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Working Paper

Sovereign external borrowing and multilateral lending: Dynamics and crises

IDB Working Paper Series, No. IDB-WP-936

Provided in Cooperation with:

Inter-American Development Bank (IDB), Washington, DC

Suggested Citation: Avellán, Leopoldo; Galindo Andrade, Arturo José; Lotti, Giulia (2018) : Sovereign external borrowing and multilateral lending: Dynamics and crises, IDB Working Paper Series, No. IDB-WP-936, Inter-American Development Bank (IDB), Washington, DC, <https://doi.org/10.18235/0001443>

This Version is available at:

<https://hdl.handle.net/10419/208141>

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IDB WORKING PAPER SERIES Nº IDB-WP-0936

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Inter-American Development Bank
Office of Strategic Planning and Development Effectiveness

November, 2018

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Cataloging-in-Publication data provided by the
Inter-American Development Bank
Felipe Herrera Library

Leopoldo Avellán.

Sovereign external borrowing and multilateral lending: dynamics and crises / Leopoldo Avellán, Arturo Galindo, Giulia Lotti.

p. cm. — (IDB Working Paper ; 936)

Includes bibliographic references.

1. Development banks. 2. Capital movements-Developing countries. 3. Debts, External-Developing countries. 4. Debts, Public-Developing countries. 5. Fiscal policy-Developing countries. 6. Financial crises-Developing countries. I. Galindo, Arturo. II. Giulia Lotti. III. Inter-American Development Bank. Office of Strategic Planning and Development Effectiveness. IV. Title. V. Series.

IDB-WP-936

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Sovereign External Borrowing and Multilateral Lending: Dynamics and Crises

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Abstract

Fiscal policy and net capital inflows in developing countries are procyclical. A large amount of literature has examined this phenomenon and explored its consequences for aggregate fluctuations. Multilateral development banks (MDBs) are an important source of external finance for governments and hence play a key role in financing the execution of fiscal policy. The literature has found evidence that government borrowing from MDBs is countercyclical, but how are MDB flows related to fiscal policy? Does this relationship depend on whether the government is running a deficit or a surplus, or would this relationship change if the sovereign is going through a fiscal crisis? Do the differences in the scope and corporate structure between MDBs translate into different disbursement patterns? Beyond their impact to foster development in recipient countries, understanding the behavior of MDB flows is important to assess their contribution to macroeconomic stability. This paper answers these questions studying the co-movement of sovereign lending from MDBs with government expenditure and with private sovereign lending in different fiscal policy stances and during fiscal crises. The paper finds that multilateral sovereign lending is correlated with government expenditure, and that this correlation does not change if the government is running a surplus or a deficit. When considering total MDB lending, this co-movement holds even in fiscal crises. Finally, the paper finds evidence of synchronization between multilateral development banks and the International Monetary Fund during fiscal crises.

JEL codes: F21, F34, F41, F44, F53

Keywords: International government debt, capital flows, multilateral development banks

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We are grateful to Guillermo Vuletin, Erin Bautista and an anonymous referee for valuable comments. We also thank Andrés Gómez-Peña, Lina M. Botero and David Einhorn for editorial assistance.

1. Introduction

Multilateral development banks (MDBs) were created after World War II to provide countries with financing directed toward development. Thanks to their high credit ratings, MDBs can borrow by issuing bonds on international capital markets at low costs. Given that their mandate is not to maximize profits, but rather sustain development activities, MDBs are subsequently able to lend to developing countries with only a narrow mark-up, even under grim domestic macroeconomic conditions or even when the government has no direct access to international financial markets. This unique financial model makes MDBs loans attractive to governments (Humphrey 2017). Indeed, their relevance as a reliable source of sovereign funding has increased over time, especially for low- and middle-income countries where their flows are larger than flows coming from private lenders.

This rising role as development partners has made MDBs critical to the execution of fiscal policy and could even have positive macroeconomic externalities such as contributing to directly increase external liquidity, or indirectly, by catalyzing private capital inflows. This is particularly crucial nowadays given that globalization has increased markedly, with countries becoming more dependent on global financial conditions and hence more vulnerable to crises. The response to crises is then acquiring more relevance and MDBs can play a role in restoring the necessary confidence to attract global investors as fast as possible, minimizing output losses and preventing the spreading of crises to other countries.

This paper studies the relationship between MDB flows and fiscal policy. It lies at the intersection of two strands of the literature. The first is the literature on the dynamics of international capital flows, spurred by the interest in financial crises over the last three decades. The large literature that looks at the cyclicity of international capital flows finds that, overall, net capital inflows are procyclical (Broner et al. 2013; Kaminsky et al. 2005). The procyclicality of capital flows can amplify business cycles, increasing consumption and spending in periods of capital flow bonanzas and imposing substantial adjustments when foreign capital no longer flows into the country (Levy Yeyati and Zúñiga 2015; De la Torre, Didier, and Pienknagura 2015). But when distinguishing by the lender of international government borrowing, there seems to be evidence of some heterogeneity in the behavior of capital flows. While private net lending to developing and emerging economies is procyclical (Galindo and Panizza 2018; Araujo et al. 2017; Levy Yeyati 2009; Dasgupta and Ratha 2000), there is scarce literature that looks at the cyclicity of multilateral institutions, emphasizing their countercyclical role (Galindo and Panizza 2018; Humphrey and Michaelowa 2011; Dasgupta and Ratha 2000), or that analyses the IMF lending responsiveness in crises (McDowell, 2017; Mody and Saravia, 2013).⁴

Some have also analyzed the reaction of capital flows to crises in more detail. Broner et al. (2013) use a composite crisis indicator for banking, currency, and debt crises and find that in times of crises, capital flows decline. Dasgupta and Ratha (2000) test the response of net foreign direct

⁴ Specifically, Mody and Saravia (2013) find that the IMF responds more promptly to countries in severe crises, and McDowell (2017) when borrowers are more exposed to bond markets and short-term debt and the threat of capital flight is higher.

investment flows to balance of payments crises (1984–1989, 1995, and 1997), but do not find significant associations. Ratha (2005) examines cross-country data in 1980–2000 and finds that World Bank lending increased in the 1998–1999 Asian crisis.⁵ Humphrey and Michaelowa (2011) examine the behavior of different institutions in years of global or regional economic crises (1982–1983, 1995, 1998–1999, and 2009)⁶ and find that in 1998–1999 and 2009 the World Bank and the Inter-American Development Bank increased their financial support.⁷ Humphrey and Michaelowa (2013) study lending commitments by the same three MDBs but for a different set of countries and years: Bolivia, Colombia, Ecuador, Peru, and Venezuela in 1991–2010.⁸ They find that the global financial crisis reduced World Bank lending, which they interpret as a supply restriction, while Inter-American Development Bank lending increased. Like the World Bank, Andean Development Corporation lending also decreased, most likely due to a spike in its own cost of funding.

The second strand of the literature looks at the procyclicality of fiscal policy. A vast body of empirical literature has found that fiscal policy is procyclical for developing and middle-to-high-income countries, reinforcing the business cycle further, and harming the economy when conditions are already critical (Végh, Lederman, and Bennett 2017; Gerling et al. 2017; Bova, Carcenac, and Geurguil 2014; Frankel, Végh and Vuletin 2013; Reinhart and Reinhart 2008; Ilzetski and Végh 2008; Alesina, Campante, and Tavellini 2008; Talvi and Végh 2005; Kaminsky et al. 2005; Tornell and Lane 1999; Gavin and Perotti 1997; Cuddington 1989). Multiple factors can explain this behavior, including political economy distortions and the quality of governments (Avellán and Vuletin 2015; Ilzetski and Végh 2008; Talvi and Végh 2005; Tornell and Lane 1999).⁹ Another cause can be that in bad times, when countries lack access to capital markets due to the procyclicality of capital flows, those countries are unable to adopt countercyclical fiscal policies. On the other hand, when international capital is plentiful, government spending increases excessively (Végh, Lederman, and Bennett 2017; Levy Yeyati and Zúñiga 2015; Frankel, Végh and Vuletin 2013; Kaminsky et al. 2005; Reinhart and Reinhart 2008).

MDB lending has been analyzed mainly from the supply side (Humphrey 2014; Dreher et al. 2010; Dreher et al. 2009a, 2009b; Kilby 2006, 2011, among many others).¹⁰ However, as Humphrey and Michaelowa (2013) point out, in recent decades countries have gained stronger financial and fiscal positions, some achieving high sovereign credit ratings and attracting investors more easily: ignoring the demand side in the analysis of MDB lending is no longer adequate. There is little research on the dynamics of MDB lending when a country's demand for credit increases and we

⁵ The author finds that World Bank lending increases not only during crises, but more in general when debt service payment increases, and international reserves decline.

⁶ The authors also examine country crises defined based on the rankings for sovereign borrower risk in the annual Institutional Investor Index, on the overall fiscal balance of the central government as a share of GDP, and on international reserves divided by external short-term debt.

⁷ For the remaining years, the authors do not observe significant differences in multilateral lending.

⁸ Humphrey and Michaelowa (2011) focus instead on 10 countries in Latin America and the Caribbean in 1980–2009.

⁹ Political economy distortions include political pressures or rent-seeking activities that call for expansionary fiscal policy in good times (Avellán and Vuletin 2015; Ilzetski and Végh 2008; Talvi and Vegh 2005; Tornell and Lane 1999). The quality of governments is captured by regulatory quality, government effectiveness, control of corruption and rule of law in Avellán and Vuletin (2015), by the legal-political institutional infrastructure and fractionalization of power in Tornell and Lane (1999).

¹⁰ See Humphrey and Michaelowa (2013) for a more complete of papers.

aim to address this gap by empirically exploring the relationship between MDB lending to the government and public expenditure in line with different fiscal policy stances. Learning how MDB flows regularly co-move with the execution of fiscal policy is also important because it furthers understanding of how these institutions exacerbate or dampen capital flow cycles. Furthermore, assessing how the relationship of MDB flows and government spending evolves during fiscal crises can shed light on the role of MDBs as external liquidity providers.

