Do the IMF and World Bank Promote Autonomous Sovereign Debt Management?

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As global financial markets develop, sovereign debt management requires an increasing degree of expertise and professionalism. The World Bank and the IMF have encouraged the professionalization of such management, but never explicitly advocated greater autonomy for Debt Management Offices (DMOs) from political decision-makers. This is surprising because autonomy is an important element of debt management professionalism, and because it is a credibility mechanism. This paper explores whether these institutions may be indirectly promoting DMO autonomy since 2000. We assembled a new country-year dataset of national debt management legislation for 75 democratic countries in the period 1950-2013. The dependent variable codes DMO autonomy from political decision-makers based on three ordered categories. Our main independent variable is World Bank and IMF potential for influence over countries. Depending on the operational measure of the influence of institutions, some of our regression results support the expectation that the institutions promoted DMO autonomy in the 2000s, while other results show the opposite. Our findings suggest that before the 2000s, countries tended to respond to large World Bank aid projects by replacing powerful appointed ministers of finance with powerful elected ones. In addition, countries tended to respond to large aid from the IMF by empowering ministers of finance. Our study is innovative in defining the political autonomy of DMOs, and coding it over such an extensive scope of countries and years. This is also the first study to test systematically the effects of World Bank and IMF advocacy of sovereign debt management professionalism, alongside competing explanations. We regard our study as a first shot at a more comprehensive effort to measure sovereign debt management professionalization, within a broader emerging research agenda of sovereign debt management politics.

KEYWORDS: Sovereign Debt Management; Professionalism; World Bank; IMF; Autonomous State Agencies

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Introduction

Events in recent years demonstrate that governments, even in the major market economies, have difficulties in making credible fiscal commitments (Reinhart and Rogoff, 2009). This has encouraged research into budgetary politics. Some scholars highlight the importance of the institutional framework of budgetary processes (Dahan and Strawczynski, 2013; Hallerberg *et al*., 2007). Budgetary politics can be incremental or path-dependent (Jones *et al*., 2014), subject to logrolling and hostage to political polarization (Alt and Lassen, 2006). In contrast, high collective responsibility, low political polarization (Breen and McMenamin, 2013) and a centralized budget process (Hallerberg *et al*., 2009; Hallerberg and Wolff, 2008) improve the credibility of sovereign commitments.

Many studies focused on how bond markets can discipline imprudent governments. Markets may raise risk premiums (Afonso and Strauch 2007; Hallerberg, 2011; Heppke-Falk and Wolff, 2008; Poterba and Kim, 2001), especially following defaults or debt restructuring (Cruces and Trebesch, 2013; Tomz, 2007). Biglaiser and Staats (2012) advocate targeting credit ratings. However, markets may fail (Mosley, 2000), overreact (Ehrmann and Fratzscher, 2005), or judge countries' performance subjectively (Brooks *et al*., 2015). Market discipline may be more effective if the institutional environment is tight (Brender, 2003; Hallerberg, 2011). All of these studies relate to the secondary bond markets, where outstanding sovereign debt is traded.

Less academic attention has been given to the ways in which sovereign debt is planned, issued and managed in primary markets, which may affect the cost of debt and thus, budgetary constraints. In a market economy, the government is a peculiar borrower.

While it has to compete with other borrowers for credit, it is at the same time a very large borrower, and its debt is an important benchmark asset. In this sense, the government is a supplier of a service, and as the sole issuer of its own debt, it may have some discretion over its parameters. Governments ask their Debt Management Offices (DMOs) to set the parameters of the debt to minimize its cost under some prudent degree of risk. This requires an increasing degree of debt management expertise and professionalism, as global financial markets develop new instruments. In the 2000s, the World Bank and the International Monetary Fund (IMF) have increasingly encouraged the professionalization of public debt management, to reduce political interference and achieve better fiscal outcomes, through a series of guidelines for public debt management, first published in 2001.

In the next section, we discuss the parameters of sovereign debt management professionalism, and the recommendations of the World Bank and the IMF with regard to such professionalism. We then argue in the third section that the autonomy of DMOs from political decision-makers is an important part of debt management professionalism. DMO autonomy is also a credibility mechanism, protecting lenders from government manipulation of bond issues to take advantage of the government's inevitable information advantage with regard to its own fiscal situation. We develop a *de jure* measure of DMO autonomy from political decision-makers, classifying DMOs into three ordered categories. For this purpose, we distinguish elected ministers of finance from appointed ones, which often have a background in the financial sector, and presumably enjoy more credibility with lenders. Given their advocacy of debt management professionalization, the silence of the World Bank and the IMF on DMO political autonomy is a puzzle that motivates us to explore whether they might be indirectly promoting DMO autonomy.

