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Private vs. official sovereign debt restructurings

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Life after default: Private vs. official sovereign debt restructurings

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Abstract: This paper studies the relationship between sovereign debt default and annual GDP growth taking into account the depth of a debt restructuring and distinguishing between commercial and official sovereign debt restructurings. Analyzing 73 default episodes in 117 countries over the period 1975-2013, we find that defaults are correlated with contraction of short-term output growth. Most importantly, controlling for the severity of the default, we are able to detect a more lasting and negative link between default and growth. While higher private haircuts imply a negative stigma which is associated to lower growth over a longer period, higher amount of official restructuring may have some costs in the short-run, but are associated to an increase in growth in the long run. Using the Synthetic Control Method, we present further evidence for the heterogeneity of the economic impact of debt restructurings, confirming that official and private defaults may have different effects on GDP growth and should then be treated differently.

Keywords: Haircuts, Output losses, Sovereign defaults

JEL Classification: F34, G15, H63

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1 Introduction

Sovereign defaults and debt restructuring are not costless as a sovereign's unilateral decisions to stop servicing its debt implies important economic costs. At least this is what the sovereign debt literature has commonly assumed as a government's main incentive to honor its debt obligations. In sovereign debt theory defaults maybe costly due to direct punishment (mainly trade sanctions), capital market exclusion or higher cost of borrowing (the so called reputational effect) or mainly domestic costs, which in turn depend on negative spillovers on corporate access to foreign credit, investments and trade (Bulow and Rogoff 1989a, Cole *et al.* 1995, Eaton and Gersovitz 1981, Sandleris 2008, Mendoza and Yue 2012).[1]

The (empirical) literature on sovereign defaults finds that default costs are difficult to quantify and short lived. Only more recently, by paying more attention to the specific analysis of debt renegotiations, very different results have been obtained with respect to the previous literature. More specifically, thanks to a more precise measurement of a country's repayment record, longer term effects can be detected, which are more in line with the effects of a default according to the theory.[2] In this paper we focus on the relationship between annual GDP growth and both private haircut and official debt restructuring applying a similar methodology to Cruces and Trebesch (2013a) to the analysis of the relationship between debt default and economic growth.[3] Specifically, we take the creditors' losses as proxy of the severity of the default episode and we verify if higher private haircuts (or higher official restructurings) are correlated with a significant contraction of (annual) economic growth over a period of ten years. While the overall evidence indicates that default episodes are negatively correlated with growth, in this literature the decision of a default has been modelled as a binary decision ignoring the large variation in restructuring outcomes.[4]

[1] For a survey see Panizza *et al.* (2009) and Tomz and Wright (2013).

[2] Asonuma and Trebesch (2016), Asonuma *et al.* (2016), Benjamin and Wright (2009), Cruces and Trebesch (2013a), Forni *et al.* (2016), Reinhart and Trebesch (2016) and Trebesch and Zabel (2017) focused on debt crisis resolution and renegotiation from a private sector perspective. Cheng *et al.* (2016a) (2016b) have instead investigated the macroeconomic impact of sovereign debt restructurings with official-sector creditors.

[3] Defined narrowly, default occurs when the debtor violates the legal terms of the debt contract (e.g., the debtor might fail to pay interest or principal within the specified grace period). This narrow definition, however, overlooks situations in which the sovereign threatens to default and creditors respond by "voluntarily" revising the contract. In recognition of this problem, credit ratings agencies like Standard and Poor's define a default as beginning either when the sovereign breaks the contract, or when the sovereign "tenders an exchange offer of new debt with less favorable terms than the original issue" (Beers and Chambers 2007). This broader definition is usually preferred and this the one we adopt in this paper.

[4] The literature has mostly focused on the occurrence of debt crises, but not on their resolution. This circumstance implies, *de facto*, no distinction between the different degrees of severity of default episodes and could (at least partially) explain why previous literature has so far detected negligible medium-run effects of debt defaults on growth.

Debt restructuring could affect growth in at least two alternative ways. Higher private haircuts (or official restructurings) may have negative effects on growth, as the adverse spillovers of a default are likely to be more severe in hard defaults (i.e., involving higher haircuts/restructurings) as compared to soft defaults (see Trebesch and Zabel 2017). Alternatively, there is the channel of debt relief operating in the opposite direction. Since higher haircuts reduce the level of government's debt more substantially, such debt reduction might allow countries to exit a debt overhang improving in this way growth prospects, as described by Krugman (1988). The overall impact of a debt restructuring on growth is then theoretically ambiguous and remains an empirical question.

Our analysis then contributes to the emerging literature focusing on the characteristics and the economic relevance of debt restructuring. Our specific contribution is to contrast the outcomes on growth between official and private debt restructurings. In fact, despite the role that official creditors have historically played in the resolution of sovereign debt crises (e.g., IMF 2013), little is known on the implications of debt restructurings involving official creditors. In particular, given the different characteristics of these two types of defaulters (most importantly their different ability to access the credit market), we expect that the above mentioned trade-off between the reputational and the "debt-relief effect" of a debt restructuring may act differently for sovereign defaulters on private and official debt.[5] To the best of our knowledge, it is the first time in this literature that the link between GDP growth and debt restructuring is investigated over such a (relatively) long time period, and that the distinction between private and official restructuring is taken into account.

Analyzing 73 default episodes in 117 countries over the period 1975-2013, we find that defaults are correlated with contraction of short-term output growth. Moreover, controlling for the severity of the default, we are able to detect a more lasting and negative link between debt default and growth. For private haircuts, occurrence and magnitude goes into opposite direction and high haircuts seem to imply a negative stigma lowering growth over a longer period. Alternatively, higher amount of official restructuring may have some costs in the short-run, but they do have some positive effects over the long run, as the debt relief effect of high restructurings seems to improve recovery. In this case, no stigma is associated to the size of the restructuring, indeed defaulters seem to benefit from the debt relief effect of high restructurings (as in Arslanalp and Henry, 2005), which somehow soften the negative consequences of an official default.

Using the Synthetic Control Method (Abadieand Gardeazabal 2003, Abadie *et al.* 2010), we

[5]For example, private defaulters would be expected, on average, to be more likely to repay, as compared to official defaulters. As a consequence, when they default, the negative stigma of a higher haircut is likely to outweigh the benefits of a greater "debt-relief effect". This distinction may be related to the debate on "excusable vs. unexcusable" types of defaults (Grossman and Van Huyck 1988).

provide further evidence for the heterogeneous effect of default on commercial and official debt. This method allows us to estimate the level of GDP per capita that defaulting countries would have reached in the absence of the default, by considering a weighed combination of non-defaulters (synthetic). Our findings, although revealing some differences among countries involved in the same type of debt restructuring, point to confirm that private haircuts are associated with output losses that persist over time. Conversely, official defaulters do not show a permanent drop in GDP per capita, and are even able to grow more than their synthetic counterparts at the end of the debt crisis.

The rest of this paper is organized as follows. Section 2 briefly describes the related literature. Section 3 introduces our data and the empirical model. In Section 4 we present our results, while Section 5 contains some robustness checks. Section 6 describes the findings obtained through the Synthetic Control Method (hereafter SCM). The final Section 7 concludes.

2 Related Literature

The (empirical) literature analyzing sovereign defaults has mainly looked at their effects on international trade, international credit market and GDP growth. There is evidence documenting trade cost of defaults in particular for export-oriented industries (Rose 2005, Borensztein and Panizza 2010). Apparently, the access to credit market is influenced by more recent repayments but not by distant repayment history (e.g., Ozler 1993), which is also confirmed in more recent papers documenting a short-lived effect of default on spreads and market access (Borensztein and Panizza 2009, Gelos *et al.* 2011 and Panizza *et al.* 2009).[6] Only more recently, Cruces and Trebesch (2013a) came to different conclusions, which are more in line with the effects of a default according to the theory. More specifically, by including in their analysis a measure of investors' losses (or "haircuts"), they show that restructuring involving higher haircuts are associated with significantly higher subsequent bond yield spreads and longer periods of capital market exclusion (that is credit markets do not seem to "forgive and forget," as in Bulow and Rogoff 1989b). Such different result with respect to the previous literature is remarkable and it is attributed to a more precise measurement of a country's repayment record. Therefore, their analysis does suggest that it is crucial to consider the magnitude of a default and not only its occurrence.

As the direct link between debt default and economic growth is concerned, a strong but *short-lived* negative contemporaneous effect on GDP growth is found by Sturzenegger (2004) and later

[6] Studies that instead provide empirical evidence in support to the "reputation view" include English (1996) and Tomz (2007).

confirmed by Borensztein and Panizza (2009) and De Paoli *et al.* (2006) and (2009).[7] In all these cases, however, the effects specifically associated with a default (on the top of those related to the crisis itself) are quite difficult to identify. Therefore, while there is evidence that sovereign debt defaults are negatively correlated with economic growth, there is no study finding a causal relationship going from default to growth.

Before the seminal contribution of Cruces and Trebesch (2103), the (empirical) literature on sovereign defaults had adopted a dichotomous treatment of sovereign defaults generally finding short lived effect of sovereign defaults. More recently, a new and emerging literature is devoting more attention to the heterogeneity in sovereign debt crises and to the specific analysis of debt restructuring strategies.

From a private sector perspective, Asonuma and Trebesch (2016), Forni *et al.* (2016), Reinhart and Trebesch (2016) and Trebesch and Zabel (2017) have investigated the economic consequences of debt restructurings, focusing in particular on their outcomes in terms of economic growth. Asonuma and Trebesch (2016) consider the asymmetric output costs between preemptive -that can be implemented prior to a payment default- and post-default restructurings. They find that preemptive restructurings are more frequent and quicker to negotiate, being associated to both lower haircuts and output losses.[8]

Reinhart and Trebesch (2016) focus on the effects of debt restructuirng by comparing episodes during the 1930s (official restructuring for European nations) and the 1990s (private restructuring for Latin American countries through the Brady Plan). Using a difference-in-difference approach, they find that softer forms of debt relief, (e.g. obtained through maturity extensions or interest rate reductions).are not generally followed by higher economic growth, while only debt write-offs are able to improve the economic situation of debtor countries. Forni *et al.* (2016) study the impact of Paris Club agreements distinguishing between "bad" and "good" debt restructurings in terms of their impact for growth. They find that restructurings are, in general, bad for growth unless they allow a country to exit a default period (if they are final). In particular, debt relief is found to have the largest growth impact for countries that exit default with relatively low debt

[7] Using higher frequency data, Levy Yeyati and Panizza (2011) actually show that output contraction precedes default and that default episodes seem actually already to mark the beginning of the economic recovery. Furceri and Zdzienicka (2012) and Kuvshinov, and Zimmermann (2016) find, instead, long-lasting output losses after debt crises, while Tomz and Wright (2007) find a negative but surprisingly weak relationship between economic output and default on loans from private foreign creditors.

[8] Similarly, Asonuma *et al.* (2016) have considered the impact of preemptive vs. post-default restructuring on the dynamics of imports and exports. They document that countries with post-default restructurings experience, on average, a more severe and protracted decline in imports and a larger fall in exports. They find additional evidence of a smaller and less prolonged decline in investment and real exchange rate in preemptive cases than in countries with post-default restructurings.

levels. Trebesch and Zabel (2017), by distinguishing between hard defaults (more confrontational) and soft defaults (adopting a consensual crisis resolutions), show that hard defaults are associated with a much steeper drop in output as compared to soft defaults. Surprisingly, however, after five years, neither high haircuts nor debtor coerciveness are associated with lower growth.

Cheng *et al.* (2016b) have instead focused on the macroeconomic impact of sovereign debt restructurings with official-sector creditors. Interestingly, they did actually build a new dataset on official debt restructurings conducted through the Paris Club, which allows them to include information on NPV losses for creditors and on the extent of provision of nominal debt relief in official deals (see Cheng *et al.* 2016a). Their results are in line with those of Reinhart and Trebesch (2016), more specifically they show that Paris Club treatments can have a significant impact on economic growth but only in the case of debt treatment involving nominal haircuts. Moreover, their results show that countries not receiving nominal debt relief turn out to be more likely to pursue a prudent fiscal policy after the restructuring than those receiving a nominal haircut. Hence, from a policy perspective, their results provide additional evidence to support the idea that the official sector faces a trade-off between the objectives of stimulating economic growth and of promoting fiscal prudence.

With respect to these empirical models, even though some papers have considered the economic consequences of restructuring involving the private sector and some others have empirically investigated the outcomes of official sector restructurings, we are the first to assess and compare the outcomes of official and private external debt restructurings altogether. Moreover, we contribute to this literature by applying the SCM to the analysis of sovereign debt default.[9] Jorra (2011) has used the SCM to analyse the cost of sovereign defaults without distinguishing the different effect of a private vs. an official default, which lies instead at the heart of our paper.

Finally, our results would also contribute to the recent policy debate on debt restructurings (e.g., Brookings-CIEPR 2013; IMF 2013, 2015, 2016). In particular, if defaulting on private or official debt is not found to be the same, this circumstance could be particularly instructive, for example, in the case of Greece, where private debt has been replaced by official debt.

[9] This method has been applied firstly by Abadie and Gardeazabal (2003) to study the economic cost of terrorism in the Basque countries. Other studies that have used the SCM include those that analyse the effect of liberalisations (Campos and Kinoshita 2010; Billmeier and Nannicini 2011), natural resource discoveries (Smith, 2015), and civil war (Costalli *et al.* 2017).

3 Data and empirical model

In this section, we analyze the effects of a debt default on economic growth by controlling for the severity of the default episode. For this reason we include both a measure of private creditors' losses (the so called private haircuts) and a measure of official restructurings (Paris Club debt restructurings) as proxies for the magnitude of both private and official defaults.

3.1 Default coding and sample composition

Our analysis spans the years between 1975 and 2013 and includes 117 developing and emerging market economies.[10] We have selected this sample as follows. First, we excluded from the sample small countries with a population of less than 1 million (as measured at the end of the sample period in 2013) and all advanced economies, in order to make the sample as homogeneous as possible. Moreover, we dropped countries whose debt restructurings took place in the context of wars and state dissolution, such as Iraq, and successor states of the Socialist Republic of Yugoslavia (i.e., Kosovo, Macedonia, Bosnia and Herzegovina and Serbia). The resulting set of 117 countries includes 73 defaulting countries, which experienced at least one debt crisis during the sample period as well as 44 non-defaulters. Among defaulters, 51 countries had both private haircuts and official debt restructurings, 18 countries had only official debt restructurings (through the Paris Club) while only 4 countries had only private haircuts. Table A1 in Appendix A shows all countries and years, including a list of debt crisis episodes studied here.

Table 1a shows summary statistics for different subsamples in the full sample of 150 restructurings. We find that the average private haircut between 1975 and 2013 is about 39 percent (simple mean). Looking at the three different subperiods, we detect a sizeable increase in the haircut size over time. Average haircut is about 39 percentage points higher during the last subperiod (2002-2013) as compared to haircuts implemented during the initial period (1975-1988) but only about 11 percentage points higher with respect to the intermediate one (1989-2001). One reason is that all the deals up to the beginning of the Brady plan (1989-1994) mainly implied maturity extensions without an actual debt reduction.[11] Figure 1 shows the frequency distribution of haircuts by percentage size.

[10] More specifically, following the 2013 World Bank Country classification, we included low, middle income and high income (non OECD) countries.

[11] In the late 1980s (1989–1994), Brady deals addressed commercial bank lending to sovereign debtors (mostly middle-income countries) involving a combination of an IMF agreement and debt-service reduction and rescheduling from commercial banks. Brady deals, which eventually put an end to the 1980s debt crisis for 17 debtor countries, involved an average haircut of 45 percent (Cruces and Trebesch 2013a).