This paper begins with a discussion of the evolution of net flows for the public sector from MDBs and private creditors since the 1980s. For most countries, net flows from MDBs are larger and less volatile than net flows from the private sector, but there is some heterogeneity depending on the country's income level.

To measure how MDB lending¹¹ is systematically related to the demand of borrowing countries, we look at government expenditure. The analysis shows that when countries' government expenditure increases, net borrowing from foreign creditors increases as well, and this is true for all creditors, confirming the correlation between fiscal policy and capital inflows found in the literature. No asymmetries are found when assessing whether this behavior differs when the government is in surplus or deficit.

Given the co-movement of every creditor with the fiscal policy within a country, the analysis checks whether there are cases where external private capital markets and MDBs move in opposite directions. The analysis finds that while in the 1980s there was a positive relationship between net flows from MDBs and the private sector, this relationship became negative in the 1990s and non-significant in recent decades. The shift in the association between net flows might be related to the high frequency of fiscal crises in the 1990s.¹²

To explore the issue above further, the analysis turns to the behavior of net flows around different types of fiscal crises. In particular, a distinction is made between fiscal crises due to credit events, exceptionally large official financing, implicit domestic public debt default, and loss of market confidence. The analysis finds that private creditors and MDBs behave differently in times of fiscal crises. While private net flows are negatively associated with credit crises, net flows from regional development banks (RDBs) are positively correlated. In crises where there is exceptionally large official financing – that is, when countries ask for support from the International Monetary Fund (IMF) – the analysis finds that all MDBs increase their financial support, which illustrates strong synchronization among these institutions. While all the MDBs' net flows are negatively correlated with implicit public defaults, net flows from private creditors do not change. In the case of crises driven by a loss of market confidence, private net flows decrease, but MDBs do not change their net flows.

Finally, the analysis looks at whether the relationship between government borrowing and expenditure changes at times of country-specific fiscal crises. It is noted that overall the

¹¹ Throughout the paper we define lending as net flows and not only approvals.

¹² The analysis was unable to disentangle whether there is crowding out of private net flows due to net flows from multilateral development banks, as only simple correlations were examined.

association with total multilateral lending remains positive, with few exceptions when we disaggregate by the type of multilateral organization.

The remainder of the paper is organized as follows. We provide a description of the data in Section 2. We discuss the empirical strategy in Section 3 and present the results in Section 4. We perform some robustness checks in Section 5 and give some final conclusions in Section 6.

2. Data

To study the dynamics of international government lending, this paper focuses on net flows received by the government during the year, that is, disbursements minus principal repayments. The World Bank's World Development Indicators are used as a source for net flows in current U.S. dollars from MDBs,¹³ RDBs,¹⁴ the World Bank,¹⁵ other multilateral institutions,¹⁶ and private creditors.¹⁷ RDBs, the World Bank and other multilateral institutions are all part of the MDBs, but they are also analyzed separately to explore potential differences in sovereign lending.

The sample includes 108 countries and totals 3,411 observations with non-missing net flows in the 1980–2015 period. High-income countries and countries that have fewer than 20 observations for GDP are excluded from the analysis.¹⁸ The analysis also uses nominal GDP (in local currency units [LCUs] or in U.S. dollars) from the World Bank's World Development Indicators. The countries in the sample are depicted in Figure 1.

To investigate the relationship between net flows and fiscal policy, the analysis uses general government total expenditure and primary fiscal balance from the IMF's *World Economic Outlook*. The former is defined as total expense and the net acquisition of nonfinancial assets (in LCUs), and the latter is defined as net lending/borrowing plus net interest payable/paid (interest expense minus interest revenue, also in LCUs).

To analyze the behavior of capital flows around fiscal crises, the analysis uses the database of fiscal crises prepared by Gerling et al. (2017). Those authors define fiscal crises as periods of extreme funding difficulties that result in a disruption in the normal debt dynamics and in the

¹³ Public and publicly guaranteed multilateral loans include loans and credits from the World Bank, RDBs, 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.

¹⁴ Net flows from RDBs include concessional and non-concessional financial flows. Concessional flows cover disbursements made through concessional lending facilities, and non-concessional financial flows cover the remaining flows. RDBs include the African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, and Inter-American Development Bank.

¹⁵ Net flows from the World Bank are the sum of net flows from the International Bank for Reconstruction and Development, the founding and largest member of the World Bank Group, and the International Development Association, the concessional loan window of the World Bank Group.

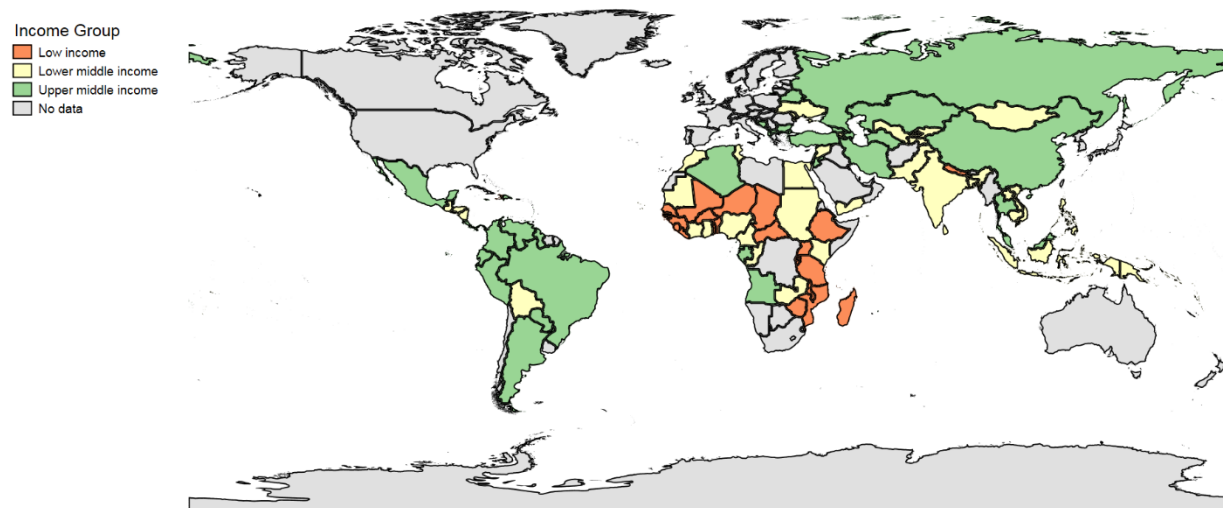
¹⁶ "Other multilateral organizations" is a residual category that includes the Caribbean Development Fund, Council of Europe, European Development Fund, Islamic Development Bank, Nordic Development Fund, and similar entities.

¹⁷ Public and publicly guaranteed debt from private creditors includes 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, as well as bank credits covered by a guarantee of an export credit agency.

¹⁸ They are excluded because the analysis will later calculate the trend of GDP, and it is important not to base the calculations on too few observations. Countries with fewer than 20 observations are Aruba, Afghanistan, Faeroe Islands, Iraq, Myanmar, Montenegro, Somalia, Serbia, São Tomé and Príncipe, and South Africa.

government taking exceptional measures. The authors distinguish between four main types of fiscal crises: credit events, exceptionally large official financing, implicit domestic public debt default, and loss of market confidence.¹⁹

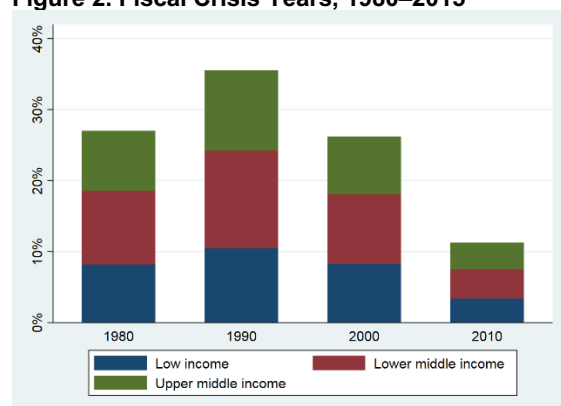
Figure 1. Countries in the Dataset, by Income Group



Source: Authors' calculations.

As Figure 2 shows, fiscal crisis years vary by decade and income group: in the 1990s, for example, 35.52% of fiscal crisis years out of the total observed in the sample occur (10.47%, 13.75%, and 11.3% in low-, lower-middle-, and upper-middle-income countries respectively)

Figure 2. Fiscal Crisis Years, 1980–2015



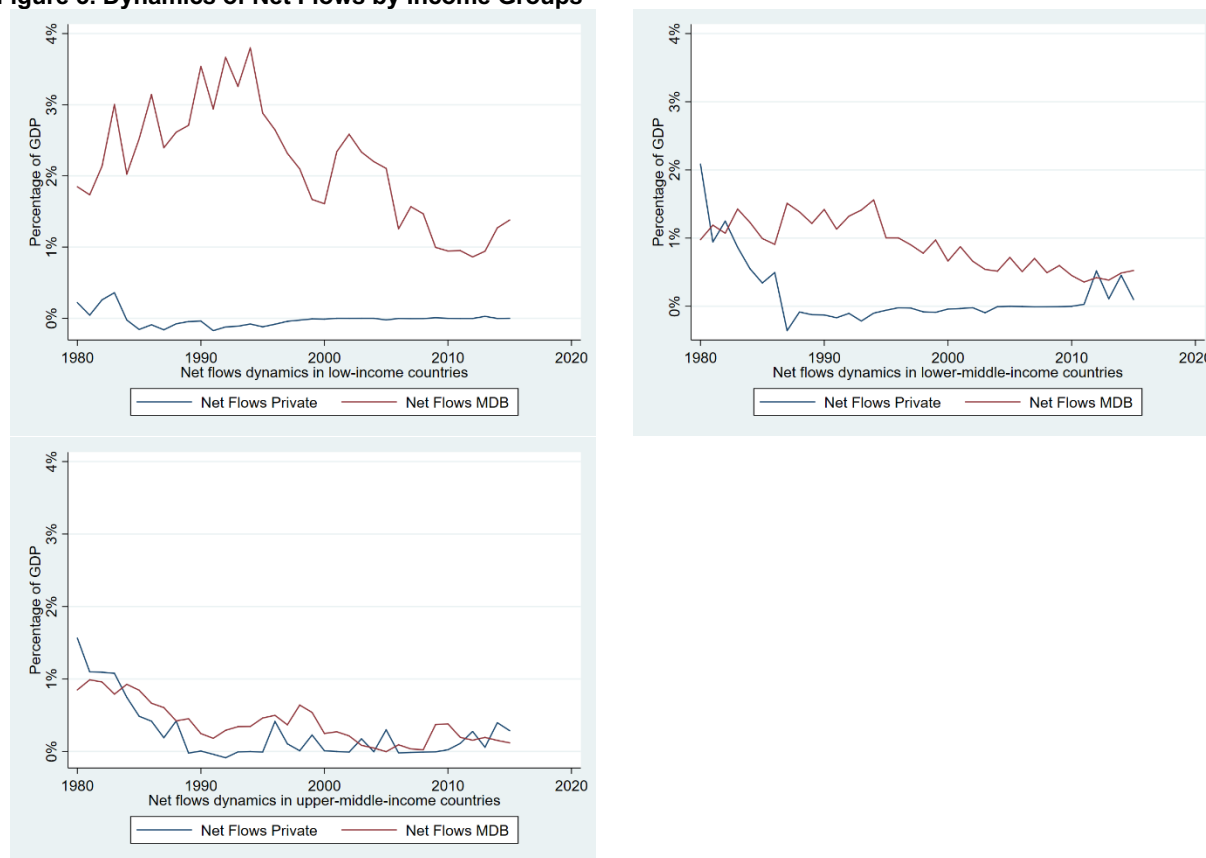
Source: Gerling et al. (2017); and authors' calculations.