The fourth section lays out our research design. We assembled a new country-year dataset of national debt management legislation for 75 democratic countries in the period 1950-2013. This is used to code the dependent variable. Our main independent variable is World Bank and IMF potential for influence over countries, operationalized with the number and size of aid projects. We control for competing explanations for DMO autonomy, including inflation, authoritarian and Marxist-Leninist legacies, engagements in interstate or non-state wars, high cabinet turnover, international financial openness and GDP per capita.

The fifth section reports mixed regression results. In contrast to what we expect, we find that the likelihood of having a highly autonomous DMO (the highest category) fell in the 2000s with the size of World Bank aid, and was not affected by IMF aid. In addition, while the likelihood of having a moderately autonomous DMO (the middle category) increased with the number of World Bank aid projects before the 2000s, counterintuitively this did not happen in the 2000s. However, closer to our expectations, while the likelihood of moderately autonomous DMOs tended to fall with the size of World Bank and IMF aid disbursements before the 2000s, that tendency disappeared in the 2000s. More specifically, our findings suggest that before the 2000s, countries in which ministers of finance dominate debt management tended to respond to large World Bank aid projects by replacing appointed ministers with elected ones. In addition, countries tended to respond to large aid from the IMF by expanding the debt management authority of appointed ministers of finance. We also find that DMO autonomy tends to increase with inflation, wars with non-state actors and international financial openness, but to fall with legacies of non-democracy, Marxism and interstate wars. Income has a complex effect – we find that rich countries are likelier to have

either highly autonomous DMOs, or alternatively, non-autonomous DMOs. The sixth section provides conclusions.

Our study is innovative in first defining the political autonomy of DMOs, and coding it over such an extensive scope of countries and years. This is also the first study to test systematically the effects of World Bank and IMF advocacy of sovereign debt management professionalism, alongside other possible explanations. We regard our study as a first shot at a more comprehensive effort to measure sovereign debt management professionalization, within a broader emerging research agenda of sovereign debt management politics.

Professionalism in sovereign debt management

In a market economy, the government is a peculiar borrower. While it has to compete with other borrowers for credit at the going price (the interest rate), it is at the same time a very large borrower, often the largest single borrower in the economy. Furthermore, the government's debt is normally an important benchmark asset on which banks, firms, financial institutions and households, domestic and foreign, rely for asset management and saving and investment decisions. For this reason, the government is often regarded as a supplier of a particular form of liquidity services, a 'seller' of its

debt, which is an asset for the 'buyers'.[1] Thus, as a borrower the government is not a perfect price taker.

As the sole issuer of its own debt, and given the uniqueness of its debt, the government could be understood as a monopoly, and as such may be able to exploit its position in order to maximize its goals. Formally, the government has discretion over the parameters of its debt. These include the timing and size of each debt issue, its type (inflation-indexed or nominal, variable or fixed rate, foreign or local denominated), and its maturity.

Economists that assume that the government is a long-sighted unitary actor with consistent preferences for maximizing the aggregate welfare have suggested a variety of aims for debt management strategy. Debt management strategy could theoretically aim to minimize welfare loss from tax distortions, enhance the credibility of macroeconomic stabilization policies, relax borrowing constraints faced by private agents and insure them against idiosyncratic shocks, improve intergenerational risk sharing, maintain a balanced budget, provide automatic stabilizers or simply minimize the costs of the debt and its risks (Missale, 1999; Nosbusch, 2008).

However, in practice the government cannot design its debt strategy to meet many of these goals. First, there are some realities familiar to political scientists. The

[1] We do not enter the discussion of the famous 'Ricardian Equivalence'. We observe that in reality vibrant markets exist for government debt, which means that for many people taxes and government debt are not equivalent, for reasons discussed extensively in the literature. It therefore follows that debt management is not fiscally neutral (Missale, 1999, Ch.2).

government may not be able to act as a unitary player with consistent preferences, if it needs the support of discordant factions (Brender and Drazen, 2005; 2008; Saiegh, 2009). Even as a consistent unitary actor, the government rarely intends to maximize the aggregate good, instead favoring its own electorate (Sadeh, 2011; Vaaler *et al*., 2005). Political pressure from foreign governments and institutions with regard to the particular parameters of debt may also not necessarily conform to the local aggregate good. Finally, office-seeking policy makers may not be long-sighted.

In addition, there are some market practicalities. First, in countries with developed financial markets, the terms of issuance of new debt in the primary market are influenced by the much larger secondary market, where outstanding debt is traded, and the government's ability to impose unpopular types of debt on reluctant lenders is limited. Government debt may have local substitutes, i.e. creditors can lend to other actors (Greenwood *et al*., 2010). In countries with a liberalized capital account, foreign substitutes are available too. In market economies with under-developed financial markets, governments may borrow from a small number of local or foreign lenders, who may become strategic players. The lenders may not cooperate with the government's attempt to reach optimal debt structure if their optimal individual choices lead to a sub-optimal aggregate equilibrium (i.e. market failure), or if they do not have the same information that the government has. Government debt is a unique asset, but governments in market economies do not control the bond markets.

