

Debtor Discrimination During Sovereign Debt Restructurings*

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VERY PRELIMINARY

Abstract

This paper explores patterns of discrimination between residents and foreign creditors during recent sovereign debt restructurings. We analyze 10 recent episodes distinguishing between neutral cases in which the sovereign treated creditors equitably irrespective of their nationality and instances of discrimination against residents and non-residents. We then present evidence in support of the hypothesis that these patterns of discrimination can be explained by the origin of liquidity pressures, the ex ante soundness of the banking system and the extent of the domestic corporate sector's reliance on international financial markets. On the theoretical side, we present a simple model of a government's strategic decision to differentiate between the servicing of its domestic and its external debt. In our model, the basic trade-off facing the authorities is to default on external debt and in so doing restricting private access to international capital markets or to default on domestic debt, thereby curtailing the banking sector's capacity to lend to domestic firms.

Keywords: Sovereign default, discrimination, bank credit, foreign capital

JEL Codes: F34, E65

Introduction

In the spirit of Bulow and Roggof (1989), early models on sovereign risk and default overlooked the role played by domestic creditors during debt crises.¹ Much of that literature tried to explain a well known paradox in international economics: in the absence of effective contract enforcement mechanisms in the sovereign context and given that governments care only about their residents'

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¹For a comprehensive review of the early literature on sovereign debt see Eaton and Fernández (1995).

welfare, why do sovereigns honour their external debt at all, and why do foreign creditors lend them in the first place? Domestic debt was seldom contemplated in these models either because the literature focused on developing countries assumed to rely mostly on external sources of finance or because the lack of a commitment technology was assumed to affect primarily cross-border loans. However, more recent papers have begun to pay attention to the importance of domestic creditors as potentially significant sources of funding also for developing and emerging economies. A case in point is Reinhart and Rogoff (2008) whose historical database challenges some existing pre-conceptions about the importance of domestic debt. Indeed, they show that, on average, residents held almost two thirds of total public debt for the 64 countries that they cover during the period 1914 to 2007. They also call for a better understanding of the way in which the relative seniority of domestic vs. foreign debt contributes to explain how crises unfold. This paper does precisely pull in that direction, analyzing patterns of discrimination between resident and non-resident creditors during sovereign debt restructurings both from an empirical and a theoretical perspective.

On the empirical side, we conduct a case study analysis on ten recent sovereign debt restructurings.² Three different scenarios are identified in these case studies: instances of discrimination against non-resident creditors; neutral cases in which similar losses were undergone by residents and non-residents; situations in which the sovereign discriminated against resident financiers. This last scenario provides some evidence against an assumption commonly held in the recent theoretical literature on sovereign debt restructurings: that in the presence of foreign and domestic debt obligations the sovereign will either give preferential treatment to residents or will not discriminate.³ We are certainly not the first ones to note that residents and non-residents have been treated differently in past debt restructurings. Zettelmeyer and Sturzenegger (2007) analyze six sovereign debt restructurings calculating haircuts instrument by instrument and showing wide variations in the losses undergone by different creditors. Enderlein et al. (2007), in turn, construct a coerciveness index showing that in a number of episodes, domestic creditors were given a harsher treatment than foreign ones. Neither of these contributions, however, tries to provide an explanation for these differential treatments. In this paper we go beyond this descriptive approach, exploring a number of hypotheses about the reasons that may push sovereigns to discriminate in one or the other direction.

More specifically, we identify three key mechanisms contributing to shape governments' strategy vis-à-vis resident and non-resident creditors in our case studies. First of all, the origin of liquidity pressures mattered: it tended to be the case that instances of discrimination against foreign creditors coincided with situations in which the sovereign was struggling primarily to roll-over external debt, and vice versa. However, we find significant exceptions to that pattern which we attribute to specific idiosyncratic factors related with the cur-

²We add three new recent episodes to the cases covered in a related work (Díaz-Cassou et al., 2008).

³See Broner et al (2009), Gennaioli et al. (2009) or Brutti (2008).

rency denomination of domestic debt, the degree of central bank independence or the extent of financial dollarization in the countries of our sample. Second, because financial institutions tend to be the main holders of domestic debt in developing economies, the *ex ante* soundness of the banking system constitutes an important determinant of governments' decision to discriminate. When the debt crisis was preceded by a banking crisis, we find that governments were more reluctant to involve residents in the restructuring. Instead, discrimination against residents was more common where the banking system was perceived to be sound *ex ante* and when financial intermediation was relatively unimportant for the real economy. Third, the private sectors' reliance on international financial markets did also shape the government's discriminatory stance. Indeed, we find evidence supporting the argument that under tight domestic financial constraints or when foreign financing was of prime importance for resident firms, governments were more reluctant to discriminate against non-residents in order to preserve their corporate sector's access to external sources of finance. This explanation for the existence of discrimination among creditors contrasts with that presented in Kohlscheen (2009) and Van Rijckeghem and Weder (2004), who argue that the difference in treatment is related to the political situation of the country.

On the theoretical side, we construct a stylized model which shows the mechanisms at play. Our model is a variation of Caballero and Krishnamurthy (2001), who considered an economy facing two types of collateral constraints limiting its borrowing capacity from both foreign and domestic creditors.⁴ Their focus, however, was on how the two constraints interact to affect both prices and assets sales. Instead, we modify the model as in Sandleris (2008) and introduce public borrowing. We depart from his work by allowing the government to endogenously differentiate repayments to foreign and domestic creditors. For a given debt structure, the key decision faced by the government is whether to honour payments due to domestic banks and to foreign creditors. When it defaults on its domestic obligations the government is affecting banks' balance sheets, reducing their ability to lend further to the private sector. On the other hand, when it defaults on external creditors, the government is negatively affecting the value of domestic collateral, which reduces the availability of foreign financing for resident firms.⁵ In this setup, the government has incentives to discriminate in one or the other direction depending on factors such as the substitutability of domestic and foreign capital, the impact of the sovereign default on private external borrowing and the health of the banking sector.

This paper relates to Sandleris (2008), who argues that Governments have incentives to avoid external defaults given that these send the wrong signal to capital markets, reducing the private sector's access to foreign capital. It also relates to Broner et al (2009), Gennaioli et al. (2009) and Brutti (2008). In Broner et al. (2009) debt is private and the government's role is to enforce contracts. They show that, given that a government has incentives to enforce debt

⁴Holmstrom and Tirole (2002) present a similar framework.

⁵See Sandleris (2008) for a similar argument and Trebesch (2009) for empirical evidence on the impact of defaults on private external financing.

contracts between residents, the existence of secondary markets in which debt instruments can be traded explains foreigners' willingness to lend to residents. Gennaioli et al. (2009) and Brutti (2008) study frameworks in which the sovereign owes money both to residents and to foreigners. However, these models take the absence of discrimination as given, and focus on the implications of sovereign defaults on private borrowing. The main take away of these papers is that the existence of complementarities between private and public borrowing has the potential to limit the risk of sovereign defaults. Our paper also relates to recent contributions on implicit seniority. In Jeanne and Bolton (2008) seniority among creditors is taken as given. Contrary to this view, we present evidence that implicit seniority is state dependent, and arises as the result of balancing the costs and benefits of defaulting on different types of investors.

Next section summarizes the evidence on selectiveness and discrimination collected from the 10 episodes of sovereign debt restructurings that we cover. Section 3 introduces a number of hypotheses to explain these patterns of discrimination and tests the relevance of these mechanisms for the countries of our sample. Section 4 introduces a model that endogenizes default selectiveness and shows how the default choice relates to underlying fundamentals. Finally, Section 5 concludes and presents directions for future research. Tables, figures and the more involved proofs are included in the Appendix.

Evidence on selectiveness: a case-study approach

This section identifies instances of discrimination between domestic and external creditors in 10 recent episodes of sovereign debt restructuring: Argentina, Belize, Dominica, the Dominican Republic, Ecuador, Grenada, Pakistan, Russia, Ukraine and Uruguay. Some of the key features of these debt restructurings are summarized in Table 1, that can be found in the appendix. The cases covered in this section can be broadly grouped in three categories: countries in which the sovereign discriminated against external creditors; countries in which the sovereign adopted a 'neutral' approach; countries in which the sovereign discriminated against domestic creditors. We focus primarily on the early stages of the debt crises during which the sovereign still retained some room for manoeuvre to adopt the type of strategic behavior studied in this paper.

Discrimination against external creditors

The cases in which the sovereign did more clearly try to spare resident creditors from the direct impact of the debt workout were Belize, the Dominican Republic, Ecuador and Pakistan. On February 2007, the government of Belize completed the preemptive restructuring of 6 international bonds with maturities ranging from 2008 to 2015 and a combined face value of US\$571 million (about 44% of total debt). The vast majority of holders of these instruments were non-residents, and the government did not try to restructure other domestic instruments, which represented about 13% of total sovereign debt. In turn,

the Dominican preemptive debt restructuring carried out in between April 2004 and October 2005 focused on bilateral official debt (Paris Club), two series of international bonds with a total face value of US\$1.100 million, and commercial debt (London Club). Overall, this represented about 18% of total sovereign debt. Again, in this case no purely domestic debt instruments were restructured, although some residents may have held part of the international bonds that were exchanged.

The case of Ecuador is more complex. Initially, the authorities tried to ring-fence the 1999 default to very specific instruments: Past-Due Interest and Discount Brady bonds. Eventually, however, the authorities were forced to launch a comprehensive debt restructuring which included bilateral official debt, the entire stock of Brady bonds, Eurobonds, and commercial debt. Overall, and excluding official debt, total private claims in default surpassed US\$7 billion (about 45% of total debt). Although domestic debt was included in the restructuring, residents were granted a preferential treatment. Indeed, the unilateral rescheduling of domestic bonds maturing between September 1999 and end-2000 was carried out at a 9% cost in NPV terms, which contrasts with the 19 to 47% haircut undergone by the holders of Eurobonds and Brady bonds (Sturzenegger and Zettelmeyer, 2007).

Finally, Pakistan's main concern was to restructure bilateral official debt and address a severe balance of payments crisis: three Paris Club treatments were signed in January 1999, January 2001 and December of that same year for a total amount of close to US\$17.5 billion. As a result of the 'Comparability of Treatment Clause' imposed by the Paris Club, private obligations were also rescheduled by the government of Pakistan: Eurobonds for an amount of US\$610 million were restructured by the end of 1999, and an agreement was reached with the London Club in July 1999 involving commercial loans with a face value of US\$929 million. Eventually, the overall amount of restructured obligations constituted about 37% of total debt. Although domestic debt amounted to almost 50% of total debt in the case of Pakistan, resident creditors were entirely spared from the restructuring. As explained below in more detail, this was facilitated by the fact that the government could rely on the monetization of fiscal deficits in order to remain current on domestic debt denominated in local currency.