We relied on the original dataset by Cruces and Trebesch (2013b) for the data on restructurings with foreign banks and bondholders (commercial creditors).[12] More specifically, the database of investor losses built by Cruces and Trebesch (2013b) is based on the methodology proposed by Sturzenegger and Zettelmeyer (2008) and consider haircuts in "final" debt restructurings only. Final deals are those that enable countries to cure the default and exit a crisis spell without a renewed default in the following 4 years. This focus on final restructurings is in the spirit of related work such as Cline (1995), Arslanalp and Henry (2005) and Reinhart and Trebesch (2015) who also study the outcome of final deals and pay less attention to intermediate restructurings like most debt operations of the 1980s.[13]

Cruces and Trebesch then define haircuts as:

$$H_{sz} = 1 - \frac{\text{Present value of New Debt } (r_t^i)}{\text{Present value of Old Debt } (r_t^i)}$$

where r_t^i is the discount factor employed to calculate the present value of old and new debt instruments.[14]

Finally, for official debt restructurings, we relied on the original dataset built by Das *et al.* (2011) which contains a list of sovereign debt restructurings with the Paris Club (between 1950 and 2010).[15] Paris Club creditors may provide (official) debt treatments to debtor countries in the form of rescheduling (i.e., debt relief by postponement) or, in the case of concessional rescheduling, reduction in debt service obligations during a defined period (flow treatment) or as of a set date (stock treatment).

As low-income countries are concerned, Paris Club creditors agreed to provide them concessional reschedulings (conditional on the adoption of an IMF program) under the Toronto (1988), Trinidad (1990), Naples terms (1994). In 1996, the World Bank and the IMF have implemented the Heavily Indebted Poor Countries (or HIPC) Debt Initiative, which was first strengthened in 1999, and more recently in 2005, when, under the Multilateral Debt Relief Initiative (MDRI) multilateral institutions were encouraged to increase their specific contribution to debt reduction.

[12] In August 2014, the authors provided an update of their data covering the year 2013 as well. Their data provides a list of 187 distressed sovereign debt restructurings with external private creditors (banks and bondholders) occurring between 1970 and 2013.

[13] Examples of final restructurings include the Brady debt exchanges of the 1990s as well as all main recent emerging market bond exchanges such as Russia 2000 or Argentina 2005.

[14] While prior literature used a constant average rate for each restructuring, Sturzenegger and Zettelmeyer set-up a restructuring-specific discount rate, r_t^i, dataset (not country-specific), which is computed by the specific country situation and by the level of credit risk premium at that time.

[15] This dataset was last updated in November 2012.

Table 1a also shows summary statistics for different subsamples in the full sample of 355 restructurings. We find that the average value over the years 1975-2013 is about 11 percent, thus resulting much more frequent but much lower that the average private haircut. Looking at the three different subperiods, we find a sizeable increase in the size of official restructurings over time. Average size is about 25 percentage points higher during the last subperiod (2002-2013), as compared to restructurings implemented during the initial period (1975-1988), and 21 percentage points higher with respect to the intermediate period (1989-2001).[16] Figure 2 shows the frequency distribution of official restructuring by percentage size.

Table 2a also shows summary statistics for different subsamples according to a country's income. As the number of countries is concerned, we do not find much difference between countries having private haircuts with respect to those with official restructurings, at least in the case of high and middle income countries. Specifically, the number of high income countries involved in a default with private haircut is very similar to those having an official debt restructuring (4 and 3, respectively). The number of middle income countries involved in a default with a private haircut is also about the same as that of countries experiencing an official restructuring (35 vs. 38, respectively).[17] Conversely, official restructurings are much more common among low income countries than private haircuts (16 vs. 28 countries, respectively). Finally, we find that, for low income countries, the average size of both private haircuts and official restructuring is always the highest with respect to both high and middle income countries.

TABLE 1a & 1b HERE

FIGURE 1 & FIGURE 2 HERE

3.2 Method

In this subsection, we analyze the relationship between private and official restructuring and annual per capita GDP growth over the 1975-2013 period. We obtain an unbalanced panel which comprises a maximum of 117 developing countries, depending on the control variables we include. We use a fixed-effects GLS estimator in order to correct for heteroskedasticity across countries and obtain efficient estimates.[18] The results are qualitatively unchanged when we correct for both

[16] The average size is only 3.5 percentage points higher during the intermediate subperiod with respect to the initial one.

[17] Such number is, however, almost twice as much the number of low income countries experiencing a private haircut.

[18] A groupwise likelihood ratio heteroskedasticity test, performed on the residuals of the baseline model estimated by OLS, led to a rejection of the null hypothesis of homoskedasticity across groups (countries) for all regressions.

serial correlation and heteroskedasticity, we estimate the model using robust OLS or OLS with standard errors clustered at the country level.

Specifically we test:

$$y_{it} = \alpha + \beta X_{it} + \gamma_j R_{it+j} + \delta_j D_{it+j} + \eta_i + \tau_t + u_{it}, \qquad j = -1, ..., -10 \tag{1}$$

where y_{it} represents per capita growth in country i at period t, R_{it+j} is the amount restructured (*private or official*) associated to the default of the year t in country i, D_{it+j} is an indicator variable equal to one when country i, in year t, has finalized its last restructuring, and X is a vector containing our control variables.

We then generated eleven variables denoting the current default and up to ten lags of each default episode; and eleven more variables denoting the haircut (and the official restructuring) at t and up to ten years following the sovereign debt restructuring. Finally, η_i and τ_t denote country and time dummies, respectively, which allow us to control for both countries unobservable and time invariant variation and common trends.[19]

The advantage of estimating equation (1) is that it allows us to disentangle the growth increase associated with the default *per se* from the growth increase associated with the size of the haircut, i.e., "occurrence" versus "magnitude."

Our choice of control variables follows the literature on the impact of default on output growth, in particular we adopt the same specification as in Levy Yeyati and Panizza (2011). More specifically, we control for investments as a percentage of GDP, a measure of openness (exports and imports over GDP), government expenditure, annual rate of growth of population and total population (both in log), rate of variation of annual terms of trade, the percentage of the population that completed secondary education, the Freedom House index of civil liberties and a dummy for a banking crises (Laeven and Valencia 2013).

Table A2 in Appendix A provides a detailed description of each control variable and its source while table A3 shows some summary statistics.

[19] In this way we can also accounts for global factors that might have influenced the simultaneous dating choice of debt restructuring events (e.g., Baker or Brady plan in the two periods, 1985-88, and, 1989-94, respectively).

4 Empirical results

4.1 Private haircuts

The results of the model of equation (1) are presented in table 2. In columns 1-3, we report only the coefficients of the private haircut dummy, the private haircut and of both variables together, in the year of the restructuring and one year after the restructuring episode without any control variables.[20] Column 4 reports the same specification of column 3 including control variables. In columns 5-8, we progressively add the coefficients of both the haircut dummies and size (from three to up to ten years after the default) to the specification of column 4. While all these results are reported for comparison, we largely base the discussion on the fully specified model of column 8.[21]

As can be seen, most of the control variables have the expected sign. Growth rates significantly increases with higher investment and civil liberties, while it decreases with higher population growth and its level (in log), higher public expenditure and after the occurrence of a banking crisis. Quite surprisingly it also strongly decreases with the level of secondary education. The coefficients of terms of trade and openness are not significant.[22]

As our variables of interests are concerned, in column 8, we find that the relationship between growth and the private haircut dummy has generally the opposite sign with respect to that between growth and the haircut size. If we look at the short-term link between growth and private haircut, one year after the default, the coefficient of the haircut dummy is positive and significant at the five-percent level (growth increases by almost 0.34 percent), while an increase of one standard deviation in the size of the haircut is associated with a decrease in growth by about 0.25 percent. Current levels of both the haircut dummy and its size seem not to be significantly related to growth.

Over a longer period, correlation between the haircut dummy and growth remains positive (but not always significant) up to the ninth year after the default episode while, over the same period, the relationship between private haircut and growth is always negative (but seldom significant). More specifically, the coefficient of the haircut dummy is positive and significant, at the one-

[20] We should be aware that the results of columns 1 and 2 do not allow differentiating between the growth variation associated with a restructuring and that associated with the size of the haircut. In particular equation 2 is problematic as it only includes the interacted variable (R_{it+j}) but not the constitutive term (D_{it+j}) (Cruces and Trebesch 2013a).

[21] The best way to interpret the findings of table 2 is to consider the expected variation in growth as conditional on the haircut size, that is $\gamma_j R_{it-j} + \delta_j$.

[22] These results are indeed quite similar to those obtained by Levy Yeyati and Panizza (2011).

percent level, nine years after the default (growth increases by about 0.42 percent). On the other hand, an increase of one standard deviation in the size of the haircut nine is associated with a decrease in growth by about 0.3 percent. Clearly, this is an economically relevant magnitude. In figure 3, we summarize the results with two graphs that track the evolution over time of the size, sign and significance of the coefficients of the private haircut.

To sum up, while the occurrence of a private haircut is positively associated to economic growth, its actual size, which proxies the magnitude of the default episode, seems to represent a negative stigma for the countries involved. Private haircuts are associated to some negative (reputational) costs which lower growth over a long period somehow delaying recovery[23].

Our results are indeed similar to those of Cruces and Trebesch (2013a). As in their analysis, controlling for both the occurrence and the magnitude of default is crucial to detect a more lasting (and negative) link between debt default and growth.[24] What we find is instead different from the results of Trebesch and Zabel (2017), who do not detect any evidence of a reduction in GDP growth in the aftermath of a default (in particular after five year from the default episodes). Our results also differ from Levy Yeyati and Panizza (2011), who show that output contractions actually precede default and that default episodes seem already to mark the beginning of an economic recovery.

We should emphasize, however, that the results in this section should be taken cautiously. In particular, they do not imply that imposing high haircuts have a long-lasting effects on growth. As we explained, identification is difficult and there are competing channels, which are hard to disentangle in the data at hand.

TABLE 2 HERE

FIGURES 3 HERE

4.2 Official Restructurings

The results for official restructurings are presented in table 3. Columns 1-3 of table 3 report only the coefficients of the official restructuring dummy, the official restructuring size and of both variables together in the year of the default and one year after the default episode, respectively, without any control variables. Column 4 reports the same specification of column 3 including

[23] These results hold even when we estimate an equation that jointly considers (allowing for different coefficients) the two types of default to be different from tranquil periods (see Table A4 in Appendix A).

[24] In their paper the dependent variable were bond yield spreads and periods of capital market exclusion.

control variables. In columns 5- 8, we progressively add, to the specification of column 4, the coefficients of both the official restructuring dummy and size from up to three to up to ten years after the default. As above, we largely base our discussion on the fully specified model of column 8.

Most of our control variables have the expected impact on growth as above. As our variables of interest are concerned, looking at column 8 of table 3, we find that the evidence of a correlation between growth and the simple event of an official restructuring becomes actually much weaker than in the case of a private haircut. The only coefficient which is significant, at ten-percent level, and with a positive sign, is that of an official restructuring occurring three years after the default, which is correlated with a growth increase of about 0.7 percent. As the actual size of the restructuring is concerned, the magnitude of an official restructuring, at time t, is negatively correlated with growth at ten-percent level.[25]

Over a longer period, i.e., since four up to ten years after the restructuring episode, we find evidence of a positive correlation between growth and the amount of the official debt restructured. In particular, both seven and eight years after the default an increase of one standard deviation in the amount of official restructuring increases growth by about 0.27 percent and 0.28 percent, respectively.[26] Figure 4 shows more clearly the evolution over time of the size, sign and significance of the coefficients of official restructuring. These results are in line with those of Cheng *et al.* (2016b), who find that Paris Club treatments can have a significant impact on economic growth in the case of a debt treatment associated to a nominal haircut.[27]

TABLE 3 HERE

FIGURES 4 HERE

In summary, the trade-off concerning the amount of a sovereign debt restructuring is associated to opposite outcomes for private and official defaulters. Higher amount of official restructuring may have some (social and political costs) in the short-run, but eventually they imply some positive effects over the long term, as the debt relief effect of high restructurings seems to improves recovery by freeing up new resources. As before, controlling for the severity of the default through the amount of official restructurings, allows us to detect a more lasting (and negative) link between

[25] In particular an increase of one standard deviation in the amount of official restructuring reduces growth by about 0.33 percent.

[26] These results (available on request) are even stronger when I exclude HIPC countries from the sample.

[27] Unfortunately our data do not allow us to quantify the size of the nominal haircut in official deals, hence we are only able to detect an average effect.

debt default and growth, which is however mitigated by the size of the restructuring. No stigma is now associated to the size of the restructuring, indeed official defaulters seem to benefit from the debt relief effect of high restructurings (as in Arslanalp and Henry, 2005), which possibly mitigate the negative consequences of an official default.

5 Robustness checks

This section aims to test the robustness of our main model of equation (1). More specifically, we try to control for the presence of (i) autocorrelated standard errors (ii) omitted variable bias, as common shocks could affect both output and haircuts, and (iii) reverse causality, since changes in output can potentially explain the type of default. All these results are shown in table 4.

Autocorrelated standard errors. We address concerns of serially correlated errors by both including lagged growth in our specification and by estimating the model correcting for AR(1) autocorrelation within panels and cross-sectional heteroskedasticity across countries. In a dynamic panel with country fixed effects the lagged dependent variable is correlated with the country-specific component of the error term and, thus, the OLS fixed-effects estimator produces biased estimates. However, Nickell (1981) shows that, in the AR(1) case, the bias declines as the time series dimension of the panel, T, increases. Judson and Owen (1999) testing the performance of the fixed-effects estimator on panels with typical macroeconomic dimensions find that the fixed-effects estimator performs well when $T = 30$. As in our sample $T = 39$, we expect any bias introduced by the inclusion of the lagged dependent variable to be very small. We then include growth at time $(t-1)$, in both columns one and four of table 4 and, as can be seen, both sign and significance of the restructuring variables remain overall the same. The same holds when we correct for AR(1) autocorrelation within panels and cross-sectional heteroskedasticity across countries in both columns two and five of table 4.

Additional controls. The results could still be biased due to the omission of time-varying country-specific variables correlated with both growth and the government payment behavior and growth, despite controlling for time and country fixed effects and standard macro controls. More specifically, following Trebesch and Zabel (2016), we include political risk (as debtor payment attitude may be affected by political crises) and control for the occurrence of currency crises (as well as the occurrence of banking crises).[28] Thus, we add the ICRG political risk indicator as well as a dummy for changes in the executive (taken from the Database of Political Institutions,

[28] Both indicators are taken from Laeven and Valencia (2013).

DPI). Moreover, we also include inflation and the debt to GDP ratio, both taken form the World Development Indicators (WDI).[29]

In both columns three and six of table 4 we have then included additional controls, which, however, are available only for a reduced sample. As the number of observations drops dramatically (by almost half) these results are hardly comparable as changes in the coefficients of the interest variables might be due to changes in sample size rather than to their different effect. Nevertheless, the results are overall similar to those of previous specifications.

Reverse causality. Reverse causality can indeed be one of the main objection to comment our result. Therefore, we test the influence of lagged growth on our explanatory variables. More specifically, in columns 1-3 of table 5 we test the influence of lagged growth on the current level of private haircut, while in columns 4-6 we test the influence of lagged growth on the level of official restructuring. In both specifications we do not find any evidence that lagged growth is a good predictor for either private haircut or official restructuring.

Taken together, we find no evidence for reverse causality and no evidence for a confounder driving our main results. Nevertheless, we should interpret our result with caution as we cannot detect any causal effect but only strong conditional correlations. In the next section we present some evidence of causality between restructuring and growth adopting an alternative specification method.

TABLE 4 & 5 HERE

6 Synthetic Control Method

In this section we investigate the heterogeneity of the economic impact of debt restructurings by constructing a counterfactual of the path of the GDP per capita for each country that had only either private haircuts or official debt restructurings. The missing counterfactual outcome is estimated with the SCM developed by Abadie and Gardeazabal (2003) and later improved by Abadie *et al.* (2010).

