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Selective Sovereign Defaults*

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Abstract

Breaches in intercreditor equity are common ground during sovereign debt restructurings. In this paper I explore residence-based breaches by studying patterns of discrimination between residents and foreign creditors during debt restructurings. I frame the analysis with a simple model of a government's strategic decision to differentiate between the servicing of its domestic and its external debt. In the 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. I test the model's conclusions by analyzing 11 recent sovereign restructurings. After distinguishing neutral cases where the sovereign treated creditors equitably and instances of discrimination against residents and foreigners, I present evidence in support of the model. The origin of liquidity pressures, the robustness and depth of the banking system and the extent of the corporate sector's reliance on foreign capital markets vis-a-vis domestic credit markets have the potential to explain the patterns of discrimination observed in the data.

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Introduction

Early models on sovereign risk overlooked the role played by domestic debt and creditors during debt crises.[1] 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. More recent papers, however, have begun to pay attention to the importance of domestic agents as significant sources of public sector funding also for developing and emerging economies. An outstanding example of this strand of the literature is Reinhart and Rogoff (2008). The historical database it analyzes challenges some pre-conceptions about the importance of domestic debt by showing that, on average, residents held almost two thirds of total public debt for the 64 countries that they cover during the period 1914-2007. Moreover, they argue that this helps explaining why some countries default at relatively low levels of external debt. This paper pulls further in the direction of understanding the role of the domestic side of sovereign debt in sovereign debt crises. It addresses Reinhart's and Rogoff's call for a better understanding of the relative seniority of domestic vs. foreign debt and how it contributes to explain crises unfolding by analyzing, theoretically and empirically, patterns of discrimination between resident and non-resident creditors during sovereign debt restructurings.

On the theoretical side, with the aim of framing the empirical analysis, we present a highly stylized model of endogenous debt servicing. The model is similar to Caballero and Krishnamurthy (2001). It considers an small open economy where entrepreneurs face constraints that limit their borrowing capacity both for domestic banks and from abroad.[2] While Caballero and Krishnamurthy (2001) focused on how the constraints interact to affect asset prices and sales, we modify the model and introduce public borrowing and repayment. Our framework is also similar to Sandleris (2008), who argues that Governments have incentives to avoid sovereign defaults, as these may send bad signals regarding the state of the economy, thereby curtailing market access to private agents. We disregard informational asymmetries but allow the government to endogenously differentiate repayments to foreign and domestic creditors. In the model, 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 it affects banks' balance sheets, which may impair their ability to lend to the private sector. On the other hand, when it defaults on external creditors, the government is negatively affecting the availability of foreign financing for resident firms.[3] We show that, in this setup, the government has incentives not to respect intercreditor equity and use residence-based discrimination in one or the other direction. The decision depends on factors such

[1] In the spirit of Bulow and Rogoff (1989), the early literature tried to explain why, in the absence of effective contract enforcement mechanisms, sovereigns honour their foreign obligations. For a comprehensive review of this literature see Eaton and Fernández (1995).

[2] See also Holmstrom and Tirole (2002) for a similar framework.

[3] Trebesch (2009) presents evidence on the impact of defaults on private external financing.

as the sources of the debt pressures, the substitutability of domestic and foreign capital, the impact of the sovereign default on private external borrowing and the strength and depth of the banking sector.[4]

On the empirical part I test the main conclusions of the model. We begin by conducting a case study analysis on ten recent sovereign debt restructurings in Argentina, Belize, Dominica, the Dominican Republic, Ecuador, Grenada, Pakistan, Russia, Ukraine and Uruguay.[5] I classify all events in our sample within three different *buckets*: 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. The classification is based on a number of indicators such as amounts involved, the haircuts suffered, and the timing of their involvement. As it is literally impossible to find a unique source with all the information required, I resorted to a large number of sources, mostly supranational and national official agencies.

Once I have classified the episodes, I study the relevance of the various channels that might affect repayment as identified by our theoretical model. To varying degrees we find that indeed, the health of the banking sector, the relative importance of foreign capital vis-a-vis domestic credit and the sources of the liquidity pressures, all seem to relate to the decision to discriminate. First of all, the origin of liquidity pressures matters. Instances of discrimination against foreign (domestic) creditors broadly coincide with situations in which the sovereign was struggling primarily to roll-over external (domestic) debt. However, we find exceptions to that pattern which we attribute to factors such as the currency denomination of domestic debt, the degree of central bank independence or the extent of financial dollarization. Second, as financial institutions hold significant amounts of public debt, the ex ante strength of the banking system constitutes an important determinant of governments' decision to discriminate. We find that, when the debt crisis was preceded by a banking crisis, 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 and when financial intermediation was relatively low. Third, we find evidence supporting the argument that, when foreign financing was of prime importance for resident firms (or under tight domestic financial constraints), in order to preserve the corporate sector's access to external sources of finance, Governments were more reluctant to discriminate against non-residents.

A number of previous papers have focused on realted issues. Mandeng (2004) argues that during recent sovereign debt restrtucturings there have been extensive breaches of the intercreditor equity principle.[6] Zettelmeyer and Sturzeneg-

[4] An interesting extension would be to introduce secondary markets (Broner et al., 2010). This would allow for portfolio rebalancing effects driven by the expected pattern of intercreditor equity.

[5] We add three recent episodes to the cases covered in Díaz-Cassou et al. (2008b).

[6] Mandeg further argues that the unpredictability of these breaches may have delayed the resolution process. Diaz-Cassou et al. (2008) shows that this is indeed the case when looking at recent debt restructurings.

ger (2007) analyze six sovereign debt restructurings and calculate haircuts instrument by instrument. They show wide variations in the losses undergone by different instruments and creditors. Enderlein et al. (2007), in turn, construct a coerciveness index showing that in a number of episodes, foreign creditors were given a harsher treatment than in others. while thse contributions provide evidence that residents and non-residents have been treated differently in past debt restructurings, neither of them provides an explanation for these differences in treatment. In this paper we go beyond their descriptive approach and explore the reasons that may push sovereigns to discriminate in one or the other direction.To our knowledge there is no other paper studying residence-based inter-creditor equity during debt restructurings and its dependence on macroeconomic factors. Our explanation for the existence of discrimination among creditors is in contrast with that presented in Kohlscheen (2009) and Van Rijckeghem and Weder (2004) who, using simple dummy indicators, argue that the inclusion of domestic debt in the negotiations relates to the political situation of the country.[7] Furthermore, the various scenarios in which residents appear to have shouldered most of the restructuring effort provide 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. In Broner et al. (2010), given that a government has incentives to enforce debt 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 and focus on the implications of sovereign defaults on private borrowing. The main take away of these two papers is that the existence of complementarities between private and public borrowing has the potential to limit the risk of sovereign defaults. However, the absence of discrimination, which is responsible for most of their results, is taken as given. Similarly, in Kremer and Mehta (2007) or in Jeanne and Bolton (2008) seniority among creditors is taken as given. Contrary to these widely used assumptions, 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.

Summarizing, in this paper we study the existence of discrimination, based on residence, during sovereign debt restructurings and identify three key mechanisms contributing to shape governments' strategy vis-à-vis resident and non-resident creditors. First, the origin of the liquidity pressures. Countries where domestic debt is relatively bigger are more likely to press on their domestic sources of finance. Similarly, countries which had healthier and/or less active banks seemed to be more willing to engage resident creditors within the restructuring strategy. Finally, countries less dependent on foreign capital might prefer placing the weight of the adjustment on their foreign financiers.

[7] In Diaz-Cassou and Erce (2010) we study the role of the IMF in shaping this and other strategic dimensions of sovereign debt restructurings.

Next section introduces a model where a Government endogenously determines the pattern of debt repayment for both foreign and resident financiers. Section 3 collects evidence on discrimination from the 10 episodes of sovereign debt restructurings that we cover. Section 4 tests the predictions of the model for our sample economies. Finally, Section 5 concludes and presents directions for future research. Some tables and figures are included in the Appendix.

A model of selective defaults

The environment

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

In period 0, the Government must honour outstanding debt B_h^g with domestic banks, which at the time hold s_0 units of liquidity (or one-period safe bonds), and B_f^g with foreign creditors. In so doing it uses incoming resources T.[8] Depending on available resources, the Government may fail to honour part of its obligations. The repayment decision is collected by the pair (d_h, d_f), with $d_f \in (0, 1)$ reflecting the proportion of outstanding debt with foreigners being honoured. A value 1 indicates full repayment. The variable d_h reflects domestic debt repayment and behaves analogously.

