

# *Hidden Holdouts: Contract Arbitrageurs and the Pricing of Collective Rights*

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## **Abstract**

*Research on the law and economics of contract typically analyzes the explicit pricing of the contract terms in a debt contract by modeling a bilateral debtor-creditor relationship, a framework we call the “classical model.” Under this model, contract terms that affect the debtor’s repayment obligations are reflected in the price the debtor pays. Much of commercial lending, however, occurs in thick markets with standardized multilateral debt instruments. Depending on the degree to which key contract terms implicate collective decision making among dispersed and anonymous creditors, the classical bilateral model of debt contracting can err in its predictions on the pricing of terms. We utilize Venezuela’s 2014-2018 debt crisis as a natural experiment to evaluate the price effects of differences in contract terms in multilateral debt instruments that require collective decision for enforcement. We test the predictions of the classical model against the predictions generated by a “collective action” model and report evidence of the non-pricing of terms consistent with the collective action story. In particular, we provide evidence of a “hidden holdout” strategy that enables the modern activist investor to capture rents without revealing arbitrage activities that enable the market to coordinate on efficient prices for different rights of enforcement.*

## **1. Introduction**

In the typical debt contract, breach occurs when the debtor fails to make a scheduled payment or takes some action (or suffers some circumstance) that makes future payment less likely. After breach, the creditor demands full payment, and in the event that is not forthcoming, seeks a judgment in court. In commercial debt contracts, key terms—such as which events count

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as a default, when payments can be accelerated, where one can sue, how one can enforce, and what remedies one can request—are governed by specific contractual provisions. The stronger the enforcement rights granted the creditor under the contract, the lower the risk of default, the greater the recovery the creditor can expect to obtain in the event of default, and, therefore, the lower the interest rate the creditor will demand. Moreover, when a debt obligation is sold to a third party purchaser, different rights of enforcement will command different prices. All things equal, a debt obligation with stronger rights of enforcement will trade at a higher price than one with weaker rights. We refer to this standard economic view of the relationship between interest rates, market prices and contractual enforcement rights as the “classical model.”

As a theoretical matter, the classical model works well in bilateral debtor-creditor-third party purchaser relationships, where the incentives and actions of each party are readily predictable. But much of commercial lending occurs through multilateral debt obligations where there are many anonymous and dispersed creditors with different characteristics, each of these creditors having participation interests in a single, standardized debt instrument. To the extent the rights in question operate through collective decision making among anonymous creditors with different interests, making predictions regarding the future price effects of those contract rights is a difficult task. And the task becomes even more difficult if the value of the contract rights in question depend on whether activist investors will choose to enforce those rights.

Our article builds on the insights in Kahan (2002) and Kahan & Rock (2009) that identified, in the corporate bond context, the need to differentiate individual and collective contract rights and, in particular, explore the role of the modern activist investor in the enforcement of those rights. In our prior work, we have analyzed the activities of these investors as contract arbitrageurs who function to exploit the latent “black holes” in standardized boilerplate contracts (Choi, Gulati & Scott 2018). These hedge funds specialize in unearthing and then enforcing contract provisions that the market may not have fully priced, paid attention to, or even understood (Kahan & Rock 2009; Gulati & Scott 2013). The rents that these activist investors capture are a function of the arbitrage services they perform for the market. But what if the market does not absorb the pricing efficiencies that arbitrage services typically provide when the arbitrage is hidden? In this paper, we explore the case where activist investors are able to capture rents while hiding from the

market's view. Addressing the importance of hidden activist arbitrage for market pricing allows us to take a further step in understanding in what ways and under what circumstances activist investors influence the value of collective, as contrasted with individual, contract rights. Our focus is the standardized sovereign bond contract that is characterized by a single debtor and many dispersed creditors each of whom may have vastly different interests and capabilities.

We advance a theory of how creditors' contractual rights of enforcement are priced by the market that we call the "collective action" model. We distinguish between those contract rights that a creditor receives directly and individually (a "unilateral right") and those that require collective action among a group of parties to the same contract (a "collective action right"). We posit that markets will price differences in unilateral rights when the participants are sophisticated commercial parties. For example, take the unilateral right to sue under the law of the jurisdiction specified in the contract. Assume that German law is more predictably protective of the contract rights of creditors than Italian law. Other things equal, therefore, creditors will consider debt contracts written under German law to be more valuable than those written under Italian law and thus will pay more to acquire those debt obligations on the market.

In contrast, where a contractual right requires a group of contracting parties to coordinate in order to invoke the right—such as a term that requires a certain percentage of bondholders to agree to change payment related terms—the pricing of variations in this collective action term will depend not only on the explicit contractual language but also on the range of investors in the market. A debt contract that by its explicit terms is more difficult for a group of contracting parties to modify as compared to another debt contract may nonetheless have a higher likelihood of modification if the parties to the first contract are more concentrated and willing to act collectively. Collective action requires coordination and coordination requires sufficient access to information to predict the actions of other creditors. Consider, for example, a party who contemplates purchasing a debt obligation that provides for the right to sue the debtor for nonpayment if, say, 80% of all of the creditors of the debtor agree to declare the debtor in default. The value of the right to enforce the debt in this example is a function of what those others will do. Estimating that value requires the prospective purchaser of the obligation to determine the probability that at least 80% of the creditors will join in the default declaration.

But imagine that predicting what the other creditors will do depends on knowing the intentions of a few creditors whose identity is unknown and who may have the incentive to block the default declaration (for example, because they sold credit default swaps on that debt). Now the value of the contract right is highly uncertain and may not be capable of probabilistic estimation. In short, where the market is uncertain of the composition and the incentives of the parties to debt obligations with collective action terms, explicit differences among contracts in the rights embodied in their collective action terms may not get priced at all.

To test the collective action model against the classical model as well as other explanations for apparent pricing anomalies, we turn to the bond covenants found in sovereign debt offerings. Over the past two decades, more than a dozen empirical studies have examined the classical model of pricing as applied to “modification” terms, a key set of contract terms in sovereign bond contracts that set the vote thresholds required for modifying the payment terms of a bond (such as principal amounts, interest rates, and dates when payments are due). These modification terms are known as “collective action clauses” or “CACs.”<sup>1</sup> The CAC thresholds generally range from a high of 100% (unanimity) of the bonds in principal amount to a low of 75% of the principal amount of the bonds.<sup>2</sup> Achieving the necessary voting threshold is a precondition to the defaulting sovereign’s ability to bargain for a reduction in its payment obligations. These restructuring efforts can be thwarted, however, if a sufficient number of bondholders obtain the votes to block modification and elect instead to pursue litigation to recover the principal amount of the debt.

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<sup>1</sup> The primary reason for the interest in CACs and their pricing is that they have been seen on multiple occasions by public sector institutions as important policy tools. Over a number of years, institutions such as the International Monetary Fund, the Bank of England and the European Monetary Union have proposed repeatedly that sovereign debt contracts that adopt strong individual creditor rights (e.g., a 100% vote requirement to change payment terms on a bond) be modified in favor of bonds with weaker rights (e.g., a 75% vote requirement to do the same) (Gelpern, Gulati & Weidemaier 2015; Schäuble 2017). The concern raised by many in the market in response to these proposals has been that weakening creditor rights will raise the cost of capital because debtors will, at the margin, be more likely to default. That’s the basic logic of moral hazard. Studies, therefore, have focused on examining empirically whether in fact markets respond to a reduction of creditors’ rights by increasing the cost of capital—what sophisticated financial markets should do according to the standard theory (Dooley 2000; Sheleifer 2003). For our purposes, the market response that these studies have been testing relies on the classical model of pricing and the resulting lack of evidence of price effects is directly inconsistent with the classical model. Other terms in sovereign bonds such as trustees v. fiscal agency clauses, *pari passu* clauses, immunity waivers and arbitration provisions have also received attention, but there are no more than a handful of studies examining these other clauses (Weidemaier 2014 & 2011; Schumacher, Chamon & Trebesch 2018; Scott & Gulati 2013; Häselser 2010). Literally no other contract term—in any field of contract law—has received as much empirical attention, with as little success in terms of confirming the basic economic intuition, as the sovereign CAC.

<sup>2</sup> Sometimes these collective provisions operate across all of an issuer’s bonds (“aggregated” clauses) and sometimes they operated on an individual, bond-by-bond basis.

Given the greater leverage a blocking position affords a creditor, the prediction from the classical model is straightforward: The higher the vote threshold required for a modification, the stronger the bargaining position of any given creditor upon default (100% being stronger than 85%, which in turn is stronger than 75%). Therefore, bonds with the 100% vote requirement should command a higher price than those with the 85% requirement; and those in turn should be more valued by creditors than bonds with the 75% threshold.

There are two reasons why, in theory, differences among these provisions—such as whether a sovereign bond’s payment terms require a vote of 100%, 85% or 75% of the creditors for modification—should affect the price of the bond. First, other things equal, because an 85% vote threshold is harder for the sovereign debtor to obtain than a 75% threshold, the sovereign seeking to restructure its debt is motivated to offer holders of the 85% bond a larger payment to obtain their consent. Second, on the flip side, because it is easier for holders of the 85% bond to organize collectively to block a sovereign’s restructuring attempt (they only need 15% of the bondholders to agree as opposed to the 25% needed for a 75% bond), they can more easily hold out and, by litigating, achieve a potentially greater recovery.

Despite the importance of these CAC thresholds, virtually none of the CAC pricing studies find evidence supporting the prediction that the markets will value bonds with the 100% vote requirement more highly than the 75% bonds. Indeed, the majority of studies report the price effect of particular CAC terms to be somewhere between negligible and zero (IMF 2004; [Häselser 2009](#), IMF 2017). And for those empirical papers that do find price effects, the direction of the price movement is inconsistent—some studies show small positive effects, others show small negative effects, and yet others have prices moving in different directions for different subsets of the market (Tsatsaronis 1999; Petas & Rahman 1999; Becker, Richards & Thaicharoen 2003; Gugiatti & Richards 2003; Eichengreen & Mody 2004; Weischenbaum & Wynne 2005; Bardozetti & Dottori 2013; Bradley & Gulati 2014; Große Steffen & Schumacher 2014; Ratha, De & Kurlat 2018; Carletti et al. 2018; Erce, Picarelli & Jiang 2019). Even though a holdout strategy (a) requires strong contract rights (so a creditor does not get crammed down involuntarily) and (b) provides returns that are as high or higher than if the creditor is unable to hold out, the empirical research consistently fails to show that bonds with stronger collective action contract terms

command higher prices than those with weaker terms. In short, the empirical analysis of sovereign bond contracts has consistently failed to map on to the classical model of debt pricing.

We build on these prior empirical studies by using a natural experiment thrown up by the Venezuelan debt crisis of 2014-2018 to test the classical model and other explanations for the absence of price effects against a competing collective action model. The Venezuelan natural experiment addresses the data infirmities that may explain why prior attempts to test the classical model in the context of these modification terms have failed: Most of the empirical papers compared bond covenants issued by different sovereigns—leading to questions whether the lack of observed differences in pricing were due to variations not captured in the empirical models across sovereigns rather than to variations in CAC modification terms. Looking only at variations in contract terms in bonds issued by Venezuela allows us to control for any differences across sovereigns.

We report evidence that differences in the terms of Venezuelan bonds that require collective action are not priced when the presence or absence of activist investors with the reputation, ability and capacity to implement a holdout strategy effectively is unknown. As a backdrop, the research on sovereign restructurings shows both that holdout creditors (usually fewer than 5% of the bondholders) have been a consistent feature of sovereign restructurings over the past two decades and that the creditors who successfully held out have, in many instances, received lucrative recoveries (Schumacher, Trebesch & Enderlein 2018).<sup>3</sup> But lacking knowledge of where these contract arbitrageurs are building a position, the market is unable to distinguish among different bonds even with formal legal differences in collective rights. In contrast, we report evidence that bond terms that either create unilateral rights or collective rights where the identity of relevant contracting parties is known are priced by the market.

