FINANCIAL EXCLUSION AND SOVEREIGN DEFAULT: THE ROLE OF OFFICIAL LENDERS

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Abstract

Is financial exclusion after default a relevant driver of sovereign default incentives? I find new evidence that suggests that this is not the case, and that there are substantial differences in the behavior of different lenders after a sovereign default. Private lenders tend to decrease their funding to developing countries that have defaulted to banks or to the Paris Club. But the financing from official creditors, i.e. bilateral and multilateral, remains mainly unaffected by the different sovereign defaults, only with some exceptions mostly related to defaults to multilateral lenders. This different pattern for official financing is very relevant since official loans are the main source of funds for developing economies. Official creditors continue offering funding to countries even after default, casting doubt on the relevance of one of the main assumptions in sovereign default models, the so-called financial exclusion.

Keywords: Sovereign default, Financial exclusion, Heterogeneous lenders, Official creditors, Emerging markets.

JEL classification: F34, G15.

Resumen

¿Es la exclusión financiera tras el *default* un factor relevante en las decisiones de *default* soberano? En este trabajo encuentro evidencia empírica que sugiere que este no es el caso, y que existen diferencias sustanciales en el comportamiento de los distintos prestamistas después de un *default* soberano. Los prestamistas privados tienden a disminuir su financiación a los países en desarrollo que han incumplido sus obligaciones de repago con bancos privados o con el Club de París. Pero la financiación de los acreedores oficiales, es decir, de los prestamistas bilaterales y multilaterales, en gran medida no se ve afectada por los diferentes *default* soberanos, solo con algunas excepciones relacionadas principalmente con los *default* a los prestamistas multilaterales. Este diferente patrón de la financiación oficial es muy relevante, ya que los préstamos de los acreedores oficiales son la principal fuente de financiación de las economías en desarrollo. Los prestamistas oficiales continúan ofreciendo financiación a los países incluso después del *default,* poniendo en duda la relevancia de uno de los principales supuestos de los modelos de *default* soberano, la llamada «exclusión financiera».

Palabras clave: *default* soberano, exclusión financiera, prestamistas heterogéneos, prestamistas oficiales, países emergentes.

Códigos JEL: F34, G15.

1 Introduction

Sovereign default is a frequent phenomenon in developing economies: Uribe and Schmitt-Grohé (2016) estimate a default probability of around 3-4 percent.[1] However, data on sovereign defaults have been generally scarce, hindering the empirical analysis. Indeed, this lack of adequate data hampers the testing of key assumptions of the economic models used to analyze sovereign default in emerging countries.

The canonical sovereign default model of Arellano (2008) and Aguiar and Gopinath (2006) features a benevolent sovereign that maximizes the utility of a representative agent by borrowing in international financial markets. Sovereign debt is issued without commitment, meaning that the sovereign may decide to default on its debt. As highlighted by Uribe and Schmitt-Grohé (2016), given the lack of commitment, the only explanation available in these models of why countries pay back their debts is to avoid the penalties associated with the default. As the empirical literature has been able to identify, default costs are multidimensional and encompass a broad set of negative effects on the ability of the country to engage in trade and financial relations, among others. However, DSGE sovereign default models generally consider that after defaulting countries suffer two type of negative consequences: output losses and financial autarky, also called financial exclusion. Financial exclusion implies that the country is unable to access international financial markets and as a result, it is unable to smooth the consumption of the representative agent. With this setting, financial exclusion is one of the key assumptions that explain why countries honor their debt in a sovereign default model.

Financial autarky is generally calibrated and broadly understood as the number of years between default and re-access to international credit markets by borrowing either in the form of bonds or bank loans. But both, international banks and bondholders, are private creditors. Within this setting, many studies overlook the fact that countries can usually tap other sources of funding different from international private credit markets, namely, official loans.[2] And these sources are quantitatively and qualitatively important.

[1] They use a sample of 93 countries in the 1975-2014 period.

[2] According to the World Bank's International Debt Statistics database (IDS) classification official lenders include loans from other governments (bilateral) and from international institutions such as the World Bank and regional development banks (multilateral), while private lenders are comprised of loans from private banks and other private institutions, bonds issuance and other private credits.

In this regard, as Horn et al. (2021) underscore "Official lending by governments, central banks, and multilateral institutions is larger than commonly known. Indeed, over the past two centuries, official creditors have played a major role in international finance. [...] This is especially true during times of war, financial crises, or other disasters, when private flows decline and official actors become the chief international lenders" (Horn et al., 2021, p. 2). Therefore, it is key to consider official creditors, especially when analyzing sovereign default. This approach is even more important given that as Marchesi et al. (2021) highlight "Despite the fact that official debt accounts for a substantial share of total sovereign debt (especially in developing countries) and that is expected to increase in the future, there is still too little research on the relative treatment of official versus private defaults." (Marchesi et al., 2021, p. 2).

Official lenders represent the highest share of debt in developing countries[3] and offer notably better conditions than private lenders. As shown in Figure 1, debt with official creditors represents approximately two thirds of total public external debt over the period 1970-2019.[4] Furthermore, these numbers have remained relatively stable over the years.

The importance of public and publicly guaranteed external debt with official creditors in terms of GDP is also high, accounting for almost 31 percent of GDP over the period 1970-2019, starting at 20.4 percent before 1985, increasing to 50 percent between 1985 and 2000 and decreasing to 23.9 percent of GDP since 2000, although roughly maintaining its share in total debt as shown in Figure 1.

However, many empirical research papers and models focus on one type of default, the default to foreign currency bonds and bank loans, and one kind of financial exclusion, the exclusion from international private financial markets. In this regard, the objective of this paper is to provide a more comprehensive view of sovereign default and financial exclusion once the role of official lenders is included. In order to do so, I analyze the role of these lenders from two points of view: as lenders that can suffer a default themselves and as lenders that can impose, or not, the penalty of financial exclusion.

[3] In this paper I will only analyze lower-middle and upper-middle income countries according to the World Bank's 2021 fiscal year classification, as low income countries many times lack access to private international financial markets and would not be the best fit to evaluate official funding vis-à-vis private financing. For more information on the sample of countries used, please see Section A.1.

[4] When debt stocks with one type of lender appeared as missing in IDS, I considered them to be zero as long as the total public and publicly guaranteed stock of debt is not missing. For more information on this assumption, please see Section A.1.

Figure 1: Debt by lender as share of public and publicly guaranteed external debt and use of IMF credit

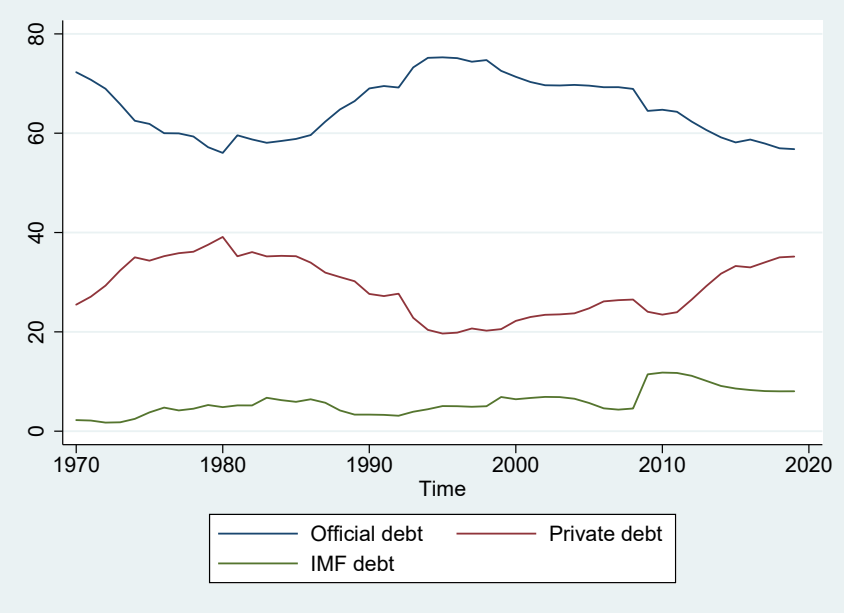


Table 1: Debt by Creditor as share of GDP(%)

Creditor	**Mean**	**Median**
Private Creditors	11.1	6.7
Official Creditors	30.8	20.9
IMF	2.5	1.2

The main contribution of this paper is to question the canonical belief of financial exclusion as an incentive for sovereign debt repayment in both, the empirical literature and in sovereign default models. By analyzing the heterogeneity of defaults and debt commitments by creditor, I am able to show that official lenders generally do not exclude countries in default from official loans, with the exception, in some specifications, of the default to multilateral lenders or to banks. This is especially startling given the importance of official lending in developing countries' debt portfolio.

This analysis can be carried out thanks to the database developed by Beers et al. (2020b) on annual amounts of defaulted sovereign debt by lender.[5] I combine this database with the World Bank's International Debt Statistics (IDS) and World Development Indicators (WDI) databases. With this dataset, first, I explore the heterogeneity in terms of default by lender through a cross-sectional analysis and I find that there are

[5]Specifically, it provides information on defaulted debt to: the Paris Club; the IMF; the International Bank for Reconstruction and Development (IBRD); the International Development Association (IDA); official lending from China; other official creditors; foreign currency bank loans; foreign currency bonds; private creditors; and local currency debt.

relevant differences across defaults depending on the creditor. In particular, I find that the default probabilities are quite different across the different lenders.

In a second step, I exploit data on private and official debt commitments, which are the loan amounts signed in a given year,[6] which allows me to analyze the differences in financial exclusion between private and official lenders. Given the importance of official debt, taking into account official commitments is key. Then, using the aforementioned dataset, I perform a panel data analysis with fixed effects and examine whether there is actually financial exclusion when official lenders are included in the analysis. I find that official creditors keep lending after countries default, with only some exceptions mainly related to defaults to multilateral lenders, while private creditors consistently reduce their financing in response to many types of default. Additionally, I study whether official lenders exclude countries from their financing by changing the financial terms rather than the amount of their loans, and I find that official lenders do not change their financial terms when countries default to most lenders, except when they default to multilateral creditors.

The paper is organized as follows: Section 2 provides an overview of the empirical literature with a focus on financial exclusion after sovereign default; Section 3 presents the data used in the paper and relevant stylized facts that emerge when defaults to the different lenders are considered separately; Section 4 shows how financial exclusion, if any, is much milder than usually considered in the literature when official lending is taken into account; Section 5 extends the analysis to the financial terms of official loans and Section 6 concludes.

2 Literature Review

Sovereign default literature, not only empirical but also quantitative models, has quite developed in recent years, to a great extent due to the improvements in data. A comprehensive general review of the main empirical findings is given by Tomz and Wright (2013) and by Uribe and Schmitt-Grohé (2016). In this regard, Uribe and Schmitt-Grohé (2016) highlight that the probability of sovereign default is around 3-4 percent, with an average length of default of 8 years, that public debt tends to be relatively high before

[6]The IDS definition of official and private debt commitments can be found in Subsection A.1.2

default, that interest rate spreads increase in default and also that countries suffer the aforementioned default costs: financial exclusion and output losses.

A leading example of a paper that has contributed to the improvement of sovereign default data and their subsequent analysis is Cruces and Trebesch (2013) who develop a database of sovereign debt restructuring processes for foreign currency bonds and bank loans. The contribution of Cruces and Trebesch (2013) is not only related to data, but also to the measurement of default penalties in international private credit markets given that, by including the size of haircuts in their analysis, they find that the effect of restructurings on financial exclusion and spreads depend largely on the size of those haircuts. These findings challenged the previous empirical research that found very small default penalties.

Regarding data on sovereign default to official lenders, Das et al. (2012) have contributed to the improvement by putting together a dataset on sovereign defaults with private lenders and the Paris Club. Similarly, Cheng et al. (2017) develop a database on sovereign debt restructurings with the Paris Club. Also recently, Horn et al. (2021) construct a database on official funding and guarantees covering more than 200 years and including information on different types of crises. Likewise, Beers et al. (2020b) is one of the prominent examples in data improvements.

Beers et al. (2020b) construct a database that includes information on stocks of debt in default with several different lenders. The Bank of Canada and the Bank of England have updated this database and the reports associated to it annually.[7] In Beers and Mavalwalla (2017), the authors provide a thorough descriptive analysis and a detailed historical evolution of sovereign debt and default. They highlight how after World War II due to the lack of financing caused by the decline in international bonds issuance, international bank loans and official lending became more relevant. The authors also underscore how from 1980 the defaults to international banks occurred together with defaults to official lenders, but improved in the nineties with the Heavily Indebted Poor Countries (HIPC) Initiative.[8] While Beers and Mavalwalla (2018) extend the analysis

[7] The earliest version of this database was published in 2014.

[8] This program was launched by the IMF and the World Bank in 1996 and aims at providing debt relief to countries that meet some criteria. For more information, please see World Bank and IMF websites: https://www.worldbank.org/en/topic/debt/brief/hipc and https://www.imf.org/en/About/Factsheets/Sheets/2016/08/01/16/11/Debt-Relief-Under-the-Heavily-Indebted-Poor-Countries-Initiative.

to the frequency of default on local currency debt, Beers and de Leon-Manlagnit (2019) analyze the size of the share of the debt in default and include data on defaulted debt to new lenders not included in previous versions.[9] In this update the authors highlight that countries default selectively, and also that when the defaulted amount is small, defaults tend to take longer to be resolved than when they involve higher shares of debt.[10]

The role of official lenders in sovereign default has been approached from many different angles. Among the most prominent examples, Cheng et al. (2018), focusing only on official debt, study how different Paris Club restructurings affect economic growth, poverty, etc. and find that when these restructurings are done through nominal debt relief they have a positive impact on these variables. However, countries that obtained nominal debt relief saw a reduction of official development assistance while those that received net present value relief observed an increase of those funds. In Cheng et al. (2017) and Cheng et al. (2019), they find that the Paris Club debt restructurings with nominal debt relief involved higher GDP growth while those with a net present value reduction were associated with a reduction of fiscal deficits. But these papers do not analyze private debt versus official debt.

Only recently empirical research has shed light on the differences between official and private lenders around sovereign default. Reinhart and Trebesch (2016) compare the effects of the official debt restructurings in the interwar period for advanced economies to those of private debt restructurings in the 80's and 90's for emerging markets. They show that those debt restructurings with face value reductions were related to subsequent better macroeconomic performance for both groups compared to other types of reschedulings.

Also Schlegl et al. (2019) analyze empirically seniority by lender and show that the only senior creditors in terms of repayment after a sovereign default are multilateral institutions and the IMF, but not bilateral lenders as it was commonly thought. Actually, they find that private creditors are more senior than bilateral lenders.

Marchesi and Masi (2021) evaluate the effect on growth of Paris Club debt restructurings vis-à-vis private debt restructurings. They find that private restructurings have

[9] In this version they include for the first time defaulted debt to IDA and to China, which is not part of the Paris Club.

[10] In the last version, Beers et al. (2020b), the authors include data on domestic arrears for 2018.

medium-long run negative effects on growth, while Paris Club debt restructurings have very small effects on growth. The authors conjecture that this may be related to the way these reschedulings are conducted, since they tend to be less confrontational than those with private lenders. Also Marchesi et al. (2021) compare the effects of Paris Club restructurings versus private ones on credit ratings and spreads, and find that Paris Club restructurings have a positive effect on ratings while private ones have a negative effect. The results are similar for spreads, with private restructurings inducing higher spreads. Marchesi and Masi (2020) do a similar exercise but for the Institutional Investor's index and find very similar results. Therefore, these papers underscore how the different costs that different types of default may have lead to selective defaults. They also highlight, as Beers and de Leon-Manlagnit (2019) and Schlegl et al. (2019), that countries decide to whom default, since the consequences of default change across lenders.

Therefore, on the one hand, this paper contributes to this recent strand of the literature on official lenders that analyzes their role in sovereign default vis-à-vis private lenders. But on the other hand, it also contributes to the literature on financial exclusion, which has been mainly focused on private lenders.

Both empirical literature and quantitative models widely accept that countries face some degree of financial exclusion after default. Several measures of resumption of access to credit markets after default have been used. Gelos et al. (2011) consider that a country experiences market access if the government is able to issue bonds internationally or to receive a syndicated loan from international financial markets, at the same time that the overall stock of debt increases. Richmond and Dias (2009) use net bank and bond transfers instead.[11] They consider that negative net transfers mean no market access.[12] Cruces and Trebesch (2013) use a measure of re-access that is close to these previous two measures, a dummy "capturing the first of the following two events: (i) foreign syndicated loan or bond issuance (public or publicly guaranteed) that leads to an increase in indebtedness, (ii) net transfer from private foreign creditors to the public sector" (Cruces and Trebesch, 2013, p. 104).

[11] Net transfers are defined in World Bank's IDS as debt disbursements minus principal and interest repayments.

[12] Particularly, Richmond and Dias (2009) define two kinds of re-access measures "partial re-access as the first year in which there are positive net bond and bank transfers to the public or private sector, whereas full market re-access is defined as the first year of positive net bond and bank transfers to the private or public sector greater than 1.0% of GDP" (Richmond and Dias, 2009, p. 6).

However, these three papers only consider private banks and bonds debt as a measure for market re-access.[13] Conversely, Levy Yeyati (2009) analyzes the cyclicality of official and private net transfers through the output gap and how they relate to default. He finds that while private lending is negatively correlated with default, official lending is not significantly affected by it. Also comparing official and private financing, Avellán et al. (2021) analyze how funding from private creditors and multilateral development banks changes in fiscal crises (which include external sovereign default) and find that multilateral institutions do not decrease their financing to countries, opposite to private creditors. They also find evidence of coordination between multilateral banks and the IMF. However, neither Levy Yeyati (2009) nor Avellán et al. (2021) distinguish between the defaults to the different lenders.