Table 1 suggests that discriminating against external creditors had little influence on outcomes such as the duration of the debt restructurings, the losses ultimately borne by investors or the degree of coerciveness with which creditors were involved in the debt workout. This is largely due to the substantial variation observed in each of these dimensions among the four countries that form this sub-sample. On the one hand, both the Belizean and the Dominican restructurings were completed in only 6 months, carrying a mild haircut and, according to the index developed by Enderlein et al. (2007), in a relatively non-coercive manner. On the other hand, the Ecuadorian and Pakistani restructurings took much longer to be completed (14 and 11 months respectively), carried a substantial haircut and were more coercive in nature. It would seem that rather than the direction of discrimination between resident and non-resident creditors,

what mattered to explain these outcomes was whether the restructurings were preemptive or not. Indeed, while the Dominican and Belizean restructurings were entirely preemptive and entailed only minor and punctual arrears on sovereign obligations, Ecuador defaulted rather comprehensively on both external and domestic debt and Pakistan accumulated substantial arrears with bilateral official creditors. There is some ground to argue, therefore, that the smoothest restructurings in terms of duration, haircut and coerciveness tend to coincide with the preemptive cases.

Neutral cases

Within our sample of countries, Uruguay, Grenada and Dominica come close to having adopted a ‘neutral’ restructuring approach. The preemptive restructuring announced by the Uruguayan government in March 2003 involved its entire stock of tradable government securities: debt worth US\$5.3 billion (equivalent to 42% of total debt), 44% of which was held by residents. Although the government tried to accommodate investors’ specific demands, the same exact conditions (a ‘maturity extension’ option and a ‘benchmark bond’ option) were offered to all the holders of these securities irrespective of their nationality. However, participation in the exchange was significantly higher among residents: 99% against a participation of 89% among non-residents. This could be partly attributed to moral suasion on the part of the government or to regulatory incentives. Nevertheless, the Uruguayan debt restructuring is broadly viewed as being of a non-discriminatory nature, reflecting the market-friendly and cooperative strategy adopted by the authorities.

In the case of Grenada, a total debt amounting to approximately US\$ 237 million in principal (40% of total public debt) was exchanged for new US\$ and Eastern Caribbean dollar-denominated bonds after the devastating effect of Hurricane Ivan forced the government to suspend payments on most classes of its outstanding obligations. Given concerns over the restructuring’s impact on the financial system, the positions of domestic banks were taken on board to design the debt restructuring strategy launched in October 2004. In addition, the authorities committed to continue servicing the obligations traded in the Regional Government Securities Market (RGSM), which was partly aimed at maintaining access to a source of short-term financing and liquidity management. Overall, however, the burden absorbed by residents and non-residents was of a comparable magnitude: about 40-45% in NPV terms. The Grenadian debt restructuring, therefore, can be considered neutral.

Due to scarce information the case of Dominica is more difficult to assess. There is some ground to argue that the authorities did consider the idea of ring-fencing domestic financial institutions from the effects of the restructuring given that the government did initially express its intention to exclude domestic creditors from the restructuring announced in December 2003. However, the authorities were eventually forced to include residents in the debt workout. Although the government tried to reach a separate agreement with each of the main domestic banks depending on their specific exposure and vulnerabilities,

this debt exchange was eventually conducted on the principle that a certain level of inter-creditor equity should be maintained. Nevertheless, the most sizable domestic restructuring operation was carried out with a public entity: the Dominica Social Security Agency. This implies that a substantial portion of Dominica’s domestic restructuring simply equated to an intra-public sector transfer of resources not really affecting obligations held by the private sector.

Table 1 shows that, if compared with the other sub-samples corresponding to the countries that discriminated in favour of specific categories of creditors, the neutral cases tend to be associated with a lower coerciveness index. In fact, a possibility which is explored later in more detail is that one of the factors shaping countries’ decision to be neutral is a willingness to signal their goodwill vis-à-vis their creditors. This seems to be particularly clear for the case of Uruguay, which was characterized by the collaborative approach adopted by the authorities, evidence of which was the mild haircut attached to the government’s offer (on the range of 5-20% in NPV terms). In Grenada and Dominica the government did also adopt a market-friendly debt restructuring approach, which is consistent with the hypothesis that being neutral does partially constitute a signalling device. However, and maybe due to the extent of the fiscal problems undergone by these two countries (debt to GDP ratios of 130%), the haircut associated with these debt restructurings were much higher. If the duration of debt restructurings is understood as an indication of their smoothness, it would seem that the strategy of being neutral, collaborative and market friendly paid off for the countries of this sub-sample. Indeed, Uruguay’s was the shortest debt restructuring among the countries of our sample (only two months), and Dominica’s and Grenada’s debt restructurings were also relatively short (about half a year).

Discrimination against residents

Three cases fall in this scenario: Argentina, Russia, and to a lesser extent Ukraine. The Argentine debt restructuring was the most contentious case among the countries of our sample, reflecting the complexity of the restructured debt and the non-collaborative stance adopted by the authorities after the December 2001 default. However, what is more relevant to our analysis is that prior to defaulting in December 2001, the Argentine government went at great length to mobilize domestic sources of finance in order to substitute for a loss of access to international financial markets. This was done through the exertion of moral suasion on firms to absorb ‘patriotic’ bonds, through financial engineering operations like the June 2001 ‘mega-swap’, and through the semi-coerced exchange of bonds for ‘guaranteed loans’. All these pre-default measures constituted an incremental and increasingly desperate attempt to avoid an international default and to save the convertibility regime. Ultimately, it is well known that this strategy failed, substantially increasing the exposure of the domestic financial sector to public debt and thereby exacerbating the long-term economic dislocation caused by the crisis.

The bulk of the liquidity pressures undergone by the Russian government in

1998 were originated in the domestic government securities market.⁶ Because investors thought a devaluation of the ruble more likely than a sovereign default, a widening of the yield-differential between ruble denominated securities and Eurobonds made it increasingly difficult to roll-over domestic instruments. In this context, when the Duma failed to ratify an IMF-endorsed package of stabilization measures, the government defaulted on GKO and OFZ obligations while committing to remain current on post-soviet external debt obligations. This amounted to a default on a debt worth approximately US\$30 billion at pre-default exchange rates. It is unclear which proportion of that debt was in the hands of residents, and estimates range between 35% and 80% (Owen and Robinson, 2003). The Russian debt restructuring, therefore had a domestic bias both in terms of the jurisdiction in which the restructured instruments were issued and in terms of the nationality of the holders of these instruments. However, it is worth noting that on top of the haircut associated with the ‘Novation’ scheme, foreign holders of ruble-denominated instruments faced capital controls, as a result of which they underwent larger losses than resident bondholders.⁷

Ukraine’s debt restructuring was carried out in two distinct stages. In years 1998 and 1999, a succession of selective restructurings with specific creditors was completed in order to bridge mounting liquidity needs. These selective restructurings did simply postpone the resolution of the underlying debt problem, and by year 2000 the government was forced to carry out a comprehensive restructuring of its entire stock of international bonds. We consider this a case of early discrimination against residents because the first deal closed by the Ukrainian authorities during the wave of selective restructurings was reached precisely with domestic banks. This was completed in September 1998, affecting a variety of treasury bills with a total face value of HrV800 million, equivalent to close to US\$130 million or one third of domestic banks’ total holdings of T-bills. This debt exchange carried a relatively mild haircut ranging in between 5% and 9% in NPV terms. The following debt restructuring actions, instead, tended to affect primarily international creditors. Overall, therefore, the Ukrainian debt restructuring was not one in which residents suffered larger losses than non residents. However, what matters for our analysis is that residents were the first category of creditors to be involved in the Ukrainian debt restructuring.

An examination of the indicators provided in Table 1 suggests that, among the countries of our sample, debt restructurings tended to be more complex for the countries that discriminated against residents. This is illustrated in the much longer duration of these restructurings: 46 months in Argentina, 35 months in Ukraine and 24 months in Russia. In addition, the Argentine and Russian debt restructurings were the most coercive among the countries of our sample, reflecting the non-collaborative approach adopted by the authorities in

⁶The main types of bonds traded in the Russian market for government securities were the so-called GKOs and OFZs. This market was opened to non-resident investors in 1996. Interest payment on these securities absorbed over 70% of total interest payments in the months leading to the default.

⁷Foreign creditors were forced to place all cash proceeds in a non-interest bearing ‘transit account’ for one year.

these two episodes. The Ukrainian debt restructuring, in turn, was comparatively less coercive. Again, this suggests that the degree of coerciveness tended to be associated with whether a restructuring was preemptive or not.

Explaining the patterns of discrimination

In this section we identify a number of factors that may have contributed to explain the patterns of discrimination between residents and non residents observed in our case studies. More specifically, we explore whether the origin of liquidity pressures, specific features of domestic financial systems and the reliance of the domestic private sector on international capital markets contributed to create incentives for the sovereign to discriminate in one or the other direction.

The origin of liquidity pressures

A first hypothesis is that the decision to discriminate depends on the origins of the liquidity pressures undergone by the authorities. If a government is primarily struggling to meet external obligations it may opt to spare resident creditors from a restructuring, or to offer them more lenient terms. Indeed, under such circumstances the liquidity relief potentially extracted from resident creditors may be considered insufficient for the government to assume the political liability of failing to honour its domestic contractual obligations or of putting the stability of the financial system at risk (see below). Conversely, if struggling primarily to roll-over domestic debt, the government may opt to discriminate against residents. In this scenario, the potential liquidity relief to be extracted from non-residents may be deemed insufficient to compensate for the effects of the loss of access to international financial markets that is likely to be associated with the restructuring of external debt both for the government itself and for the domestic corporate sector (see below). Summing up this first hypothesis, if the sovereign is struggling to roll-over external (domestic) obligations we would expect to observe discrimination against non-residents (residents).

This hypothesis needs to be qualified for at least two reasons. First of all, the currency denomination of domestic debt obligations is likely to play a relevant role in the decision to discriminate in one or the other direction. If a substantial part of that debt is denominated in local currency and the central bank lacks independence, the government may resort to seigniorage and inflation in order to reduce the burden of domestic debt servicing without explicitly restructuring its contractual obligations. This link between domestic debt and government's incentives to inflate has been recently emphasized by Reinhart and Rogoff (2008). The bottom line for this paper is that we would expect discrimination against resident creditors to be less likely under scenarios of fiscal dominance and in countries with a large stock of domestic currency debt. This does not mean that residents will not bear the burden of the crisis in such setups. Far from it, inflation may wipe out the real value of the debt instruments they hold. However, this type of losses falls outside of the scope of this paper,

which sticks to a “narrow” definition of discrimination centred on the direct participation of residents and non residents in the restructuring.

Second, there may be situations in which the government tries to squeeze residents in order to remain current on external obligations. This could be done in various ways. For instance, a domestic restructuring of dollar-denominated debt could be instrumental to free up resources later used to honour obligations owed to non-residents. Alternatively, the government could coerce residents into absorbing further volumes of foreign currency debt. We would expect this form of discrimination against resident creditors to be more likely if the domestic financial system is highly dollarized, giving room for the government to extract domestically the currency that is needed to honour external obligations. Instead, if there are few dollars in circulation domestically, soaking liquidity from residents in order to remain current externally would not avoid the depletion of the central bank’s stock of foreign exchange reserves. This may turn out to be counterproductive if the debt crisis is compounded by a currency crisis, as is often the case in emerging markets.