Afterwards, in period 1, entrepreneurs receive an investment opportunity which requires foreign and domestic capital.[9] With probability p the investment is successful and with probability $(1 - p)$ it fails and produces nothing. We assume that both domestic and foreign borrowing must be collateralized and that entrepreneurs have a limited amount of collateral. More specifically, entrepreneurs have an amount C_h of domestic collateral and C_f units of foreign collateral.[10] On top of that *given* collateral, we assume that a fraction γ_h of the output can also be pledged as collateral with domestic banks and a fraction γ_f is pledgeable in foreign capital markets.[11]

At the time, domestic banks' have available resources of size D, which include both the cash brought in the balance sheet from the previous period and those domestic public obligations actually honoured. Banks use these resources to form a portfolio including loans to domestic entrepreneurs, b_e, and holdings of the safe asset, s_1. In this way Government's repayment can affect private domestic borrowing through its impact on banks' balance sheet. In turn, foreign capital must be obtained on international capital markets populated by deep-pocketed, risk neutral investors. We further assume that the valuation that

[8] We take B_h^g, B_f^g as given. An interesting extension would endogenize these quantities.

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

[10] Our framework has two important differences with Caballero and Krishnamurthy (2001). First, our modeling of domestic credit does not allow for a credit chain, whichcould have implications for the domestic interest rate. Second, while in Caballero and Krishnamurthy (2001) there is one type of collateral, we assume the existence of capital-specific collateral.

[11] We further assume that $\gamma_f + \gamma_h < 1$.

foreign creditors make of foreign collateral C_f depends on the Government's repayment decision, $C_f(d_f)$. Private collateral losses value as the proportion of sovereign foreign debt in default increases, $\frac{\partial C_f(d_f)}{\partial d_f} > 0$.[12] Through this channel Government actions vis-a-vis non-residents can affect the amount of foreign funds available to domestic entrepreneurs.Finally, in period 2, payoffs are realized.

Optimization

As their behavior determines the financing constraints faced by entrepreneurs, we begin by introducing both banks and foreign creditors' behavior.

Foreign creditors

Foreign creditors sign collateralized agreements with entrepreneurs,

$$p(1+r_f)b_e^f + (1-p)C_f = b_e^f, \tag{1}$$

where b_e^f is the amount of lending extended by foreign creditors and r_f represents the interest rate on foreign capital. Banks will charge the break-even interest rate. In order to make the agreement incentive compatible to entrepreneurs

$$(1+r_f)b_e^f \leq C_f + \gamma_f f(k_h, k_f) \tag{2}$$

Domestic banking sector

In period 1, the domestic financial sector has resources D given by

$$D = d_h B_h^g + s_0,$$

where s_0 stands for the liquidity carried by the banks from period 0, and $d_h B_h^g$ is the amount of public debt honoured and available for private lending.[13] For simplicity, the gross safe rate is set equal to one. Banks' assets, D, will be used to acquire either the safe bond, s_1, or to finance private investments, b_e,

$$s_1 + b_e = D.$$

When dealing with private borrowers, banks require adequate collateral, and set the interest rate to break even,

$$p(1+r_h)b_e + (1-p)C_h = b_e, \tag{3}$$

where r_h stands for the domestic interest rate. Banks set the loan contract so that it is incentive compatible for entrepreneurs to fulfill it

$$(1+r_h)b_e \leq C_h + \gamma_h f(k_h, k_f) \tag{4}$$

[12] There is extensive evidence (Trebesch, 2009 or Arteta and Hale, 2008) showing that external sovereign defaults reduce private sector's ability to tap international capital markets. This modelling device is a shortcut to introduce this effect into our setup.

[13] We are assuming that domestic banks cannot access international markets to finance domestic entrepeneurs. This simplifies the model without qualitatively affecting the results.

Moreover, given that domestic banks have a limited amount of resources, the following must hold

$$b_e \leq D. \tag{5}$$

This equation indicates that domestic credit can be limited by either a shortage of liquidity within the financial sector or by a lack of adequate collateral.

Entrepreneurs: Domestic and foreign credit

Entrepreneurs receive an investment opportunity $f(k_h, k_f)$ and solve the following problem:

$$\begin{gathered} Max \;\; \Pi = pf(k_h, k_f) - (1 + r_h)k_h - (1 + r_f)k_f \\ s.t. \\ [1] - [5] \end{gathered}$$

While, in general, equilibrium allocations could be constrained and depend also on D, C_f and C_d, as a first step, I characterize the 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*

$$f_{k_f}(k_h, k_f) - r_h = f_{k_h}(k_h, k_f) - r_f = 0.$$

For future reference we define the unconstrained optimum as (k_h^{opt}, k_f^{opt}).

Government behavior

In period 0 the Government receives revenues T and chooses the repayment profile that maximizes domestic welfare,

$$\begin{gathered} \underset{d_h, d_f}{Max}\; W \\ s.t. \\ W = \Pi - d_h B_h^g - d_f B_f^g + D + T \\ D = s_0 + d_h B_h^g \\ C_f = C_f(d_f) \\ d_h B_h^g + d_f B_f^g \leq T \\ d_h \leq 1 \\ d_f \leq 1 \end{gathered}$$

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. However, when T is low, the government is forced to choose what type of agents will face a default. This situation represents the ability to repay problem.

Definition 2 *Taking $s_0, C_f(.), T, B_h^g$ and B_f^g as given, an equilibrium is composed by a set (d_h, d_f) of time 0 decisions, and a set of time 1 choices (b_e^f, b_e, k_h, k_f) and prices (r_h, r_f), such that:*

(i) All agents maximize their expected utility, and

(ii) credit markets are in equilibrium: $b_e = k_h$ and $b_e^f = k_f$

When and on whom do Governments default?

In what follows, we solve the model under a set of simplifying assumptions to clarify the mechanisms at work:

(i) No uncertainty $\rightarrow p = 1$

(ii) $f(k_h, k_f) = ak_h^\alpha + bk_f^\beta$, with $\alpha < 1$ and $\beta < 1$.

(iii) No pledgeability of future output: $\gamma_f = \gamma_h = 0 \rightarrow r_h = r_f = 0$.

(iv) $C_f(d_f) = C + d_f\overline{c_f}$.

(v) $C_h > B_h^g + s_0$.

Assumption (ii) implies both no complementarities between domestic and foreign capital and decreasing returns to scale. It guarantees the existence of an unconstrained interior solution. In turn, by using assumption (iii) we focus the analysis on quantities.[14] The functional form in assumption (iv) delivers an external private borrowing ceiling equal to $C + \overline{c_f}$, available as long as the Government fully honours its external obligations. Finally, assumption (v) implies that any shortage of domestic capital is due to a lack of liquidity within the banking sector. Using these assumptions the entrepreneurs problem becomes

$$\begin{aligned} &Max\ ak_h^\alpha + bk_f^\beta - (k_h + k_f) \\ &s.t. \\ &k_h \leq D \qquad (6) \\ &k_f \leq C_f \qquad (7) \end{aligned}$$

Define the Lagrange multipliers associated with constrains on D and C_f as λ_1 and $\lambda_2$respectively. The impact on entrepreneurs of constrained domestic liquidity is collected by λ_1, the shadow value of the domestic capital constraint. Analogously, the importance of further availability of foreign credit is collected by λ_2.Depending on the parameter space, the entrepreneurs problem can have four different types of equilibria. In what follows we present them and discuss what are Government incentives for repayment in each of them.

[14] While allowing for risky private borrowing would introduce a price effect, the mechanism presented here would remain active.

Unconstrained optimum In this case entrepreneurs attain their first best. The FOCs are

$$a\alpha k_h^{\alpha-1} - 1 = 0$$

and

$$b\beta k_f^{\beta-1} - 1 = 0.$$

Simple manipulations show that the optimum is

$$\begin{aligned} k_h &= k_h^{opt} = (a\alpha)^{\frac{1}{1-\alpha}} \\ k_f &= k_f^{opt} = (b\beta)^{\frac{1}{1-\beta}} \end{aligned}$$

with

$$\lambda_1 = \lambda_2 = 0.$$

In this situation, entrepreneurs do not profit from increased access to foreign capital, leaving the government with no incentive to repay foreign debt.