Flogstad and Nordtveit (2014) analyze the effect on official financing of a default to official and private creditors altogether, and the effect of each of them in separate regressions, but not their separate and simultaneous effect, for low and middle income countries.[14] They use arrears as share of external debt as a measure for default and net transfers as a measure of access to financing; however, they cannot distinguish among the different types of default by lender, as I do. They find that concessional bilateral and multilateral lending tends to decrease when arrears are positive but results for non-concessional lending are not robust. Their findings are similar when they evaluate official and private arrears separately: concessional lending tends to decrease with both defaults, but the effect tends to be not significant for non-concessional funds. Thus, their results are somehow different to the findings in this paper.

In sum, to the best of my knowledge this is the first paper that tackles official versus private sector financial exclusion taking into account how the defaults to the countries' main different lenders affect that well-known penalty in the default literature.

[13] Nevertheless, Gelos et al. (2011) considers the impact that official flows may have on private market access by studying whether having higher than average official flows reduces private flows. They find that this is not the case, with official funding being a complement of private financing.

[14] Therefore, the sample of countries in Flogstad and Nordtveit (2014) is larger than the sample in this paper.

3 Heterogeneous Defaults: Stylized Facts

3.1 Data

I make use of the database developed by Beers et al. (2020b) which provides information on annual amounts of sovereign debt in default from 1960 to 2019,[15] disaggregated by the following lenders: the Paris Club; the IMF; the International Bank for Reconstruction and Development (IBRD); the International Development Association (IDA);[16] official lending from China; other official creditors; foreign currency bank loans; foreign currency bonds; private creditors; and local currency debt. I use this database together with the World Bank's IDS and WDI databases, which provide relevant data to analyze how the defaults to the different creditors may differ in a wide range of characteristics.

Beers et al. (2020b) provide information on the amount of loans in default every year plus the amount of interest arrears, which are sometimes reported by the defaulted lenders, sometimes estimated by the authors and sometimes unavailable as it is the case for the Paris Club.[17] In this regard, a caveat of Beers et al. (2020b) database is that it identifies the amount of arrears by period rather than default episodes, understanding by episode the event that starts when a country defaults to a lender until that default is resolved through rescheduling, write-off, repayment, etc.

Regarding the default data in Beers et al. (2020b), I only take into account defaults to the following lenders: the Paris Club, as proxy for defaults to bilateral debt; the IMF; the World Bank's agencies IBRD and IDA[18] as proxy for defaults to multilateral institutions; foreign currency bank loans and foreign currency bondholders. It is important to consider the defaults to the different lenders separately because, as shown in Sections 3.2.1, 3.2.2 and 3.2.3, defaults across creditors are highly heterogeneous.

Despite defaults to the Paris Club,[19] do not include all possible bilateral loans that

[15] Except for default data for the World Bank which is only available from 1985.

[16] The IBRD and IDA are the two institutions in the World Bank that offer lending to governments in developing countries. As explained in the World Bank's website "IDA focuses on the world's poorest countries, while IBRD assists middle-income and creditworthy poorer countries". For more information on this, please see `https://www.worldbank.org/en/who-we-are`.

[17] For more information in this regard, please see Beers et al. (2020a).

[18] Data on sovereign defaults to IBRD and IDA is available only from 1985.

[19] The permanent members of the Paris Club are: Australia, Austria, Belgium, Brazil, Canada, Denmark, Finland, France, Germany, Ireland, Israel, Italy, Japan, Korea, Netherlands, Norway, Russian Federation, Spain, Sweden, Switzerland, United Kingdom and United States.

a country may receive, it is a good proxy for default to bilateral creditors given that as pointed out by Das et al. (2012) "A key principle of the Paris Club is the "comparability of treatment" clause, contained in each agreement. The clause foresees equal burden sharing across all creditor groups, in particular private creditors (banks, bondholders and suppliers), but also by other official bilateral creditor countries that are not members of the Paris Club" (Das et al., 2012, p. 16). As Cheng et al. (2017) highlight this implies that other lenders should provide similar agreements, except multilateral creditors which enjoy the preferred creditor status. However, that is not always necessarily the case.

Similarly, since there is no disaggregated default data to other multilateral lenders apart from the two agencies that comprise the World Bank, IBRD and IDA, I only analyze the default to these two agencies despite the stock of debt with other multilateral creditors is relevant. However, being these defaults quite unusual due to their aforementioned preferred creditor status, I consider the default to the World Bank a good proxy for the default to multilateral institutions.

I do not include in my analysis defaults to "other official creditors" since it aggregates bilateral and multilateral lending not included in the Paris Club or World Bank categories, which makes impossible to disentangle the effect of bilateral and multilateral lenders. Similarly, I exclude defaults to "private creditors" because it is used when there is no separate data on foreign banks and bonds lending and other situations as explained in Beers et al. (2020a).[20] These two categories are important in order to evaluate default, however, due to the objective of this paper which is to analyze heterogeneity across lenders, they should be excluded from the analysis.

Furthermore, I do not include defaults to "official lending from China" despite, as pointed out by Beers and de Leon-Manlagnit (2019), there has been an increase in debt acquired by China in the last years. Actually, as Mitchener and Trebesch (2021) underscore "China, in particular, has emerged as the largest official creditor to developing

[20]Beers et al. (2020a) highlight the issues of the private creditors category: "This dataset has the same drawbacks [...] it does not always appear to properly differentiate public and publicly guaranteed borrowers from private sector borrowers. We utilize these data in cases where we do not have separate data on bank loans and foreign currency bonds, when the reported private creditor amounts are larger than the data on bank loans and bonds, and when we have sufficient information from other sources that shows arrears by private sector borrowers in the country are a small share of the total" (Beers et al., 2020a, p. 10).

countries over the past 20 years – even surpassing the total lending portfolio of the World Bank" from 2014 (Mitchener and Trebesch, 2021, p. 40). As a result, Paris Club defaults may not be the best proxy for bilateral default in the last years in the sample. Nevertheless, according to the data in Mitchener and Trebesch (2021), China's lending only surpassed Paris Club lending from 2013. Therefore, I claim Paris Club defaults are the best proxy for bilateral defaults in the entire dataset. Finally, I also exclude the defaults to "local currency debt" due to the focus of this paper on external lending.

Taking into account these considerations, I construct an unbalanced panel of 60 countries that defaulted at least to one of the aforementioned six lenders[21] from 1970 to 2019.[22]

Regarding debt data, I restrict my analysis to external public and publicly guaranteed debt by creditor, and to the "Use of IMF credit" when needed, using the data provided by IDS database.[23] Both, official and private debt stocks are part of public and publicly guaranteed external debt. This distinction between private and official lenders debt is only available for long term debt, i.e. debt with a maturity longer than one year. Thus, the analysis in this paper is restricted to debt with a maturity higher than one year.

Based on the available default data, I only consider six main lending types in the debt analysis: bilateral, IMF and multilateral[24], as part of official lenders; and commercial banks and publicly issued or privately placed bonds, as part of private lenders; and also the aggregate classification of official and private lenders. Even though the IMF is an official lender, their loans are not included in official debt stocks or commitments, since

[20] Beers et al. (2020a) highlight the issues of the private creditors category: "This dataset has the same drawbacks [...] it does not always appear to properly differentiate public and publicly guaranteed borrowers from private sector borrowers. We utilize these data in cases where we do not have separate data on bank loans and foreign currency bonds, when the reported private creditor amounts are larger than the data on bank loans and bonds, and when we have sufficient information from other sources that shows arrears by private sector borrowers in the country are a small share of the total" (Beers et al., 2020a, p. 10).

[21] I consider that when there is no record of defaulted debt with a lender, i.e. missing data in the database category, there is no default with that lender, even though it may be the case that there was a non-recorded default or a default not attributed to that precise lender and included in one of the aggregate categories such as other official creditors or private lenders.

[22] The complete list of countries used can be found in Section A.2. The sample starts in 1970 to match Beers et al. (2020b) default data with World Bank's debt data.

[23] Public and publicly guaranteed external debt is the main debt indicator used in this paper, unless otherwise specified. The definition of public and publicly guaranteed external debt in IDS is: "Public debt is an external obligation of a public debtor, including the national government, a political subdivision (or an agency of either), and autonomous public bodies. Publicly guaranteed debt is an external obligation of a private debtor that is guaranteed for repayment by a public entity."

[24] Depending on the type of analysis I may use IBRD and IDA debt or the aggregate multilateral debt.

they are part of "Use of IMF credit". This differentiation helps the analysis, because bailout loans provided by the IMF are not included in official debt or official commitments. In Appendix A there is more information on the data used in this paper and further analysis.

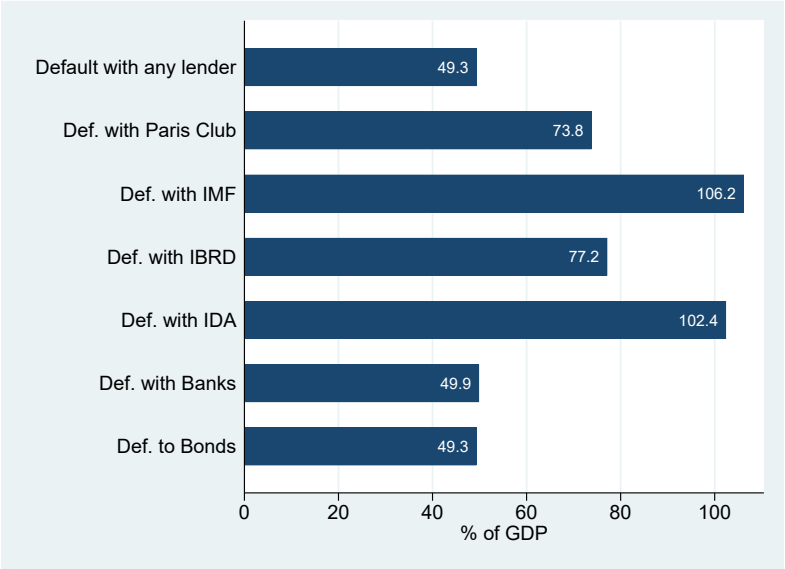
3.2 Heterogeneity across Defaults

There exists substantial heterogeneity across defaults to the different lenders, as it is presented in this section.[25] This high degree of heterogeneity justifies the use of separate independent variables for the default to the six main lenders in Section 4, rather than a measure that aggregates several types of default.

3.2.1 Debt and Default

Defaults to official lenders generally occur in times of higher total public debt as share of GDP. One of the main empirical findings in the literature is that public debt tends to be high before default. This fact remains unchanged when analyzing it by creditor and by type of default, although with some peculiarities.[26] As shown in Figure 2, total debt as share of GDP in the first year in default with the Paris Club, IBRD, and

Figure 2: Public and Publicly Guaranteed Debt as % of GDP in the First Year in Default to Each of the Lenders



[25] For additional information in this regard, please see Section A.3.

[26] The t-test confirms that the mean debt when countries default to official lenders is higher than when they default to private lenders at a level of significance of 10 percent, except for the Paris Club default where the level of significance is 1 percent.

especially with IDA and IMF is substantially higher than total debt as share of GDP in the first year in default with banks and bondholders.

Therefore, when countries default to official lenders, they are usually in situations of higher debt levels, compared to when they default to private creditors.[27] This may suggest that countries try to avoid defaulting to official creditors given their preferred creditor status or that they only default to them in severe over-borrowing crises. It may also mean that countries default somehow sequentially, first to private creditors and then to official lenders in case the crisis worsens.

3.2.2 Default Frequency

Probabilities of default are quite heterogeneous across creditors, being the highest for Paris Club and the lowest for multilateral lenders.[28] Despite Beers et al. (2020b) database does not include the number of default episodes, but years in default, I can compute a lower bound for default episodes[29] Taking this lower bound for episodes into account, and considering that not all countries have positive debt stocks with all their lenders every year, I can compute the probability of default with each of the lenders. Default probability is estimated by dividing the number of default episodes with a specific lender by the number of years with positive debt stock with that lender. These probabilities are quite different across creditors, but this heterogeneity is usually not considered in the calibration of quantitative models of sovereign default. The probability of default to the Paris Club is substantially higher than the probability of default to private lenders, which in turn is significantly higher than the probability of default to multilateral creditors.[30]

Additionally, I can compute the probability of being in default in a given year with each of the lenders for every country. I estimate this probability by dividing the number of years in default with a specific lender by the number of years with positive debt stock with that lender. The probability of being in default in a given year is substantially

[27] For further analysis in this regard, please see SectionA.3.1.

[28] Despite data on default to the World Bank is only available from 1985, since this is not a frequent phenomenon, I consider that the estimations in this section are sufficiently robust.

[29] This lower bound is computed by assuming that if a country is in default several years consecutively, all of them belong to the same default episode. For more information in this regard, please see Section A.3.2.

[30] The results in this section are not directly comparable with many results in the empirical literature since the default episodes estimation is a lower bound estimation.

Table 2: Probability of Default and Probability of Being in Default in a Given Year with the Different Lenders over the Sample Period (%)

By Creditor	Probability of default	Probability of Being in Default
Paris Club	5.5	19.0
IMF	1.0	4.2
IBRD	1.3	5.2
IDA	0.7	3.1
Banks	2.7	20.4
Bonds	3.3	8.7

higher for banks, followed by Paris Club and bonds. This corroborates the finding in the literature that defaults with banks tend to last longer,[31] despite the relatively low probability of default to banks compared to the Paris Club. The probabilities of being in default to IBRD, IDA and the IMF are again relatively lower.

3.2.3 Are Defaults Simultaneous?

Countries are usually in default with just one lender or at most two. As Beers and de Leon-Manlagnit (2019) highlight, in 72 percent of the default observations in their sample, countries defaulted to amounts lower or equal than 10 percent of government debt, suggesting that countries default selectively.

Using as measure the number of defaulted lenders every year in which a country is in default with any of its main creditors, I find that sovereigns are in default with just one lender 54 percent of the years they spend in default and with two lenders 29.5 percent of the years in default. The defaults to three lenders or more are infrequent.[32] Indeed, only three countries in the sample, Argentina in 2003, Zambia in 1990 and Zimbabwe from 2009 to 2016 have been in default to five lenders at the same time.

The Paris Club, banks and bondholders are more often the only lenders who suffer a default where just one lender is not being repaid. Roughly one third of the years in default to banks, bondholders and the Paris Club, these are the only creditors with positive amounts of defaulted debt. Therefore, quite often lenders suffer a sovereign default while

[31] For more information in this regard, please see Section A.3.2.

[32] These percentages are for the period 1985-2019 given that there is no data on IBRD and IDA defaults for the 1970-1984 period.

the defaulting country still keeps performing loans with other creditors, as shown by Beers and de Leon-Manlagnit (2019). Conversely, sometimes the sovereign is in default with several of its creditors simultaneously, regardless of whether the default episode started or finished at the same time. Some lenders, mainly the IMF, but also the IBRD, almost never suffer a default that is not simultaneous, which follows from the role of the IMF as a lender of last resort. Additional information on this issue can be found in Subsection A.3.3.

Thus, apparently countries decide whom to default. In this regard, I constructed a measure of share of lenders in default as the number of lenders in default divided by the number of lenders with positive debt stock in a given year, and I find that countries on average default to only 40 percent of their creditors, that is, to only two of their creditors.

4 Financial Exclusion

In this section, I conduct an empirical analysis following closely Gelos et al. (2011), although with several differences. Specifically, I perform fixed effect regressions using as dependent variables official commitments and private commitments as share of GDP[33] against several lagged independent variables, including dummies for the six types of default obtained thanks to Beers et al. (2020b) database.[34] Each of these dummies, which are included as lagged and contemporaneous variables - although not simultaneously in the same specification-, take the value one as long as there are positive amounts of defaulted debt with each of the creditors. The regression specification, where the sub-index t represents time, the sub-index i represents country and the sub-index l represents official or private lenders, is as follows:

$$Y_{i,t,l} = \beta_0 + \beta_1 \mathbb{D}_{i,t/t-1} + \beta_2 \mathbb{S}_{i,t-1,l} + \beta_3 \mathbb{Z}_{i,t-1} + \beta_4 \mathbb{X}_{i,t-1} + \beta_5 \mathbb{M}_{i,t-1} + \alpha_i + \gamma_t + u_{i,t}$$

where,

$Y_{i,t,l}$ = Official/Private debt commitments as share of GDP

[33] In order to evaluate the overall effect of default on commitments, I also consider total commitments as dependent variable in Section 4.3

[34] I include the six default dummies at the same time in the regression, given that, opposite to Flogstad and Nordtveit (2014), I do not find that the six dummies of default are highly correlated among them. Actually, most of the correlation coefficients between the different dummies are below 0.4, and only two coefficients, those of IMF and IBRD defaults and IBRD and IDA defaults are around 0.55.

$$
\begin{aligned}
\mathbb{D}_{i,t/t-1} &= \text{Contemporaneous/Lagged default dummies with the different lenders} \\
\mathbb{S}_{i,t-1,l} &= \text{Debt stock with official and with private creditors as share of GDP} \\
\mathbb{Z}_{i,t-1} &= \text{Use of IMF credit as share of GDP} \\
\mathbb{X}_{i,t-1} &= \text{Several macro financial controls as shown below} \\
\mathbb{M}_{i,t-1} &= \text{Amount of loans in default as share of GDP} \\
\alpha_i &= \text{Country fixed effects} \\
\gamma_t &= \text{Time fixed effects}
\end{aligned}
\tag{1}
$$

This approach is very similar to Gelos et al. (2011), who perform fixed effect regressions on a dummy for private market access, rather than commitments as share of GDP, against several lagged independent variables, which include two types of dummies for default that take into account only banks and bondholders.[35] Some of the differences in this article compared to Gelos et al. (2011) come from the different focus of this paper, which is explaining both official and private market access taking into account the six kinds of default with the different lenders, rather than private market access and its relation with default to private creditors. Also, other differences come from issues related to data availability.