Do our case studies provide some evidence in support of the liquidity pressures hypothesis? Our preferred indicators to track the origin of liquidity pressures would be the ratio of domestic short-term debt to total short-term debt or the ratio of domestic debt service to total debt service. Unfortunately, information on the maturity profile of domestic debt or the decomposition of debt servicing is scant for the countries of our sample. We are therefore constrained to use two alternative indicators: the ratio of domestic to total debt (see Figure 1) and the proportion of domestic debt to total restructured debt (see Figure 2). With the caveat that it does not take the servicing profile of domestic vs. external debt into account, higher values of the former indicator should be associated with more intense domestic liquidity pressures. In turn, the second indicator gives us an idea of the extent to which it would have been possible for governments to restructure the total amount of debt that was ultimately restructured involving only domestic creditors. Therefore, the higher that ratio, the more likely we would expect governments to have discriminated against residents. In order to find out whether the two special scenarios mentioned above applied to any of our case studies, we also compare the ratio of financial dollarization (reported in Figure 1 as the percentage of deposits denominated in foreign currency) and the degree of fiscal dominance at the time of their respective debt restructurings (reported in Figure 2 as the Cukierman index of central bank independence).^{8, 9}

⁸Sources for Figures 1 and 2: CLYPS database; Art. IV reports; Owen & Robinson (2003); Polillo and Guillen (2005), Carstens and Jácome (2005), Jácome and Vázquez (2005), Díaz-Cassou, Erce-Domínguez and Vázquez-Zamora (2008), Moody’s (2007) national sources (Secretaría de Estado de Hacienda, República Dominicana); authors’ calculations.

⁹The ratios reported in Figure 2 correspond to period t , with the exception of Russia, where we report data for $t-1$. This is justified by the fact that after the August 1998 Russian default, this ratio becomes distorted due to the strong fluctuations of the rouble. Such an exchange rate effect is not so acute in the other cases either because the debt restructuring was launched closer to the end of the corresponding year, because domestic debt was not denominated in domestic currency or because the exchange rate was more stable. No CBI available for Belize.

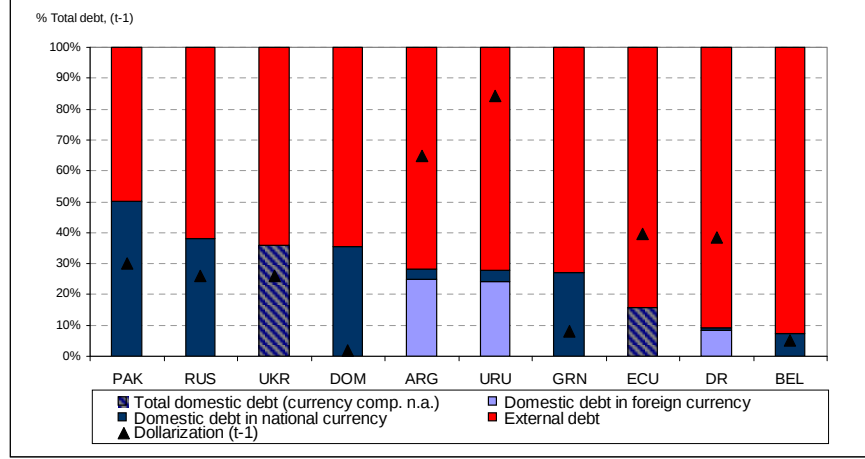


Figure 1: Public debt composition and financial dollarization

Consistent with our hypothesis on the role of liquidity pressures, Figure 1 shows that the countries of our sample with a lower proportion of domestic to total debt are Ecuador, the Dominican Republic and Belize, the three of which discriminated against non-residents in their respective debt restructurings. In addition, and as we would expect, Figure 2 shows that these countries did also display low ratios of domestic debt to restructured debt. Surprisingly, however, the proportion of domestic to total debt and the ratio of domestic to restructured debt were the highest in Pakistan, which is the fourth case in which residents were either spared or treated preferentially in the debt workout. The currency denomination of its domestic debt together with the lack of independence of its central bank may provide an explanation for the Pakistani exception. Indeed, Figure 2 shows that Pakistan had the least independent central bank among the countries of our sample. It may well be, therefore, that the government monetized a substantial part of its deficit, diluting the burden of domestic debt and partly overcoming the liquidity pressures stemming from local currency claims in the hands of residents. Agha and Khan (2006) provide an empirical account on the significance of fiscal dominance in Pakistan which supports this hypothesis. Although this practice has become less common in recent years, they argue that a substantial portion of fiscal deficits was still financed through the State Bank of Pakistan in the late 90s. This could only have eased domestic liquidity pressures, thereby shaping the outcome of this debt restructuring.

The CBI reported for Uruguay corresponds to year t-3. Because Dominica and Grenada are members of the ECCU, we assume their CBI to be one (maximum degree of central bank independence)

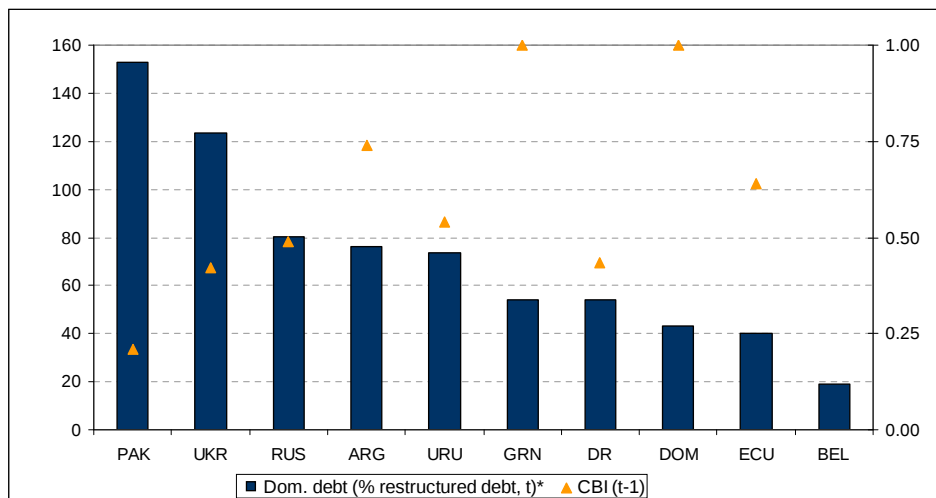


Figure 2: Domestic debt to restructured debt and Central Bank independence

In line with our hypothesis, Russia, the only country of our sample that managed to stick to a discriminatory approach against residents all through its debt restructuring, had a relatively high proportion of domestic to total debt. In fact, as mentioned above, it is well known that in this case liquidity pressures were mostly generated by rouble denominated treasury bills issued domestically (Owen and Robinson, 2003). Especially in light of the aforementioned Pakistani experience and given the relative lack of independence of its central bank (see Figure 2), an interesting question is why the Russian authorities did seemingly restrain from resorting to inflation to honour and dilute such domestic debt instruments. A possible explanation for these divergent experiences is that by the late 90s Russia had recently completed a painful process of monetary stabilization, overcoming years of hyperinflation and fast economic decline. Under such circumstances, the Russian government is likely to have been more cautious when deciding on whether to involve the central bank in the resolution of its debt crisis. A similar explanation may apply to the case of Ukraine, where a comparable stabilization process was undergone prior to the first wave of selective restructurings of domestic debt obligations in 1998.

The Argentine experience of early discrimination against resident creditors differs from Russia's in that the pressure to alleviate domestic liquidity pressures was less intense. In fact, Figure 1 shows that, among the countries of our sample, Argentina did not have a particularly high proportion of domestic to total debt. Rather, there is ground to argue that in this case the observed pattern of early discrimination against residents was mostly aimed at substituting external sources of finance, from which the Argentine government had been effectively cut out in the months leading to the default, for domestic sources of finance. As mentioned above, this was done initially by exerting moral suasion on residents

(firms, banks and pension funds) to increase their exposure to the sovereign, and later by coercing them into restructuring specific instruments. Given that the domestic financial system was highly dollarized, there was a relatively large pool of privately held foreign currency in the hands of residents which the government tried to soak in order to remain current externally. After the sovereign default was consummated in December 2001, this motivation disappeared and the discriminatory measures adopted by the authorities were mostly aimed at softening the impact of the crisis on resident creditors.

According to the liquidity pressures hypothesis, the countries that adopted a neutral approach should be expected to have obtained a non-negligible liquidity relief from the inclusion of resident creditors in the restructuring. In fact, in Dominica, Grenada and Uruguay domestic obligations amounted to about 30% of total obligations. However, other motivations may also explain these countries' restructuring approach. Most notably, some governments may avoid discrimination in order to signal their goodwill and cooperative disposition towards their external creditors. This motivation is likely to have been particularly relevant in the case of Uruguay. Indeed, Uruguay's emphasis on inter-creditor equity (as well as the low haircut that was eventually attached to this restructuring) is best explained by the government's intention to differentiate this crisis resolution package from the contentious Argentine experience. Probably, the adoption of such a market-friendly stance was also encouraged by the IMF, whose leverage on the authorities was particularly strong given that its Uruguayan financial program was the largest in history if measured against the size of the recipient economy (Díaz-Cassou et al, 2008). Uruguay's struggle to present its restructuring as the antithesis of Argentina's uncooperative stance towards bondholders may therefore explain why, in spite of having a similar debt structure and comparable levels of financial dollarization, both countries adopted such different strategies vis-à-vis their domestic and external creditors. In fact, this same line of reasoning may explain why the mechanisms that are explored below as determinants of the patterns of discrimination observed in our case studies appear to have played a somewhat weaker role in the case of Uruguay.

The domestic financial system

The most important domestic holders of sovereign debt in emerging and developing countries are usually resident financial institutions. As a result, it is often the case that domestic banks are highly exposed to government paper in such economies. The countries of our sample were no exception in that respect: as shown in Figure 3, in period t-1, public debt constituted about 30% of total banks' assets in Pakistan and Russia, 17% in Argentina and close to 10% in Belize, Dominica, Dominican Republic, Ecuador, Ukraine and Uruguay. Given such levels of exposure to the public sector, a risk associated with the restructuring of domestic debt in emerging economies is its potential impact on the stability of the banking system. On the asset side, the 'haircut' associated with the restructuring constitutes a direct loss for financial institutions to the extent

that they hold restructured debt instruments. Perhaps even more importantly, on the liability side the restructuring can feed a loss of confidence on domestic banks, potentially large scale deposit withdrawals and an interruption of interbank credit lines. In this context, restructuring sovereign debt in emerging markets poses the risk of triggering or aggravating a banking crises and a credit crunch.