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<sup>3</sup> In Greece's restructuring of 2012—one of the biggest sovereign restructurings in history—creditors who successfully held out were paid 100% of their claims whereas the other creditors received haircuts of 60% or more. And those who held out were able to do so in part because their CACs had higher vote thresholds than those who were unable to hold out. Similarly, in Ecuador in 2000 and Argentina in 2016, those who held out were paid close to 100% of their claims while those who voluntarily restructured received haircuts of between 60% and 40%. A rigorous comparison of the returns from holding out as opposed to voluntarily participating in a restructuring requires adjusting returns in the two scenarios for opportunity costs and the risk that the holdout's legal costs will not be awarded. As Cruces and Samples show in their analysis of Argentina's recent and infamous battle with holdout creditors, the basic observation in the text holds (Cruces & Samples 2016).

Section 2 of the article expands on our collective action theory, discards several implausible explanations and discusses an alternative explanation for why the literature has failed to show price effects from different CAC terms. Section 3 sets out our empirical predictions. Section 4 reports the results of our empirical tests. Section 5 concludes.

## **2. Explanations for the Puzzling Pricing Results.**

We argue that the reported absence of price effects in CAC terms with different voting thresholds is due to the effects of collective action impediments that prevent the bond market from being fully informed. While the value of an individual contract right to a bondholder is relatively easy to estimate, the value of a collective right whose exercise depends on the support of other creditors is more uncertain. And that is especially so if it is difficult to determine whether other creditors have the same incentives to join in the collective exercise of the contract right. Litigation is costly, both in terms of direct litigation costs and indirect reputational ones for the litigating parties. We posit that many institutional investors (termed “non-litigating creditors”) will not view suing a sovereign issuer in court as a viable option because of the desire to maintain good relationships with sovereigns and the burden of justifying large front end litigation costs to their passive investors. Rather, such parties will, if no other option is available, simply accept the restructuring offer of the sovereign. Another option, however, is possible if a more activist investor (termed a “contract arbitrageur”) is willing to litigate and pursue a holdout strategy. There are a few institutional investors who have developed an expertise in litigating against defaulting sovereigns and are motivated to hold out from restructuring offers and aggressively litigate their positions. Then the non-litigating creditors may free ride on the efforts of the contract arbitrageur. In this case, the primary value of the CAC contract rights is the option to pursue a holdout strategy. But that option has value to a non-litigating creditor (who, by definition, is reluctant to reject the restructuring offer of the sovereign) only if it can predict which bond offerings the contract arbitrageurs, who have the motivation and expertise to hold out and litigate, will choose.<sup>4</sup>

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<sup>4</sup> A threshold question is whether one should expect contract provisions to be priced at all in a sovereign context—given that sovereigns generally have legal immunities that make them difficult to sue. There was a time when litigation against sovereigns was nearly impossible because of the immunities that sovereign debtors enjoyed. Hence, scholars examining the question of sovereigns’ inclinations toward default could put aside the risk of legal enforcement as a consideration (e.g., Aguiar & Amador 2014). This changed in the mid 1970s when the leading jurisdictions issuing sovereign bonds, the US and the UK, passed sovereign immunity laws that allowed sovereigns acting in a commercial capacity to be sued in the same fashion as other commercial actors (Schumacher, Trebesch & Enderlein 2015 & 2018a). Today, as the successes of holdout creditors in the restructurings of Argentina

To illustrate, let's take the market pricing of a bond with an 85% CAC as against a bond with a 75% CAC and ask whether a non-litigating investor<sup>5</sup> would value the former more than the latter. At first cut, since it is harder for the debtor to squeeze the creditors in the 85% bond than the 75% bond, one would expect non-litigating creditors to feel more protected if they are in the 85% bond where the greater risk of a holdout will constrain the sovereign's restructuring efforts more than in the case of the 75% bond. And that is the basic reason why the market should reflect the preference of most creditors for the 85% bond thus causing the price of those bonds to rise relative to the less favored 75% bond.

But for both the 85% and 75% CAC, the non-litigating creditor must assess whether, in fact, a holdout situation is likely to occur. To be sure, holding out is easier in theory with the 85% CAC, since a contract arbitrageur need only acquire 15% of the outstanding bonds to achieve a blocking position. But in practice the motivations of the other bondholders are critical to determining whether, in fact, holding out is plausible. The non-litigating creditor must predict whether there are other creditors among the bondholders that are motivated to hold out and who possess the litigation expertise and capital resources to sustain the high front end costs necessary to succeed as a contract arbitrageur. Ordinarily, one might think that the CAC itself would provide the basis for such a prediction. Marginal creditors could examine the contract terms in different bonds and predict that those bonds with the best holdout rights would be those the contract arbitrageurs would target. So, from this perspective, the 85% CAC bond would be a better bet than the 75% bond.

The fly in the buttermilk is that the most effective holdout strategy depends vitally on the holdout remaining hidden from the market until after the restructuring deal is done. These contract arbitrageur holdout experts are best able to extract a disproportionate recovery if they can wait

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and Greece and the emergence of specialist litigation funds have demonstrated, litigation is a risk that every restructuring sovereign faces (Schumacher, Trebesch & Enderlein 2018a; Choi, Gulati & Scott 2018). One should expect, therefore, that empirical studies of the pricing of sovereign bond covenants would find evidence of price effects supporting the classical theory of bond pricing. Indeed because of the lack of a bankruptcy regime for sovereign debts, creditors seeking redress must pursue a sovereign's assets via contract law. And that, in turn, means that contract terms should be particularly meaningful in the the sovereign setting.

<sup>5</sup> By "non-litigating investor" we mean bondholders who have neither the inclination (owing to their status as repeat players in the market) nor the capital resources to pursue the holdout strategy of declining a restructuring offer and aggressively pursuing the sovereign through litigation and other extra-legal collection efforts.



until the debtor negotiates a significant haircut with the other creditors and then pursue both the debtor and the holders of the restructured bonds until a settlement is negotiated. Put differently, holding out works best if the population of holdouts is relatively small so that it is in the financial interest of the debtor to pay the holdouts in full in order to settle with the other creditors at the restructured rate. This means that a creditor planning to pursue a holdout strategy has strong incentives to hide its plans, including which bonds it plans to target, until after the other creditors have settled their claims with the sovereign. If the non-litigating investors believe that a contract arbitrageur will purchase a blocking position in the 85% bond because it requires a smaller investment, a prospective contract arbitrageur may choose instead to invest more in the 75% bond in order to obtain a larger net recovery. And that hidden information likely will prevent the market price from reflecting the true value of the bond that will be selected for litigation by the holdout creditor. In short, because the contract arbitrageurs are hidden there should be little differentiation in bond prices notwithstanding different CAC terms until holdout creditors have been revealed—which typically does not occur until after the restructuring deal is complete and there is no longer any trading on the market.

## ***2.1 Partial (and Inapplicable) Explanations: Econometric Issues and Confounding Effects***

There are several competing explanations for why the CAC pricing studies find little in the way of price effects. These explanations share a common characteristic that helps us in our study: they are inapplicable in the case of Venezuela's debt crisis.

One such explanation derives from the limitations of the data on which prior studies were based. The existing sovereign bond empirical literature focuses on terms for bond covenants from varying bonds across different sovereigns. Bonds issued in different legal settings tend to contain numerous differences in their contract terms in addition to having different rules and norms of interpretation for those terms. Given the number and the difficulty of controlling for these differences in contract terms, let alone country characteristics, these cross-sectional studies are not able to control for all of the endogenous variables (e.g., Tsatsaronis 1999; Petas & Rahman 1999; Becker, Richards & Thaicharoen 2003; Eichengreen & Mody 2004; Ratha, De & Kurlat 2018). Without proper controls for sovereign and bond-level differences, the cross-sectional studies'

findings on the relationship (or lack thereof) between CAC bond terms and market prices are suspect.

A related explanation for the lack of price effects when using cross-sectional data across different sovereigns has to do with the possibility of confounding effects. The argument here is that when a sovereign issues new bonds with different contract terms (for example, switching from a 100% modification requirement to a 75% threshold), this change produces offsetting price effects. On the one hand, because it is easier to restructure a 75% bond than a 100% bond, the change may signal to the market an increased likelihood that the particular sovereign will default (the classic debtor moral hazard problem). On the other hand, the sovereign potentially has earned savings in the future by including a CAC to ensure that any future restructuring will face fewer threats from holdout creditors (Guggiati & Richards 2003; Bradley & Gulati 2014).<sup>6</sup> If there are indeed such savings from reducing future restructuring costs, investors should increase the price they are willing to pay for all of the particular sovereign's bonds relative to the bonds of other sovereigns.<sup>7</sup> With potential price impacts that move in opposite directions when looking at cross-sectional data, the overall direction of the price change when comparing different sovereigns is ambiguous. In short, the argument is that, when comparing the bonds of different sovereigns, the CAC's effects are cancelling each other (Gelpern & Gulati 2006, reporting on interviews with policy makers on the possible reasons for the lack of pricing effects).

The third explanation for the puzzling results concerns the presence of bailouts. If international institutions such as the IMF that are concerned about contagion are motivated to bail out countries that are in crisis, then the contract terms become irrelevant (Weischenbaum & Wynne 2005). One possible explanation, therefore, for the lack of results on the previous CAC studies is that scholars have not sufficiently separated the countries with a high likelihood of bailouts from those with a low likelihood.

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<sup>6</sup> In theory, there might also be positive behavioral effects on both the sovereign and creditors if the presence of CACs reduces the likelihood of future bailouts by the Official Sector. Absent the moral hazard effects of future bailouts, sovereigns then will be more careful in their borrowing decisions and creditors in their lending decisions.

<sup>7</sup> As noted in the text, the most likely net impact of CACs or similar schemes is to increase the sovereign's borrowing costs: the market will observe the change making it easier for a sovereign to restructure as a signal that the sovereign will be more eager to restructure (Shleifer 2003).

The solution to the deficiencies in the existing studies is to examine bond contracts with different CAC terms, issued by the same issuer who is in the bad graces of the IMF, during crisis times, under the same law, and identical in all other respects except for the CAC threshold. But until Venezuela's current crisis, a substantial amount of data meeting these criteria has not been available. Our study employs a natural experiment for bonds issued only by Venezuela and that tracks pricing as Venezuela goes into default, addressing key weaknesses of the prior empirical studies.

## ***2.2 Low Default Risk and Agency Costs in the Initial Market for Sovereign Bonds***

Almost all of the prior CAC studies examine bond prices prior to the time when the sovereigns are experiencing repayment difficulties and are approaching default. During the time when the probability of default is low, it is difficult to discern the price impact of any particular contract term whose impact will only be relevant in the event of default. (IMF 2017). Even if there is a pricing difference between bonds with varying contract terms, the remote risk of default will obscure such pricing differences.

Compounding the difficulty in observing pricing differences when the probability of default is low are the agency costs of actors that are responsible for the initial pricing of sovereign bonds. These agency costs may obscure pricing differences particularly at the time new sovereign bonds are issued.

The private interests of the lawyers, managers and initial investors who dominate the sovereign bond market are to process bond issues at the least ex ante cost and as quickly as possible, notwithstanding expected default costs (Gulati & Scott 2013; Choi, Gulati & Scott 2017). This single minded focus on front end contracting costs is simply a reflection of the fact that the "legal terms" for which the lawyers are responsible and that form the standard boilerplate are seen as immaterial in the initial pricing of the bonds (Guggiatti & Richards 2004). Thus, any change in the ability of an investor to recover in the event of a default owing to differences in the legal terms of the contract is ignored by both the debt managers (who act as agent for the sovereign) and the investment bank (that serves as agent for the investors). The debt managers for the sovereigns do

not care about the legal terms at the time of issuance: they do not regard the legal terms as relevant to the initial pricing of their bonds because they know that the investment banks charged with marketing the bonds only care about having the standard form (Gugiatti & Richards 2004; Häselser 2009; Gelpern, Gulati & Zettelmeyer 2018).

But why don't the investors who buy the bonds care about their expected recovery in the event of default? One hypothesis is that it is too costly to try and match a given sovereign with the optimal CAC clause. Some sovereigns may present a measurable default risk while others may not, and the information to make particularized *ex ante* calculations is costly to acquire. Another consideration is the fact that this is a liquid market where bonds can easily be resold on the secondary market and where many institutional investors are required by their investment standards to sell their bonds when the sovereigns are near default and thus these initial investors are never participants in the holdup game. Even so, shouldn't there be arbitrage in the primary market where informed investors buy bonds selectively based on their reading of the legal terms? Even if these arbitrageurs do not plan to be there when the sovereign defaults, they know that others will pay a higher price for the bonds with better contract terms in that near-default scenario. Perhaps not. The tradeoff between the moral hazard risk of inviting a future restructuring with weak contract terms and the increase in returns to creditors from a successful restructuring owing to the very same terms is difficult to resolve *ex ante*. So long as the initial investors only bear a portion of any price distortion from purchasing bonds with contract terms that make the bond less valuable upon default, it may still be rational for their agents to buy and sell bonds without discriminating among legal terms that influence the costs of default.

