	
	Without Interactions	**With Interactions**
All Bonds	0.002 (2.5)	
0-35		0.052 (5.9)
36-50		0.003 (3.9)
50+		-0.019 (-7.4)
Number of Bonds	564	564
Rho (ρ)	-0.317	-0.051
Residual standard error (σ)	0.437	0.417

Note: dependent variable is launch spread, as defined in the text.
Source: See text.

Table 3. The Aggregation Effect Differentiated By Governing Laws

Rating Category	UK Law	US Law	All Other Laws
	Coefficient on Number of Bonds		
0-35	0.040 (2.8)	0.037 (2.9)	0.067 (3.0)
36-50	-0.000 (-0.1)	0.002 (0.9)	0.004 (3.0)
50+	-0.014 (-3.6)	-0.015 (-3.2)	-0.011 (-2.7)
Number of Bonds	182	171	211
Rho (ρ)	-0.100	0.051	-0.363
Residual standard error (σ)	0.339	0.364	0.382

Note: dependent variable is launch spread, as defined in the text.
Source: See text.

Table 4. Influence of Collective Action Clauses Using Secondary Spreads

Explanatory Variable	(1) 12 Apr 02	(2) 30 Sep 02	(3) 31 Jan 03	(4) Random Effect	(5) Fixed Effect	(6) Fixed Effect & Rating > C
EMBI+ Spread (bp)	583	1041	730			
EMBI Daily Volatility	6.4	47.7	20.5			
Constant	3.267 (7.2)	2.076 (4.5)	3.233 (7.8)	3.161 (14.0)	3.101 (12.0)	3.507 (13.0)
Rating	0.286 (5.3)	0.572 (9.5)	0.338 (5.8)	0.289 (8.4)	0.325 (7.7)	0.274 (5.0)
Rating-squared	0.004 (1.9)	-0.01 (-3.9)	-0.004 (-1.3)	0.003 (1.8)	0.001 (0.7)	0.002 (0.7)
Duration	0.187 (4.7)	0.21 (4.8)	0.079 (2.1)	0.119 (7.5)	0.114 (7.1)	0.066 (4.0)
Duration*Rating	-0.017 (-3.5)	-0.032 (-5.2)	-0.005 (-0.9)	-0.013 (-6.7)	-0.012 (-6.3)	-0.004 (-2.1)
Dollar-denominated	0.05 (0.7)	0.074 (0.9)	0.024 (0.3)	0.148 (5.1)	0.147 (5.0)	0.138 (4.9)
Ln(Amount)	-0.047 (-0.8)	0.079 (1.3)	0.021 (0.4)	-0.005 (-0.2)	-0.006 (-0.3)	-0.025 (-1.0)
CAC	**-0.479** **(-2.8)**	**-0.851** **(-4.4)**	**-0.657** **(-3.8)**	**-0.177** **(-2.4)**	**-0.138** **(-1.8)**	**-0.177** **(-2.1)**
CAC*Rating	**0.026** **(1.6)**	**0.067** **(3.3)**	**0.056** **(2.7)**	**0.015** **(2.1)**	**0.013** **(1.7)**	**0.019** **(2.0)**
06 Sep 00	n.a.	n.a.	n.a.	-0.173 (-4.8)	-0.177 (-4.9)	-0.184 (-5.1)
02 Nov 01	n.a.	n.a.	n.a.	0.156 (4.6)	0.145 (4.2)	0.129 (3.8)
12 Apr 02	n.a.	n.a.	n.a.	-0.16 (-4.9)	-0.165 (-5.0)	-0.177 (-5.3)
30 Sep 02	n.a.	n.a.	n.a.	0.314 (9.8)	0.312 (9.7)	0.334 (10.7)
No. Observations	211	206	210	1034	1034	943
Adjusted R^2	0.904	0.859	0.814	0.843	0.841	0.765

Notes: Dependent variable is the natural logarithm of the option-adjusted spread as reported by Merrill Lynch Global Index System. *t*- and *z*- statistics shown in parentheses. Displayed panel regressions allow for random and fixed effects within 40 countries in sample across five different dates: 6 Sep 2000, 2 Nov 2001, 12 Apr 2002, 30 Sep 2002, and 31 Jan 2003. R^2 for these regressions corresponds to overall R^2.