One argument defended in this paper is that, as a result of certain features of their banking systems, some governments tend to be more vigilant than others over the risks induced by a debt restructuring on domestic financial stability, which may contribute to explain certain patterns of discrimination between residents and foreign creditors. Firstly, there is a wide variation in the importance of financial intermediation in emerging markets. This is illustrated in the differences observed in the stock of credit to the private sector among the countries of our sample which, at the outset of the crises, ranged from almost 80 per cent of GDP in Grenada or Uruguay to less than 10 per cent of GDP in Ukraine (see Figure 3). Interestingly, the countries in which we have observed instances of early discrimination against resident creditors are precisely those with the lowest ratios of credit to the private sector: Argentina, Russia and Ukraine.

This may reflect the fact that the authorities from countries with a low level of financial intermediation can expect debt restructurings to have a more limited impact on the overall performance of their non-financial private sectors. Such sovereigns, therefore, may have less to fear about discriminating against domestic creditors if so is needed to address a debt crisis. This seems to apply especially to the cases of Russia and Ukraine, where the disconnection between the banking system and the non-financial corporate sector was particularly acute prior to the 1998 crisis (Huang et al., 2004). Instead, in countries with high levels of financial intermediation, the authorities may be more concerned about potential spillovers from the financial sector to the real sector. Indeed, where the savings investment process relies more strongly on financial intermediation, weakening the banking system as a result of the debt restructuring can be expected to be more costly in terms of foregone future economic growth (Dell’Ariccia et al., 2005). As a result, such countries may be more reluctant to involve residents in the debt workout.

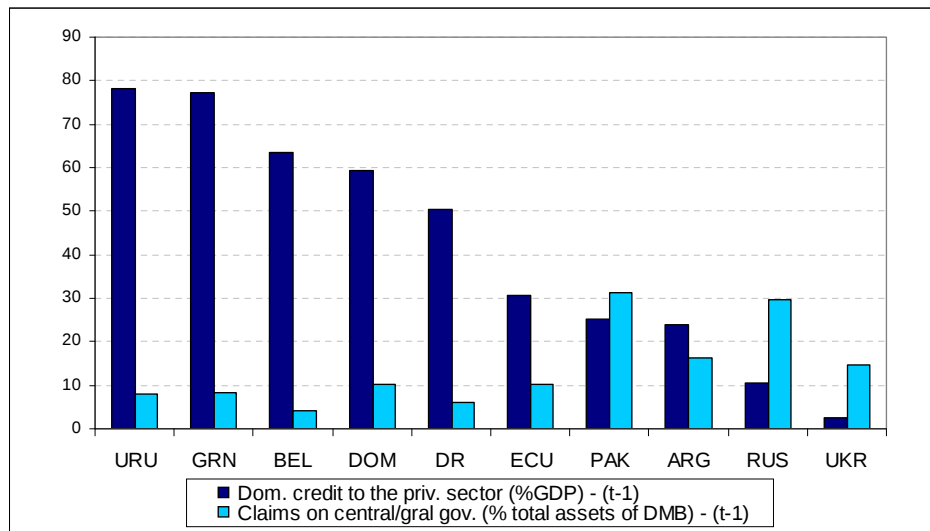


Figure 3: Domestic credit and public debt as a share of total bank assets

In addition to financial intermediation, we hypothesize that the ex ante robustness of the financial system was a factor contributing to shape the government's decision to discriminate. When the government perceives the financial system to be sound ex ante, the risks associated with the restructuring for domestic banks may be considered manageable. In such a context it may pay off for the government to try to extract liquidity domestically (i.e. to discriminate against resident creditors) in order to avoid an external default and/or to preserve some degree of access to international financial markets. Conversely, when the debt crisis is compounded by severe banking vulnerabilities, involving domestic creditors in a debt restructuring may seem counterproductive from the outset. Indeed, governments engulfed in a banking crisis are probably facing the need to re-capitalize domestic banks, as a result of which they may be more reluctant to imposing further losses onto financial institutions through a debt restructuring (i.e. to discriminate against foreign creditors). Summing up, we argue that the ex ante robustness of the banking system should be negatively correlated with governments' propensity to discriminate against external creditors.

Do our case studies bring some support to this hypothesis? To proxy for the ex ante soundness of the financial system we analyze the evolution of two variables in the quarters surrounding the beginning of the debt restructuring process. The first variable captures the evolution of total deposits in local currency and in US\$ measured as an index. The second variable captures the evolution of the liquidity support extended to the banking sector by the monetary authority. As in Laeven and Valencia (2008), we proxy this liquidity support with claims of the monetary authority on the banking sector, expressed

as a percentage of total deposits and foreign liabilities in the banking system. Figure 4 in the Appendix shows the evolution of these two variables for the ten countries of our sample.

Consistent with our hypothesis, the three countries that discriminated against residents appeared to have relatively sound banking systems prior to the debt restructuring. As shown in Figure 4, in Argentina the total deposit base remained stable up until the quarter of the June 2001 mega-swap, which we identify as the beginning of the debt restructuring. Another manifestation of the relative stability of the Argentine financial system was the low volume of liquidity injected by the central bank, which remained well below 1 per cent of total deposits and foreign liabilities until the mega-swap. In this context, the government had some reason to be confident about the capacity of the banking sector to absorb larger volumes of public debt, or even the losses imposed by a selective restructuring. However, right after the mega-swap was completed, the banking system began to experience severe problems. In fact, the run on deposits of November-December 2001 was largely due to an increasing public concern over the future solvency of Argentine banks given their high exposure to a sovereign on the brink of default. This illustrates the fact that placing an excessive burden on domestic banks at the early stages of a debt crisis poses substantial risks to financial stability even when these institutions seem resilient *ex ante*.

As suggested by the growing deposit base exhibited in both countries, the banking systems of Russia and Ukraine also appeared to be in a relatively stable situation in the quarters leading to the beginning of their respective debt restructurings. Added to the aforementioned low level of financial intermediation both in Russia and Ukraine, this probably contributes to explain why the government discriminated against residents at the early stages of these debt restructurings. As suggested by the observed surge in liquidity support extended to domestic financial institutions by the monetary authority in Russia, severe banking problems emerged following the August 1998 default. However, and further illustrating the disconnection between the domestic financial system and the real economy, this banking crisis did only constrain moderately the recovery of Russia's real output, which was quite pronounced in 1999 and thereafter (Owen and Robinson, 2003). In the case of Ukraine, instead, we do not observe any clear indication of the presence of post-restructuring banking problems. In part, this may be due to the fact that during the later stages of this debt crisis, the bulk of the restructuring's burden was borne by external creditors and not by resident institutions.

In contrast, the Dominican Republic, Ecuador and, to a lesser extent, Pakistan, three of the countries that discriminated against non-resident creditors, experienced substantial banking problems prior to the launching of their respective debt restructurings. In the Dominican Republic, this materialized in massive injections of liquidity: although in slight decline, the central bank's claims on the banking sector still constituted about 40 per cent of total deposits and liabilities in the quarters leading to the launching of the debt restructuring. Indeed, to a large extent the Dominican debt restructuring was the result of the mishandling of this banking crisis and the ensuing surge in public debt required

for recapitalization purposes. In Ecuador, both a collapse in deposits and a surge in liquidity injections are apparent a few months before the 1999 default. Although Pakistan was not going through a full-blown banking crisis, the large and rising central bank's claims on the banking sector suggests the existence of significant fragilities in the financial system. In line with our hypothesis on the role of the domestic banking system, it is highly likely that fears about the impact of the restructuring on its already troubled financial institutions did constrain the choices ultimately made by the Dominican Republic, Ecuador and Pakistan as regards the treatment of its resident creditors.

Another country where the debt restructuring was preceded by a banking crisis was Uruguay. In that case, a sustained fall in dollar-denominated deposits can be observed in the quarters leading to the restructuring. This was largely due to a contagion from the Argentine crisis which materialized in massive deposit withdrawals on the part of cash-strapped Argentine nationals caught in the Corralito. Given the extent of its banking problems, the fact that the Uruguayan authorities opted to apply a neutral approach instead of granting a preferential treatment to domestic financial institutions contrasts with the experiences of the Dominican Republic, Ecuador and Pakistan. To some extent, this may be due to the fact that by the time of the launching of the debt restructuring the worse of the banking crisis had already passed, as suggested by the evolution of the central banks' claims on the banking sector, which were already close to zero in 2003. As mentioned above, another factor which we consider important to explain this exception is Uruguay's struggle to present its restructuring as the antithesis of Argentina's crisis resolution approach.

The domestic private sector's reliance on international financial markets

Our last hypothesis regarding governments' strategic behavior vis-à-vis their creditors relates to the importance of external funding for the private sector. Various recent contributions such as Arteta and Hale (2008) have emphasized that sovereign debt crises have a negative impact on the corporate sector's access to international financial markets in emerging economies. Similarly, Trebesch (2009) finds that the extent of this loss of access is partly determined by the coerciveness with which the government treats its external creditors during a debt restructuring. Along these lines, we argue that country authorities are likely to take their corporate sector's reliance on international financial markets into account when deciding whether to discriminate between resident and non residents. If keeping access to external finance is deemed important for the functioning of the corporate sector, the government may decide to act more coercively on its domestic financiers while trying to fully or partially spare its foreign creditors from the effects of the debt workout. Such a strategic stance would be adopted in the hope of preserving some level of corporate sector's access to international financial markets and, in so doing, reduce the impact of the crisis on the real economy. Instead, according to this line of reasoning, a small reliance on international financial markets on the part of the corporate

sector should tend to reinforce the sovereign's incentives to discriminate against non residents when conducting a debt restructuring.

This section proposes various indicators to compare the private sector's reliance on international financial markets among our sample countries. Because we argue that access to external sources of finance is all the more important for the corporate sector when credit is constrained domestically, these indicators are presented as ratios against the stock of domestic credit to the private sector.¹⁰ In the first place, we compare the average weight of the various types of capital inflows considered in the balance of payments statistics over the five years that preceded the crises. As shown in Figure 5, according to this metric the countries that discriminated against domestic creditors at an early stage of their debt restructuring appear to be those that exhibited a greater dependency on international sources of finance. This was particularly clear in Ukraine, where foreign banks' loans to the non-financial private sector averaged over 80% of domestic credit prior to the crisis.¹¹ This reflects the fact that in Ukraine and to a lesser extent in Russia, the underdevelopment of the financial system was such that recently privatized firms had a very limited access to domestic credit during most of the 1990s. In such a scenario, retaining some degree of access to international financial markets for the corporate sector may have been prioritized over the objective of mitigating the impact of the restructuring of domestic obligations on financial stability. In the case of Argentina, on top of FDI, activity in international financial markets was dominated by debt portfolio investment, which averaged 12% of domestic credit, second only to Ukraine among the countries of our sample. However, IFS data does not allow us to disaggregate between debt portfolio flows directed to the private or to the public sector, as a result of which this can only be considered a partial indicator of domestic firms' reliance on international financial markets.