But the corollary of this proposition is that arbitrage should occur once the risk of default becomes salient to the market. This agency cost story thus predicts, consistent with the classical story, that there will be price effects from different CAC terms but those effects will not appear until the sovereign debtor nears default, the bonds fall into the junk category, and conservative investors such as pension funds exit (Gelpern & Gulati 2006, reporting on interviews). Put differently, the careful reading and therefore pricing of legal terms only occurs at crisis time. We focus in this study on the pricing of Venezuela bonds as Venezuela approaches default, exactly

when the agency cost story predicts that pricing effects for bonds with different contract terms will appear with increasing clarity.

### **3. Testing the Classical and Collective Action Models**

The classical model predicts that bonds with different contract enforcement terms will be priced differently in the market. We expect to see those differences most clearly as the sovereign nears default. In contrast, the collective action model predicts that, for contract terms that require a contract arbitrageur to lead a holdout strategy, we should not see pricing effects even as the debtor is closer to default so long as the market lacks information on which bonds the specialist holdouts are targeting. It is only when such information leaks into the market that pricing differences should appear (with the bonds that are rumored to be targeted by the holdouts rising in value). Finally, price effects should appear much earlier for contract terms that permit individual parties to assert default rights unilaterally.

For our study, we use bonds issued by a single sovereign, Venezuela, that are governed by the same choice of law and forum provisions (to control for unobservable variations across sovereigns and bonds governed by different laws and jurisdictions). We also focus on the pricing of the bonds as Venezuela nears and then enters default, a period when the contract terms are of heightened salience to the market.

As of this writing, in mid 2018, Venezuela has over \$60 billion in bond debt outstanding, approximately \$35 billion issued directly by the sovereign (“Republic” bonds) and another \$25 billion issued by Venezuela’s state-owned oil company, *Petróleos de Venezuela, S.A. (PDVSA)*, which produces roughly 95% of the state’s foreign currency revenues (Lerrick 2018). Helpfully, these various bonds (Republic and PDVSA) have differences in key contract terms despite being issued under the law of the single jurisdiction of New York. In particular, the currently outstanding Venezuelan bonds have been issued over more than a twenty-year period during which the standard-form for sovereign bonds in the broader market has changed significantly. Of greatest interest to us, the voting threshold on modification clauses in the Republic’s bonds (the CACs) changed from 100% (in the mid 1990s) to 85% (2003-04) to 75% (2005 onwards). This same

feature applies to all sovereigns that have issued bonds consistently during this time period, but Venezuela is the only one of those sovereigns that has both issued bonds consistently during the two-decade period *and* has gone into default.

The variations in the Republic and PDVSA bonds yield five primary tests where we can compare the market pricing of Venezuelan bonds that carry distinctly different legal risks. We then supplement these five tests comparing bonds with different legal risks with a sixth test that examines the market effect of a rumor that materialized at the end of our data period that specialist holdouts were targeting one particular bond. Helpfully, we are able to run the foregoing comparisons during a period in which the probability of default has been high, and the bond rating low (CCC+ and below). Using six-month CDS prices, the probability of Venezuela's default has been in the range of 70-95% during the period from September 16, 2014 (when Venezuela bonds dropped into junk status) to December 15, 2017.

The primary focus of our inquiry is the impact of different voting thresholds on the pricing of bonds. As noted, this question has already generated a significant amount of academic and policy interest. It is worth noting as well that the market has evinced considerable interest in the differences in voting thresholds in Venezuelan bonds. During 2017 and 2018, there were multiple research reports issued by Bank of America, Deutsche Bank, Nomura, Citigroup, Torino Capital, and Morgan Stanley updating clients on the situation in Venezuela. Each of these reports included a discussion of relevant legal issues and, of those, the voting thresholds were the most discussed legal issue (Kropp, Weidemaier & Gulati 2018).

In three of the five tests of differences in the bonds' contract terms, we find no price effects for what, in theory, should be legally significant disparities in the bondholders' rights upon default. Importantly, for our purposes, the relevant contract terms for the three tests become effective only if there is a certain degree of collective will among the bondholders. We do see a price premium, however, in the case of the one bond where there were credible rumors that contract arbitrageurs were targeting the bond because of its holdout friendly contract terms. Put differently, legal differences in collective action provisions can matter—but only if it appears likely that a specialist holdout is going to operationalize those provisions.

For the two remaining tests of legal differences, we also find evidence of price effects consistent with the collective action story. The key difference in these cases is that the rights that are valued differently by the market are those that require relatively little in the way of collective action for implementation: these are “unilateral” rights as distinct from those rights that do require collective action and are not valued differently. The two bonds where we do find price effects are: (a) a bond with collateral protection in the form of stock in Citgo, a US subsidiary of PDVSA (the “Collateral bond”) and (b) a bond where accusations of legal infirmity surrounding its issuance increased the risk of non-payment (known in the market as the “Hunger bond”).<sup>8</sup>

As noted, we use five comparisons of contract terms for the Republic and PDVSA bonds to test for price differences as a function of differences in legal default rights. These tests compare (1) Unanimity Action Clauses (or UACs) as against Collective Action Clauses (or CACs), (2) CACs with differing vote thresholds (85% v. 75%), (3) exit consents, (4) collateral protection for one PDVSA bond, and (5) a legal infirmity that may invalidate another PDVSA bond. To add to these five comparisons of the pricing of contract terms, we examine whether contract terms that otherwise are not priced do become priced for a specific bond once there are credible rumors of specialist holdouts targeting the bond for purchase (referred to as the “rumor” bond).

Even though the PDVSA and Republic bonds are backed by essentially the same credit (Venezuela’s oil assets), they use different contract terms. The Republic’s bonds are sovereign bonds under a Fiscal Agency structure, carrying standard sovereign bond contract terms and receiving the standard sovereign immunity protections of a sovereign contract. The PDVSA bonds, by contrast are under a Trust Structure and PDVSA, while 100% state owned, is a corporation that, in theory, could be subject to a bankruptcy proceeding (from which the sovereign is immune). Hence, we separate both types of bonds in analyzing whether the market differentially prices contract terms in the bonds of the Republic and PDVSA.<sup>9</sup>

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<sup>8</sup> The bond was possibly issued at an artificially high principal value and low yield, as compared to what the market rates would have predicted. That artificiality puts the creditors holding these bonds at risk of being accused of having engineered something akin to a fraudulent transfer. These accusations could result in future Venezuelan governments refusing to repay this Hunger Bond in full (Wigglesworth 2017).

<sup>9</sup> For a discussion of the differences between Trust Indentures and Fiscal Agency agreements, see Buchheit (2018).

### ***3.1 Republic Bonds***

#### ***i. Prediction One: Unanimity v. Supermajority (UAC v. CAC)***

Here, we examine the price impact of a sovereign debt contract requiring a 100% or unanimous vote of the creditors for the modification of “payment” terms (a UAC) versus a lower threshold (a CAC with either a 85% or 75% vote). Given that “payment” terms include principal and interest amounts and times of payment along with currency, a restriction on changing these terms without unanimous consent from the bondholders predictably should make these bonds more difficult to restructure and correspondingly easier for a holdout to succeed in blocking that attempt by the sovereign. We focus our test of Prediction One on the time period where the sovereign, Venezuela, approaches default.

Even though securing the necessary consent to modify 100% bonds is more difficult to achieve, these bonds do not provide creditors with effective unilateral rights. To be sure, the 100% vote bond gives every bondholder a veto right (in theory, an individual right), thus this bond should be more valuable than, for example, a 75% bond. A non-litigating investor need not calculate whether this is the bond where a sufficient number of other investors are willing to hold out and litigate against the sovereign. It is likely, however, that many investors are constrained from exercising litigation rights. Typical sovereign bonds require a 25% vote of the creditors for acceleration in the event of a default (and acceleration can usually be reversed by a 50% vote of the creditors). Absent acceleration, a creditor is left with litigating over unpaid coupon payments only—not likely to be a cost effective strategy. The holdout strategy in the sovereign context is most effective for those creditors—the contract arbitrageurs—who can threaten not only to hold out, but thereafter to disrupt any settlement made with the other creditors through litigation (Schumacher, Trebesch & Enderlein 2018a). Hence, if a credible litigation threat requires the support of other creditors, a bond that requires a 100% vote to change payment terms in effect requires the exercise of collective rights. And, of course, the same conclusion holds for the bond that requires the 75% vote to change payment terms.



Our dataset contains two UAC Venezuelan Republic bonds with 100% vote requirements for changes to key bond terms. The other fourteen Republic bonds, have CACs and require either 75% (twelve bonds) or 85% (two bonds) of the creditors in principal amount for a debt write down to take effect. Other things equal, under standard economic assumptions about a bilateral debtor-creditor relationship, the 100% bonds should be more valuable in a near default scenario than the 75% or the 85% bonds, and, reflecting this greater value, the yield of the 100% Republic bonds should be lower as compared to the yields of the 75% and 85% Republic bonds.<sup>10</sup>

Along these lines, a August 8, 2017 Citigroup research report stated:

We think that inclusion of CAC [75% vote and 85% vote] clauses . . . makes it easier to achieve participation rate for a certain level of recovery. Investors holding a bond with a CAC clause will [be more likely] to accept the recovery offer around the ‘actual’ recovery than ones without. In other words, if Venezuela decides to target [an] 80% participation rate, they will have to offer higher recovery to the no-CAC bondholders than to the 75% bondholders.

#### ***ii. Prediction Two: 85% versus 75%***

Similar to prediction one, the 85% bond should be more attractive to the market than the 75% bond. The reasoning is the same: the 15% vote required to block the operation of a CAC is easier for holdout creditors to achieve than a 25% threshold. In the near-default scenario, the yield on the 85% Republic bonds should be lower than the yield on the 75% Republic bonds. We focus our test of Prediction Two on the time period where the sovereign, Venezuela, approaches default.

To quote from a veteran of the sovereign debt markets at the Paris Club meetings of mid-2016 where Venezuelan debt and strategies to deter holdout creditors were discussed:

The two 85% bonds are ones to watch. They are not as easy to hold out on as the 100% bonds. But they are easier to get a blocking position on than many of the 75% bonds, especially the one \$500 million bond that was issued in 2004; that was a small issue.

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<sup>10</sup> One factor that might alter the calculation as to which bonds are easier to holdout from a restructuring offer is the size of the debt stock that has the particular legal characteristic. If, for example, the vast majority of the Venezuelan debt stock was made up of 100% vote bonds, the restructuring team would be forced to focus its attention on developing a strategy to force holdouts on those bonds to agree to a deal. But here the two 100% vote bonds are but a small fraction of the overall debt stock of Venezuela’s bond debt (less than 5% of the overall bond debt). Put differently, the holdout strategy works best when it is keyed to a legal characteristic that the vast majority of other bonds do not possess.

Everyone is focused on the 2027 bond (without CACs), but I suspect that real smart holdouts have their eyes on the 85% bond.<sup>11</sup>

\_\_\_\_\_ A prior paper (Carletti et al. (2016)), tested the pricing of different voting thresholds using Venezuelan sovereign bond data in the 2014-2016 period; that is, significantly prior to the defaults on the various Venezuelan defaults that began in November 2017 and continued thereafter. In this paper, our tests of Predictions One and Two focus in particular on the period as Venezuela neared default through December 2017. This time period is critical because the voting threshold to change payment and payment related terms becomes particularly important to investors as a sovereign nears default.

### ***iii. Prediction Three: Exit Consents and The Second Circuit's Marblegate Opinion***

Prior to the emergence of CACs in New York law bonds in early 2004 and the 75% voting requirements on changing payment terms on a sovereign bond, almost all sovereign bonds issued in New York had 100% vote requirements for modifying their payment terms. The primary solution to solving the holdout problem in this context—the 100% bond—was the Exit Consent in which creditors accepting a restructuring offer agreed to modify the non-financial terms of the original bonds (making those bonds less valuable) thus encouraging holdouts to accept the settlement offer (Buchheit 2000; IMF 2002). As discussed earlier, Venezuela has two of these pre-2004 bonds outstanding. Our third empirical test of pricing effects examines the impact on the prices of these two Venezuelan bonds of a Court of Appeals decision in New York that significantly increased the viability of the Exit Consent technique.