Contrary to other econometric approaches used to solve the "fundamental problem of causal inference," the SCM provides for the identification of heterogeneous responses of macro-policies

[29] More specifically, this specification allows us to control for several factors that may be associated to the occurrence of a sovereign debt crisis, such as proxies for countries' ability and willingness to repay (see Manasse and Roubini 2009). In particular, solvency crises are characterized by high level of external debt to GDP, together with monetary or fiscal imbalances, while liquidity crises are identified by moderate debt levels but greater political uncertainty, which, at least to some extent, can capture a country's willingness to pay.

or events (treatments) that affect macro-units in small-sample comparative studies.[30] The SCM compares the outcome of the case of interest (treated country) with that of the control unit (synthetic).

In our analysis, we evaluate the GDP per capita of defaulting countries with respect to the GDP per capita of a sample of non-defaulters. One of the value added features of this method is that it reduces discretion in the choice of the comparison units. Indeed, the synthetic is constituted by a weighted combination of all potential comparison units that best reproduces the characteristics of the treated country. More precisely, the SCM is a data-driven procedure that assigns to each control unit a weight in order to minimise the pre-treatment differences between the treated country and its synthetic counterpart, taking into account a set of pre-intervention variables that are relevant to predict the outcome variable (predictors). The ability to match the pre-event outcome of the treated country with that of the synthetic control is measured by the root of the mean squared prediction error (hereafter RMSPE): the lower the RMSPE, the more the synthetic resembles the characteristics of the treated country.

As an additional benefit, the SCM deals with endogeneity from omitted variable bias by accounting for the presence of unobservable time-varying confounders. When there is a large number of pre-event periods, only those units that are similar in both observed and unobserved characteristics would produce similar paths for the outcome under analysis. Thus, if the path of the outcome variable of the treated country and the synthetic control are alike over a sufficiently long pre-treatment period, the difference (gap) between the GDP per capita of a defaulting country and the synthetic in the aftermath is an unbiased estimation of the effect of the default.

Finally, the SCM improves on other statistical methods for impact evaluation by allowing us to assess the evolution of the effect over time for each country in the sample, rather than considering only average effects. In the following subsections, we describe the selected case studies and discuss our findings, while a formal presentation of the method is provided in Appendix B.

6.1 Sample and data

We consider the year of default as the starting point of the treatment period. This timing assumption enables us to observe what would have happened in the absence of the default both during the debt crisis and in its aftermath. We use GDP per capita (in constant 2010 US$) as

[30] This problem arises when, for a given unit exposed to a programme or treatment, the alternative state of affairs in the absence of the intervention is unobservable, and therefore the effect of treatment is unidentifiable (Holland 1986).

our outcome variable.[31] For each treated country, the pool of potential control units encompasses no-defaulters for which data are available.[32]

Our sample includes only countries that had either a private haircut or a restructuring of official debt. As described in Section 3.1, among defaulters, 18 countries had only official debt restructurings (through the Paris Club) while 4 countries had only private haircuts.[33] Among private defaulters, we have to exclude Venezuela since, as an oil exporter country, it proves difficult to find a credible comparison units that reproduces the volatile path of its GDP per capita. We include Argentina among private defaulters given the relevance of its default episode in 2001, which involved only private creditors. Although Argentina has also experienced in the eighties (1982-93) a default involving both private and public creditors, the interval between the two episodes is long enough to prevent us from capturing the effect of the first episode.

As official restructurings are concerned, we should exclude seven countries (out of 18) for different reasons. We exclude Angola and Cambodia due to data availability constraints.[34] Furthermore, since the credibility of the SCM hinges on its ability to match the pre-treatment outcome of the treated and the synthetic unit, we do not present results for Burundi, whose RMSPE was too high to guarantee a credible estimation of treatment effect. Moreover, the SCM is not suited to deal with additional shocks that affect the outcome in the period after the event under analysis. Thus, we cannot consider Central African Republic, Guinea-Bissau and Rwanda, whose economies were harmed by internal conflicts, and Haiti, which was stricken by a terrible earthquake just at the end of the debt crisis. Furthermore, since the credibility of the SCM hinges on its ability to match the pre-treatment outcome of the treated and the synthetic unit, we do not present results for those countries for which we fail to obtain a good fit for a period of ten years before the default.

Therefore, we overall discuss four and eleven cases of private and official restructurings, respectively. We use two sets of predictors. The first one encompasses the same variables used in the regression analysis (investment, openness, government consumption, population growth and total population, secondary education, terms of trade, civil liberties, and banking crisis). The second

[31] Macroeconomic applications of the SCM (e.g., Abadie and Gardeazabal 2003) commonly refer to GDP per capita instead of GDP growth.

[32] The results are unchanged considering different pools of control units. In particular, we consider countries that had official restructurings as additional comparison units for each private restructuring episode, and countries that had private restructurings as additional controls for each official restructuring episode. Results are available upon request.

[33] Table A1a, in Appendix A, shows the list of defaulting countries, the dates of default and the type of resctructuring.

[34] As already highlighted, the SCM requires a sufficiently long pre-treatment period with no missing values in the outcome variable for the entire period of analysis. GDP data for Angola and Cambodia are available from 1986 (three years before the default) and 1993 (two years before the default), respectively.

one includes only those variables that are typically used in growth regressions, such as the level of investments, openness, population growth and total population, and secondary education. We add to both of these specifications the average GDP per capita calculated in the 10 years preceding the default.[35] Although the two sets of predictors lead to similar results, for each case study, we take into account the set that guarantees a better fit in the pre-treatment period, in order to increase the confidence on the post-treatment projection of the synthetic outcome.[36] The predictors are averaged over a 10-year pre-event period, and the path of the outcome variable is observed until 2014.

6.2 Private haircuts

Table 6 reports the weights assigned to each country that constitutes the synthetic, and the predictor balance obtained through the optimisation procedure for sovereign defaulters on private debt. While the last rows in the table ensure transparency and reduce concerns about interpolation biases (Abadie *et al.* 2010), a comparison of the predictors in the pre-treatment period provides an appraisal of the quality of the synthetic control.[37] As can be seen, the synthetic control groups are able to reproduce the pre-treatment characteristics of the treated countries. This is especially true considering the average GDP per capita in the period before the default, for which the difference between the treated country and its counterpart ranges from -0.01 percent (in the case of Argentina) to 0.29 percent (in the case of Pakistan). Instead, the degree of similarity is smaller for Uruguay and Argentina when judged by openness and population growth and by openness and terms of trade, respectively. However, these variables have a relative low predictive power for the outcome variable prior to the debt restructurings.[38] Overall, we can argue that the control units constructed by the SCM are not statistically different from their respective treated countries.

The ability of the SCM to produce a reliable control unit can be also assessed from Figure 5, which displays the path of GDP per capita in each country that had private haircuts (solid lines) and its synthetic counterpart (dashed lines). Each graphs shows that the synthetic unit tracks well the trajectory of GDP per capita in the country under analysis when we look at the years before the

[35] Our findings are robust to the exclusion of pre-treatment average of GDP per capita. However, the inclusion of these data ensures a better pre-treatment fit.

[36] The SCM requires at least one observation for each of the predictors in the pre-treatment period. To not further restrict our sample, if data are not available for a treated country, we exclude the variable from the set of predictors. Tables 6 and 8 show, for each country, which variables are actually used to conduct the optimization procedure.

[37] The list of weights assigned to each potential control makes it explicit that countries characterized by geographical proximity or similar risk of default contribute relatively more to the counterfactual outcome.

[38] As we explain in Appendix B, the SCM assigns to each predictor a weight v that reflects the predictive power of the variables. The values obtained from the data-driven procedure are available upon request.

default (indicated by the first vertical line). Combined with the high degree of predictor balance, this suggests that the synthetic units would continue to track the outcome of the defaulting countries if the debt crisis had not happened. That is, the synthetic units provide a rational estimate of the level of GDP per capita that these countries would have reached in the absence of the default.

TABLE 6 HERE

FIGURES 5 HERE

Although figure 5 shows that private debt restructurings affect defaulting countries differently, each of the four cases display a negative gap between the actual and the synthetic GDP per capita after the debt crisis, which persists (or even increases) until the final deal (indicated by the second vertical line).[39] Some striking differences, however, are detectable afterwards. In particular, while the output losses increase in the case of Paraguay and South Africa, Uruguay and Argentina were able to catch up with their synthetic units, even though their GDP per capita remains below the synthetic outcome for at least ten years from the default. Interestingly, unlike Paraguay and South Africa, these countries benefitted from a haircut associated with a face value reduction, which is consistent with both Reinhart and Trebesch (2016) and Forni *et al.* (2016) who find that only debt write-offs (but not softer forms of debt relief) are able to improve the economic situation of debtor countries.

Table 7 quantifies the economic impact of private restructurings in the ten years following the default.[40] As can be seen, the negative gap between the actual and the synthetic GDP per capita consistently increases in the case of Paraguay and South Africa, while it starts to decrease five years after the Argentinean default. Finally, the negative effect is somehow constant in Uruguay during the period considered. On average, the annual GDP gap induced by the default ranges between -10.17 percent (Paraguay) and -16.66 percent (South Africa).[41]

Summing up, the SCM confirms that private restructurings are associated to a negative reputa-

[39] Notice that the duration of the debt crisis differs quite substantially, ranging from two years in the case of South Africa to eight years for Uruguay.

[40] The effect is calculated as the percentage difference between the observed GDP per capita and its synthetic counterfactual.

[41] Estimates over a larger time span provide even a stronger difference between defaulters and their synthetic units. Table B1 in Appendix B shows that the average negative effect in Paraguay and South Africa is far higher considering the ten years following the last deal, reaching the values of -22.20 percent and -21.36 percent, respectively. During the same time span, the output of Argentina is on average 5.12 percent lower with respect to the synthetic. Uruguay was able to overcome the output loss completely seven years after the end of the debt crisis (i.e., fifteen years after the initial deal), even if its GDP per capita dropped again in the following year.

tional cost which prevents the country from overcoming its output losses in the medium-long run. It also suggests, however, that a face value reduction, by freeing new resources, may mitigate this negative effect, thereby triggering the recovery.

TABLE 7 HERE

6.3 Official Restructurings

Table 8 reports the weights assigned to each country that constitutes the synthetic, and the predictor balance obtained through the optimisation procedure for sovereign defaulters on official debt. As before, the comparison of the variables used to construct the control units proves that the SCM provides a good estimate of the counterfactual outcome for defaulters on official debt. In this case, the difference in the average GDP per capita in the period before the default ranges between -0.89 percent (Chad) and 0.39 percent (Burkina Faso). The synthetic counterparts of Burkina Faso, Chad and Mali show considerable higher values for secondary education, but this not invalidate our analysis, given the low prediction power attributed to this specific variable. Thus, we are again confident that the SCM reduces the possible bias arising from control units that do not provide a satisfying fit in terms of pre-treatment variables.

Figure 6 provides a graphical confirmation of the ability of the synthetic units to match the pre-treatment outcome of the defaulting countries. For most of the cases, the synthetic GDP per capita very closely tracks the trajectory of this variable in the treated country, and the actual and the synthetic outcome start to diverge only at the end of the pre-treatment period.[42]

TABLE 8 HERE

FIGURES 6 HERE

Similalrly to private restructurings, defaults on official debt have heterogeneous effects across countries. However, none of the defaulters have a reduction in the output that lasts after the end of the debt crisis, and, for some of them, the debt restructurings seem to have a positive effect on growth.[43] More precisely, Benin and Chad were able to recover the output losses, achieving a GDP per capita higher than their counterparts at the end of the debt crisis (indicated by the second

[42] Even when the SCM does not provide a perfect fit for the outcome variable prior to the default, the divergence is negligible, especially considering the years right before the event, and the two paths of GDP per capita start to diverge significantly only after the beginning of the crisis.

[43] The length of the default period varies from one year (El Salvador and Sri Lanka) to fourteen years (Benin).

vertical line). Indonesia and Sri Lanka show a negative outcome gap after the default but they catch up with their synthetic units within six years after the resolution of the crisis. Mali displays both negative and positive values of the outcome gap, but its GDP per capita starts to increase consistently after the last debt restructuring. In the case of Ghana, there is no evidence of an effect of the default, whereas this event seems to have a positive impact on growth for El Salvador and Georgia. Finally, the GPD per capita of Burkina Faso, Egypt and Kyrgyz Republic is constantly below its counterfactual in the post-treatment period, but it did not drop significantly after the default. In particular, while the output path is somewhat flat in the case of Egypt, the GDP of Burkina Faso and Kyrgyz Republic smoothly increases.

Table 9 sets out the economic impact of official debt restructurings in the ten years following the initial deal.[44] During this time window, Chad, Egypt, Indonesia, Kyrgyz Republic, and Mali all show an increasing negative gap between the actual and the synthetic GDP per capita. Such negative effect, however, decreases substantially from the last debt restructuring in the case of Chad, Indonesia, and Mali.[45] On the contrary, El Salvador and Georgia show an increasing positive gap. On average, the annual outcome gap induced by the default ranges between -28.13 percent (Kyrgyz Republic) and +25.93 percent (El Salvador), with a higher degree of variation with respect to the cases of private haircuts. We should emphasize, however, that the negative gap observed between defaulters and their synthetic units are mainly due to the better economic performance of the latter rather than to a drop in the outcome of official defaulters. Hence, the overall negative average effect of official restructurings, ten years after the first deal, is far smaller than the one observed in the case of private haircuts, which is consistent with the findings presented in Section 4.

In summary, while the SCM shows the heterogeneity of the economic impact of official debt restructurings, it also confirms that official defaulters do not experience a permanent drop in their GDP per capita, which may even increase some years after the restructuring. Hence, we do not observe evidence of a stigma associated to a debt restructuring when official creditors are involved.

TABLE 9 HERE

[44] The effect is calculated as the percentage difference between the observed GDP per capita and its synthetic counterfactual.

[45] As shown in Table B2 in Appendix B, the average effects calculated over ten years after the end of the crisis are -1.98 percent, -3.67 percent, and +3.02 percent, respectively.

7 Conclusions

This paper studies the relationship between debt default and GDP growth, over a period of ten years, by taking into account the depth of a debt restructuring and by distinguishing between commercial and official sovereign debt restructuring. More specifically, the amount of restructured debt is used as a proxy for the severity of the default episode. Analyzing 73 default episodes in 117 countries over the period 1975-2013, consistently with previous results in this literature, we find that defaults are correlated with contraction of short-term output growth.

Moreover, controlling for the severity of the default, we find that while the simple occurrence of a (commercial debt) default is generally associated with an increase in economic growth, the amount which is actually restructured (the private haircut) carries a negative stigma up to nine years after the default, somehow hampering recovery. For official debt restructuring, the simple event of a restructuring seems not to be related to growth, while the magnitude of the event (the amount of official restructurings) is indeed associated to an improvement in the growth prospect since seven years after the default.

More generally, by controlling for both the occurrence and the magnitude of sovereign debt defaults, we are able to detect a more lasting and negative link between debt default and growth. For private haircuts, occurrence and magnitude goes into opposite direction and high haircuts seem to imply a negative stigma lowering growth over a longer period. Alternatively, higher amount of official restructuring may have some costs in the short-run, but they do have some positive effects over the long run, as the debt relief effect of high restructurings seems to improve recovery. In this case, no stigma is associated to the size of the restructuring, indeed defaulters seem to benefit from the debt relief effect of high restructurings (as in Arslanalp and Henry, 2005), which somehow soften the negative consequences of an official default.