I choose debt commitments as share of GDP as dependent variable because it is a good proxy for the actual access to international financial markets, since commitments are the loan amounts signed in a given year. There are several reasons why I decide to use commitments rather than disbursements or net transfers as other authors do. First, the measure of access to financial markets through debt disbursements may be affected by delays in loan disbursements after the loan approval. Considering that often official loans are earmarked and subject to strict procurement procedures, the disbursement may take longer than in a regular debt issuance in international markets. Second, if the loan starts disbursing relatively small amounts, net transfers may be negative, even though the country has access to international financial markets. These two reasons are particularly relevant for official loans. Additionally, negative net transfers may imply some degree of debt rollover, although to a lower extent, which in the canonical quantitative sovereign default model is not allowed during financial exclusion. Thus, I argue that commitments are closer to the definition of financial autarky used in most quantitative models. Also, I

[35] Gelos et al. (2011) use one dummy for defaults and another for defaults solved rapidly.

claim that commitments are a better fit for official financing and actually show the country's ability to obtain funds in the international financial markets regardless of delays and disbursements' schedule.

Nevertheless, as a robustness check I include in Section A.4.1 the same analysis but using as dependent variable official and private disbursements as share of GDP. Disbursements are defined in IDS as "drawings by the borrower on loan commitments during the year specified". The use of disbursements addresses the potential concerns about debt contracts being signed, but commitments not being disbursed or being delayed, since the former may actually mean financial exclusion. The use of disbursements also tackles the issues of whether these disbursements of commitments might be contingent on the sovereign's macroeconomic performance, or on aspects related to the loans themselves, or even conditional on the use of disbursements for roll-over purposes. Despite these potential concerns, the results remain robust to the change of the dependent variable to disbursements.

One of the main issues in this kind of regressions is the identification problem, since commitments are the result of an interaction between loan supply and demand. Gelos et al. (2011), who aim to analyze countries that cannot access international financial markets (supply factor) rather than countries that do not want to borrow (demand factor), take a series of steps in order to partially avoid this problem. First, they only consider developing economies and secondly, they ignore those countries classified by the IMF as creditor countries. Additionally, they include former communist countries after they started their transition to market economies, and finally Gelos et al. (2011) exclude those countries where the private sector was able to borrow while the public was not. The approach that I follow is very similar. First, I also include only lower-middle income and upper-middle income countries as classified by The World Bank and, among them, only countries that have defaulted at least once over the sample period as a proxy for countries in need of financing. The inclusion of countries that defaulted at least once is also justified by the focus of this paper, which is to find empirical relevance for the financial exclusion of countries in default and not to find differences between countries with and without default episodes. Secondly, I include all countries after they gained actual independence, which is close to the measure used by Gelos et al. (2011) for former

soviet countries.[36] However, given the focus of this paper on analyzing official versus private commitments, I do not follow the last step taken by Gelos et al. (2011) regarding the private sector.

Then, in the spirit of Gelos et al. (2011), I also use fixed effects estimations,[37] since there may be unobservable variables affecting commitments that are correlated with the observable regressors. Despite the use of fixed effects, these regressions may suffer from endogeneity due to the possibility of a simultaneity bias or reverse causality. In order to reduce it, I use lagged independent variables as Gelos et al. (2011) did, except for the default dummies, where I consider both lagged and contemporaneous variables. Nevertheless, I acknowledge the possibility of the existence of residual endogeneity. However, even in that case, it is still useful to show whether the defaults to different lenders are correlated in a different way with official and private commitments.

Regarding default data, I include both default and lagged default dummies, although not simultaneously in the same specification, while Gelos et al. (2011) only use contemporaneous default dummies. I take this approach because data is annual, therefore, with contemporaneous dummies if a default occurred at the end of a year, its effect on commitments may appear to be negligible because most commitments could have taken place throughout the year and before the default took place, while the effects in the year after the default may be notorious. Additionally, I use six separate default dummies, rather than some aggregate measure of default, given the high heterogeneity across defaults, as presented in Section 3.2. For example, an aggregate measure of default to official lenders would ignore the consequences of the lack of seniority of bilateral lenders shown by Schlegl et al. (2019). Furthermore, this choice reduces the possibility of an omitted variable bias.

With respect to the possible presence of cross-sectional dependence, I use time dummies to reduce it. As in Gelos et al. (2011), time fixed effects also contribute to control

[36] For more information on how the sample was constructed, please see Subsection A.1

[37] I do not use the Arellano-Bond estimator in this application for several reasons. First, Arellano-Bond is intended for panels with small T, large N, not long macro panels with relatively fewer individuals and many time periods. Furthermore, macro panels usually show cross-sectional dependence, which is a problem in this type of estimators. Even though cross-sectional dependence can be reduced through the use of time dummies, as shown by Roodman (2009) with large T the preferred method is fixed effects since "dynamic panel bias becomes insignificant" (Roodman, 2009, p. 128) and "the number of instruments in difference and system GMM tends to explode with T. If N is small, the cluster–robust standard errors and the Arellano–Bond autocorrelation test may be unreliable" (Roodman, 2009, p. 128).

for global push factors that drive financial flows to emerging economies, while the country controls would take into account domestic pull factors, which attract those same flows.[38] Additionally, I cluster errors at the country level to take into account serial correlation.

The control variables that I use, following when feasible Gelos et al. (2011), are: GDP per capita growth and real GDP per capita;[39] CPI to measure "quality of macroeconomic policies" (Gelos et al., 2011, p. 245);[40] trade openness and foreign direct investment (FDI) as share of GDP to show "country's economic links with the rest of the world" (Gelos et al., 2011, p. 244); a dummy variable that takes the value one in case of conflict according to the Political Instability Task Force (PITF) Consolidated Problem Set by Marshall et al. (2019) in the Center for Systemic Peace;[41] total debt service as share of exports and primary income, and total reserves in months of imports to control for liquidity; and the aforementioned time dummies to capture overall economic conditions and avoid issues with cross-sectional dependence.[42] Additionally, Gelos et al. (2011) include the stock of public debt with private creditors and the use of the different IMF programs, but in my analysis I include the stock of public debt with private lenders and also the stock with official creditors -given the focus on the effect of official lending-, and the aggregate use of IMF credit as well. In this regard, as Marchesi and Masi (2021) highlight, including official and private creditors reduces the possibility of an omitted variable bias. Furthermore, as underscored in Marchesi and Masi (2021) it is important to also include IMF loans "to control for the possibility that the different results, between private and official agreements, may depend on additional financing from the IMF that are associated

[38] A richer discussion of push and pull factors is available in Galindo and Panizza (2018) and Avellán et al. (2021).

[39] The log of the real GDP per capita in 2010 US dollars.

[40] Gelos et al. (2011) use World Bank's CPIA to take into account institutional quality, but since I do not have series of CPIA long enough I use CPI instead. In this regard, Gelos et al. (2011) also use CPI as a robustness check to substitute for CPIA. Furthermore, country fixed effects would also control somehow for institutional quality.

[41] Center for Systemic Peace Web site: `http://www.systemicpeace.org/inscrdata.html`. This variable is different from the ICRG index of political risk used by Gelos et al. (2011). PITF records historical state armed conflicts and regime crises.

[42] Some of the variables used by Gelos et al. (2011) could not be used here or had to be substituted by others due to availability issues. I did not include as independent variables, apart from those already mentioned, the following variables: short term debt as share of total debt and institutional investors ratings (due to data availability). Regarding short term debt as share of total debt, I do not include it in my regressions because IDS database does not distinguish between public and private non-guaranteed short-term debt, and given the focus of this paper on the distinction between private and official flows, this is key. Additionally, this indicator is the third variable used by Gelos et al. (2011) to capture liquidity, together with total debt service as share of exports and primary income and total reserves in months of imports. Therefore, its omission should be mitigated by the inclusion of those related variables.

with official restructurings. If an IMF programme is a sine quo non condition for Paris Club creditors to provide relief, not all private restructurings were associated with IMF programmes" (Marchesi and Masi, 2021, p. 13).

Additionally, following Cruces and Trebesch (2013), Marchesi and Masi (2021) and Marchesi et al. (2021) I add a specification that includes both the "occurrence" of default and its "magnitude". These authors, apart from considering the "occurrence" of default which is taken into account through default or restructuring dummies, include what they call the "magnitude" of default which is proxied by the haircut size. The idea behind this approach in Cruces and Trebesch (2013), Marchesi and Masi (2021) and Marchesi et al. (2021) is that it is not only the default or restructuring event which is important in order to explain financial access, but also the size of that restructuring. In the same vein, I control for the "magnitude" of default by including the lagged amount of defaulted debt to each creditor as share of GDP rather than the haircut size, given the different focus of this paper. Despite in principle this is a richer specification, it involves losing data since in Beers et al. (2020b) there are cases where there is evidence on the existence of default, but the amount of debt in default is missing. Therefore, the specifications that only include the lagged or the contemporaneous default dummy are also important and complement the former, which is the most demanding specification.

The amount of defaulted debt to each lender in Beers et al. (2020b) generally consists of the defaulted principal together with the interest arrears, which reduces the probability of collinearity between this measure and the stock of official and private debt given that the stocks of debt exclude interest arrears. Furthermore, the fact that both indicators are included in the regression as share of GDP also contributes to reduce this possible effect. Nevertheless, the channel of the principal in arrears still remains. However, the correlation coefficients between official and private debt stocks and the amounts of debt in default are relatively low. Actually, for the official debt stock they range from 0.02 for the amount of IBRD debt in default to 0.27 for the amount of Paris Club debt in default, while for the private debt stock the correlation coefficients are between -0.01 for IBRD debt in default to 0.34 for the amount of debt in default with banks. Therefore, collinearity should not be an issue when the "magnitude" of default is included in the regression. Additionally, by including both indicators, the stock of debt and the amount

of debt in default, I take into account not only the quantity of financing but also the quality of that financing.

Furthermore, as a robustness check and given that default data for IBRD and IDA start in 1985, I add other specifications in which I exclude these defaults in order to increase the number of years in the sample. Also, as an additional robustness check, I include natural resource rents as share of GDP, which Gelos et al. (2011) do not include in that version of the paper,[43] but which could be relevant in order to explain financial flows in commodity-exporter countries. These tables can be found in Section A.4.

Finally, in order to understand the magnitude of the impacts on the dependent variables, it is key the relative importance of the different commitments. Official commitments and private commitments as share of GDP represented on average around 3.9 percent and 1.8 percent of GDP, respectively, over the sample period. Official commitments represent the highest share of commitments in developing countries, amounting to 72 percent of total commitments, versus 28 percent for private ones.[44] Furthermore, the official share of commitments has increased in the last decades reaching 75 percent of total commitments from 1990 to 2019, from 66 percent in the period that goes from 1970 to 1990.

4.1 Private Commitments

In the first regression of private commitments with lagged default dummies, shown in Table 3 in column PFE1, defaults to Paris Club, IMF and banks were found significant with a negative sign. Therefore, a default with any of these lenders would reduce private commitments. This reduction is more substantial for the default to IMF than for banks and the Paris Club. A default to the IMF would cut private funding almost in half, leaving it at 1 percent of GDP, while a default to banks would reduce private commitments to 1.3 percent of GDP and one to the Paris Club to 1.5 percent. Conversely, defaults to bondholders and the IBRD do not appear to have an effect on private commitments. However, defaults to IDA are significant and have a positive and substantial impact on private commitments. This may be related to the findings of Marchesi et al. (2021), that show how credit ratings improve after official debt restructurings, since a reduction of the debt stock with official lenders can enhance private lenders confidence.

[43] Nevertheless, Gelos et al. (2011) take natural resource indicators into account in a previous version.

[44] When either private or official commitments appear in IDS as missing I considered them to be zero. For more information on this assumption, please see A.1.1.

When using the contemporaneous defaults instead, in column PFE2, only banks and the Paris Club are significant and the impact of a default to the Paris Club is higher than the one to banks. A default to the Paris Club would decrease private commitments to 1.3 percent of GDP, while a default to banks would reduce them to 1.4 percent of GDP.

When lagged defaulted amounts are included as shown in column PFE3, defaults to the Paris Club, the IMF and banks remain significant and with the expected negative sign, while the positive effect of defaults to IDA stops being significant. Additionally, the amount of defaulted debt to bondholders becomes significant, signaling that whether a default to bondholders affects private funding is largely related to the size of it. However, this specification where lagged defaulted amounts are included should be considered an interaction model, where the interacted variables are the lagged amounts of debt in default and the constitutive terms are the lagged default dummies (Cruces and Trebesch, 2013, p. 103).[45] This implies that the coefficients of the dummies and the coefficients of the amounts of debt in default cannot be interpreted separately, thus, as in Cruces and Trebesch (2013), the amount of debt in default will capture at the same time the effect of the default itself and the effect of the size of the default.[46] Following Cruces and Trebesch (2013) and Brambor et al. (2006),[47] in order to analyze the overall effect that these defaults have on commitments, I estimate their marginal effects[48] taking into account the defaulted debt size through this equation:

$$Y_{i,t,l} = \beta_1 \mathbb{D}_{i,t-1} + \beta_5 \mathbb{M}_{i,t-1} \tag{2}$$

The results of this exercise for each of the defaults to the different lenders are shown in Figure 3. Defaults to official lenders do not generally affect private commitments, except for those defaults to the Paris Club of lower magnitude in terms of defaulted debt. However, the defaults to private lenders tend to be significant and of great magnitude. Defaults to banks would reduce private commitments, except for those defaults that are higher than 45 percent of GDP, approximately. Conversely, defaults to bondholders are not significant as long as the amount of debt in default is relatively low, but for defaults

[45] Similarly, in Cruces and Trebesch (2013) "the interacted variables are the lagged haircuts, while the lagged restructuring dummies are the constitutive terms, which should always be included in this kind of econometric setting" (Cruces and Trebesch, 2013, p. 103)

[46] Cruces and Trebesch (2013) underscore that "lagged haircut coefficients in that model will potentially pick up two effects at the same time: that of the default and that of the haircut" (Cruces and Trebesch, 2013, p. 103)

[47] Please, see `http://mattgolder.com/interactions`

[48] I repeat this equation for each of the lenders.

Table 3: Private Commitments as % of GDP: Fixed Effects Regression

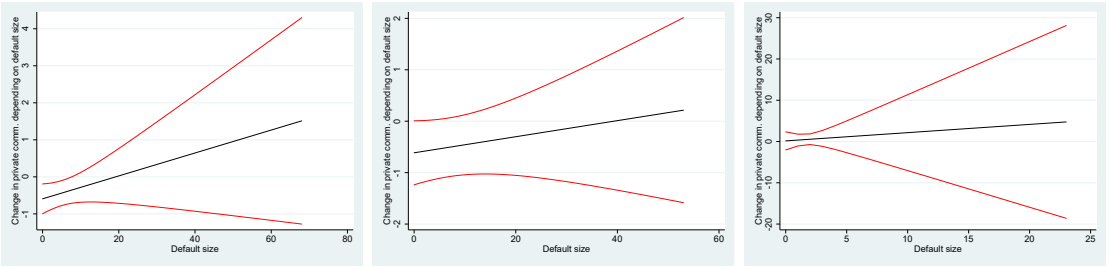
VARIABLES	PFE1	PFE2	PFE3
Growth of GDP pc	-0.012	-0.013	-0.010
	(0.018)	(0.018)	(0.016)
Real GDPpc	1.724**	1.876***	1.413**
	(0.709)	(0.684)	(0.555)
Trade openness	-0.006	-0.004	-0.001
	(0.007)	(0.007)	(0.007)
FDI as % GDP	-0.007	-0.003	-0.008
	(0.031)	(0.030)	(0.040)
Inflation (CPI)	-0.0002***	-0.0002***	-0.001*
	(0.000)	(0.000)	(0.001)
Conflict dummy (PITF)	0.067	0.024	0.267
	(0.304)	(0.317)	(0.290)
Total debt service as % exp. and inc.	0.033***	0.032**	0.028**
	(0.012)	(0.012)	(0.012)
Reserves in months of imp.	-0.199***	-0.189***	-0.203***
	(0.049)	(0.045)	(0.045)
Debt stock with off. creditors as % GDP	-0.019***	-0.019***	-0.026***
	(0.006)	(0.006)	(0.008)
Debt stock with priv. creditors as % GDP	0.019*	0.020*	0.037**
	(0.011)	(0.011)	(0.018)
Use of IMF credit as % GDP	-0.025	-0.026	-0.028
	(0.025)	(0.027)	(0.032)
Default with Paris Club (Lagged)	-0.332**		-0.594***
	(0.155)		(0.205)
Default with IMF (Lagged)	-0.823*		-0.614*
	(0.444)		(0.318)
Default with IBRD (Lagged)	0.868		0.151
	(0.730)		(1.119)
Default with IDA (Lagged)	2.309*		1.301
	(1.254)		(0.901)
Default with Banks (Lagged)	-0.545***		-0.440*
	(0.163)		(0.229)
Default with Bonds (Lagged)	-0.259		0.245
	(0.345)		(0.428)
Default with Paris Club (Contemp.)		-0.503***	
		(0.187)	
Default with IMF (Contemp.)		-0.716	
		(0.586)	
Default with IBRD (Contemp.)		1.224	
		(0.999)	
Default with IDA (Contemp.)		2.860	
		(1.760)	
Default with Banks (Contemp.)		-0.398*	
		(0.237)	
Default with Bonds (Contemp.)		-0.003	
		(0.341)	
Defaulted debt to Paris Club as % of GDP			0.031
			(0.022)
Defaulted debt to IMF as % of GDP			0.016
			(0.019)
Defaulted debt to IBRD as % of GDP			0.200
			(0.558)
Defaulted debt to IDA as % of GDP			-0.162
			(0.369)
Defaulted debt to Banks as % of GDP			-0.015
			(0.015)
Defaulted debt to Bonds as % of GDP			-0.075**
			(0.028)
Constant	-10.481**	-11.837**	-8.343**
	(5.051)	(4.921)	(3.832)
Observations	1,479	1,509	1,287
R-squared	0.178	0.183	0.214
Number of countries	54	54	54

Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

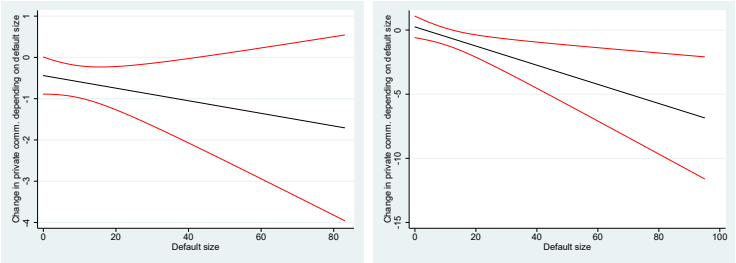
higher than 20 percent of GDP approximately, private commitments decrease substantially, even reaching a decline higher than 5 percent of GDP.