¹⁰The IMF's 2009 Global Financial Stability Report uses this same approach to analyze whether domestic credit could be used as a substitute for external financing in a number of emerging economies (GFSR, 2009).

¹¹For the cases of Dominica and Grenada IFS data does not allow to disentangle between debt and equity portfolio investment and private financial, private non financial and public other investment. That's why Figure 5 does not provide the distinction.

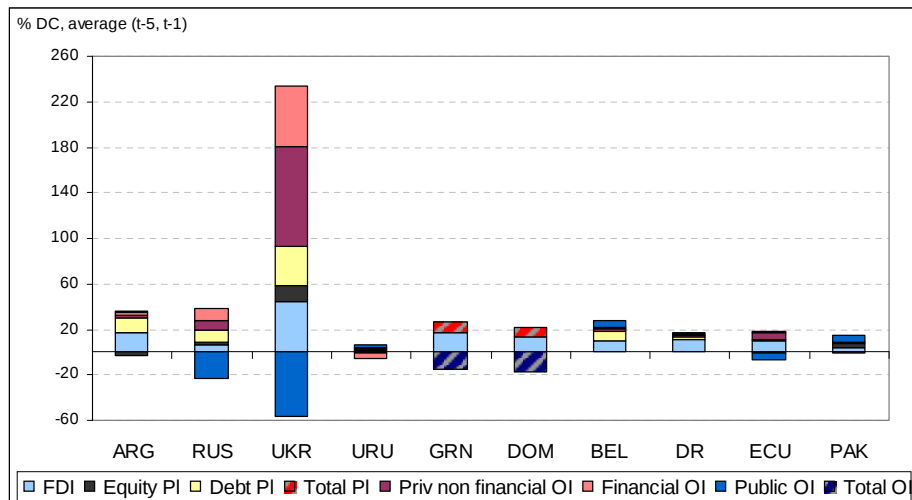


Figure 5: Net capital inflows: balance of payment statistics

Apart from FDI, which tends to behave in its own idiosyncratic way during emerging market crises (Gopinath and Aguiar, 2005), the only three categories of capital flows reported by IFS that are unambiguously directed to the private sector are equity portfolio flows, other investment towards the private non-financial sector (mostly foreign bank loans to domestic firms), and other investment towards the private financial system (mostly interbank loans involving a foreign bank). Figure 6, that can be found in the Appendix, compares the weight of these three flows for our sample countries during the years leading to the crises. Consistent with our hypothesis, Figure 6 shows that the average for each of these flows in the three countries that discriminated against residents (Argentina, Russia and Ukraine) was significantly higher than that for the other countries of our sample. Again, the Russian and Ukrainian private sectors' reliance on international sources of finance was largely explained by domestic credit constraints. Two years prior to the launching of the restructuring, private equity flows amounted to 7% of domestic credit in Russia and 20% in Ukraine, while foreign bank loans to the private non financial sector reached as much as 11% and 91% of domestic credit respectively. These figures are much higher than those of any of the countries that did not discriminate against resident creditors. In Argentina, instead, net outflows both of equity and bank loans to the corporate sector were registered in the years that preceded the default, suggesting that by that time private investors were already quite concerned about the sustainability of the Convertibility regime. However, back in the mid 1990s, Argentina was one of the most important recipient of equity and international loans both among the countries of our sample and among emerging markets as a whole. Indeed, in between 1993 and 1998 the combined net amount of these three categories of capital inflows averaged as much as 12%

of domestic credit.¹²

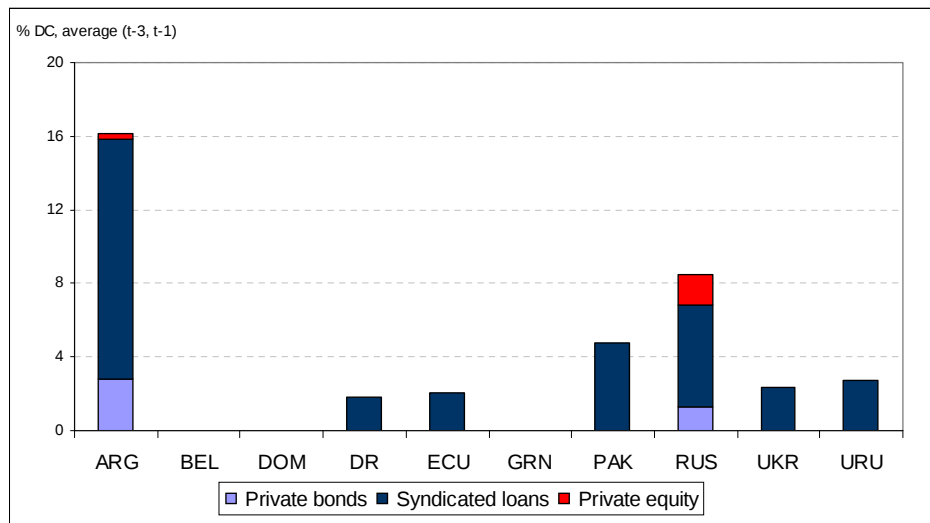


Figure 7: Corporate activity in international financial markets

Finally, in order to compare corporate activity in international financial markets we use data from DCM Analytic to track cross-border financial operations involving our sample countries' private sectors during the three years that preceded the launching of the restructuring. More precisely, we look for bonds and equity issuances in foreign jurisdictions, and for syndicated loans operations with international banks. As shown in Figure 7, according to this database Argentina and Russia were by far the most active players in international financial markets among the countries of our sample. Syndicated credit appears to have been the most important source of external credit both for the Argentine and for the Russian corporate sectors. However, Argentine firms were also able to issue bonds externally on a substantial scale (for an average amount of close to 3% of domestic credit) while Russian firms did participate in foreign equity markets (for an average amount of about 2% of domestic credit). Again, this experience is consistent with the idea that the larger the reliance of domestic firms on external finance, the likelier will the government be to discriminate against resident creditors. On the other hand, the fact that Pakistan did discriminate against external creditors in spite of displaying a relatively substantial corporate activity in international financial markets (syndicated loans averaged about 10% of domestic credit prior to the crisis) does not square well with this hypothesis. To some extent, this may be due to the fact that, as emphasized above, Pakistan resorted to inflation in order to cope with domestic liquidity pressures. Furthermore, given its relatively low level of financial dollarization, Pakistan had little room to extract domestically the volume of foreign currency

¹²IFS, WDI and authors' calculations.

required to remain current on external debt.

After reviewing evidence in support of the above hypotheses on the determinants of sovereigns' incentives to discriminate against residents or external creditors, this section presents a stylized model to show the mechanisms at play

A simple (and preliminary) model of selective defaults

The environment

There are four types of agents: a government, domestic entrepreneurs, domestic banks, and foreign investors. They interact during three time periods, $t = 0, 1, 2$.

At time $t = 0$, the Government has to honour outstanding debt of size B_h^g with domestic banks and of size B_f^g with foreign creditors. In so doing it can use a predetermined amount T of resources.¹³ The decision to repay/default is collected by the pair (d_h, d_f) . The variable $d_f \in (0, 1)$ reflects the proportion of outstanding debt with foreigners being honoured, with the value 1 indicating full repayment. The variable d_h reflects domestic debt repayment and behaves in a parallel way. Note that, depending on the resources available, the Government may be forced to fully/partly default. At that time banks are holding s_0 units of liquidity (or one-period safe bonds). For simplicity, the gross safe rate is set equal to one.

After public debt repayment, at $t = 1$, entrepreneurs receive an investment opportunity which requires foreign and domestic capital.¹⁴ For simplicity, we assume that both domestic and foreign borrowing must be fully collateralized and that entrepreneurs have a limited amount of collateral C that can be used to back either type of borrowing.¹⁵ As shown in detail below, at this time, domestic banks' have available resources of size D . This includes domestic debt obligations honoured by the Government. Banks will use these resources to form a portfolio of loans to domestic entrepreneurs and holdings of the safe asset. Note that, through its impact on the banks' balance sheet, the Government's repayment choice can affect private domestic borrowing.

In turn, foreign capital must be obtained on international capital markets. We assume that foreign lenders are risk neutral and have deep pockets. As domestic banks, they can also invest in a safe asset. Following Sandleris (2008) and Caballero and Krishnamurthy (2001) we assume that domestic banks have a valuation $\gamma_h \in (0, 1)$ of each unit of collateral available, which is higher than

¹³We take B_h^g , B_f^g and T as given.

¹⁴The need for both types of resources represent the fact that most production opportunities require foreign machinery, intermediate goods or know-how.

¹⁵This similar to Caballero and Krishnamurthy (2001). Our modeling of domestic credit provisioning is, however, different. The absence of a credit chain, together with the nonpledgability of future output, has implications for the domestic interest rate that remains equal to that on foreign borrowing.

that of foreign creditors, γ_f .¹⁶ Moreover, we assume that γ_f depends on the Government's repayment decision, $\gamma_f(d_f)$.¹⁷ Private collateral is less valued the higher the proportion of sovereign foreign debt suffering from default, $\frac{\partial \gamma_f}{\partial d_f} > 0$. Again, Government actions can potentially affect borrowing decisions by entrepreneurs. In this case, by reducing the valuation of collateral, a sovereign default on external debt will affect the amount of borrowing that entrepreneurs can obtain from international sources.

Finally, at time $t = 2$, the outcome from entrepreneurial activity and payoffs are realized.

Optimization

While the problem is solved backwards, starting with the entrepreneurs problem, we begin by introducing both banks and foreign creditors' behavior as they determine the financing constraints faced by the entrepreneurs.

Domestic banking sector

In period $t = 1$, after the repayment decision by the government, the domestic financial sector will have an amount of resources D given by

$$D = d_h B_g^h + s_0,$$

where s_0 stands for the liquidity carried by the banks from time $t = 0$, and $d_h B_g^h$ is the amount of public debt actually honoured and hence available for private lending. In this way, available resources for financing domestic activity depend on the repayment decision of the Government.¹⁸ The banks' assets, D , will be used to acquire either the safe bond, s_1 , or to finance private investments, b_e . Domestic banks' balance sheet must imply

$$s_1 + b_e = D$$

with banks using all resources not lent to private entrepreneurs to acquire the safe asset.

Additionally, when dealing with private borrowers, banks require adequate collateral, and so

$$b_e \leq \min(C_h, D),$$

with $C_h = \gamma_h C$ representing the valuation that domestic banks make of available collateral. This equation determines maximum lending given the realization of

¹⁶ Resident lenders may be better informed and/or require briefer and less costly procedures to get repayment in the event of a private default.

¹⁷ There is extensive empirical evidence showing that external defaults reduce private sector's ability to self-fund via international capital markets (Trebesch (2009) or Arteta and Hale (2008)). This modelling device is a short cut to introduce such effect into the model.