This Exit Consent technique was used successfully in a number of sovereign restructurings between 2000 and 2006 (Ran, Chamon & Zettelmeyer 2016). But in the years following, three trial court decisions in the New York courts (and one in England) had thrown doubt on the viability of the technique (Bratton & Levitin 2018; Kahan 2018). Based on the results of these new cases, the two 100% vote Venezuelan sovereign bonds were essentially restructuring proof.

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<sup>11</sup> The Paris Club is a gathering of the most influential creditor nations that is organized on a regular basis by the French Ministry of Finance. The primary task of these meetings is to provide a setting where official (nation to nation) loans are rescheduled for debtors who are unable to pay. But there are also sessions at which outsiders are invited to present research and issues concerning the broader markets (such as the problem of holdout creditors) are discussed.

On January 17, 2017, this state of affairs changed when the Second Circuit Court of Appeals reversed the position taken by the three trial courts. This was a significant legal change and its importance supports the prediction that the bonds where the Exit Consent technique would be used (the two Venezuela 100% vote bonds) would experience a relative drop in value as compared to the bonds where the Exit Consent technique was neither necessary nor viable (such as the two 85% and all the 75% vote bonds) (Kahan 2018).

Prediction Three, therefore, is that the yields for the 100% Republic bonds should rise relative to the 85% and 75% bonds at the point at which the *Marblegate* decision from the Second Circuit is released.<sup>12</sup>

### **3.2 PDVSA Bonds**

Predictions Four and Five concern the bonds of PDVSA, Venezuela's state-owned oil company. Given that Venezuela receives over 90% of its foreign revenues from the oil industry, PDVSA risk is essentially the sovereign risk. What is significant for our purposes is that two of the PDVSA bonds have legal features that create unilateral default rights in the sense that they accrue directly to the individual creditor independent of whether a subset of other creditors chooses to enforce them. Below we examine whether the market prices those legal features.

#### ***i. Prediction Four: The Collateral Bond***

PDVSA placed its last bond issue in October 2016 shortly before the market for Venezuelan bonds collapsed. Investors demanded and received collateral as additional protection for buying this bond. Specifically, the bond is backed by a 51% stake in the shares of Citgo, a

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<sup>12</sup> While the Exit Consent strategy provides a possible pathway for restructuring the sovereign's debt, for two reasons the strategy is a second-best solution to clauses (such as CACs) that directly allow for changes to payment terms. First, the Exit Consent mechanism cannot force holdouts to take lower payment amounts, and, second, if used too aggressively (which is when it is most effective) the strategy is vulnerable to legal challenge. Because Exit Consents are a second best solution, we conjecture that the possibility of Exit Consents, while diluting the advantage of a 100% bond, does not change the relative advantage for holdouts of a 100% bond compared with those bonds with CAC clauses.

Delaware corporation that is a wholly owned subsidiary of PDVSA and that operates a significant portion of PDVSA's US refineries. Access to collateral should decrease the default risk of holders of the Collateral Bond, reducing the yield of the Collateral Bond relative to other PDVSA bonds.

A difference worth noting between the collateral feature analyzed here and the CAC voting terms for the Republic Bonds discussed earlier is that the benefit to an investor of the collateral feature does not depend on the hold out and litigate strategy. In that strategy, a prospective bondholder who hopes to secure a premium return must (a) purchase a bond in which another creditor(s) has a large enough stake to engineer a holdout strategy, and (b) rely on the creditor with the hold out capacity to impose sufficient costs on the debtor through post-restructuring litigation that the debtor settles with all the bondholders at a premium. In other words, the strategy works only if the creditor is in the same bond as a holdout specialist and if that specialist doesn't make a side deal with the debtor that excludes the other bondholders.

The holders of the bond with rights to collateral can exercise those rights when the debtor defaults; the trustee, upon instruction, will conduct a sale of the collateral and share the proceeds equally among the claimants.<sup>13</sup> Consequently, having access to collateral should make the Collateral Bond more valuable than unsecured PDVSA bonds so long as Citgo has a significant going concern value. Informal investor reports suggest that Citgo's value is between \$6 and \$10 billion, providing an ample cushion to ensure that all the bondholders of the \$3 billion Collateral Bond are paid in full. Drawing from a Deutsche Bank July 14, 2017 research report:

Given our increasingly cautious stance [due to the worsening of the crisis in Venezuela], we prefer these bonds on the curve: PDVSA 20s (due to partial collateral), . . . [and listing some other Venezuelan bonds] (due to their low prices).

## ***ii. Prediction Five: The Hunger Bond***

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<sup>13</sup> The collateral feature in the PDVSA bond is not completely free from collective action in that a super-majority of creditors (66.67% in principal amount) could, in theory, vote to voluntarily eliminate the collateral support for the bond. The difference between this hypothetical collective vote to take less and a 75% CAC vote to take less is illustrative of the point we make in the text regarding the difficulty of valuing certain collective rights that require specialized litigation to back them. Here, with the collateral feature, the creditors would not have to engage in the kind of complex post-restructuring litigation strategy to get paid off. They would instead, in effect get paid directly by virtue of their right to have a share of the sale proceeds of collateral that is located in the US.

The second PDVSA bond with a unique legal feature is a PDVSA bond that suffers from a potential process illegality (the “Hunger Bond”). In May 2017, Goldman Sachs Asset Management (GSAM) purchased roughly \$2.8 billions of a PDVSA bond that had not been trading despite having purportedly been issued some years prior in 2014. GSAM purchased the bonds at a deep discount (it paid \$865 million for bonds with a face of \$2.8 billion), significantly greater than the discount on other PDVSA bonds on the market. Fueled by the sudden \$750 million spike in Venezuela’s capital reserves around the date of the sale to GSAM, observers speculated that GSAM had, in effect, purchased the particular bonds directly from the Republic in a primary market transaction that was disguised to look like a secondary market transaction with an artificially low coupon (6% when the market yield at the time was in the 35% range). The bonds were labelled “the Hunger Bond” thanks to Harvard economist Ricardo Hausmann, who castigated investors in a blog post for lending to a regime that was paying coupons to foreign investors at the same time that people were starving (Wigglesworth & Long 2017).

If the rumors in the financial press were true, holders of the Hunger bonds would potentially be vulnerable to a legal challenge either from other creditors or a future Venezuelan government on the ground that a portion of the issuance was fake principal (akin to a fraudulent transfer) (Gulati & Panizza 2018). To quote the title of a report to investors from NERA Economic Consultants in August 2017: “PDVSA’s Peculiar Oct 22 Bond May Carry Elevated Risks.” We predict, therefore, that the Hunger Bond should be priced in the market at a higher yield compared with other PDVSA bonds due to this possible legal vulnerability.

Similar to the Collateral Bond, the infirmity imposed on holders of the Hunger Bond does not require any significant collective action on the part of the bondholders to recover. Instead, the risk of a legal challenge is one that all the bond holders face regardless of collective action or the presence of types of investors (such as contractual arbitrageurs) more willing to engage in collective action.

### ***3.3 Rumor Bond***

A key assumption of the collective action story that we advance is the inability of market participants to predict in what bonds contractual arbitrageurs will take positions and facilitate a holdout against the sovereign. The corollary prediction is that there will be a price effect if the market acquires credible information, through rumors or other sources, on positions taken by specialist holdouts. To test this possibility, we searched various news outlets that regularly report news on Venezuelan bonds—blogs, sell-side research reports, oil industry analyses and articles in the financial press—for rumored buying of particular bonds by specialist holdouts. We found one instance of a rumor reported by multiple sources. The rumor was first reported in an email from a specialist research firm for subscribers in late January 2018 and it suggested that a group of distressed debt funds had joined forces to target a particular bond (the 85% vote bond due in 2034).<sup>14</sup> To quote that source, the VIP subscriber-only research report from the investment advisory firm, Caracas Capital, from January 29, 2018:

[We] can report that several hedge funds have been doing some strategic acceleration calculations. One of the bonds that some have settled on is the \$1.5 billion Venezuela 9.375% of January 13, 2034. That particular bond is being targeted because it only requires \$375 million in face to vote to accelerate, one of the lower amounts (25% of the \$1.5 billion total issue size). In all, the \$375 million of the Venezuela 34, which is currently trading at around a price of 26 (and without interest), costs less than \$100 million.

The prediction from the collective action model concerning this rumor is straightforward. We predict that there will be evidence of a spike in the price of the bond that was the subject of the rumors in comparison to other bonds.

The fact that there were no other events around this period of time that could have conceivably impacted the price of the rumor bond, but not its comparators, helps us isolate the effect of the rumors on the bond prices.

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<sup>14</sup> Our three public sources here were: (1) an investor report that was emailed by an investment research firm specializing in news on Venezuelan debt that was emailed to subscribers to that report in January 2018 (on file with authors) (2) an investor blog post making that information public very shortly thereafter; and (3) a Bank of America research report from April 2018. We also were told of this news by participants at a seminar on sovereign debt that one of us was teaching at the European University Institute in late April 2018 (April 23-24), where some of the participants who had heard of the rumor told us about it. Interestingly, a prior Bank of America research report, from December 2018 (presumably before Bank of America's analysts received news of the rumor that this bond was being targeted because of its holdout-friendly characteristics), identified this particular bond as being slightly overpriced by the market. On May 31, 2018, Bloomberg reported confirmation of the rumor, stating that a hedge fund group had emerged that was holding a blocking position on the 85% bond maturing in 2034 -- although the names of the hedge funds were still kept under wraps (Porzecanski 2018).

## 4. Empirical Results

We identify two sets of bonds for our tests: Venezuelan Republic bonds and PDVSA bonds. We obtain daily pricing data on the two sets of bonds from Datastream from January 1, 2012 to December 15, 2017. For data on the contract terms themselves, we hand coded the sales documents from the Perfect Information database (offering circulars and prospectuses) and supplemented those with the underlying Fiscal Agency Agreements (for the Republic) and Trust Indentures (for PDVSA). We obtained the latter from the banks and law firms that were identified on the sales documents as having prepared them.

### *4.1 Republic Bonds*

#### *i. The Pricing of CACs Near Default*

If the voting threshold for changes to the payment term matters, as it should under the classical theory, we predict that the market should reflect yield differences for comparable Venezuela Republic bonds with different voting thresholds. In particular, the agency cost theory predicts that even if there is no evidence of price effects upon initial issuance, those yield differences should be apparent in the near default environment that we are testing.

Figure 1 depicts bond yields for three comparable Venezuela sovereign bonds with relatively similar maturities: one with a 75% vote threshold and maturity in May 2028, the second with a 85% vote threshold and maturity in January 2034, and the third with a 100% vote threshold and maturity in September 2027. Prediction One is that we should observe lower yields for the 100% bonds compared with the 85% or 75% bonds particularly as Venezuela nears default. The 100% bond provides greater protection in theory to bondholders against restructuring (given the unanimity requirement to change a payment term).

As Figure 1 depicts, however, while at times the 100% bond yield is lower than the 75% bond yield, this spread is not consistent even as Venezuela approaches default. Often, the 85% bond yield is below the 100% bond yield. We do not find what either the simple classical theory or its agency cost variant would predict.

Similarly, Figure 2 provides a graphical depiction of bond yields for two comparable Venezuela sovereign bonds with similar maturities: one with a 85% vote threshold and maturity in December 2018, and the second with a 75% vote threshold and maturity in October 2019. Prediction Two is that we should observe lower yields for the 85% threshold compared with the 75% bonds as Venezuela nears default because a holdout blocking position is easier to assemble for the 85% bond. As Figure 2 depicts, however, the yield for the 85% vote bond is consistently greater than the 75% vote threshold bond, particularly after Venezuela's credit rating drops to CCC+ or lower (marked by Crisis on the Figure). Again, the yield pattern is inconsistent with the classical theory and the agency cost theory gloss.