Figure 3: Expected Change in Private Commitments according to the Default Size to the Different Lenders

(a) Default to the Paris Club (b) Default to IMF (c) Default to IBRD



(d) Default to Banks (e) Default to Bonds



Note: The lines represent the expected change in private commitments after the default to every lender depending on the default size as share of GDP to that same creditor. Confidence intervals are calculated at the 95%. IDA defaults are not shown due to the small number of observations; nevertheless, results were not significant.

These results remain robust to the exclusion of IBRD and IDA defaults in order to increase the number of observations. As shown in columns PFE4 and PFE5 in Table 11 both Paris Club and banks defaults are significant with the expected sign, however IMF defaults are no longer significant in this specification. In column PFE8 lagged amounts of defaulted debt are included, while the aforementioned IBRD and IDA defaults and the amounts of defaulted debt to them are excluded, and the results do not change substantially: the amount of defaulted debt to bondholders is significant together with the dummies of default to banks and to the Paris Club.

Likewise, if I include as an independent variable natural resource rents as share of GDP, I find similar results. When lagged default dummies are used, I find that defaults to Paris Club, IMF and banks are significant with a negative sign, as shown in column PFE6 in Table 11. Defaults to IDA are also significant, but with a positive sign. When including the contemporaneous dummies of default in column PFE7, banks and IMF

defaults stop being significant. Nevertheless, natural resource rents are not significant in any of these specifications, and its effect might be somehow captured by country and time fixed effects.

Regarding other regressors apart from default variables, real GDP per capita, inflation, total debt service as share of exports and primary income, reserves in months of imports, and debt stock with private lenders and with official lenders were found significant in all specifications. GDP per capita is significant with a positive sign, meaning that richer countries tend to have more access to private funding, as expected. Conversely, inflation has a negative sign, so countries with higher inflation levels receive less private commitments on average. Total debt service is significant as well and its positive coefficient implies that the higher the debt service is, the higher private commitments will be, which could be related to debt roll-over. Reserves in months of imports show a negative sign, which suggests that high levels of reserves lower the need for private financing in developing economies.

Additionally, debt stocks with private and official creditors are significant, the first with a positive sign and the second with a negative sign. Therefore, while higher debt with private creditors is associated with higher private commitments, the opposite happens with official debt. Higher debt stocks with official creditors are negatively correlated with private commitments, suggesting some degree of substitution across lenders or a higher risk aversion of private lenders that take into account the official debt level of countries. It could also be related to the fact that private lenders may acknowledge the seniority that some official lenders enjoy. This is in line again with the findings of Schlegl et al. (2019) and Marchesi et al. (2021).

In order to evaluate the different impact that the significant independent variables have vis-à-vis the significant default dummies, I compute the overall estimated effect on private commitments associated to the differences in these variables between periods in default and periods where the country is not under those defaults. For instance, in order to evaluate the effect on private commitments of the differences in real GDP per capita in a Paris Club default, I compute the difference between the average GDP per capita under a Paris Club default and the average GDP per capita in periods of no default to Paris

Club, multiplied by its regression coefficient. A caveat of this analysis is that it takes into account each default separately, and does not account for the possibility of simultaneous defaults. Additionally, I also include the coefficient of the dummy and the corresponding coefficient of the amount of defaulted debt if only one of them is found significant given that, as explained, these two coefficients should not be interpreted separately.

Taking the regression PFE3 in Table 3, a Paris Club default would reduce private commitments by almost 0.6 percentage points, compared to -0.3 percentage points for the differential effect of GDP per capita, -0.1 percentage points for the differences in inflation, an increase of 0.1 and 0.2 percentage points for differences in total debt service and reserves in months of imports, -0.7 percentage points due to the relatively higher stock of official debt in periods of default with the Paris Club and an increase of 0.3 percentage points for the differences in the stock of private debt. The effect of the amount of debt in default to the Paris Club would increase private commitments by 0.3 percentage points of GDP. Therefore, the two main effects that reduce private commitments in a Paris Club default would be the default itself (-0.3 percentage points in net) and the differences in the stock of official debt. The latter points again to the seniority of official creditors shown by Schlegl et al. (2019). The net estimated effect of a Paris Club default on private commitments combining all the significant explanatory variables (except those related to other defaults) amounts to -0.9 percent of GDP, cutting private commitments in half.

I perform the same analysis for the rest of the significant defaults in regression PF3, according to the results in Figure 3. In the case of a default to banks, the main differences in significant independent variables that would decrease private commitments would be the default itself (-0.6 percentage points considering both the dummy and the amount of debt in default) and the difference in the stock of official debt (-0.9 percentage points). The combined effect of all significant explanatory variables (except those related to other defaults) on private commitments would reach -0.7 percent of GDP.

Finally, for the default to bondholders, the average amount of defaulted debt to bondholders would decrease private commitments by 0.7 percentage points, the most important effect, since the rest of the differences in the independent variables would add between 0.0 and 0.2 percentage points of GDP to private commitments. Also the default dummy

would add 0.2 percentage points to private commitments. Overall, the estimated effect of all significant independent variables, excluding those related to defaults to other lenders, on private commitments would be an increase of 0.2 percent of GDP. Further analysis on the significance of the independent variables can be found in Annex A.5.

In sum, several different types of default, both private and official, affect private commitments, and the magnitude of these impacts is considerable. This evidence suggests that private financial exclusion exists especially after the default to private lenders themselves, but also due to the default to other creditors.

4.2 Official Commitments

In the first regressions of official commitments as share of GDP on the lagged independent variables, none of the variables were found significant, as shown in column OFE1 in Table 4. However, when the contemporaneous default dummies are included instead, in column OFE2, the only variable that becomes significant is the default to the IBRD, and with a magnitude that would substantially reduce official commitments: from 3.9 percent of GDP to 1.6 percent of GDP, so in more than in half.

When the amounts of defaulted debt are included in column OFE3, defaults with banks and the amount of defaulted debt to the IMF and IDA become significant. However, as explained in Section 4.1, these coefficients cannot be interpreted individually but as part of an interaction model. To analyze the overall effect that these defaults have on commitments, I follow Cruces and Trebesch (2013) and estimate their marginal effects through Equation 2. The results are shown in Figure 4. Defaults to the Paris Club, the IBRD and bondholders are never significant. Defaults to banks are virtually not significant, as the confidence interval almost overlaps the zero line. Defaults to the IMF and IDA are significant with a positive sign for those amounts of defaulted debt that are above 8 percent and 1.5 percent of GDP, approximately. This could be related to bailout or debt relief programs from these institutions. In this regard, Avellán et al. (2021) show coordination of IMF programs with multilateral financial flows, which are part of official commitments. Therefore, a default to these institutions, probably in the context of a bailout or a debt relief program, is related to an increase of funds from official lenders.

Table 4: Official Commitments as % of GDP: Fixed Effects Regression

VARIABLES	OFE1	OFE2	OFE3
Growth of GDP pc	-0.017	-0.017	-0.032
	(0.021)	(0.020)	(0.025)
Real GDPpc	-0.735	-0.904	-0.728
	(0.653)	(0.608)	(0.643)
Trade openness	0.003	0.002	0.002
	(0.007)	(0.006)	(0.008)
FDI as % GDP	-0.052	-0.054	-0.065
	(0.042)	(0.041)	(0.043)
Inflation (CPI)	-0.000	-0.000	-0.002**
	(0.000)	(0.000)	(0.001)
Conflict dummy (PITF)	-0.125	-0.014	-0.050
	(0.269)	(0.225)	(0.284)
Total debt service as % exp. and inc.	0.010	0.006	0.007
	(0.010)	(0.010)	(0.009)
Reserves in months of imp.	-0.059	-0.051	-0.058
	(0.037)	(0.036)	(0.043)
Debt stock with off. creditors as % GDP	-0.005	-0.002	-0.015
	(0.008)	(0.007)	(0.011)
Debt stock with priv. creditors as % GDP	0.019	0.018	0.028
	(0.019)	(0.018)	(0.026)
Use of IMF credit as % GDP	0.039	0.039	0.040
	(0.033)	(0.034)	(0.045)
Default with Paris Club (Lagged)	0.162		0.404
	(0.207)		(0.349)
Default with IMF (Lagged)	0.020		0.013
	(0.803)		(0.950)
Default with IBRD (Lagged)	-1.075		1.679
	(0.748)		(1.661)
Default with IDA (Lagged)	0.992		-0.100
	(0.704)		(0.828)
Default with Banks (Lagged)	-0.417		-0.764*
	(0.294)		(0.385)
Default with Bonds (Lagged)	0.331		0.836
	(0.414)		(0.563)
Default with Paris Club (Contemp.)		0.115	
		(0.210)	
Default with IMF (Contemp.)		0.017	
		(0.496)	
Default with IBRD (Contemp.)		-2.343***	
		(0.750)	
Default with IDA (Contemp.)		0.399	
		(1.468)	
Default with Banks (Contemp.)		-0.289	
		(0.317)	
Default with Bonds (Contemp.)		0.265	
		(0.246)	
Defaulted debt to Paris Club as % of GDP			0.010
			(0.027)
Defaulted debt to IMF as % of GDP			0.168***
			(0.045)
Defaulted debt to IBRD as % of GDP			0.088
			(0.635)
Defaulted debt to IDA as % of GDP			0.997**
			(0.401)
Defaulted debt to Banks as % of GDP			0.006
			(0.022)
Defaulted debt to Bonds as % of GDP			-0.049
			(0.050)
Constant	9.390*	11.134**	9.754*
	(5.054)	(4.717)	(4.978)
Observations	1,479	1,509	1,287
R-squared	0.156	0.160	0.185
Number of countries	54	54	54

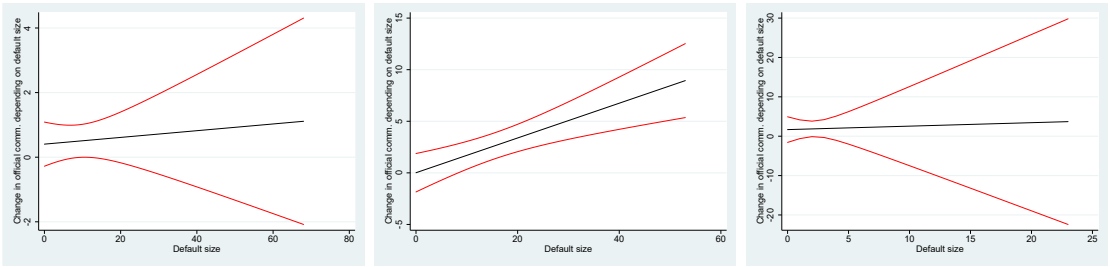
Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Regarding other explanatory variables, and similar to the results for private commitments, higher levels of inflation would reduce official commitments, since inflation can be perceived as poor macroeconomic policies, as explained by Gelos et al. (2011).

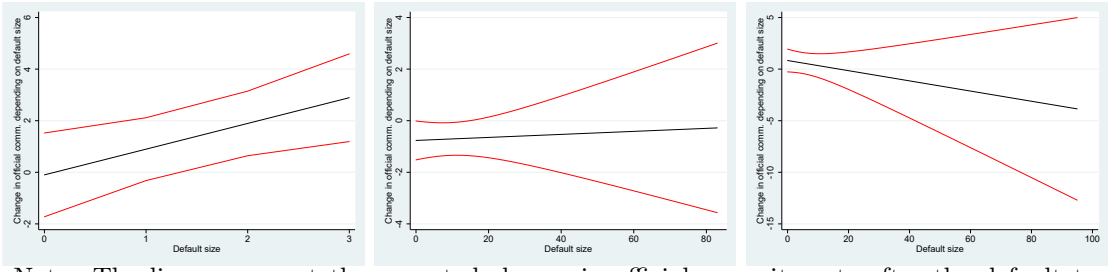
Apart from the impact of the default variables, there are other important differences between the results of the regression for private and official commitments. The lack of significant independent variables for official commitments suggests that the factors driving private commitments are not relevant in order to explain official flows, which may be driven by different reasons, such as political or historical.

Figure 4: Expected Change in Official Commitments according to the Default Size to the Different Lenders

(a) Default to the Paris Club (b) Default to IMF (c) Default to IBRD



(d) Default to IDA (e) Default to Banks (f) Default to Bonds



Note: The lines represent the expected change in official commitments after the default to every lender depending on the default size as share of GDP to that same creditor. Confidence intervals are calculated at the 95% level.

As a robustness analysis, when I exclude the defaults to IBRD and IDA, real GDP per capita, FDI and use of IMF credit become significant, as shown in Table 12 in columns OFE4, OFE5 and OFE8. However, their level of significance is relatively low. Real GDP per capita shows a negative sign, so official commitments would tend to be higher for poorer countries. Similarly, the sign of FDI, which is also negative, suggests that countries that obtain lower foreign private funds for the private sector tend to receive higher funds from official lenders. This is reasonable given that countries that attract relatively less private funds would probably require more official financing. Also, the use of IMF credit is positively correlated with official funds, again in line with Avellán et al. (2021).

When the amount of defaulted debt is also included in column OFE8 in Table 12, inflation becomes significant like in regression OFE3. Additionally, the default to bondholders becomes significant, with a positive sign, meaning that official lenders would increase their loans to countries that have defaulted on their bonds. This suggests that official lenders might offset the fall in private commitments when a default to bondholders takes place, since the amount of defaulted debt to bondholders reduces private commitments as seen in columns PFE3 in Table 3.

Additionally, when natural resource rents are added, either none of the independent variables are significant or only defaults to the IBRD are significant, depending on whether default dummies are lagged or not. In the case of a contemporaneous default to the IBRD, official commitments would decrease substantially to 1.6 percent of GDP. These results are shown in columns OFE6 and OFE7 in Table 12.

These results are also quite robust to changes in the dependent variable. In Table 13 the dependent variables, rather than official commitments, are their two components: bilateral commitments (in columns BFE1, BFE2 and BFE3) and multilateral commitments (in columns MFE1, MFE2 and MFE3) as share of GDP.[49] Bilateral commitments represent on average 1.7 percent of GDP while multilateral commitments reach 2.2 percent of GDP.

Regarding bilateral commitments, in the specifications in columns BFE1 and BFE2, the only significant default is the default to IBRD and with a magnitude that would make bilateral commitments disappear. Additionally, reserves in months of imports in BFE1 and debt stock with official creditors in all three regressions for bilateral commitments are significant at the 10 percent level and with a negative sign. The latter involves that bilateral commitments are lower when official debt levels are high.

Similarly, for multilateral lenders only defaults to the IMF (when default dummies are lagged) or to the IBRD (when default dummies are contemporaneous) are significant in columns MFE1 and MFE2. A default to IMF would cut multilateral commitments almost in half, to 1 percent of GDP, while a default to IBRD would decrease them to 1.5

[49] Similar to the rest of the data on commitments, if data were missing it was considered to be zero, as explained in Section A.1

percent of GDP. Furthermore, the conflict dummy becomes significant with a negative sign in the three specifications for multilateral debt, showing that multilateral commitments tend to decrease during conflicts.

When the amounts of defaulted debt are added in column BFE3, default dummies stop being significant for bilateral commitments, and only the amount of defaulted debt to the IMF and IDA are significant with a positive sign, which again points to the role of IMF as lender of last resort and the coordination with multilateral institutions underscored by Avellán et al. (2021). Also Horn et al. (2021) find evidence of bilateral support during crises among countries with close political and economic ties. Finally, when these defaulted amounts are added in the regression on multilateral commitments in column MFE3, the default dummy to banks becomes significant as in column OFE3 in Table 4.