Underprovision of domestic liquidity and insufficiency of international collateral. The banking sector is unable to provide as much credit as required. Simultaneously, entrepreneurs would acquire more foreign capital but fall short of international collateral. Equilibrium allocations are

$$k_h = D < k_h^{opt}$$

and

$$k_f = C_f < k_f^{opt},$$

with shadow values

$$\lambda_1 = a\alpha D^{\alpha-1} - 1 > 0 \tag{8}$$

and

$$\lambda_2 = b\beta C_f^{\beta-1} - 1 > 0. \tag{9}$$

Now, both domestic and foreign debt repayment increase entrepreneurs welfare. After considering also the impact on its own wealth and that of the banks, the Government has to decide whether aggregate welfare is higher from paying domestic or foreign obligations.

Underprovision of domestic liquidity and unconstrained external borrowing. Firms would like to borrow more domestically but a lack of domestic credit prevents them from doing so. Conversely, international collateral is enough to guarantee the optimal amount of foreign capital. The FOCs deliver

$$a\alpha D^{\alpha-1} - 1 = \lambda_1 > 0$$

and

$$b\beta k_f^{\beta-1} = 1.$$

Equilibrium allocations are

$$k_h = D$$
$$k_f = (b\beta)^{\frac{1}{1-\beta}} = k_f^{opt}$$

In such situation, the government would repay domestic debt obligations.

Sufficient domestic liquidity and constrained external borrowing. Firms are able to borrow domestically as much as needed, $\lambda_1 = 0$. They would like, however, to increase the scale of production by acquiring more foreign capital, $\lambda_2 > 0$. FOCs and equilibrium allocations are:

$$a\alpha k_d^{\alpha-1} = 1$$

and

$$b\beta C_f^{\beta-1} - 1 = \lambda_2$$

with

$$k_h = (a\alpha)^{\frac{1}{1-\alpha}} = k_h^{opt}$$
$$k_f = C_f$$

In this case domestic debt repayment has no impact on welfare. Governments will honour foreign obligations only as long as the gain for the private sector more than compensates the reduction in public cash balances.

On the incidence of default

Recall the Government's problem:

$$\underset{d_h, d_f}{Max} \;\; \Pi[k_h(s_0, C_f, d_h, d_f), k_f(s_0, C_f, d_h, d_f)] - d_f B_f^g + s_0 + T$$
$$s.t.$$
$$d_h B_h^g + d_f B_f^g \leq T$$

where $\Pi[.]$ represents the profits from entrepreneurial activities. In what follows we focus on some of the different equilibria that may arise in this setting.[15]

Note that the dependence of C_f and D on d_h and d_f, summarizes how government repayment affects entrepreneurs optimal decisions and welfare. This dependence is one manifestation of the Governments' incentives to discriminate in one or another direction. Moreover, the government impact on entrepreneurial welfare can be measured as a transformation of the Lagrange multipliers.

[15] A full characterization of the Kuhn-Tucker conditions is available under request.

Using $\frac{\partial \Pi}{\partial D} = \lambda_1$ and $\frac{\partial \Pi}{\partial C_f} = \lambda_2$, and the fact that $\frac{\partial D}{\partial d_h} = B_h^g$ and $\frac{\partial C_f}{\partial d_f} = \overline{c_f}$ we arrive to

$$\frac{\partial \Pi}{\partial d_h} = \frac{\partial \Pi}{\partial D}\frac{\partial D}{\partial d_h} = \lambda_1 B_h^g \tag{10}$$

and

$$\frac{\partial \Pi}{\partial d_f} = \frac{\partial \Pi}{\partial C_f}\frac{\partial C_f}{\partial d_f} = \lambda_2 \overline{c_f}. \tag{11}$$

Willingness to repay

Suppose that $T > B_h^g + B_f^g$. Now the government problem is one of willingness to repay and reduces to

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

The corresponding FOCs are:

$$\frac{\partial \Pi}{\partial d_h} - B_h^g + B_h^g = 0$$

$$\frac{\partial \Pi}{\partial d_f} - B_f^g = 0$$

Using (10) and (11), these conditions can be rewritten as:

$$\lambda_1 = 0 \tag{12}$$

and

$$\lambda_2 \overline{c_f} = B_f^g, \tag{13}$$

Domestic debt repayment

Use (12) to obtain

$$d_h^* = \frac{(\alpha a)^{\frac{1}{1-\alpha}} - s_0}{B_h^g}.$$

The government sets d_h^* to guarantee that the entrepreneurial sector has access to as much domestic capital as required. In this situation further domestic debt repayment would not further increase output. Note, however, that repayment beyond that point simply amounts to a within country redistribution of wealth. As a result $d_h^* = 1$ not detrimental for aggregate welfare.

Foreign debt repayment

Foreign debt will be serviced as long as the increase in entrepreneurial profits, $\lambda_2 \overline{c_f}$, is at least as big as the amount of resources leaving the public coffers, B_f^g. Using (13), foreigners will face a partial default if

$$\lambda_2(d_f^*) = \tau^{-1} \ for \ d_f^* < 1,$$

where $\tau = \frac{\overline{c_f}}{B_f^g}$ can be interpreted as the catalytic effect of sovereign debt repayment.[16] Further manipulation of (13) leads to

$$d_f^* = \frac{(\tau\beta b)^{\frac{1}{1-\beta}} - C}{\overline{c_f}}$$

Note is that, as long as $C < k_f^{opt} = (b\beta)^{\frac{1}{1-\beta}}$, entrepreneurs will not be able to borrow their optimum. Entrepreneurs are only concerned with their private benefits. Conversely, the Government also considers the impact of repayment on its own wealth, creating a wedge between the optimal level of foreign capital for entrepreneur and from an aggregate perspective.

It is immediate, notice that $\frac{\partial \tau}{\partial B_f^g} < 0$, that the higher the external exposure, B_f^g, the easier will be that foreigners will suffer a haircut, $d_f^* < 1$.

Similarly, the lower the productivity (defined by either b or β) of foreign capital the less it will be demanded. As a result, the likelier will be that the government partly defaults on its external obligations.

Finally, it is immediate that, the lower is $\overline{c_f}$, 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 it's foreign debt.

Creditor discrimination and ability to repay

If $T < B_h^g + B_f^g$, the government must decide how to divide available cash between residents and foreigners. We shown first how an interior solution would look like and then move to show the two extreme cases in which all available resources go to just one specific type of investor.

In an interior solution,

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

Rearranging terms

$$\lambda_1(d_h) = \tau\lambda_2(d_f) - 1 \tag{14}$$

Equation (14) states that, in the margin, the welfare increase per unit of repayment to foreigners (RHS) must be equal to the effect on welfare of a marginal increase per unit of repayment to residents (LHS). That is, an additional unit of repayment provides identical aggregate welfare regardless the creditor involved.

Together with $d_h B_h^g + d_f B_f^g = T$, equation (8) completely determines the sovereign repayment behavior. Using equations (8), (9) and the budget constraint, (14) can be expressed as

$$\frac{\alpha a}{[s_0 + T - d_f B_f^g]^{1-\alpha}} = \frac{\tau\beta b}{[C + d_f \overline{c_f}]^{1-\beta}} - \tau. \tag{15}$$

[16] The country's private external borrowing ceiling increases by τ units for every unit repaid by the sovereign.

From (15) it is immediate to perform comparative statics. First, as $\frac{\alpha a}{\beta b}$ increases the relative productivity of domestic capital increases. As a result, the optimal strategy for the Government would be to reduce d_f while increasing d_h. Next, as s_0 increases, so that banks ability to provide domestic credit in the absence of public repayment is larger, the Government has stronger incentives to increase foreign repayment at the expense of domestic banks. Finally, as B_h^g increases, the proportion that needs to be repaid to attain the desired level of domestic capital is smaller, leading to an increase in repayment of foreign debts at the expense of domestic creditors.

Domestic defaults

When will a sovereign place all the adjustment effort on its domestic financiers? We show below that if banks are healthy enough and 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, for $d_h = 0$ and $d_f = \frac{T}{B_f^g}$ to be an equilibrium outcome

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

Available resources will be fully used to repay foreign creditors whenever the gain of deviating a marginal unit of funds to domestic banks (LHS) is smaller than the gain from using such funds for external repayment (RHS).