One of the stories told for why prior scholarship might not have found pricing differences between bonds with 100% vote thresholds and those with 75% thresholds was that these pricing differences might only be discerned when default likelihoods were very high. In other words, viewing the classical model from an agency cost perspective, we would expect to observe evidence for Predictions One and Two only when Venezuela was close to default. When a country is close to default, contract terms that make it more (or less) likely that holdouts will be able to block a restructuring for the specific bond can provide substantial positive (or negative) value to the holders of that specific bond. As described earlier, the large and disproportionate recoveries that holdout specialists have obtained via the exercise of contract terms in the recent restructurings of Argentina and Greece are vivid examples of this – something that the broader data bears out (Schumacher, Trebesch & Enderlein 2015 & 2018a).

To test the importance of credit risk and near-default conditions on bond pricing (Predictions One and Two), we assess the relationship between bond spreads and the minimum vote to change payment terms following the methodology of Bradley and Gulati (2014) and Carletti et al. (2016). For the dependent variable we use the log of the secondary market redemption yield for each bond. To reduce measurement error, we use weekly (log) yields based on averages of daily (log) yields in the week ( $Yield_{i,t}$ ). We estimate the following model on bond-week level data for Venezuela's sovereign bonds using random effects with errors clustered by bond (termed the "Base Model").



$$\text{Yield}_{i,t} = \alpha + \beta \text{Vote}_i + \gamma X_{i,t} + \gamma_{i,t} + \theta_i + \varepsilon_{i,t}$$

To test the relationship between yields and the voting requirement to change payment terms, we include  $\text{Vote}_i$ , the minimum percentage of bondholders required to change the payment terms for bond  $i$ , as an explanatory variable. Where 100% is the voting threshold,  $\text{Vote}_i$  is equal to 1. We also include  $X_{i,t}$ , a vector of time variant control variables,  $\gamma_{i,t}$ , a vector of bond-level time variant variables, and  $\theta_i$ , a vector of bond-level time invariant variables.  $X_{i,t}$  includes the 10YR US benchmark yield (Bm yield, in logs) to account for general movement in sovereign bond yields, the VIX index as a proxy for market volatility (VIX, in logs), and the spread between US corporate AAA and BBB bonds as a proxy for the credit risk premium (BBB – AAA Spread, in logs). We also construct a variable to measure issuer credit risk. We map daily long-term issuer credit ratings issued by Fitch, Moody's and Standard & Poor's to a numeric scale ranging from 14 (B+, for Standard & Poor's and B+ for Fitch) to 22 (SD, for Standard and Poor's). Then we create a variable (Rating) defined as the weekly average of daily averages across the three rating agencies. Higher values of Rating indicate worse credit ratings.

The bond-level time variant  $\gamma_{i,t}$  variables include the following: First, we include residual maturity, given by the difference between a bond maturity and week  $t$  (Resid Mat, in log-weeks). The greater the time to maturity of a bond, the more likely it is that borrower creditworthiness will change during the life of the bond. Residual maturity is a proxy for the degree of uncertainty about repayment. Second, we use the bid-ask spread (BA Spread%, in percentage) as a proxy for bond liquidity. The bond-level time invariant  $\theta_{i,t}$  variable includes the coupon rate (Coupon%, in percentage) since there is sometimes a tax related preference for higher coupon bonds.

Descriptions of the variables are in Table 1. Descriptive statistics for our variables are provided in Table 2. Table 3 reports our results. In Model 1 of Table 3 we report the Base Model estimated for Venezuelan sovereign bonds with an interaction term between Rating and Vote. In Model 2 of Table 3 we estimate the Base Model for Venezuela sovereign bonds replacing Vote with indicator variables for Vote85 (minimum vote threshold of 85% to change payment terms) and Vote100 (minimum vote threshold of 100% to change payment terms) and using bonds with

a 75% vote threshold to change payment terms as the base category. In Model 2 we also include interaction terms between Rating and Vote85 and Vote100.

[Insert Table 3 Here]

As in Carletti et al. (2016), the control variables in Models 1 and 2 of Table 3 largely follow expectations. The greater the 10YR US benchmark yield, the VIX index, and the spread between US Corporate BBB and AAA bonds, the higher is the Yield on the Venezuela Republic bonds. The higher the credit rating (given by a lower Rating) and the longer the maturity (Resid Mat), the lower is the Yield on the Venezuela Republic bonds. Our key explanatory variables of interest, Vote in Model 1 and Vote85 and Vote100 in Model 2, are not significantly different from zero.

Focusing on pricing when a sovereign nears default (Predictions One and Two), note in Models 1 and 2 that the coefficients on the interactions terms with Rating and Vote and Rating and Vote85 and Vote100 are not significantly different from zero. Even as Venezuela gets close to default, we find no evidence that the market prices differences in the contract provisions that dictate the voting threshold for changes to the payment terms.

To test whether the market may only price the voting threshold provisions discontinuously after the risk of default passes a particular threshold, we create an indicator variable for Rating greater or equal to 17 (corresponding to CCC+ or lower rating by Standard & Poor's) that we term in the "Crisis" period. Our reason for examining this discontinuous scenario is the possibility that some investment vehicles, such as pension funds, may have internal rules about the types of investments they are allowed to hold. For example, they may be permitted to invest only in securities that have a credit rating above a certain level or securities listed on an international exchange (de Fontenay et al. 2018).

We re-estimate Model 1 of Table 3, substituting the Rating variable with the Crisis variable and an interaction between Crisis and Vote. Model 3 of Table 3 reports the results. We re-estimate Model 2 of Table 3, substituting the Rating variable with the Crisis variable and interactions between Crisis and Vote85 and Crisis and Vote100. Model 4 of Table 3 reports the results.

As reported in Table 3, the coefficients on Crisis in Models 3 and 4 are positive and significant at the 10% and 1% levels respectively. Crisis corresponds to higher yields for the Venezuela sovereign bonds. The coefficient on the Crisis x Vote interaction term is not significantly different from zero in Model 3. In contrast, the coefficient on Crisis x Vote85 is positive and significant at the 10% level in Model 4. Some evidence exists that the market does price a particular provision, the 85% voting threshold term, differently in the Crisis period compared with the 75% voting threshold base category. But the pricing differential is the opposite of what the classical model predicts. Because a holdout creditor should have an easier time building a 15% block to stop a change to the payment terms under a 85% as compared with a 75% voting threshold, one would expect that the yield on the 85% term bond should be lower than for the 75% term bond. However, the coefficient on Crisis x Vote85 is positive, indicating that the yield for the 85% term bond becomes relatively greater compared with the 75% term bond as Venezuela approaches default. This is inconsistent with Prediction Two. The difference between Crisis x Vote85 and Crisis x Vote100 as well as the difference between Vote85 + Crisis x Vote85 and Vote100 + Crisis x Vote100 are also not significantly different from zero. This is inconsistent with Prediction One.<sup>15</sup>

Our results demonstrate only a failure to reject the null hypothesis that the coefficient on the voting threshold is equal to zero. Failure to reject the null is not the same as proving the null. Nonetheless, both Figures 1 and 2 demonstrate for Venezuelan sovereign bonds closely matched in terms of maturity that the market does not price the voting threshold in the way one would predict under the classical model, where the bonds with the higher vote thresholds should display lower yields. Moreover, the models in Table 3 are for bonds all from the same sovereign, reducing the concern that other, unobserved factors may be driving the model results.

In sum, we do not find evidence that the voting provisions to change payment terms are correlated with yields for the Venezuela sovereign bonds even as Venezuela approached default.

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<sup>15</sup> We re-estimate the models in Table 3 without the use of random effects using ordinary least squares and errors clustered by bond. Unreported, we obtain the same qualitative results as in Models 1 through 4 with one exception. In Model 3, the coefficient on Crisis v Vote85 while positive is no longer significantly different from zero.

This is inconsistent with the classical view of contract pricing and does not support Predictions One and Two.

## *ii. Pricing the Marblegate Effect*

To explore further the (lack of) a pricing effect for vote thresholds even as a sovereign approaches default, we turn to the Second Circuit’s *Marblegate* decision on January 17, 2017 that opened up the possibility of Exit Consents as a means of restructuring the 100% threshold Republic bonds. Prediction Three is that the *Marblegate* decision should have increased the yield of the 100% bonds relative to the 85% and 75% bonds, decreasing the spread between the 100% and the 85% and 75% bonds.

We examine the same three comparable bonds as in Figure 1, 75%, 85%, and 100% threshold Republic bonds in the period from minus four weeks to plus four weeks centered on the week of the *Marblegate* decision. We depict the yields for the three comparable bonds in Figure 3. Note from Figure 3 that the yield on the 100% bond is higher than the 75% and 85% bonds prior to *Marblegate*. After *Marblegate*, the yield on the 100% bond, if anything, moves lower relative to the 75% and 85% bonds. This downward movement in the yield for the 100% bond after *Marblegate* is inconsistent with the expectation that the market would react to the increased possibility of Exit Consents by viewing the 100% bond as relatively more vulnerable to an aggressive restructuring.

As a multivariate test of Prediction Three, we estimate the Base Model for Venezuelan sovereign bonds with the addition of an indicator variable for the bond yields in the time period after the week containing January 17, 2017 (termed “*Marblegate*”) and an interaction term between *Marblegate* and *Vote*. We report the results as Models 1 of Table 4, estimated with random effects and errors clustered by bonds. In Model 2 of Table 4 we estimate the Base Model for Venezuelan sovereign bonds, replacing *Vote* with indicator variables for *Vote85* (minimum vote threshold of 85% to change payment terms) and *Vote100* (minimum vote threshold of 100% to change payment terms) and using bonds with a 75% vote threshold to change payment terms as the base category. In Model 2 we also include an indicator variable for *Marblegate* and interaction terms between

*Marblegate* and Vote85 and Vote100. We estimate Model 2 with random effects and errors clustered by bonds.

[Insert Table 4 Here]

As reported in Table 4, the coefficients on *Marblegate* are not significantly different from zero in Models 1 and 2. In addition, the interaction terms between *Marblegate* x Vote in Model 1 and *Marblegate* x Vote85 and *Marblegate* x Vote100 in Model 2 are not significantly different from zero. That is, we find no evidence of the market pricing the impact of the *Marblegate* decision into the Republic's bond yields with a 85% or 100% voting threshold for changes to payment terms. This result is consistent with the lack of any systematic change in the yield spread between the 100% and 75% vote threshold Republic bonds in Figure 3 after the *Marblegate* decisions. Again, contrary to the predictions of simple classical model as extended by the agency cost theory, there is little evidence in support of Prediction Three, regardless of how close to default we get.<sup>16</sup>

#### **4.2 The PDVSA Bonds**

Our next two tests focus on the pricing of PDVSA bonds and in particular, the pricing of the Collateral Bond and the Hunger Bond relative to other PDVSA bonds. Both the Collateral Bond and the Hunger Bond have special features that, in theory, should affect the market's pricing of the bonds.

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<sup>16</sup> We re-estimate the models in Table 4 without the use of random effects using ordinary least squares and errors clustered by bond. Unreported, we obtain somewhat different results. First, in Model 1, while the coefficient on Vote remains not significant, the coefficient on *Marblegate* x Vote is positive and significant at the 10% level. Second, in Model 2 the coefficient on Vote100 is negative and not significant however the coefficient on the *Marblegate* x Vote100 interaction term is positive and significant at the 10% level. These results are consistent with the greater ability to use exit consents for UAC bonds after *Marblegate* corresponding to an increase in yields for the UAC bonds. Similar with the results in Carletti et al. (2016), this provides support for the premise that the market may have priced the UAC bond separately from the CAC bonds during some periods of time (although, overall, we don't find support this in our models in Table 3). One can see these patterns more vividly if one graphs the yields for the 2027 UAC bond against its closest comparator, as Carletti et al. (2016) do. Specifically, there is period of time of a few months in late 2015 and early 2016—when there were rumors that the 2027 UAC bond was being targeted by specialists holdouts—where the 2027 bond has a lower yield. But as the rumors dissipated, the yield difference disappears.

Holders of the Collateral Bond will enjoy the value of the collateral unilaterally in the event of a default. Prediction Fou is that the Collateral Bond should have lower yields compared with other PDVSA bonds. Similarly, holders of the Hunger Bond will suffer unilaterally if other actors (a successor government in Venezuela) seek to declare the Hunger Bond legally invalid. Prediction Five is that the Hunger Bond will have higher yields compared with the other PDVSA bonds. For predictions one through three, by contrast, the relative strength of the legal strategies for squeezing holdouts in the Republic and PDVSA bonds all depend on the ability of either the government or the holdout to induce (or block) collective action.