Second, it is impractical to issue the kinds of sophisticated state-contingent instruments that are needed for a debt strategy to maximize aggregate welfare. Markets prefer simple and liquid types of debt that are less likely to be manipulated by government policy. Some of those goals can be achieved with simple instruments (Buera and

Nicolini, 2004) but the highly detailed information this would require is only available with hindsight, and at varying degrees of accuracy (Missale, 1999). The sensitivity of valuations to small changes in assumptions makes it safer to follow simple and transparent rules (Faraglia *et al*., 2010).

Thus, studies have repeatedly shown that actual debt structures do not conform to the predictions of normative analyses about optimal policies beyond minimizing the costs of the debt and its risks (Faraglia *et al*., 2008). In practice, governments determine the amount they need to borrow each year given political exigencies, and ask their debt managers to set the parameters of the debt in such a way as to minimize its cost and limit its risks (Blommestein and Turner, 2012). Indeed, the International Monetary Fund (2014, 5) defines public debt management as "the process of establishing and executing a strategy for… [raising] the required amount of funding at the lowest possible cost over the medium to long run, consistent with a prudent degree of risk."[2]

As Wheeler (2004, 3) notes, even these more humble goals require an increasing degree of debt management expertise and professionalism, as global financial markets develop new instruments. The World Bank and the IMF have encouraged the professionalization of public debt management in order to reduce political interference and improve fiscal outcomes. These institutions first issued a set of risk-management guidelines in 2001, later amended (International Monetary Fund, 2014). In the recent guidelines, the IMF has determined that "poorly structured debt portfolios, in terms of maturity, currency, or interest rate composition…" often result in economic crises

[2] Wheeler (2004, 4) also emphasizes "…developing and maintaining an efficient market for government securities."

(2014, 5-6), and that such substantial debt portfolios require sound risk management as a tool for reducing uncertainty for investors. More specifically, the IMF and the World Bank recommend:

- Centralization of debt management authority: the International Monetary Fund's (2014, 14) guidelines acknowledge that DMOs should operate separately from monetary policy-makers, under clearly articulated legal arrangements, consolidating the debt management functions in a single, clearly defined authority (section 3.1, 20). This is valid whether the debt managers are administratively part of the public or private sector – as long as operational independence is preserved. Scholars agree. Hallerberg (2016) emphasizes the importance of centralizing sovereign debt management in a single DMO rather than splitting it among different and sometimes, rival agencies, at different levels of government and different sectors of government activity.[3]
- Publication and execution of a publicized debt management plan: The IMF and the World Bank recommend regularly publishing information on outstanding debt and submitting to external audit. "Authorities should pay greater attention to the benefits of having a prudent debt management strategy, framework, and policies that are coordinated with a sound macro policy framework" (International Monetary fund and the World Bank, 2001, 5). Furthermore, section 4 of the IMF's 2014 guidelines (24) calls for the adoption of a debt management strategy and an annual borrowing scheme – "a plan that operationalizes the debt management objectives and… lays out the desired composition of the portfolio" – and for its publication (section 2.2, 17). These programs should strongly focus on "managing the risk exposure

[3] See also Gandrud and Hallerberg 2016; Harkness, 2006; Jeal, 2006; Wheeler, 2004.

embedded in the debt portfolio", while carefully monitoring the government's debt structure (section 4, 24). Melecky (2012) and Wheeler (2004, 7) too advocate the publication of numerical benchmarks with regard to specific types of risk[4].

- High-end training and recruitment: the 2014 (section 3.2, 21) and original 2001 guidelines (18) specify that "Government debt management requires staff with a combination of market skills (such as portfolio management and risk analysis) and public policy skills", and that "the ability to attract and retain skilled debt management staff is crucial for mitigating operational risk." Together with investment in training and minimizing salary gaps between the public and private sectors, DMOs are also advised to adopt special codes-of-conduct and conflict-of-interest rules. To that, we can add that professional government debt-management staff should probably be recruited from the same pool of talent on which lenders draw (which means they are should enjoy similar employment terms).

In practice, countries vary in their degree of debt-management professionalism. An important distinction is between developing and developed economies. In the former, promoting the rule of law, debt sustainability, staff training and development of local debt markets assume greater priority, and the potential for conflict between debt management and monetary and exchange rate policies is greater (Wheeler, 2004, 5). Rollover risk is a major concern. In developed economies, those issues are mostly resolved and public debt is managed under a clearly defined and relatively centralized governance structure. While coordinated with fiscal and monetary policies, in

[4] According to Wheeler, these include market risks (changes in interest rates, exchange rates and commodity prices), rollover risk, liquidity risk (unanticipated demand on cash), settlement and other risks.

developed economies debt management is a distinct responsibility with a distinct policy.