Table 5. Implications of Existing Composition of Bonds for Changeover

Explanatory Variable	Additional UK Law Bond		Additional US Law Bond	
	(1)	(2)	(3)	(4)
Share of the "alternative" in the stock of bonds	0.044 (0.2)		0.647 (3.2)	
Interacted with rating category:				
0-35		0.908 (2.5)		0.939 (3.0)
36-50		-0.287 (-1.2)		0.475 (2.2)
50+		-0.510 (-0.7)		-0.502 (-0.6)
Number of Bonds	182	182	171	171
Rho (ρ)	-0.271	-0.080	0.162	0.196
Residual standard error (σ)	0.367	0.351	0.377	0.374

Note: "Alternative Bonds" refers to bonds under the other law, e.g., when considering a new UK law bond, the alternative is a US law bond. Dependent variable is launch spread as defined in the text.

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Appendix: Theoretical Analysis

Our theoretical analysis of collective action clauses uses a simple willingness-to-pay model of sovereign debt repayment and renegotiation. The two-period model is based on the infinite-horizon model of Kletzer and Wright [2000] using dynamic programming and provides a richer framework than the bargaining model of Bulow and Rogoff [1989] with which it is consistent. For our purposes, the essential elements of the Kletzer and Wright model are that the debtor country government seeks to maximize some expected utility function defined over aggregate domestic consumption,

$$U_t = E_t \sum_{s=t}^{\infty} \beta^{s-t} u\left(c_s\right),$$

at each date, and can choose to revert to permanent loan autarky at any time. The government's willingness to pay is implicitly defined by the constraint

$$u\left(c_t\right) + E_t \sum_{s=t+1}^{\infty} \beta^{s-t} u\left(c_s\right) \geq u\left(y_t\right) + E_t \sum_{s=t+1}^{\infty} \beta^{s-t} u\left(y_s\right)$$

where y_t represents gross output and $y_t - c_t$ is the net repayment to foreign creditors at time t. This is rewritten in terms of the utility surplus of the government,

$$W_t = u\left(c_t\right) - u\left(y_t\right) + \beta E_t W_{t+1},$$

where sovereignty allows the government to ensure that W_t and W_{t+1} are never negative. The present value of payments to creditors equals

$$\Pi_t = \left(y_t - c_t\right) + E_t \sum_{s=t+1}^{\infty} \beta^{s-t} \left(y_s - c_s\right) = y_t - c_t + \beta E_t \Pi_{t+1}. \tag{1}$$

Π_t equals the present value of the outstanding debt, taking renegotiation into account. The

amount, $y_t - c_t$, is the debtor's current net payment and $\beta E_t \Pi_{t+1}$ is the discounted expected value of the next period's debt stock. The debtor government's utility surplus can be expressed as $W_t(\Pi_t)$ and its willingness to pay (that is, its maximal capacity to transfer resources from the private sector to foreign creditors) as V_t where $W_t(V_t) = 0$. V_t is the maximum value of Π_t possible in an equilibrium, given the constraints that $W_{t+1}(V_{t+1}) \geq 0$ and $V_{t+1} \geq 0$ in every state. Constrained optimal debt renegotiation with full information is analyzed in Kletzer and Wright [2000]. Below, we allow incomplete information but require just some basic structure from the model.

The debtor government optimally chooses whether to repay or default in each period subject to its sovereignty constraint. The consequences of default will depend on the structure of debt contracts and information. First, we compare renegotiation of bond contracts under unanimous action and collective action clauses. Suppose that an adverse shock leaves V_t less than the outstanding debt obligation, D_t, so that renegotiation is necessary.

Holdouts and renegotiation of collective action and unanimous action clause bonds

