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ORIGINAL PAPER

The Hausmann–Gorky Effect

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Abstract
On May 26, 2017, Harvard economist Ricardo Hausmann published an Op Ed titled "Hunger Bonds", urging investors to avoid Venezuelan sovereign bonds on the grounds that the country was prioritizing payments on the bonds over remedying a humanitarian crisis. Contemporaneously, news emerged regarding a suspicious looking bond issue by Venezuela's oil company that was purchased largely by Goldman Sachs. That bond got tagged with the label "Hunger Bond", and suffered a price hit. Using both quantitative data and interviews with investors, we examine the causes of the Hunger Bond penalty, its impact on the prices of other outstanding Venezuelan bonds, and how long it was sustained. The primary determinants of the Hunger Bond penalty appear to have been a combination of negative press attention and crowd-sourced disapproval. For instance, we show that a large number of Google searches for "Hunger Bonds" are associated with a 200 basis point increase in the spread of the bond purchased by Goldman Sachs.

Keywords Odious debt · Sovereign finance · Venezuela

Introduction: Odious Regimes Versus Odious Debts

For over a century, legal scholars have debated the question of whether there is, or should be, in public international law, a doctrine of Odious Debts. The general rule in international law is that governments inherit the debts of prior governments, regardless of their character. This is known as the "strict rule of government succession" (Buchheit et al. 2007). History teaches us nevertheless that there have been exceptions to the strict rule, where new governments have not paid the debts of their predecessors. Two of the most famous are the debts of Imperial China and the Russian Tsar (Lienau 2014). Almost always the reason has been that the new government has found the prior one distasteful or illegitimate (Buchheit et al. 2007; Ludington et al. 2010). The question for international law scholars though, has been whether there are cognizable *legal* excuses for a government not to pay the debts of their distasteful predecessors; excuses that can serve as a legal defense against lawsuits that unhappy creditors inevitably bring.

In particular, the instances that have generated the most discussion are those where a government becomes hostile to the interests of its own people and uses the proceeds of its borrowing to do things like buy guns to quash popular uprisings. The question then is whether the despotic government's debts have to be repaid once the good guys succeed in taking over. Over the years, this question has intrigued scholars from a variety of disciples including economics, philosophy, political science, history, and law (Dimitriu 2015; Lienau 2014; Gosseries 2007; Perez and Weissman 2007).

To take the perspective of the discipline that has been most interested in Odious Debts other than law, economics, the rationale for an anti-despot exception to the strict rule of government succession is the following: If creditors know, ex ante, that the debts incurred by despotic governments are legally infirm, they are going to be less willing to lend to them. In other words, the cost of capital for despotic governments will be higher than that of good governments. That, in turn, will deter despots from seeking power in the first place or, to the extent every despot starts out a good guy, deter the good guys from turning bad. Alternatively, lack of financial resources will weaken the odious government and,

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hopefully, lead to a democratic transition (Stiglitz 2003; Jayachandran and Kremer 2006; Bolton and Skeel 2007; Center for Global Development 2010).[1]

Despite the scores of academic articles advocating some version of an Odious Debt exception, the rule of government succession rule remains strict in international law.[2]

The reason is that changes in public international law require a high degree of consensus in the international community. And it is difficult to get consensus on a definition of what it means for a government to be despotic. Put simply, the move towards a legal doctrine of Odious Debt that focuses on starving despotic regimes of capital has not gained traction.

For purposes of this article, we put aside the question of whether raising the cost of capital for despotic regimes is welfare enhancing. We focus on the narrower question of whether recent events in Venezuela have shown an alternate path to the goal of increasing the cost of borrowing for despotic governments.

The key events that took place were the following:

- *First, on May 23*, 2017, the asset management arm of Goldman Sachs (GSAM) purchased $2.8 billion in bonds of the Venezuelan state-owned oil company, PDVSA. GSAM paid 31 cents on the dollar, for a total disbursement of about $865 million (Vyas and Kurmanaev 2017). Nomura Capital also purchased some of these bonds—about $100 million—but GSAM garnered the bulk of the attention. On its face, GSAM appeared to have purchased these bonds on the market through a broker, but, almost simultaneously, Venezuela's international reserves increased by a large amount. The top panel of Fig. 1 shows the monthly evolution of Venezuela's stock of international reserves. Reserves, which had reduced from $10.6 billion at the end of January 2017 to $10.1 billion at the end of April 2017, increased by roughly $750 million (back to nearly $10.6 billion) during May 2017. Daily data from the Central Bank of Venezuela show a sudden jump in reserves within two days of the of GSAM purchase of PDVSA bonds with an increase in reserves from $10,130 million on May 23 to $10,893 million on May 25 (bottom panel of Fig. 1). Press articles on May 31 and June 1, 2017 (Tanzi 2017 and; Tanzi and Zerpa 2017) pointed out the obvious fact that that this $765 million increase in international reserves was suspiciously close to the $865 million paid by GSAM for the PDVSA bond. That, combined with the fact that the broker was a little-known intermediary that was likely a front, suggested to some that these bonds, while purportedly sold to GSAM in a secondary market transaction, were actually being sold by the Venezuelan government (Wigglesworth and Long 2017).
- *Second, on May 26, 2017*, the noted Harvard economist, Ricardo Hausmann, published an Op Ed in *Project Syndicate* titled "Hunger Bonds" (Hausmann 2017). Hausmann argued that investing in Venezuelan bonds was causing immense harm to the Venezuelan people, because it was helping finance a despotic regime that was privileging the repayment of bondholders over the welfare of people (who were and are, literally, suffering through a malnutrition crisis). He also, the same day, went on *Bloomberg Television* to talk about his idea (Crooks 2017). Hausmann's target in the May 2017 piece was JP Morgan's emerging markets index (the EMBI+). He was advocating that JP Morgan remove Venezuela from the EMBI + so as to make Venezuelan bonds less attractive to the markets and particularly fund managers who measure their performance as a function of how they do vis-à-vis the index. Pulling no punches, he asked:

> Should decent people put their money in emerging-market bond funds? The returns of the JP Morgan Emerging Market Bond Index (EMBI+) are heavily influenced by what happens in Venezuela. The reason is simple: while Venezuela represents only about 5% of the index, it accounts for about 20% of its yield, because the yield on Venezuelan debt is about five times larger than that of other countries in the index, a reflection of the huge risk premium that Venezuela faces. Moreover, the price volatility of Venezuelan debt—the highest in the EMBI+—accounts for a disproportionate share of the index's daily price movements.

[1] For skeptics from the economic perspective, who point to implementation barriers and possible collateral damage, see Rajan (2004); Choi and Posner (2007); and Janus (2012).

[2] To quote from two prominent legal commentators:Anna Gelpern writes:

> [N]o national or international tribunal has ever cited Odious Debt as grounds for invalidating a sovereign obligation. Each of the treaties and other examples of state practice cited even by the doctrine's most thorough and principled advocates appears fundamentally flawed-it lacks one or more of the doctrine's essential elements and/or is accompanied by a chorus of specific disavowals of the doctrine by indispensable parties. But even if the examples were on point, the fact that Odious Debt's most fervent proponents to this day must cite an 1898 treaty and a 1923 arbitration as their best authorities suggests that the law-making project is in trouble.

Gelpern (2005, p. 406).

Christoph Paulus writes:

> The present article addresses itself exactly to [the] task [of analyzing the historical basis for a doctrine of Odious Debts] and comes to the conclusion that the remarkable inconsistencies within this historical development in addition with the almost complete lack of any explicit case material lead to the result that there is no such legal concept of odious debts.

Paulus (2007, abstract). For optimistic perspectives on the existence of an Odious Debt doctrine, see Howse (2007) and King (2016).

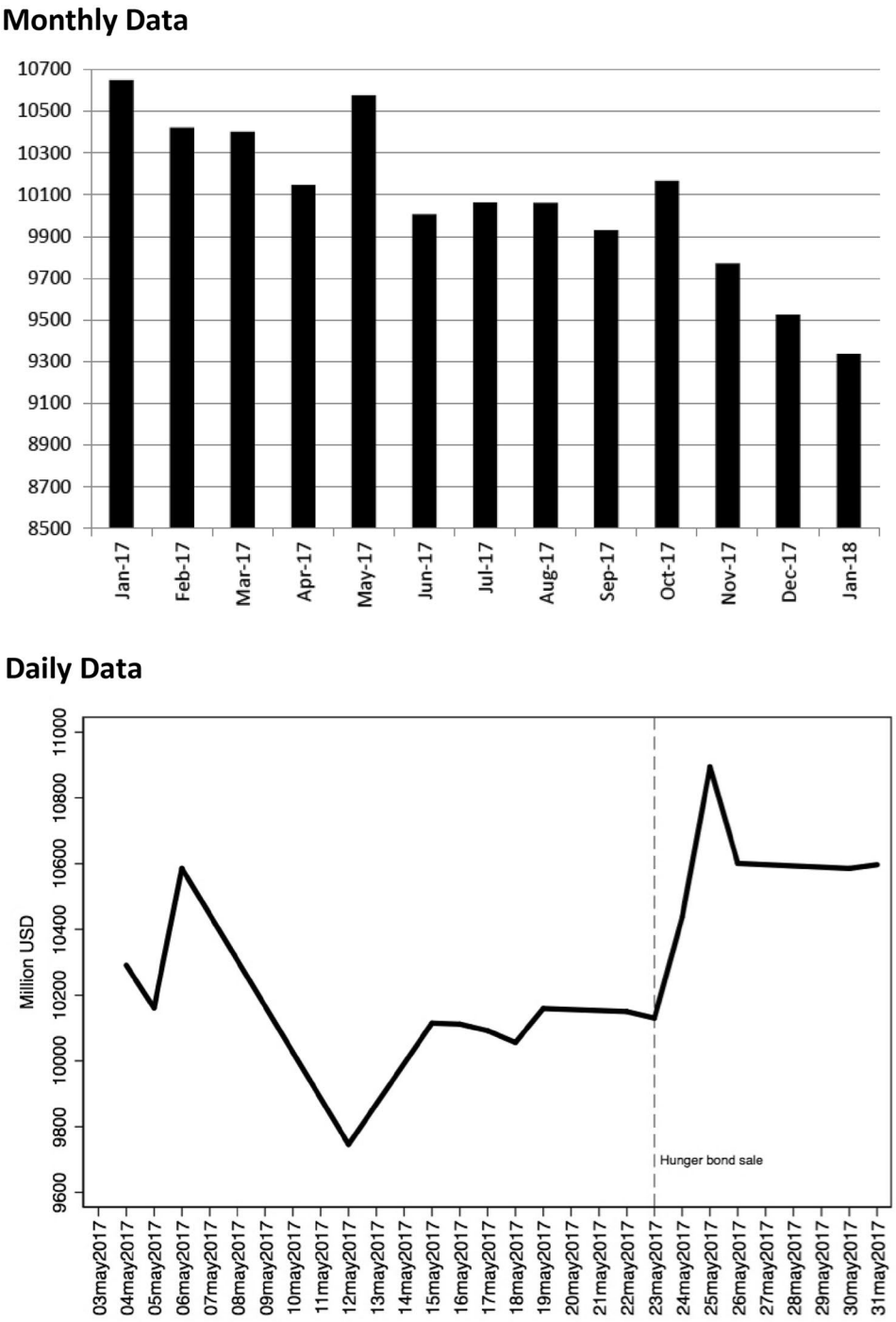

Fig. 1 International reserves (millions USD)

You might invest in the EMBI+ because it promises higher returns, or because you want to make your savings available to a larger segment of humanity. But if you do, you will root for Venezuelan debt, which means wishing for really bad things to happen to Venezuela's people.