¹⁸ We are assuming that the domestic banking sector cannot access international markets to finance domestic entrepreneurs. This simplifies the exposition while not affecting the existence of the relevant trade-off.

the collateral. It shows how lending to domestic entrepreneurs can be limited by either a shortage of liquidity within the financial sector or by a lack of adequate collateral.

Foreign creditors

As banks, they sign collateralized agreements with entrepreneurs, so that

$$b_e^f \leq [C_f - \gamma_h^{-1} b_e],$$

where b_e^f is the amount of lending extended by foreign creditors and $C_f = \gamma_f C$ is the valuation that foreign creditor make of pledgeable collateral from domestic entrepreneurs. Note that, when deciding how much to lend, foreign creditors take into account that part of the collateral has been allocated to domestic banks.

Domestic entrepreneurs: Domestic liquidity and collateral utilization

At $t = 1$ entrepreneurs receive an investment opportunity represented by the technology $f(k_h, k_f)$ with $f_{k_h} > 0$, $f_{k_f} > 0$, $f_{k_h k_h} < 0$, $f_{k_f k_f} < 0$ and $f_{k_h k_f} > 0$. As all borrowing is fully collateralized, private interest rates are zero and entrepreneurs solve the following problem:

$$\text{Max } f(k_h, k_f) - (k_h + k_f) \quad (1)$$

s.t.

$$k_h \leq X \quad (1a)$$

$$k_f \leq C_f - a k_h \quad (1b)$$

where $X = \min(C_h, D)$ and $a = \gamma_h^{-1} > 1$. We define the Lagrange multipliers associated with (1a) and (1b) as λ_1 and λ_2 , respectively.

As a first step it is useful to characterize the benchmark equilibrium allocation in the absence of credit frictions.

Proposition 1 *In a non-binding equilibrium, entrepreneurs would set their demand of foreign and domestic capital to fulfill the following condition*

$$f_{k_f}(k_h, k_f) = f_{k_h}(k_h, k_f) = 1.$$

For future reference I define the unconstrained optimum as (k_h^*, k_f^*) .

Proof. From (1) is immediate. ■

Corollary 2 *There exist upper limits for both D and C_f , defined as $\bar{D} = k_h^*$ and $\bar{C}_f = k_f^* + a k_h^*$ respectively, such that: if $D > \bar{D}$ and $C_f > \bar{C}_f$, then $\lambda_1 = 0$ and $\lambda_2 = 0$.*

Proof. For allocation $k_h = k_h^*$ and $k_f = k_f^*$ to be feasible it must be that:

- (i) domestic liquidity is high enough and therefore $D \geq ak_h^*$, and
- (ii) the remaining collateral allows for the optimal choice k_f^* . It must then be that $C_f \geq k_f^* + ak_h^*$. ■

In general, however, equilibrium allocations are likely to be constrained and depend not only of the technology available but also on D , C_f and C_d :

$$\begin{aligned} k_h &= k_h(D, C_f, C_d, \cdot), \\ k_f &= k_f(D, C_f, C_d, \cdot), \\ \lambda_1 &= \lambda_1(D, C_f, C_d, \cdot), \end{aligned}$$

and

$$\lambda_2 = \lambda_2(D, C_f, C_d, \cdot).$$

Credit availability within the banking sector and international collateral within the entrepreneurial sector are main determinants of equilibrium output. As indicated by the dependence of λ_1 and λ_2 on d_h and d_f , the repayment decisions of the Government may affect entrepreneurs optimal decisions and welfare. It is this that creates the incentives of the government to discriminate in one or another direction will vary.

To clarify the mechanisms at play we solve the optimization problem (1) assuming that:

- (i) $f(k_h, k_f) = k_h^\alpha k_f^\beta$, with $\alpha + \beta < 1$.
- (ii) No debt repayment has been made at all, so that $d_h = d_f = 0$, and
- (iii) $C_d > a[B_g^h + s_0]$, what implies that any domestic liquidity shortage is due to a lack of liquidity within the banking sector and $X = s_0$.¹⁹

Assumption (i) implies decreasing returns to scale and makes it simple to derive an unconstrained interior solution. Assumption (iii) allows us to focus on situations in which Government impact on banks' balance sheets has the potential to affect the real economy. There are four potential outcomes of the entrepreneurs problem. We present them here and discuss Government incentives for debt repayment in each of them.

Underprovision of domestic liquidity and insufficiency of international collateral. The banking sector is unable to provide as much domestic credit as entrepreneurs would want. At the same time, entrepreneurs would be willing to acquire more foreign capital but they fall short of international collateral. This is the case in which $\lambda_2 > 0$ and $\lambda_1 > 0$. In this scenario the FOCs are the following:

$$[f_{k_h}(k_h, k_f) - 1] - a\lambda_2 = \lambda_1 \tag{x}$$

$$f_{k_f}(k_h, k_f) - 1 = \lambda_2 \tag{xx}$$

¹⁹Note that a lack of liquidity could arise both if collateral is too low, $C_d < D$, or if the banking sector does not have enough liquidity, $C_d > D$. The distinction is of importance because, it is in the second case when domestic debt repayment is likely to have an impact, as it allows banks to lend further.

and equilibrium allocations are $k_h = s_0$ and $k_f = C_f - as_0$.

In this situation, both domestic and foreign debt repayment will increase entrepreneurs welfare. The government, after considering the impact on its own wealth and on that of the banking sector, will have to decide whether the aggregate welfare gain is higher from domestic or foreign repayment.

Underprovision of domestic liquidity and (conditionally) unconstrained external borrowing. In this case firms would like to borrow more domestically but either a lack of liquidity in the financial system or a lack of collateral prevents them from doing so. In this case, however, given availability of domestic capital, firms' collateral is enough as to guarantee as much external borrowing as needed. Now we have that $\lambda_2 = 0$ and $\lambda_1 > 0$, with FOCs and the relevant constraints looking as follows:

$$\begin{aligned} f_{k_h}(k_h, k_f) - 1 &= \lambda_1 \\ f_{k_f}(k_h, k_f) &= 1 \\ k_h &= s_0 \\ k_h &< C_f - as_0 \end{aligned}$$

Importantly, when the overall collateral constraint is slack, $k_f < C_f - as_0$, neither k_f nor λ_1 depend on d_f .

Starting from this situation, the government will begin by repaying its domestic debt obligations, as increases in domestic capital arising from higher banks' wealth can be matched by increased foreign borrowing. Depending on C_f , at some point it may begin to be welfare enhancing to repay also to foreign creditors.

(Conditionally) sufficient domestic liquidity and constrained external borrowing. In this situation firms are able to borrow domestically as much as needed, so that $\lambda_1 = 0$. They would like, however, to have more collateral to increase the scale of production by acquiring more foreign capital, $\lambda_2 > 0$. FOCs and the relevant constraints in this case are:

$$\begin{aligned} f_{k_h}(k_h, k_f) - 1 &= a[f_{k_f}(k_h, k_f) - 1] \\ f_{k_f}(k_h, k_f) - 1 &= \lambda_2 \\ k_h &< s_0 \\ k_f &= C_f - ak_h \end{aligned}$$

In this case domestic debt repayment will have no impact on welfare, and Governments will honour foreign obligations as long as the gain obtained by the private sector more than compensates the reduction in cash balances of the government.

Unconstrained optimum In this case entrepreneurs attain their first best,

$$\begin{aligned} f_{k_h}(k_h, k_f) &= 1 \\ f_{k_f}(k_h, k_h) &= 1 \\ k_h &< s_0 \\ k_f &< C_f - ak_h \\ \lambda_1 &= \lambda_2 = 0 \end{aligned}$$

It is immediate that, when faced with this situation, the economy will not profit from increased access to foreign capital and government will make no repayment to foreign creditors.

These different scenarios make clear how collateral valuation and bank liquidity matter. The importance of banks' liquidity is collected by λ_1 , the shadow value of the domestic capital constraint. Analogously, the benefit from increasing foreign credit by one unit is collected in λ_2 .

Note that both C_f and D are affected by public debt repayment. This implies that sovereign repayment impact on welfare can be measured as a transformation of the Lagrange multipliers. More specifically, we know that $\frac{\partial \Pi}{\partial D} = \lambda_1$. Given that $\frac{\partial D}{\partial d_h} = B_h^g$, we arrive to

$$\frac{\partial \Pi}{\partial d_h} = \frac{\partial \Pi}{\partial D} \frac{\partial D}{\partial d_h} = \lambda_1 B_h^g. \quad (2)$$

Similarly, $\frac{\partial \Pi}{\partial C_f} = \lambda_2$ and $\frac{\partial C_f}{\partial d_f} = \frac{\partial \gamma_f}{\partial d_f}$, and so

$$\frac{\partial \Pi}{\partial d_f} = \frac{\partial \Pi}{\partial C_f} \frac{\partial C_f}{\partial d_f} = \lambda_2 \frac{\partial \gamma_f}{\partial d_f} C. \quad (3)$$

The following proposition studies in detail the behavior of the shadow values as a function of D and C_f . This will help determine the optimal actions of the government.

Proposition 3 *The value of the Lagrange multipliers fluctuates with D and C_f as follows.*

For a given D :

$$\begin{aligned} \text{if } C_f &\in [0, \tilde{C}_f(D)] \rightarrow \lambda_2 > 0 \text{ and } \lambda_1 = 0 \\ \text{if } C_f &\in [\tilde{C}_f(D), \hat{C}_f(D)] \rightarrow \lambda_2 > 0 \text{ and } \lambda_1 > 0 \\ \text{if } C_f &> \hat{C}_f(D) \rightarrow \lambda_2 = 0 \text{ and } \lambda_1 > 0 \end{aligned}$$

with $\tilde{C}_f(D)$ and $\hat{C}_f(D)$ depending positively on D and $\frac{\partial \lambda_2}{\partial C_f} \leq 0$ and $\frac{\partial \lambda_1}{\partial C_f} \geq 0$.

Analogously, for a given C_f :

$$\begin{aligned} \text{if } D &\in [0, \tilde{D}(C_f)] \rightarrow \lambda_2 = 0 \text{ and } \lambda_1 > 0 \\ \text{if } D &\in [\tilde{D}(C_f), \hat{D}(C_f)] \rightarrow \lambda_2 > 0 \text{ and } \lambda_1 > 0 \\ \text{if } D &> \hat{D}(C_f) \rightarrow \lambda_2 > 0 \text{ and } \lambda_1 = 0 \end{aligned}$$

with $\tilde{D}(C_f)$ and $\tilde{D}(C_f)$ depending positively on C_f and $\frac{\partial \lambda_2}{\partial D} \geq 0$ and $\frac{\partial \lambda_1}{\partial D} \leq 0$.

Proof. See Appendix. ■

This proposition links output gains from entrepreneurial activity, as represented by the Lagrange multipliers, to changes in the funding constraints. As shown above, the Government actions have a one to one mapping into the constraints, so that the proposition is a guide into the Government's behavior.