Under the classical model, we conjecture that for Venezuela, the market should price the contractual features in the Collateral Bond, the Hunger Bond, and the different voting thresholds to change payment and payment related terms. All three types of differences in contracts bonds could impact the returns investors can expect in major ways and all three should consequently be priced in the market. The only variation is that for two, the Collateral Bond and Hunger Bond, the legal differences do not require collective action, while for the voting thresholds to change payment and payment-related terms, the differences do require collective action. This variation allows us to test whether instead the market prices according to the collective action model, under which those terms requiring collective action will only be priced when the market learns of the existence of contract arbitraguers playing a holdout role.

The basic result is discernable on a simple graph. We graph the various PDVSA bonds in Figure 4. Note that the yields for the Collateral Bond are the lowest among all the PDVSA bonds. As well, the yields for the Hunger Bond are among the highest for all the PDVSA bonds.

As a multivariate test, we estimate the Base Model now for the PDVSA bonds removing the Vote indicator variable (because all PDVSA bonds have a 100% voting threshold to change payment terms) and adding an indicator variable for Collateral Bond. We report the results as Model 1 of Table 5, estimated with random effects and clustered errors at the bond level. We also estimate the Base Model for PDVSA bonds by removing the Vote indicator variable and adding an indicator variable for Hunger Bond. We report the results in Model 2 of Table 5, estimated with random effects and clustered errors at the bond level. Lastly, we estimate the Base Model for

PDVSA bonds removing the Vote indicator variable and adding indicator variables for both Collateral Bond and Hunger Bond. We report the results in Model 3 of Table 5, estimated with random effects and clustered errors at the bond level.

[Insert Table 5 Here]

In Model 1 of Table 5, the coefficient on Collateral Bond is negative and significant at the 1% level. The market clearly prices the presence of the collateral provision in the PDVSA 2020 bond resulting in lower yields for this particular PDVSA bond. In Model 2 of Table 5, the coefficient on Hunger is positive and significant at the 1% level. The market prices the legal infirmity of the Hunger Bond, resulting in higher yields for this bond. When we include indicator variables for both the Collateral Bond and Hunger Bond in Model 3 of Table 5, we get the same qualitative results.<sup>17</sup> While our earlier tests in Tables 3 and 4 indicated no pricing difference for variations in voting thresholds to change payment and payment related terms, we do observe pricing of arguably equally important variations from the Collateral and Hunger bonds where these variations involve unilateral rights.

### ***4.3 The Rumor Bond***

Our final test looks at whether the market reacted to the rumor in late January 2018 that activist investors were targeting a particular bond in which to build a holdout position. If the reason differences in CACS are not priced is due to the market's inability to determine where facilitators of collective action are holding positions, then we would predict that rumors should correspond with a pricing shift. In particular, we should observe a price increase and corresponding yield decrease for the rumor bond.

To test the price impact of the rumor in late January 2018, we examine the relative yields for the rumor bond, the Venezuelan 9.375% January 2034 bond (85% CAC), with two Venezuelan sovereign bonds of comparable maturity, the 9.25% May 2028 bond (75% CAC) and the 9.25%

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<sup>17</sup> We re-estimate the models in Table 5 without the use of random effects using ordinary least squares and errors clustered by bond. Unreported, we obtain the same qualitative results as in Models 1 through 3 of Table 5.

September 2027 bond (100% unanimity). We examined these two bonds in Figure 1 above and found no discernable difference in yield for these bonds despite the differences in the voting thresholds necessary to change payment terms.

For our test, we focus on yields from -4 weeks prior to the last week of January 2018 to +4 weeks.<sup>18</sup> We go back 4 weeks to take into account that rumors may have affected market yields prior to the public announcement of the rumors. Figure 5 depicts the difference in the yield for the rumor bond and the mean yield for the comparison bonds (a positive yield difference indicates that the market prices the rumor bond with a higher yield compared with the comparison bonds).

Note from Figure 5 that the rumor bond starts with a higher yield than the comparison bonds at -4 weeks, indicating that the rumor views the rumor bond as riskier compared with the comparison bond. However, starting at -2 weeks, the yields flip and the rumor bond yield shifts to below the yield of the comparison bonds. This flip is consistent with the market pricing in the information regarding specialist holdouts in the rumor bond which would increase the risk of a holdout relative to other bonds irrespective of the formal voting thresholds. This increased holdout risk makes the rumor bond more valuable to investors, diminishing the relative yield of the rumor bond. This supports the collective action story that while the market does not generally price differences in terms that require collective action for enforcement, the market does price credible information about the presence of specialist holdouts in particular bonds that suggests coordination is underway.

## **5. Investor Perspectives**

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<sup>18</sup> A complication we faced here was that the one highly credible rumor that we found was from late January 2018, for a time period out of our data sample—which we ended on December 15, 2017. Ordinarily, it would have been a simple matter to extend our full dataset into early 2018. However, unfortunately, because this is also roughly the time at which Venezuela goes into full default on almost of its bonds, the data sources such as Datastream begin reporting pricing data in a different form than they had been doing previously (specifically, consolidating the prices of bonds traded under the Rule 144A exception of the US Securities laws and those under Regulation S exception). The change in data format made it difficult to compare yield data from pre and post the format change. Consequently, we only looked at the relative comparison of yields for the -3 week to +3-week period for the rumor bond and two comparison bonds (during which there was no format change for the three bonds) and did not extend our full sample tests past December 15, 2017.



After we had developed initial empirical results and formulated our hypotheses, we solicited comments from a number of investors in Venezuelan bonds during the period from February 2018 through May 2018. We were interested in the perspectives of parties who were engaged in buying and selling—and thus setting the price of—Venezuelan bonds. We spoke to executives at twenty-four firms in the US and Europe that we had met in the context of group discussions relating to a possible future Venezuelan debt restructuring.<sup>19</sup> For twenty of the firms, we spoke to respondents in person at their offices. In sum, we spoke to over fifty executives at the twenty-four firms. Below, we report on what we heard in response to the empirical findings and our collective action hypothesis.

### *5.1 It's Too Early to Tell*

The most frequent response to the finding that the various voting thresholds had no price effect was that it was too early to tell whether any effects would emerge. Consistent with the collective action story, these respondents believed that price differences among bonds might well appear but those differentials would depend on the likelihood of a holdout and that event could not be assessed by the bondholders until later in the process.

To be sure, at the time we were asking for comments, Venezuela was in technical default and had been so for some months. But, we were told, the relevant event leading to the repricing of the holdout risk of different collective action terms is when the “real money” investors exit the market and the litigation hedge funds enter.<sup>20</sup> These contract arbitrageurs are reputed to read the contract terms carefully and are willing to pay for the value that strong contract rights produce in enabling holdout litigation. And that, according to these respondents, had not yet happened in the data period we were examining.

Indeed, according to some, the foregoing would likely play out only after an initial restructuring had occurred and the litigation-oriented funds had initiated legal action. At that stage,

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<sup>19</sup> The four meetings were at: (1) the World Bank/IMF annual meetings (for Deutsche Bank); (2) at Nomura Capital in New York, (3) at JP Morgan in New York, and at a Duke-UNC conference on Venezuelan debt.

<sup>20</sup> “Real money” refers to the type of investors (usually large ones) who measure their performance vis-à-vis the index—in this case, the JP Morgan Emerging Market Index.

and only then, would the balance of the market be able to determine which bonds were being targeted by the holdouts and which contract terms (if at all) were the basis of their litigation claims. Put differently, the distinction we had conjectured at the start, between pre and post crisis periods, was not the relevant distinction. Rather, the market absorbs the information about arbitrage activity only after a restructuring deal has been concluded with non-litigating investors.

A manager at a mid-sized Boston-based fund explained:

[What we do is] different from what [either] Aurelius or Elliott [*two litigation specialist hedge funds*] [do]. Their specialty is holding out and litigating. . . . they read the fine print with a magnifying glass and they sue the hell out of everyone. But we can't play that game. We don't know how and neither our bosses nor our investors want us to. We have compliance departments and we worry about what our investors will think. Green investing is big; they don't like seeing their names in the papers as taking money from starving widows and orphans in some poor country. We are hoping to get a few more coupons on these bonds – we don't need to litigate to make big gains in Venezuela.

### ***5.2 An Arbitrageur Can't Calculate the Incentive to Holdout Until the Offer is Made***

The second, and related, observation heard from some of the litigation-oriented firms was that an activist investor cannot tell whether it is worth playing the holdout game until after the restructuring offer has been extended. Often, as in the case of Argentina, Greece, Peru and others, the sovereign is either deeply in debt or otherwise seeks to impose a substantial haircut on the bondholders. In that case, and many imagine that Venezuela will be such a case, investors expect that holdouts will ultimately reveal themselves. On the other hand, if the restructuring offer is generous, as it apparently was in Ukraine and Uruguay, then there is little incentive for anyone to hold out. The potential recovery values from the litigation strategy in that case are too small. And potential holdout creditors may not even get involved.

### ***5.3 Pricing Occurs Once Investors Know Who is the Big Bondholder***

For the Collateral Bond, a default on the bond would mean that the trustee would sell Citgo – an asset that is readily attachable in the US and likely worth more than the principal amount the bondholders were owed. Our respondents agreed that a bond with collateral that the trustee was obligated to seize and liquidate for investors upon default was clearly more valuable than one

without those rights. But they also made an additional point, illustrated by the following quote from a senior manager in the London office of a global asset management firm:

Everyone knows who the biggest holders for the 2020s [the Collateral Bond] are. It is on Bloomberg. You could interview them [here, in London]. They paid for that collateral; they will [make sure it gets] enforced.

The implication from this observation is that the market reacts once it learns that an individual creditor with unilateral rights has sufficient leverage over the actions of a third party (the trustee in this case) to ensure their effective enforcement. In short, some unilateral rights may require collective efforts to enforce that impose costs on any given creditor sufficient to offset any price advantage the rights may otherwise provide.

#### ***5.4 Hidden Holdouts***

The version of the story from our respondents that mapped most closely onto our collective action story emphasized the difference between investors in the market who are willing to engage in litigating against a sovereign and those that are not. Our respondents believed that, absent information that a specialist holdout creditor had built a position in a particular bond and planned to litigate, the market would not price formal differences in collective rights among bonds from the same sovereign. The reason is that no conventional institutional investor will resist a sovereign restructuring by threatening to litigate. This follows from the fact that non-litigating investors are usually precluded by their own investment standards and their market reputation from undertaking a holdout strategy.<sup>21</sup>

A senior manager at one of the largest New York-based funds explained the lack of price differences in contract terms in this way: “We don’t litigate, so contract terms don’t matter to us.” We then asked: “Well, you are trying to maximize profits for your clients, so wouldn’t you be able

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<sup>21</sup> A recent study of the enforcement of covenant violations in private loan contracts finds that violations are enforced in only a small fraction of cases (11%). Among the factors resulting in the low levels of enforcement are (a) the reluctance of lenders in long-term lending relationships to aggressively enforce covenant breaches, and (b) the difficulty of enforcing violations when costly coordination among creditors is required. Bird et al. (2017).

to sell the bonds with the good litigation terms to a potential holdout who will litigate.” This response followed:

It isn't easy to sell to an Aurelius or Elliott. They don't announce their strategies ahead of time. And they are not in every bond. They pick their battles and they are . . . secretive . . . you don't even know what their strategy is. They probably won't be using *pari passu* anymore. They will find something new. . .

And it is not even clear you want to be in the bonds that they pick, even if you could figure that out. They are willing to wait and litigate for years. They have deep pockets and their own money. Sometimes you can get lucky . . . [if you are in the same bond] . . . But we can't do that because we don't know where they are going to be. And maybe we don't want to. We want a quick settlement . . . and [to] get . . . out. If you are stuck as a small fry in a bond where they have control, you can't do anything.