Additionally, and similar to the analysis performed for private commitments, I evaluate the different impacts that the only significant independent variable apart from defaults, inflation, has vis-à-vis the defaults that are found significant in Figure 4. For defaults to the IMF, the average amount of debt in default would increase official commitments by 1.6 percent of GDP, while the dummy of default would have a negligible impact and the effect of the differences in inflation would contribute to reduce official commitments by 0.6 percentage of GDP. As a result, the combined effect of inflation and the default to the IMF would increase official commitments by 1.1 percent of GDP. Similarly, the average amount of defaulted debt to IDA would increase official commitments by 0.8 percent of GDP, while the default dummy and the differences in inflation would have a very small effect, leaving the combined effect of inflation and the default to IDA in an increase in official commitments of 0.8 percent of GDP.[50]

In sum, official commitments are affected by fewer types of default than private commitments, which in general are quite affected by sovereign defaults. The only defaults that affect official commitments are defaults to multilateral lenders and the IMF (with mixed effects). This different reaction causes an overall smaller effect of sovereign default on official financing. Additionally, the effect of the defaults on official commitments is not consistent across specifications and it is affected by the choice of independent variables

[50] As mentioned, this analysis takes into account each default separately, and as a result, it ignores the possibility of simultaneous defaults.

used in the different specifications. Meanwhile, private commitments as share of GDP are correlated even with defaults to official lenders, namely the Paris Club or the IMF, which do not affect private commitments directly. Furthermore, these results remain robust under several specifications.

Therefore, sovereign default has a modest impact on official commitments. This fact is even more relevant considering that official lending is the main source of financing in developing economies, which casts doubt on the way financial exclusion has been calibrated in the literature.

4.3 The Overall Effect on Commitments

In order to assess the impact of default on total commitments, that is, the net effect of default once private and official commitments are considered, it is also useful to perform the prior analysis but for the total amount of commitments a country receives. Therefore, I repeat the regressions run above but using as a dependent variable total commitments as share of GDP. The average total commitments as share of GDP amounts to 5.6 percent of GDP.

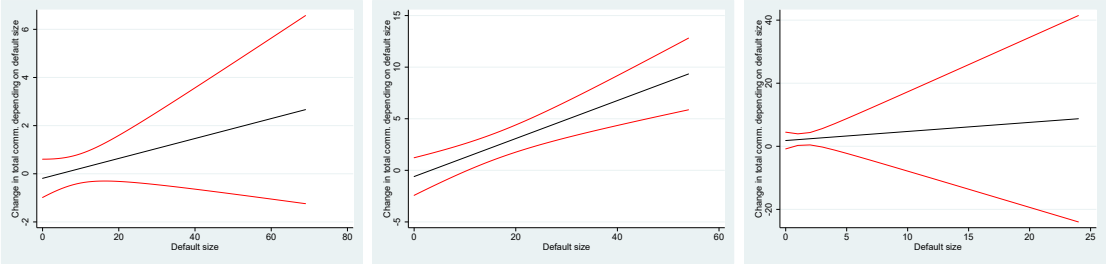
In the first regression with lagged default variables, in column TFE1 in Table 5, only the defaults to banks and to IDA are significant, the former with a negative sign and the latter with a positive sign. The number of defaults that are significant for total commitments is lower than for private commitments, but higher than for official funds: Paris Club, IMF, IDA (with a positive sign) and banks defaults are significant for private commitments and no default is for official funds.

Despite the coefficients in the regression for total commitments are greater, proportionally total commitments would decrease less than private commitments in case of default. For example, a default to banks would involve a reduction of total commitments to 4.7 percent of GDP, which means a 17 percent decrease compared to a 30 percent reduction for private commitments. This is expectable as official commitments are typically not affected by defaults.

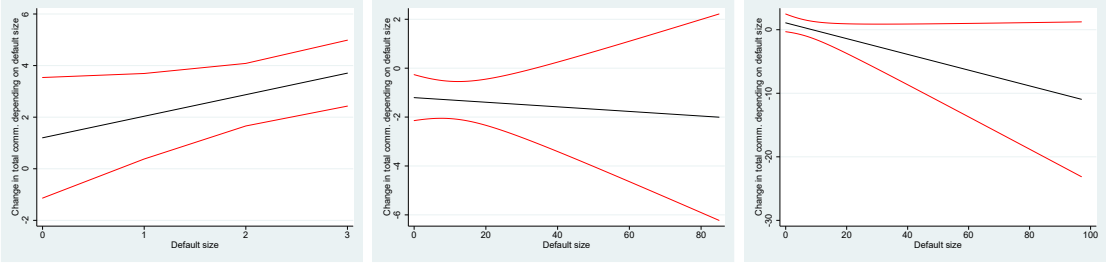
In the second specification, in column TFE2, only defaults to banks are significant, but not the Paris Club defaults (like in the private commitments regression) or IBRD defaults (as in the official ones). A default to banks would decrease total commitments to 4.9 percent of GDP, a smaller effect than on private commitments (12.5 percent fall versus 22 percent).

Figure 5: Expected Change in Total Commitments according to the Default Size to the Different Lenders

(a) Default to the Paris Club (b) Default to IMF (c) Default to IBRD



(d) Default to IDA (e) Default to Banks (f) Default to Bonds



Note: The lines represent the expected change in total commitments after the default to every lender depending on the default size as share of GDP to that same creditor and the confidence intervals are calculated at the 95%.

In the last specification, TFE3, and according to the results in Figure 5 defaults to the IMF and IDA -as in the official commitments regression- and to banks -as in the private commitments regression- are again significant, with a positive and negative effect, respectively. Therefore, compared to private, total commitments are not affected by defaults to the Paris Club or bondholders, and similar to official commitments, the default to the IMF and IDA has a positive impact on total commitments.

Thus, these results confirm the conclusions already presented: the effect of a default on total financing is limited due to the virtual lack of financial exclusion from official lending after most defaults.

Table 5: Total Commitments as % of GDP: Fixed Effects Regression

VARIABLES	TFE1	TFE2	TFE3
Growth of GDP pc	-0.029	-0.030	-0.043
	(0.028)	(0.027)	(0.027)
Real GDPpc	0.989	0.972	0.684
	(0.971)	(0.922)	(0.922)
Trade openness	-0.003	-0.003	0.001
	(0.010)	(0.010)	(0.011)
FDI as % GDP	-0.059	-0.057	-0.072
	(0.053)	(0.053)	(0.066)
Inflation (CPI)	-0.0004***	-0.0003***	-0.004***
	(0.000)	(0.000)	(0.001)
Conflict dummy (PITF)	-0.058	0.010	0.217
	(0.414)	(0.380)	(0.395)
Total debt service as % exp. and inc.	0.043***	0.038***	0.035**
	(0.013)	(0.014)	(0.014)
Reserves in months of imp.	-0.258***	-0.240***	-0.261***
	(0.044)	(0.042)	(0.038)
Debt stock with off. creditors as % GDP	-0.023**	-0.021*	-0.041***
	(0.012)	(0.011)	(0.015)
Debt stock with priv. creditors as % GDP	0.038**	0.038**	0.065**
	(0.016)	(0.017)	(0.030)
Use of IMF credit as % GDP	0.014	0.013	0.012
	(0.037)	(0.038)	(0.051)
Default with Paris Club (Lagged)	-0.169		-0.189
	(0.228)		(0.406)
Default with IMF (Lagged)	-0.803		-0.601
	(0.965)		(0.929)
Default with IBRD (Lagged)	-0.207		1.830
	(1.255)		(1.354)
Default with IDA (Lagged)	3.301*		1.201
	(1.689)		(1.193)
Default with Banks (Lagged)	-0.962***		-1.205**
	(0.336)		(0.480)
Default with Bonds (Lagged)	0.072		1.081
	(0.528)		(0.711)
Default with Paris Club (Contemp.)		-0.389	
		(0.307)	
Default with IMF (Contemp.)		-0.699	
		(0.723)	
Default with IBRD (Contemp.)		-1.119	
		(1.178)	
Default with IDA (Contemp.)		3.259	
		(2.030)	
Default with Banks (Contemp.)		-0.687*	
		(0.407)	
Default with Bonds (Contemp.)		0.262	
		(0.392)	
Defaulted debt to Paris Club as % of GDP			0.041
			(0.032)
Defaulted debt to IMF as % of GDP			0.184***
			(0.043)
Defaulted debt to IBRD as % of GDP			0.288
			(0.737)
Defaulted debt to IDA as % of GDP			0.836*
			(0.433)
Defaulted debt to Banks as % of GDP			-0.009
			(0.028)
Defaulted debt to Bonds as % of GDP			-0.124*
			(0.067)
Constant	-1.091	-0.703	1.411
	(7.370)	(6.812)	(7.180)
Observations	1,479	1,509	1,287
R-squared	0.190	0.183	0.218
Number of countries	54	54	54

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

5 Financial Terms: Official Loans' Interest Rates and Maturities

Another key element of official lending is the financial terms of its loans. If official creditors keep lending to countries after default, but they penalize them by substantially increasing the interest rate or decreasing the maturity, even if there is no financial exclusion, overall debt dynamics might be affected by those changes.

As Uribe and Schmitt-Grohé (2016) underscored, countries tend to suffer high spreads under default compared to normal times. However, it is important to distinguish between the market spread in the secondary markets and the actual spread that the countries experience when borrowing, meaning the spread on new debt commitments. If a country can tap other sources of funding while secondary market spreads are high, the effects of those spreads on the country's financial position may be lower than expected.

Regarding loans' conditions, official lenders tend to offer much more favorable terms. In this regard, I compute the average official spread on new debt commitments as the difference between the average interest on new official debt commitments and the the annual 6-month US Treasury bill.[51] This estimation poses some problems since the average interest rate may change due to changes in the maturity of the different loans. Furthermore, the maturity of the different commitments will be longer than the 6-month of the Treasury bill, however given the lack of disaggregated data, this is a useful approximation at least in terms of comparing official versus private average spreads. The average official spread is -0.8 percent compared to an average private spread of 2 percent, while the average interest rate on new official debt commitments over the sample period is 3.6 percent compared to 7 percent for private commitments. The average official spread became positive after 1990 reaching 0.2 percent, but well below the spread for private commitments of 2.8 percent. It is important to highlight that these are the actual interest rates that countries would face when they take on their new debt commitments, that is, in primary markets. These are often very different from those in the secondary market,

[51] Specifically it is computed as the "Average interest on new external debt commitments, official", from IDS database, minus the annual 6-month US Treasury bill secondary market rate (discount basis) obtained from the US Federal Reserve; and in the same way for the private spread, but using the "Average interest on new external debt commitments, private" instead.

since when spreads are too high, countries may decide not to borrow or to tap alternative sources of funding, such as official lending.

Furthermore, this lower official spread is not related to a lower average maturity of official loans. Indeed, the average maturity on new external official debt commitments is 23.5 years, compared to 10.5 years for private commitments over the sample period.

Therefore, it is important to understand how official financial terms are affected by default. I do not study the effect of sovereign default on private financial terms because this issue has been widely analyzed in the literature and also because the interest rates in IDS reflect the actual interest rate that countries are paying in primary markets, not the interest rate in secondary markets. The private loans' interest rate in primary markets may remain unaffected by financial exclusion, because it is computed taking into account not only international bank loans and bonds issuance, but also other private commercial credits.[52] Thus, it may reflect the cost of other financing different from that obtained from international banks and bondholders, and it could maintain a similar interest rate but at the expense of not being able to access private international financial markets.

To evaluate the effect of the different defaults on official financial terms, ideally I would evaluate how defaults affect official spreads. However, the use of the official spreads as dependent variable is problematic since the computation of spreads is biased by the lack of disaggregated data by maturity, which would allow to disentangle the effect of interest rates and maturity separately. Similarly, if I use as dependent variable the interest rate instead, I would need to include maturity as one of the controls (contemporaneous, not lagged), but this may cause a reverse causality issue. In order to circumvent these issues, I use as dependent variable an indicator of the interest rate weighted by maturity, that is, each year I weight the average official interest rate on new debt commitments by the average maturity of the new official commitments. An increase of this indicator implies either an increase of the interest rate or a fall of the maturity of the new loans, so in any

[52] According to IDS the average private interest rate on new debt commitments is computed as follows: "To obtain the average, the interest rates for all public and publicly guaranteed loans have been weighted by the amounts of the loans. Debt from private creditors include bonds that are either publicly issued or privately placed; commercial bank loans from private banks and other private financial institutions; and other private credits from manufacturers, exporters, and other suppliers of goods, and bank credits covered by a guarantee of an export credit agency".

case a tightening of financial conditions. Nevertheless, for the sake of completeness I also perform the same regressions for the interest rate and the maturity separately.

I follow the same strategy that I followed in Section 4, but changing the dependent variable to these new indicators. Additionally, I exclude total debt service as a control in the regression, since it is closely related to the interest rates themselves.[53] Therefore, I perform a panel data analysis with fixed effects and almost the same lagged controls (and contemporaneous default dummies in one of the specifications) as in Section 4. Likewise, I use time fixed effects and I cluster errors at the country level to account for cross-sectional and serial correlation.

The main result for the weighted interest rate indicator is that, while several of the controls used are significant, most defaults are not, and only defaults to the multilateral institutions are significant. These results are shown in Table 6. As shown in columns WFE1 and WFE2, defaulting to the IMF (both lagged and contemporaneous) and IDA (contemporaneous) is correlated with higher weighted interest rates, which may be related to the multilateral institutions' seniority shown by Schlegl et al. (2019). Therefore, when countries default to the IMF or IDA, official lenders seem to impose some kind of penalty on them by increasing the interest rate or shortening the maturity of new debt commitments. This result is also confirmed for the individual regressions for interest rates and maturities in Tables 14 and 15 and even more for IDA defaults since both defaults, lagged and contemporaneous, would decrease the official loans' maturities.

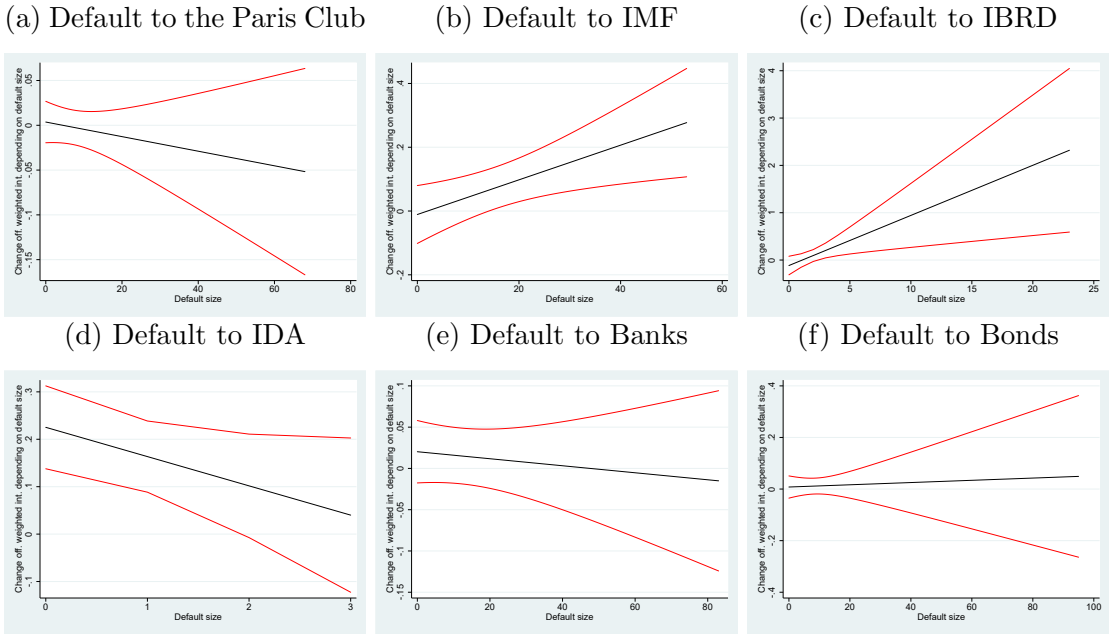
When the amount of defaulted debt is included in Table 6 in column WFE3, the dummy of default to IDA is again significant with a positive sign. Similarly, the amount of debt in default to the IMF and the IBRD are significant with a positive sign. These results remain unchanged in Tables 14 and 15 for unweighted interest rates and maturities, except for the negative effect of the amount of defaulted debt to IDA, which is not significant in order to explain official maturities. The interpretation of the coefficients in column WFE3 is the same as in the previous sections, and the marginal effect of the different defaults should be analyzed through the results of equation 2 shown in Figure 6. According to Figure 6, financial terms tend to worsen after a default to the IMF, the IBRD

[53] Total debt service is defined by IDS as: "the sum of principal repayments and interest payments".

or IDA which again is probably related to the seniority of multilateral lenders. These results give a different perspective to the findings in regression OFE3 in Section 4.2, where the defaults to the IMF and IDA were significant with a positive sign. Thus, apparently, the increase in official commitments after a default to the IMF or IDA is accompanied by an increase in the interest rate or a reduction in the maturity of these loans, meaning some kind of penalty in the case countries default to these lenders, even if official funds are not cut. The situation is similar for official financial conditions after a default to the IBRD, although in this case it is not accompanied by an increase in official commitments.