Government behavior

In the initial period, the Government receives revenues T and has to decide if it repays acquired debts, (B_g, B_g^*) . Government's aim is to maximize domestic welfare,

$$\begin{aligned} & \underset{d_h, d_f}{Max} \quad \widetilde{W}_1 \\ & s.t. \\ & d_h B_h^g + d_f B_f^g \leq T_1 \end{aligned}$$

where $\widetilde{W}_1 = f(k_f, k_h) - (k_f + k_h) - d_h B_h^g - d_f B_f^g + D + T$, represents the aggregate domestic welfare, and includes not only entrepreneurs net wealth but also wealth within the domestic banking sector and the public sector.

Depending on the realization of the tax revenues, the government faces two scenarios. On the one hand, if $T > B_h^g + B_f^g$, the government has enough resources to honour all its obligations and we are in the classical situation in which if a external default arise is due to unwillingness to repay. On the other hand, when T is low, the government can not fulfill all of its obligations and it is forced to default or at least choose what type of agents will face a default (selective default). This situation represents the ability to repay problem.

Definition 4 *An equilibrium of the model is composed by a set (d_h, d_f) of time 0 decisions and a set of time 1 choices (b_e^*, b_e, k_h, k_f) , such that:*

- (i) *All agents maximize their expected utility, and*
- (ii) *credit markets are in equilibrium: $b_e = k_h$ and $b_e^f = k_f$*

The model is solved backward. We just characterized optimal investment by entrepreneurs taking s_0, C, d_h, d_f, B_h^g and B_f^g as given. We now move back and formally analyze the Government's repayment decision. We begin by abstracting from ability problems and assume away the resource constraint of the Government.

When and on whom do Governments default?

Recall the Government's optimization problem:

$$\begin{aligned}
& \underset{d_h, d_f}{Max} \quad \Pi[k_h(D, C, \gamma_f), k_f(D, C, \gamma_f)] - d_h B_h^g - d_f B_f^g + D + T \\
& \quad s.t. \\
& \quad D = s_0 + d_h B_h^g \\
& \quad \gamma_f(d_f)C = C_f \\
& \quad d_h B_h^g + d_f B_f^g \leq T \\
& \quad d_h \leq 1 \\
& \quad d_f \leq 1
\end{aligned}$$

where $\Pi[\cdot]$ represents the profits from entrepreneurial activities. This can be reformulated in a more compact way as follows:

$$\begin{aligned}
& \underset{d_h, d_f}{Max} \quad \Pi[k_h(s_0, C, d_h, d_f), k_f(s_0, C, d_h, d_f)] - d_f B_f^g + s_0 + T \\
& \quad s.t. \\
& \quad d_h B_h^g + d_f B_f^g \leq T \\
& \quad d_h \leq 1 \\
& \quad d_f \leq 1
\end{aligned}$$

As stated before the Government evaluates the outcome in the event of a full default and will decide how much to repay in light of the behavior of the shadow values associated with the constraints. The corresponding Lagrangian of the problem looks like follows

$$L(d_h, d_f) = \Pi[k_h(s_0, C, d_h, d_f), k_f(s_0, C, d_h, d_f)] - d_f B_f^g + s_0 + T + \mu_1 [T - d_h B_h^g - d_f B_f^g] + \mu_2 [1 - d_h] + \mu_3 [1 - d_f].$$

The Appendix contains a full characterization of the Kuhn-Tucker conditions for this problem. In what follows we show different equilibria that may arise in this setting and put them in context with our empirical findings.

Debtor discrimination and willingness to repay

Suppose first that T is unbounded, that is, the government problem is not one of ability to repay. With this assumption the problem of the government reduces to

$$\underset{d_h, d_f}{Max} \quad \Pi[k_h(s_0, C, d_h, d_f), k_f(s_0, C, d_h, d_f)] - d_f B_f^g + s_0 + T.$$

The corresponding FOCs are:

$$\begin{aligned}
\frac{\partial \Pi}{\partial d_h} - B_h^g + B_h^g &= 0 \\
\frac{\partial \Pi}{\partial d_f} - B_f^g &= 0
\end{aligned}$$

Recall that $\frac{\partial \Pi}{\partial d_h} = B_h^g \lambda_1$ and that $\frac{\partial \Pi}{\partial d_f} = \lambda_2 \frac{\partial \gamma_f}{\partial d_f} C$. Using these results the conditions can be rewritten as:

$$\lambda_1 = 0$$

and

$$\alpha \lambda_2 C = B_f^g,$$

where $\alpha = \frac{\partial \gamma_f}{\partial d_f}$ is assumed, for simplicity, to be constant.

In this case domestic debt will always be fully serviced. Even though $\lambda_1 = 0$ means that further repayments to domestic banks will not lead to further increases in output, repayment amounts to a redistribution of wealth from the government to the financial sector. As long as domestic repayment does not limit repayment ability to foreigners, is not detrimental for aggregate welfare.

Foreign debt, in turn, will be serviced as long as the increase in entrepreneurial profits, $\frac{\partial \gamma_f}{\partial d_f} \lambda_2 C$, is at least as big as the amount of resources leaving the public coffers, B_f^g . That is, foreigners will face a partial default if

$$\alpha \lambda_2(1, x) = \frac{B_f^g}{C} \text{ for } x < 1.$$

We know that, as $\frac{\partial \lambda_2}{\partial d_f} \leq 0$, the LHS weakly decreases with d^* . As a result, and in line with our empirical evidence (recall Figure 2), the higher B_f^g (external exposure) the easier will be that $d_f < 1$, with foreigners suffering a debt haircut.

Similarly, the lower the marginal productivity, and hence dependence of foreign capital, the likelier will be that the government partly defaults on its external obligations. Note that $\lambda_2 = \max\{0, f_{k_f}(k_f, k_h) - 1\}$. The less productive foreign capital is, so that the lower is f_{k_f} for a given level of k_h , the lower λ_2 will be for given s_0 , leading to a lower welfare gain from increases in foreign debt repayment. Our empirical evidence, see Figures 5 to 7, focuses on capital flows. We showed that countries with more foreign capital flowing in are potentially less likely to discriminate against foreigners. The model presents the analogous argument but focusing on capital stocks instead.

Finally, it is immediate that, the lower is α , the punishment suffered by private agents when the government defaults, the more likely it is that the Government will choose to at least partly default in its foreign debt.

On ability to repay

In this case there can be a revenue shortage and hence the government will be forced to default on part of its obligations. It must then decide how to divide this credit loss between residents and foreigners.

In an interior solution we will have the following

$$\frac{\frac{\partial \Pi}{\partial d_h}}{B_h^g} = \frac{\frac{\partial \Pi}{\partial d_f} - B_f^g}{B_f^g}.$$

This simply states that, at the margin, the welfare increase per unit of repayment from an increase in debt repayment to foreigners (RHS) must be equal to the effect on welfare of a marginal increase per unit of repayment to domestic banks (RHS). That is, an additional unit of repayment provides identical aggregate welfare regardless the creditor involved.

Using (X) and (XX) above we can rewrite this as follows

$$\lambda_1(d_h, d_f) = \alpha \lambda_2(d_h, d_f) - 1$$

Domestic defaults

When will we observe a sovereign discriminating against its domestic creditors? We show below that, in line with the empirical evidence, if the domestic banking sector is healthy enough and/or foreign financing is either very necessary or very sensitive to external repayment problems, the Government will decide to cancel debt payments to residents in order to fulfill its obligations with external creditors.

According to our model, the Government will devote all its resources to honour outstanding external obligations, that is $d_h = 0$ and $d_f = \frac{T}{B_f^g}$, whenever

$$\lambda_1(0, \frac{T}{B_f^g}) < \alpha \lambda_2(0, \frac{T}{B_f^g}) - 1.$$

The inequality above states that available resources will be fully used to repay foreign creditors whenever the gain of marginally deviating funds to the domestic banking sector (LHS of the equation) is smaller than the gain obtained by using such funds for external repayment (RHS).

Proposition 5 *As the importance of domestic liquidity pressures increase the likelihood of a domestic default increases.*

Proof. Increases in the amount of outstanding domestic debt B_g will reduce the value of the RHS on the inequality by increasing the denominator. ■

Proposition 6 *The stronger the banking sector balance sheet, the easier that the government will choose them as the objective of the debt default.*

Proof. By Proposition 3 we know that:

(i) $\frac{\partial \lambda_1}{\partial D} \leq 0$, so that there is a maximum D_m such that, for all $D \geq D_m$, the value of $\lambda_1 = 0$.

(ii) There is a $C_m(D_m)$ such that, if $C \leq C_m(D_m)$, $\lambda_2 > 0$ and $\frac{\partial \lambda_2}{\partial C_f} \leq 0$.

We also know that $\frac{\partial D}{\partial s_0} \geq 0$. It is straight forward that if $s_0 \geq D_m$ then $\lambda_1 = 0 \forall d_h$. Additionally, using (ii) above and the fact that $\frac{\partial \lambda_2}{\partial C_f} \leq 0$ is continuous, one can find a $C(s_0)$ such that the inequality above holds for $d_h = 0$ and $d_f = \frac{T}{B_f^g}$. ■

External defaults

Analogously, we find that when the following condition holds the Government will devote all its resources to honour domestic debt obligations while fully defaulting on its external ones. The conditions is

$$\lambda_1\left(\frac{T}{B_h^g}, 0\right) > \alpha\lambda_2\left(\frac{T}{B_h^g}, 0\right) - 1.$$

Note that, beginning from a situation where all available resources are used to repay domestic obligations, reducing domestic repayment to increases foreign repayment would lead to a reduction in welfare of size $\lambda_1(\frac{T}{B_h^g}, 0)$, due to reduced lending by domestic banks, while producing an increase in welfare, as a result of expanded lending capacity of the banking sector equal to $\alpha\lambda_2(\frac{T}{B_h^g}, 0) - 1$.

The next proposition explains how low reliance on foreign capital or low foreign penalties in the event of a default may lead to a full external default.

Proposition 7 *Governments of countries for which foreign capital is a relatively less important input or whose supply of foreign capital is relatively inelastic to sovereign defaults are more likely to discriminate against domestic creditors if the need arises.*

Proof. We already argued that, for a given s_0 , λ_2 is larger the more productive is k_f . Assume we are in a situation in which given C , $\gamma_f(0)$ and s_0 we have $\lambda_2 = 0$ and $\lambda_1 > 0$. In this situation, reducing domestic repayment would lead to a reduction in welfare equal to $\lambda_1(\frac{T}{B_h^g}, 0)$. At the same time, the increase in availability of foreign capital would have no impact on welfare as the foreign collateral constraint was already slack. ■

Conclusions

Following Reinhart and Rogoff (2008) and other recent contributions, there is a growing awareness about the fact that a traditional disregard to the role played by domestic creditors may constitute a substantial gap in the literature on sovereign risk and debt restructurings. This paper contributes to fill that gap by analyzing the relative seniority of domestic and external debt both from an empirical and a theoretical perspective. The central idea that is to be extracted from this paper is that contrary to what is commonly assumed in the literature neither domestic nor external obligations can be considered intrinsically senior. Rather, we argue that the relative seniority between both types of obligations is state dependent and determined by factors such as the structure of sovereign debt, the state of the financial system and the reliance of domestic firms on international capital markets.