Consider the case of two bondholders, one holding a portion, x, of the outstanding issue. Each has equal seniority and must agree to any revision of the terms of the bond. Following the convention of collective action, the two bondholders receive pro rata shares, x and $(1-x)$, respectively, of Π_t if they jointly agree to renegotiate repayments. If x is small, the first bondholder may be able to holdout forcing a better settlement. Let Δt be the delay in negotiations if the bondholders cannot agree to cooperate and $e^{-r\Delta t}$ the discount factor for the creditors applied to settlements from postponed negotiations. If the first bondholder (lender A)

holds out for full repayment, lender B can choose to accept Π_t minus A's claim, xD_t, or wait for later negotiation. If the second round is successful (it must be if waiting is an equilibrium action for B), the payoff to lender B is $e^{-r\Delta t}(1-x)\Pi_t$. By allowing lender A to receive xD_t without delay, lender B would receive the payoff $\Pi_t - xD_t$. If

$$\Pi_t - xD_t \geq e^{-r\Delta t}(1-x)\Pi_t,$$

then lender A can successfully enforce her full claim against the debtor by threatening to hold up negotiations. Her threat is credible if she is better off waiting for a payoff $e^{-r\Delta t}xD_t$ than accepting $x\Pi_t$ so that the second inequality, $e^{-r\Delta t}\frac{D_t}{\Pi_t} \geq 1$, also holds. The restriction on x is given by

$$\frac{1-e^{-r\Delta t}}{\frac{D_t}{\Pi_t} - e^{-r\Delta t}} \geq x. \tag{2}$$

A small bondholder can successfully hold out even for discount factors, $e^{-r\Delta t}$, near one and small debt overhangs, $\frac{D_t}{\Pi_t} > 1$.

For renegotiation of a collective action clause bond to be successful, the qualified majority needs to be small enough so that the holder of the last bond necessary to make a qualified majority cannot hold out for more than her pro rata share of the settlement. Any holder of a bond can compete to be the one who completes the quorum. The holder of a single bond will gain by holding out if

$$\frac{1-e^{-r\Delta t}}{\frac{D_t}{\Pi_t} - e^{-r\Delta t}} \geq 1-m, \tag{3}$$

where m is the proportion of bonds required for a qualified majority (for example, three-quarters). If this inequality holds, a minority greater than $1-m$ gain by holding out, and

a qualified majority will not form. However, if m does not satisfy inequality (3), then any bondholder will be just as well off joining the majority as not. In this case, if a qualified majority does not form, there will be no agreement and all bondholders suffer the cost of delaying an ultimate settlement. Any bondholder gains by completing the qualified majority when

$$m < 1 - \frac{1 - e^{-r\Delta t}}{\frac{D_t}{\Pi_t} - e^{-r\Delta t}}. \tag{4}$$

Inequality (4) gives us combinations of the minimum discount factor for delayed negotiations, maximum size of the required supermajority and debt discount (the discount equals $\frac{\Pi_t}{D_t} - 1$) that allow successful use of majority action clauses. For example, if the debt discount is 50% and the qualified majority is 75%, then $e^{-r\Delta t}$ must be at least 0.67 (equivalent to $r\Delta t = 0.41$). If the qualified majority is raised to 85%, then $e^{-r\Delta t}$ must be at least 0.82 (equivalent to $r\Delta t = 0.19$).

Under unanimous action clauses, any bondholder can be the last to agree to a revision of the repayment terms. If all other bondholders agree to a restructuring, a maverick only needs to hold a share, x, of the bond issue satisfying inequality (2). However, any bondholder can be the last, pivotal bondholder, or seek to be last. Unanimous action clauses give every bondholder the right to hold out, but only a fraction can successfully exercise this right. Competition among bondholders to exploit unanimity clauses can be modeled as a war of attrition, as discussed in Kletzer [2003]. The model used here is identical to simple war of attrition games which have equilibria in which each player gives in with positive probability each period. This results in a probability that the creditors reach agreement at each time after default is declared. For

simplicity, we assume a constant probability that all lenders agree to renegotiate the bond that equals λ, where $0 < \lambda < 1$. The expected return to lenders from renegotiation of the bond then equals

$$\Pi_t^{UAC} = \frac{\lambda}{\lambda + r}\Pi_t.$$

Result 1: Delay to agreement can be an equilibrium outcome under unanimous action clauses, reducing the value of the bond relative to a collective action bond in the absence of moral hazard. Holdouts are eliminated by collective action bonds if the qualified majority is less than the bounds given by inequality (3). Renegotiation of multiple collective action bonds can be held up if the share of some individual bond issue in total debt satisfies inequality (2).