Thus, almost all OECD countries have national debt management plans, most of them public and half of them with numerical benchmarks. However, proportionally fewer non-OECD countries have such plans, publicize them, and employ benchmarks (Melecky, 2012). A few OECD countries have established their DMOs as state-owned corporations, which allowed them to offer higher pay and attract staff from lenders. Examples in recent years include Austria, Germany, Hungary, Ireland and since 2012 Portugal. However, this might come at the expense of the interests of the government, if it results in excessive intimacy between the DMO and the lenders. Most countries assign civil servants to DMOs, and pay them less than their private sector peers earn. Countries also vary in their declared debt management priorities and the extent of DMO centralization, not to mention the political, institutional, market and macroeconomic environments in which they manage their debts.

There is also variation across time in debt management professionalism. The International Monetary Fund and the World Bank (2003, xiv) identify "a clear trend toward… centralizing debt management activities as much as possible in one entity, even though the preferred entity varies depending on country circumstances". Wheeler (2004, 2) notes that until the 1990s, government debt management in many countries was decentralized, lacked clear objectives and ignored risks, and financing decisions were often politically motivated. He identifies a wave of reforms in recent decades, following fiscal crises and increasing international financial mobility.

The significance of DMO autonomy from political decision-makers

In order to enhance the ability to function efficiently, the International Monetary Fund (2014, 14) recommends instating a clear "separation of debt management policy and monetary policy objectives and accountabilities" [and making sure that] "debt management, monetary, fiscal, and financial sector regulatory authorities… [retain their] independence and accountabilities". However, the World Bank and the IMF have never explicitly advocated greater autonomy for DMOs from political decision-makers. Likewise, while Anderson (2006), Storkey (2006) and Wheeler (2004) discuss the efficiency and effectiveness of separate public debt management departments, they do not discuss their political autonomy. This section discusses why DMO autonomy is important and how it may be measured.

Hallerberg (2016) suggests that the autonomy of DMOs from political decision-makers is another important dimension of sovereign debt management professionalism, alongside centralization of debt management, publishing a detailed debt management plan, and hiring well-trained staff, as discussed in the previous section. A fully autonomous DMO would make and execute its debt management plan without consulting political decision-makers, much as independent central banks make monetary policy. In contrast, non-autonomous DMOs are likelier to come under pressure to subject their operations to short-term, electoral, partisan or even personal interests of political decision-makers, making public debt costlier or riskier than it could be. Evidence from the study of regulatory agencies, which may be relevant to DMOs as well, suggests that independence improves the quality of their output (Koop and Hanretty, 2017).

In addition, Sadeh and Porath (2016) argue that DMO autonomy is a credibility mechanism. Governments enjoy an information lead over lenders with regard to their borrowing requirements. A government that expects a deterioration in its finance and a resulting rise in the yield could 'lock in' the current yield with a long issue, causing it to lose value in the secondary market when the information is revealed, at the expense of its holders. Conversely, a government that expects a yield fall could issue short in order to cheaply rollover the debt after the information is disclosed, at the expense of the lenders.[5] Such opportunistic use of privileged information erodes the credibility of the government with lenders, which in the long term, may demand a premium as compensation for this risk. A DMO that is autonomous from political decision-makers can enjoy greater credibility with lenders than a non-autonomous DMO, because it is likelier to consider the long term than political decision-makers are.

Our measure of DMO autonomy from political decision-makers follows a growing literature that measures the autonomy of various state agencies. For example, political economists have developed various central bank independence measures (Cukierman, 1992; Garriga, 2016). Public policy literature offers a number of measures of the autonomy of industry regulators (Gilardi, 2002). Some of these are *de jure* measures, which analyze formal statues of the relevant agencies, while others are *de facto* measures based on questionnaires, or on the turnover rate of the heads of agencies.

[5] In developed countries, demand in the primary market is concentrated in debt with a few benchmark maturities (such as two or ten years), but the government can adjust the combination of maturities of the debt it issues.

De jure measures have their disadvantages. Laws cannot cover all aspects of the relations between a state agency and other state bodies. In addition, the practice of such relations may differ from what the law stipulates. The rule of law varies even among democracies. However, legal-based measures are useful for comparing cross-sectional data across time, and for assessing the institutional choices that political decision-makers and the legislature make when passing debt management legislation. Much of the relevant laws in this study are constitutional, central to the operation of government (defining who is entitled to borrow in the name of the state), and/or electoral, which are observed in democracies, even when the rule of (other) law is not strong.[6]

In contrast, questionnaires used for *de facto* measures of agency autonomy may suffer from narrow coverage, problematic cross-sectional comparability, and little within-country variation. Worse, *de facto* measures of agency autonomy are likely to be endogenous to their performance, if not to other variables of interest (Garriga, 2016; Guardiancich and Guidi, 2016). Thus, we believe that *de jure* measures of DMO autonomy are more appropriate for this study than *de facto* ones.