Note: The histogram shows the percentage of fiscal crisis years that a group of countries in the sample (by income level) experience in a decade.

¹⁹ See the Appendix for more details on the definition of crises.

A first step in the analysis explores the dynamics of net flows scaled by GDP in different income groups (Figure 3). Net flows are scaled by GDP to prevent larger countries from driving the results and to gain a better understanding of the relative magnitude of net flows with respect to the country's economy. To avoid a bias from outliers, observations in the top and bottom 1 percent of the net flow/GDP variables are dropped. It can be seen that net flows from MDBs as a percentage of GDP decreased over time for all income levels. Net flows from private creditors decreased over time as well but experienced a small recovery in the 2010s. It is also interesting to note that the relative importance of MDB net flows increases the lower the income group.

Figure 3. Dynamics of Net Flows by Income Groups



Source: Authors' calculations.

Note: The figure shows the trends of median new flows scaled by GDP for upper-middle-income, lower-middle-income, and lower-income countries. The sample period is from 1980 to 2015. MDB: multilateral development banks.

To dig further into how these net flows behave over time, the sample was split into decades (1980s, 1990s, 2000s, 2010s), and averages and standard deviations per country were computed for each subperiod. The median average and median standard deviation of net flows per decade were then taken for each set of countries.

To scale the variables using an exogenous metric, the analysis scales net flows by trend GDP rather than by GDP only, as in Broner et al. (2013).²⁰

As seen in

²⁰ Trend GDP is calculated by applying the Hodrick-Prescott filter. Given that the data are yearly, a smoothing parameter of 100 to the series of nominal GDP in U.S. dollars is used. Nominal GDP is obtained from the World Bank's World Development Indicators.

Table 1, net flows from MDBs tend to be larger than net flows from the private sector, with the former being 0.94 percent of trend GDP, and the latter 0.44 percent. Moreover, net flows from MDBs are more stable, as shown by a median standard deviation of 0.92 of trend GDP compared to 1.30 for private creditors.

The aggregate results hide some heterogeneity across income groups: as the income level increases, net flows from MDBs decrease, going from 2.27 percent of trend GDP in the median low-income country to 0.48 in the median upper-middle-income country, but become more stable, with the standard deviation decreasing from 1.9 percent of trend GDP to 0.69 percent. This is true both for the MDBs altogether and for each MDB taken individually. The opposite occurs for net flows from private creditors, which increase by income level while becoming more volatile. It is also interesting to note that even in upper-middle-income countries, which capture most of the private flows, MDBs are an important source of external finance, reaching almost 90 percent of private median average net flows.

All net flows from MDBs experienced a decline over time. Only in upper-middle-income countries was there a recent small recovery, from 0.19 percent of trend GDP in the 2000s to 0.40 percent in 2010s. The pattern is similar for RDBs, while the retrenchment in net flows from the World Bank was constant through the decades. Net flows from private lenders, on the other hand, decreased sharply in the 1990s and 2000s and finally reverted the trend in 2010, even though they did not attain the levels they had in the 1980s.

The remainder of this paper further explores the relationship between net flows from private creditors and MDBs. The next section outlines the empirical strategy used to more formally assess the relationship between the two, their association with fiscal policy, and their behavior in times of fiscal crises.

Table 1. Trends of Net Flows to the Government by Income Group and Decade

Net Flows MDB	All Countries		Low-income		Lower-middle-income		Upper-middle-income	
	Median Average	Median Std Dev	Median Average	Median Std Dev	Median Average	Median Std Dev	Median Average	Median Std Dev
All	0.94	0.92	2.27	1.90	1.20	0.91	0.48	0.69
1980s	1.65	0.81	2.83	1.31	1.68	0.86	0.94	0.41
1990s	1.15	0.82	2.79	1.70	1.46	0.77	0.54	0.57
2000s	0.53	0.58	1.74	0.73	0.71	0.48	0.19	0.57
2010s	0.51	0.35	1.03	0.50	0.57	0.30	0.40	0.32
Net Flows RDB								
All	0.33	0.37	0.57	0.61	0.31	0.36	0.16	0.29
1980s	0.49	0.31	0.84	0.56	0.44	0.32	0.38	0.24
1990s	0.34	0.34	0.77	0.64	0.56	0.35	0.21	0.18
2000s	0.15	0.21	0.35	0.25	0.27	0.21	0.08	0.16
2010s	0.16	0.13	0.19	0.18	0.24	0.12	0.13	0.20
Net Flows WB								
All	0.52	0.54	1.30	1.09	0.61	0.54	0.20	0.42
1980s	0.71	0.40	1.73	0.72	0.79	0.42	0.28	0.32
1990s	0.63	0.46	1.72	0.93	0.62	0.46	0.19	0.25
2000s	0.25	0.26	1.11	0.51	0.28	0.26	0.04	0.18
2010s	0.16	0.18	0.50	0.28	0.22	0.12	0.07	0.12
Net Flows Others								
All	0.18	0.30	0.35	0.46	0.08	0.18	0.15	0.39
1980s	0.19	0.25	0.65	0.40	0.14	0.16	0.10	0.23
1990s	0.15	0.27	0.15	0.33	0.03	0.19	0.31	0.44
2000s	0.10	0.18	0.11	0.18	0.09	0.17	0.07	0.17
2010s	0.10	0.13	0.21	0.20	0.06	0.07	0.04	0.13
Net Flows Private								
All	0.44	1.30	0.06	0.88	0.45	1.32	0.54	1.46
1980s	0.68	1.28	0.19	0.57	0.91	1.37	0.93	1.45
1990s	-0.01	0.63	-0.05	0.03	-0.04	0.56	0.22	0.92
2000s	0.04	0.65	0.02	0.08	-0.02	0.49	0.35	1.01
2010s	0.58	0.76	0.00	0.24	1.03	0.98	0.58	0.94

Source: Authors' calculations.

Notes: This table presents the summary statistics of net flows scaled by trend GDP. The median value of country averages and of country standard deviations of net flows are reported for all the countries in the sample, as well as separately for low-, lower-middle- and upper-middle-income countries, as well as for all countries together. The sample period is from 1980 to 2015. MDB: multilateral development banks; RDB: regional development banks; WB: World Bank.

3. Empirical Strategy

The examination of the relationship between net flows and fiscal policy begins with a look at co-movements between government expenditure and net flows. Expenditure rather than the fiscal balance is used because the former is a tool for fiscal policy, while the latter is an outcome of the execution of the fiscal policy (Végh, Lederman, and Bennett 2017; Kaminsky et al. 2005). Expenditure is also used instead of tax receipts because the latter are endogenous to the business cycle (Frankel, Végh, and Vuletin 2013).

Both net flows and government expenditure are divided by trend GDP and the series is standardized by de-meaning and dividing by country standard deviations so that individual countries do not drive the results. The analysis includes country fixed effects and country trends in order to consider country-specific differences and country changes over time. To control for within-country error correlation, standard errors are clustered at the country level. The estimated model is:

$$y_{i,t} = \alpha_i + \gamma_i t + \beta G_{i,t} + \varepsilon_{i,t}, \quad (1a)$$

where $y_{i,t}$ are the net flows scaled by trend GDP, $G_{i,t}$ is government expenditure scaled by trend GDP, α_i are country fixed effects, and $\gamma_i t$ are country trends. β is our primary parameter of interest.

To evaluate if there are heterogeneities in the relationship between net flows and fiscal policy, interactions are added for income groups:

$$y_{i,t} = \alpha_i + \gamma_i t + \beta_L G_{i,t} + \beta_{LM} G_{i,t} * I_{LM} + \beta_{UM} G_{i,t} * I_{UM} + \varepsilon_{i,t}, \quad (1b)$$

where I_{LM} and I_{UM} are dummies for lower-middle-income and upper-middle-income countries. The excluded dummy is the indicator for low-income countries. Hence, β_L will capture the relationship between government expenditure and net flows in low-income countries, the sum $\beta_L + \beta_{LM}$ in lower-middle-income countries, and the sum $\beta_L + \beta_{UM}$ in upper-middle-income countries.