Hidden information and renegotiation

Drawing on this framework, we can represent the government's willingness to pay by a function of the observable state and unobservable characteristic of the debtor. The government knows both parameters, but foreign creditors do not know the actual willingness to pay of the government. We summarize this function as

$$V\left(y_t, \theta\right)$$

where y is mutually observable, θ is not known to creditors and V is increasing in each argument. The parameter θ summarizes any asymmetric information about the government's current and future willingness to pay capturing moral hazard in renegotiation in this general framework. An interpretation of θ is that it represents the government's effort transferring resources from the domestic private sector to foreign creditors. The state, y_t, represents

observable gross output, investment and so forth, and is taken to be exogenous. After y_t is observed, the government can repay its debt in full or default and pay a negotiated amount (in present value) equal to $\Pi(y_t, \theta) \leq V(y_t, \theta)$. If $V(y_t, \theta)$ exceeds the outstanding debt, D_t, then the government repays according to contract. For such states, $\Pi(y_t, \theta)$ equals D_t.

Collective action clause bonds

We first consider debt renegotiation when creditors act as one. This models a single collective action bond or a majority action clause that covers all bond issues (as in the two-step proposal for Uruguay). In renegotiation, the government faces an implicit contract which offers combinations of debt service payments in period t and a debt burden for period $t+1$. Each combination gives the debtor a present value payoff equal to $V(y_t, \theta) - \Pi(y_t, \theta)$. The government maximizes this payoff in making its choice across renegotiation offers or repayment. Creditors face a standard agency problem in offering alternative debt repayment options. Two general results for such problems apply here: θ will be revealed in equilibrium and the debtor's willingness to pay will be exhausted for the lowest possible value of θ (that is, $V(y_t, \theta_{\min}) = \Pi(y_t, \theta_{\min})$). Creditors will seek to maximize the present value of their debt subject to incentive compatibility constraints (the constraints that θ is revealed). These imply that the debtor's payoff,

$$\Phi(y_t, \theta) = V(y_t, \theta) - \Pi(y_t, \theta),$$

is an increasing function of $\theta - \theta_{\min}$ which is zero for $\theta - \theta_{\min} = 0$.

Take the debtor type, θ, to be distributed over an interval, $[\theta_{\min}, \theta_{\max}]$. Given the state, y_t,

the government cannot repay its debt for θ such that

$$V(y_t, \theta) - D_t < 0$$

and must default. Let $\overline{\theta}(y_t)$ be defined by $V\left(y_t, \overline{\theta}(y_t)\right) = D_t$. If the creditors knew the debtor type, then they could reduce the present value of debt payments to equal the debtor's willingness to pay. In that case, the debtor's payoff would be zero for each $\theta \leq \overline{\theta}(y_t)$, and the debtor would pay D_t for each $\theta \geq \overline{\theta}(y_t)$. With asymmetric information, the debtor receives positive surplus for $\theta > \theta_{\min}$ under standard technical assumptions, and there will be some $\widehat{\theta}(y_t) > \overline{\theta}(y_t)$ such for $\theta \geq \widehat{\theta}(y_t)$, $\Pi(y_t, \theta) = D_t$ and for $\theta < \widehat{\theta}(y_t)$, $\Pi(y_t, \theta) < D_t$.

The probability of default equals the probability that the debtor's type is in the interval $\left[\theta_{\min}, \widehat{\theta}(y_t)\right)$. The government cannot service its debt as contracted for θ in the smaller interval, $\left[\theta_{\min}, \overline{\theta}(y_t)\right)$. Both $\overline{\theta}(y_t)$ and $\widehat{\theta}(y_t)$ are decreasing with the state, y_t, and increasing with indebtedness, D_t, so that the probability of default rises as fundamentals deteriorate. The expected future value of the bond is given by

$$E\Pi^{CAC} = E_{t-1}\left(\Pi(y_t, \theta) \mid \theta < \widehat{\theta}(y_t)\right) \Pr\left(\theta < \widehat{\theta}(y_t)\right) + D_t \Pr\left(\widehat{\theta}(y_t) \leq \theta\right). \qquad (5)$$

If information about debtor willingness to pay improves (for example, $\theta_{\max} - \theta_{\min}$ shrinks), $\widehat{\theta}(y_t)$ approaches $\overline{\theta}(y_t)$. The probability of default falls, and the government's surplus in renegotiation decreases while the returns to creditors conditional on default rise. For a given distribution of y_t, such a reduction in information imperfections should be reflected by a decrease in the interest rate spread and could result in a rise in the country risk rating. In an extreme case, θ is a fixed parameter known to all and the country will only default when

$V(y_t, \theta) < D_t$. That is, renegotiations will be a consequence of "acts of god" for a government whose effort to repay is known.