Unfortunately, existing *de jure* regulator and central bank autonomy measures cannot be easily adapted to the study of DMOs, for two reasons. First, unlike industry regulators, DMOs do not play an impartial law-monitoring function. Unlike central banks, they are not responsible for aggregate economic conditions. Rather, DMOs are expected to serve the financial interests of their governments, seeking a good bargain

[6] Indeed, Hanretty and Koop (2013) find that legal autonomy of regulators in democracies is strongly correlated with *de facto* autonomy, even after controlling for the extent of the rule of law.

from the lenders. Perhaps as a result, DMOs are never fully autonomous of political decision-makers, as some regulators and central banks are.

Second, existing *de jure* regulator and central bank autonomy measures rely on formal mandates that explicitly lay out minute details such as the terms of office of the head of the agency and its board, their hiring and dismissal procedures, the agency's finance and its organization (Hallerberg, 2016). Central bank independence measures also relate to details that are specific to monetary policy. However, only a few countries have such detailed legislation with regard to DMOs, and any such legislation was mostly adopted in recent years. Indeed, debt management is still carried out in many countries without any legally mandated specialized agency. Even when debt management is centralized, it is typical for the finance ministry to be generally in charge of debt management according to the law, and to allocate the task to one of its internal departments, with or without the involvement of other state bodies such as the cabinet, the legislature and/or the central bank.

Instead of devising a DMO autonomy index, we analyze any legislation related to debt management, and classify DMOs into three ordered categories of relative autonomy from political decision-makers, as described below. Beyond analysis of legislation relating directly to debt management authority, we also took account of constitutional arrangements, electoral laws and central bank laws, relating to allocation of authority over financial and fiscal affairs, general executive authority, and relations between the executive and the legislature. Our analysis disregards regulations and decrees that the legislature did not adopt as law, even if they are legally binding, because they are relatively easily revocable and are not a truly binding constraint on the executive. However, legally binding agreements contracted by organizations with distinct legal

identities (such as the 1991 agreement between the Danish ministry of finance and the Danish central bank), are taken into account in our analysis. We communicated with the relevant authorities in each country in order to locate the relevant legislation (available on-line or digitally forwarded to us) and to interpret it.

As stated above, we are not aware of any DMO that is fully autonomous of political decision-makers, with the formal power to dictate the parameters of issuance to political decision-makers. However, we classify DMOs as relatively highly autonomous if by law they have some independent authority in designing the parameters of debt issuance (even if subject to political decision-makers approval), or if debt management is subject to veto by apolitical players. We expect such DMOs to command professional expertise in debt management that is unrivaled by other government bodies. Political decision-makers must receive their independent advice before taking a decision.[7]

Even moderately autonomous DMOs may still gain some *de facto* autonomy if the law at least mentions them, they have a distinct legal identity, and/or no single political decision-maker can legally dictate the parameters of debt issuance.[8] Such DMOs may

[7] Of course, politically autonomous DMOs may still coordinate their policies with fiscal and monetary policy authorities.

[8] Thus, our classification method is sensitive to the extent of political constraints (veto points) on government action, but rather than resort to general indices (Henisz, 2000), we focus specifically on such constraints in debt management. For example, we interpret greater parliamentary oversight over debt management as a constraint on the government, and hence an indirect strengthening of a professional DMO (Hallerberg, 2016).

be able to exploit disagreements among political veto players, and under certain circumstances, overruling them could be politically costly.[9]

The non-autonomous DMOs have no separate legal entity, are governed (and may even be disbanded) by ministerial regulations and decrees, and ultimately follow the orders of a single elected policymaker (often the minister of finance). We classify DMOs as being non-autonomous if they are not explicitly mentioned in any law and if they are subordinate to a single political decision-maker, who needs no approval from other authorities in managing debt (Guardiancich and Guidi, 2016; Hanretty and Koop, 2013).

For the purpose of the above classification, we identify the DMO as the most senior apolitical decision-maker in charge by law of deciding the parameters of newly issued sovereign debt. Depending on legislation, the DMO could for example be the head of a specialized agency outside any ministry, the head of a legally designated unit inside a ministry, the head of a government-owned enterprise, or simply the general director of the ministry of finance.