Potential asymmetries in the association between net flows to the sovereign and government expenditure are evaluated depending on the primary fiscal balance through the following model:

$$y_{i,t} = \alpha_i + \gamma_i t + \beta_1 G_{i,t} + \beta_2 \text{dum}(1|pri_fb_{i,t} < 0) + \beta_3 \text{dum}(1|pri_fb_{i,t} < 0) * G_{i,t} + \varepsilon_{i,t}, \quad (2a)$$

where $\text{dum}(1|pri_fb_{i,t} < 0)$ is an indicator variable equal to 1 when the primary fiscal balance is negative. Therefore, β_2 captures the association between net flows and the fiscal deficit, while β_1 captures the relationship with government expenditure when the country is in primary surplus. The sum of $\beta_1 + \beta_3$ represents the association between net flows and government expenditure when the government is running a primary deficit. β_3 measures the difference in the relationship between net flows and government expenditure if the primary fiscal balance is positive or negative.

To evaluate potential asymmetries in the relationship between net flows and government expenditure by income group, interactions with income group dummies are included and the following estimate is made:

$$y_{i,t} = \alpha_i + \gamma_i t + \beta_{1L} G_{i,t} + \beta_{1LM} G_{i,t} * I_{LM} + \beta_{1UM} G_{i,t} * I_{UM} + \beta_{2L} dum + \beta_{2LM} dum * I_{LM} + \beta_{2UM} dum * I_{UM} + \beta_{3L} dum * G_{i,t} + \beta_{3LM} dum * G_{i,t} * I_{LM} + \beta_{3UM} dum * G_{i,t} * I_{UM} + \varepsilon_{i,t}. \quad (2b)$$

Hence, β_{1L} will capture the relationship between government expenditure and net flows in low-income countries in fiscal surplus, the sum of $\beta_L + \beta_{LM}$ will capture that relationship in lower-middle-income countries, and the sum of $\beta_L + \beta_{UM}$ will capture that relationship in upper-middle-income countries. $\beta_{1L} + \beta_{3L}$ will measure the association between government expenditure and net flows in fiscal deficit in low-income countries, the sum of $\beta_{1L} + \beta_{1LM} + \beta_{3L} + \beta_{3LM}$ will measure that association in lower-middle-income countries, and the sum of $\beta_{1L} + \beta_{1UM} + \beta_{3L} + \beta_{3UM}$ will measure that association in upper-middle-income countries.

To assess the presence of co-movements between private and net flows from MDBs, the following models are estimated for each subperiod (1980s, 1990s, 2000s, 2010s), for each country grouping, and for the whole sample, as in Broner et al. (2013):

$$MDB_{i,t} = \alpha_i + \gamma_i t + \beta Private_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$Private_{i,t} = \alpha_i + \gamma_i t + \beta MDB_{i,t} + \varepsilon_{i,t}, \quad (4)$$

where $MDB_{i,t}$ ($Private_{i,t}$) are net flows to the public sector from MDBs (private creditors) in country i in year t , scaled by trend GDP, de-meaned, and standardized by the country-level standard deviation of the net flows. The variable α_i represents country fixed effects, $\gamma_i t$ represents country-specific trends, and $\varepsilon_{i,t}$ is the error term, clustered at the country level.

The analysis then turns to assessing the dynamics of net flows from different agents in fiscal crises by estimating the following equation:

$$y_{i,t} = \alpha_i + \gamma_i t + \beta fisc_cr_{h,i,t} + \varepsilon_{i,t}, \quad (5a)$$

where $y_{i,t}$ are the different types of net flows scaled by trend GDP and standardized at the country level; $fisc_cr_{h,i,t}$ are dummies for the years of fiscal crises of type h (credit events, exceptionally large official financing, implicit domestic public debt default, and loss of market confidence) in country i and year t , α_i are country fixed effects, and $\gamma_i t$ are country trends; and $\varepsilon_{i,t}$ is the error term, clustered at the country level.

When heterogeneities in the relationship between net flows and fiscal crises by income group are allowed, equation (5a) becomes:

$$y_{i,t} = \alpha_i + \gamma_i t + \beta_L fisc_cr_{h,i,t} + \beta_{LM} fisc_cr_{h,i,t} * I_{LM} + \beta_{UM} fisc_cr_{h,i,t} * I_{UM} + \varepsilon_{i,t}. \quad (5b)$$

To check what happens to the relationship between net flows and government expenditures at times of crises and to the relationship between fiscal crises and net flows once government is controlled for, the following is estimated for fiscal crises:

$$y_{i,t} = \alpha_i + \gamma_i t + \beta_1 G_{i,t} + \beta_2 fisc_cr_{h,i,t} + \beta_3 fisc_cr_{h,i,t} * G_{i,t} + \varepsilon_{i,t}, \quad (6a)$$

where β_1 will capture the association between net flows and government expenditure outside of fiscal crises, while the sum of $\beta_1 + \beta_3$ will measure the association between net flows and

government expenditure when the country experiences a fiscal crisis. β_2 will capture the relationship between net flows and fiscal crises once government expenditure is controlled for.

Finally, to allow for heterogeneities in the relationship between net flows and government expenditure in fiscal crises by income group, the following is estimated:

$$y_{i,t} = \alpha_i + \gamma_i t + \beta_{1L} G_{i,t} + \sum_{g=LM}^{UM} \beta_{1g} G_{i,t} * I_g + \beta_{2L} fisc_{crh,i,t} + \sum_{g=LM}^{UM} \beta_{2g} fisc_{crh,i,t} * I_g + \beta_{3L} fisc_{crh,i,t} * G_{i,t} + \sum_{g=LM}^{UM} \beta_{3g} fisc_{crh,i,t} * G_{i,t} * I_g + \varepsilon_{i,t}. \quad (6b)$$

The next section presents the main empirical results, and the Appendix further describes the results by income group.

4. Results

4.1. Net Flows and Government Expenditure

The analysis begins by showing the relationship between net flows from different agents and fiscal policy, specifically government expenditure, and by estimating equation (1a). As can be seen from Table 2, net flows from private creditors, MDBs, RDBs, the World Bank and other multilateral organizations all co-move with government expenditure: the more a country spends, the larger net flows it receives from external borrowers.

Table 2. Net Flows to the Government and Government Expenditure

	MDB	RDB	WB	Others	Private
β	0.0641***	0.0231**	0.0292***	0.0243***	0.0380***
<i>se</i>	(0.020)	(0.010)	(0.009)	(0.006)	(0.011)
Country FE	Yes	Yes	Yes	Yes	Yes
Country-trends	Yes	Yes	Yes	Yes	Yes
Average NFL	0.203	0.0218	0.0527	0.00833	0.0481
Average G	7.869	7.655	7.774	7.871	7.536
No. of countries	108	98	108	107	106
No. of observations	2,371	2,054	2,324	2,258	1,989
R-squared	0.307	0.226	0.326	0.150	0.130

Source: Authors' calculations.

Note: This table reports the correlations between net flows to the government from different agents and government expenditure (G). Both net flows and government expenditure are scaled by trend GDP, de-meaned, and standardized by country standard deviations. The sample period is from 1980 to 2015. Standard errors in parentheses are clustered at the country level; *** p<0.01, ** p<0.05, * p<0.1. FE: fixed effects; MDB: multilateral development banks; RDB: regional development banks; WB: World Bank; Others: other multilateral organizations.

The analysis then assesses if the relationship between net flows and government expenditure changes depending on whether or not government is running a primary fiscal deficit. The results of estimating equation (2a) are reported in Table 3.

β_1 is found to be significantly positive for all the net flows, indicating that when a government is in fiscal surplus and increases its government expenditure, net flows from every creditor increase (Table 3).

β_3 is never significantly different from zero, which implies that the behavior of foreign creditors does not change when the country is in deficit. Indeed, as can be seen from the sum of $\beta_1 + \beta_3$, the relationship of net flows and government expenditure stays positive for every creditor.

Overall, Table 3 suggests that when a country increases its total expenditure, net flows from international creditors increase, irrespective of whether the country is in fiscal primary deficit or surplus.

Table 3. Net Flows to the Government and Government Expenditure, Asymmetries

	MDB	RDB	WB	Others	Private
G (β_1)	0.0577***	0.0189*	0.0349***	0.0245***	0.0365***
<i>se 1</i>	(0.015)	(0.010)	(0.007)	(0.007)	(0.012)
Fiscal Deficit (β_2)	0.2398***	0.1489	0.2060***	0.1162*	0.2185***
<i>se 2</i>	(0.075)	(0.090)	(0.063)	(0.064)	(0.070)
Fiscal Deficit # G (β_3)	-0.0019	-0.0041	-0.0051	-0.0028	-0.0071
<i>se 3</i>	(0.005)	(0.004)	(0.003)	(0.003)	(0.005)
Country FE	Yes	Yes	Yes	Yes	Yes
Country-trends	Yes	Yes	Yes	Yes	Yes
Average NFL	0.164	0.00394	0.0318	-0.00783	0.0345
Average G	7.377	7.170	7.333	7.378	7.335
$\beta_1 + \beta_3$	0.056***	0.0148*	0.0298***	0.0216***	0.0294**
No. of countries	106	96	106	105	104
Observations	2,250	1,960	2,210	2,145	1,903
R-squared	0.314	0.232	0.340	0.145	0.144

Source: Authors' calculations.

Note: The table reports the correlations between net flows to the government from different agents and government expenditure (G), exploring different behaviors to positive/negative primary fiscal balances. Both net flows and government expenditure are scaled by trend GDP, de-meaned and standardized by country standard deviations. The sample period is from 1980 to 2015. Standard errors in parentheses are clustered at the country-level; *** p<0.01, ** p<0.05, * p<0.1. FE: fixed effects; MDB: multilateral development bank; RDB: regional development banks; WB: World Bank; Others: other multilateral organizations.

4.2 Net Flows from Multilateral Development Banks and Private Creditors

Given that the relationship of private and multilateral lending with government expenditure is the same, it is important to explore further differences between the two types of lending.

Table 4 presents the correlations between net flows from MDBs and private creditors (equations 3-4). Despite some differences in magnitude by income group, overall, the different net flows were positively associated in the 1980s, but their relationship turned negative in the 1990s. In the most recent decades, however, no sign of co-movement between the two is found.