Relevant, for our story, is that Hausmann did not at any point in his piece mention the Goldman Sachs purchase two days prior.[3] Nor did he say anything about the legal doctrine

[3] We emailed and asked him specifically and he responded that he had known nothing about the GSAM purchase at the time he wrote the Hunger Bonds piece—he only learned of it two days later from a Wall Street Journal piece that he then tweeted.

Table 1 Hunger bond, spread and liquidity at issuance

Date	Hunger bond (PDVSA 2014 6% 28/10/2022)				Control 1 (PDVSA 2011, 12 3/4%, 17/02/2022)				Control 2 (PDVSA 2014, 6%, 16/05/2024)			
	Price	YTM (bps)	Spread (bps)	Bid/ask	Price	YTM (bps)	Spread (bps)	Bid/ask	Price	YTM (bps)	Spread (bps)	Bid/ask
05/25/17	37.9	3720	3552	0.1	61.3	3329	3171	0.9	39.5	2872	2681	0.8
05/26/17	32.7	4299	4130	0.1	61.2	3341	3183	1	39.8	2855	2663	1
05/29/17	32.7	4313	4142	0.1	60.9	3366	3207	0.8	39.6	2867	2675	1
05/30/17	32.5	4312	4146	0.1	61.4	3329	3173	0.9	39.6	2866	2677	0.9
05/31/17	32.3	4332	4195	0.1	61.2	3341	3187	1.0	39.4	2885	2698	1
06/01/17	32.6	4363	4162	0.1	60.7	3387	3231	1.1	39.1	2911	2723	1
06/02/17	32.7	4325	4151	0.1	60.9	3369	3216	1.0	39.5	2897	2696	1

of Odious Debts. His piece was about the ethics of investing. Indeed, he wasn't even the first have used the "hunger bonds" term. It had been coined months prior by Venezuelan businessman Jorge Botti in a Twitter post and had not garnered much attention; at least not in terms of impacting the willingness of investors to buy Venezuelan bonds. Hausmann's timing in using the term in his *Project Syndicate* piece was near perfect.

Adding two plus two, GSAM appeared to be providing direct funding to the Venezuelan government, flying in the face of Hausmann's plea for the government to be starved of capital. Adding fuel to the fire, GSAM appeared to have purchased its bonds at roughly 31 cents on the dollar (about 100 basis points below what other similarly situated PDVSA bonds were trading at). The Washington Post, the Boston Globe, the New York Times, the Wall Street Journal, Reuters, Bloomberg, Fortune, Forbes, the Financial Times, the Economist, all reported on the story. Those stories then got tweeted and retweeted by both Hausmann and US Senator Marco Rubio, both of whose followers number in the hundreds of thousands. Hausmann also went on CNN; this time talking about the GSAM purchase (Gillespie 2017). Protests broke out outside GSAM's office in New York, with many protesters using the term "hunger bonds" on their placards. The result: The Hunger Bond name got indelibly joined with the single issuance that GSAM had purchased on May 25, 2017.

- *Third, also on May 26*, piggybacking on the protests, a Venezuelan opposition leader, Julio Borges, sent out public letters—purportedly aimed at the investment community—asserting that a large portion of the proceeds of the bond issue would be used to buy military equipment (supposedly $300 million worth). The letters also condemned the Venezuelan government for being illegitimate and asserted that the opposition, when it came to power, would call for a "thorough investigation of this dubious transaction" (Tanzi and Soto 2017). And it added, for good measure, that the bonds would not be paid if and when the opposition came into power. Versions of these letters had also been sent out prior to the GSAM purchase of the Hunger Bonds, in April 2017, but they had gotten little attention. Now, thanks to a combination of factors, they had made the international news.

What appears to have happened as a result of the foregoing sets of events was to create chatter in the market about some combination of a heightened legal risk and reputational taint for anyone purchasing the particular bond issue that GSAM and Nomura had purchased on May 23, 2017 (the Hunger Bond).

On its first day of trading (May 25, 2017), the Hunger Bond had a yield to maturity of 3720 basis points, corresponding to a spread over US Treasuries of 3552 basis points (Table 1). Two comparable bonds also issued by PDVSA, one maturing 8 months before the Hunger Bond (PDVSA 2011, 12 3/4%, 17/02/2022) and one maturing 19 months after the Hunger Bond (PDVSA 2014, 6%, 16/05/2024) were trading at yields of 3329 and 2872 basis points, respectively (corresponding to spreads over US Treasuries of 3171 and 2681 basis points).[4] While on the first day of trading, the Hunger bond traded at a discount with respect to comparable bonds, it traded at a large premium with respect to what GSAM had purportedly paid for it. On May 23, GSAM had paid 31 cents for the bond and, on May 25, the bond closed at a price of 37.9: a 22% price increase in two days.

On the day of the Hausmann *Project Syndicate* piece, the price of the Hunger Bond dropped by 14% (from 37.9 to 32.7, just above the price paid by GSAM) and the yield and the spread increased by nearly 600 basis points (the yield reached 43% and the spread surpassed 4100 basis points). There was, however, no change in price in the other two PDVSA bonds described in Table 1. In the next 5 days of

[4] Note that the first bond is closer in maturity with respect to the Hunger Bond but it has a much higher coupon (12 ¾% instead of 6%). The second bond has longer maturity but the same coupon (6%). In theory, when comparing spreads the coupon should not make a big difference. However, the coupon changes the duration of the bond and may become important in the presence of high default risk.

trading, the spread of the Hunger Bond remained stable at around 4151 basis points. The other two bonds continued trading at a price similar to that of May 25. The increase in the spread documented in Table 1 is remarkable given the discount at which Venezuelan bonds were already trading.

Roughly speaking, between 5/25 and 6/2, the week after Hausmann's *Project Syndicate* piece came out, Goldman took a loss of about $50 million on the Hunger Bond. To provide more context, the spread between a Venezuelan bond with a Collective Action Clause requiring a 100% vote to change payment terms and one of roughly the same maturity that required only a 75% vote (i.e., a weaker bond, vis-à-vis a future restructuring) was in the 5–10 basis points around same time (Carletti et al. 2017). To quote Christine Jenkins Tanzi of Bloomberg:

> Opponents [of the Maduro regime had] struggled to bring attention to the [protest] movement until May, when Goldman Sachs Group Inc. made a big purchase that provided the regime with desperately needed dollars. Critics pounced on what they saw as a soulless investment bank throwing a lifeline to a despot. "Hunger bonds" became one of the themes of a demonstration outside Goldman's New York headquarters, and the phrase showed up in tweets and memes featuring images of malnourished Venezuelans scavenging for food. The opposition-controlled National Assembly vowed to investigate the deal (Tanzi 2017).

The press accounts about the Hunger Bond, and our interviews with investors, suggested that the market was imposing a penalty on this bond issue because of some combination of a higher risk of repudiation and reputational taint. But neither the market players we spoke to nor the press accounts made clear what the legal basis for the increased risk of repudiation was or what the long-term pricing penalty was.

Below, we attempt to unpack these questions.

As noted at the outset, prior attempts to create an international legal regime that would condemn the debts of particular despotic government as Odious have failed. Part of the reason has been that the governments around the world—who control the determination of what international law is—have been unable to coordinate agreement over a definition of an Odious Regime.[5]

An alternate is the possibility of using domestic laws, either of the country of the despotic regime, or those the jurisdictions where the debt was issued (e.g., New York) (Gulati and Panizza 2018b; Buchheit et al. 2007). Here, the idea is to find and use infirmities with particular debts under domestic laws to threaten their repudiation in the future – for example a failure to follow the proper procedures for obtaining legislative authorization for a debt issuance (something that a despot might be unwilling to do). If it were the case that despotic regimes were likely to make legal process errors whereas good governments were not, then we have, in theory, a way to increase the cost of capital for bad regimes.

The foregoing route will not satisfy all advocates for the idea of an Odious Debt legal doctrine. That is because the traditional goal of an Odious Debt doctrine was to taint *all* of a despotic regime's debt stock, regardless of legal infirmities with individual issuances. But that sort of a legal regime is showing few signs of materializing. Our premise though is that inherent in the nature of a despotic regime is that there will be high levels of misbehavior and corruption. That is, a high probability that there will be characteristics of individual bond issuances that, if flagged in advance for investors, would cause them to avoid these issuances. And the Hunger Bonds may provide one such example, perhaps pointing in the direction of a new and workable mechanism for achieving at least some of the goals of the Odious Debt movement.

Before concluding that a path to a new method of forcing the cost of capital for despotic regimes has been devised though, we have to figure out whether in fact there was a meaningful Hausmann Effect on the pricing of these bonds and, if so, how long it lasted and how it evolved as a function of additional pieces of news regarding Venezuela's impending default.

The ongoing Venezuelan debt crisis allows us to ask these questions for two reasons. First, because Venezuela has a large stock of debt outstanding (roughly $65 billion in unpaid bond indebtedness; for a discussion of the challenges linked to restructuring Venezuela's debt see Buchheit and Gulati 2018a, b); with multiple bonds that are near identical to the Hunger Bond, albeit without comparable levels of legal taint and condemnation by the international press, we can examine the effect of the Hunger Bond taint. Second, Venezuela, while appearing to be on the brink of default when GSAM purchased the Hunger Bonds—the six-month CDS contracts at the time were predicting a probability of default of over 70%—managed to stay out of default for another six months. Indeed, as of this writing in January 2019, although Venezuela is in default on almost all of its bonds and has been classified as being in selective default by the rating agencies, the majority of investors have not yet called for accelerations. And a moratorium on debt payments by the Venezuelan state has not yet occurred. That gives us more data in a near-default scenario—where we expect the

[5] To quote the opening paragraph of a World Bank report on the topic:

> The last few years have seen a rising chorus of demands from non-governmental and civil society organizations for the cancellation of the sovereign debt of many developing countries on the grounds that such debt is "odious". Yet there is little agreement on a workable definition of "odious" debts. This should hardly be surprising, because those promoting the cancellation of "odious" debts are doing so for a variety of reasons, often pursuing widely differing aims.

(Nehru and Thomas 2008).

effect of the taint to be salient to investors—than we would ordinarily expect to have.