Therefore, while more severe private haircuts seem more costly for private defaulters, the opposite holds for official restructuring. The trade-off concerning the amount of a sovereign debt restructuring provides opposite outcomes for private and official defaulters. Taken together, the results point to confirm that official and private defaults may have different effects and should then be treated differently

Using the SCM, we adopt a case study analysis to investigate this heterogeneous response of GDP per capita to private and official restructurings. Consistently with the results obtained from the regression analysis, we find that countries involved in only private haircuts are not able to recover their output losses in the medium-long run, whereas official restructurings may also have

a positive impact on growth. Although a face value reduction seem to mitigate the negative effect of a private haircut, in the case of an official restructuring no negative stigma is observed.

The analysis is of course limited in several respects. We do not claim to draw causal inferences from the empirical analysis, given the nature of the data available. We do emphasize that the direction of causality in the relationship between sovereign defaults and growth raises some questions and thus a robust association between debt defaults and low growth can only be indicative of a correlation between the two variables. We could observe punishment effects, reputational effects or none of the two. Lower growth might not be the consequence of a default per se but of other factors affecting debt sustainability as well. Thus, both the determinants and the effects of a debt restructuring should be more carefully investigated. Nevertheless, these concerns are, at least partially, overcome by the results obtained using the SCM, which specifically deals with the endogeneity due an omitted variables bias by accounting for the presence of unobservable time-varying confounders.

References

[1] Abadie A., Diamond A. and J. Hainmueller. 2010. Synthetic control methods for comparative case studies: estimating the effect of California's tobacco control program. *Journal of the American Statistical Association* 105(490): 493–505.

[2] Abadie A., Diamond A. and J. Hainmueller. 2011. SYNTH: Stata module to implement Synthetic Control Methods for comparative case studies, Statistical Software Components S457334, Boston College Department of Economics, revised 28 Jan 2014.

[3] Abadie A. and J. Gardeazabal. 2003. The economic costs of conflict: A case study of the Basque Country. *American Economic Review* 93(1): 113–32.

[4] Arslanalp S. and P.B. Henry. 2005. Is debt relief efficient? *Journal of finance* 62 (2): 1017-051.

[5] Asonuma T., Chamon M. and A. Sasahara. 2016. Trade Costs of Sovereign Debt Restructurings: Does a Market-Friendly Approach Improve the Outcome? IMF Working Paper 222.

[6] Asonuma T. and C. Trebesch. 2016. Sovereign Debt Restructurings: Pre-emptive or Post-Default," *Journal of the European Economic Association* 14: 175-214.

[7] Beers D.T. and J. Chambers. 2007. Default Study: Sovereign Defaults At 26-Year Low, To Show Little Change In 2007. Standard and Poor's, Global Credit Portal www.standardandpoors.com/ratingsdirect

[8] Benjamin, D. and M.L. Wright. 2009. Recovery Before Redemption: a Theory of Delays in Sovereign Debt Renegotiations. CAMA Working Paper Series 15.

[9] Billmeier A. and T. Nannicini. 2013. Assessing economic liberalization episodes: A synthetic control approach. *Review of Economics and Statistics* 95(3): 983-1001.

[10] Borensztein E. and U. Panizza. 2009. The costs of sovereign default. *IMF Staff Papers* 56 (4): 683–741.

[11] Borensztein E., and U. Panizza. 2010. Do Sovereign Defaults Hurt Exporters? *Open Economic Review* 21(3): 339-412.

[12] Buchheit L. C.; Gelpern A., Gulati M., Panizza U., Weder di Mauro B. and J. Zettelmeye. 2013. Revisiting Sovereign Bankruptcy. Committee on International Economic Policy And Reform. Brookings-CIEPR October 2013.

[13] Bulow, J. and K.S. Rogoff. 1989a. A Constant Recontracting Model of Sovereign Debt. *Journal of Political Economy* 97(1): 155–78.

[14] Bulow J. and K.S. Rogoff. 1989b. Sovereign Debt: Is to Forgive to Forget? *American Economic Review* 79(1): 43-50.

[15] Campos N. F. and Y. Kinoshita. 2010. Structural Reforms, Financial Liberalization, and Foreign Direct Investment. *IMF Staff Papers* 57: 326-365.

[16] Cheng, G., Diaz-Cassou, J. and A. Erce. 2016a. From Debt Collection to Relief Provision: 60 Years of Official Debt Restructurings through the Paris Club. European Stability Mechanism Working Papers 20.

[17] Cheng G., Diaz-Cassou J. and A. Erce. 2016b. The Macroeconomic effects of Official Debt Restructuring: Evidence from the Paris Club. European Stability Mechanism Working Paper 21.

[18] Cline W. 1995. International Debt Reexamined. Washington, DC: Institute for International Economics.

[19] Cole H.L., Dow J. and W.B. English. 1995. Default, Settlement and Signalling: Lending Resumption in a Reputational Model of Sovereign Debt. *International Economic Review,* 36, 365-384.

[20] Costalli S., Moretti L. and C. Pischedda. 2001. The economic costs of civil war: synthetic counterfactual evidence and the effects of ethnic fractionalization. *Journal of Peace Research* 54(1): 80-98.

[21] Cruces J.J. and C. Trebesch. 2013a. Sovereign Defaults: The Price of Haircuts. *American Economic Journal: Macroeconomics* 5: 85-117.

[22] Cruces J.J. and C. Trebesch. 2013b. Sovereign Defaults: The Price of Haircuts: Dataset. *American Economic Journal: Macroeconomics.* http://dx.doi.org/10.1257/mac.5.3.85.

[23] Das, Papaioannou and Trebesch. 2012. Sovereign Debt Restructurings 1950-2010: Literature Survey, Data and Stylized Facts. IMF Working Paper 203.

[24] De Paoli B., Hoggarth G. and V. Saporta. 2006. Costs of Sovereign Default. Financial Stability Paper 1.

[25] De Paoli B., Hoggarth G. and V. Saporta. 2009. Output costs of sovereign crises: some empirical estimates. Bank of England Working Paper 362.

[26] Eaton J J. and M. Gersovitz. 1981. Debt with Potential Repudation: Theoretical and Empirical Analysis. *Review of Economic Studies* 48(2): 289-309.

[27] English W.B. 1996. Understanding the Costs of Sovereign Default: American State Debts in the 1840's. *American Economic Review* 86 (1): 259-275.

[28] Forni L., Palomba G., Pereira, J. and C. Richmond. 2016. Sovereign Debt Restructuring and Growth. IMF Working Paper 147.

[29] Freedom House. 2015. Freedom of the Press Index.

[30] Furceri F. and A. Zdzienicka. 2012. How costly are debt crises? *Journal of International Money and Finance* 31: 726–742.

[31] Gelos G., Sahay R. and G. Sandleris. 2011. Sovereign Borrowing by developing countries: what determines market Access? *Journal of International Economics* 83 (2): 243–254.

[32] Grossman H.I. and J.B. Van Huyck. 1988, Sovereign Debt as a Contingent Claim: Excusable Default, Repudiation, and Reputation. *The American Economic Review* 78 (5): 1088-1097.

[33] Holland P. W. 1986. Statistics and Causal Inference. *Journal of the American Statistical Association* 81(396): 945-960.

[34] International Country Risk Guide. 2013. Country Rankings, The PRS Group, Various Years.

[35] International Monetary Fund. 2013. World Economic Outlook Database. Washington, DC.

[36] International Monetary Fund. 2015. International Financial Statistics. Washington, DC.

[37] Krugman P. 1988. Financing vs. forgiving a debt overhang. *Journal of Development Economics* 29(3): 253-268.

[38] Jorra M. 2011. The heterogeneity of default costs: Evidence from recent sovereign debt crises. MAGKS - Joint Discussion Paper Series in Economics 51.

[39] Judson R.A., Owen, A.L.1999. Estimating dynamic panel data models: a guide for macroeconomists. *Economic Letters* 65: 9-15.

[40] Kuvshinov D. and K. Zimmermann. 2016. Sovereigns going bust: estimating the cost of default. Bonn Econ Discussion Papers 1.

[41] Loeven L. and F. Valentia. 2013. Systemic Banking Crises Database: An Update. *IMF Economic Review* 61 (2): 225-270.

[42] Levy Yeyati E. and U. Panizza. 2011. The Elusive Costs of Sovereign Defaults. *Journal of Development Economics* 94: 95-105.

[43] Manasse P. and N. Roubini. 2009. "Rules of thumb" for sovereign debt crises. *Journal of International Economics* 78: 192–205.

[44] Mendoza, E. G. and V. Z. Yue. 2012. A General Equilibrium Model of Sovereign Default and Business Cycles. *The Quarterly Journal of Economics* 127: 889-946.

[45] Nickell S.J. 1981. Biases in dynamic models with fixed effects. *Econometrica* 49: 802-816.

[46] Ozler S. 1993. Have commercial banks ignored history? *American Economic Review* 89 (3): 473–500.

[47] Panizza U., Sturzenegger F. and J. Zettelmeyer. 2009. The Economics and Law of Sovereign Debt and Default. *Journal of Economic Literature* 47(3): 1-47.

[48] Reinhart, C. M. and C. Trebesch. 2016. Sovereign Debt Relief and its Aftermath. *Journal of the European Economic Association* 14(1): 215-251.

[49] Rose A. K. 2005. One Reason Countries Pay Their Debts: Renegotiation and International Trade. *Journal of Development Economics* 77: 189-206.

[50] Sandleris, G. 2008. Sovereign Defaults: Information, Investment and Credit. *Journal of International Economics* 76: 267- 275.

[51] Smith B. 2015. The resource curse exorcised: Evidence from a panel of countries. *Journal of Development Economics* 116: 57-73.

[52] Sturzenegger F. 2004. Tools for the Anlysis of debt problems. *Journal of Reconstructing Finance* 1(1): 1-23.

[53] Sturzenegger F. and J. Zettelmeyer. 2008. Haircuts: Estimating Investor Losses in Sovereign Debt Restructurings, 1998-2005. *Journal of International Money and Finance* 27: 780-805.

[54] Tomz M. and M. Wright. 2007. Do countries default in bad times? *Journal of the European Economic Association* 5 (2): 352–360.

[55] Tomz M. and M. L. J. Wright. 2013 Empirical Research On Sovereign Debt And Default. NBER Working Paper 18855.

[56] Trebesch C. and M. Zabel. 2017. The Output Costs of Hard and Soft Sovereign Default. *The European Economic Review* 92: 416-432

[57] World Bank. 2012. Database of Political Institutions. Washington, DC.

[58] World Bank. 2015. World Development Indicators. Washington, DC.

Table 1a: Private Haircut and Official Restructuring

	Observations	Mean	SD	Min	Max
Private Haircut					
1975-1988	79	27.75	18.92	0.7	103.5
1989-2001	43	53.5	29.66	8.7	102.3
2002-2013	11	66.37	33.34	5.63	97
Official restructuring					
1975-1988	121	6.86	6.17	0.4	30.33
1989-2001	139	10.4	12.72	0.03	82.06
2002-2013	41	31.38	55.27	0.43	326.13

Note: Since there is only one case of an official restructuring equal to 326 percent of GDP (Liberia 2010), in Figure 2 this value was dropped.

Table 1b: Private Haircuts and Official Restructurings by country's income

Private Haircuts (Average size)		
High Income	Middle Income	Low Income
30.59	35.18	56.34
Official Restructurings (Average size)		
High Income	Middle Income	Low Income
8.50	10.78	12.03
Private Haircuts (# of countries)		
High Income	Middle Income	Low Income
4	35	16
Official Restructurings (# of countries)		
High Income	Middle Income	Low Income
3	38	28

Table 2: Private Haircuts and Growth, 1975-2013, GLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Haircut dummy	0.476		-0.102	0.877	0.749	0.873	0.892	1.154
	(1.503)		(-0.188)	(1.104)	(0.935)	(1.112)	(1.139)	(1.352)
Haircut dummy (-1)	0.921***		1.001*	1.790**	1.750**	1.783**	1.709**	1.879**
	(2.912)		(1.845)	(2.276)	(2.205)	(2.299)	(2.245)	(2.437)
Haircut dummy (-2)					0.742	0.742	0.818	1.216*
					(0.960)	(0.987)	(1.098)	(1.716)
Haircut dummy (-3)					-0.966	-0.808	-0.731	-0.733
					(-1.295)	(-1.125)	(-1.028)	(-1.067)
Haircut dummy (-4)						1.355*	1.379*	1.435**
						(1.737)	(1.800)	(1.965)
Haircut dummy (-5)						0.856	0.888	0.994
						(1.135)	(1.192)	(1.410)
Haircut dummy (-6)							0.369	0.493
							(0.507)	(0.714)
Haircut dummy (-7)							0.850	0.663
							(1.089)	(0.901)
Haircut dummy (-8)								0.633
								(0.879)
Haircut dummy (-9)								2.110***
								(2.970)
Haircut dummy (-10)								0.399
								(0.548)
Haircut		0.013**	0.015	0.002	0.007	0.003	0.002	-0.005
		(2.003)	(1.296)	(0.104)	(0.391)	(0.184)	(0.142)	(-0.254)
Haircut (-1)		0.015**	-0.002	-0.026	-0.023	-0.024	-0.022	-0.029*
		(2.342)	(-0.145)	(-1.488)	(-1.330)	(-1.430)	(-1.362)	(-1.807)
Haircut (-2)					0.014	0.013	0.012	0.007
					(0.774)	(0.718)	(0.665)	(0.443)
Haircut (-3)					0.032*	0.026	0.025	0.024
					(1.886)	(1.628)	(1.546)	(1.567)
Haircut (-4)						-0.008	-0.009	-0.014
						(-0.468)	(-0.553)	(-0.922)
Haircut (-5)						-0.013	-0.014	-0.018
						(-0.778)	(-0.858)	(-1.167)
Haircut (-6)							0.008	-0.000
							(0.619)	(-0.036)
Haircut (-7)							-0.021	-0.020
							(-1.136)	(-1.156)
Haircut (-8)								-0.011
								(-0.664)
Haircut (-9)								-0.032**
								(-2.164)
Haircut (-10)								0.002
								(0.112)