Proposition 3 *A stronger banking sector balance sheet and limited productivity of domestic capital make more likely that the government will choose domestic banks as the objective of the debt default.*

Proof. *Substitute (8) and (9) into the inequality above and rearrange*

$$s_0 > [\frac{\alpha a}{\tau\beta b}]^{\frac{1}{1-\alpha}}[C + \frac{T}{B_f^g}\overline{c_f}]^{\frac{1-\beta}{1-\alpha}}.$$

It is immediate that increases in s_0 and decreases in $\frac{\alpha}{\beta}$ make it likelier that the above inequality will hold. ■

External defaults

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 $\lambda_1(\frac{T}{B_h^g})$, due to reduced lending by domestic banks, while producing an increase in welfare, $\tau\lambda_2(0) - 1$, resulting from substracting from the welfare increase obtained from the expanded borrowing capacity the direct cost for the public coffers from servicing the debt. The

Government will devote all its resources to honour domestic debt obligations whenever,

$$\lambda_1(\frac{T}{B_h^g}) > \tau\lambda_2(0) - 1.$$

Proposition 4 *Countries where foreign capital is relatively less productive 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. *Use equations (2) and (3) along with the budget constraint and the specified behavior of the Government to get*

$$\frac{a\alpha}{[s_0 + T]^{1-\alpha}} > \frac{\tau\beta b}{C^{1-\beta}} - \tau.$$

Again, as β (or b) fall relative to α (or a) the RHS increases relative to the LHS, making a full external default more likely. Similarly, as C increases the RHS decreases, raising the potential for using all resources to cover domestic debt obligations. ■

After having presented the main implications of our model,we study its relevance using a sample of recent sovereign debt restructurings. We begin by cataloging the cases either as neutral or discriminatory. We then explore if the main conclusions of the paper are backed by the data by analyzing information on the countries debt structure (domestic versus external), on the health and importance of the domestic financial sector and on the dependence of the corporate sector on external financing.

Evidence on selectiveness: a case-study approach

In this section we identify residence-based breaches in intercreditor equity during 10 recent sovereign debt restructurings. We cover the following cases: Argentina, Belize, Dominica, the Dominican Republic, Ecuador, Grenada, Pakistan, Russia, Ukraine and Uruguay. Due to the scarcity of information and the lack of a uniform source, the classification is based on various indicators such as amounts involved, the approximated holdings of both residents and foreigners of the different instruments, the haircuts suffered, and the timing of their involvement. Therefore we had to resort to a large number of sources. We used mostly reports from multilateral organizations and national agencies. We found especially useful IMF's Article IV Consultations as well as various program reviews whenever these were in place around the time of the restructuring. We also made use of a few cross-country analysis of previous restructurings prepared by the IMF staff. To double check and obtain relevant information whenever we could not find it from these sources, we used information coming from Ministries of Economics and Finance and Central Banks of the countries involved. Finally, the year 2008 S&P's reports on sovereign debt was especially useful, as it provides detailed evidence for many of the cases we cover here, including estimates on haircuts and amounts involved.[17] In our view, a first relevant contribution of this analysis is to put together such detailed information on the various restructuring episodes under consideration.

Note that our focus on the early stages of the episodes is of particular interest. We do so as it is then that the sovereigns still retain some room for manoeuvre to adopt the type of behavior studied here. Some of the key features of the debt restructurings covered in this section are summarized in Table 1. The table provides information on the various actors and instruments involved in each episode. It shows wide heterogeneity regarding the involvement different types of instruments and creditors. In line with Mandeng (2004), this variety inn restrcuturing approaches indicates that breaches of the inter-creditor equity principle go beyond the domestic versus foreign divide tackled in this paper.[18] For instance in Serbia and Ukraine official debt was an important component of public debt. Even Uruguay, who followed a market friendly approach to debt restructurings, spared foreign bank loans from the restructuring. Regarding the domestic versus foreign divide at the core of this paper, we grouped the cases in three categories: countries in which the sovereign discriminated against external creditors; countries in which the sovereign adopted a 'neutral' approach, and countries where the sovereign discriminated against domestic creditors

[17] Indeed it covers a few episodes we do not. These include the domestic restructuring in Venezuela in 1998, the debt restructuring in Moldova in 2002, Peru' brief default in 2000 and that on Ivory Coast in 2000. In Peru and Venezuela arrears were minor and unrelated to issues of sustainability. The lack of information prevented us from including Moldova and Ivory Coast in the analysis.

[18] See Erce (2010) for a characterization of other breaches of intercreditor equity.

TABLE 1 - KEY FEATURES OF RESTRUCTURINGS. AGENTS INVOLVED.

	1998 **Russia**	*1999* **Pakistan**	*1998* **Ukraine**	*1999* **Ecuador**	*2001* **Argentina**	*2003* **Uruguay**	*2004* **Dom. Rep.**	*2000* **Serbia**[6]	*2004* **Dominica**	*2004* **Grenada**	*2006* **Belize**
Announcement of the restructuring/date of default	aug - 98	may - 99	aug - 98	sept - 99	june -01	march - 03	dec - 04	dec-00	dec - 03[9]	oct - 04[12]	aug - 06
Completion of the restructuring	aug - 00	dec - 01	july - 01	end -00	june - 05	may - 03	oct - 05	nov-05	june - 04[10]	nov - 05	feb - 07
Debt to GDP (%)[1]	51	84	42	100	62.2 (2001); 132 (2004)	104	54	127	130	129	98
Restructured debt (%GDP)	32	27	14.80	46	*30 (2001); 53.4 (2005)*	44	7.4[7]	30	66	53	47
Restructured debt (USD bn)	71.6[8]	19	4.7	7.81	162.3[4]	5.35	1.63	7.12	0.17	0.29	0.57
Rest. debt - private sector (% GDP)[13]	*28.3*	*2.5*	*12.9*	*40.8*	*30 (2001); 53.4 (2005)*	*44.0*	*5.9*[7]	*7.1*	65.6	*49.8*	47
Paris Club reschedulings (% GDP)	*4.14*	*24.9*	*1.85*	*5.52*[5]	*no resch.*	*no resch.*	*1.5*[7]	*19*	*no resch.*	*2.83*	*no resch.*
London Club restructuring (%GDP)	12.24	1.49	*no rest.*	*no rest.*	*no rest.*	*no rest.*	*0.9*	11	*no rest.*	*no rest.*	*no rest.*
Default on external private debt	n[16]	n	n[3]	y	y	n	n	y	y	y	n[15]
Default on foreign currency bond debt	n[16]	n	n	y	y	n	n	n	n[11]	y	n[15]
Default on foreign currency bank debt	n[16]	n	n	y	y	n	n	y	y	y	n
Default on domestic private debt	y	n	n	y	y	n	n	y	n	y	n
Default on official debt	y	y	n[3]	y	y	n	y	y	n	y	n
External debt restructuring	y	y	y	y	y	y	y	y	y	y	y
Foreign currency bond debt restructuring	y	y	y	y	y	y	y	n	y	y	y
Foreign currency bank debt restructuring	y (1997)	y	y	n	y	n	y	y	y	y	y
Domestic debt restructuring	y	n[2]	y	y	y	y	n	n	y	y	n
Official debt restructuring	y	y	y	y	y	n	y	y	y	y	n

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

[1] Closest available data to the launch of the exchange.

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

[3] Ukraine was in default for a short period.

[4] This figure does not include 52 bn USD affected by 2002 pesification (of which 16.3 were redollarised in 2003)

[5] 2003 Paris Club agreement not included.

[6] Serbia and Montenegro. Ratios computed using 2000 GDP data. We exclude 2005 Paris Club agreement.

[7] Ratios computed using 2004 GDP.

[8] At pre-crisis exchange rates for 1998-98 debt exchange

[9] The formal debt exchange offer was made in April 2004.

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

[11] Although this was a pre-emptive restructuring, arrears were accumulated in 2 bonds in legal dispute

[12] The offer was launched in September 2005.

[13] Computed as total restructured debt - Paris Club agreements.

[14] Two bond payments were suspended in December 2006

[15] Russia defaulted on Soviet era debt (MinFin and PRINS/IANs)

SOURCES: Erce and Diaz-Cassou (2010), Diaz-Cassou and Erce (2008a), Diaz-Cassou and Erce (2008b), IMF (2003), IMF (2006), Moody's, Owen and Robinson (2003), Sturzenegger and Zettelmeyer (2007), S&P, WDI and autho

Discrimination against external creditors

The cases in which the sovereign more clearly tried to spare residents from 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 (44% of total debt).[19] According to Moody's (2008), the vast majority of holders of these instruments were non-residents. Importantly, although domestic instruments represented about 12% of total sovereign debt, the government did not include any domestic instruments in the restructuring.