Before proceeding, we note that what we call the "Hausmann Effect", is not the first of its kind. Economic historians Stephanie Collet and Kim Oosterlinck, in a 2018 article in the *Journal of Business Ethics*, documented a similar effect of an editorial written by another famous intellectual, Maxim Gorky, in 1906, which pointed to a legal process infirmity with the issuance of a particular bond issue by the Russian Tsar. In that case also, the particular bond targeted by Gorky suffered a significant price penalty compared to the other outstanding Russian Tsarist bonds. Hence, the title of our article is "The Hausmann-Gorky Effect".

Analysis and Empirical Tests

Before delving into empirical tests, we set out the possible legal risks with the Hunger Bonds that could translate into an increased risk of repudiation by some future and more legitimate government of Venezuela. There were four possible elements to this heightened legal risk/reputational stink around the Hunger Bond issuance.

- *First*, even though the bonds were purportedly issued by PDVSA, the proceeds of the bonds appeared to have gone directly into the coffers of the Republic; hence the sudden increase in its international reserves. If, in effect, the bonds had been issued by the Republic, using the oil company as a front, then that might mean that the bonds were legally infirm when issued. The reason being that, under Venezuelan domestic law, all debt issuances by the Republic require legislative approval. If the issuance was really a Republic issuance, with PDVSA as a front, then it was illegally issued since legislative approval had not been obtained. And given the hostility of the members of the legislature to the Maduro administration, approval would not have been forthcoming.

Arguing for foregoing though (what is called "alter ego" liability) is a long shot, as commentators have pointed out (Weidemaier and Gauthier 2017). PDVSA is a 100% owned subsidiary of the Republic of Venezuela. So, in a sense, it is not surprising that the Republic would choose to take for itself a portion of the capital raised by PDVSA. For courts to agree to do veil piercing, there would have to be more; usually, evidence of fraud.

- *Second*, the below-market rates at which the bonds were issued created a whiff of corruption. Someone might have gotten a kickback since there was no obvious reason, otherwise, for the bonds to be issued at a 100 basis points below what equivalent other bonds were being traded. Suspecting that there was corruption is not enough without more concrete evidence though. Further, to the extent the entity asserting corruption as a defense to paying the debt is a future (non-Maduro) government in Venezuela, this assertion will hit the objection that, as a legal matter, the future and current government of Venezuela are one and the same and that a debtor cannot assert its own corruption as a defense to paying its debts.[6]
- *Third*, is the OID or Original Issue Discount problem. When GSAM purchased the Hunger Bond in 2017, the stated yield on the bond was 6%. The market yield though, for a similarly situated already trading PDVSA bond was in the mid 30 s and GSAM's purchase price suggested an even higher yield of around 40%. In other words, the principal amount on the bond was inflated considerably. Given the predictions of imminent default at the time, this was relevant because when a bond defaults and payments are accelerated, it is the principal amount that is accelerated and not the un-accrued interest. So, GSAM would end up getting a bonus in the form of unearned interest masquerading as principal—all at the expense of the Venezuelan taxpayer and other, prior, creditors.[7] As a legal matter, bankruptcy courts in the US sometimes will refuse to recognize the fake principal; and commentators speculated that GSAM's bond would be vulnerable to the same problem (NERA 2017)—although it has to be noted that this risk only comes into play if PDVSA goes into a US (or similar) bankruptcy court proceeding; and it is not clear, at this stage, that that is the way its default will play out.
- *Fourth*, the letters sent by the Venezuelan opposition, and the publicity and criticism that the GSAM purchase received, put investors on notice regarding the legal infirmities with the bonds. Credit Suisse, for one,

[6] A complication here is whether a successor regime can use the "unclean hands" (*in pari delicto*) defense to defend actions by its predecessor regime. In the corporate context, this has been held to be possible in at least some contexts such as that of a receiver in bankruptcy. *See* Scholes v. Lehmann, 56 F.3d 750, 752–753 (7th Cir. 1995) (Posner, J.); *see also* Buchheit et al. 2007, pp. 1257–1258. But the claim appears less likely to work in the sovereign context where a new government is trying to defend against paying the obligations of a misbehaving predecessor government. *See* Republic of Iraq. v. ABB et al., 768 F.3d 145 (2d. Cir. 2014). So, ultimately, this may boil down to whether the court in question sees PDVSA as a separate enough entity from the Republic to view it as a corporation or sees it as essentially the sovereign.

[7] In effect, assuming a default, the later creditor with the inflated principal amount obtains a type of structural priority over prior creditors by taking a disproportionate share of the limited set of assets that the distressed debtor has. Scholars of sovereign debt have flagged this debt dilution scenario as a potential problem in settings where there is no enforceable formal priority structure for debt, but this is one of the few concrete examples we have seen. *See* Weidemaier and Block-Lieb (2018); Bolton and Jeanne (2009).

announced publicly that it would not facilitate trading in this bond (Wigglesworth and Platt 2017). And JPMorgan's EMBI+ index, Hausmann's original target, while ignoring his call for it to drop all of the Venezuelan sovereign debt from the index, dropped the Hunger Bond issuance. This final element is potentially important, as a legal matter, because it makes it difficult for the kinds of sophisticated investors who buy distressed sovereign debt to argue that they did not know about the legal infirmities (lack of knowledge of an infirmity with a bond might protect investors—but only to the extent that they can plausibly make such a case). That said, investors, especially after multiple sales have been conducted and the brouhaha over the Hunger Bonds has died down could argue that they didn't know, and it would be hard to disprove that.

To reiterate, the foregoing sets out the legal and reputational risks that observers of the Venezuelan debt situation speculated about with regard to the bonds that GSAM purchased in May 2017. As is hopefully clear from the discussion above, we do not think that any one of the foregoing factors is conclusive in the sense of a lawyer being able to predict with a high degree of certainty that some judge in New York would rule that the Hunger Bonds were infirm and that PDVSA (or the government of Venezuela) was not obligated to pay it. Indeed, we would say that all four of the foregoing factors add up to no more than a low probability of a court ruling that a future government was justified in not paying them.

That said then, the question is the extent to which this combination of added legal risk and reputational taint served to penalize the Hunger Bond. We are interested in whether, why, and for how long, the market penalized this particular bond issue. We know from press accounts that there was a penalty imposed by the market at the very start, when GSAM purchased the bond. But did it persist, especially after attention from the press diminished, and can we unpack its elements?

In examining this question, we use two approaches.

First, using data on pricing for the Hunger Bond and closely comparable Venezuelan bonds, we analyze the evolution of the pricing penalty. To unpack the effect of reputational taint from legal risk, we look to two things: (a) what happens to the price penalty as press attention to the Hunger Bonds dissipates; and (b) the degree to which there is a reverse Hausmann effect when "un-tainting" events occur.[8]

Second, we interviewed investors at thirty different investment firms (and spoke to over fifty investors) holding Venezuelan bonds about their perception of the Hunger Bond, any pricing penalty that they perceived regarding it, and the reasons for that.

Data Analysis

Figure 2 shows that the Hunger bond always trades at a penalty over the 2024 PDVSA bond described in Table 1 that has an identical coupon.[9] Surprisingly, after the August 25 announcement by US Treasury Secretary Mnuchin of a list of Venezuelan bonds exempt from sanctions—a list that included the Hunger Bond—the spread of the Hunger Bond increased, surpassing 5500 basis points in mid-September.[10] The spread of the Hunger Bond then decreased in the second half of September.

The bottom panel of Fig. 2 plots the spread of the 2 bonds during the last quarter of 2017 and the first 2 months of 2018. The valuation of all Venezuelan bonds collapsed after President Maduro gave a speech that discussed the need to restructure Venezuela's debt. In the aftermath of the speech, the spread of the 2024 bond increased by about 700 basis points (from 3792 to 4468) and the spread of the Hunger Bond increased by nearly 1200 basis points (from 5142 to 6316 basis points). In November, Venezuela missed a series of payments and its bonds were rated as in selective default by Standard and Poor's. This event increased the spread of the Hunger Bond but had no effect on the spread of the 2024 bond.

[8] The two events we examine are: (a) when the US Treasury Department, on August 25, 2017 put out a list of bonds, trading in which was exempt from sanctions, and failed to exclude the Hunger Bonds (a matter which was rumored to have been discussed at the US Treasury department) and (b) when, on November 28, 2017, after credit default swaps had been triggered for PDVSA, the International Swap Dealers Association (ISDA) determined that one of the bonds that could be delivered into the auction was the Hunger Bond—in effect, therefore, making a determination that whatever taint that these bonds had, they were still acceptable for purposes of a generic CDS contract written on a package of PDVSA bonds. We pick these events because they are the two that the financial press commented on in the context of the Hunger Bonds not being singled out either for sanctions or as ineligible for delivery in the CDS auction. (Tanzi and Bartenstein 2017).

[9] Investors and asset managers repeatedly told us that, because of the large difference in coupon (6% versus 12.75%), the February 2022 bond was not directly comparable to the Hunger Bond. While the Hunger Bond had a higher spread than the February 2022 Bond until late July, after the Venezuelan strikes of July 17 and the US threat of sanctions, the price of the February 2022 bonds decreased at a faster rate than the price of the Hunger Bond. On July 20, the spread of the February bond surpassed that of the Hunger Bond. The differential between the two 2022 bonds then peaked after the imposition of sanctions on President Maduro on July 31st. The two 2022 bonds went back to trading at a similar spread in August 15.

[10] The title of Bloomberg's piece says it all: "Goldman's Hunger Bonds Dodge U.S. Sanctions That Bypass Traders". (Tanzi and Bartenstein 2017).