Table 4. Correlations of Net Flows to the Government from Multilateral Development Banks and Private Creditors

	Low-income				Lower-middle-income				Upper-middle-income				All			
	1980s	1990s	2000s	2010s	1980s	1990s	2000s	2010s	1980s	1990s	2000s	2010s	1980s	1990s	2000s	2010s
MDB = β PRIV (3)	0.020	-0.327	0.024	-0.021	0.114*	-0.044	0.044	-0.063	0.006	-0.082*	0.029	0.004	0.049*	-0.076*	0.032	-0.028
<i>se</i>	(0.042)	(0.198)	(0.108)	(0.039)	(0.049)	(0.045)	(0.105)	(0.078)	(0.035)	(0.043)	(0.041)	(0.078)	(0.026)	(0.032)	(0.039)	(0.044)
PRIV = β MDB (4)	0.053	-0.063	0.014	-0.167	0.218*	-0.038	0.054	-0.158	0.010	-0.115*	0.055	0.006	0.099*	-0.068*	0.046	-0.064
<i>se</i>	(0.103)	(0.054)	(0.058)	(0.330)	(0.067)	(0.041)	(0.132)	(0.176)	(0.063)	(0.064)	(0.075)	(0.124)	(0.047)	(0.031)	(0.053)	(0.098)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of countries	23	22	21	19	31	41	38	36	30	40	41	41	84	103	100	96
No. of observations	185	162	151	86	258	323	326	202	258	335	371	228	701	820	848	516
<i>R</i> -squared (3)	0.419	0.325	0.402	0.462	0.404	0.357	0.384	0.265	0.360	0.419	0.163	0.256	0.388	0.370	0.299	0.275
<i>R</i> -squared (4)	0.333	0.219	0.069	0.366	0.440	0.295	0.321	0.280	0.350	0.318	0.248	0.337	0.378	0.303	0.254	0.321

Source: Authors' calculations.

Note: The table shows the correlations between net flows to the government from MDBs and private creditors for upper-middle-income, lower-middle-income, and lower-income countries. Net flows are scaled by trend GDP, de-measured, and standardized by country standard deviations. The sample period is from 1980 to 2015. Standard errors in parentheses are clustered at the country-level; *** p<0.01, ** p<0.05, * p<0.1. MDB: multilateral development bank; PRIV: private creditors.

The question arises as to whether the negative correlations observed in the 1990s might be related to the higher frequency of fiscal crises during that decade. Indeed, when the number of years affected by fiscal crises is considered in the sample, a prevalence of fiscal crises during the 1990s is identified (Figure 2). Hence, the analysis now turns to the dynamics of net flows during fiscal crises.

4.3. Net Flows and Fiscal Crises

When fiscal crises are considered regardless of their type (credit events, exceptionally large official financing, implicit domestic public debt default, and loss of market confidence), it can be seen that at times of crises there is a retrenchment in private creditors' net flows, while MDBs, RDBs and the World Bank tend to increase net flows to the public sector (Table 5). Net flows from other multilateral organizations do not change during fiscal crises.

Table 5. Net Capital Flows Dynamics in Fiscal Crises

	Fiscal Crises				
	MDB	RDB	WB	Others	Private
Crisis (β)	0.129**	0.127***	0.111**	-0.002	-0.231***
<i>se</i>	(0.059)	(0.048)	(0.049)	(0.049)	(0.056)
Country FE	Yes	Yes	Yes	Yes	Yes
Country-trends	Yes	Yes	Yes	Yes	Yes
No. of countries	108	98	108	107	106
No. of observations	3,411	2,967	3,323	3,233	2,944
<i>R</i> -squared	0.202	0.151	0.221	0.121	0.087

Source: Authors' calculations.

Note: Net flows are scaled by trend GDP, de-measured, and standardized by country standard deviations. The sample period is from 1980 to 2015. Standard errors in parentheses are clustered at the country-level; *** p<0.01, ** p<0.05, * p<0.1. MDB: multilateral development banks; RDB: regional development banks; WB: World Bank; Others: other multilateral organizations.

But it is important to differentiate among types of fiscal crises, as not doing so might hide major heterogeneities.

The fiscal crisis with the highest frequency throughout the period is related to credit events when countries experience a significant decrease of net flows from the private sector but an increase of support from RDBs. In events of exceptionally large official financing, that is, when the IMF gives its support, the MDBs join efforts to provide financing to governments, while this is not the case for other multilateral organizations (Table 6).

The third type of crisis examined is implicit defaults. Implicit defaults signal that the government either resorted to seigniorage to finance the fiscal deficit and/or accumulated domestic arrears. When countries default implicitly, all the MDBs significantly decrease their lending, apart from other multilateral institutions.

Table 6. Net Flows Dynamics in Fiscal Crises, by Type

	Credit Event					Exceptionally Large Official Financing				
	MDB	RDB	WB	Others	Private	MDB	RDB	WB	Others	Private
Crisis (β)	0.033	0.094*	0.048	-0.072	-0.141**	0.412***	0.188***	0.320***	0.0705	0.023
se	(0.059)	(0.051)	(0.056)	(0.050)	(0.061)	(0.078)	(0.068)	(0.074)	(0.069)	(0.083)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of countries	108	98	108	107	106	108	98	108	107	106
No. of observations	3,411	2,967	3,323	3,233	2,944	3,411	2,967	3,323	3,233	2,944
R-squared	0.200	0.149	0.219	0.122	0.082	0.218	0.153	0.233	0.122	0.080

	Implicit Domestic Public Default					Loss of Market Confidence				
	MDB	RDB	WB	Others	Private	MDB	RDB	WB	Others	Private
Crisis (β)	-0.580***	-0.327**	-0.546***	0.194	0.021	-0.004	0.043	-0.083	-0.039	-0.660***
se	(0.159)	(0.138)	(0.164)	(0.143)	(0.170)	(0.100)	(0.088)	(0.099)	(0.077)	(0.116)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of countries	108	98	108	107	106	70	67	70	69	69
No. of observations	3,409	2,965	3,321	3,231	2,942	1,387	1,268	1,357	1,311	1,310
R-squared	0.207	0.150	0.227	0.123	0.080	0.250	0.168	0.277	0.133	0.163

Source: Authors' calculations.

Note: Net flows are scaled by trend GDP, de-measured, and standardized by country standard deviations. The sample period is from 1980 to 2015. Standard errors in parentheses are clustered at the country-level; *** p<0.01, ** p<0.05, * p<0.1. MDB: multilateral development banks; RDB: regional development banks; WB: World Bank; Others: other multilateral organizations.

Finally, as expected, when a country experiences a loss of market confidence, private net flows decrease; but under these circumstances, MDBs do not change their net flows to the country affected.

So far, sovereign lending co-moves with government expenditure, irrespective of the primary fiscal balance and the type of creditor. At times of fiscal crises, on the other hand, the direction of net flows changes according to the creditor, with private investors decreasing their lending in crises due to credit events or a loss of market confidence. Moreover, net flows from MDBs do not seem to finance governments in fiscal crises, unless it is a joint effort with the IMF. However, the relationship between fiscal crises and sovereign borrowing might be capturing a relevant feature of the MDB business model, for which net flows co-move with government expenditure. For example, if government expenditure decreases during implicit defaults and MDB lending consequently decreases, the estimated β in Table 6 might be simply capturing the relationship between net flows and government expenditure. The next section will test whether this is the case.

4.4. Net Flows and Government Expenditure in Fiscal Crises

This section studies what happens to the relationship between net flows and government expenditure in times of fiscal crises and to the relationship between net flows and fiscal crises once we control for government expenditure.

Table 7 estimates equation (6) for the different types of fiscal crises. The co-movement between net flows to the public sector and government expenditure is confirmed when there are no fiscal crises: β_1 is always positive and significantly different from zero.²¹ Panel A shows that credit crises do not change the relationship previously found between government expenditure and net flows: β_3 is not significantly different from zero and the sum of $\beta_1 + \beta_3$ is always positive and significantly different from zero. The relationship between RDB lending and credit crises is still positive once we control for government expenditure (β_2), but not significantly different from zero anymore.

The positive relationship between crises due to exceptionally large official financing (that is, when the IMF intervenes) and multilateral lending is maintained even when government expenditure is controlled for: in Panel B, β_2 is positive and significantly different from zero for MDBs, RDBs, and the World Bank. Controlling for exceptionally large official financing, the co-movement between net flows and government expenditure is also maintained (β_1). It is interesting to note that once this type of crisis hits, RDBs significantly reverse their behavior (β_3) until they no longer co-move with government expenditure: the sum of $\beta_1 + \beta_3$ is no longer significantly different from zero. However, the positive relationship between net flows and government expenditure is maintained also in fiscal crises for all MDBs together, for the World Bank, for other multilateral organizations and for private creditors.

It can also be seen in Panel C that once government expenditure is controlled for, net flows from MDBs, RDBs, and the World Bank do not retrench any further during implicit public domestic defaults (β_2), that is, multilateral lending does not seem to decrease in crises either. Moreover, the positive association between government expenditure and MDBs in the aggregate remains significant ($\beta_1 + \beta_3$). The relationship between government expenditure and net flows from RDBs,

²¹ The relationship with MDBs and the World Bank under the loss of market confidence scenario is not shown because this fiscal crisis variable has many missing values and, together with the missing values of government expenditure, more than half of the sample is lost. Results are available upon request.

the World Bank and other multilateral organizations is still positive during this type of crisis, but no longer significant.

The relationship between net flows and government expenditure in crises of loss of market confidence is not assessed because there are too few observations to draw any conclusions.

Heterogeneous results by income group are presented in the Appendix.