In turn, the Dominican preemptive debt restructuring carried out in between December 2004 and October 2005 focused on two series of international bonds with a total face value of US$1.100 million, commercial debt (London Club) and bilateral official debt (Paris Club). Overall, this represented about 18% of total sovereign debt.[20] According to the Secretaria de Estado (2005), just a minor quantity of public debt in the hands of residents was restructured. Importantly, the associated terms were milder than those applied to foreign creditors.

In Ecuador, the authorities tried to ring-fence the 1999 default to 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 (45% of total debt). Most important for my analysis, although domestic debt was included in the restructuring, residents were granted a preferential treatment. The unilateral rescheduling of domestic bonds maturing between September 1999 and end-2000 carried out at a 9% cost in NPV terms (see ECB, 2005). This contrasts with the 19 to 47% haircut undergone by the holders of Eurobonds and Brady bonds (Sturzenegger and Zettelmeyer, 2007).

Finally, in the middle of a severe balance of payments crisis, the main concern for Pakistan was to restructure bilateral official debt. Three Paris Club treatments were signed in January 1999 and January and December 2001 for a total amount 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. 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. Despite the fact that domestic debt amounted to almost 50% of total debt, resident creditors were almost entirely spared from the restructuring.[21] 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 2 suggests that discriminating against external creditors had little in-

[19] This included around 160 USD millions in loans with foreign banks (Government of Belize, October 2006). According to Moody's (2008) around 250 USD millions of this debt fell in arrears during the restructuring process.

[20] It should be noted, however, that a large fraction of the international bonds, while held by a foreign bank, it was actually owned by a dominican resident.

[21] According to IMF (2002), one third of the obligations restructured were in residents' hands.

fluence 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. On the one hand, the Belizean and the Dominican restructurings were completed in only 6 and 9 months respectively, carrying a mild haircut and, according to Enderlein et al. (2007), in a non-coercive manner. On the other hand, the Ecuadorian and Pakistani restructurings took much longer to be completed (5 and 11 quarters respectively), carried a substantial haircut and were more coercive in nature.[22]

TABLE 2- KEY FEATURES OF RESTRUCTURINGS. OUTCOME.

	1998	*1999*	*1998*	*1999*	*2001*	*2003*	*2004*	*2000*	*2004*	*2006*	*2004*
	Russia	**Pakistan**	**Ukraine**	**Ecuador**	**Argentina**	**Uruguay**	**Dom. Rep.***	**Serbia**	**Dominica**	**Belize**	**Grenada**
NPV loss (%)	(40,75)	(29-32)	(5-59.2)	(9-47)	(25-82)	(5-20)[2]	(1-2)	62	50	(1-28)	(40-45)
Participation in the exchange (%)	(75-99)	99	(82-100)	98	(50-76)	(90-99)	97	-	79	98	91
Duration (quarters)	8	11	12	5	15	1	3	20	2	2	3
Coerciveness index[1]	(3,6)	(2,4)	(0,1)	5	(0,7)	0	(1,3)	-	1	1	1
Capital controls	y	y	y	y	y	n	y	y	y	y	y
Deposit freezes	y	y	n	y	y	y	-	y	-	-	-
Access to int'l capital markets[3]											
1st int'l bond issuance (quarters)	10	18	16	24	19	4	4	not yet	-	not yet	not yet
EMBI Global below 1000 p.b.	11	11	13	17	14	1	4	-	-	0	-

We consider 2004 as the year of the restructuring t even if informal contacts with creditors started the previous year.

[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] Some minor bonds carried a higher haircut (Sturzenegger and Zettelmeyer, 2005).

Quarters after the announcement of the reestructuring (except Argentina's int. bond issuance: quarters after December 2001 default).

SOURCES:Diaz-Cassou and Erce (2008b), Dealogic, Moody's, IMF (2002, 2003, 2006)), Enderlein et al. (2007), IMF AREAER, Sturzenegger and Zettelemeyer (2007), Thomson Reuters and authors' calculations.

Neutral cases

Uruguay, Grenada and Dominica are the countries in our sample which adopted an approach closer to neutral during their restructuring episodes. 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) which included 1.6 USD billoins in domestic instruments and 3.7 USD billions in external obligations. According to

[22] *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, therefore, ground to argue that the smoothest restructurings in terms of duration, haircut and coerciveness tend to coincide with preemptive cases.*

ECB (2005) around half of the restructured instruments were 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. Reflecting the market-friendly and cooperative strategy adopted by the authorities, I view the Uruguayan debt restructuring as non-discriminatory.[23]

In Grenada, debt amounting to approximately US$ 290 million in principal (40% of total public debt) was exchanged for new US$ and Eastern Caribbean dollar-denominated bonds after the Hurricane Ivan forced the government to suspend payments on most debt classes (IMF, 2006a).[24] 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 launched in October 2004. In addition, the authorities committed to continue servicing the obligations traded in the Regional Government Securities Market. This 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 (Moody's, 2008).

In Dominica, there is ground to argue that the authorities considered ring-fencing domestic financial institutions from the effects of the restructuring announced in December 2003. The government did initially express its intention to, at least, reach agreements with the main domestic banks depending on their exposures and vulnerabilities. However, although short term tresury obligations were finally excluded, residents were included in the debt workout. Moreover, the debt exchange was conducted on the principle that a certain level of inter-creditor equity should be maintained between commercial and domestic creditors.[25,26]

Table 2 shows that, if compared with countries that discriminated specific categories of creditors, the neutral cases are less coercive. This was particularly clear in Uruguay, whose collaborative approach is evidenced by the mild haircut attached to the government's offer (5-20% in NPV terms). In Grenada and Dominica the government did also adopt a market-friendly approach. However, probably due to the extent of the fiscal problems undergone by these countries (debt to GDP ratios of 130%), the haircuts were higher. Besides, if the lenght of the negotiations serves as an indication of their smoothness, it would seem that the strategy of being neutral, collaborative and market friendly paid off.

[23] 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.

[24] This included 190 USD millions of external debt, 86 USD millions of domestic debt and 16 USD millions with the Paris Club.

[25] See Offer to exchange (Common Wealth of Dominica, April 2004).

[26] Nevertheless, the largest domestic restructuring operation was carried out with the Dominica Social Security Agency. Thus, a substantial portion of Dominica's domestic restructuring just equated to an intra-public sector transfer of resources, not affecting privately held obligations.

Indeed, Uruguay's was the shortest debt restructuring among the countries of our sample (two months). Also Dominica's and Grenada's debt restructurings were relatively short (about half a year).[27]

Discrimination against residents

Three cases fall into this category: Argentina, Russia, and to a lesser extent Ukraine. Reflects the complexity of the restructured debt and the non-collaborative stance adopted by the authorities after the December 2001 default,the Argentine restructuring is the most contentious case of our sample. However, most relevant to our analysis, prior to defaulting in December 2001, the Argentine government went at great length to mobilize domestic sources of finance.[28] This was done through the exertion of moral suasion on firms to absorb 'patriotic' bonds, financial engineering operations like the June 2001 'mega-swap', and through the semi-coerced exchange of bonds for 'guaranteed loans'. All these measures constituted a desperate attempt to avoid an international default and save the convertibility regime. Ultimately this strategy failed, substantially increasing the exposure of the domestic financial sector to public debt**,** thereby exacerbating the economic dislocation caused by the crisis. According to estimates by SZ (2007) the cumulative NPV loss suffered by residents after both the phase I and the pesification was of comparable magnitude (60-80%) to that suffered by foreign creditors after the 2001 default.

The liquidity pressures undergone by Russia in 1998 originated mainly in the domestic public securities market.[29] A widening yield-differential between ruble denominated securities and Eurobonds made it increasingly difficult to roll-over domestic instruments.[30] In this context, when the Duma failed to ratify an IMF's stabilization program, the government defaulted on GKOs and OFZs while committing to remain current on post-soviet external debt obligations. This amounted to a default on domestic debt worth approximately US$30 billion at pre-default exchange rates. Estimates about the proportion of that debt was in residents' hands range between 60% and 80% (Owen and Robinson (2003) or ECB (2005)).[31] This restructuring, therefore had a domestic bias both in terms of the jurisdiction of the restructured instruments and of the nationality of the holders.[32]

[27] A possibility that should be explored in detail is to what extent being neutral constitutes a signalling device. A factor shaping countries' decision to be neutral might be the Government's desire to signal their goodwill vis-à-vis their private creditors by respecting intercreditor equity and adopting a market-friendly approach.

[28] This was done to substitute for a loss of access to international financial markets (Diaz-Cassou et al., 2008b).