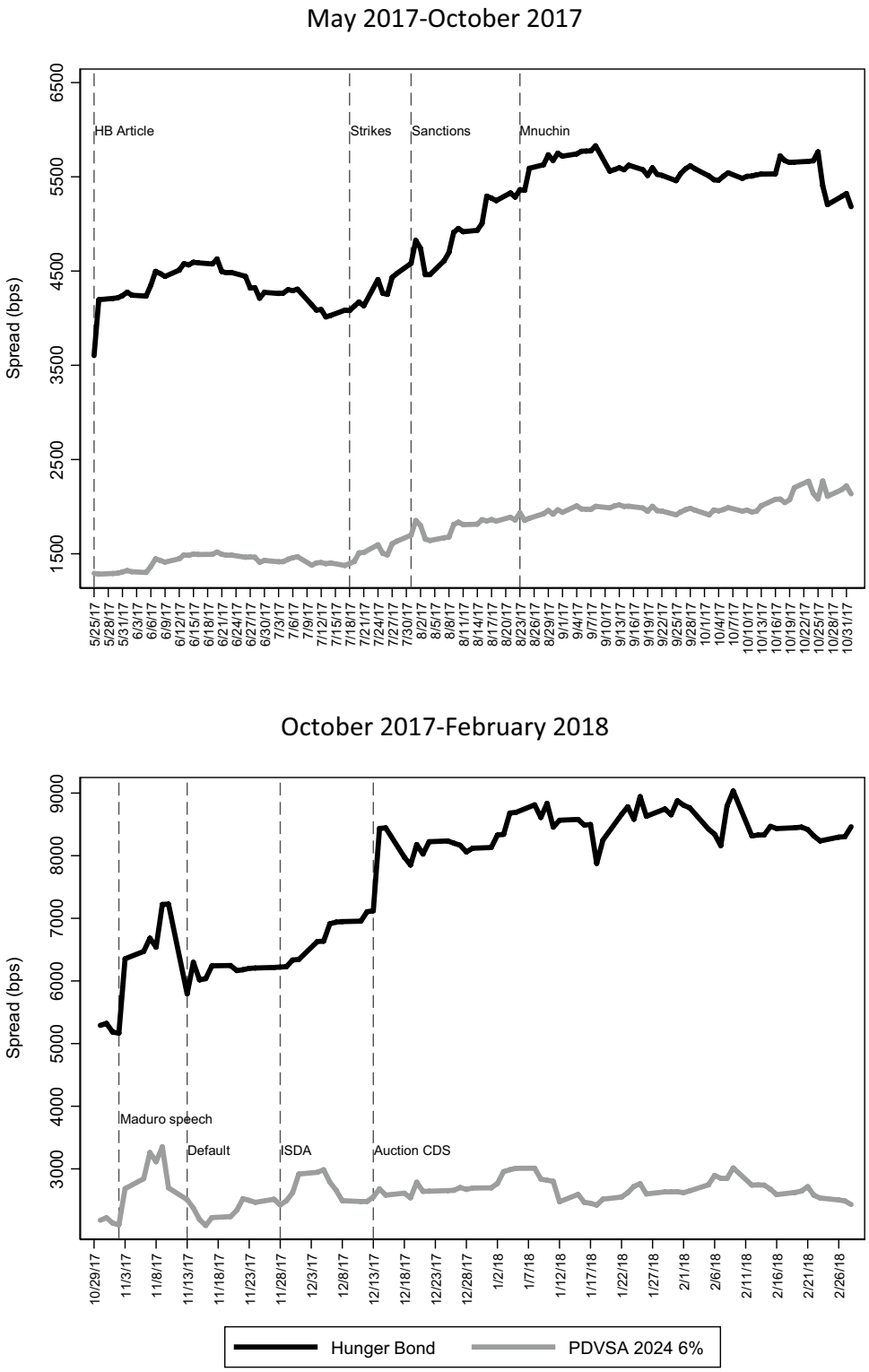

Fig. 2 Spreads of the hunger bond and PDVSA 2024 6% bond

The triggering of the CDS and the ISDA declaration that the Hunger Bond was included in a list of acceptable bonds was followed by an increase in the spread of all bonds, but the increase in spread was (relatively) more muted for the Hunger Bond than for the 2024 bond. There was then a jump in the spread of the Hunger Bond (from 6896 to 8109 basis points) on December 13 and almost no change in the spread of the 2024 bond. This jump in spread happened on the same day of the auction which determined the payout on credit default swaps tied to bonds issued by PDVSA. Note that

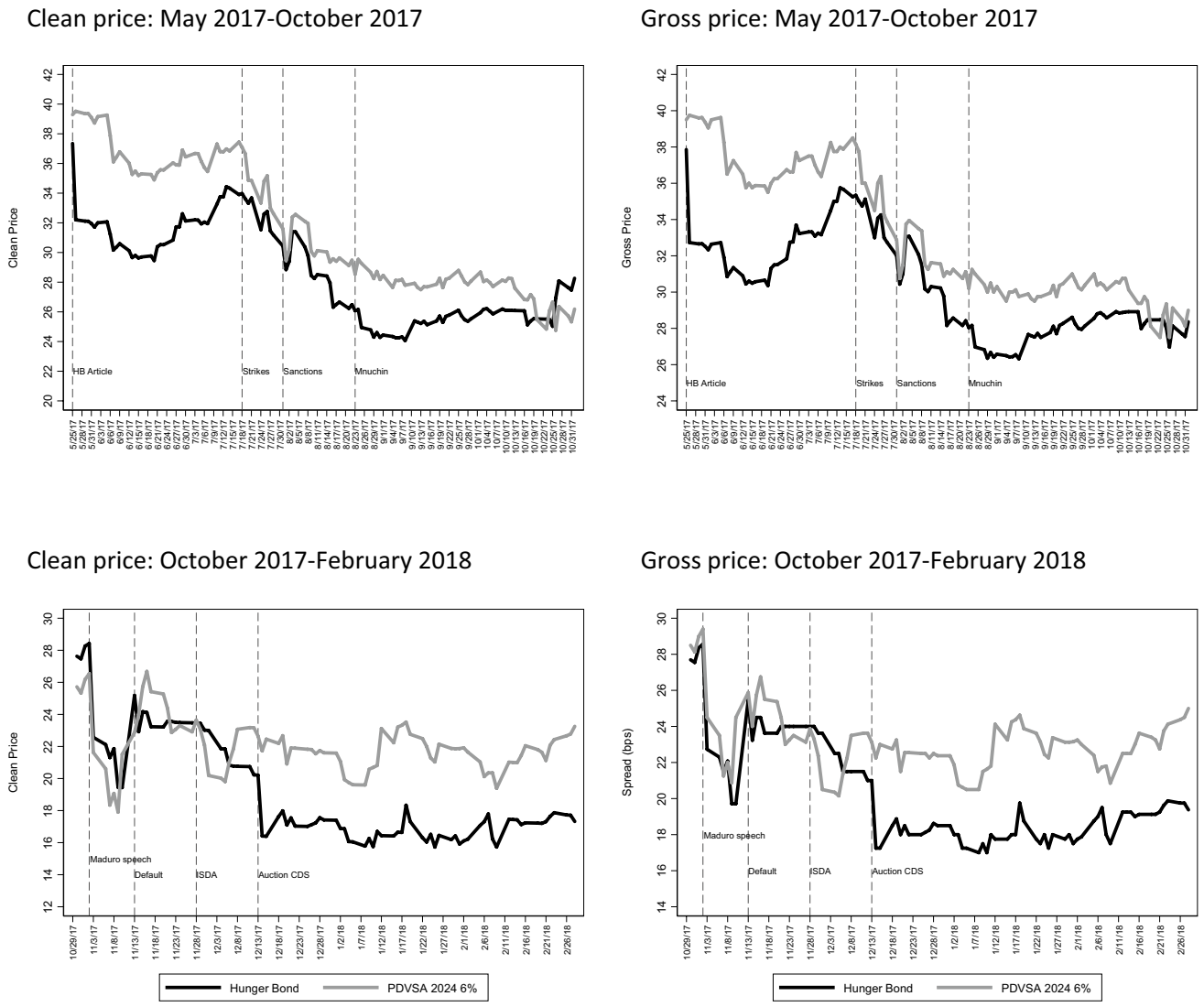

Fig. 3 Prices (clean and gross) of the Hunger Bond and PDVSA 2024 6% bond

the increase in spread did not affect the 2024 bond and may have been specifically related to the Hunger Bond and its inclusion in CDS deliverables.

Figure 3 compares the prices (clean and gross) of the Hunger Bond with those of the 2024 PDVSA bond. The figure shows that the prices, which had converged in late October 2017, diverged rapidly in early December and widened further after December 13. Table 2 reports the results of a set of regressions aimed at explaining the drivers of the spread of the Hunger Bond. Formally, we estimate the following model:

$$S_t = \alpha + \beta H_t + \delta C_t + \theta G_t + D_t \Gamma + \varepsilon_t$$

where S_t is the spread of the Hunger Bond, H_t is a dummy that takes value one after the publication of Haumsann's piece, C_t is the spread of a comparable PDVSA bond (or the first three principal components of a set of comparable bonds), G_t capure Google searches for the term Hunger Bonds, D_t are a series of dummies that may affect the spread of the Hunger Bond (see below for details) and ϵ_t is a well-behaved error term.

All regressions use daily data and are estimated for the period May 25, 2017-December 31st 2017.[11] The first

[11] We obtain similar results if we use yields instead of spreads. All results are robust to estimating the model with Newey-West Standard errors and with a GARCH(1,1) model. We pretested the series for stationarity and find that the hypothesis that spreads have a unit root can be rejected at the 5% confidence level but cannot be rejected at the 1% confidence level (we use a model with two lags and a deterministic trend). The KPSS test, instead, suggests that the series are stationary.

Table 2 The drivers of the spread on the Hunger Bond (OLS regressions)

	(1)	(2)	(3)	(4)	(5)
Hunger Bond article	653.3***	547.4***	536.8***	464.4***	444.3***
	(30.42)	(38.04)	(39.64)	(44.71)	(47.03)
Google Searches				197.6***	210.9***
				(35.81)	(37.15)
Strikes	−78.38	−197.6***	−171.2**	−125.2**	−111.9*
	(56.40)	(48.79)	(67.76)	(50.22)	(62.19)
Sanctions on Maduro	555.0***	345.8***	293.7***	336.1***	294.1***
	(79.25)	(80.87)	(91.74)	(80.56)	(91.23)
HB exempt from sanct	478.3***	330.8***	284.6***	323.9***	284.6***
	(65.59)	(63.68)	(73.03)	(63.64)	(73.27)
Maduro Speech	1394***	819.1***	973.4***	792.2***	883.4***
	(178.0)	(255.6)	(318.1)	(256.5)	(315.0)
Venezuela in SD	−468.4***	−353.0**	−387.5*	−347.6**	−396.3**
	(179.1)	(168.6)	(203.4)	(168.9)	(200.3)
HB ISDA eligible	403.5***	173.7	141.1	162.9	112.7
	(92.19)	(131.5)	(140.4)	(133.1)	(141.8)
December 13 Auction	1255***	1278***	1330***	1279***	1304***
	(121.0)	(130.3)	(177.1)	(131.6)	(177.8)
PDVSA 05/2024		0.572***		0.599***	
		(0.154)		(0.156)	
1st PC Ven bonds			120.6***		131.7***
			(34.75)		(34.80)
2nd PC Ven bonds			189.9**		169.7*
			(90.82)		(90.20)
3rd PC Ven bonds			−61.76		−48.56
			(83.97)		(82.35)
Constant	3552***	2019***	3686***	1947***	3707***
	(120.3)	(413.7)	(56.73)	(417.5)	(54.22)
Observations	157	157	157	157	157
R^2	0.964	0.970	0.972	0.971	0.972

Robust standard errors in parentheses

*p < 0.1, **p < 0.05, ***p < 0.01

column regresses the spread over a set of eight dummy variables that capture the events described in Figs. 1 and 2.[12] Each dummy takes a value of one starting from the day of the event and zero before the event. The dummy for the Hunger Bond article takes the value zero for just one day and the value one for all other observations. Hence, when we include this dummy the results for all other variables are the same as what we would have obtained by dropping the first observation from the sample (Salkever 1976).

We find that the publication of Hausmann's article is associated with a 650 basis point increase in the spread of the Hunger Bond; the imposition of sanctions on Maduro is associated with a 550 basis point increase in the spread, and Maduro's speech with a nearly 1400 basis point increase in the spread of the Hunger Bond.