We use two alternative operational definitions of political decision-makers. According to one definition, we define any member of cabinet as a political decision-maker. Alternatively, only elected members of cabinet are considered as political decision-makers, a definition which allows appointed ministers of finance, who did not run for

[9] Wheeler (2004, 50-51) suggests that a legal requirement to seek parliamentary authorization for debt transactions could introduce political considerations into decision-making. However, he implicitly assumes that the minister in charge of the DMO is a benevolent aggregate welfare maximizer.

office, to be identified as DMOs. Appointed ministers are typical of presidential democracies, but are not rare in some parliamentary democracies too.[10] This distinction between elected and appointed ministers is interesting because appointed ministers have often had a career in finance (and sometimes return to that career after stepping down), which presumably makes them more credible in the eyes of financial institutions, even if their political affiliation is overt. They are certainly more experienced and knowledgeable in finance than other ministers. Some governments may also hope to get better borrowing terms from lenders based on the personal contacts of such finance ministers. When we do not consider appointed ministers of finance as political decision-makers, they often become the DMO for our classification purpose (if they have legal debt management authority). This may result in classification as highly autonomous DMO, if the law at least gives veto power over debt management to such a minister of finance.

Given their advocacy of debt management professionalization in the 2000s, the silence of the World Bank and the IMF on DMO political autonomy motivates us to explore whether they might be indirectly promoting DMO autonomy, perhaps as a spillover from advances in the other parameters of DMO professionalism. Since we expect the World Bank and the IMF to use their influence to promote professional debt management, the hypothesis to be tested in this study is therefore:

[10] In parliamentary democracies with an explicit legal prohibition of membership in the legislature by cabinet members (such as the Netherlands), we considered all cabinet members as political decision-makers. In such countries, cabinet members generally first run for office in the legislature and then resign to become members of cabinet.

Since the year 2000, an increase in the influence of World Bank and the IMF is associated with greater political autonomy for DMOs.

Research design

We assembled a new dataset of national debt management legislation for the period 1950-2013. While we are interested in IMF and World Bank advocacy of more professional debt management in the 2000s, a longer data period provides perspective. We restrict our study to independent democracies, since there cannot be meaningful autonomy of any state body from political decision-makers under non-democratic regimes. We consider countries democratic when they score 7 or more in the polity2 index compiled in the Polity IV 2016 database. However, political culture changes only gradually and democracy cannot take root instantly. Thus, we do not consider periods of democracy shorter than five consecutive years, unless shorter periods of non-democracy separate them from previous or future five-year democratic periods. For the sake of efficiency, we also left out countries that according to these criteria have qualified as democracies in the past, but have not scored 6 or more continuously in polity2 over the past ten years, as we expected difficulties in gaining access to the relevant historical documents in such countries. 85 countries qualify all of the above criteria for at least some periods, and we have so far been able to code 75 of them, yielding 2,692 country-year observations.

The dependent variable, which has three binary variants, codes DMO autonomy from political decision-makers based on the three ordered categories outlined in the previous section. *AUTO1* is a dummy variable that assigns the value 1 to 556 country-years with highly autonomous DMOs, assuming that only elected members of cabinet are political decision-makers (see Table 1). For example, in Austria since 1993, a board of non-elected professionals supervises the minister of finance on debt management. In Denmark since 1991, the minister of finance and the central bank co-manage debt. In Slovakia since 2003 and in Sweden since the 18th century, statutorily independent DMOs propose the debt plan to the government. Among presidential democracies, examples include South Korea, Taiwan and the US, in which the law delegates sole authority to their ministers, who are not elected. Moderately and non-autonomous DMOs are both coded 0 in *AUTO1*.

AUTO2 is a dummy variable that assigns the value 0 to 877 country-years with non-autonomous DMOs, assuming again that only elected members of cabinet are political decision-makers. Examples include Belgium since 2001, France since 1959, Spain since 1996, and Canada, New Zealand and the United Kingdom since long before 1950. Highly and moderately autonomous DMOs are both coded 1 in *AUTO2*. Alternatively, *AUTO3* is a similar dummy that codes 956 country-years 0, assuming that any member of cabinet is a political decision-maker.[11] *AUTO1* and *AUTO3* each nests in *AUTO2* but not in each other. Observations coded 1 by *AUTO2* are necessarily coded 1 by either *AUTO1* or *AUTO3* or both. In observations coded 0 by *AUTO1* but 1 by *AUTO2* or

[11] We did not code a version of *AUTO1* under the assumption that all members of cabinet are political decision-makers, because only 158 observations would qualify as highly autonomous, which does not allow meaningful generalizations.

AUTO3, the DMOs are moderately autonomous. Table 2 reports the frequency of the dependent variable's values before and during the 2000s.