Investment				0.201***	0.204***	0.199***	0.193***	0.187***
				(11.501)	(11.154)	(10.493)	(9.938)	(9.308)
(delta) Population				-0.614***	-0.570***	-0.516**	-0.501**	-0.615***
				(-2.917)	(-2.636)	(-2.372)	(-2.287)	(-2.735)
Secondary Edu				-0.052***	-0.051***	-0.045***	-0.047***	-0.057***
				(-3.966)	(-3.773)	(-3.237)	(-3.337)	(-3.905)
(log) Popolation				-2.969***	-3.376***	-3.359***	-2.536**	-2.305*
				(-2.588)	(-2.854)	(-2.787)	(-2.028)	(-1.709)
Government Cons.				-0.154***	-0.173***	-0.199***	-0.213***	-0.220***
				(-4.774)	(-5.105)	(-6.110)	(-6.428)	(-6.159)
Civil Liberties				0.278**	0.328***	0.342***	0.280**	0.339**
				(2.439)	(2.813)	(2.796)	(2.154)	(2.423)
(delta) Terms of Trade				-0.000	-0.000	-0.000	-0.000	-0.000
				(-1.055)	(-1.073)	(-1.042)	(-1.147)	(-1.031)
Openness				-0.017***	-0.014**	-0.012*	-0.009	-0.011
				(-2.650)	(-2.242)	(-1.805)	(-1.296)	(-1.432)
Banking Crises				-1.510***	-1.384***	-1.259***	-1.379***	-1.167***
				(-5.140)	(-4.658)	(-4.257)	(-4.621)	(-3.795)
Observations	3,944	3,944	3,944	1,531	1,470	1,411	1,345	1,238
Country FE	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES
Number of id	117	117	117	72	72	72	72	72

t-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 3: Official Restructurings and Growth, 1975-2013, GLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Off. Restr. dummy	0.025		0.112	0.304	0.349	0.430	0.349	0.617
	(0.109)		(0.405)	(0.756)	(0.846)	(1.052)	(0.846)	(1.497)
Off. Restr. dummy (-1)	0.694***		0.531*	0.560	0.502	0.585	0.609	0.467
	(3.093)		(1.909)	(1.439)	(1.255)	(1.441)	(1.487)	(1.153)
Off. Restr. dummy (-2)					0.067	0.199	0.332	0.398
					(0.169)	(0.502)	(0.828)	(1.005)
Off. Restr. dummy (-3)					0.500	0.556	0.566	0.702*
					(1.247)	(1.396)	(1.396)	(1.766)
Off. Restr. dummy (-4)						-0.309	-0.388	-0.297
						(-0.791)	(-0.968)	(-0.761)
Off. Restr. dummy (-5)						-0.106	-0.085	-0.090
						(-0.291)	(-0.229)	(-0.251)
Off. Restr. dummy (-6)							0.467	0.397
							(1.145)	(1.000)
Off. Restr. dummy (-7)							-0.049	-0.059
							(-0.119)	(-0.144)
Off. Restr. dummy (-8)								-0.368
								(-0.939)
Off. Restr. dummy (-9)								0.036
								(0.088)
Off. Restr. dummy (-10)								0.514
								(1.230)
Official Restr		-0.006	-0.009	-0.024	-0.041	-0.035	-0.030	-0.040*
		(-0.428)	(-0.512)	(-0.920)	(-1.609)	(-1.387)	(-1.201)	(-1.676)
Official Restr (-1)		0.037**	0.018	-0.014	-0.008	-0.010	-0.017	-0.005
		(2.547)	(0.971)	(-0.506)	(-0.318)	(-0.389)	(-0.669)	(-0.200)
Official Restr (-2)					-0.023	-0.023	-0.031	-0.027
					(-0.855)	(-0.872)	(-1.206)	(-1.111)
Official Restr (-3)					-0.005	-0.003	-0.005	-0.012
					(-0.185)	(-0.103)	(-0.212)	(-0.487)
Official Restr (-4)						0.036	0.042	0.036
						(1.465)	(1.628)	(1.455)
Official Restr (-5)						-0.003	0.005	0.016
						(-0.127)	(0.204)	(0.732)
Official Restr (-6)							0.013	0.020
							(0.511)	(0.805)
Official Restr (-7)							0.055*	0.056*
							(1.788)	(1.792)
Official Restr (-8)								0.058**
								(2.564)
Official Restr (-9)								0.009
								(0.347)
Official Restr (-10)								0.000
								(0.007)

Investment				0.193***	0.193***	0.182***	0.178***	0.171***
				(10.657)	(10.145)	(9.170)	(8.659)	(8.008)
(delta) Population				-0.616***	-0.588***	-0.505**	-0.478**	-0.542**
				(-2.895)	(-2.704)	(-2.253)	(-2.090)	(-2.310)
Secondary Edu				-0.047***	-0.049***	-0.045***	-0.047***	-0.054***
				(-3.446)	(-3.544)	(-3.133)	(-3.150)	(-3.487)
(log) Popolation				-2.633**	-3.139**	-2.957**	-2.146	-1.869
				(-2.120)	(-2.437)	(-2.220)	(-1.531)	(-1.206)
Government Cons.				-0.167***	-0.188***	-0.196***	-0.196***	-0.215***
				(-5.083)	(-5.348)	(-5.864)	(-5.592)	(-5.832)
Civil Liberties				0.248**	0.334***	0.359***	0.319**	0.383**
				(2.101)	(2.716)	(2.735)	(2.291)	(2.533)
(delta) Terms of Trade				-0.000	-0.000	-0.000	-0.000	-0.000
				(-1.085)	(-1.068)	(-1.074)	(-1.172)	(-1.014)
Openness				-0.014**	-0.012*	-0.011	-0.007	-0.007
				(-2.083)	(-1.710)	(-1.523)	(-0.936)	(-0.821)
Banking Crises				-1.458***	-1.349***	-1.300***	-1.468***	-1.249***
				(-4.936)	(-4.513)	(-4.374)	(-4.892)	(-3.993)
Observations	3,596	3,595	3,595	1,472	1,409	1,349	1,281	1,171
Country FE	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES
Number of id	117	117	117	71	71	71	71	71

t-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 4: Robustness check for Private Haircut and Official Restructuring

	Private haircut			Official restructuring		
	(1)	(2)	(3)	(4)	(5)	(6)
Restr. dummy	1.077	1.277	1.309	0.731*	0.631	0.459
	(1.276)	(1.527)	(1.441)	(1.802)	(1.554)	(1.071)
Restr. dummy (-1)	1.392*	1.763**	0.742	0.543	0.582	0.937**
	(1.829)	(2.324)	(0.862)	(1.365)	(1.414)	(2.253)
Restr. dummy (-2)	1.121	1.058	1.006	0.342	0.414	0.993**
	(1.561)	(1.508)	(1.214)	(0.886)	(1.043)	(2.466)
Restr. dummy (-3)	-0.516	-0.567	0.251	0.466	0.579	1.074***
	(-0.761)	(-0.837)	(0.317)	(1.199)	(1.454)	(2.741)
Restr. dummy (-4)	1.346*	1.396*	0.695	-0.320	-0.265	-0.403
	(1.883)	(1.948)	(0.868)	(-0.835)	(-0.673)	(-0.998)
Restr. Dummy (-5)	0.833	0.992	-0.853	-0.008	-0.036	-0.250
	(1.214)	(1.432)	(-1.037)	(-0.023)	(-0.098)	(-0.659)
Restr. dummy (-6)	0.473	0.650	-0.167	0.613	0.522	0.076
	(0.711)	(0.957)	(-0.202)	(1.580)	(1.315)	(0.198)
Restr. dummy (-7)	0.491	0.567	1.206	0.016	-0.101	-0.550
	(0.692)	(0.789)	(1.495)	(0.040)	(-0.245)	(-1.467)
Restr. dummy (-8)	0.350	0.709	-0.079	-0.408	-0.445	-0.042
	(0.502)	(1.006)	(-0.096)	(-1.069)	(-1.137)	(-0.115)
Restr. dummy (-9)	1.143	2.078***	1.087	-0.013	0.001	0.210
	(1.629)	(2.993)	(1.343)	(-0.032)	(0.003)	(0.523)
Restr. dummy (-10)	-0.056	0.237	0.403	0.597	0.531	0.388
	(-0.082)	(0.337)	(0.486)	(1.454)	(1.302)	(0.941)
Restructuring	-0.005	-0.006	-0.016	-0.037	-0.046**	-0.025
	(-0.265)	(-0.318)	(-0.958)	(-1.596)	(-1.994)	(-1.070)
Restructuring (-1)	-0.024	-0.027	-0.015	0.010	-0.008	-0.011
	(-1.486)	(-1.639)	(-0.908)	(0.410)	(-0.324)	(-0.423)
Restructuring (-2)	0.009	0.009	0.013	-0.025	-0.032	-0.039
	(0.553)	(0.560)	(0.725)	(-1.063)	(-1.292)	(-1.548)
Restructuring (-3)	0.019	0.021	0.003	-0.001	-0.008	-0.034
	(1.293)	(1.403)	(0.163)	(-0.051)	(-0.316)	(-1.311)
Restructuring (-4)	-0.019	-0.015	-0.001	0.040*	0.037	0.020
	(-1.222)	(-0.980)	(-0.063)	(1.746)	(1.523)	(0.767)
Restructuring (-5)	-0.013	-0.018	0.018	0.008	0.015	-0.008
	(-0.848)	(-1.159)	(1.089)	(0.397)	(0.679)	(-0.417)
Restructuring (-6)	-0.004	-0.005	-0.000	0.014	0.018	0.005
	(-0.334)	(-0.363)	(-0.005)	(0.605)	(0.731)	(0.266)
Restructuring (-7)	-0.017	-0.019	-0.032*	0.041	0.057*	0.054**
	(-1.032)	(-1.104)	(-1.907)	(1.418)	(1.874)	(2.481)
Restructuring (-8)	-0.001	-0.012	0.003	0.048**	0.061***	-0.001
	(-0.092)	(-0.777)	(0.148)	(2.251)	(2.674)	(-0.059)
Restructuring (-9)	-0.004	-0.032**	-0.003	0.003	0.010	-0.012
	(-0.247)	(-2.170)	(-0.195)	(0.114)	(0.395)	(-0.419)
Restructuring (-10)	0.009	0.005	-0.013	-0.008	0.001	0.009
	(0.713)	(0.347)	(-0.877)	(-0.304)	(0.055)	(0.297)

Growth (-1)	0.218***			0.235***		
	(7.524)			(7.814)		
Investment	0.132***	0.196***	0.174***	0.117***	0.177***	0.161***
	(6.433)	(9.041)	(7.916)	(5.432)	(7.615)	(6.955)
(delta) Population	-0.537**	-0.617**	-1.265***	-0.427*	-0.571**	-1.099***
	(-2.384)	(-2.528)	(-4.202)	(-1.811)	(-2.218)	(-3.497)
Secondary Edu	-0.045***	-0.057***	-0.068***	-0.040***	-0.051***	-0.060***
	(-3.122)	(-3.509)	(-4.249)	(-2.628)	(-2.943)	(-3.555)
(log) Popolation	-0.102	-2.166	-0.942	0.476	-1.738	-1.272
	(-0.078)	(-1.464)	(-0.499)	(0.317)	(-1.009)	(-0.630)
Government Cons.	-0.184***	-0.232***	-0.141***	-0.174***	-0.239***	-0.237***
	(-5.429)	(-5.900)	(-3.065)	(-4.834)	(-5.749)	(-4.874)
Civil Liberties	0.240*	0.302**	-0.155	0.291**	0.332**	-0.116
	(1.764)	(2.003)	(-0.955)	(1.985)	(2.022)	(-0.682)
(delta) Terms of Trade	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-1.573)	(-1.140)	(-0.813)	(-1.539)	(-1.117)	(-0.635)
Openness	-0.006	-0.012	-0.002	-0.004	-0.007	-0.002
	(-0.889)	(-1.434)	(-0.315)	(-0.483)	(-0.827)	(-0.291)
Banking Crises	-0.917***	-1.059***	-1.099***	-0.936***	-1.151***	-0.989***
	(-3.001)	(-3.297)	(-3.236)	(-3.024)	(-3.501)	(-2.864)
Currency Crises			-3.615***			-3.727***
			(-6.326)			(-6.332)
Debt to GDP			-2.450***			-3.180***
			(-5.227)			(-6.117)
Gov. Change			-0.520**			-0.675***
			(-2.144)			(-2.693)
Inflation			7.374***			5.624***
			(3.860)			(2.783)
(Absence of) Political risk			0.025			0.020
			(1.455)			(1.096)
Observations	1,230	1,236	853	1,163	1,170	804
Country FE	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Number of id	72	70	56	71	70	54

In columns 1-3, the interest variable is the haircut, in columns 4-6 it is official restructuring.
t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Reverse Causality, GLS

	Dependent variable: haircut			Dependent variable: off. restructuring		
	(1)	(2)	(3)	(4)	(5)	(6)
Growthpc (t-3)	0.003	0.006	0.006	-0.003	0.003	0.006
	(0.197)	(0.375)	(0.383)	(-0.197)	(0.173)	(0.348)
Growthpc (t-2)		-0.007	-0.007		-0.017	-0.019
		(-0.465)	(-0.458)		(-0.977)	(-1.008)
Growthpc (t-1)			0.003			0.003
			(0.178)			(0.184)
Observations	1,821	1,789	1,753	1,754	1,722	1,686
Country FE	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Macro controls	YES	YES	YES	YES	YES	YES
Number of id	69	69	69	69	69	69

In columns 1-3 the dependent variable is the haircut, in columns 4-6 it is official restructuring.

t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Private restructurings: predictor balance, RMSPE and country weights

	Paraguay (1986)		South Africa (1985)		Uruguay (1983)		Argentina (2001)	
	Treated	*Synthetic*	*Treated*	*Synthetic*	*Treated*	*Synthetic*	*Treated*	*Synthetic*
Average pre-treatment GDP pc	2183.23	2189.46	6767.94	6766.39	6504.10	6512.23	7899.80	7898.98
Investment	-	-	26.88	22.60	18.76	20.13	18.50	26.61964
Openness	-	-	55.86	55.65	34.99	67.47	21.44	79.39372
(delta) Population	2.74	2.74	2.32	2.32	0.46	2.54	1.18	0.6407553
(log) Population	14.99	14.97	17.12	17.09	14.87	16.92	17.39	15.57105
Secondary Education	26.60	26.58	-	-	61.52	43.66	79.13	87.40235
Government Cons.	-	-	-	-	-	-	13.01	18.82909
(delta) Terms of trade	-	-	-	-	-	-	1.23e+08	-3.62e+09
Banking Crisis	-	-	-	-	-	-	0.29	0
Civil Liberties	-	-	-	-	-	-	2.86	3.437
RMSPE	180.25		281.72		174.31		329.63	
Control group	Bangladesh 0.028 Botswana 0.25 China 0.016 Colombia 0.021 Hong Kong 0.02 India 0.02 Iran Islamic Rep. 0.019 Lesotho 0.178 Malaysia 0.022 Mauritius 0.13 Myanmar 0.03 Nepal 0.035 Papua New Guinea 0.059 Saudi Arabia 0.011 Swaziland 0.05 Thailand 0.024 Tunisia 0.033 United Arab Emirates 0.002 Zimbabwe 0.051		Bangladesh 0.001 China 0.125 Colombia 0.417 Hong Kong 0.001 India 0.001 Iran Islamic Rep. 0.194 Malaysia 0.001 Nepal 0.001 Papua New Guinea 0.001 Puerto Rico 0.22 Saudi Arabia 0.034 Thailand 0.001 Zimbabwe 0.001		China 0.098 Colombia 0.57 Hong Kong 0.243 Saudi Arabia 0.089		Hungary 0.521 Lebanon 0.479	

Table 7: Private restructurings: country-specific and average effects of debt restructurings *n* years after the default

	t_1	t_2	t_3	t_4	t_5	t_6	t_7	t_8	t_9	t_{10}	**Average**
Paraguay	-1.08	-4.94	-5.70	-9.16	-11.73	-14.60	-13.89	-13.36	-11.94	-15.28	-10.17
South Africa	-3.94	-6.70	-7.61	-9.61	-14.46	-18.43	-24.22	-26.05	-27.12	-28.44	-16.66
Uruguay	-15.71	-13.20	-11.26	-9.71	-13.62	-13.66	-17.16	-17.85	-15.50	-15.78	-14.34
Argentina	-25.04	-20.94	-17.99	-14.17	-10.55	-6.36	-6.77	-12.07	-5.94	-1.04	-12.09
Average	-11.44	-11.44	-10.64	-10.66	-12.59	-13.26	-15.51	-17.33	-15.12	-15.14	-13.31

Table 8: Official restructurings: predictor balance, RMSPE and country weights

	Benin (1989)		**Burkina Faso (1991)**		**Chad (1989)**		**Egypt (1987)**		**El Salvador (1990)**	
	Treated	Synthetic	*Treated*	*Synthetic*	*Treated*	*Synthetic*	*Treated*	*Synthetic*	*Treated*	*Synthetic*
Average pre-treatment GDP pc	613.25	612.48	339.36	340.70	473.69	469.47	1277.97	1277.55	2151.20	2153.14
Investment	15.17	17.51	17.72	17.75	4.27	17.02	26.48	29.75	12.76	17.36
Openness	52.30	37.76	38.20	28.05	42.71	25.30	63.04	63.01	0.97	62.83
(delta) Population	2.85	2.75	2.56	2.406	2.53	2.53	2.51	1.96	1.42	2.66
(log) Population	15.23	16.31	15.87	17.17	15.41	17.50	17.62	18.32	15.40	15.50
Secondary Education	16.31	26.01	4.46	25.35	5.95	21.86	49.24	40.96	35.19	32.31
Government Cons.	-	-	-	-	-	-	-	-	-	-
(delta) Terms of trade	-	-	-	-	-	-	-	-	-	-
Banking Crisis	-	-	-	-	-	-	-	-	-	-
Civil Liberties	-	-	-	-	-	-	-	-	-	-
RMSPE	14.72		13.47		27.47		22.36		103.61	
Control group	Bangladesh 0.003		Bangladesh 0.301		Bangladesh 0.543		China 0.591		Colombia 0.071	
	Nepal 0.638		Lesotho 0.001		Nepal 0.447		Malaysia 0.193		Namibia 0.437	
	Papua N. Guinea 0.043		Nepal 0.699		Oman 0.01		Mauritius 0.014		Nepal 0.492	
	Zimbabwe 0.315						Swaziland 0.202			