Table 2 presents a set of OLS regressions where the dependent variable is the spread on the 6% PDVSA bond with maturity on 28/10/2022 (the Hunger Bond). The explanatory variables are a dummy that takes a value of one after the publication of Hausmann's article, a dummy that takes value one in weeks with a high number of Google searches for the term "Hunger Bonds," a dummy that takes value one after the strikes of July 19, 2017, a dummy that takes value one after the imposition of sanctions on

[12] These events are: (i) the publication of Hausmann's article in May 2017; (ii) the strikes of July 19, 2017; (ii) the imposition of sanctions on President Maduro (August 2, 2017); (iv) the exemption of the Hunger Bond from US sanctions (August 25, 2017); (v) President Maduro's speech about the likely restructuring Venezuela's debt (November 2, 2017); (vi) Venezuela classified in selective default (November 13, 2017); (vii) ISDA's inclusion of the Hunger Bond in a list of bonds that are acceptable for the purposes of a generic CDS contract written on a package of PDVSA bonds (November 28, 2017); and (viii) the auction of December 13.

President Maduro (August 2, 2017), a dummy that takes value one after the hunger bond was exempted from sanctions (August 25, 2017), a dummy that takes value one after President Maduro speech about the possibility of restructuring Venezuela's debt (November 2, 2017), a dummy that takes value one after Venezuela was classified in selective default (November 13, 2017), a dummy that takes value one after ISDA included the Hunger Bond in a list of bonds that were acceptable for purposes of a generic CDS contract written on a package of PDVSA bonds (November 28, 2017), a dummy that takes value one after the December 13 auction, the spread on the 6% PDVSA bond with maturity on 16/05/2024, and the first 3 principal components of the spreads of all PDVSA and Republic of Venezuela bonds (excluding the Hunger Bond) that mature after 2021.

Surprisingly, we find that the Hunger Bond's exemption from sanctions and its inclusion in the ISDA list are associated with an *increase* in its spread and that Venezuela's selective default rating is associated with a drop in the spread of the Hunger Bond (an issue that we return to in the interviews). The strikes of July 19 have a negative but not statistically significant coefficient. Finally, the December 13 auction has a large effect (1200 basis points) on the valuation of the Hunger Bond.

One problem with the results of Column 1 is that they do not discriminate between shocks that are specific to the Hunger Bond and shocks that affect all Venezuelan bonds. To address this issue, we augment the model with the spread of the PDVSA May 2024 bond.[13] Inasmuch as the spread on this bond captures aggregate shocks that affect all Venezuelan sovereign bonds, the coefficients of the dummies should then measure how the events included in the regression affect the Hunger Bond above and beyond their effect on other Venezuelan bonds.

Column 2 of Table 2 shows that the spread of the 2024 bond is closely correlated with that of the Hunger Bond (the point estimate implies that a 100 basis point increase in the spread of the 2024 bond is associated with 57 basis points increase in the spread of the Hunger Bond). When we control for the spread of the 2024 bond, the coefficient on the dummy for strikes becomes larger (in absolute value) and statistically significant. This finding confirms the visual impression of Fig. 2 which suggested that the strikes had a larger effect on the comparator bonds. The Hunger Bond article, US sanctions on Maduro, Maduro's speech, and the selective default dummies remain statistically significant but their coefficients are now smaller. The ISDA ruling is no longer statistically significant. The December 13 dummy, however, is unchanged with respect to the results of column 1. Whatever happened on December 13, it was specific to the Hunger Bond.

The choice of the May 2024 bond as a benchmark is somewhat arbitrary and it would be problematic if there are shocks that are specific to this bond. To address this issue, we create a synthetic benchmark by taking the first three principal components of 14 PDVSA and Republic of Venezuela bonds that mature after 2021 (we use all bonds for which we have data excluding the Hunger bond and Regulation 144 bonds).

The "Appendix" of the working paper version of this article (Gulati and Panizza 2018a) shows the eigenvalues of the 14 components and shows that the first 3 components capture nearly 99% of the total variance. In other words, the first three components capture the near totality of the aggregate shocks that hit Venezuelan bonds. The principal component analysis indicates that the shocks to the first component raise all spreads by approximately the same amount. This finding indicates that the first component is a level effect that captures Venezuela's sovereign risk. The second component, by contrast, discriminates between PDVSA and Republic bonds. A shock to this component increases the spreads of PDVSA bonds (positive loading) and decreases the spread of Republic bonds (negative loading). The third, component seems to capture the slope of the yield curve. A positive shock to this factor decreases the slope of the yield curve by lowering most long-term rates (negative loadings) and increasing most short-term rates (positive loadings).

Column 3 of Table 2 substitutes the February 2024 bond with the scores of the three components described above. We find that the first component (the one that captures Venezuela's sovereign risk) is positively correlated with the spread of the Hunger Bond. The point estimates suggest that a one-unit increase in this component is associated with a 120 basis points increase in the spread of the Hunger Bond. As suggested by Figure A2, the second component is also positively correlated with the spread (this is the PDVSA specific effect), and the third component is not statistically significant. More interesting for our purposes, when we control for these factors we find results which are similar to those of Column 2. This suggests that the 2024 bond is a good benchmark for the Hunger Bond.

In column 4 we test the hypothesis that the Hunger Bond penalty reduced as press attention to the Hunger Bond dissipated. To this purpose we use Google Trends and recover the index for searches of "Hunger Bond." This index (which does not measure the number of searches but the relative popularity of a given item) is available at weekly frequency and ranges from zero (most weeks) to 100 (the week of May 28, 2017). We create a dummy variable that takes a value of one during weeks when the index was greater than 20 and 0 in the remaining weeks. Column 4 estimates the same

[13] The advantage of a comparator bond of a somewhat longer maturity is that the difference in spreads cannot be attributed to the fact that expectations of default have a smaller effect on the yields of bonds that are close to maturity. Our thanks to one of our referees for this point.

model of Column 2 controlling for Google searches. Most results are unchanged and the Google Search dummy is positive and statistically significant. The point estimate indicates that in weeks with a high number of searches for "Hunger Bonds" the spread of the Hunger Bond was about 200 basis points higher than in weeks with a low number of searches. The remaining results are unchanged. Column 5 estimates the model controlling for the principal components of the 14 Venezuelan bonds and finds results similar to those of column 4.

We also estimate a set of regressions similar to those of Table 2, but use bond prices (we use the clean price) instead of spreads. The results confirm the presence of a large and statistically significant effect of the Hausmann Hunger Bond article (at 5 points, the effect corresponds to 13% of the price on the first day of trading).[14]

In Table 3 we conduct a series of robustness tests. Columns 1 and 2 estimate models similar to those of columns 4 and 5 of Table 2, but substitute the Google search dummy with individual dummies for the specific values of the index (the excluded category is zero). We find that a low number of searches (a value of the index below 20) are associated with an insignificant spread differential with respect to the excluded dummy (no searches) and that a high number of searches is associated with an increase in spread that ranges between 100 and 250 basis points. In column 3 we use the actual value of Google searches and find that the spread of the Hunger Bond is positively correlated with this variable.

We also experiment with two indices of daily press mentions of the "hunger bond" term using a primary general news database (Pro Quest) and specific business news database (ABI). We find that while these two indexes are positively correlated with the spread of the hunger bond, the correlation is never statistically significant.[15] This finding supports the idea that the crowd-sourcing of disapproval was likely the most important element in the Hunger Bond penalty.

We also tried to explore whether the differences in spreads were due to the Original Issue Discount ("OID") problem. This is, unfortunately, hard to test because the risk of an OID penalty depends on part on how many times the bond has changed hands—and that is not data that we have. However, assuming that the bond does not trade hands, we should expect to see the OID penalty increase as the default probability increases (see Fig. 4 and Box 1). However, the spread between the hunger bond and the similarly dated February 2022 bond decreased as the default probability increased at the end of 2017.

As a final exercise, we looked at the effects on the price of Goldman Sachs common shares. We found that the four

Table 3 The drivers of the spreads and prices of the Hunger Bond, Robustness analysis

	(1)	(2)	(3)
Hunger Bond Article	506.3***	490.6***	494.0***
	(61.70)	(64.47)	(51.71)
Search Index 11	77.93	98.46	
	(105.7)	(104.1)	
Search Index 12	10.15	4.152	
	(41.97)	(41.93)	
Search Index 13	−92.41**	−86.75*	
	(45.77)	(45.58)	
Search Index 25	238.5***	231.7***	
	(42.76)	(43.37)	
Search Index 48	167.2***	176.8***	
	(49.46)	(52.03)	
Search Index 100	97.89	121.8*	
	(60.17)	(64.65)	
Google Searches			1.72***
			(0.619)
Strikes	−111.2*	−87.00	179.04***
	(57.88)	(70.01)	47.89
Sanctions on Maduro	334.6***	289.1***	340.23
	(84.43)	(92.61)	80.83
HB exempt from sanct	338.7***	284.6***	323.33***
	(66.89)	(77.79)	(63.50)
Maduro Speech	825.0***	943.3***	7771.66***
	(261.2)	(326.6)	(260.37)
Venezuela in SD	−307.7*	−336.3*	−331.39*
	(169.8)	(202.1)	(168.81)
HB ISDA eligible	194.3	160.0	157.43
	(139.4)	(152.4)	(134.99)
December 13 Auction	1276***	1315***	1279.98***
	(131.6)	(184.3)	(131.98)
PDVSA 05/2024	0.521***		0.612***
	(0.183)		(0.162)
1st PC Ven bonds		112.1***	
		(41.19)	
2nd PC Ven bonds		163.0*	
		(96.30)	
3rd PC Ven bonds		−70.43	
		(87.92)	
Constant	2156***	3692***	1910.39***
	(491.9)	(55.22)	(434.58)
Observations	157	157	157
R^2	0.972	0.973	0.970

Robust standard errors in parentheses

*p < 0.1, **p < 0.05, ***p < 0.01

[14] We do not report the full regression results to save space (full results are available in the working paper version of this article, see Gulati and Panizza (2018a)) but also because standard stationarity tests suggest that bond prices may be better described as a unit root process.

[15] Results available upon request.

trading days after the publication of the Hunger Bond articles were characterized by negative returns averaging 2 percent a day. The effect was however short-lived as the following 5 days were characterized by positive returns of similar size. We also looked at the correlation between the price of Goldman Sachs' shares and Google searches for "hunger bond" and found no significant correlation between these variables.