Unanimous action clause bonds

Renegotiation of a unanimous action bond can be compared to renegotiation of the collective action bond using this model. We model the costs of delay to agreement imposed on the debtor country as additional penalties for default. Willingness to pay measures the government's ability to transfer resources from the domestic private sector to foreign creditors. The output lost during delays to agreement are suffered in addition to the cost of debt repayment (in contrast to Kletzer [2003]). With this assumption, the model can be used to analyze the validity of the argument that unanimous action bonds increase capital inflows by raising the penalties for default.

As in our starting analysis of bargaining delays under unanimous action clauses, willingness to pay does not change over time and holdout bondholders play a war of attrition game resulting in a flow probability of agreement equal to $\lambda < 1$. The expected payoff to bondholders equals

$$\Pi_t^{UAC} = \frac{\lambda}{r+\lambda}\Pi(y_t, \theta),$$

and the debtor's expected surplus equals

$$W^{UAC}(y_t, \theta) = \frac{\lambda}{r+\lambda}\left[V(y_t, \theta) - \Pi(y_t, \theta)\right] - \frac{q}{r+\lambda}$$

where r is the opportunity real interest rate and q is the per period cost of delay.

Whenever the return to paying as contracted, $V(y_t, \theta) - D_t$, exceeds both $W^{UAC}(y_t, \theta)$ and zero, the debtor does not default. For sufficiently small λ or large q, $W^{UAC}\left(y_t, \overline{\theta}(y_t)\right)$, will be

negative, so that the government only defaults if $V(y_t, \theta) < D_t$. It will not "opportunistically" default. The probability of full repayment equals the probability that $\theta \geq \overline{\theta}$, not $\widehat{\theta}$, but the returns to creditors for $\theta \leq \overline{\theta}$ are the fraction $\frac{\lambda}{r+\lambda}$ of the returns under the collective action bond.

The expected future value of a unanimous action clause bond is

$$E\Pi^{UAC} = E_{t-1}\left(\frac{\lambda}{r+\lambda}\Pi(y_t, \theta) \mid \theta < \overline{\theta}(y_t)\right) \Pr\left(\theta < \overline{\theta}(y_t)\right) + D_t \Pr\left(\overline{\theta}(y_t) \leq \theta\right). \quad (6)$$

Comparing this to the collective action clause bond value, we have

$$\begin{aligned} E\Pi^{CAC} - E\Pi^{UAC} &= E_{t-1}\left(\frac{r}{r+\lambda}\Pi(y_t, \theta) \mid \theta < \overline{\theta}(y_t)\right) \Pr\left(\theta < \overline{\theta}(y_t)\right) \quad (7) \\ &\quad - E_{t-1}\left(D_t - \Pi(y_t, \theta) \mid \overline{\theta}(y_t) \leq \theta \leq \widehat{\theta}(y_t)\right) \Pr\left(\overline{\theta}(y_t) \leq \theta \leq \widehat{\theta}(y_t)\right) \quad (8) \end{aligned}$$

which has an ambiguous sign. Therefore, governing law has an ambiguous effect on ex ante equilibrium capital inflows. If this difference is positive, more will be lent at a given opportunity cost of funds to creditors under collective action clauses, and conversely.

What happens as y_t rises or falls? If y_t is large enough relative to outstanding debt so that $V(y_t, \theta) > D_t$ with probability one, then the value will be the same under either type of governing law. If the y_t is small enough so that the probability of default equals one for a collective action bond ($\widehat{\theta} \geq \theta_{\max}$), then equation (7) implies that the spread between collective action and unanimous action clause bonds falls as y_t decreases. When the probability that $V(y_t, \theta) < D_t$ reaches one, the collective action bond has a higher value than the unanimous action bond implying that the interest rate spread on a unanimous action bond will exceed that on a collective action bond.