With respect to the rest of the controls, I find several significant variables. The growth of GDP per capita is significant with a negative sign, which means that when countries are growing they tend to pay lower official interest rates or enjoy higher maturities with official lenders. Similarly, reserves in months of imports also have a significant negative

Figure 6: Expected Change in Official Weighted Interest Rates according to the Default Size to the Different Lenders



Note: The lines represent the expected change in official weighted interest rates after the default to every lender depending on the default size as share of GDP to that same lender. Confidence intervals are calculated at the 95% level.

sign, so countries with higher reserves tend to pay lower official interest rates weighted by maturity, maybe due to their lower financing needs. These results are confirmed when interest rates and maturities are analyzed separately in Tables 14 and 15.[54]

[54]Growth of GDP per capita and reserves in months of imports have a significant negative coefficient for interest rates and a positive one for maturities. Despite the limitations of the individual regressions for interest rates and maturities already mentioned, these results suggest that the interest rate ratio decreases due to both, a negative effect on the numerator, and a positive effect on the denominator.

Table 6: Average Official Weighted Interest Rates: Fixed Effects Regression

VARIABLES	WFE1	WFE2	WFE3
Growth of GDP pc	-0.003***	-0.003***	-0.003***
	(0.001)	(0.001)	(0.001)
Real GDP pc	0.047	0.054	0.055
	(0.038)	(0.036)	(0.039)
Trade openness	0.000	0.000	0.000
	(0.000)	(0.000)	(0.001)
FDI as % GDP	-0.000	-0.000	0.000
	(0.002)	(0.002)	(0.002)
Inflation (CPI)	-0.000***	-0.000***	-0.000
	(0.000)	(0.000)	(0.000)
Conflict dummy (PITF)	-0.057***	-0.055***	-0.066***
	(0.017)	(0.018)	(0.018)
Total debt service as % exp. and inc.	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)
Reserves in months of imp.	-0.010***	-0.010***	-0.009***
	(0.001)	(0.001)	(0.001)
Debt stock with off. creditors as % GDP	-0.002***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.001)
Debt stock with priv. creditors as % GDP	0.000	0.000	0.001
	(0.001)	(0.001)	(0.001)
Use of IMF credit as % GDP	-0.002	-0.002	-0.002
	(0.001)	(0.001)	(0.002)
Default with Paris Club (Lagged)	-0.005		0.004
	(0.010)		(0.012)
Default with IMF (Lagged)	0.072**		-0.011
	(0.030)		(0.046)
Default with IBRD (Lagged)	-0.006		-0.116
	(0.042)		(0.100)
Default with IDA (Lagged)	0.047		0.225***
	(0.077)		(0.045)
Default with Banks (Lagged)	0.004		0.020
	(0.013)		(0.019)
Default with Bonds (Lagged)	0.006		0.008
	(0.018)		(0.022)
Default with Paris Club (Contemp.)		-0.005	
		(0.010)	
Default with IMF (Contemp.)		0.094***	
		(0.020)	
Default with IBRD (Contemp.)		-0.035	
		(0.039)	
Default with IDA (Contemp.)		0.106*	
		(0.059)	
Default with Banks (Contemp.)		0.002	
		(0.013)	
Default with Bonds (Contemp.)		0.008	
		(0.016)	
Defaulted debt to Paris Club as % of GDP			-0.001
			(0.001)
Defaulted debt to IMF as % of GDP			0.005**
			(0.002)
Defaulted debt to IBRD as % of GDP			0.106**
			(0.042)
Defaulted debt to IDA as % of GDP			-0.062*
			(0.033)
Defaulted debt to Banks as % of GDP			-0.000
			(0.001)
Defaulted debt to Bonds as % of GDP			0.000
			(0.002)
Constant	-0.009	-0.037	-0.083
	(0.291)	(0.278)	(0.298)
Observations	1,426	1,456	1,244
R-squared	0.190	0.205	0.193
Number of countries	54	54	54

Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Additionally, as shown in Table 6, the inflation coefficient has a negative sign, so countries with higher inflation would enjoy lower weighted interest rates. Nevertheless, the effect of inflation on the official weighted interest rates is very small. Indeed, inflation is generally not significant when interest rates and maturities are analyzed separately, and it neither is in column WFE3. The conflict dummy is significant with a negative sign, meaning that the official interest rates tend to be lower (or maturities higher) when a country faces a conflict situation. This result is supported by the individual regressions of interest rates and maturities shown in Tables 14 and 15. Official debt stocks are inversely correlated with the indicator of official weighted interest rates: the higher the official debt stock, the lower the interest rate, or the higher the maturity. Again the coefficients for the individual regressions on interest rates and maturities confirm these results since they are significant with a negative and a positive sign, respectively.

In sum, the financial terms of official loans are overall negatively affected by defaults to multilateral institutions, and only by them. When countries default to any other lender, the indicator of the official weighted interest rates remains unaffected, further supporting the lack of financial exclusion from official lending when countries do not honor their debt with private creditors and with many official lenders.

6 Conclusion

This paper tries to complement the literature on sovereign default by analyzing official lenders as creditors that can suffer default and that may or may not impose financial exclusion. When taking into account official lenders, financial exclusion is found to be, generally, at most partial. Official commitments tend to remain unaffected by most defaults, almost only correlated with defaults to multilateral institutions. Conversely, sovereign default has a substantial impact on private commitments, which are consistently correlated with many types of default. Indeed, they are even correlated with defaults to official lenders. Therefore, the main source of financing in developing economies, official funds, seems to follow different patterns in default, allowing countries to continue borrowing during a default episode. These results are further supported by the fact that official lenders do not worsen their financial terms when countries default to private lenders or to the Paris Club.

In sum, the main finding of this paper is to cast doubt on financial exclusion by taking into account official commitments. These results may have significant implications for the sovereign default models that have financial exclusion as a key assumption. These models assume that countries repay their debts to avoid financial exclusion and output losses, but when official lenders are included, there is no such exclusion, or at least not with the same magnitude. Therefore, financial exclusion should be re-calibrated in sovereign default models. Additionally, the substitution mechanism across the different lenders and the reasons behind the apparent selection in default deserve further study.

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A Appendix

A.1 Data

I use mainly the following databases in order to assemble the dataset used in this paper:

- **Beers et al. (2020b): BoC-BoE Sovereign Default Database: What's New in 2020?** (June 2020) and the information on methodology and assumptions in Beers et al. (2020a). Available at `https://www.bankofcanada.ca/2020/06/staff-analytical-note-2020-13/` (Accessed January 2021). Entire database used.

- **H.15 Selected Interest Rates retrieved from the Board of Governors of the Federal Reserve System**. Database available at: `https://www.federalreserve.gov/releases/h15/` (Accessed February 2021). Indicator used: 6-month Treasury bill secondary market rate - discount basis [$H15/H15/RIFSGFSM06\_N.A$].

- **Marshall, Monty G., Ted Robert Gurr, and Barbara Harff. 2019. Political Instability Task Force (PITF) Consolidated Problem Set, Historical State Armed Conflicts and Regime Crises, 1955-2018**. Political Instability (formerly, State Failure) Task Force (PITF). Revision September 2019. Center for Systemic Peace. Societal-Systems Research Inc, Vienna, VA. Web site: Center for Systemic Peace Web site: `http://www.systemicpeace.org/inscrdata.html`. Indicator used: I create a dummy that takes the value one when there is a conflict according to PITF Consolidated Problem Set.

- **World Bank. 2021. International Debt Statistics 2021.** Washington, DC: World Bank. doi:10.1596/978-1-4648-1610-9. License: Creative Commons Attribution CC BY 3.0 IGO. Database available at: `https://data.worldbank.org/products/ids` (Accessed February 2021)

- **World Bank. 2020. World Development Indicators**. Washington, D.C.:

World Bank. License: CC BY-4.0. Database available at: https://datatopics.worldbank.org/world-development-indicators/ (Accessed February 2021).

However, the sample of countries that I use is smaller than the one provided by Beers et al. (2020b) and World Bank's databases above. In addition to the changes introduced to the database already specified in Sections 3.1 and 4, I have done the following adjustments:

- I include only those countries that were common to IDS and Beers et al. (2020b) databases.

- I take into account in which year countries gained complete independence/sovereignty and adjusted the sample accordingly, since being completely independent is a relevant characteristic in order to talk about sovereign default. In this regard, I follow the BBC country profiles and country timelines available online at: http://news.bbc.co.uk/1/hi/country_profiles/default.stm. I further restrict the sample with the information for Bulgaria and Zambia in Gelos et al. (2011) regarding the date of inclusion in the sample of former soviet countries.

- I only include countries classified by the World Bank as lower-middle income and upper-middle income according to the World Bank's 2021 fiscal year classification. The reason why I exclude low income countries is because many times these countries have little access to private financial markets, not being as a result a good sample to study private financing vis-à-vis official funding.

- I exclude the countries with no records of default with the main six lenders (Paris Club, IMF, IBRD, IDA, banks and bondholders) in Beers et al. (2020b) database. In this regard, since Beers et al. (2020b) is a database on defaulted debt, when there is no record of debt in default with any of these lenders in the database, I assume there was no default, even though there may be defaults not recorded or included in one of the aggregate categories as explained in Section 3.1.

- Due to lack of debt data for several years in IDS database, I also exclude several countries from their date of inclusion (which depends on their independence or sovereignty, or the beginning of the database) to the first year with available debt data in IDS. The excluded periods by country are: Angola from 1975 to 1988, Bosnia Herzegovina in 1992, Cabo Verde from 1975 to 1980, Dominica from 1978

to 1980, Iran from 1970 to 1980, North Macedonia in 1992, St. Lucia from 1978 to 1980 and Vietnam from 1970 to 1978.

- Finally, I exclude Sao Tome and Principe, because of inconsistencies between IDS and default data; South Africa, because for the years with information on default, IDS does not provide information on debt; and countries with virtually no private commitments (Cambodia and Comoros, with just one year with positive private commitments each).

The final list of countries and dates included is provided in Section A.2, notwithstanding that there may be years with missing data that would further restrict the use of data in the regressions.[55]

A.1.1 Assumptions

When either official or private commitments are missing in IDS, I consider them to be zero. This decision is related, on the one hand, to the fact that in earlier versions of IDS many of the years where now commitments appear as missing used to be zero. On the other hand, there are no years with zero commitments in IDS, which seems unrealistic. Therefore, in order to exploit as much information as possible, I assume that all the years with missing commitments actually represent zero commitments. In this regard, it is highly likely that the previous difference between zero commitments and missing commitments was somewhat spurious, i.e. in both cases the absence of identifiable commitments, and as a result all of them were finally classified as missing.

This is a reasonable assumption considering that the sum of official and private commitments equals total commitments, and when I assume that the missing data equals zero, this equality is met with minimum differences (US$3 difference on average and with the highest differences around US$2,000, which is a negligible amount in terms of public debt). Therefore, as long as the amount of total commitments is not missing, I can obtain the ratio of private and official commitments as share of total commitments. Thanks to this change, the sum of official and private commitments as share of total commitments becomes 100 percent as it would be expected, and not a number higher than 100 percent

[55] For instance, there are many years for Myanmar with missing data in WDI.

as it occurred before I introduced this modification. I also follow the same strategy for total, multilateral and bilateral commitments.

I follow a similar criteria and for the same reasons for the debt stock with the different lenders. When there is information on the total stock of public and publicly guaranteed debt (which is the sum of the public and publicly guaranteed individual debt stocks) but the stocks for one or more creditors appear as missing, I consider them to be zero. Taking into account that in IDS debt stocks with individual creditors are never equal to zero, I believe this also is a reasonable assumption.

A.1.2 Data definitions

According to the definition provided by IDS, official commitments are "the amount of long-term loans for which contracts were signed in the year specified. Debt from official creditors includes loans from international organizations (multilateral loans) and loans from governments (bilateral loans). Loans from international organization include loans and credits from the World Bank, regional development banks, and other multilateral and intergovernmental agencies. Excluded are loans from funds administered by an international organization on behalf of a single donor government; these are classified as loans from governments. Government loans include loans from governments and their agencies (including central banks), loans from autonomous bodies, and direct loans from official export credit agencies. Long-term external debt is defined as debt that has an original or extended maturity of more than one year and that is owed to nonresidents by residents of an economy and repayable in currency, goods, or services."

On the other hand, private commitments are defined similarly: "the amount of long-term loans for which contracts were signed in the year specified; data for private nonguaranteed debt are not available. Debt from private creditors include bonds that are either publicly issued or privately placed; commercial bank loans from private banks and other private financial institutions; and other private credits from manufacturers, exporters, and other suppliers of goods, and bank credits covered by a guarantee of an export credit agency. Long-term external debt is defined as debt that has an original or extended maturity of more than one year".

A.2 List of Countries

Table 7: List of Countries

Countries	Years	Countries	Years
Albania	1991-2019	Jamaica	1970-2019
Algeria	1970-2019	Jordan	1970-2019
Angola	1989-2019	Kenya	1970-2019
Argentina	1970-2019	Kyrgyz Republic	1992-2019
Belize	1981-2019	Mauritania	1970-2019
Benin	1970-2019	Mexico	1970-2019
Bolivia	1970-2019	Moldova	1992-2019
Bosnia and Herzegovina	1993-2019	Morocco	1970-2019
Brazil	1970-2019	Myanmar	1970-2019
Bulgaria	1985-2019	Nicaragua	1970-2019
Cabo Verde	1981-2019	Nigeria	1970-2019
Cameroon	1970-2019	North Macedonia	1993-2019
Congo, Rep.	1970-2019	Pakistan	1970-2019
Costa Rica	1970-2019	Paraguay	1970-2019
Cote d'Ivoire	1970-2019	Peru	1970-2019
Djibouti	1977-2019	Philippines	1970-2019
Dominica	1981-2019	Russian Federation	1992-2019
Dominican Republic	1970-2019	Samoa	1970-2019
Ecuador	1970-2019	Senegal	1970-2019
Egypt, Arab Rep.	1970-2019	Serbia	1992-2019
El Salvador	1970-2019	Solomon Islands	1978-2019
Gabon	1970-2019	Sri Lanka	1970-2019
Georgia	1992-2019	St. Lucia	1981-2019
Ghana	1970-2019	Tanzania	1970-2019
Grenada	1974-2019	Turkey	1970-2019
Guatemala	1970-2019	Ukraine	1992-2019

Table 7: List of Countries

Countries	Years	Countries	Years
Guyana	1970-2019	Venezuela, RB	1970-2019
Honduras	1970-2019	Vietnam	1979-2019
Indonesia	1970-2019	Zambia	1990-2019
Iran, Islamic Rep.	1981-2019	Zimbabwe	1980-2019

A.3 Cross-Sectional Analysis

This Section complements the findings presented in Section 3.2.

A.3.1 Debt and Default

Debt tends to be high when countries default to their different creditors. The average debt by lender as share of GDP approximately doubles in the first year in default to each of the different lenders compared to their unconditional average.[56] [57]

Table 8: Debt by Lender as % of GDP: Unconditional Average and Average in the First Year in Default to Each of the Lenders

Unconditional	**Average**	**In Default**	**Average**
Bilateral Debt	16.8	Bilateral Debt	32.2
IMF Debt	2.5	IMF Debt	6.6
IBRD Debt	2.3	IBRD Debt	5.9
IDA Debt	4.0	IDA Debt	7.6
Banks Debt	4.7	Banks Debt	10.3
Bonds Debt	3.4	Bonds Debt	10.8

However, the picture changes slightly when analyzing debt by creditor as a percentage of total public and publicly guaranteed debt and use of IMF credit. For private lenders, their share doubles in the first year in default compared to their historical average, but that is not the case for official debt, which suffers an increase but not that high, as can be

[56] In order to analyze this issue across the different lenders, first I compute the average debt by lender over the entire sample and then, the average debt by lender in the first year in default with that specific lender as share of GDP or as share of total lending. I take the first year in default with each of the lenders, because being default a discrete event, it is the year in which default takes place. Therefore, for instance, in Table 8 the value of bilateral debt in the first year in default represents the debt with bilateral creditors in the first year in default to the Paris Club.

[57] The t-test confirms that the unconditional and under default averages are different for all lenders.

seen in Table 9. Although the debt share of official lenders also increases in the first year in default, this increase is smaller than the one experienced by private creditors. Indeed, the t-test confirms that the unconditional and under default averages are different for the Paris Club, the IBRD, banks and bondholders, but not for the IMF and IDA.

Table 9: Debt by Lender as % of Public and Publicly Guaranteed Debt and Use of IMF credit: Unconditional Average and Average in the First Year in Default to Each of the Lenders

Unconditional	**Average**	**In Default**	**Average**
Bilateral Debt	32.8	Bilateral Debt	37.0
IMF Debt	6.1	IMF Debt	6.9
IBRD Debt	5.8	IBRD Debt	9.9
IDA Debt	8.8	IDA Debt	13.5
Banks Debt	10.9	Banks Debt	21.6
Bonds Debt	10.8	Bonds Debt	21.6

Note: The average debt by lender in this table and in Table 8 does not comprise all possible lenders in a country. The rest of multilateral lenders apart from IBRD and IDA and other private creditors apart from banks and bondholders are not included in order to use the same debt categories as in default data. For the averages in the first year in default, the sum of all shares in this table is above 100% since these averages are computed for different years.

This is also related to the findings in Section 3.2.1 that show how defaults to official creditors tend to occur in periods of higher debt as share of GDP, which would lead to an increase of total debt as share of GDP for these lenders, but not necessarily to an increase of their debt share in total public debt.