Table 8 (cont'd): Official restructurings: predictor balance, RMSPE and country weights

	Georgia (2001)		Ghana (1996)		Indonesia (1995)		Kyrgyz Republic (2002)		Mali (1988)		Sri Lanka (2005)	
	Treated	Synthetic	*Treated*	*Synthetic*	*Treated*	*Synthetic*	*Treated*	*Synthetic*	*Treated*	*Synthetic*	*Treated*	*Synthetic*
Average pre-treatment GDP pc	1395.41	1388.77	831.10	832.95	1551.87	1548.34	642.30	643.05	440.63	441.16	1752.42	1746.70
Investment	15.96	15.96	15.45	14.74	26.68	24.75	16.07	16.18	16.86	18.52	23.90	23.82
Openness	79.10	101.67	47.32	43.74	49.13	49.80	83.22	107.29	46.99	40.36	79.86	65.93
(delta) Population	-0.83	0.76	2.76	2.70	1.89	2.07	1.02	1.03	1.85	2.33	0.71	1.57
(log) Population	15.36	15.34	16.51	16.53	18.99	17.72	15.36	15.62	15.82	16.33	16.74	16.63
Secondary Education	81.68	81.65	36.91	26.77	45.29	29.05	87.50	82.77	8.19	21.76	76.57	57.06
Government Cons.	-	-	-	-	9.80	9.13	-	-	-	-	10.95	11.62
(delta) Terms of trade	-	-	-	-	-3.6e+12	-5.7e+08	-	-	-	-	1.52e+10	8.22e+09
Banking Crisis	-	-	-	-	0	0.02	-	-	-	-	0	0.0163
Civil Liberties	-	-	-	-	5.5	4.12	-	-	-	-	4	4.33
RMSPE	349.88		13.38		13.28		30.27		22.39		32.14	
Control group	Armenia 0.299		Bangladesh 0.403		Bangladesh 0.42		Armenia 0.184		Nepal 0.843		Azerbaijan 0.163	
	Lao PDR 0.1		Lao PDR 0.365		Colombia 0.012		Bangladesh 0.001		Papua N. Guinea 0.157		Hungary 0.029	
	Oman 0.04		Namibia 0.058		Malaysia 0.032		Lao PDR 0.048				India 0.039	
	Tajikistan 0.561		Swaziland 0.059		Thailand 0.381		Tajikistan 0.659				Lebanon 0.051	
			Zimbabwe 0.116		Tunisia 0.154		Uzbekistan 0.108				Nepal 0.525	
											Tunisia 0.192	

Table 9: Official restructurings: country-specific and average effects of debt restructurings *n* years after the default

	t_1	t_2	t_3	t_4	t_5	t_6	t_7	t_8	t_9	t_{10}	**Average**
Benin	-8.19	-10.67	-6.48	-5.66	-12.50	-9.33	-13.60	-12.23	-11.90	-9.62	-10.02
Burkina Faso	-8.89	-9.60	-14.46	-13.35	-8.88	-8.17	-5.66	-3.92	-8.47	-7.99	-8.94
Chad	-1.73	1.29	3.19	-17.24	-13.83	-17.40	-20.23	-21.21	-20.44	-25.07	-13.27
Egypt	-9.77	-12.73	-16.73	-21.31	-24.23	-28.44	-31.32	-33.89	-35.92	-36.66	-25.10
El Salvador	5.47	8.16	18.51	23.95	28.80	29.20	31.73	35.37	39.26	38.83	25.93
Georgia	-0.86	7.29	9.66	14.37	17.39	23.40	20.11	23.41	31.03	42.57	18.84
Ghana	-2.13	-1.25	-1.05	-1.14	-1.46	-0.94	0.56	-0.84	-0.71	-1.69	-1.07
Indonesia	2.19	3.52	7.89	-2.41	-6.13	-6.26	-6.06	-6.39	-7.84	-9.10	-3.06
Kyrgyz Republic	-16.10	-18.58	-26.26	-31.06	-32.65	-32.20	-27.01	-30.68	-30.83	-35.94	-28.13
Mali	6.90	2.97	7.40	-3.29	-8.77	-11.84	-11.79	-11.32	-8.66	-2.60	-4.10
Sri Lanka	-3.72	-6.99	-7.20	-7.88	-4.23	4.30	12.18	13.00	15.75	-	1.69
Average	-3.35	-3.33	-2.32	-5.91	-6.04	-5.24	-4.64	-4.43	-3.52	-4.73	-4.29

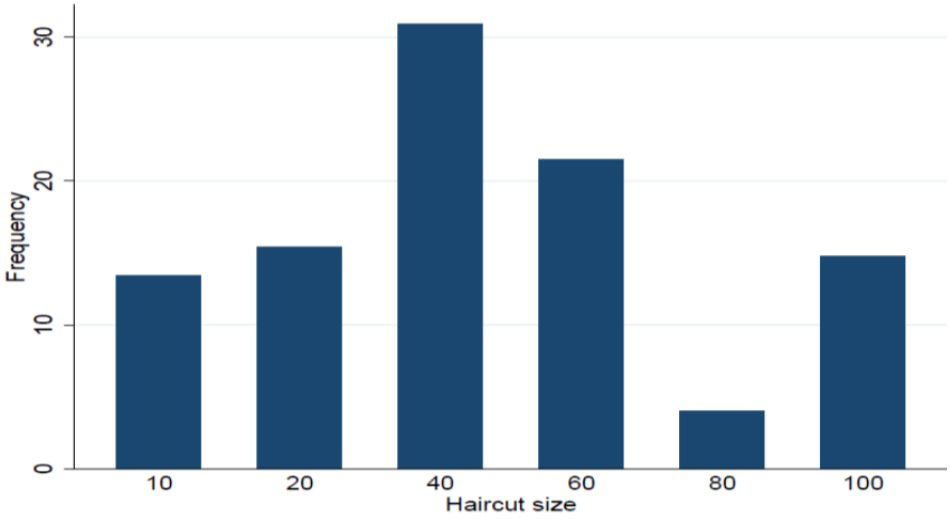


Figure 1: Private Haircuts frequency by size (percent)

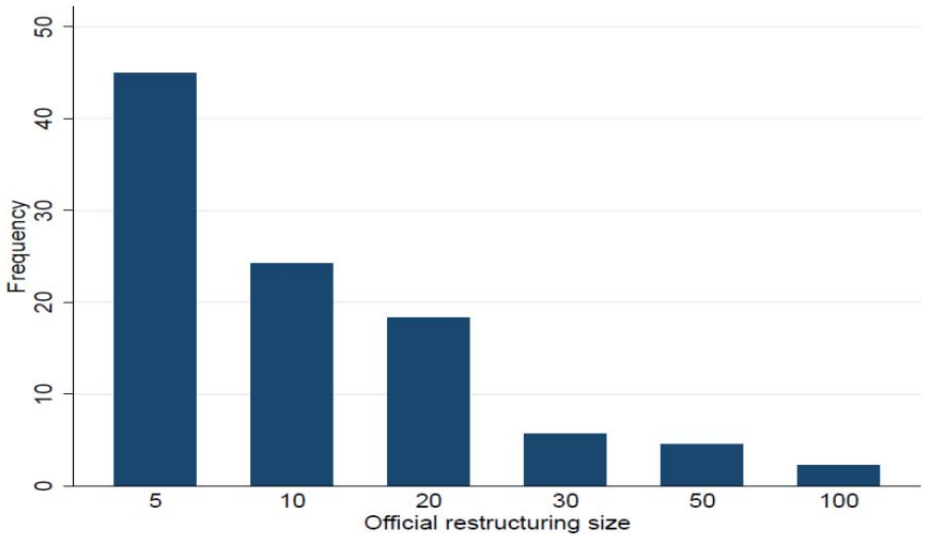


Figure 2: Official restructurings frequency by size (percent)

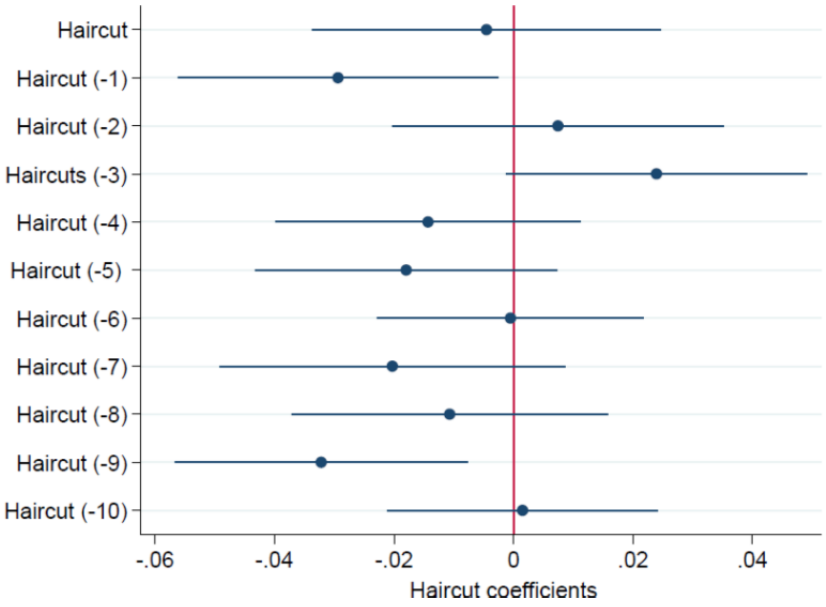


Figure 3: Private Haircuts and Growth, haircut coefficients over time

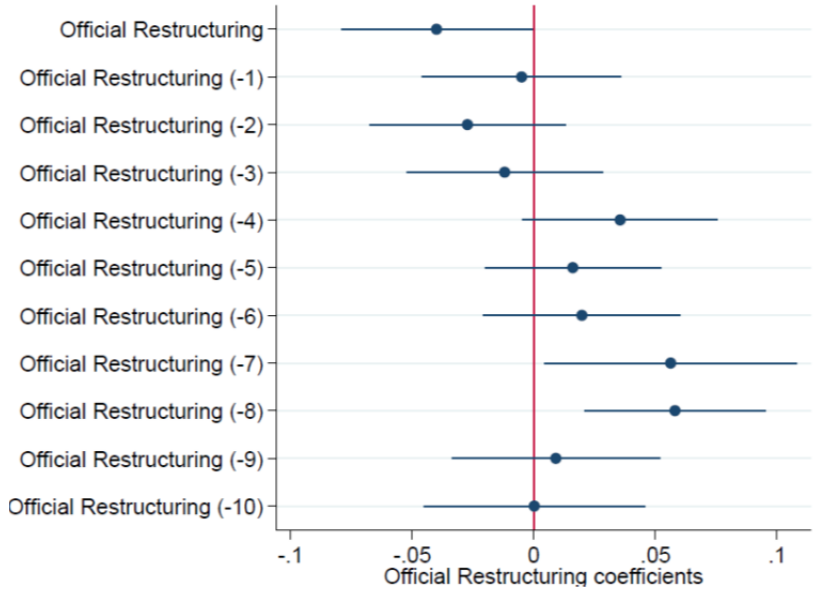


Figure 4: Official Restructurings and Growth, restructuring coefficients over time