Table 7. Net Flows to the Government and Government Expenditure during Fiscal Crises

	(1)	(2)	(3)	(4)	(5)
Panel A	MDB	RDB	WB	Others	Private
G (β_1)	0.0650*** (0.020)	0.0244** (0.010)	0.0290*** (0.009)	0.0240*** (0.006)	0.0361*** (0.012)
Credit crisis (β_2)	0.0583 (0.072)	0.0906 (0.088)	0.0138 (0.064)	0.0059 (0.070)	-0.0549 (0.074)
Credit crisis # G (β_3)	-0.0020 (0.005)	-0.0025 (0.004)	0.0026 (0.004)	0.0018 (0.003)	0.0070 (0.007)
Observations	2,371	2,054	2,324	2,258	1,989
Number of countries	108	98	108	107	106
Country FE	Yes	Yes	Yes	Yes	Yes
Country-trends	Yes	Yes	Yes	Yes	Yes
Average NFL	0.203	0.022	0.053	0.008	0.048
Average G	7.869	7.655	7.774	7.871	7.536
$\beta_1 + \beta_3$	0.0629***	0.0219**	0.0316***	0.0259***	0.0431***
R-squared	0.308	0.227	0.326	0.15	0.131

	(1)	(2)	(3)	(4)	(5)
Panel B	MDB	RDB	WB	Others	Private
G (β_1)	0.0609*** (0.020)	0.0226** (0.010)	0.0263*** (0.008)	0.0240*** (0.006)	0.0395*** (0.011)
Exceptionally large official financing (β_2)	0.3596*** (0.096)	0.2969*** (0.098)	0.2388** (0.093)	0.0916 (0.110)	0.0274 (0.090)
Exceptionally large official financing # G (β_3)	-0.0019 (0.007)	-0.0103** (0.004)	0.0006 (0.005)	-0.0025 (0.005)	-0.0070 (0.010)
Observations	2,371	2,054	2,324	2,258	1,989
Number of countries	108	98	108	107	106
Country FE	Yes	Yes	Yes	Yes	Yes
Country-trends	Yes	Yes	Yes	Yes	Yes
Average NFL	0.203	0.022	0.053	0.008	0.048
Average G	7.869	7.655	7.774	7.871	7.536
$\beta_1 + \beta_3$	0.059***	0.012	0.0269**	0.0215***	0.0324**
R-squared	0.319	0.236	0.334	0.151	0.131

	(1)	(2)	(3)	(4)	(5)
Panel C	MDB	RDB	WB	Others	Private
G (β_1)	0.0641*** (0.020)	0.0231** (0.010)	0.0290*** (0.009)	0.0244*** (0.006)	0.0374*** (0.011)
Implicit domestic public default (β_2)	0.1236 (0.430)	-0.0815 (0.406)	0.0312 (0.583)	0.0986 (0.733)	-0.2786 (0.531)
Implicit domestic public default # G (β_3)	-0.0009 (0.015)	0.0023 (0.014)	0.0004 (0.018)	0.0016 (0.022)	0.0190 (0.028)
Observations	2,369	2,052	2,322	2,256	1,987
Number of countries	108	98	108	107	106
Country FE	Yes	Yes	Yes	Yes	Yes
Country-trends	Yes	Yes	Yes	Yes	Yes
Average NFL	0.204	0.022	0.053	0.008	0.048
Average G	7.875	7.662	7.779	7.877	7.542
$\beta_1 + \beta_3$	0.0632**	0.025	0.029	0.026	0.0564*
R-squared	0.307	0.225	0.326	0.15	0.131

Source: Authors' calculations.

Note: The table shows the correlations between net flows and government expenditure (G) in times of fiscal crises. Net flows and G are scaled by trend GDP, de-meaned, and standardized by country standard deviations. The sample period is from 1980 to 2015. Standard errors in parentheses are clustered at the country-level; *** p<0.01, ** p<0.05, * p<0.1. FE: fixed effects; MDB: multilateral development banks; RDB: regional development banks; WB: World Bank; Others: other multilateral organizations.

5. Robustness Checks

This section constructs net flows by scaling them by trend GDP and by standardizing, de-meaning, and dividing by the country standard deviation. To check whether results are driven by the manipulation of the dependent variable, the analysis is performed again by scaling net flows by simply dividing by GDP. Trend GDP is used to isolate the cyclical component of GDP away from the analysis. However, even when net flows are re-scaled only by GDP, the same results are obtained.

6. Conclusion

The literature on fiscal policy and international private capital flows has found evidence of procyclicality. This paper has explored whether multilateral sovereign lending moves together with private capital flows and fiscal policy, amplifying economic fluctuations.

The analysis finds that sovereign borrowing tracks government expenditure, irrespective of the type of creditor. This result holds whether the government runs a deficit or not. These findings show that the co-movement of net flows with public expenditure holds regardless of the stance of fiscal policy.

The study then explores sovereign net flows dynamics during fiscal crises. The evidence is that multilateral lending and private lending exhibit very different behavior during fiscal crises, with private creditors mostly decreasing their exposure, but MDBs only doing so during implicit domestic public defaults. However, once we control for government expenditure, results show that multilateral lending does no longer change in implicit defaults.

Finally, countries going through a macroeconomic crisis might seek help from the IMF. The analysis finds that MDBs increase their net flows when there is an IMF program in place, and this finding holds also when controlling for the co-movement between net flows and government expenditure. This is evidence of coordination of MDBs and the IMF during fiscal crises, in line with the mandate of working as a system within the International Financial Architecture.

Appendix

1. Definition of Fiscal Crises

A credit event occurs when the government reduces the present value of its debt owed to official or other creditors (de facto, mainly defaults on external debt). Exceptionally large official financing refers to any year under an IMF financial arrangement with access above 100 percent of quota and fiscal adjustment as a program objective. Financial support from the IMF is an alternative to outright default, usually for countries that are unable to pay their international bills and have associated balance of payment problems. Implicit domestic public debt default happens when countries default implicitly on domestic debt or their payment obligations by running domestic payment arrears or printing money to finance their budget (high inflation). The inflation rate threshold is 35 percent per year for advanced markets (the average haircut of their public debt) and small developing states. The threshold for emerging markets and low-income developing countries is 100 percent. Finally, a loss of market confidence crisis occurs in years of extreme market pressures, when either the country loses market access²² or the price of market access surpasses a threshold of 1,000 basis points for the spreads, which is widely seen as market participants' psychological barrier (Gerling et al., 2017).

2. Further Results by Income

This section presents the relationship between net flows and government expenditure by income.

Net Flows and Government Expenditure

The co-movement between net flows from MDBs and expenditure does not change significantly by income group (Appendix Table 1). Net flows from the World Bank also always co-move with expenditure, but this co-movement is significantly stronger in low-income countries and loses significance in middle-income countries.

When flows are divided by income, RDBs and private net flows no longer co-move with government expenditure in low-income and low-middle-income countries, probably due to the loss of power when adding interaction terms in the estimation.

²² The authors define loss of market access as the inability to “tap international capital markets on a sustained basis through the contracting of loans and/or issuance of securities across a range of maturities” (Gerling et al. 2017, p. 11).

Appendix Table 1. Net Flows to the Government and Government Expenditure, by Income

	MDB	RDB	WB	Others	Private
G (β_L)	0.1040*** (0.021)	0.0115 (0.010)	0.0750*** (0.014)	0.0254** (0.012)	0.0361 (0.027)
G # I_{LM} (β_{LM})	-0.0414 (0.037)	0.0226 (0.017)	-0.0588*** (0.018)	-0.0080 (0.014)	0.0036 (0.030)
G # I_{UM} (β_{UM})	-0.0516 (0.032)	-0.0055 (0.016)	-0.0410** (0.018)	0.0119 (0.023)	0.0004 (0.035)
Country FE	Yes	Yes	Yes	Yes	Yes
Country-trends	Yes	Yes	Yes	Yes	Yes
Average NFL	0.203	0.0218	0.0527	0.00833	0.0481
Average G	7.869	7.655	7.774	7.871	7.536
$\beta_L + \beta_{LM}$	0.0626**	0.0341	0.0162***	0.0174***	0.0397
$\beta_L + \beta_{UM}$	0.0524**	0.00598**	0.0340	0.0373*	0.0365***
No. of countries	108	98	108	107	106
No. of observations	2,371	2,054	2,324	2,258	1,989
R-squared	0.309	0.228	0.330	0.150	0.130

Source: Authors' calculations.

Note: The table reports the correlations between net flows to the government from different agents and government expenditure (G) by income group. Both net flows and government expenditure are scaled by trend GDP, de-meaned, and standardized by country standard deviations. The sample period is from 1980 to 2015. Standard errors in parentheses are clustered at the country-level; *** p<0.01, ** p<0.05, * p<0.1. FE: fixed effects; MDB: multilateral development banks; RDB: regional development banks; WB: World Bank; Others: other multilateral organizations.

When exploring for asymmetric responses by income, the relationship between World Bank net flows and expenditure in times of fiscal surplus or deficit remains positive, irrespective of income (Appendix Table 2). The same applies to MDB net flows, except for upper-middle-income countries in fiscal deficit, where those flows significantly decrease (β_{3UM} is negative and significantly different from zero).

As previously, when adding interaction terms, significance is lost in the co-movement between government expenditure and net flows from private creditors or RDBs, with some exceptions.

Appendix Table 2. Net Flows to the Government and Government Expenditure, Asymmetries, by Income

	MDB	RDB	WB	Others	Private
G (β_{1L})	0.0867*** (0.022)	0.0134 (0.014)	0.0550*** (0.014)	0.0288** (0.014)	0.0301 (0.032)
G # I_{LM} (β_{1LM})	-0.0352 (0.026)	0.0181 (0.018)	-0.0277 (0.017)	-0.0160 (0.016)	0.0112 (0.037)
G # I_{UM} (β_{1UM})	-0.0389 (0.034)	-0.0121 (0.016)	-0.0179 (0.019)	0.0066 (0.026)	0.0012 (0.039)
Fiscal deficit (β_2)	-0.0107 (0.153)	-0.1603 (0.216)	0.1313 (0.126)	-0.0090 (0.129)	0.2372* (0.122)
Fiscal deficit # I_{LM} (β_{2LM})	0.1389 (0.188)	0.1795 (0.232)	0.1074 (0.166)	0.0312 (0.164)	-0.1096 (0.168)
Fiscal deficit # I_{UM} (β_{2UM})	0.4142** (0.194)	0.6346** (0.263)	0.0576 (0.159)	0.2469 (0.166)	0.0398 (0.164)
Fiscal deficit # G (β_{3L})	0.0127 (0.011)	0.0038 (0.011)	0.0094 (0.010)	-0.0020 (0.007)	-0.0051 (0.011)
Fiscal deficit # G # I_{LM} (β_{3LM})	-0.0118 (0.013)	-0.0030 (0.012)	-0.0201* (0.011)	0.0038 (0.008)	0.0020 (0.013)
Fiscal deficit # G # I_{UM} (β_{3UM})	-0.0227* (0.013)	-0.0191 (0.012)	-0.0121 (0.011)	-0.0032 (0.008)	-0.0085 (0.014)
Country FE	Yes	Yes	Yes	Yes	Yes
Country-trends	Yes	Yes	Yes	Yes	Yes
Average NFL	0.164	0.00394	0.0318	-0.00783	0.0345
Average G	7.377	7.170	7.333	7.378	7.335
$\beta_{1L} + \beta_{1LM}$	0.0516***	0.0315***	0.0273***	0.0128**	0.0413
$\beta_{1L} + \beta_{1UM}$	0.0478*	0.00124***	0.0371***	0.0353	0.0313***
$\beta_{1L} + \beta_{1LM} + \beta_{3L} + \beta_{3LM}$	0.0525***	0.0323	0.0166**	0.0146	0.0382
$\beta_{1L} + \beta_{1UM} + \beta_{3L} + \beta_{3UM}$	0.0379	-0.0140	0.0345**	0.0302*	0.0176**
No. of countries	106	96	106	105	104
Observations	2,250	1,960	2,210	2,145	1,903
R-squared	0.319	0.243	0.344	0.148	0.145

Source: Authors' calculations.