On the empirical side, we study 10 recent sovereign debt restructurings and analyze the role that both domestic and external creditors played during these episodes. Interestingly, and converse to standard assumptions in recent models

on sovereign risk, we provide evidence that governments may treat external and domestic creditors differently, with discrimination affecting the two groups in non homogenous ways. Indeed, while the Belizean, Dominican, the Pakistani and (to a lesser extent) the Ecuadorian governments spared resident creditors from the restructurings, in the Argentine, the Russian and (to a lesser extent) the Ukrainian cases, the authorities did initially try to put the weight of the restructuring on domestic financial institutions. To some extent, this was simply due to the origin of liquidity pressures: the countries that discriminated against residents tended to be struggling primarily with domestic obligations. However we find significant exceptions to this pattern. First, if the Central Bank lacks independence and domestic debt is denominated in local currency, this debt may be monetized (as in Pakistan) in order to relieve the sovereign from domestic sources of liquidity pressure. Second, if the domestic financial sector is highly dollarized (as in Argentina) the government may opt to discriminate against resident creditors in order to extract liquidity domestically and alleviate external sources of liquidity pressure.

On top of this rather mechanic liquidity pressure hypothesis, we find that sovereigns' discriminatory stance is likely to be influenced by certain features of their domestic financial systems. Through its impact on domestic banks' balance sheets, a default on domestic debt is likely to depress domestic credit provisioning and, therefore, economic activity. However, the extent to which a domestic debt restructuring will spill over to the real sector will depend on the importance of bank intermediation. In other words, in countries with low levels of intermediation such as Russia and Ukraine discriminating against residents was seen as a less costly option than in countries with high levels of intermediation such as the Caribbean nations of our sample. In addition, sovereigns do base their decision to discriminate on the ex ante health of their banking systems. When the debt crisis is preceded by a banking crisis, as in the Dominican Republic or Ecuador, defaulting on domestic obligations is likely to be perceived as a "last nail in the coffin" of domestic banks, which is why sovereigns tend to discriminate against non-residents. In turn, when the domestic financial system is perceived to be sound ex ante (as in Argentina), the government may be tempted to "gamble for redemption" by discriminating against residents as the debt crisis unfolds.

The third mechanism that is identified in this paper is that played by international capital markets: external defaults have been shown to curtail foreign inflows to private agents. As a result, the potential impact of defaults on private capital flows and the relative importance of these flows for the domestic productive sector are likely to be taken into account by governments undergoing a debt crisis. Russia and Ukraine with tight domestic financial constraints and with local firms' substantial reliance on international sources of finance may best fit this profile: keeping access to external financiers may have been seen as a less costly option than impairing domestic banks' balance sheets.

In order to complement this empirical evidence, the paper presents a highly stylized model of sovereign debt repayment able to replicate the empirical evidence. We believe that a similar mechanism should be a center piece of models

studying sovereign debt crises.

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Appendix

Model's Time Line

	$t = 0$	$t = 1$	$t = 2$
Government	Observes (T, C, s_0) . Decides repayment (d_h, d_f)	Inactive	payoffs
Entrepreneurs	Inactive	Endowed with project. Use C as collateral to acquire k_f and k_h	payoffs
Domestic banks	Inactive Balance sheet affected by Government's actions	Lend b_e	payoffs
Foreign creditors	Inactive. Collateral valuation affected by Government's actions	Lend b_e^*	payoffs

Proof of Proposition 3 (to be completed)

Table 1: Debt restructurings in our case study

Restructurings - Key Features										
<i>t</i> (announcement of the debt exchange)	1998	1999	1998	1999	2001	2003	2004**	2005	2004	2006
	Russia	Pakistan	Ukraine	Ecuador	Argentina	Uruguay	Dominica	Dominican Republic	Grenada	Belize
Debt to GDP (%)	52	84	42	101	130	103	130	56	130	98
Restructured debt to GDP (in purple: from LIA)	24	31	9	45	30	43	83	10	63.4*	43.13*
<i>Rest. debt owed to the private sector (% GDP)</i>	23.7	1.0	12.8	49.4	30 (2001); 59.7 (2005)	48.3	--	7.0	--	--
<i>Paris Club reschedulings (US\$ M)</i>	8113	3254	578	880	no resch.	no resch.	no resch.	137	16	no resch.
<i>GDP (WDI)</i>	270953	62974	41883	16682	--	--	--	29101	434	--
<i>Paris Club reschedulings (% GDP)</i>	2.99	5.17	1.38	5.28	no resch.	no resch.	no resch.	0.47	3.69	no resch.
Announcement of the restructuring	aug - 98	jan - 99	aug - 98	oct - 99	june -01	march - 03	dec - 03 ³	apr - 04	oct - 04 ⁶	aug - 06
Completion of the restructuring	aug - 00	dec - 99	july - 01	end -00	june - 05	may - 03	june - 04 ⁴	oct - 05	may - 06/ongoing	feb - 07
Duration (months)	24	11	35	14	46	2	6	12		6
Default on external private debt	n	n	n ⁸	y	y	n	n ⁵	n	y	n
Default on domestic private debt	y	n	n	y	y	n	n ⁵	n	y	n
Default on official debt	Y	Y	n ⁸	Y	Y	n	n	n	y	n
External debt restructuring	y	y	y	y	y	y	y	y	y	y
Domestic debt restructuring	y	n ²	y	y	y	y	y	n	y	n
Official debt restructuring	Y	y	y	y	y	n	n	y	y	n
NPV loss (%)	(40,75)	(29-33)	(5-59.2)	(9-47)	(25-82)	(5-20) ⁹	50	(1-2)	(40-45)	(1-28)
Participation in the exchange (%)	92	99	99	98	76	93	79	97	91	98
Coerciveness index ¹	(3,6)	(2,4)	(0,1)	5	(0,7)	0	1	(1,3)	1	1
Capital controls	y	y	y	n	y	n	n	n	n	n
Deposit freezes	y	y	n	Y	Y	Y	n	n	n	n

¹ Index of Government Coerciveness (Enderlein, Müller and Trebesch - 2007), ranging from 0 (cooperative restructuring without missed payments) to 9 (highest level of coerciveness).

² No domestically issued debt instrument was restructured but one third of the bonds exchanged in late 1999 were held by residents.

³ The formal debt exchange offer was made in April 2004.

⁴ The exchange offer formally closed in June 2004, but the deal was not completed until 2007 due to discussions with hold out creditors.

⁵ Although this was a pre-emptive restructuring, 2 bonds were in legal dispute.

⁶ The offer was launched in September 2005.

⁷ This figure refers to the 2002 exchange.

* Own calculations.

⁸ Ukraine was in default for a short period.

⁹ Some minor bonds carried a higher haircut (Sturzenegger and Zettelmeyer, 2005)

** We consider 2004 as the year of the restructuring t even if the debt exchange offer was launched in December of the previous year.

Figure 4: Deposits, credit to the private sector and Central Bank liquidity support

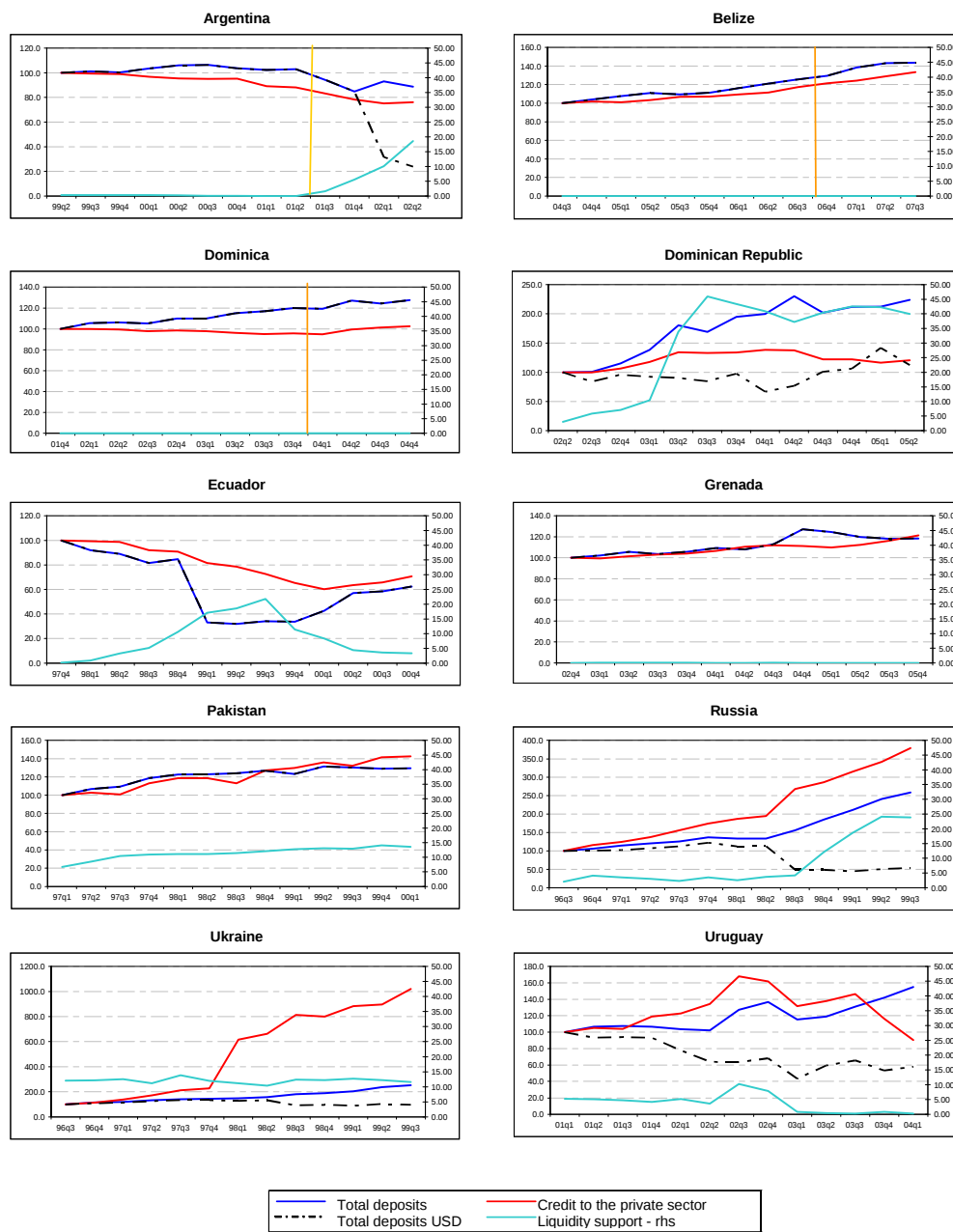


Figure 6: Portfolio equity and other investment to the private sector