## **6. Conclusion**

We find that differences in enforcement rights in Venezuelan debt contracts are generally not priced, a result that is inconsistent with the classical model of contract term pricing. We reject the explanation that the lack of contract term pricing is because pricing is hard to discern in sovereign bond datasets when the sovereign is far from default. We examine Venezuelan bond prices both on the brink of default and in default and find no price effects. While it is possible that the sovereign markets may be inefficient in not pricing clearly relevant public information about contract terms, we find that not all legal differences are ignored by the market. Some legal rights are priced and in a discernable fashion. In particular, these are legal rights that do not depend on the enforcement of a collective right by an activist investor. The one instance where a contract term that depends on collective action is priced appears due to the ability of the market to learn through credible rumors which bond had been targeted by activist investors for enforcement.

Our results support the view that the difference between the risks that are priced and those that are not is a function of two features: (a) whether the contract rights in question are unilaterally enforceable by an individual bondholder or are collective rights that require specialist firms for enforcement; and (b) whether the market acquires credible information that contractual arbitrageurs are undertaking the coordination necessary to enforce particular collective rights.

By focusing on the costs of collective action and the essential role of the contract arbitrageur in overcoming those costs, this paper points to the importance of collective action dynamics in understanding and predicting how markets will price differences in contract terms. More importantly, these results also raise normative questions about the role of contract arbitrageurs in this and other similar markets (Choi, Gulati & Scott 2018). Firms that specialize in the close reading of contract provisions in order to enforce contract rights aggressively often are able to capture rents at the expense of more passive investors as well as the citizens of the defaulting sovereign state. The traditional welfare justification for these rents is that contract arbitrageurs perform a service by causing the market to price differences in contract rights more efficiently (Gulati & Scott 2013). Our current study suggests that, because of the hidden holdout problem, contract arbitrageurs can secure these rents even though market prices adjust very slowly or not at all (until it is too late). At a minimum, this points to a regressive wealth redistribution with few efficiency gains (Kahan & Rock 2009; *but see* Elias 2016). How and whether the official sector should seek to regulate this activity remain open questions that this paper suggests are worth exploring.

An inevitable question raised by our study is the relevance of our results for other markets. We believe the difficulty of predicting collective action dynamics is a general problem that is relevant in any multilateral market that uses standard boilerplate contract terms. Earlier papers by Kahan (2002) and Kahan and Rock (2009) focused on corporate bond contracts and also identified the need to better understand both the operation of collective versus individual contract rights and the role of activist investors (our contract arbitrageurs). Our paper provides further evidence that activist investors strive to avoid informing the market of their activities, thereby impairing the arbitrage function that provides the economic justification for the rents that they capture from other actors in the market.

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**Table 1. Definition of variables**

<b>Variable</b>	<b>Description</b>	<b>Units/Scale</b>	<b>Source</b>
Vote	Minimum percentage of bondholders required to change the payment terms. 100% is coded as Vote=1	Decimals	Perfect Info
Vote85	=1 if Vote = 0.85, =0 otherwise	Binary	Perfect Info
Vote100	=1 if Vote = 1, =0 otherwise	Binary	Perfect Info
Bm Yield	US government benchmark yield 10YR	% (log)	Datastream
VIX	VIX index, settlement price	% (log)	Datastream
BBB-AAA Spread	Yield spread between BofA Merrill Lynch US Corporate AAA and BBB	bps (log)	Datastream
Rating	Average of foreign currency LT debt issuer rating given by Fitch, Moody's and S&P	14 (B+) to 22 (SD)	Bloomberg
CDS	5YR CDS spread, senior unsecured debt with CR clause	% (log)	Datastream
Resid Mat	Distance to maturity	Months (log)	Datastream
BA Spread	Percentage bid-ask spread (Pask - Pbid)/Pmid	%	Datastream
Coupon	Annual Coupon	%	Datastream

**Table 2. Descriptive Statistics**  
**Panel A: Bond-Invariant Variables**

Variable	N	mean	p25	p50	p75	sd
Bm Yield (% , log)	310	1.142	1.045	1.159	1.225	0.118
VIX (% , log)	310	2.749	2.613	2.724	2.88	0.204
BBB-AAA Spread (bps, log)	310	4.755	4.559	4.729	4.948	0.352
Rating (index)	310	16.72	14.667	17.233	18.333	1.877
CDS (% , log)	310	7.697	6.819	8.106	8.518	0.866

**Panel B: Venezuela Sovereign Bond-Level Variables**

Variable	N	mean	p25	p50	p75	sd
Vote	15	0.813	0.75	0.75	0.85	0.103
Coupon	15	9.615	7.65	9.25	11.95	2.516
Yield (% , log)	4650	3.016	2.581	2.97	3.387	0.513
Resid Mat (months, log)	4650	4.629	4.234	4.754	5.13	0.69
BA Spread (%)	4027	2.108	1.387	2.085	2.877	3.599

**Panel C: PDVSA Bond-Level Variables**

Variable	N	mean	p25	p50	p75	sd
Vote	11	1	1	1	1	0
Coupon	11	7.193	5.375	6	9	2.468
Yield (% , log)	2170	3.053	2.681	3.059	3.36	0.434
Resid Mat (months, log)	3410	4.901	4.539	4.868	5.429	0.509
BA Spread (%)	2014	1.858	1.614	2.298	2.965	5.041

**Table 3. Near Default Pricing**

The models in Table 3 are estimated on bond-week level data for Venezuela's sovereign bonds using random effects with errors clustered by bond. The dependent variable for the models is the log of the secondary market redemption yield for each bond. We include as independent variables the following time variant control variables: the 10YR US benchmark yield (Bm yield, in logs); the VIX index as a proxy for market volatility (VIX, in logs); the spread between US corporate AAA and BBB bonds as a proxy for the credit risk premium (BBB – AAA Spread, in logs). We also construct a variable to measure issuer credit risk. We map daily long-term issuer credit ratings issued by Fitch, Moody's and Standard & Poor's to a numeric scale ranging from 14 (B+, for Standard & Poor's and B+ for Fitch) to 22 (SD, for Standard and Poor's). Then we create Rating as the weekly average of daily averages across the three rating agencies and include Rating as an independent variable in the models. We include a number of bond specific control variables including: residual maturity, given by the difference between a bond maturity and week t (Resid Mat, in log-weeks); the coupon rate (Coupon%, in percentage); and the bid-ask spread (BA Spread%, in percentage) as a proxy for bond liquidity. In Model 1, we include as an independent variable Vote, the minimum percentage of bondholders required to change the payment terms for bond i, and an interaction term between Rating and Vote. In Model 2, we replace Vote with indicator variables for Vote85 (minimum vote threshold of 85% to change payment terms) and Vote100 (minimum vote threshold of 100% to change payment terms) using bonds with a 75% vote threshold to change payment terms as the base category instead of the Vote variable. We also include interaction terms between Rating and Vote85 and Vote100 respectively. In Model 3, we re-estimate Model 1 replacing Vote with Crisis, an indicator variable for when Rating is greater or equal to 17 (corresponding to CCC+ or lower rating by Standard & Poor's for Venezuela) and replacing the Rating x Vote interaction variable with Crisis x Vote. In Model 4, we re-estimate Model 2 replacing Rating with Crisis and include interaction terms between Crisis and Vote85 and Vote100.

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
	<b>Yield (% , log)</b>	<b>Yield (% , log)</b>	<b>Yield (% , log)</b>	<b>Yield (% , log)</b>
Vote	-2.723 (-1.32)		-1.623 (-1.32)	
Vote85		-0.637 (-0.97)		-0.0568 (-0.16)
Vote100		-0.641 (-1.29)		-0.435 (-1.31)
Bm Yield	0.266** (5.88)	0.255** (6.67)	0.434** (7.46)	0.425** (7.49)
VIX	0.0986** (4.73)	0.0949** (4.76)	0.179** (7.19)	0.176** (7.13)
BBB-AAA Spread	0.452** (10.42)	0.451** (11.44)	0.228** (4.55)	0.227** (4.95)
Rating	0.134+ (1.67)	0.205** (23.59)		
Resid Mat	-0.575** (-5.16)	-0.567** (-5.47)	-0.726** (-6.28)	-0.715** (-6.68)

BA Spread	0.00428 (1.45)	0.00456 (1.60)	0.00876* (2.30)	0.00895* (2.26)
Coupon	0.0249 (0.88)	0.0352 (1.03)	0.0277 (0.72)	0.0386 (0.85)
Rating x Vote	0.101 (0.98)			
Rating x Vote85		0.0416 (1.43)		
Rating x Vote100		0.0205 (0.92)		
Crisis			0.451+ (1.82)	0.572** (18.58)
Crisis x Vote			0.181 (0.58)	
Crisis x Vote85				0.150+ (1.96)
Crisis x Vote100				0.0209 (0.31)
Constant	1.305 (0.90)	-0.789 (-0.97)	5.045** (4.04)	3.695** (4.62)
<i>N</i>	4027	4027	4027	4027
R-overall	0.6879	0.7016	0.5537	0.5676

*z* statistics in parentheses; +  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ .

**Table 4. Marblegate Tests**

The models in Table 4 are estimated on bond-week level data for Venezuela’s sovereign bonds using random effects with errors clustered by bond. The dependent variable for the models is the log of the secondary market redemption yield for each bond. We include as independent variables the following time variant control variables: the 10YR US benchmark yield (Bm yield, in logs); the VIX index as a proxy for market volatility (VIX, in logs); the spread between US corporate AAA and BBB bonds as a proxy for the credit risk premium (BBB – AAA Spread, in logs). We also construct a variable to measure issuer credit risk. We map daily long-term issuer credit ratings issued by Fitch, Moody’s and Standard & Poor’s to a numeric scale ranging from 14 (B+, for Standard & Poor’s and B+ for Fitch) to 22 (SD, for Standard and Poor’s). Then we create Rating as the weekly average of daily averages across the three rating agencies and include Rating as an independent variable in the models. We include a number of bond specific control variables including: residual maturity, given by the difference between a bond maturity and week t (Resid Mat, in log-weeks); the coupon rate (Coupon%, in percentage); and the bid-ask spread (BA Spread%, in percentage) as a proxy for bond liquidity. In Model 1, we include as an independent variable Vote, the minimum percentage of bondholders required to change the payment terms for bond i. We also include an indicator variable for the bond yields in the time period after the week containing January 17, 2017 (termed “Marblegate”) and interaction terms between Marblegate and Vote85 and Vote100. In Model 2, we replace Vote with indicator variables for Vote85 (minimum vote threshold of 85% to change payment terms) and Vote100 (minimum vote threshold of 100% to change payment terms) using bonds with a 75% vote threshold to change payment terms as the base category. We also include interaction terms between Marblegate and Vote85 and Vote100.