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

[30] This widening differential could reflect the increasing likelyhood of both a domestic default or a large devaluation of the ruble.

[31] Subsequently additional 32 billion USD of soviet era external debt and above 8 USD billions of Paris Club debt were restructured. See SZ (2007) and Paris Club.

[32] It should be noted that, on top of the haircut associated with the 'Novation' scheme,

Ukraine's debt restructuring was carried out in two distinct stages. In 1998 and 1999, a succession of selective restructurings with specific creditors was completed in order to bridge mounting liquidity needs. Tis strategy simply postponed the resolution of the underlying debt problem, and by year 2000 the government was forced to comprehensively restructure its entire stock of international bonds. We consider this a case of early discrimination against residents because, in addition to accumulate significant arrears with domestic suppliers, the first deal closed by the Ukrainian authorities during the wave of selective restructurings was reached precisely with domestic banks. Completed in September 1998, it affected a variety of treasury bills with a total face value of HrV800 million (close to US$130 million) or one third of domestic banks' total holdings of T-bills. According to Sturzenegger and Zettelmeyer (2007), this debt exchange carried a relatively mild haircut ranging in between 5% and 9% in NPV terms. Subsequent restructuring actions, instead, tended to affect primarily international creditors. Overall, therefore, the Ukrainian debt restructuring was not one in which residents suffered larger losses. However, what matters for our analysis is that residents were the first category of creditors to be involved in the restructuring process.

An examination of the indicators provided in Table 2 suggests that, debt restructurings tended to be more complex for countries that discriminated against residents. This is illustrated by 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 of our sample, reflecting the non-collaborative approach adopted by the authorities. The Ukrainian debt restructuring, in turn, was comparatively less coercive.[33]

Explaining the patterns of discrimination

I now study to what extent the factors uncovered by our simple model contribute to explain the patterns of discrimination between residents and non residents just detailed. Thus, I 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 provided incentives for the sovereign to discriminate in one or the other direction.

The origin of liquidity pressures

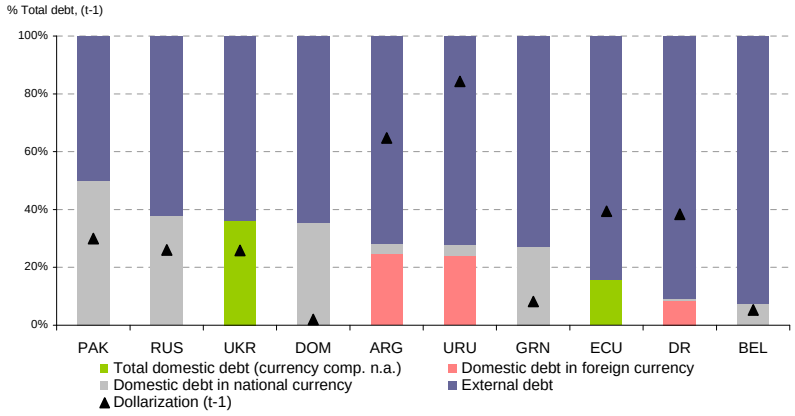
A first hypothesis derived from the model is that the decision to discriminate depends on the origin of the liquidity pressures. If a government is primarily

foreign holders of ruble-denominated instruments were forced to place all cash proceeds in a non-interest bearing 'transit account' for one year. As a result of this, they underwent larger losses than resident creditors.

[33] Again, this suggests that the degree of coerciveness tended to be associated with whether a restructuring was preemptive or not

struggling to meet external obligations, the liquidity relief potentially extracted from resident creditors may be considered insufficient and the government may opt to spare resident creditors from a restructuring or offer them more lenient terms.[34] Conversely, if struggling primarily to roll-over domestic debt, the government may opt to discriminate against residents.[35] Do our case studies provide 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 our sample countries. Thus, we are 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 shows to what extent the government could have restructured the total amount of debt ultimately affected involving only domestic creditors. Therefore, the higher that ratio, the more likely the government discriminated against residents. Consistent with our model, 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, all of which did not focus their respective debt restructurings on domestic resources.



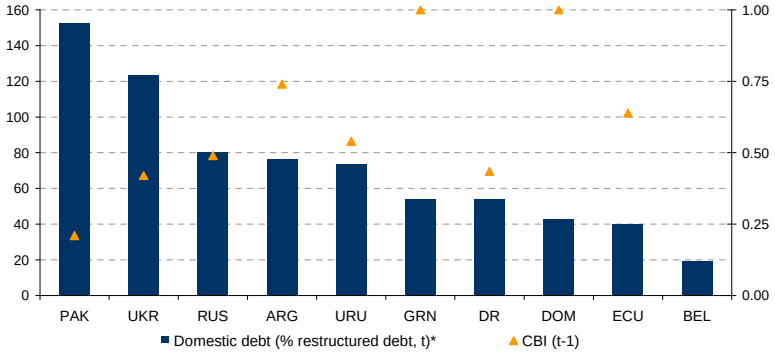
Note: DR's debt composition of year (t+2)
Sources: CLYPS, Articles IV, IMF Country Reports, Reviews under the Stand-By-Arrangements, Owen and Robinson (2003), national sources and authors' calculations.

Figure 1: Public debt composition and financial dollarization

[34] For a Government, failing to honour its domestic obligations is a political liability.

[35] Such strategy should compensate for the loss of access to international financial markets, both for the government and for the domestic private sector, that is likely to accompany the restructuring of external debt.

Figure 2 shows that these countries also displayed low ratios of domestic debt to restructured debt. Converse to the model predictions, the proportion of domestic to total debt and the ratio of domestic to restructured debt were highest in Pakistan, where residents were treated preferentially in the debt workout.



* Russia: (t-1)
Notes: No Central Bank Independence Index (CBI) data for Belize. Uruguay: (t-3)
For Dominica and Grenada we assume CB is independent since they are members of ECCU.

Sources: CLYPS, Articles IV, Owen and 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 and authors' calculations.

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

In line with the model, Russia 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). The situation was similar in Argentina. However, as detailed below, 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.

As expected, the countries that adopted a neutral approach also obtained a non-negligible liquidity relief from including resident creditors in their restructurings. In fact, in Dominica, Grenada and Uruguay domestic obligations amounted to about 30% of total obligations. Remarkably, Pakistan is far from fititng into this hypothesis. As I explore in te next subsection, this hypothesis can be qualified in a number of ways.

Currency composition, dollarization and Central Bank Independence

The liquidity hypothesis needs to be qualified for at least two reasons. First, 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. Second, the degree of Central Bank independence can affect the governmetn startegy to cope with a liquidity problem. Finally, the degree of dollarization of the banking

system can affect it's reliability as a source of hard currency.

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). We should then expect domestic defaults to be less likely under scenarios of both fiscal dominance and a large stocks of domestic currency debt.[36] 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. Finally, 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 Argentina's uncooperative stance towards bondholders.[37] This may 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 order to find out whether the first two caveats above applied to 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

[36] This does not mean that residents will not bear the burden of the crisis. 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 definition of discrimination centered on the direct participation of residents and non residents in the restructuring.

[37] Probably, the adoption of such a market-friendly stance was also encouraged by the IMF, whose leverage 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).

in Figure 2 as the Cukierman index of central bank independence).[38,39] In fact, Figure 1 shows that, while not insignificant, Argentina did not have a particularly high proportion of domestic to total debt. Rather, the early discrimination against residents was mostly aimed at substituting external sources of finance for domestic sources of finance. As 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 to remain current externally. After the external default was consummated, this motivation disappeared and the discriminatory measures adopted by the authorities were mostly aimed at softening the impact of the crisis on resident creditors.

The currency denomination of its domestic debt together with the lack of independence of its central bank provide an explanation also for the Pakistani exception. Figure 2 shows that Pakistan had the least independent central bank among our sample countries. Agha and Khan (2006) provide an empirical account on the significance of fiscal dominance in Pakistan which supports the hypothesis that, in the late 90s, the government used the State Bank of Pakistan to monetize a substantial part of its deficit, diluting domestic debt and partly overcoming the liquidity pressures stemming from local currency claims in the hands of residents. Given the relative lack of independence of Russia's and Ukraine's central banks (see Figure 2), an interesting question is why the authorities, especially the Russian ones, restrain from resorting to inflation to honour domestic debt instruments. A possible explanation is that by the late 90s Russia had just completed a painful process of monetary stabilization, overcoming years of hyperinflation. Under such circumstances, the Russian government might 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.