Note: The table reports the correlations between net flows to the government from different agents and government expenditure (G), exploring different behaviors to positive/negative primary fiscal balance. Both net flows and government expenditure are scaled by trend GDP, de-meaned, and standardized by country standard deviations. The sample period is from 1980 to 2015. Standard errors in parentheses are clustered at the country-level; *** p<0.01, ** p<0.05, * p<0.1. FE: fixed effects; MDB: multilateral development banks; RDB: regional development banks; WB: World Bank; Others: other multilateral organizations.

Net Flows and Fiscal Crises

The analysis now turns to the response of net flows in fiscal crises disaggregating by income (Appendix Table 3). It can be seen that the positive (negative) relationship between net flows from RDBs (private creditors) and credit crises found in the aggregate is mainly driven by upper-middle-

income (lower-middle-income) countries: the sum of $\beta_L + \beta_{UM}$ ($\beta_L + \beta_{LM}$) is significantly different from zero. Moreover, a positive association is found between net flows from the World Bank and credit crises in low-income countries (β_L).

Appendix Table 3. Net Flows Dynamics in Fiscal Crises, by Type and by Income Group

Panel A	MDB	RDB	WB	Others	Private	Panel B	MDB	RDB	WB	Others	Private
Credit crisis (β_L)	0.1678 (0.118)	0.1332 (0.093)	0.1813* (0.107)	-0.0008 (0.086)	-0.1086 (0.107)	Exceptionally large official financing (β_L)	0.3298** (0.147)	0.1745 (0.113)	0.2443* (0.130)	-0.1172 (0.097)	-0.1606 (0.098)
Credit crisis # I_LM (β_{LM})	-0.2330 (0.146)	-0.1633 (0.120)	-0.2284 (0.138)	-0.1737 (0.117)	-0.1396 (0.140)	Exceptionally large official financing # I_LM (β_{LM})	-0.1273 (0.192)	-0.0941 (0.159)	-0.0781 (0.182)	0.1724 (0.143)	0.3092 (0.192)
Credit crisis # I_UM (β_{UM})	-0.1565 (0.153)	0.0974 (0.129)	-0.1558 (0.139)	-0.0289 (0.126)	0.0487 (0.154)	Exceptionally large official financing # I_UM (β_{UM})	0.3969** (0.186)	0.1767 (0.162)	0.3249* (0.171)	0.4085** (0.172)	0.1713 (0.154)
Observations	3,411	2,967	3,323	3,233	2,944	Observations	3,411	2,967	3,323	3,233	2,944
Number of countries	108	98	108	107	106	Number of countries	108	98	108	107	106
Country FE	Yes	Yes	Yes	Yes	Yes	Country FE	Yes	Yes	Yes	Yes	Yes
Country-trends	Yes	Yes	Yes	Yes	Yes	Country-trends	Yes	Yes	Yes	Yes	Yes
Average NFLs	0.371	0.124	0.204	0.0568	0.111	Average NFLs	0.371	0.124	0.204	0.0568	0.111
Average G	7.869	7.655	7.774	7.871	7.536	Average G	7.869	7.655	7.774	7.871*	7.536
$\beta_L + \beta_{LM}$	-0.0652	-0.0301	-0.0471	-0.175**	-0.248***	$\beta_L + \beta_{LM}$	0.203	0.0804	0.166	0.0551	0.149
$\beta_L + \beta_{UM}$	0.0112	0.231**	0.0255	-0.0297	-0.0599	$\beta_L + \beta_{UM}$	0.727***	0.351***	0.569***	0.291**	0.0107
R-squared	0.201	0.152	0.221	0.124	0.083	R-squared	0.223	0.155	0.238	0.126	0.081
Panel C	MDB	RDB	WB	Others	Private	Panel D	MDB	RDB	WB	Others	Private
Implicit public domestic default (β_L)	-1.0201** (0.396)	-0.3316** (0.162)	-0.7373*** (0.265)	-0.0174 (0.190)	0.2579*** (0.077)	Loss of market confidence (β_{LM})	-0.0629 (0.133)	0.0739 (0.147)	-0.1452 (0.114)	-0.1912* (0.108)	-0.6457*** (0.163)
Implicit public domestic default # I_LM (β_{LM})	0.3638 (0.509)	0.0630 (0.340)	-0.0858 (0.439)	0.5614* (0.301)	-0.0966 (0.478)	Loss of market confidence # I_UM (β_{UM})	0.1086 (0.196)	-0.0697 (0.180)	0.1122 (0.192)	0.2994** (0.145)	-0.0399 (0.233)
Implicit public domestic default # I_UM (β_{UM})	0.6409 (0.436)	-0.0415 (0.239)	0.4390 (0.331)	0.0912 (0.298)	-0.3740 (0.228)	Observations	1,289	1,172	1,264	1,213	1,212
Observations	3,409	2,965	3,321	3,231	2,942	Number of countries	62	59	62	61	61
Number of countries	108	98	108	107	106	Country FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Country-trends	Yes	Yes	Yes	Yes	Yes
Country-trends	Yes	Yes	Yes	Yes	Yes	Average NFLs	0.191	0.0863	0.0514	0.0102	0.141
Average NFLs	0.371	0.124	0.205	0.0568	0.111	Average G	9.263	9.614	9.236	9.436	8.918
Average G	7.875	7.662	7.779	7.877	7.542	$\beta_{LM} + \beta_{UM}$	0.0457	0.00419	-0.0330	0.108	-0.686***
$\beta_L + \beta_{LM}$	-0.656**	-0.269	-0.823**	0.544**	0.161	R-squared	0.222	0.164	0.268	0.142	0.161
$\beta_L + \beta_{UM}$	-0.379**	-0.373**	-0.298	0.0739	-0.116						
R-squared	0.208	0.151	0.228	0.124	0.080						

Source: Authors' calculations.

Note: Net flows are scaled by trend GDP, de-meanned, and standardized by country standard deviations. The sample period is from 1980 to 2015. Standard errors in parentheses are clustered at the country-level; *** p<0.01, ** p<0.05, * p<0.1. FE: fixed effects; G: government expenditure; MDB: multilateral development banks; RDB: regional development banks; WB: World Bank; Others: other multilateral organizations.

In events of exceptionally large official financing – that is, when the IMF provides support – it is found that all the MDBs join efforts to provide financing to governments. When distinguishing effects by income, it is interesting to note that the association is particularly strong in upper-middle-income countries: the sum of $\beta_L + \beta_{UM}$ is significantly different from zero for all the multilateral net flows. No significant co-movement between private creditors and the IMF is seen.

When countries default implicitly, all the MDBs significantly decrease their lending, and this is true across income groups. Finally, when a country experiences a loss of market confidence, private net flows decrease across income groups.²³

Net Flows and Government Expenditure in Fiscal Crises

The relationship between net flows and government expenditure in fiscal crises by income group is now estimated. As previously, when adding interaction terms, significance is often lost in the co-movement between government expenditure and net flows from private creditors or RDBs, hence we will not comment on that.

Appendix Table 4 finds that once credit crises are controlled for, the co-movement between government expenditure and net flows from MDBs remains positive across income groups, while the relationship between government expenditure and net flows from the World Bank loses significance in low-middle-income countries during credit crises.

When examining the relationship between government expenditure and net flows by income when the IMF intervenes, it is found that net flows from MDBs co-move across income groups, while net flows from the World Bank no longer co-move with government expenditure in upper-middle-income countries.

During implicit domestic defaults, the positive association between government expenditure and MDBs in the aggregate remains significant in low-income and low-middle-income countries. The World Bank, on the other hand, no longer co-moves with government expenditure during this type of crisis, and this holds across income groups.

²³ When examining by income group, only eight low-income countries are observed (due to missing values for loss of market confidence). Therefore, only lower-income and upper-middle-income countries are considered.