Table 3 presents a set of OLS regressions where the dependent variable is either the spread (columns 1 and 2) or the clean price (columns 3 and 4) of the 6% PDVSA bond with maturity on 28/10/2022 (the Hunger Bond). The explanatory variables are a dummy that takes a value of one after the publication of Hausmann's article, a dummy that takes value one in weeks with a high number of Google searches for the term "Hunger Bonds," a set of dummies for the different search ranking provided by Google, a dummy that takes value one after the strikes of July 19, 2017, a dummy that takes value one after the imposition of sanctions of President Maduro (August 2, 2017), a dummy that takes value one after the hunger bond was exempted from sanctions (August 25, 2017),a dummy that takes value one after President Maduro speech about the possibility of restructuring Venezuela's debt (November 2, 2017), a dummy that takes value one after Venezuela was classified in selective default (November 13, 2017), a dummy that takes value one after ISDA included the Hunger Bond in a list of bonds that acceptable for purposes of a generic CDS contract written on a package of PDVSA bonds (November 28, 2017), a dummy that takes value one after the December 13 auction, the spread (columns 1 and 2) or the clean price (columns 3 and 4) of the 6% PDVSA bond with maturity on 16/05/2024, and the first 3 principal components of the spreads of clean prices of all PDVSA and Republic of Venezuela bonds (excluding the Hunger Bond) that mature after 2021.

To summarize, we find the following: (A) There is a significant and persistent pricing penalty that applies to the Hunger Bond. When we compare the Hunger Bond with a similar dated PDVSA bond (which, however, has a higher coupon) this penalty persists for approximately two months. When we compare the Hunger bond with a bond with a slightly longer maturity (19 months) but the same coupon, the penalty persists from when the Hunger Bond starts trading to the end of dataset (March 1st 2018); (B) The size of the penalty is correlated with the salience of the Hunger Bond story on social media; (C) Surprisingly, some factors that we thought should have reduced the, relative, reputational/legal taint of the Hunger Bond are either irrelevant (the inclusion of the Hunger Bond in the list of ISDA eligible instruments) or associated with an drop in the valuation of the Hunger Bond (the exemption of the Hunger Bond from US sanctions). This finding may suggest that the source of the reputational taint is important; although what we found from interviews suggests a more nuanced story.[16]

The Natives Respond

The foregoing results suggest a Hausmann Effect. It diminishes over time, but remains substantial as of the conclusion of our empirical analysis, roughly 10 months later.

The results do not, however, clearly tell us what the causal dynamics for the price penalty were. Our primary hypothesis, starting out, had been that Ricardo Hausmann had caused something of a crowd sourced reputational taint to this one bond. If that was the case, we should have seen variables measuring greater crowd attention to the Hunger Bond issue correlating with higher yields for the bond (greater distaste) and also higher yields for the bond upon the occurrence of events reducing the reputational taint (or increasing their legitimacy).

The three events we used were Google Searches, where a high number should indicate greater crowd attention, and the exclusion of the Hunger Bond from US sanctions and the choice of the ISDA Determinations Committee to allow the Hunger Bond to be submitted in its auction. Our prediction was that the first variable (Google Searches) would correlate with a yield increase and the second and third variables (exemption from sanctions and inclusion in the auction list) would correlate with yield decreases vis-à-vis the other, untainted, PDVSA bonds. We got the first predicted result (on the Google Searches), but on the second two events we either found that the event was irrelevant or that it had the opposite result from our prediction.

To better understand what was going on, we talked to a set of investors in Venezuelan bonds. The questions we asked were the following: Why were investors staying away from the Hunger Bond? Was it some sense of heightened morality in the bankers that Hausmann's piece triggered? How much of it was reputational taint? How much was the threat by the opposition party that it would investigate and perhaps repudiate the debt using the OID legal argument? Was the Hausmann Effect going to dissipate?

Below, we report on what we heard from a set of investors in Venezuelan debt with whom we had conversations during the period July 1, 2017 and March 5, 2018. The context of these conversations was that these investors were willing to talk to us because they were interested in asking us questions about the pricing of the various Venezuelan bonds in the context of how a future restructuring of Venezuelan debt might play out. As part of those conversations, the Hunger Bond inevitably came up, since one of the questions

[16] As of this writing, we are attempting to investigate the puzzle here further.

investors had was what kind of additional haircut this bond issuance might face in a debt restructuring.

Summarizing the conversations at thirty investment firms, with over fifty portfolio managers we came away with five main observations.

Before proceeding though, a caveat is in order. We do not offer these observations from our investor conversations for the truth of what we were told. Our respondents could have been spinning us. Nevertheless, we hope that the way they talked about the Hunger Bond can help our understanding of the quantitative results.

At the outset, there were two consistent themes. First, not one investor we spoke to mentioned, or came close to mentioning, the morality of buying Venezuelan debt as a factor influencing their purchasing choices. Second, they all knew about the pricing penalty—often they had graphs to show us—and thought it would likely remain.

Why the Price Penalty?

Our conversations with investors initially focused on the question of how they perceived the differential value of Venezuelan sovereign bonds that required a vote of 100% of the creditors for any modifications to payment terms as compared to those that required 85% and 75% votes. These are substantial differences. Other things equal, the 100% bonds are harder to restructure than the 85% and 75% ones. And the 85% ones are harder to restructure than the 75% ones (Choi et al. 2018). In Greece's debt restructuring of March 2012, these kinds of vote differentials had meant the difference between creditors receiving a 60% NPV haircut and a 0% haircut (Zettelmeyer et al. 2013). Yet, our analysis showed little in the way of pricing differences among these bonds. By contrast, the Hunger Bond, over the same period of time, traded at a substantial discount to other similar bonds, with differences in legal risk that seemed less substantial as compared to the differentials in vote thresholds.

The response we heard was simple. The voting thresholds were not going to make a difference in what deal was offered the bondholders in a restructuring. They might make a difference to someone trying to adopt a holdout strategy, if the holdout was liquidity constrained. But, with the Hunger Bonds, there was a possibility that if there was a new government in place, that these bonds would be separated out for a lower offer than what everyone else was receiving. They were tainted.

To quote a senior manager at a large New York-based fund:

> There is taint [to these]. They smell [bad]. Many institutions don't want anything to do with this; just the headline risk is enough to avoid it. It is not that it is a big arbitrage. Not worth it to do that trade. Only a few [cents] difference between that bond and the others. And … it is … controlled by one investor – one big investor who everyone knows. Some. . substantial … risk of repudiation. The opposition has said they will repudiate – how many client questions with respect to Hunger Bonds does one want to handle? We don't want clients asking us why we own Hunger Bonds.

At another meeting in New York, the following was the conversation among a set of fund managers (two of whom, both at large funds, had strong opinions on the matter):

> [Manager 1] [The] market knows that these Hunger Bonds have been issued at a deep discount. [They know they] have been infected [with OID issues or other illegalities].
> [Manager 2]: [Yes they are] infected – [maybe they] can be treated together as different. There is a repudiation risk. They might get a different deal in a restructuring. They might not get any deal. That's different from other legal terms [such as the Collective Action clauses and Pari Passu clauses] – like the ones you [were asking] about.

No One Wants to be the Subject of Marco Rubio's Tweet Tirades

We followed up responses of the foregoing, where respondents said that they perceived a repudiation risk; trying to unpack what they meant. To do so, we would point out something along the lines of: But isn't the repudiation risk here quite small, especially as contrasted with the value of a bond that cannot be restructured without unanimous approval of the bondholders? Both because Goldman Sachs says that it purchased the bonds on the secondary markets, through a broker, and because the Maduro government does not seem likely to fall anytime soon.

Responses fell along the following lines. Our respondents recognized that the risk of repudiation was small, and would get smaller still as the bond changed hands (each successive purchaser having a stronger legal claim that she had purchased a legitimate bond on the secondary market). But, the key, they explained, was that they were institutionally constrained. The Hunger Bond was infamous, and it might draw the attention of their compliance departments. And, if other large institutions were similarly constrained, then the Hunger Bond was likely to remain stuck in the hands of the initial sets of investors. A manager at a mid-size New York fund explained:

> Imagine if Compliance asks why we bought it – and then Marco Rubio sends [a] tweet [mentioning our name] – you don't want the reputational hit – for five points, no one will do it. For 20 basis points … cheaper

> … maybe? We are all worried about some tweet that names us. GSAM – those tweet storms were a nightmare for them. People were tweeting really nasty stuff. Goldman made a great deal financially. But the reputational hit was big. Right now, it has about three basis points difference with the other bonds.…

A somewhat different perspective had to do with creditor cooperation and coordination. This bond was different enough, that investors worried that they would be isolated in it in the context of a restructuring. A London-based small firm manager said:

> With the Hunger Bond, things are different. With other bonds, there is institutional support for contract rights. The largest institutions will join to support and defend each other—there is coordination and cooperation. But this bond was weird. We just generically fear that this has a huge OID.… You will always be vulnerable to this—if you go into a fight—and the other side says it is outrageous and that you are not like the others … the other creditors will also be willing to isolate you on this … Some people are willing to carry the risk, but not many. But ultimate long-term players don't like this risk.

We followed up again by asking about the more aggressive funds, the so-called vulture funds, the ones who do not worry about ethical investors or compliance departments. Indeed, there are funds who one might say embrace the reputation of being aggressive in pushing ethical and legal boundaries. The answer was simple: Liquidity. These investors, even if they were willing to try to construct an arbitrage, want to be able to get out of it quickly. And if they were long the Hunger Bond and needed to get out quickly for whatever reason, they would worry that there would be no big institutions to sell to -- and the big institutions are key in creating liquidity.

Three Basis Points

One of the questions we were particularly curious about what whether investors thought that, over time, the Hunger Bond discount would disappear. As we saw it, this could happen in a couple of ways. One avenue could be an increased understanding of the fact that the legal risk of repudiation was actually quite small and the other avenue might be a reduction in the adverse publicity over the Hunger Bond. We raised this.

Respondents resisted the suggestion that the penalty on the Hunger Bond would completely dissipate—at least not anytime soon—despite one of us affirmatively making the argument to them for why this might happen. For them, the bond had been branded, and that was not going to take years to change. It would always have a penalty of a few basis points. The initial market penalty had been high; and that was bound to diminish. To quote a large fund manager with offices in London and New York:

> When it was 500 bp difference, [some] people were willing to buy [not us, and the other large firms] – because the repudiation risk, after one thought about it, was just not that big. But maybe not the big players … and not the ones with reputations to protect. Small guys who can hide and don't care about Marco Rubio's [twitter] tirades … maybe they can buy. They probably did buy [a little]. … [But] no one with a compliance department wants to touch these bonds, so everyone knows the bonds are less liquid. And that produces a discount; slight discount. It is going to settle at about a 2–3 bp discount. Probably has.
> Holdouts [like Elliott or Aurelius are not] going to buy this either … holdouts want a clean bond; they are going to court. Court won't rule for you, if you have played dirty already. No holdouts want this – if you think [a] holdout would buy, you don't understand the holdout strategy in sovereign…

What Happens When the Bond Changes Hands?