	<b>Model 1</b>	<b>Model 2</b>
	<b>Yield (% , log)</b>	<b>Yield (% , log)</b>
Vote	-1.012 (-1.11)	
Vote85		0.0496 (0.21)
Vote100		-0.296 (-1.19)
Bm Yield	0.279** (6.31)	0.277** (6.61)
VIX	0.114** (6.17)	0.114** (6.16)
BBB-AAA Spread	0.469** (10.27)	0.468** (10.53)
Rating	0.216** (23.79)	0.216** (23.52)
Resid Mat	-0.567** (-4.63)	-0.562** (-4.79)
BA Spread	0.00418	0.00422

	(1.29)	(1.30)
Coupon	0.0252 (0.91)	0.0346 (1.03)
Marblegate	-0.208 (-0.66)	0.0150 (0.41)
Marblegate x Vote	0.304 (0.80)	
Marblegate x Vote85		0.0846 (1.19)
Marblegate x Vote100		0.0701 (0.79)
Constant	-0.264 (-0.21)	-1.140 (-1.29)
<i>N</i>	4027	4027
R-overall	0.6922	0.7020

*z* statistics in parentheses; <sup>+</sup>  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$

**Table 5. Collateral and Hunger Bonds**

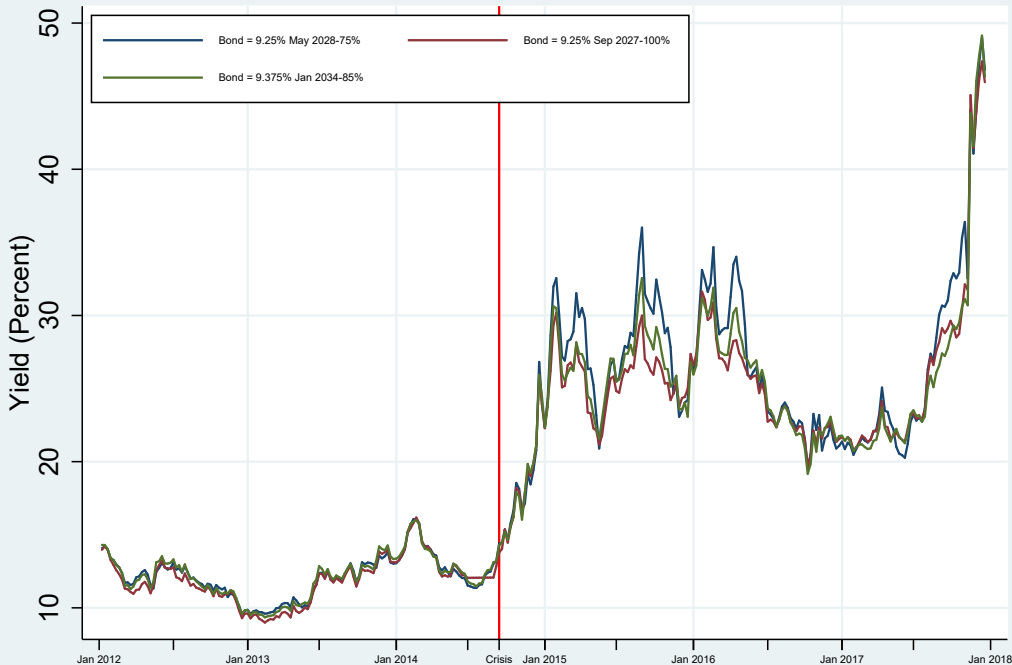
The models in Table 5 are estimated on bond-week level data for PDVSA bonds using random effects with errors clustered by bond. The dependent variable for the models is the log of the secondary market redemption yield for each bond. We include as independent variables the following time variant control variables: the 10YR US benchmark yield (Bm yield, in logs); the VIX index as a proxy for market volatility (VIX, in logs); the spread between US corporate AAA and BBB bonds as a proxy for the credit risk premium (BBB – AAA Spread, in logs). We also construct a variable to measure issuer credit risk. We map daily long-term issuer credit ratings issued by Fitch, Moody's and Standard & Poor's to a numeric scale ranging from 14 (B+, for Standard & Poor's and B+ for Fitch) to 22 (SD, for Standard and Poor's). Then we create Rating as the weekly average of daily averages across the three rating agencies and include Rating as an independent variable in the models. We include a number of bond specific control variables including: residual maturity, given by the difference between a bond maturity and week t (Resid Mat, in log-weeks); the coupon rate (Coupon%, in percentage); and the bid-ask spread (BA Spread%, in percentage) as a proxy for bond liquidity. In Model 1, we include an indicator variable for Collateral Bond. In Model 2, we include an indicator variable for Hunger Bond. In Model 3, we include indicator variables for Collateral Bond and Hunger Bond.

	<b>Model 1</b> <b>Yield (% , log)</b>	<b>Model 2</b> <b>Yield (% , log)</b>	<b>Model 3</b> <b>Yield (% , log)</b>
Bm Yield	-0.0133 (-0.24)	-0.0840 (-1.00)	-0.0295 (-0.54)
VIX	0.0894** (4.03)	0.0963** (5.04)	0.0986** (4.48)
BBB-AAA Spread	0.215** (4.15)	0.189** (3.26)	0.203** (4.10)
Rating	0.184** (9.18)	0.197** (9.28)	0.189** (9.24)
Resid Mat	-0.472** (-4.79)	-0.175 (-0.79)	-0.374** (-4.87)
BA Spread	0.00490** (3.16)	0.00668** (3.39)	0.00584** (3.28)
Coupon	0.0154 (0.72)	0.0347* (2.50)	0.0278 (1.64)
Collateral Bond	-1.088** (-13.62)		-0.976** (-15.38)
Hunger Bond		0.625** (2.78)	0.409** (5.38)
Constant	0.875 (1.12)	-0.861 (-0.72)	0.252 (0.38)
<i>N</i>	2014	2014	2014

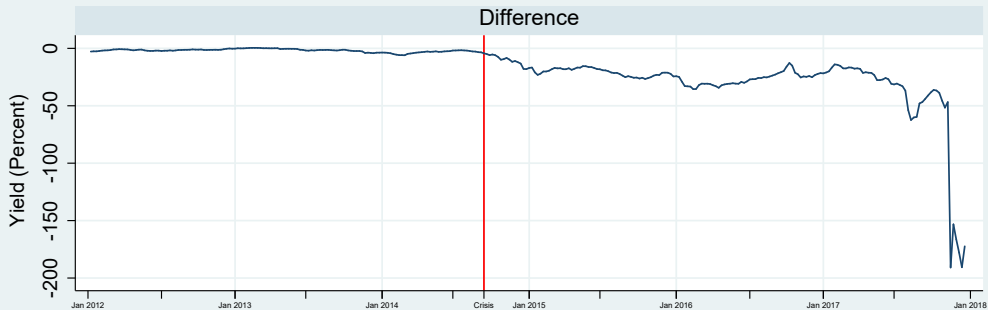


R overall	0.8708	0.7892	0.8953
<hr/>			
<i>z</i> statistics in parentheses; <sup>+</sup> $p < 0.10$ , <sup>*</sup> $p < 0.05$ , <sup>**</sup> $p < 0.01$			

# Figure 1. 100% v 85% v 75% Vote Threshold



# Figure 2. 85% v 75% Vote Threshold



# Figure 3. Yields Around Marblegate Decision

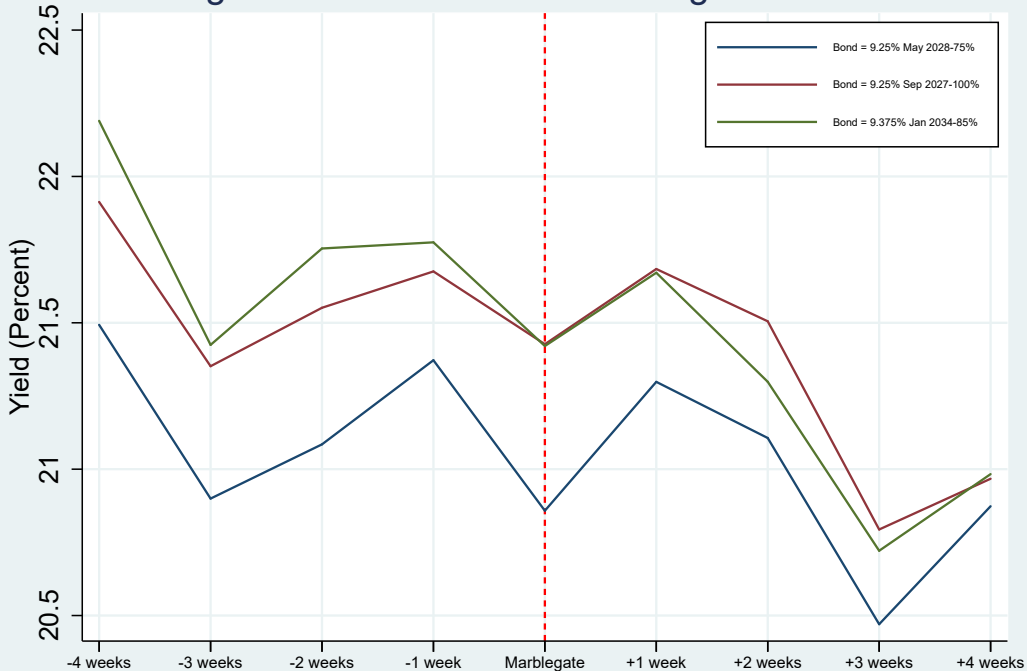


Figure 4. PDVSA Bonds

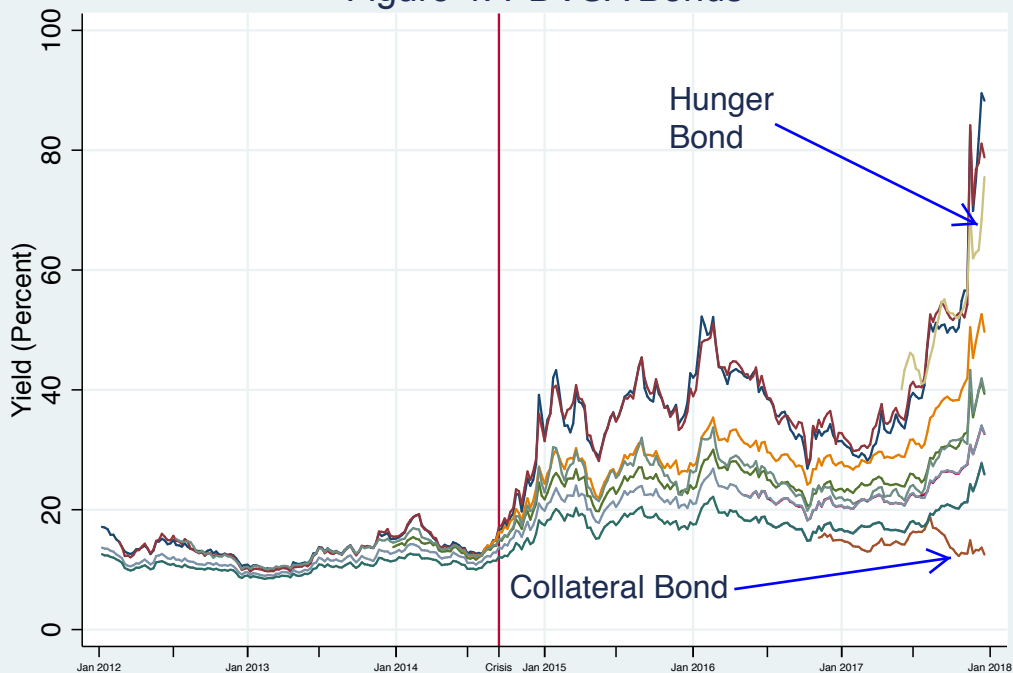
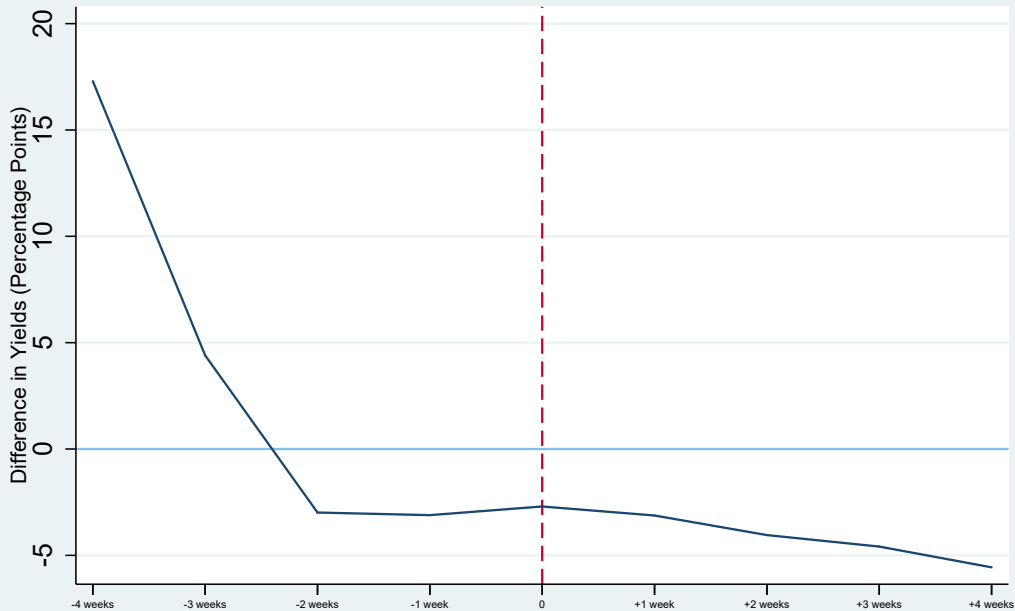


Figure 5. 85% (Rumor Bond) v Comparison Bonds  
Centered on Week of January 29, 2018



85% (Rumor Bond)=9.375% Jan 2034-85% and Comparison Bonds=Mean of 9.25% May 2028-75% and 9.25% Sep 2027-100%