Appendix Table 4. Net Flows and Government Expenditure in Times of Fiscal Crises, by Income

Panel A	MDB	RDB	WB	Others	Private
G (β_{1L})	0.1058*** (0.022)	0.0142 (0.012)	0.0766*** (0.016)	0.0275** (0.013)	0.0358 (0.028)
G # I_{LM} (β_{1LM})	-0.0437 (0.037)	0.0188 (0.018)	-0.0621*** (0.020)	-0.0111 (0.014)	0.0056 (0.031)
G # I_{UM} (β_{1UM})	-0.0521 (0.034)	-0.0060 (0.017)	-0.0429** (0.019)	0.0081 (0.023)	0.0024 (0.037)
Credit crisis (β_{2L})	0.1234 (0.136)	0.1723 (0.183)	0.0984 (0.117)	0.1062 (0.127)	-0.0082 (0.162)
Credit crisis # I_{LM} (β_{2LM})	-0.1064 (0.179)	-0.2478 (0.212)	-0.1319 (0.158)	-0.1708 (0.158)	-0.0601 (0.178)
Credit crisis # I_{UM} (β_{2UM})	-0.0611 (0.178)	0.0706 (0.245)	-0.1015 (0.159)	-0.1310 (0.189)	-0.0888 (0.218)
Credit crisis # G (β_{3L})	-0.0077 (0.014)	-0.0078 (0.009)	-0.0044 (0.013)	-0.0033 (0.006)	0.0034 (0.009)
Credit crisis # G # I_{LM} (β_{3LM})	0.0110 (0.016)	0.0102 (0.011)	0.0112 (0.014)	0.0058 (0.007)	-0.0065 (0.010)
Credit crisis # G # I_{UM} (β_{3UM})	-0.0007 (0.019)	0.0009 (0.012)	0.0062 (0.014)	0.0116 (0.009)	0.0318* (0.017)
Observations	2,371	2,054	2,324	2,258	1,989
Number of countries	108	98	108	107	106
Country FE	Yes	Yes	Yes	Yes	Yes
Country-trends	Yes	Yes	Yes	Yes	Yes
Average NFLs	0.203	0.0218	0.0527	0.00833	0.0481
Average G	7.869	7.655	7.774	7.871	7.536
$\beta_{1L} + \beta_{1LM}$	0.0621**	0.0330**	0.0145***	0.0163**	0.0413***
$\beta_{1L} + \beta_{1UM}$	0.0537**	0.00818**	0.0338***	0.0356**	0.0382***
$\beta_{1L} + \beta_{1LM} + \beta_{3L} + \beta_{3LM}$	0.0654**	0.0354	0.0213	0.0188***	0.0382***
$\beta_{1L} + \beta_{1UM} + \beta_{3L} + \beta_{3UM}$	0.0453**	0.00124	0.0355*	0.0438*	0.0734
R-squared	0.310	0.232	0.331	0.152	0.137

Appendix Table 5 (continued). Net Flows and Government Expenditure in Times of Fiscal Crises, by Income

Panel B	MDB	RDB	WB	Others	Private
G (β_{1L})	0.0878*** (0.021)	0.0062 (0.011)	0.0561*** (0.016)	0.0293** (0.012)	0.0380 (0.027)
G # I_{LM} (β_{1LM})	-0.0258 (0.037)	0.0293* (0.017)	-0.0404** (0.020)	-0.0132 (0.014)	0.0039 (0.030)
G # I_{UM} (β_{1UM})	-0.0391 (0.031)	-0.0028 (0.015)	-0.0241 (0.019)	0.0053 (0.022)	-0.0004 (0.035)
Exceptionally large official financing (β_{2L})	0.0782 (0.186)	0.2864 (0.202)	-0.1196 (0.152)	-0.0260 (0.179)	0.0365 (0.122)
Exceptionally large official financing # I_{LM} (β_{2LM})	0.2107 (0.233)	-0.0613 (0.241)	0.4564** (0.217)	0.0083 (0.244)	0.0880 (0.197)
Exceptionally large official financing # I_{UM} (β_{2UM})	0.5800** (0.229)	0.1225 (0.285)	0.4945** (0.201)	0.4119 (0.283)	-0.1233 (0.195)
Exceptionally large official financing # G (β_{3L})	0.0231* (0.014)	-0.0051 (0.011)	0.0373*** (0.014)	-0.0055 (0.009)	-0.0098 (0.006)
Exceptionally large official financing # G # I_{LM} (β_{3LM})	-0.0286* (0.016)	-0.0062 (0.012)	-0.0449*** (0.015)	0.0094 (0.011)	0.0003 (0.015)
Exceptionally large official financing # G # I_{UM} (β_{3UM})	-0.0349** (0.016)	-0.0037 (0.013)	-0.0468*** (0.015)	-0.0035 (0.013)	0.0069 (0.012)
Observations	2,371	2,054	2,324	2,258	1,989
Number of countries	0.325	0.239	0.345	0.156	0.132
Country FE	108	98	108	107	106
Country-trends	Yes	Yes	Yes	Yes	Yes
Average NFLs	Yes	Yes	Yes	Yes	Yes
Average G	0.203	0.0218	0.0527	0.00833	0.0481
$\beta_{1L} + \beta_{1LM}$	0.0619**	0.0355	0.0157**	0.0161**	0.0420***
$\beta_{1L} + \beta_{1UM}$	0.0487**	0.00344*	0.0320	0.0346	0.0377**
$\beta_{1L} + \beta_{1LM} + \beta_{3L} + \beta_{3LM}$	0.0565*	0.0242	0.00813*	0.0200*	0.0324
$\beta_{1L} + \beta_{1UM} + \beta_{3L} + \beta_{3UM}$	0.0369*	-0.00530***	0.0225	0.0256**	0.0347*
R-squared	7.869	7.655	7.774	7.871	7.536

Appendix Table 6 (continued). Net Flows and Government Expenditure in Times of Fiscal Crises, by Income

Panel C	MDB	RDB	WB	Others	Private
G (β_{1L})	0.1100*** (0.019)	0.0123 (0.011)	0.0795*** (0.014)	0.0268** (0.013)	0.0405 (0.029)
G # I_{LM} (β_{1LM})	-0.0478 (0.036)	0.0216 (0.017)	-0.0638*** (0.018)	-0.0097 (0.014)	0.0001 (0.031)
G # I_{UM} (β_{1UM})	-0.0581* (0.031)	-0.0064 (0.016)	-0.0461*** (0.017)	0.0110 (0.023)	-0.0051 (0.037)
Implicit domestic public default (β_{2L})	1.5546*** (0.291)	0.1392 (0.135)	1.1463*** (0.195)	0.3187* (0.188)	0.6949 (0.438)
Implicit domestic public default # I_{LM} (β_{2LM})	-2.9058*** (0.392)	-0.9328 (0.743)	-3.0340*** (0.508)	2.4870*** (0.189)	-0.0256 (0.526)
Implicit domestic public default # I_{UM} (β_{2UM})	-0.6621** (0.330)	0.2393 (0.357)	-0.2391 (0.334)	-0.4398 (0.952)	-1.9397*** (0.447)
Implicit domestic public default # G (β_{3L})	-0.1272*** (0.022)	-0.0146 (0.013)	-0.0937*** (0.016)	-0.0290** (0.014)	-0.0527 (0.033)
Implicit domestic public default # G # I_{LM} (β_{3LM})	0.2600*** (0.027)	0.1128** (0.045)	-0.0856 (0.150)	1.8363*** (0.022)	-0.2049 (0.274)
Implicit domestic public default # G # I_{UM} (β_{3UM})	0.1040*** (0.023)	0.0009 (0.016)	0.0687*** (0.017)	0.0385 (0.031)	0.1034** (0.041)
Observations	2,369	2,052	2,322	2,256	1,987
Number of countries	0.315	0.229	0.339	0.153	0.136
Country FE	108	98	108	107	106
Country-trends	Yes	Yes	Yes	Yes	Yes
Average NFLs	Yes	Yes	Yes	Yes	Yes
Average G	0.204	0.0224	0.0531	0.00831	0.0483
$\beta_{1L} + \beta_{1LM}$	0.0622**	0.0339***	0.0157	0.0171***	0.0406**
$\beta_{1L} + \beta_{1UM}$	0.0519**	0.00586**	0.0334***	0.0378***	0.0355
$\beta_{1L} + \beta_{1LM} + \beta_{3L} + \beta_{3LM}$	0.195***	0.132	-0.164	1.824	-0.217***
$\beta_{1L} + \beta_{1UM} + \beta_{3L} + \beta_{3UM}$	0.0287	-0.00785	0.00839	0.0474*	0.0862
R-squared	7.875	7.662	7.779	7.877	7.542

Source: Authors' calculations.

Note: The table shows the correlations between net flows and government expenditure (G) in times of fiscal crises. Net flows and G are scaled by trend GDP, de-meaned, and standardized by country standard deviations. The sample period is from 1980 to 2015. Standard errors in parentheses are clustered at the country-level; *** p<0.01, ** p<0.05, * p<0.1. FE: fixed effects; MDB: multilateral development banks; RDB: regional development banks; WB: World Bank; Others: other multilateral organizations.

Appendix Table 7. List of Countries in the Sample, by Income Group

Low-income	Lower-middle-income	Upper-middle-income
Burundi	Armenia	Pakistan
Benin	Bangladesh	Philippines
Burkina Faso	Bolivia	Papua New Guinea
African Republic	Côte d'Ivoire	Sudan
Comoros	Cameroon	Solomon Islands
Ethiopia	Republic of Congo	El Salvador
Guinea	Cabo Verde	Syria
The Gambia	Djibouti	Tajikistan
Guinea-Bissau	Egypt	Tonga
Haiti	Ghana	Tunisia
Liberia	Guatemala	Ukraine
Madagascar	Honduras	Uzbekistan
Mali	Indonesia	Vietnam
Mozambique	India	Vanuatu
Malawi	Kenya	Samoa
Niger	Kyrgyz Republic	Yemen
Nepal	Cambodia	Zambia
Rwanda	Lao P.D.R.	
Senegal	Sri Lanka	
Sierra Leone	Morocco	
Chad	Moldova	
Togo	Mongolia	
Tanzania	Mauritania	
Uganda	Nigeria	
Zimbabwe	Nicaragua	
		Angola
		Albania
		Argentina
		Azerbaijan
		Bulgaria
		Bosnia and Herzegovina
		Belarus
		Belize
		Brazil
		China
		Colombia
		Costa Rica
		Dominica
		Dominican Republic
		Algeria
		Ecuador
		Fiji
		Gabon
		Georgia
		Equatorial Guinea
		Grenada
		Guyana
		Islamic Republic of Iran
		Jamaica
		Jordan
		Kazakhstan
		Lebanon
		St. Lucia
		Maldives
		Mexico
		FYR Macedonia
		Mauritius
		Malaysia
		Panama
		Peru
		Paraguay
		Russia
		Thailand
		Turkmenistan
		Turkey
		St. Vincent and the Grenadines
		Venezuela

Source: Prepared by the authors.

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