A.3.2 Default Frequency

There are important differences in terms of the number of countries that have defaulted at least once to each of the different lenders over the sample period, with most countries having defaulted at least once to the Paris Club and to banks, but with less than a quarter of them defaulting to multilateral lenders.[58]

The differences are also significant regarding the number of years that the average country spends in default with its different creditors over the 1970-2019 period, or 1985-

[58]Specifically, 87 percent of the countries defaulted at least once to the Paris Club; 72 percent defaulted at least once to banks; 40 percent to bondholders; 30 percent to the IMF; 23 percent to IBRD; and 15 percent to IDA. Data for IBRD and IDA only cover from 1985.

2019 for the World Bank defaults. This number is especially high for banks and the Paris Club, as shown in Table 10. This may mean that there are more default episodes[59] to these lenders, or that these defaults take longer to be resolved.

The number of years in default tends to be higher after 1990 than before 1990 for all creditors except for the IMF, for which it remained stable. Before 1990, the highest number of years in default was with banks (4 years), but after 1990 the number of years in default to the Paris Club is the highest, 6.4 years. There are also significant differences across regions, with Latin American and Sub-Saharan African countries spending on average a higher number of years in default with most of their lenders.

Despite Beers et al. (2020b) database does not include the number of default episodes, but years in default, I can compute a lower bound for default episodes by assuming that if a country is in default several years consecutively, all of them belong to the same default episode. This assumption is quite mild since many papers consider that when several defaults occur consecutively in a few years they are part of the same default episode. Taking that into account, I can estimate the average number of default episodes by country over the sample period. The average country experienced the highest number of default episodes with the Paris Club and with banks, and the lowest with multilateral institutions.[60] These numbers are brought down by the fact that some countries have never experienced defaults with some of their lenders, since as shown in Section 3.2.3, countries do not usually default to all their lenders at the same time. These estimations are in line with the findings of Schlegl et al. (2019) who show that the number of Paris Club restructurings doubles the number of private ones. Also, Das et al. (2012), with a sample that covers 1950-2010, find that there are more restructurings with the Paris Club than with private lenders given that until 1990's the Paris Club did rarely provide debt relief, so countries had to reschedule their debts.

[59] As mentioned, an episode is the event that includes several years in default and goes from the moment that a country defaults to a lender until that default is resolved through rescheduling, write-off, etc.

[60] As already stated data on default cover between 1970 and 2019 for the Paris Club, IMF, banks and bondholders, and between 1985 to 2019 for IBRD and IDA. It also is important to take into account that not every developing country is eligible for IDA and IBRD loans, as IDA provides loans to the poorest countries, while IBRD works with middle income countries. Therefore, IBRD and IDA complement each other, although some countries may borrow from both at the same time. More information can be found in `https://www.worldbank.org/en/home`

Following the same approach, I estimate the duration of the different defaults by dividing the average number of years that a country spends in default with a lender by the number of default episodes with that same lender. Again, I find substantial heterogeneity across creditors, with duration of defaults with banks being the longest. As expected, this is again in line with the findings of Das et al. (2012), since Das et al. (2012) is one of the sources of Beers et al. (2020b), who show that restructurings with banks take longer than those with bondholders.

Table 10: Average Years in Default, Number of Default Episodes and Duration of Default Episodes (in Years) with the Different Lenders over the Sample Period

By Creditor	Years in default	Number of episodes	Duration of episodes
Paris Club	8.4	2.5	4.6
IMF	1.5	0.4	4.5
IBRD	1.3	0.3	4.5
IDA	0.8	0.2	5.1
Banks	8.2	1.1	8.7
Bonds	2.3	0.7	3.6

A.3.3 Default Simultaneity

In order to complete the analysis in Section 3.2.3 and have information on the share of defaulted debtors for the period 1970-2019 rather than from 1985, I need to disregard multilateral lenders for whom default data in Beers et al. (2020b) is only available from 1985. Using as measure the number of defaulted lenders every year in which a country is in default with any of its main creditors excluding multilateral institutions, I find that 57.5 percent of the defaults occur with just one creditor, 33 percent with two lenders, 9 percent with three, and only 0.1 percent with four creditors.

Nevertheless, not every country has positive debt stocks with all creditors every year, and thus, they do not have the possibility of defaulting to all of their creditors simultaneously. Then, adjusting this measure to only those years in which countries had positive debt stocks with their five main creditors (therefore the sample covers from 1985 to 2019),

even though this measure reduces the number of observations available in more than half, the results remain relatively similar: countries are in default with just one lender 48 percent of the years in default; with two creditors 30 percent of the years in default; with three lenders 12 percent of the years in default; with four creditors 8 percent of the years in default; and with five lenders 3 percent of the years in default.

A.4 Panel data analysis: Tables

Below I present the tables that complement the analysis in Sections 4 and 5. In Table 11 and 12, I present the robustness analysis for private and official commitments, respectively. This analysis is extended further for official commitments by changing the dependent variable to bilateral and multilateral commitments in Table 13.

Regarding official loans' financial terms, in Tables 14 and 15 I present the individual regressions for interest rates and maturities, respectively, which complement the regression on the indicator for the weighted interest rate in Section 5. These results should be analyzed cautiously due to the issues mentioned in Section 5 that arise when interest rates and maturities are assessed separately. The main differences compared to the results in Table 6 are that in one of the specifications in Table 14 for official unweighted interest rates, defaults to IBRD are significant with a negative sign. Similarly, defaults to the Paris Club are significant in order to explain official maturities in all specifications in Table 15 and with a positive coefficient. These apparent counterintuitive results might be related to the effect of changes in maturities for the former, and changes in interest rates for the latter. Additionally, there exist differences in other controls' significance between the individual regression for maturities in Table 15 and the regression for weighted interest rates in Table 6. In particular, real GDP per capita and the use of IMF credit are significant with a negative and a positive sign, respectively, in the regression for maturities, as shown in Table 15, but not in Table 6. This could be somehow related to changes in interest rates as well, since these variables are not significant when analyzing weighted and unweighted interest rates.

Table 11: Private Commitments as % of GDP: Fixed Effects Regression

VARIABLES	PFE4	PFE5	PFE6	PFE7	PFE8
Growth of GDP pc	0.016	0.014	-0.008	-0.010	0.018
	(0.018)	(0.019)	(0.017)	(0.017)	(0.018)
Real GDP pc	1.403**	1.451**	1.452**	1.614**	1.091**
	(0.594)	(0.599)	(0.582)	(0.607)	(0.493)
Trade openness	-0.003	-0.003	-0.003	-0.002	0.001
	(0.007)	(0.008)	(0.007)	(0.007)	(0.006)
FDI as % GDP	-0.010	-0.006	0.002	0.005	-0.005
	(0.031)	(0.031)	(0.032)	(0.032)	(0.040)
Inflation (CPI)	-0.0002***	-0.0002***	-0.0002***	-0.0002***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Conflict dummy (PITF)	0.057	0.088	0.016	-0.021	0.086
	(0.325)	(0.327)	(0.325)	(0.332)	(0.322)
Total debt service as % exp. and inc.	0.019*	0.021**	0.033***	0.031**	0.017
	(0.010)	(0.010)	(0.012)	(0.012)	(0.010)
Reserves in months of imp.	-0.206***	-0.208***	-0.184***	-0.176***	-0.208***
	(0.042)	(0.042)	(0.050)	(0.045)	(0.037)
Debt stock with off. creditors as % GDP	-0.013**	-0.014**	-0.018***	-0.018***	-0.021**
	(0.006)	(0.006)	(0.006)	(0.007)	(0.008)
Debt stock with priv. creditors as % GDP	0.033**	0.032**	0.019*	0.019*	0.049***
	(0.013)	(0.013)	(0.010)	(0.011)	(0.018)
Use of IMF credit as % GDP	-0.022	-0.025	-0.033	-0.033	-0.019
	(0.026)	(0.027)	(0.024)	(0.025)	(0.032)
Default with Paris Club (Lagged)	-0.416***		-0.333**		-0.544***
	(0.131)		(0.156)		(0.182)
Default with IMF (Lagged)	-0.106		-0.682*		0.236
	(0.419)		(0.386)		(0.638)
Default with Banks (Lagged)	-0.831***		-0.523***		-0.715***
	(0.186)		(0.168)		(0.243)
Default with Bonds (Lagged)	-0.113		-0.280		0.283
	(0.273)		(0.346)		(0.327)
Default with IBRD (Lagged)			0.994		
			(0.814)		
Default with IDA (Lagged)			2.289*		
			(1.251)		
Natural resource rents as % of GDP			-0.046	-0.043	
			(0.043)	(0.035)	
Default with Paris Club (Contemp.)		-0.490***		-0.510***	
		(0.171)		(0.190)	
Default with IMF (Contemp.)		-0.316		-0.560	
		(0.304)		(0.525)	
Default with Banks (Contemp.)		-0.688***		-0.377	
		(0.231)		(0.238)	
Default with Bonds (Contemp.)		0.007		-0.040	
		(0.305)		(0.352)	
Default with IBRD (Contemp.)				1.317	
				(1.042)	
Default with IDA (Contemp.)				2.757*	
				(1.621)	
Defaulted debt to Paris Club as % of GDP					0.018
					(0.024)
Defaulted debt to IMF as % of GDP					-0.016
					(0.032)
Defaulted debt to Banks as % of GDP					-0.019
					(0.014)
Defaulted debt to Bonds as % of GDP					-0.063**
					(0.026)
Constant	-7.422*	-7.774*	-8.280**	-9.712**	-5.360
	(3.857)	(3.899)	(3.915)	(4.239)	(3.270)
Observations	1,726	1,726	1,479	1,509	1,524
R-squared	0.210	0.208	0.183	0.187	0.250
Number of countries	55	55	54	54	55

Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 12: Official Commitments as % of GDP: Fixed Effects Regression

VARIABLES	OFE4	OFE5	OFE6	OFE7	OFE8
Growth of GDP pc	0.008	0.010	-0.015	-0.015	-0.001
	(0.019)	(0.019)	(0.021)	(0.020)	(0.021)
Real GDP pc	-1.095*	-1.103*	-0.913	-1.079	-1.131*
	(0.606)	(0.616)	(0.695)	(0.657)	(0.652)
Trade openness	0.006	0.007	0.005	0.003	0.005
	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)
FDI as % GDP	-0.081*	-0.084*	-0.046	-0.049	-0.104**
	(0.048)	(0.049)	(0.045)	(0.044)	(0.050)
Inflation (CPI)	-0.000	-0.000	-0.000	-0.000	-0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Conflict dummy (PITF)	-0.259	-0.217	-0.158	-0.044	-0.180
	(0.234)	(0.219)	(0.268)	(0.224)	(0.248)
Total debt service as % exp. and inc.	0.005	0.004	0.010	0.006	0.002
	(0.010)	(0.011)	(0.010)	(0.010)	(0.009)
Reserves in months of imp.	-0.037	-0.042	-0.049	-0.043	-0.039
	(0.036)	(0.037)	(0.040)	(0.039)	(0.044)
Debt stock with off. creditors as % GDP	-0.004	-0.004	-0.004	-0.002	-0.012
	(0.006)	(0.006)	(0.008)	(0.007)	(0.009)
Debt stock with priv. creditors as % GDP	0.016	0.014	0.019	0.018	0.026
	(0.016)	(0.016)	(0.019)	(0.018)	(0.020)
Use of IMF credit as % GDP	0.079*	0.087*	0.033	0.033	0.081*
	(0.041)	(0.046)	(0.032)	(0.033)	(0.048)
Default with Paris Club (Lagged)	0.185		0.162		0.276
	(0.206)		(0.207)		(0.322)
Default with IMF (Lagged)	1.277		0.111		1.981
	(1.723)		(0.792)		(1.479)
Default with Banks (Lagged)	-0.337		-0.403		-0.478
	(0.288)		(0.295)		(0.378)
Default with Bonds (Lagged)	0.537		0.318		0.967*
	(0.403)		(0.418)		(0.522)
Default with IBRD (Lagged)			-0.993		
			(0.788)		
Default with IDA (Lagged)			0.980		
			(0.713)		
Natural resource rents as % of GDP			-0.030	-0.029	
			(0.022)	(0.022)	
Default with Paris Club (Contemp.)		0.241		0.110	
		(0.230)		(0.211)	
Default with IMF (Contemp.)		-0.285		0.121	
		(0.624)		(0.485)	
Default with Banks (Contemp.)		-0.164		-0.275	
		(0.369)		(0.317)	
Default with Bonds (Contemp.)		0.403		0.239	
		(0.307)		(0.247)	
Default with IBRD (Contemp.)				-2.282***	
				(0.768)	
Default with IDA (Contemp.)				0.331	
				(1.484)	
Defaulted debt to Paris Club as % of GDP					0.013
					(0.026)
Defaulted debt to IMF as % of GDP					0.035
					(0.071)
Defaulted debt to Banks as % of GDP					-0.003
					(0.016)
Defaulted debt to Bonds as % of GDP					-0.026
					(0.037)
Constant	10.410**	10.502**	10.828*	12.555**	11.185**
	(4.310)	(4.363)	(5.474)	(5.152)	(4.603)
Observations	1,726	1,726	1,479	1,509	1,524
R-squared	0.193	0.190	0.157	0.162	0.221
Number of countries	55	55	54	54	55

Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 13: Bilateral and Multilateral Commitments as % of GDP: Fixed Effects Regression

VARIABLES	BFE1	MFE1	BFE2	MFE2	BFE3	MFE3
Growth of GDP pc	-0.011	-0.006	-0.011	-0.005	-0.015	-0.018
	(0.013)	(0.016)	(0.012)	(0.015)	(0.016)	(0.015)
Real GDP pc	-0.148	-0.588	-0.248	-0.656	-0.044	-0.684
	(0.557)	(0.484)	(0.592)	(0.449)	(0.563)	(0.450)
Trade openness	0.004	-0.001	0.004	-0.002	0.003	-0.001
	(0.006)	(0.004)	(0.006)	(0.003)	(0.006)	(0.004)
FDI as % GDP	-0.027	-0.025	-0.030	-0.024	-0.027	-0.038
	(0.025)	(0.030)	(0.025)	(0.029)	(0.029)	(0.030)
Inflation (CPI)	-0.000	-0.000	-0.000	-0.000	-0.001	-0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Conflict dummy (PITF)	0.259	-0.384**	0.253	-0.267*	0.302	-0.352**
	(0.175)	(0.189)	(0.174)	(0.159)	(0.203)	(0.173)
Total debt service as % exp. and inc.	-0.003	0.013*	-0.002	0.008	-0.004	0.010
	(0.006)	(0.007)	(0.006)	(0.007)	(0.006)	(0.008)
Reserves in months of imp.	-0.052*	-0.007	-0.046	-0.006	-0.049	-0.009
	(0.028)	(0.018)	(0.028)	(0.017)	(0.030)	(0.019)
Debt stock with off. creditors as % GDP	-0.008*	0.003	-0.007*	0.005	-0.011*	-0.004
	(0.004)	(0.005)	(0.004)	(0.005)	(0.007)	(0.006)
Debt stock with priv. creditors as % GDP	0.017	0.002	0.013	0.005	0.021	0.007
	(0.015)	(0.008)	(0.015)	(0.008)	(0.020)	(0.010)
Use of IMF credit as % GDP	-0.002	0.040	0.005	0.033	0.004	0.036
	(0.026)	(0.033)	(0.030)	(0.034)	(0.026)	(0.039)
Default with Paris Club (Lagged)	-0.007	0.170			0.240	0.165
	(0.143)	(0.159)			(0.274)	(0.205)
Default with IMF (Lagged)	1.054	-1.034***			0.077	-0.064
	(0.649)	(0.345)			(0.356)	(0.776)
Default with IBRD (Lagged)	-1.908***	0.834			0.762	0.917
	(0.629)	(0.591)			(0.696)	(1.308)
Default with IDA (Lagged)	0.823	0.169			0.427	-0.527
	(0.676)	(0.618)			(0.592)	(0.525)
Default with Banks (Lagged)	-0.209	-0.208			-0.260	-0.504**
	(0.226)	(0.180)			(0.278)	(0.206)
Default with Bonds (Lagged)	0.309	0.022			0.655	0.181
	(0.274)	(0.229)			(0.422)	(0.335)
Default with Paris Club (Contemp.)			-0.021	0.136		
			(0.147)	(0.142)		
Default with IMF (Contemp.)			0.495	-0.478		
			(0.359)	(0.291)		
Default with IBRD (Contemp.)			-1.647***	-0.697*		
			(0.602)	(0.351)		
Default with IDA (Contemp.)			0.956	-0.556		
			(0.900)	(0.657)		
Default with Banks (Contemp.)			-0.051	-0.237		
			(0.247)	(0.194)		
Default with Bonds (Contemp.)			0.216	0.048		
			(0.203)	(0.178)		
Defaulted debt to Paris Club as % of GDP					0.008	0.003
					(0.020)	(0.019)
Defaulted debt to IMF as % of GDP					0.178***	-0.010
					(0.021)	(0.035)
Defaulted debt to IBRD as % of GDP					-0.511	0.599
					(0.428)	(0.507)
Defaulted debt to IDA as % of GDP					1.115***	-0.117
					(0.257)	(0.228)
Defaulted debt to Banks as % of GDP					-0.007	0.012
					(0.014)	(0.013)
Defaulted debt to Bonds as % of GDP					-0.005	-0.045
					(0.031)	(0.032)
Constant	2.846	6.544*	3.952	7.182**	2.119	7.635**
	(4.312)	(3.744)	(4.602)	(3.486)	(4.360)	(3.512)
Observations	1,479	1,479	1,509	1,509	1,287	1,287
R-squared	0.117	0.138	0.114	0.136	0.128	0.167
Number of countries	54	54	54	54	54	54

Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 14: Average Official Interest Rates: Fixed Effects Regression

VARIABLES	IFE1	IFE2	IFE3
Growth of GDP pc	-0.030***	-0.029**	-0.038***
	(0.011)	(0.011)	(0.013)
Real GDP pc	0.800	0.894	0.923
	(0.641)	(0.622)	(0.625)
Trade openness	0.001	0.001	0.003
	(0.005)	(0.005)	(0.005)
FDI as % GDP	0.019	0.023	0.029
	(0.027)	(0.026)	(0.022)
Inflation (CPI)	-0.000	-0.000	-0.001
	(0.000)	(0.000)	(0.001)
Conflict dummy (PITF)	-0.596**	-0.575*	-0.651**
	(0.278)	(0.288)	(0.291)
Total debt service as % exp. and inc.	0.000	0.001	-0.000
	(0.007)	(0.007)	(0.007)
Reserves in months of imp.	-0.092***	-0.096***	-0.083***
	(0.017)	(0.017)	(0.019)
Debt stock with off. creditors as % GDP	-0.023***	-0.024***	-0.025***
	(0.004)	(0.004)	(0.007)
Debt stock with priv. creditors as % GDP	0.012	0.013	0.019
	(0.009)	(0.010)	(0.011)
Use of IMF credit as % GDP	-0.018	-0.018	-0.020
	(0.022)	(0.021)	(0.025)
Default with Paris Club (Lagged)	0.089		0.249
	(0.139)		(0.186)
Default with IMF (Lagged)	0.902**		0.076
	(0.352)		(0.622)
Default with IBRD (Lagged)	-0.606		-1.697
	(0.544)		(1.179)
Default with IDA (Lagged)	0.580		3.207***
	(1.035)		(0.628)
Default with Banks (Lagged)	0.126		0.405
	(0.205)		(0.255)
Default with Bonds (Lagged)	-0.015		0.233
	(0.242)		(0.299)
Default with Paris Club (Contemp.)		0.073	
		(0.140)	
Default with IMF (Contemp.)		1.294***	
		(0.258)	
Default with IBRD (Contemp.)		-1.186**	
		(0.451)	
Default with IDA (Contemp.)		1.524**	
		(0.747)	
Default with Banks (Contemp.)		0.125	
		(0.201)	
Default with Bonds (Contemp.)		0.084	
		(0.205)	
Defaulted debt to Paris Club as % of GDP			-0.022
			(0.015)
Defaulted debt to IMF as % of GDP			0.065**
			(0.030)
Defaulted debt to IBRD as % of GDP			1.625***
			(0.530)
Defaulted debt to IDA as % of GDP			-1.112***
			(0.388)
Defaulted debt to Banks as % of GDP			-0.003
			(0.011)
Defaulted debt to Bonds as % of GDP			-0.026
			(0.018)
Constant	0.393	-0.098	-0.943
	(4.909)	(4.792)	(4.862)
Observations	1,426	1,456	1,244
R-squared	0.505	0.532	0.531
Number of countries	54	54	54

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 15: Average Official Maturity: Fixed Effects Regression

VARIABLES	MFE1	MFE2	MFE3
Growth of GDP pc	0.121**	0.128***	0.136**
	(0.048)	(0.046)	(0.056)
Real GDP pc	-3.503*	-3.716**	-3.878**
	(1.967)	(1.731)	(1.862)
Trade openness	-0.012	-0.011	-0.016
	(0.017)	(0.017)	(0.018)
FDI as % GDP	-0.052	-0.076	-0.080
	(0.082)	(0.078)	(0.083)
Inflation (CPI)	0.000	0.000	0.004**
	(0.000)	(0.000)	(0.002)
Conflict dummy (PITF)	2.245***	2.329***	2.405***
	(0.660)	(0.582)	(0.646)
Total debt service as % exp. and inc.	-0.009	-0.011	0.002
	(0.026)	(0.026)	(0.029)
Reserves in months of imp.	0.467***	0.468***	0.462***
	(0.069)	(0.072)	(0.073)
Debt stock with off. creditors as % GDP	0.054***	0.058***	0.059**
	(0.019)	(0.019)	(0.025)
Debt stock with priv. creditors as % GDP	-0.033	-0.027	-0.052
	(0.031)	(0.029)	(0.035)
Use of IMF credit as % GDP	0.214**	0.189*	0.247**
	(0.095)	(0.096)	(0.119)
Default with Paris Club (Lagged)	1.387**		1.118*
	(0.540)		(0.648)
Default with IMF (Lagged)	-3.290**		3.537
	(1.625)		(2.193)
Default with IBRD (Lagged)	5.736		8.005
	(4.008)		(6.820)
Default with IDA (Lagged)	-11.949**		-20.408***
	(4.831)		(3.055)
Default with Banks (Lagged)	-0.029		-0.224
	(0.661)		(0.875)
Default with Bonds (Lagged)	-0.167		-0.362
	(0.853)		(1.235)
Default with Paris Club (Contemp.)		1.024**	
		(0.419)	
Default with IMF (Contemp.)		-2.461*	
		(1.258)	
Default with IBRD (Contemp.)		2.655	
		(2.791)	
Default with IDA (Contemp.)		-14.310**	
		(5.520)	
Default with Banks (Contemp.)		-0.288	
		(0.569)	
Default with Bonds (Contemp.)		-0.356	
		(0.666)	
Defaulted debt to Paris Club as % of GDP			0.038
			(0.051)
Defaulted debt to IMF as % of GDP			-0.485***
			(0.112)
Defaulted debt to IBRD as % of GDP			-4.876*
			(2.469)
Defaulted debt to IDA as % of GDP			2.187
			(3.391)
Defaulted debt to Banks as % of GDP			-0.006
			(0.030)
Defaulted debt to Bonds as % of GDP			-0.070
			(0.087)
Constant	46.039***	48.851***	48.980***
	(14.995)	(13.089)	(14.301)
Observations	1,431	1,461	1,247
R-squared	0.195	0.199	0.213
Number of countries	54	54	54

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

A.4.1 An Alternative Dependent Variable: Disbursements as Share of GDP

Private disbursements as share of GDP represent on average 1.6 percent of GDP annually, compared to 2.9 percent of GDP for official disbursements, which almost doubles private creditors' disbursements. When private disbursements are used as an alternative measure, results remain quite similar to those in the private commitments regressions. In the first specification in Table 16 in column PDFE1, Paris Club, IMF and banks defaults are significant with a negative sign, while defaults to IDA are significant with a positive sign. The significance and sign of the results are the same as those for private commitments, although with the reasonable changes in magnitude. In the second specification in column PDFE2, defaults with Paris Club and banks are significant with a negative sign and those with IDA are significant with a positive sign, the same results as in the private commitments regression except for the defaults to IDA.

In the last specification, PDFE3, defaults to Paris Club and banks are significant with a negative sign, and the magnitude of defaulted debt to banks and bondholders is also significant with a negative sign, while the amount of debt in default to the Paris Club is significant, but with a positive sign. These results are in line with those for private commitments, except for the fact that the defaulted debt to the Paris Club and banks is now significant. Despite the differences between the results in both sets of regressions, these do not involve a divergent interpretation of the main results already presented for private commitments, further supporting the conclusions of the paper.

Furthermore, the rest of the controls in Table 16 show the same sign and significance as in the regression for private commitments in Table 3, which confirms the robustness of the results.

Regarding official disbursements as share of GDP, in the first specification in Table 17 in column ODFE1, defaults to IDA and bonds, with a positive sign, and to banks, with a negative sign are significant. In the second specification in column ODFE2, apart from defaults to bondholders-with a positive sign- and to banks-with a negative sign-, also defaults to the IBRD are found significant with a negative sign and a large magnitude. The results for the IBRD are the same as in the commitments regression in Table 4,

Table 16: Private Disbursements as Share of GDP: Fixed Effects Regression

VARIABLES	PDFE1	PDFE2	PDFE3
Growth of GDP pc	-0.019	-0.021	-0.028*
	(0.015)	(0.015)	(0.015)
Real GDP pc	1.872**	1.983***	1.363***
	(0.719)	(0.697)	(0.435)
Trade openness	-0.007	-0.004	-0.001
	(0.008)	(0.007)	(0.007)
FDI as % GDP	-0.035	-0.030	-0.033
	(0.024)	(0.021)	(0.028)
Inflation (CPI)	-0.000**	-0.000***	-0.002**
	(0.000)	(0.000)	(0.001)
Conflict dummy (PITF)	0.052	0.010	0.171
	(0.270)	(0.275)	(0.266)
Total debt service as % exp. and inc.	0.024***	0.024***	0.017**
	(0.009)	(0.008)	(0.008)
Reserves in months of imp.	-0.140***	-0.136***	-0.138***
	(0.030)	(0.031)	(0.028)
Debt stock with off. creditors as % GDP	-0.013**	-0.014**	-0.021***
	(0.006)	(0.006)	(0.008)
Debt stock with priv. creditors as % GDP	0.034***	0.033***	0.056***
	(0.011)	(0.011)	(0.014)
Use of IMF credit as % GDP	-0.039	-0.034	-0.043
	(0.024)	(0.025)	(0.029)
Default with Paris Club (Lagged)	-0.311**		-0.529***
	(0.135)		(0.162)
Default with IMF (Lagged)	-0.823**		-0.375
	(0.380)		(0.239)
Default with IBRD (Lagged)	0.351		-0.556
	(0.456)		(0.663)
Default with IDA (Lagged)	1.743*		1.074
	(0.909)		(0.700)
Default with Banks (Lagged)	-0.738***		-0.468*
	(0.209)		(0.237)
Default with Bonds (Lagged)	-0.294		0.278
	(0.299)		(0.444)
Default with Paris Club (Contemp.)		-0.414**	
		(0.166)	
Default with IMF (Contemp.)		-0.843	
		(0.541)	
Default with IBRD (Contemp.)		0.652	
		(0.745)	
Default with IDA (Contemp.)		2.345*	
		(1.391)	
Default with Banks (Contemp.)		-0.421**	
		(0.209)	
Default with Bonds (Contemp.)		0.019	
		(0.307)	
Defaulted debt to Paris Club as % of GDP			0.027*
			(0.014)
Defaulted debt to IMF as % of GDP			0.027
			(0.017)
Defaulted debt to IBRD as % of GDP			0.571
			(0.422)
Defaulted debt to IDA as % of GDP			-0.114
			(0.287)
Defaulted debt to Banks as % of GDP			-0.027*
			(0.014)
Defaulted debt to Bonds as % of GDP			-0.085***
			(0.026)
Constant	-11.396**	-13.009**	-7.700**
	(5.262)	(5.107)	(3.241)
Observations	1,479	1,509	1,287
R-squared	0.208	0.206	0.249
Number of countries	54	54	54

Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1

while those for banks, bonds and IDA are different. The positive sign of the coefficient for the defaults to IDA, already found in column OFE3 in Table 4 delve into the idea of debt relief provided by this institution. And the result on the default to banks, which is similar to the results in other regressions for official commitments, shows a lower impact for this kind of default on official disbursements compared to private disbursements due to both, the larger magnitude of official disbursements as share of GDP, and the lower magnitude of the coefficient in the official disbursements' regression. Additionally, and similar to the results in OFE8 in Table 12, defaults to bondholders are significant with a positive sign pointing to official lenders offsetting the lower funding from private creditors after a default to bondholders. Concerning the last specification in column ODFE3, only banks defaults, with a negative sign, and defaults to bondholders are significant.

Additionally, the results for the rest of the controls are also very similar to the results in Table 4. Most controls are again not significant, although in the regression for official disbursements, debt stock with private creditors and use of IMF credit become significant with a positive sign. The latter points again to the the coordination among multilateral institutions highlighted by Avellán et al. (2021).

In sum, defaults tend to affect official disbursements in a different way compared to private disbursements, even by increasing the disbursements from official lenders after a default to bondholders or to IDA. Only defaults to banks would negatively affect official disbursements. Despite the differences with the results for official commitments, overall the results remain robust. Private funds, both commitments and disbursements, are affected by more types of default, and to a greater extent, than official ones. As a result, sovereign default has a smaller effect on official financing than it does on private financing. Additionally, while the effect of sovereign default on private funds is robust to changes in the regressions, the results for official funds are affected by the choice of the variables. In sum, sovereign default tends to have a smaller impact on official funds, the main source of financing for developing countries, than on private ones.

Table 17: Official Disbursements as Share of GDP: Fixed Effects Regression

VARIABLES	ODFE1	ODFE2	ODFE3
Growth of GDP pc	-0.022	-0.023	-0.029
	(0.016)	(0.015)	(0.019)
Real GDP pc	0.556	0.610	0.452
	(0.515)	(0.496)	(0.527)
Trade openness	0.003	0.003	0.003
	(0.004)	(0.005)	(0.004)
FDI as % GDP	-0.029	-0.030	-0.025
	(0.029)	(0.030)	(0.027)
Inflation (CPI)	0.000	0.000	-0.001*
	(0.000)	(0.000)	(0.001)
Conflict dummy (PITF)	-0.018	0.055	0.025
	(0.222)	(0.207)	(0.225)
Total debt service as % exp. and inc.	0.004	0.001	-0.003
	(0.007)	(0.007)	(0.006)
Reserves in months of imp.	-0.034	-0.029	-0.041
	(0.035)	(0.032)	(0.037)
Debt stock with off. creditors as % GDP	0.004	0.006	0.005
	(0.007)	(0.005)	(0.006)
Debt stock with priv. creditors as % GDP	0.024*	0.025*	0.029**
	(0.014)	(0.014)	(0.013)
Use of IMF credit as % GDP	0.083***	0.090***	0.077***
	(0.025)	(0.027)	(0.023)
Default with Paris Club (Lagged)	-0.024		0.124
	(0.143)		(0.229)
Default with IMF (Lagged)	-0.128		0.149
	(0.416)		(0.824)
Default with IBRD (Lagged)	-0.638		1.342
	(0.465)		(1.148)
Default with IDA (Lagged)	1.083*		0.822
	(0.644)		(0.738)
Default with Banks (Lagged)	-0.596**		-0.532**
	(0.233)		(0.249)
Default with Bonds (Lagged)	0.422*		0.680**
	(0.246)		(0.255)
Default with Paris Club (Contemp.)		0.153	
		(0.158)	
Default with IMF (Contemp.)		0.192	
		(0.393)	
Default with IBRD (Contemp.)		-2.071***	
		(0.436)	
Default with IDA (Contemp.)		-0.390	
		(0.401)	
Default with Banks (Contemp.)		-0.506*	
		(0.271)	
Default with Bonds (Contemp.)		0.581**	
		(0.250)	
Defaulted debt to Paris Club as % of GDP			-0.004
			(0.014)
Defaulted debt to IMF as % of GDP			0.050
			(0.036)
Defaulted debt to IBRD as % of GDP			-0.567
			(0.487)
Defaulted debt to IDA as % of GDP			-0.268
			(0.378)
Defaulted debt to Banks as % of GDP			-0.014
			(0.010)
Defaulted debt to Bonds as % of GDP			-0.049***
			(0.016)
Constant	-1.335	-1.396	-0.421
	(3.991)	(3.713)	(4.062)
Observations	1,479	1,509	1,287
R-squared	0.280	0.299	0.304
Number of countries	54	54	54

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

A.5 Significance of Independent Variables

In order to assess the joint significance of all individually significant independent variables, excluding the default dummies and the regressors of the amount of defaulted debt, I perform a Wald test. To estimate the effect of the independent variables under the different significant defaults according to the results in figures 3, 4 and 5 for the most demanding specification, I need to compute the difference of these variables between periods of default with each of the lenders and periods when they are not in default with each of them. In this analysis I only take into account those independent variables that were found significant for private, official and total commitments in columns PFE3, OFE3 and TFE3 in Tables 3, 4 and 5, respectively. Thus, the effect of the differences in the significant independent variables is computed as the sum of the products of the betas and the differences in values between periods of default to each of the lenders and periods of no default to each of them.

In case this expression is significantly different from zero, it would imply that a country in default would have some characteristics that make the country different in terms of commitments from another that is not in default, beyond the impact of the default decision. Thus, those characteristics, and not only the occurrence of default, would drive the change in commitments.

Table 18: Significance Level F Test

Creditor	**Private Commitments**	**Total Commitments**
Paris Club	0.1004	-
IMF	-	0.0145
IDA	-	0.1541
Banks	0.9961	0.7132
Bonds	0.0000	-

The results in Table 18 show that countries tend to be different in terms of private commitments when they default to bondholders, and in terms of total commitments if they default to the IMF. However, when defaults to the rest of the lenders are analyzed, the level of significance of the tests does not allow to reject the null that the independent variables are significantly different under default and under no default. In particular, the result for the defaults to banks and to the Paris Club may be related to the fact that these are the most common defaults in the sample.

The test for the official commitments regression is not included in the table since it always returns the same coefficient, 0.0236, given that there is only one significant independent variable in the regression, CPI, apart from the default dummies and the amounts of defaulted debt. Then, the difference in inflation under default and under no default is always significantly different from zero in terms of official commitments.

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