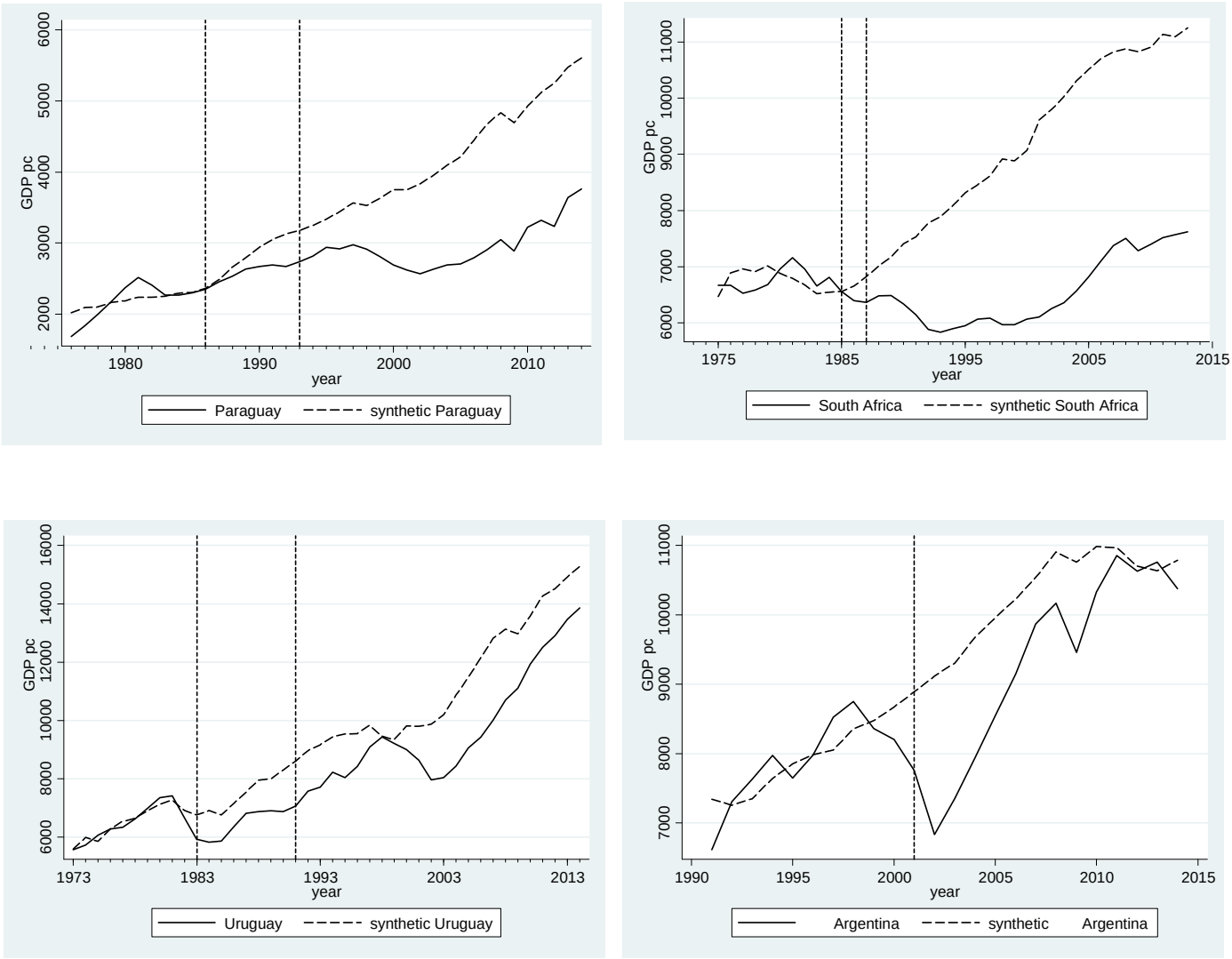
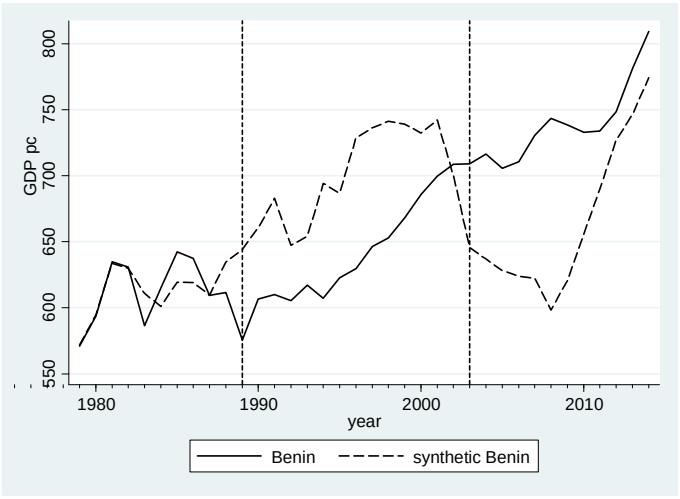
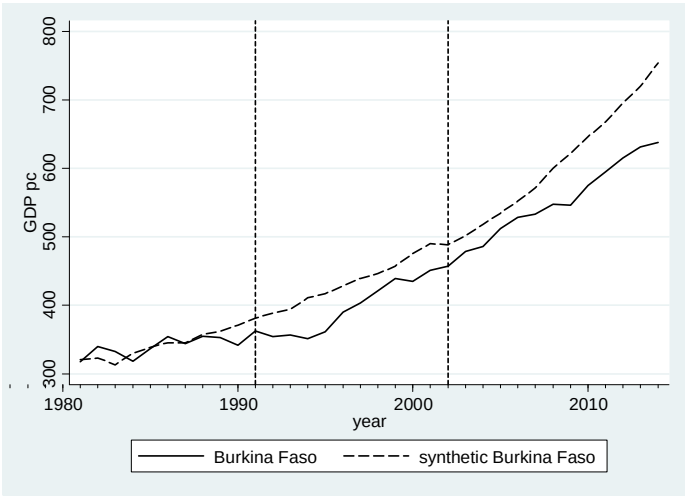
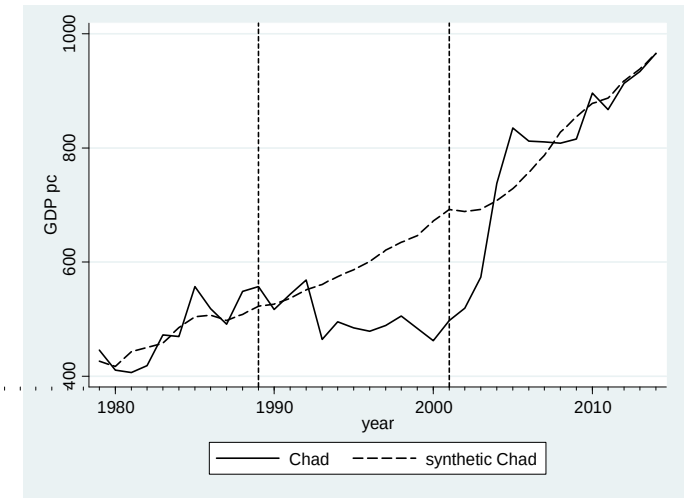
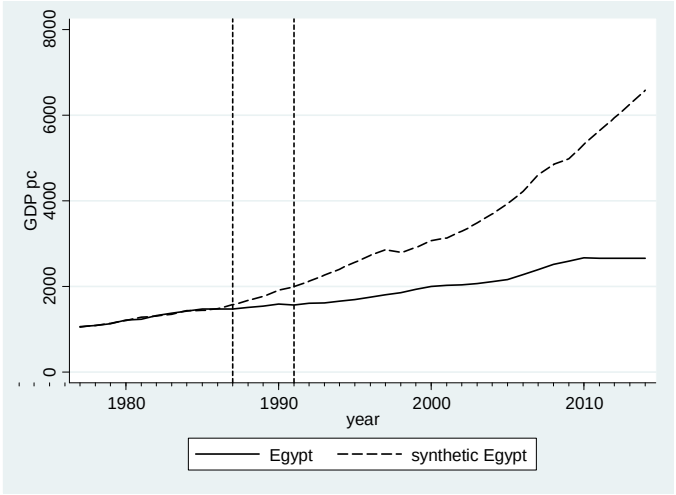


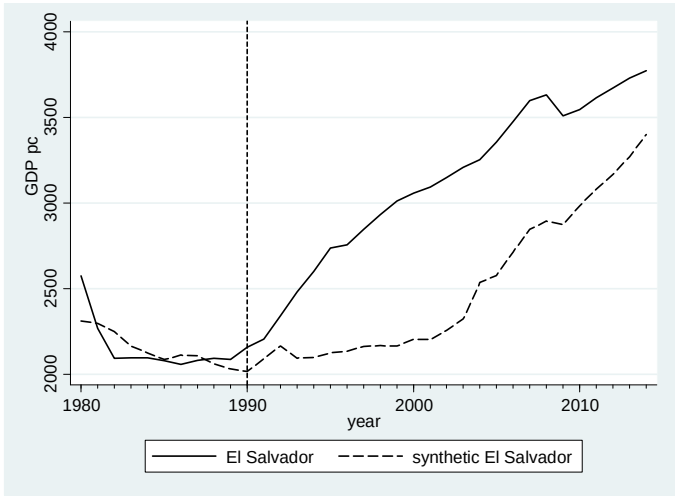
Figure 5: Private restructurings: evolution of GDP pc, treated versus synthetic

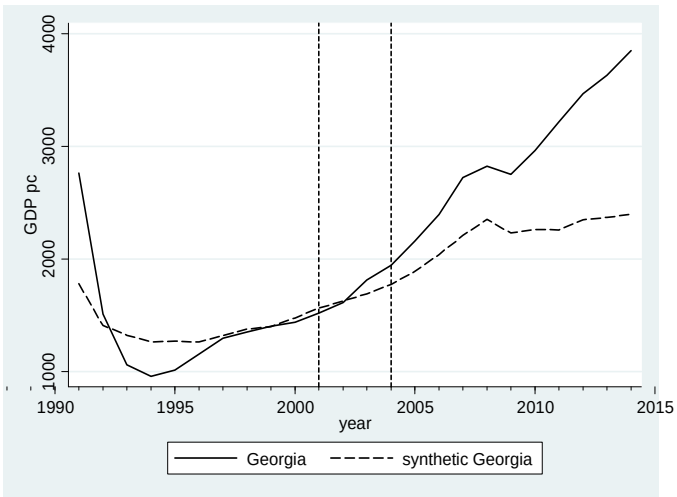

GDP pc
550
600
650
700
750
800
1980
1990
2000
2010
year
Benin
synthetic Benin


GDP pc
300
400
500
600
700
800
1980
1990
2000
2010
year
Burkina Faso
synthetic Burkina Faso


GDP pc
400
600
800
1000
1980
1990
2000
2010
year
Chad
synthetic Chad


GDP pc
0
2000
4000
6000
8000
1980
1990
2000
2010
year
Egypt
synthetic Egypt


GDP pc
2000
2500
3000
3500
4000
1980
1990
2000
2010
year
El Salvador
synthetic El Salvador


GDP pc
1000
2000
3000
4000
1990
1995
2000
2005
2010
2015
year
Georgia
synthetic Georgia

…continued

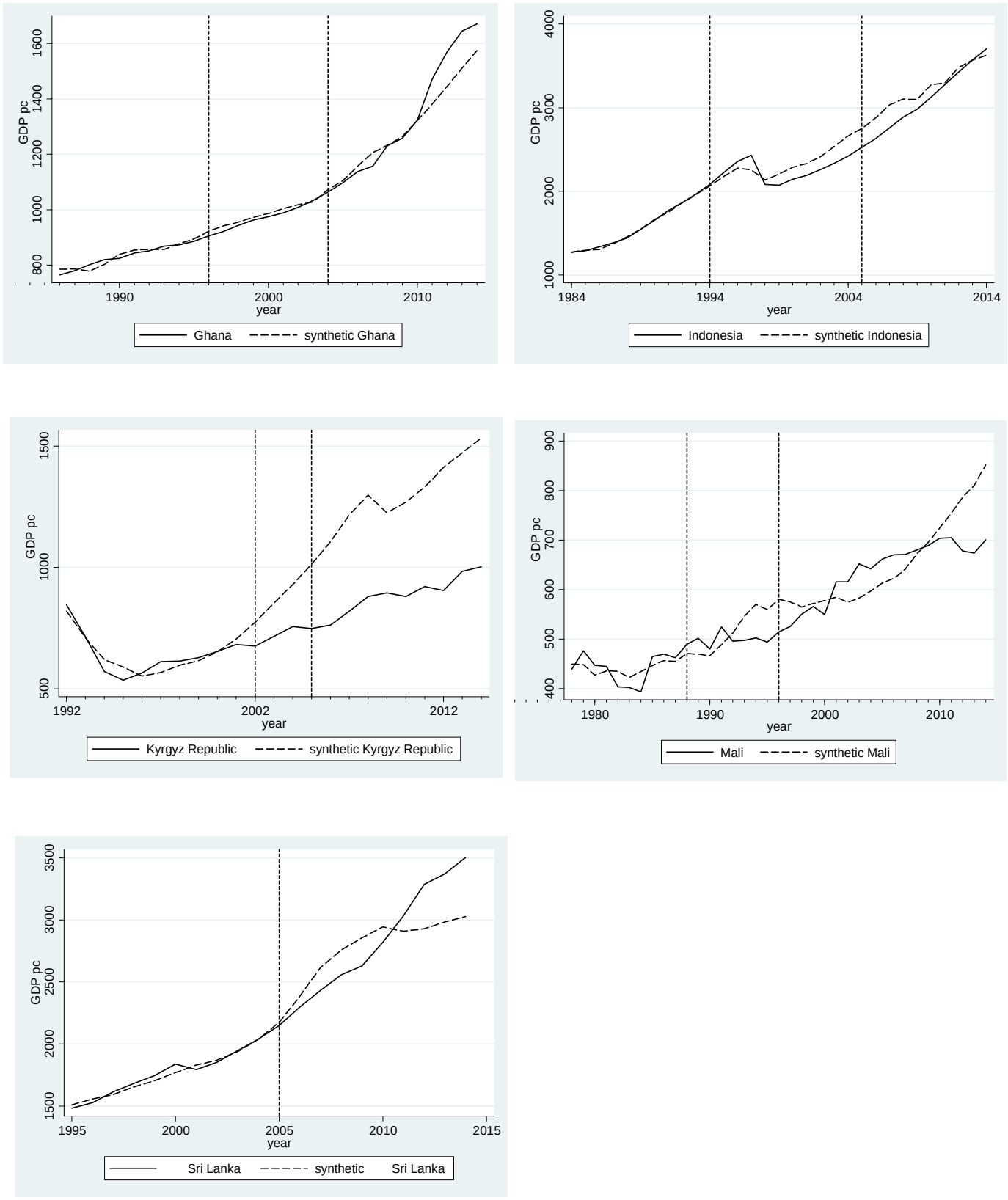


Figure 6: Official restructurings: evolution of GDP pc, treated versus synthetic

Appendices

Appendix A: Sample and Variable description

Table A1a: Country sample, defaulters

	Private Haircut			Official restructuring	
Albania	1991-1995			1993-2000	
Algeria	1991-1996			1994-1995	
Angola				1989	
Argentina	1982-1993	2001-2005		1985-1992	
Benin				1989-2003	
Bolivia	1980-1993			1986-2001	
Brazil	1983-1994			1983-1992	
Bulgaria	1990-1994			1991-1994	
Burkina Faso				1991-2001	
Burundi				2004-2009	
Cambodia				1995	
Cameroon	1985-2003			1989-2006	
Central African Republic				1981-2009	
Chad				1989-2001	
Chile	1983-1990			1975-1987	
Congo, Dem. Rep.	1980-1989			1976-1989	2002-2010
Congo, Rep.	1980-1988	2007		1986-1994	1996-2010
Costa Rica	1981-1990			1983-1993	
Cote d'Ivoire	1983-1998	2000-2012		1984-1994	1998-2009
Cuba	1980-1985			1985-1986	
Dominican Republic	1982-1994	2004-2005		1985-2005	
Ecuador	1982-1995	1999-2000	2008-2009	1983-2003	
Egypt, Arab Rep.				1987-1991	
El Salvador				1990	
Ethiopia	1991-1996			1992-2004	
Gabon	1985-1994			1987-1995	2000-2004
Gambia, The	1985-1988			1986	2007-2008
Georgia				2001-2004	
Ghana				1996-2004	
Guinea	1986-1998	©		1986-1995	1997-2008
Guinea-Bissau				1987-1995	2001-2010
Haiti				1995-2009	
Indonesia				1994-2005	
Jamaica	1975-1990			1984-1993	
Jordan	1989-1993			1989-2002	
Kenya	1994-1998			1994-2004	
Kyrgyz Republic				2002-2005	
Liberia	1980-1982	2009		1980-1984	2008-2010
Madagascar	1981-1990			1981-1990	1997-2004
Malawi	1980-1988			1982-1988	2001-2006
Mali				1988-1996	2000-2003
Mauritania	1992-1996			1985-1995	2000-2002
Mexico	1982-1990			1983-1989	

Moldova	1998-2002			2006	
Morocco	1983-1990			1983-1992	
Mozambique	1983-1992			1984-1996	1999-2001
Nicaragua	1979-2007			1991-1995	1998-2004
Niger	1983-1991			1983-1996	2001-2004
Nigeria	1982-1992			1986-1991	2000-2005
Pakistan	1998-1999			1981	1989-2001
Panama	1983-1996			1985-1990	
Paraguay	1986-1993				
Peru	1983-1997			1978-1996	
Philippines	1983-1992			1984-1994	
Poland	1991-1994			1981-1991	
Romania	1981-1983	1986		1982-1983	
Russia	1991-2000			1993-1999	
Rwanda				1998-2005	
Senegal	1980-1985	1990-1996		1981-1995	1998-2004
Sierra Leone	1986-1995			1977-1996	2001-2007
South Africa	1985-1987	1989	1993		
Sri Lanka				2005	
Sudan	1985			1979-1984	
Tanzania	2004			1986-1992	1997-2002
Togo	1985-1988	1997		1979-1995	2008-2009
Turkey	1981-1982			1978-1980	
Uganda	1980-1993			1981-1983	1989-2000
Ukraine	1998-2000			2001	
Uruguay	1983-1991	2003			
Venezuela, RB	1982-1990	2004-2005			
Vietnam	1997			1993	
Yemen, Rep.	1985-2001			1996-2001	
Zambia	1983-1994			1983-1992	1996-2005

Notes: Countries in bold correspond to are those with only private haircuts, while countries in italics are those with only official restructuring.