The domestic financial system

Domestic financial institutions are usually among the most important resident holders of sovereign debt in emerging and developing countries. 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. Figure 3 presents information obtained from the World development indicators

[38] Sources 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 (2008a and 2008b), Moody's (2008), Secretaria de Estado de Hacienda (Republica Dominicana) and authors' calculations.

[39] The ratios reported in Figure 2 correspond to period t, with the exception of Russia, where we report data for t-1. In Russia, after the August 1998 default, this ratio becomes distorted by 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. The CBI reported for Uruguay corresponds to year t-3. As Dominica and Grenada are members of the ECCU, we assume their CBI to be one (maximum degree of independence)

regarding the holdings of public instrument by domestic banks in the year prior to the restructuring. Public debt constituted above 30% of total banks' assets in Pakistan Ukraine 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 is its potential impact on the stability of the banking system. On the asset side, as represented in the model, the 'haircut' associated with the restructuring constitutes a direct loss for financial institutions to the extent that they hold restructured debt instruments. In this context, restructuring sovereign debt poses the risk of triggering or aggravating a banking crises and a credit crunch.[40]

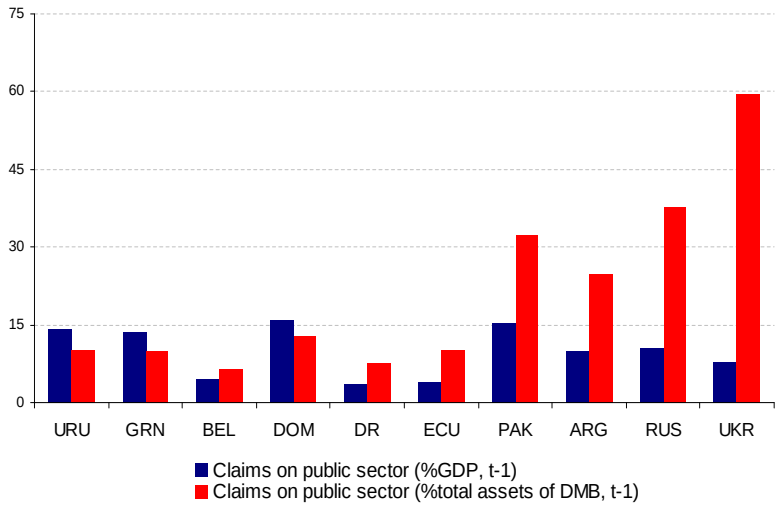


Figure 3: Banks' holdings of public debt

Our model indicated that as a result of certain features of their banking systems, some governments might be more vigilant than others over the risks induced by a debt restructuring on domestic financial stability. Accordingly,concerns about the impact of the restructuring both on domestic credit provisioning and on domestic financial stability, should contribute to explain the observed patterns of discrimination.

[40] 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.

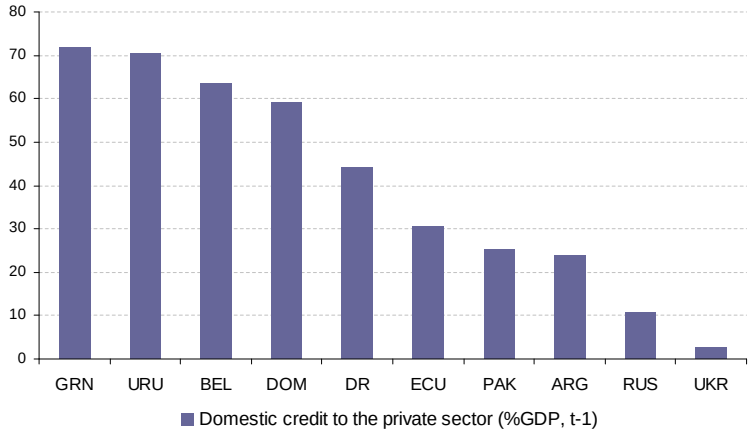


Figure 4: Relevance of domestic financial intermediation

Regarding the first aspect, we find wide variation in the importance of financial intermediation. Figure 4 illustrates these differences by presenting the stock of credit to the private sector among the countries of our sample. At the outset of the crises, domestic private credit ranged from almost 80 per cent of GDP in Grenada or Uruguay to less than 10 per cent of GDP in Ukraine. 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. In line with our prior, the authorities from countries with a low level of financial intermediation may have less to fear about discriminating against domestic creditors as the debt restructurings is likely to have a more limited impact on the overall performance of their non-financial private sectors. This applies especially to 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, 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 force residents to absorb the full impact of the debt workout. This might help explain why, in the Caribean countries and Uruguay,where domestic credit was high, the resolution strategy did not involve only resident financiers

Regarding the second aspect, the ex ante robustness of the financial system. When the government perceives the financial system to be sound ex ante, it may pay off for the government to try to extract liquidity domestically (i.e. discriminate against residents) 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 and facing the need to re-capitalize domestic banks, may be reluctant to imposing further losses onto financial institutions through a debt restructuring. Summing up, 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? We proxy the ex ante soundness of the financial system by analyzing the evolution of two variables in the quarters surrounding the beginning of the debt restructuring process. The first variable is an index captures the evolution of total deposits in local currency and in US$. 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 5 in the Appendix shows the evolution of these two variables for our sample countries.

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 5, in Argentina the deposit base remained stable up until the third quarter of 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 below 1 per cent of total deposits and foreign liabilities until the mega-swap. In this context, the government had reasons 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 concern over the future solvency of Argentine banks given their high exposure to a sovereign on the brink of default.[41]

As suggested by the growing deposit base exhibited in both countries, the banking systems of Russia and Ukraine also appeared to be in a stable situation in the quarters leading to the beginning of their respective debt restructurings. Together with the low level of financial intermediation in both in countries, this contributes to explain why the government discriminated against residents at the early stages of these 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

[41] This illustrates how 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.

(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.

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 restructuring. Indeed, to a large extent the Dominican debt crisis was the result of the mishandling of this banking crisis and the ensuing surge in public debt used 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 model's prediction, it is likely that fears about the impact of the restructuring on its already troubled financial institutions constrained the choices 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, where a sustained fall in dollar-denominated deposits can be observed in the quarters leading to the restructuring. This was largely due to contagion from Argentina, which materialized in massive deposit withdrawals by 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.[42]

The domestic private sector's reliance on international financial markets

In a recent contribution, Arteta and Hale (2008) show that sovereign debt crises have a negative impact on the corporate sector's access to international financial markets. Similarly, Trebesch (2009) finds that the extent of this loss of access is partly determined by the coerciveness with which governments treat their external creditors during restructurings. Along these lines, our model predicts that the governments' strategic behavior vis-à-vis their foreign creditors is likely to

[42] As mentioned above, a factor which we consider important to explain this exception is Uruguay's struggle to present its restructuring as the antithesis of Argentina's approach.

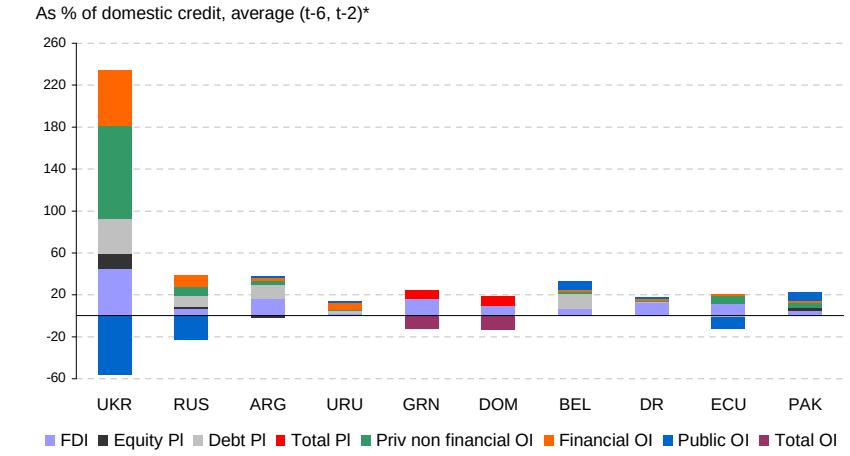
be affected by the corporate sector's reliance on international financial markets. If keeping access to external finance is deemed important for the functioning of the corporate sector, the government may decide to act more coercively on its domestic financiers while trying to spare its foreign creditors from 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, a small reliance on international financial markets by the corporate sector should reinforce the sovereign's incentives to discriminate against non residents.