To say more, we simplify the model by assuming that the debtor's payoff, $\Phi(y_t, \theta)$, depends

only on $\theta - \theta_{\min}$ as $\phi(\theta - \theta_{\min})$ (note that the settlement, $\Pi(y_t, \theta)$, can increase one-for-one with willingness to pay as y_t rises so that this restriction is sensible). We also assume for simplicity that θ is uniformly distributed over the interval and $V(y_t, \theta)$ and $\phi(\theta - \theta_{\min})$ are increasing linear functions of θ. (To ensure an interior solution for the probability of default, the slope of ϕ needs to be less than the slope of V.) The difference in the value of the two types of bonds can be rewritten as

$$\begin{aligned} E\Pi^{CAC} - E\Pi^{UAC} &= E_{t-1}\left(\frac{r}{r+\lambda}V(y_t,\theta) \mid \theta < \overline{\theta}(y_t)\right)\Pr\left(\theta < \overline{\theta}(y_t)\right) \\ &\quad -E_{t-1}\left(D_t - V(y_t,\theta) \mid \overline{\theta}(y_t) \leq \theta \leq \widehat{\theta}(y_t)\right)\Pr\left(\overline{\theta}(y_t) \leq \theta \leq \widehat{\theta}(y_t)\right) \\ &\quad -E_{t-1}\left(\phi(\theta - \theta_{\min}) \mid \theta < \widehat{\theta}(y_t)\right)\Pr\left(\theta < \widehat{\theta}(y_t)\right), \end{aligned}$$

where $\widehat{\theta}$ solves $\phi\left(\widehat{\theta} - \theta_{\min}\right) = V\left(y_t, \widehat{\theta}\right) - D_t$. This can only be negative for any value of y_t if its derivative with respect to y_t is negative for interior solutions for the probability of default, $\Pr\left(\theta < \widehat{\theta}(y_t)\right)$. Once this probability reaches one, the sign of the derivative reverses. If the expected value of a unanimous action bond is higher than that for a collective action bond for some y_t, then the difference increases as y_t falls until the probability of default on the collective action clause reaches one.

Result 2 : The the interest rate spread between a collective action bond and a unanimous action bond rises as output falls until the probability of default on the collective action bond reaches unity. Then the spread decreases and will become negative. Collective action clauses should become more desirable when the probability that the government cannot meet its debt obligations ($D_t > V(y_t, \theta)$) is large.

Result 3 : The more informed creditors are about the willingness of the government to meet its debt obligations (the parameter θ), the lower the spread between collective action bonds and unanimous action bonds. If higher country credit ratings reflect less creditor uncertainty about the government's true willingness to repay its debt (given the distribution of future output and outstanding debt ratios), then the spread on collective action bonds relative to unanimous action bonds will decrease with country ratings and can be negative for high-rated countries.

Two-step procedure

These result can be used to motivate the two-step debt restructuring proposal made by J.P. Morgan and currently being pursued by Uruguay. A sufficiently large adverse shock to GDP can increase the expected return to collective action bonds over the expected return to unanimous action bonds, even though the probability of default and restructuring is higher with collective action bonds. The model shows that when the inability of the government to meet its debt obligations becomes sufficiently probable, a swap of unanimous action bonds for collective action bonds may make bondholders better off. In the two-step procedure, bondholders swap unanimous action bonds that face default with positive, but less than unit, probability before restructuring, for various bonds that carry a common majority action clause. This clause allows the restructuring of all the bonds in a single renegotiation to avoid costly delays caused by holdouts.

Every individual bondholder will only be better off swapping unanimous action bonds for collective action bonds before renegotiation of the debt. After default, any individual holder will increase her payoff by holding onto the unanimous action bonds. If everyone else

agrees to restructure the unanimous action bonds after default, she has the right to hold out for full payment. The two-step procedure allows precommitment to a mutually beneficial renegotiation when renegotiation without strategic delay under unanimous action clauses is not time consistent.

Coordination game with many collective bond issues

Collective action clauses may not solve the problem of delay to agreement when there are many different issues each containing its own majority action clause. The majority of holders of a small bond issue have the incentive to hold out for more than a pro rata share of any negotiated settlement as shown above. This leads to a coordination problem among representatives of the qualified majorities of each bond issue.