Table A1b: Country sample, not defaulters

Armenia	Hungary	Lithuania	Qatar	United Arab Em.
Azerbaijan	India	Malaysia	Saudi Arabia	Uzbekistan
Bahrain	Iran, Islamic Rep	Mauritius	Singapore	West Bank and Gaza
Bangladesh	Kazakhstan	Mongolia	Slovak Rep	Zimbabwe
Belarus	Kuwait	Myanmar	Swaziland	
Botswana	Lao PDR	Namibia	Syrian Arab Rep.	
China	Latvia	Nepal	Tajikistan	
Colombia	Lebanon	Oman	Thailand	
Eritrea	Lesotho	Papua New Guinea	Tunisia	
Hong Kong	Libya	Puerto Rico	Turkmenistan	

Table A2: Variable definitions and sources

Variable	Definition	Source
DEPENDENT VARIABLE		
GDP growth	Per capita GDP (constant 2005 US$), Annual rate of change	GDP growth
VARIABLES OF INTEREST		
Haircut	Private debt restructurings, in percent	Cruces and Trebesch (2013)
Haircut Dummy	Dummy =1 in case of an haircut	Built by the author
Official Restructuring	Official debt restructurings, percent of total external debt	Das, Papaioannou and Trebesch (2011)
Official Dummy	Dummy =1 in case of an official restructuring	Built by the author
CONTROL VARIABLES		
Investment	Gross fixed capital formation, ratio to GDP	WDI (2015)
Gov. Consumption	Gen. government final consumption expenditure, ratio to GDP	WDI (2015)
Openness	Exports plus imports of goods and services, ratio to GDP	WDI (2015)
Inflation	Consumer price index (2010 = 100), Annual rate of change	WDI (2015)
External debt to GDP	Ratio of external debt to GDP	WDI (2015)
Political Risk	ICRG Political Risk Index	ICRG (2013)
Government change	Dummy variable with a value of one in years with a change in the executive	Database of Political Institutions (2012)
(delta) Population	Rate of population growth, annual	WDI (2015)
(log) Popolation	Log of total population	WDI (2015)
Secondary Education	Percentage of the population that completed secondary education	WDI (2015)
(delta) Terms of Trade	Annual change in terms-of-trade (in million)	WDI (2015)
Banking crisis	Dummy equal 1 in the case of a banking crisis, 0 otherwise	Laeven and Valencia (2013)
Currency crisis	Dummy equal 1 in the case of a currency crisis, 0 otherwise	Laeven and Valencia (2013)
Civil Liberties	the Freedom House index of civil liberties, range goes from-1 to 7	Freedom House (2015)

Table A3: Summary statistics

Variable	Mean	SD	Min	Max
Haircut	1.29	8.55	0	103.5
Haircut (-1)	1.32	8.66	0	103.5
Haircut (-2)	1.36	8.77	0	103.5
Haircut (-3)	1.4	8.89	0	103.5
Haircut (-4)	1.42	8.97	0	103.5
Haircut (-5)	1.42	8.91	0	103.5
Haircut (-6)	1.47	9.04	0	103.5
Haircut (-7)	1.44	8.81	0	103.5
Haircut (-8)	1.48	8.94	0	103.5
Haircut (-9)	1.51	9	0	103.5
Haircut (-10)	1.52	8.98	0	103.5
Haircut dummy	0.03	0.18	0	1
Haircut dummy (-1)	0.03	0.18	0	1
Haircut dummy (-2)	0.03	0.18	0	1
Haircut dummy (-3)	0.04	0.18	0	1
Haircut dummy (-4)	0.04	0.19	0	1
Haircut dummy (-5)	0.04	0.19	0	1
Haircut dummy (-6)	0.04	0.19	0	1
Haircut dummy (-7)	0.04	0.19	0	1
Haircut dummy (-8)	0.04	0.19	0	1
Haircut dummy (-9)	0.04	0.2	0	1
Haircut dummy (-10)	0.04	0.2	0	1
Official restr.	0.95	7.2	0	326.13
Official restr. (-1)	0.95	7.2	0	326.13
Official restr. (-2)	0.95	7.2	0	326.13
Official restr. (-3)	0.95	7.2	0	326.13
Official restr. (-4)	0.86	4.93	0	146.84
Official restr. (-5)	0.87	4.96	0	146.84
Official restr. (-6)	0.86	4.94	0	146.84
Official restr. (-7)	0.87	4.9	0	146.84
Official restr. (-8)	0.87	4.86	0	146.84
Official restr. (-9)	0.84	4.22	0	88.24
Official restr. (-10)	0.8	4.11	0	88.24
Official restr. dummy	0.08	0.28	0	1
Official restr. dummy (-1)	0.08	0.28	0	1
Official restr. dummy (-2)	0.08	0.28	0	1
Official restr. dummy (-3)	0.08	0.28	0	1
Official restr. dummy (-4)	0.09	0.28	0	1
Official restr. dummy (-5)	0.09	0.28	0	1
Official restr. dummy (-6)	0.09	0.28	0	1
Official restr. dummy (-7)	0.09	0.29	0	1

Official restr. dummy (-8)	0.09	0.29	0	1
Official restr. dummy (-9)	0.09	0.29	0	1
Official restr. dummy (-10)	0.09	0.29	0	1
Growth	1.69	6.52	-62.47	102.78
Investment	22.33	8.87	-5.74	74.82
(delta) Population	2.06	1.61	-7.6	17.48
Secondary Edu	53.87	30.27	0.64	122.9
(log) Popolation	16.1	1.44	12.01	21.06
Government Cons.	15.06	6.98	0	86.91
Civil Liberties	4.49	1.55	1	7
(delta) Terms of Trade	-0.99	0.62	-19.27	20.86
Openness	76.67	51.76	0	455.28
Banking Crises	0.1	0.3	0	1
Currency Crises	0.04	0.2	0	1
External debt to GDP	0.66	0.91	0	18.97
Gov. Change	0.14	0.34	0	1
Inflation	44.12	515.1	-13.06	23773.13
Political Risk	59.25	12.25	0	89.13

Table A4: Private Haircuts and Official Restructurings and Growth, 1975-2013, GLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Haircut dummy	0.386		-0.218	0.800	0.601	0.657	0.780	1.048
	(1.193)		(-0.390)	(0.986)	(0.722)	(0.804)	(0.962)	(1.153)
Haircut dummy (-1)	0.877***		0.826	1.756**	1.737**	1.867**	1.933**	2.316***
	(2.719)		(1.474)	(2.197)	(2.120)	(2.330)	(2.441)	(2.815)
Haircut dummy (-2)					0.774	0.865	1.011	1.551**
					(0.956)	(1.104)	(1.299)	(2.044)
Haircut dummy (-3)					-0.992	-0.663	-0.637	-0.708
					(-1.279)	(-0.892)	(-0.860)	(-0.976)
Haircut dummy (-4)						1.695**	1.717**	1.645**
						(2.082)	(2.141)	(2.119)
Haircut dummy (-5)						0.896	0.885	1.242
						(1.131)	(1.128)	(1.640)
Haircut dummy (-6)							0.892	1.075
							(1.093)	(1.388)
Haircut dummy (-7)							0.588	0.391
							(0.727)	(0.506)
Haircut dummy (-8)								0.817
								(1.054)
Haircut dummy (-9)								2.269***
								(3.004)
Haircut dummy (-10)								0.476
								(0.615)
Haircut		0.013**	0.015	0.001	0.009	0.006	0.003	-0.004
		(1.972)	(1.345)	(0.049)	(0.465)	(0.326)	(0.146)	(-0.233)
Haircut (-1)		0.016**	0.002	-0.025	-0.023	-0.026	-0.029*	-0.044**
		(2.519)	(0.182)	(-1.426)	(-1.292)	(-1.492)	(-1.680)	(-2.513)
Haircut (-2)					0.009	0.008	0.006	-0.007
					(0.473)	(0.439)	(0.315)	(-0.396)
Haircut (-3)					0.034*	0.028*	0.026	0.025
					(1.955)	(1.671)	(1.523)	(1.513)
Haircut (-4)						-0.012	-0.017	-0.022
						(-0.710)	(-0.951)	(-1.340)
Haircut (-5)						-0.012	-0.014	-0.024
						(-0.725)	(-0.795)	(-1.427)
Haircut (-6)							-0.002	-0.014
							(-0.130)	(-0.888)
Haircut (-7)							-0.013	-0.013
							(-0.651)	(-0.707)
Haircut (-8)								-0.013
								(-0.739)
Haircut (-9)								-0.036**
								(-2.210)
Haircut (-10)								-0.001
								(-0.094)
Off. Restr. dummy	-0.033		0.040	0.069	0.020	0.120	0.040	0.231
	(-0.144)		(0.142)	(0.168)	(0.048)	(0.287)	(0.097)	(0.547)

Off. Restr. dummy (-1)	0.600***		0.396	0.314	0.153	0.248	0.300	0.137
	(2.655)		(1.403)	(0.795)	(0.374)	(0.604)	(0.724)	(0.328)
Off. Restr. dummy (-2)					-0.073	-0.020	-0.013	0.270
					(-0.179)	(-0.050)	(-0.031)	(0.665)
Off. Restr. dummy (-3)					0.405	0.218	0.210	0.421
					(1.004)	(0.545)	(0.517)	(1.045)
Off. Restr. dummy (-4)						-0.683*	-0.736*	-0.754*
						(-1.736)	(-1.830)	(-1.886)
Off. Restr. dummy (-5)						-0.390	-0.427	-0.494
						(-1.061)	(-1.124)	(-1.298)
Off. Restr. dummy (-6)							0.301	0.361
							(0.723)	(0.876)
Off. Restr. dummy (-7)							-0.196	-0.161
							(-0.474)	(-0.374)
Off. Restr. dummy (-8)								-0.689*
								(-1.670)
Off. Restr. dummy (-9)								-0.255
								(-0.590)
Off. Restr. dummy (-10)								0.526
								(1.213)
Official Restr		-0.005	-0.006	-0.019	-0.033	-0.028	-0.023	-0.032
		(-0.351)	(-0.340)	(-0.718)	(-1.309)	(-1.105)	(-0.919)	(-1.304)
Official Restr (-1)		0.037**	0.021	-0.008	0.001	-0.001	-0.008	0.010
		(2.498)	(1.164)	(-0.305)	(0.054)	(-0.031)	(-0.326)	(0.384)
Official Restr (-2)					-0.019	-0.020	-0.023	-0.020
					(-0.717)	(-0.785)	(-0.892)	(-0.797)
Official Restr (-3)					-0.004	0.003	0.001	0.000
					(-0.147)	(0.139)	(0.055)	(0.009)
Official Restr (-4)						0.043*	0.045*	0.053**
						(1.750)	(1.762)	(2.113)
Official Restr (-5)						-0.001	0.007	0.022
						(-0.037)	(0.332)	(0.946)
Official Restr (-6)							0.007	0.003
							(0.256)	(0.126)
Official Restr (-7)							0.052*	0.040
							(1.685)	(1.231)
Official Restr (-8)								0.057**
								(2.461)
Official Restr (-9)								0.009
								(0.333)
Official Restr (-10)								-0.001
								(-0.034)
Observations	3,596	3,595	3,595	1,472	1,409	1,349	1,281	1,171
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES	YES
Number of id	117	117	117	71	71	71	71	71

t-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1

Appendix B: a formal discussion of the SCM

The SCM provides quantitative inference in small-sample comparative studies by estimating the counterfactual situation of one or several aggregate entities in the absence of an event or intervention (Abadie and Gardeazabal 2003; Abadie *et al.* 2010). To frame the SCM in the context of our study, assume that there is a balanced panel of $I+1$ countries indexed by i and observed over T years. Among these, country $i=1$ has a debt restructuring (treated country) at time $T_0 < T$, whereas the remaining I countries are non-defaulters (control group). The effect of this event is given by:

$$\beta_{1t} = Y_{1t} - Y_{1t}^N \tag{B1}$$

where $t > T_0$, Y_{1t} is the observed (actual) outcome of country $i=1$ for a post-default period t, and Y_{1t}^N is the unobservable potential (synthetic) outcome, that is the GDP per capita that would have been observed in the absence of the debt restructuring. The SCM estimates Y_{1t}^N by defining a weighted average of all countries in the control group (synthetic), and the estimator of β_i at time t is given by the difference between the actual and the synthetic outcome at that period:

$$\widehat{\beta}_{1t} = Y_{1t} - \sum_{i=2}^{I} w_i Y_{it} \tag{B2}$$

The weights w_i attached to each country in the control group are chosen such that the characteristics of the defaulting country in the pre-event period are best reproduced by the characteristics of the synthetic unit. Formally, the vector W^* containing the weights assigned to each control unit minimises the following sum:

$$\sum_{k=1}^{K} v_k (X_{1k} - X_{0k}W)^2, \qquad s.t\ w_i \geq 0 \text{ and} \sum_{i=2}^{I} w_i = 1 \tag{B3}$$

where X_{1k} and X_{0k} are vectors the pre-event variables (predictors) that are relevant to predict the GDP per capita, for the defaulter and non-defaulter, respectively, and v_k is a weight that reflects the predictive power of variable k. The weights v_k are chosen to minimise the mean squared prediction error (MSPE), that is the expected squared distance between the outcome of the treated country and the outcome of the synthetic in the pre-event period,

$$MSPE = \frac{1}{T_0} \sum_{t<T_0} (Y_{it} - \sum_{i=2}^{I+1} w_i Y_{it}) \tag{B4}$$

To achieve lower MSPE, we implemented the nested optimisation procedure that searches among all the positive semi-definite and diagonal matrices V and all the sets of W for the best fitting convex combination of the units in the control group. The nested optimization procedure is implemented by the Stata module synth (Abadie *et al.* 2011). To ensure that the global minimum in the parameter space has been found, we run the nested optimisation using three different starting points of V: the regression-based V, the equal V weights, and a third procedure that uses the Stata maximum likelihood search.

Table B1: Private restructurings: country-specific and average effects of debt restructurings *n* years after the end of the debt crisis

	t_1	t_2	t_3	t_4	t_5	t_6	t_7	t_8	t_9	t_{10}	**Average**
Paraguay	-13.36	-11.94	-15.28	-16.62	-17.45	-22.56	-28.23	-30.21	-32.98	-33.42	-22.20
South Africa	-7.61	-9.61	-14.46	-18.43	-24.22	-26.05	-27.12	-28.44	-28.27	-29.38	-21.36
Uruguay	-15.50	-15.78	-12.92	-15.61	-11.72	-7.62	-0.20	-1.49	-8.33	-11.82	-10.10
Argentina	-10.55	-6.36	-6.79	-12.07	-5.94	-1.04	-0.70	1.17	-3.84	-	-5.12
Average	-11.75	-10.92	-12.35	-15.68	-14.83	-14.32	-14.06	-14.74	-18.35	-24.88	-14.70

Table B2: Official restructurings: country-specific and average effects of debt restructurings *n* years after the end of the debt crisis

	t_1	t_2	t_3	t_4	t_5	t_6	t_7	t_8	t_9	t_{10}	**Average**
Benin	12.47	12.31	13.91	17.37	24.26	19.01	11.80	6.37	2.98	4.67	12.52
Burkina Faso	-4.49	-6.28	-4.16	-4.31	-6.67	-8.78	-12.09	-11.02	-10.88	-11.59	-8.03
Chad	-24.59	-17.21	4.24	14.64	7.28	2.99	-2.31	-4.60	2.01	-2.25	-1.98
Egypt	-24.23	-28.44	-31.32	-33.90	-35.92	-36.66	-33.75	-33.63	-34.96	-35.24	-32.80
El Salvador	5.47	8.16	18.51	23.95	28.80	29.20	31.73	35.37	39.25	38.83	25.93
Georgia	14.37	17.39	23.40	20.11	23.41	31.03	42.57	47.76	53.23	60.69	33.40
Ghana	-0.71	-1.69	-4.08	-0.17	-0.59	0.06	6.58	8.64	8.82	6.11	2.30
Indonesia	-8.60	-9.11	-6.95	-3.78	-4.58	-0.67	-1.54	0.02	2.14	-	-3.67
Kyrgyz Republic	-31.06	-32.65	-32.20	-27.01	-30.68	-30.83	-35.94	-33.18	-34.55	-	-32.01
Mali	-8.66	-2.60	-1.09	-4.92	5.29	7.28	11.75	7.45	7.95	7.74	3.02
Sri Lanka	-3.72	-6.99	-7.20	-7.88	-4.23	4.30	12.18	13.00	15.75	-	1.69
Average	-6.71	-6.10	-2.45	-0.54	0.58	1.54	2.82	3.29	4.70	8.62	0.03