In what follows, we present various indicators of our sample countries' private sector's reliance on international financial markets. To gauge the relative importance of foreign vis-a-vis domestic financing, the indicators are presented as ratios against the stock of domestic credit to the private sector.[43]

First, we compare the weight of the various types of capital inflows considered in the balance of payments statistics using the average value of the flows over the five years that preceded the crises. As shown in Figure 6a, according to this metric, the countries that discriminated against domestic creditors at an early stage 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.[44] This reflects the fact that, during most of the 1990s, in Ukraine and Russia, the underdevelopment of the financial system was such that firms had a very limited access to domestic credit. 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 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.

[43] The IMF's 2009 Global Financial Stability Report (GFSR) uses the same approach to analyze whether domestic credit could be used as a substitute for external financing.

[44] For 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 6a does not provide the distinction.



Sources: IFS, WDI and authors' calculations.
* Except Russia and Ukraine: (t-4, t-1)

Figure 6a: Net capital inflows: BoP statistics

However, IFS data does not disaggregate between debt portfolio flows directed to the private or to the public sector. Therefore, this measure can only be considered a partial indicator of domestic firms' reliance on international financial markets. Apart from FDI, which tends to behave in its own idiosyncratic way during 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 6b 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, it 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 concerned about the sustainability of the Convertibility regime. However, back in the mid 1990s, Argentina was one of the most im-

portant recipient of equity and international loans both among the countries of our sample and among emerging markets as a whole. Between 1993 and 1998 the combined net amount of these three categories of capital inflows averaged as much as 12% of domestic credit.[45]

We complement this story based in flows by using data regarding the stock of external debt liabilities. More specifically, we study the relative importance of foreign liabilities in each of our sample countries two periods ahead of the restructurings. This information, which was obtained from the World Development Indicators, is collected in Figure 7.

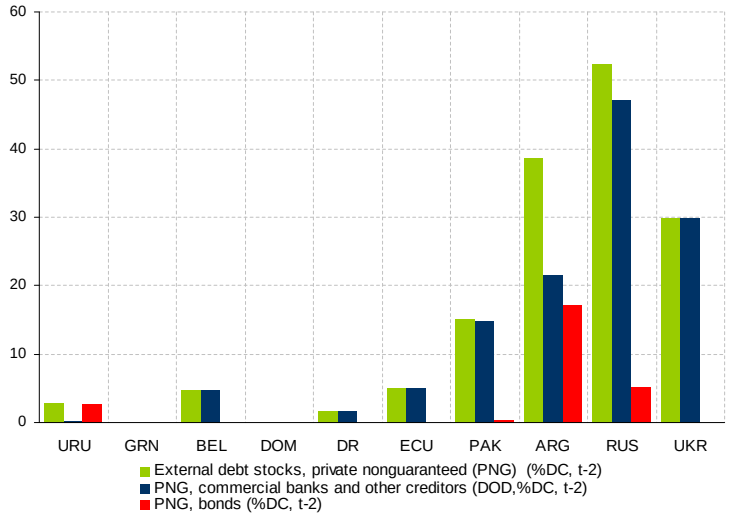


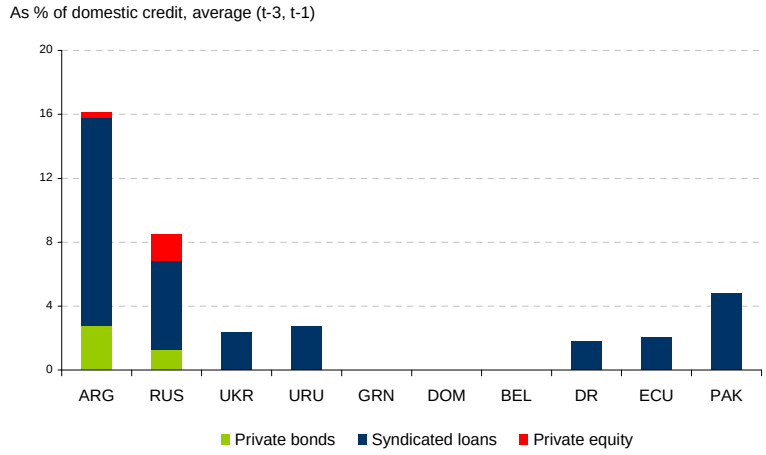
Figure 7: External debt positions

The picture that emerges is very similar to the one depicted by capital flows. Argentina, Ukraine, Russia and Pakistan appear as the countries within our sample with a higher level of external obligations.[46]

Finally, we compare corporate activity in international financial markets using data from DCM Analytic. We use this data to track cross-border financial operations involving our sample countries' private sectors during the three years that preceded the launching of the restructurings. More precisely, we look for bonds and equity issuances in foreign jurisdictions, and for syndicated loans operations with international banks.

[45] IFS, WDI and authors' calculations.

[46] Note, however, that available data for the Caribbean economies is likely to be incomplete.



Sources: Dealogic, WDI and authors' calculations.

Figure 8: Corporate activity in international financial markets

As shown in Figure 8, according to this database Argentina and Russia were by far the most active players in international financial markets among our sample countries. For both countries corporate sectors, syndicated credit appears as the most important source of external credit. However, Argentine firms were also able to issue bonds externally on a substantial scale (close to 3% of domestic credit on average) while Russian firms did participate in foreign equity markets (about 2% of domestic credit on average).

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. However, as emphasized above, Pakistan resorted to inflation in order to cope with domestic liquidity pressures. Interestingly, while both Ecuador and Dominican Republic appear as dependent on external financing, they both discriminated against external creditors. This might indicate that when domestic financial stability is at stake, considerations regarding foreign financing are second order.

Conclusions

Following Reinhart and Rogoff (2008), there is a growing awareness that the traditional disregard to the role played by domestic creditors constitutes a substantial gap in the sovereign debt literature. This paper contributes to fill the gap by analyzing the relative seniority of domestic and external debt both from an empirical and a theoretical perspective. The central idea to be extracted from this paper is that, contrary what recent models on sovereign risk assume,

neither domestic nor external obligations can be considered intrinsically senior. The relative seniority between both types of obligations is state dependent.

To discipline the analysis I present an stylized model of endogenous debt repayment where the Government can differentiate the servicing of its obligations to foreign and resident creditors. The model shows that the decision to discriminate is 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. To test these implications I study 10 recent sovereign debt restructurings.

First, I provide evidence that various governments treated external and domestic creditors differently, with discrimination affecting the two groups in non homogenous ways. While the Belizean, Dominican, Pakistani and Ecuadorian governments spared resident creditors from the restructurings, in Argentina, Russia and (to a lesser extent) Ukraine, the authorities did initially put the weight of the restructuring on domestic financial institutions. I Then study the relevance of the mechanisms outlined by the model using these cases

First, I show that, to some extent, countries discriminate against foreigners (residents) if they are struggling primarily with external (domestic) obligations. There are significant exceptions to this pattern that relate to Central Bank independence, the degree of financial dollarization and the currency composition of public debt.

On top of this rather mechanic liquidity pressure channel, we show that sovereigns' discriminatory stance is influenced by certain features of their domestic financial systems. Through its impact on domestic banks' balance sheets, a default is likely spill over to the real sector by depress domestic credit provisioning. However, the extent of this effect will depend on the importance of bank intermediation. Indeed, countries with low levels of intermediation such as Russia and Ukraine discriminated against residents. Instead, this was potentially more costly for 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 financiers 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.

Finally, we identify the role played by international capital markets. As external defaults curtail foreign inflows to private agents, governments will take into account the relative importance of these flows for the domestic productive sector. Argentina, Russia and Ukraine with tight domestic financial constraints and with local firms' substantial reliance on international sources of finance best fit this profile: keeping access to external financiers may have been seen as a less costly option than impairing domestic banks' balance sheets.

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Appendix

Model's Time Line

	$t=0$	$t=1$	$t=2$
Government	*Observes* (T, C_d, C_f, s_0) *Repays* (d_h, d_f)	*Inactive*	payoffs
Entrepreneurs	*Inactive*	*Endowed with project* *Use* C_d *and* C_f *to acquire* k_f *and* k_h	payoffs
Domestic Banks	*Inactive* *Balance sheet* affected $D = d_h B_g^h + s_0$	*Lend* b_e	payoffs
Foreign Creditors	*Inactive* *Collateral valuation* affected $C_f(d_f)$	*Lend* b_e^f	payoffs

Figure 5: Deposits, credit to the private sector and Central Bank liquidity support

Source: IFS and authors' calculations.

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