As noted, we started out skeptical about there being a meaningful legal risk to the Hunger Bond, as compared to the other PDVSA bonds. As a result, we pushed our respondents on this matter. When they told us that they perceived a repudiation risk, we both pointed out that there was no real evidence that GSAM had not purchased the Hunger Bond on the secondary market from a broker (maybe the broker was suspicious looking, but did GSAM have a duty to investigate?) and that surely, after this bond had changed hands many times it was going to be highly unlikely that some court would impute knowledge of the original (possible) problem with the issuance. Our argument did not persuade—and it bears emphasis that these conversations were in a context in which our respondents were speaking to us because they wanted to hear our legal analysis on how various legal factors (such as CACs and *pari passu* clauses) would play out in an eventual restructuring. The following, from a small and aggressive distressed-debt hedge fund in London, is illustrative:

> You are not understanding the dynamic. Legal risk does not play in a restructuring in the way you imagine … Sovereign debt restructurings are different. Politicians sometimes need to show that they are being tough. This happened with Kazakhstan some years ago—there was a bank restructuring, which was really the state. There were some fishy bonds—they just got set aside … no explanation … they just got put aside. I almost bought them … but didn't … And the other

> creditors did not squeak [when these bonds were set aside] … everyone one knew these were dodgy … you bought them at your peril.
>
> This transaction with the "park and hide" bonds, from the Vene Central Bank …everyone knew … I was offered something like this after the GSAM deal got into trouble.. . even I stayed away. If politicians need to make an example [of a particularly tainted bond], they will do so. And other creditors won't help.

The theme of other creditors not coming to the assistance of the Hunger Bond holders was one that we heard many times. Multiple respondents pointed out that the purchase of a bond at such a deep discount from face was, in effect, an attempt to obtain a kind of structural priority over the other creditors who had purchased at face or close to it. This was not looked up kindly by others; and their support was considered important in the restructuring context.

The Gorilla in the Corner

Finally, we turn to the one outlier respondent who told us they had purchased the Hunger Bond on the secondary market a few days after June 1, 2017 (and subsequently sold it in October 2017). They shared our view that the legal risk eventually would go to zero, but thought there was an additional "Gorilla" factor we were not considering. The NY-based fund manager for this London-based fund, who was one of the few who we spoke to by phone as opposed in person, explained:

> Everything in this market right now is about liquidity. And the coupons are driving liquidity because there is still the hope of receiving coupons … even though [there have been no coupons for months] … the PDVSA guys keep saying they will pay [not the Republic]. There is no talk of restructuring in Caracas … I was there last week … nobody is thinking restructuring … If you compare bonds, you need to compare on coupons…
>
> And for the Hunger Bond there is no liquidity. It has a Gorilla, one big holder who everyone knows. And no one wants to be in the bond with them when push comes to shove … Maybe down the line, if they can sell enough of their position. But … now, there is a risk … penalty … just for being in there with them. No big players will buy their position because they would get attacked immediately—it would be too public. No small player will buy because the big player is a Gorilla. So no one buys … The bonds are so cheap—a big purchase of multiple hundred million will be seen by everyone…
>
> Also, have you looked at who makes a market in these … Look at these markets [*shows phone screen to us*] … Standard Chartered does not list a price for the 6%, Nomura does not, [X—undecipherable] does not … only [Y—undecipherable] does … This is illiquid … and won't become more liquid, unless the Gorilla leaves…

To conclude, an aspect of what our respondents pointed to that we had not considered at the start of our inquiry, was that the spotlight that Hausmann had put, inadvertently, on these "park and hide" transactions. Apparently, during the past few years, the artificial inflation of principal amounts had been occurring frequently with PDVSA debts and there were other transactions that had been planned that were similar to the Hunger Bonds sale. But, thanks to the drama over the Hunger Bonds, most of them did not go through.[17] If indeed that had happened, the real Hausmann Effect might have been more significant that the price penalty for the one bond that we have examined.

The Puzzling Yield Increases

Our final question for our respondents had to do with the two puzzling yield increases that we described in the prior section. Specifically, we had expected to see the decision of the US Treasury to exempt trading in the Hunger Bond from sanctions and the decision of the ISDA Determinations Committee to allow the Hunger Bond to be delivered in the auction to be yield reducing events for the Hunger Bond. After all, these not only were arguably taint reducing events, they were also liquidity enhancing events. The data, however, showed either no effect or an increase in yields instead of the decrease we expected.

Our respondents didn't see a puzzle. The answer was obvious. In the case of the Treasury announcement, there had been advance knowledge of what Treasury was likely to do since it had conducted inquiries in the market prior to making its decision. In the case of the ISDA decision, apparently Goldman had delivered the Hunger Bonds to a number of sellers of CDS protection (since it was "cheapest to deliver") and those unhappy recipients had immediately tried to sell it, creating a drop in price.

[17] Some some small loans (as opposed to bonds) might have slipped the scrutiny of social media though. As we were doing our final revisions on this article, a reporter at a major financial news agency pointed us to an article in an obscure Spanish language publication describing a transaction very similar to the Hunger Bond one. *See* Petit (2018).

A Historical Precursor

The literature on the empirical effects of legal infirmities that might be challenged by successor regimes is sparse; understandably, since there has generally been little legal basis upon which successor regimes could mount challenges. The two articles that have addressed the question are by the economic historians Kim Oosterlinck and Stephanie Collet.

Collet (2013), analyzes the price penalty that certain Spanish bonds backed by Cuban revenue streams suffered because of the risk that the US would not pay those debts once it took over Cuba. The US had won Cuba as part of the bounty from the Spanish American war of 1892. Spain wanted the US to take over the responsibility to pay certain bonds backed by Cuban revenue streams. The US refused on the grounds that these debts were really those of Spain since the proceeds of the bonds had been used to suppress the Cuban independence movement rather than for the benefit of the Cuban people. Collet argues that the market recognized the risk of repudiation and imposed a penalty on these bonds as compared to others.

In a more recent article, Collet and Oosterlinck (2018) tell a story that has remarkable parallels to ours, except that it is from over a century ago when there was no equivalent to modern social media. At the center of their story also sits a famous intellectual, this time Maxim Gorky.

The context was the Tsarist regime in Russia in the early 1900s. The regime was on shaky political ground and desperately needed outside capital. Legislative approval from the recently constituted legislature, however, was not forthcoming. The regime, nevertheless, with the support of the French government and much of the French press (which had been bribed) did a bond issuance in Paris (Oosterlinck 2016, provides details).

The campaign against the bond was begun a couple of days prior to its issuance by Gorky in a short piece in the one French paper that had not been co-opted, L'Humanité.[18] He wrote:

> This money will only help to carry out massacres. Do not give a penny to the executioners of the Russian people, executioners of bodies and executioners of minds! It is painful for me to think that a civilized Europe, which is witnessing the way in which a barbarous power, for fear of losing its position in the country, oppresses, tortures, kills thousands of men, that this Europe is helping precisely the political power in its crime.

Although the rest of the French press did not pick up on the piece, it got reproduced widely in other countries such as Germany and England. As Oosterlinck and Collet tell the story, the drama levels got raised to such a level that the bond became a subject of debate in the context of the French presidential elections (Oosterlinck 2016). The opposition to the Tsar, in the form of the socialist party, added fuel to the fire by announcing that the 1906 bond would not be repaid. The storm was of such intensity—in part because it helped connect to the criticism of the French government's support for the Tsar and its manipulation of the press accounts of the strength of the Russian economy—that debate over the bond lasted for over a year, well into 1907 (Oosterlinck 2016).

Relevant for our purposes, is that the markets imposed a penalty on the bond's price. Initially, the bond had been oversubscribed, with a number of prominent underwriters, such as Credit Lyonnaise and Banque de Paris, buying significant portions of it. But, as it became apparent that the markets viewed this particular bond with disfavor, even the attempts of these underwriters and the Russian to artificially maintain the price failed (those sorts of things were not illegal then). And an article by a French journalist in early 1907, revealing the attempts at price manipulation, helped heap further disfavor on the bond.

While precise estimates of the price penalty are difficult, since easily comparable bonds with identical terms are not available, it was estimated that the 1906 bond lost almost a third of its value thanks to the campaign against it.

To cut a long story short, Oosterlinck and Collet find evidence that the 1906 bond suffered a penalty over and above the other Russian bonds of the time, and the campaign of denouncement that Gorky started appears to have been the cause. As the years pass, however, and public attention diminishes, the penalty on the 1906 bond also diminishes, eventually coming down to near zero. They also suggest though that the drama over the 1906 made it difficult for the Tsar to do other similar borrowing transactions that had been in the planning stages at the time. Oosterlinck and Collet's bottom line, therefore, is that public attention denouncing a regime and its borrowing can have a significant impact on that regime's borrowing costs.

The Oosterlinck and Collet story raises questions for our analysis of the Hausmann Effect. In particular, there is the question of whether the effect dissipates over time, to zero, as public attention does. 1906 of course was a different time, without twitter and facebook and the legal regime governing enforcement of sovereign debt was largely reputational. The rule of governmental succession was just as strict then as it is now if not stricter, but there was no meaningful court proceeding in which that rule would have played a role at the time.

[18] M. Gorky, "Pas un sou au gouvernement russe", L'Humanité, 9 April 1906.

Implications

Scholars have struggled unsuccessfully, for over a century, to come up with a workable legal doctrine of Odious Debts. The attempts to do so have faced two barriers. First, the difficult of defining what an appropriately despotic regime is, and second, and more difficult, when creditors should be assumed to have had knowledge of the despotism in question. Given the likely costs of creating a new legal risk for creditors that raises the costs on too many potentially beneficial transactions, reform efforts have floundered.

The question is whether what we have learned about the Hausmann Effect has shown us an alternate path. We know that, at least for a year, the yields on one bond that was the subject of intense press attention and had a potential legal infirmity, was significantly increased relative to other bonds. Interestingly, as the image below from late February 2018 that we obtained from one of our contacts in the market (whose firm was concerned that the same OID infirmity might infect other PDVSA bonds) shows, there are other bonds outstanding that have been issued with a similar OID infirmity. But, none of them appears to be suffering the same market penalty that the Hunger Bond is. We inquired about this and the answer was along the following lines: Those bonds have moved into the wider market and the Hunger Bond has not. What is unique about the Hunger Bond is that both the taint and the risk of repudiation are tied to the single big player holding most of the bond. And both big and small players have reasons to avoid being in the bond, as long as that big player is still there.

To summarize, in our one case, it appears that the combination of a vilified regime, a suspicious looking transaction, an identifiable big investor, intense public scrutiny, and a possible legal infirmity combined to cause a sustained and significant price penalty.

Going back to the Odious Debts issue, the question is whether this effect is replicable beyond a single bond. The key to the Hausmann-Gorky effect, as we see it, was shining a spotlight on a suspicious looking transaction that, when examined carefully, had potential infirmities. If we assume that despotic or illegitimate regimes—in part because they lack popular support—tend to engage in shady and legally problematic transactions, then the key to replicating the Hausmann-Gorky effect is generating the spotlight on a systematic basis and early enough in the process such that the market decides it is prudent to avoid the securities in question.

Indeed, the most significant impact of the entire Hunger Bond drama was probably not the price penalty being imposed on that one bond issuance, but the deterrent effect that this drama had on those who were contemplating other such transactions. In interviews, we were told in three separate instances that respondents had been offered transactions akin to the Hunger Bond deal and, because of the cost GSAM had had to bear, they had decided to avoid doing the deals. We have no way of verifying the foregoing, but it does appear that few other transactions of this type occurred after May 2017.