Table 1: Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max	Unit
AUTO1	2,692	0.07	0.405	0	1	Dummy
AUTO2	2,692	0.674	0.469	0	1	Dummy
AUTO3	2,692	0.645	0.479	0	1	Dummy
WB_AID_NUM	2,692	1.46	2.95	0	34	Count
WB_AID_GDP	2,672	0.003	0.008	0	0.071	Fraction
WB_AID_GOV	2,601	0.024	0.060	0	0.820	Fraction
WB_API_GDP	2,669	0.018	0.034	0	0.271	Fraction
WB_API_GOV	2,601	0.133	0.279	0	3.068	Fraction
IMF_AID_GDP	2,672	0.003	0.019	0	0.631	Fraction
IMF_AID_GOV	2,601	0.019	0.150	0	5.110	Fraction
IMF_DBT_GDP	2,668	0.007	0.022	0	0.330	Fraction
IMF_DBT_GOV	2,601	0.052	0.157	0	2.217	Fraction
2000s	2,692	0.371	0. 483	0	1	Dummy
INFLATION	2,672	16.8	83.3	-2.2	1,694.4	% points
NON_DEMOCRACY	2,692	0.405	0. 491	0	1	Dummy
EXTRM_DICTATOR	2,692	0.140	0.347	0	1	Dummy
SOCIALIST	2,692	0.108	0.311	0	1	Dummy
ISWAR	2,478	0.030	0.171	0	1	Dummy
ISWARlast4Y	2,478	0.074	0.262	0	1	Dummy
ISWARsince1950	2,478	0.369	0.483	0	1	Dummy
NSWAR	2,478	0.047	0.211	0	1	Dummy
NSWARlast4Y	2,478	0.081	0.273	0	1	Dummy
NSWARsince1950	2,478	0.241	0.427	0	1	Dummy
EXCUTV_TRNVR	2,692	3.6	1.9	1	18	Count
INT_FIN_OPN	2,692	72.0	26.9	0	100	Index
INCOME	2,672	10,776	15,161	52	115,398	USD

Table 2: Distribution of dependent variable's values by period

		AUTO1	*AUTO2*	*AUTO3*
Before 2000	0	1,370	546	591
	1	324	1,148	1,103
Since 2000	0	766	331	365
	1	232	667	633

Changes to the legal situation provide temporal variation in DMO classification of 27 countries.[12] Of these, 12 countries increased their DMOs' autonomy: In Australia, Botswana, the Dominican Republic, Finland, Greece, Mongolia and Senegal, legal changes shifted DMO classification only once during their data years, from being non-autonomous to being moderately autonomous. In Austria, Denmark, Slovakia and Turkey, similar one-time legal changes turned their DMOs from being moderately autonomous into being highly autonomous. Kenya leaped from the non-autonomous category to the highly autonomous one when it became a presidential democracy in 2011. In contrast, eleven countries reduced their DMOs' autonomy: in Belgium, Croatia, France, Italy, Luxembourg, Mauritius, the Netherlands, Slovenia, Trinidad and Uruguay, legal changes shifted DMO classification once during their data years, from being moderately autonomous into being non-autonomous. Paraguay shifted once from the highly autonomous classification to the moderately autonomous one. Finally, in Brazil, Hungary, Moldova and Romania, legislation has changed DMO classification twice in their data years, once in either direction.

Another source of temporal variation in DMO classification stems from turnover in the cabinet's finance portfolio. Recall that if only elected members of cabinet are regarded as political decision-makers, then in parliamentary democracies with a law that at least gives veto power over debt management to the minister of finance, the DMO alternates from being non-autonomous or moderately autonomous to being highly autonomous when an appointed minister replaces an elected one. Such temporal variation in DMO classification (in either direction) occurred in 13 countries: the Czech Republic,

[12] Transition years (from one coding to another) were coded in accordance with the most prevalent classification during the year.

Finland, Greece, Hungary, Israel, Italy, Latvia, Madagascar, Mongolia, Poland, Romania, South Africa and Spain. In 41 other countries, no changes in DMO classification are observed during the data years, for either legal changes or cabinet turnover.

Our main independent variable is World Bank and IMF potential for influence over countries. We assume that the influence potential of these institutions over a particular country increases with the number of projects they support in it, and with the financial size of the aid. It also seems straightforward that these institutions would especially appreciate professional management of recipient countries' debts to them, which rise with the aid disbursed. We use five different measures of such support by the World Bank, and four by the IMF. *WB_AID_NUM* is the number of projects approved by the Bank for each country in each particular year[13]. *WB_AID_GDP* is the ratio between the value of overall World Bank aid disbursed to each country in each particular year[14] (regardless of project approval time and duration), and the recipient country's GDP in that year. Alternatively, *WB_AID_GOV* is the ratio between the same value and the recipient country's government consumption in that year.[15] *WB_API_GDP* is the ratio

[13] Taken from the "boardapprovaldate" series, the "World Bank Projects & Operations" cluster, https://data.worldbank.org/data-catalog/projects-portfolio

14 Based on "totalamt" series, the "World Bank Projects & Operations" cluster, https://data.worldbank.org/data-catalog/projects-portfolio

[15] World Bank aid is more likely to enter the government's investment budget than its consumption aggregate, but the latter is more available and is a good proxy for the size of government, and thus a reasonable yardstick to measure the importance of the aid to the recipient government.

between the value of all open projects approved for each country as of each particular year (regardless of project approval time, duration, disbursement and repayment), and the recipient country's GDP in that year. Alternatively, *WB_API_GOV* is the ratio between the same value and the recipient country's government consumption in that year. GDP and government consumption data are taken from the IMF's *International Financial Statistics (IFS)* database.