Consider an example with N collective action bonds without asymmetric information. Each bond issue's share of the total debt satisfies inequality (2). If all bondholder representatives agree to renegotiate, the holders of a typical bond receive the payoff, $x\Pi_t$. If all other representatives agree to renegotiate, the holders of this bond can successfully hold out for xD_t, leaving the rest with the total payoff, $\Pi_t - xD_t$, to divide in a pro rata fashion. The holders of other bond issues have the same incentive to hold out, until the payoff for the holders of the remaining issues is driven to zero (since $D_t > \Pi_t$). They no longer have an incentive to meet with the debtor. This uncooperative behavior results in delay. The best payoff for the holders of the typical issue after delaying negotiations for Δt is $e^{-r\Delta t}\Pi_t$. This is a simple coordination game with the payoff structure of the Prisoners' Dilemma. Negotiations end when all bondholder representatives are instructed by their respective qualified majorities to accept

pro rata terms in the debt restructuring. It is not a repeated version of the Prisoners' Dilemma.

Result 4 : Renegotiation with many bond issues, each with its own majority action clause, is subject to coordination failures that introduce inefficient delays to bond restructuring.

The coordination problem shows that collective action clauses may not be sufficient to eliminate socially wasteful delay to agreement following default. It implies that some means of assuring that negotiators coordinate on the Pareto efficient outcome of the game needs to be added to the inclusion of collective action clauses in sovereign loan contracts. One possible means is the inclusion of a "code of conduct" outlining requirements that bondholder agents meet after default and accept pro rata shares in renegotiations. Clauses that specify qualified majorities of representatives in first-round negotiations and adjourned negotiations following bankruptcy are used under UK governing law for corporate debt.

Interest spreads on minority bond shares by governing law

Suppose that a single unanimous action bond issue represents a small share, x, of the outstanding debt, D_t, with the remainder held in bonds issued with collective action clauses. If the share x satisfies inequality (2), then the holders of collective action bonds are willing to renegotiate apart from the holders of the unanimous action bond. The individual holders of the unanimous action bond will delay its renegotiation if the collective action bondholders and the debtor government agree to an aggregate settlement on the collective action bonds exceeding $\Pi_t - xD_t$. The government avoids delay costs if paying the collective action bondholders $\Pi_t - xD_t$ and the unanimous action bondholders xD_t is an equilibrium outcome. However, the country's costs of delay may decrease with the percentage of the debt that remains in default.

Suppose, for example, that the cost of delaying agreement are proportionate to fraction of the debt remaining in default. If the government offers to pay an amount $\Pi^{UAC} < xD_t$ to holders of the unanimous action bond, and settles with the holders of the collective action bonds, the country suffers an expected penalty equal to $\frac{xq}{\lambda+r}$ and avoids a penalty equal to $(1-x)\,q$ for each period that restructuring of the majority of the debt is delayed. If $(1-x) > \frac{x}{\lambda+r}$, then the government will accept paying the holders of the collective action bonds

$$\Pi_t - \frac{\lambda}{\lambda+r}\Pi^{UAC} > \Pi_t - xD_t$$

without delay, where Π^{UAC} is the equilibrium amount the government is willing to pay to avoid further delay costs equal to xq per period (the eventual payment should be no greater than the original obligation, xD_t). If this is positive, individual holders of the unanimous action bond have incentives to hold out, delaying agreement. The small costs, $\frac{xq}{\lambda+r}$, induce a small reduction in the probability of default for all the debt. The unanimous action bond has a higher interest spread than the collective action bonds if delay is costly for bondholders ($\frac{\lambda}{\lambda+r}\Pi^{UAC} < x\Pi_t$). The spread rises as the share of collective action bonds in the total, $1-x$, rises if the ultimate settlement falls as xq falls.

Next, consider a single collective action bond representing a small share, x, of the outstanding debt, D_t, with the remainder held in bonds issued with unanimous action clauses. The qualified majority of holders of this bond will accept renegotiation allowing full repayment for the holders of all the unanimous action bonds and avoiding costly delay if the reported

willingness to pay Π_t satisfies the inequality,

$$\Pi_t - (1 - x)\, D_t \geq \frac{\lambda}{\lambda + r} x \Pi_t.$$

This allows a positive probability that the collective action bond will be renegotiated while the unanimous action bonds are paid in full. The interest rate spread on the collective action bond will be greater than that for the unanimous action bonds to compensate its holders. This spread decreases as imperfect information regarding θ decreases.