Moving to the broader canvas, Hausmann and Panizza (2017) have suggested the creation of an odiousness sovereign

Sorted by Dirty Bond Price

Petroleos de Venezuela, S.A. (all bonds are denonminated in USD)

Bond	Coupon	Maturity	Issuance Price	Dirty Price Today	Hunger Bond Discount	Accrued (% of Face)	Risk to Par Claim	Issuance Date	Amt Out. (mm)	Days since CPN Rec'vd
PDVSA										
PDVSA 20 (Sec)	8.50%	10/27/2020	71.50	82.60	**-75%**	2.7%	YES	Oct 2016	2,526	116
PDVSA 22	12.75%	2/17/2022	77.00	29.60	**-32%**	6.6%	-	Feb 2011	3,000	186
PDVSA 21	9.00%	11/17/2021	64.00	27.80	**-27%**	6.9%	-	Nov 2011	2,394	276
PDVSA 35	9.75%	5/17/2035	82.10	27.10	**-25%**	7.5%	-	Jun 2012	3,000	276
PDVSA 27	5.375%	4/12/2027	76.15	24.90	**-19%**	2.0%	-	Apr 2007	3,000	131
PDVSA 37	5.50%	4/12/2037	74.00	24.70	**-18%**	2.0%	-	Apr 2007	1,500	131
PDVSA 24	6.00%	5/16/2024	61.00	24.50	**-17%**	4.6%	-	May 2014	5,000	277
PDVSA 26	6.00%	11/15/2026	55.25	24.20	**-16%**	4.6%	-	Dec 2013	4,500	278
PDVSA 22 New	**6.00%**	**10/28/2022**	**31.00**	**20.25**	**n.m.**	**4.9%**	**YES**	**Mar 2016**	**3,000**	**295**
PDVSA Total:									**$ 27,920**	

rating system, akin to credit ratings. In that proposal, the odiousness rating scale would assess the odiousness of *all* the debt issued by a given regime in a given period. The article suggests that, by becoming part of soft international law, odiousness ratings could perhaps provide an estimate of the likelihood that a court would enforce a given debt contract. The article also points to several challenges and open questions linked to the creation of an odiousness rating system. The most important challenge, the challenge that has been the main obstacle to the creation of an odious debt doctrine, is that of building international consensus around this idea.

The story of the Hunger Bond suggests a new possibility towards establishing a tool that can limit access to credit by despotic regimes. A public ranking of bonds which lists all potential legal problems of individual bonds could lead to price penalties for bonds with legal infirmities—such as whether the bond was issued without proper legislative approval or whether the promised use of the proceeds had not materialized—and possibly increase the borrowing costs for regimes that, besides being despotic, adopt murky debt management practices. In the presence of such type of public information, few investors could claim to have bought a bond on the secondary market without knowing the illegal origin of the bond. This would depress the price of the bond in the secondary market and, hence, also increase the cost of funds in the primary market. Such a system could also help the opposition parties in countries with potentially despotic regimes announce their future plans regarding likely investigation or even repudiation of those bonds.

This proposal is far from the odiousness rating system proposed by Hausmann and Panizza (2017). In our modest proposal here, the tainting would focus on individual bonds and be based on technicalities, often linked to incompetence and corruption rather than to the despotic nature of the regime. An odious but technically sound regime would escape from the sanctioning effect of our proposal. However, our conjecture is that despotic regimes are also often going to be both incompetent and corrupt and that those traits will show up in their foreign debt transactions.

While modest, our proposal has the advantage of not requiring any legal innovation or international consensus building because it is based on existing law and legal principles. It is thus implementable and would be a step, perhaps small, in the right direction. At worst, our proposal satisfies the Hippocratic Oath of doing no harm and would create incentives for the adoption more transparent sovereign debt management practices.

BOX 1: Computing OID Valuations

Consider a zero-coupon bond issued at 90 and with a one-year maturity. The yield of this bond is 11% (10/90 = 0.11). The OID value of this bond one day after issuance will be approximately 90 (90 + 0.11*80/365 = 90.03). Six months after issuance the OID value will be 95, and one year after issuance it will be 100. Now, consider a bond with a one-year maturity, a 5.5% coupon, and issued at 95. This bond has approximately the same yield of the zero-coupon bond. However the yield will have a different composition (a 5.2% return on the zero-coupon component and a 5.8% return on the coupon).[19] The bond will also have a different OID value. One day after issuance, the OID value will be approximately 95 and 6 months after issuance, the OID value will be approximately 100.25 (the zero-coupon component is 95 + 0.052*95/2 = 97.5 and the coupon is 5.5/2 = 2.75). At maturity, the OID value will be 105.5. This example shows that the best way to compute the OID value of a bond issued at discount is to decompose the return into a zero-coupon bond and then add the coupon.

Consider for instance the PDVSA 12.75% bond issued on February 17 2011, with February 2022 maturity. On the first day of trading (February 21, 2011), this bond was priced 76.62. If we assume that this price is close to the issuance price (a good assumption, given that the first day of trading was just 4 days after issuance), we can model part of the yield of this bond as that of a zero-coupon bond with a 11-year maturity issued at 76.62. This can be obtained by solving the following formula: $100 = 76.62*(1 + r)^{11}$. The solution for r is: $r = (100/76.62)^{1/11} - 1 = 0.0245$, or 2.45%. Next, we compute the return on the coupon which is 12.75/76.62 = 0.167 or 16.7%. The yield to maturity on the bond is then 16.7 + 2.45 = 19.1%. Note that this is similar to the yield to maturity reported by DataStream and listed in Table 1 (18.6%). We can use these yields to compute the OID value of the bond at any point in time. For instance, in mid-August 2011 (6 months after issuance), the OID value of this bond was 83.93: 77.6 is the value of the zero-coupon bond (76.62*(1 + 0.0245/2) = 77.6) and 6.375 is the value of the coupon (12.75/2 = 6.375). One year after issuance, but before paying the coupon, the OID value of the bond is 91.25 (78.5 for the zero-coupon component and 12.75 for the coupon), but the day after the payment of the coupon, the bond is worth 78.5.

We can do the same calculations for the 6% PDVSA bond issued on May 15 2014 at 61.75 and expiring in May 2024 and for the Hunger bond. For the Hunger bond, however, the calculation is complicated by the fact that the first day of trading was on May 2017 (about 5 years after the official

[19] 5/95 = 0.052 and 5.5/95 = 0.058.

issuance date). Moreover, it is not clear if the issuance price for this bond should be 31 (this is how much Godman Sachs is reported to have paid for the bond) or 37.9 (the price on the first day of trading). We compute OID values using both prices.

The solid lines of Fig. 4 plot the OID value of the zero-coupon component of the bonds listed in Table 1 and the segmented lines plot the OID values that also includes the coupon. For the Hunger bond we report two different values: one assuming that the issuance price was 31 and the other one assuming that the issuance price was 37.9.

Compliance with Ethical Standards

Conflict of interest Mitu Gulati declares that he has no conflicts of interest with respect to this article. Ugo Panizza declares that he has no conflicts of interest with respect to this article. In the case of both Gulati and Panizza, there is nothing further to declare on this matter.

Ethical Approval Animals: No animals were involved in the research for this paper. Therefore, all applicable international, national, and/or institutional guidelines for the care and use of animals were followed. Humans: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Conversations with human subjects were conducted with informed consent having been obtained from all individual participants included in the study. (In case humans are involved.)

Appendix

Figure 4 plots the OID valuation of the three bonds described in Table 1. The straight lines plot the OID valuation of the principal; the overlapping lines plot the OID valuation of the principal plus accrued interests. In the case of the October 2022 bond (the Hunger Bond) there are two alternative OID valuations (see Box 1 for details).

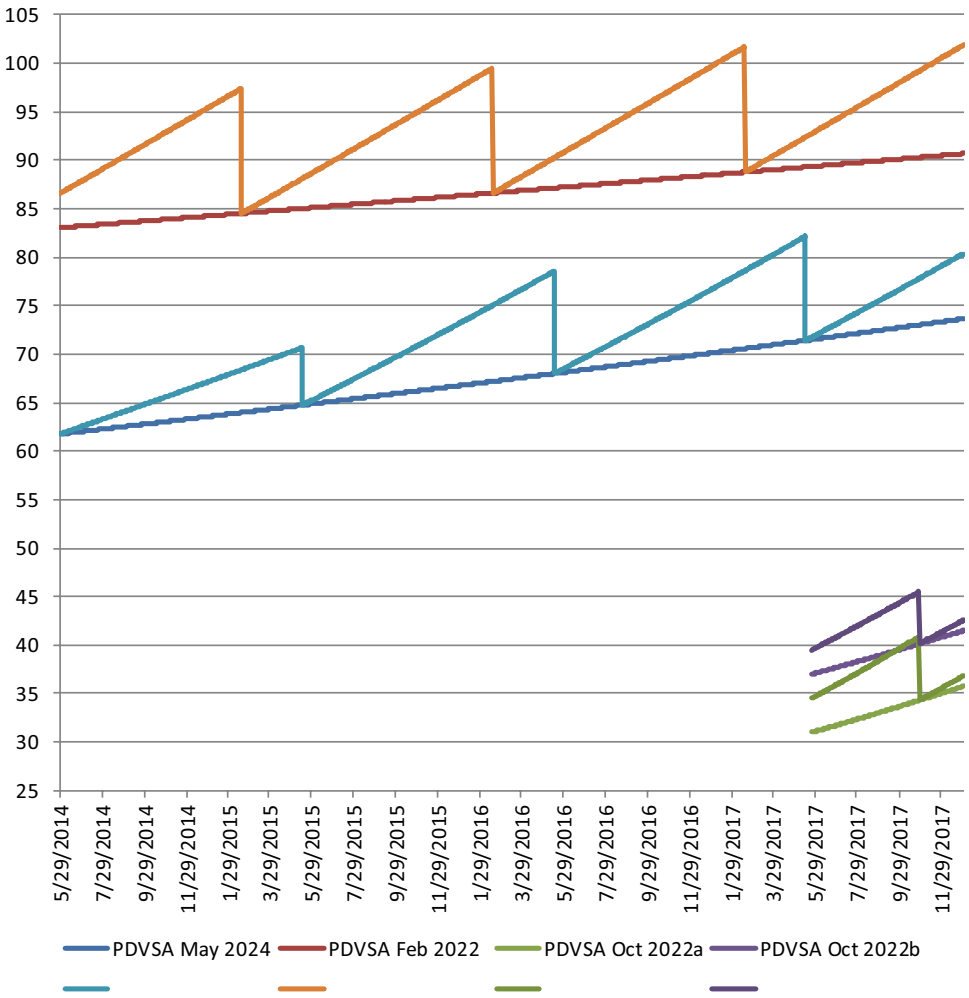

Fig. 4 Bond valuation using original issue discount

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