We interact these five variable with a dummy for the period since 2000 (*2000s*). Since the World Bank became more interested in improving debt management professionalism in the 2000s, positive coefficients for these interactions would support our hypothesis. Positive sums of the coefficient of each of these variables and the coefficient of its interaction with *2000s* would also support our hypothesis.[16]

We use four different measures of IMF influence on countries and interact them with *2000s* too, with the same expectations for coefficients and their sums. *IMF_AID_GDP* and *IMF_AID_GOV* are similar to the corresponding variables described above for the World Bank.[17] *IMF_DBT_GDP* is the ratio between the value of each country's outstanding debt to the IMF as of each particular year[18] and its GDP in that year.

[16] Arguably, the line of causation may also run the other way, without refuting our hypothesis: the more autonomous the country's DMO is, the more it may win World Bank aid.

[17] All IMF aid data is based on the "AidData" database, introduced by Tierney *et al.*, 2011.

[18] Based on data retrieved from the IMF Financial Data Query Tool (22 June 2017): https://www.imf.org/external/np/fin/tad/query.aspx

Alternatively, *IMF_DBT_GOV* is the ratio between the same value and the country's government consumption in that year.

As discussed above, DMO autonomy could serve as a credibility mechanism. Thus, we use a number of variables controlling for a record that could be problematic for countries trying to raise debt, and which as a result could motivate them to make their DMOs more autonomous. Inflation is default by stealth on local currency denominated debt, so high-inflation countries are expected to suffer from poor reputation. *INFLATION* is the average annual rate of consumer price inflation over the current year and the preceding three years (to reduce the effect of exceptional years), based on the *IFS* database.

A non-democratic legacy may create a credibility problem, if fiscal discipline is greater in democracies (Ballard-Rosa *et al*., 2016; Schultz and Weingast, 2003). This may encourage more DMO autonomy. However, the democratic advantage argument may be exaggerated (Archer *et al*., 2007; Beaulieu *et al*., 2012; DiGiuseppe and Shea, 2015). To the contrary, as an institutional legacy of non-democracy, authority may still be concentrated in the hands of a few (now democratically elected) decision makers, who prefer to avoid granting autonomy to various state bodies, including DMOs. To control for these conflicting effects, *NON_DEMOCRACY* is a dummy variable coding observations 1 if the country's polity2 score fell below 7 at any year between 1950 and the observation year (relating obviously to any non-data years). *EXTRM_DICTATOR* is a dummy for a legacy of extreme dictatorship, coding countries 1 for having their polity2 score fall below -7 at any year between 1950 and the observation year. Since *EXTRM_DICTATOR* nests in *NON_DEMOCRACY*, the effect of extreme dictatorship is estimated as the sum of coefficients of these two dummies.

In countries with a Marxist-Leninist legacy, the political and bureaucratic class, educated before the transition to market economy, may remain suspicious of private financial institutions. Such an attitude may lead to reluctance to allow DMOs to be autonomous, lest they be more favorable to the interests of finance. However, precisely for this reason investors may be concerned that default may be likelier. DMO autonomy may be helpful in assuaging investors' concerns. *SOCIALIST* is a dummy for a legacy of Marxist-Leninist regime, coding 15 countries 1 for proclaiming themselves (in their constitutions) to be Socialist states (as distinguished from merely being run by a Socialist government), or for being part of such a country, at any year between 1950 and the observation year.[19] Note that since non-democratic legacy is controlled for as discussed above, *SOCIALIST* measures an ideological, policy-cultural bias, not any lingering authoritarian tendency associated with Marxism-Leninism legacy.

Wars are associated with very expensive open-ended costs. Thus, investors may deem countries with a history of engagement in wars as likelier to default on their debts. This could motivate more DMO autonomy. However, wars motivate concentration of executive powers, so it is possible that they lead to less DMO autonomy. *ISWAR* is a dummy variable for a country engaged in an interstate war in the observation year (taken from the Correlates Of War database). *ISWARlast4Y* is a dummy for a country engaged in an interstate war in the observation year and/or in any of the three preceding years, and *ISWARsince1950* is a dummy for a country ever being engaged in an interstate war between 1950 and the observation year. *ISWAR* nests in *ISWARlast4Y*,

[19] *SOCIALIST* does not nest in *NON_DEMOCRACY* because there are countries that were part of a Socialist country, later became independent, and immediately qualified the polity2=7 threshold. These countries are coded 0 in *NON_DEMOCRACY*.

which nests in *ISWARsince1950*. Thus, the effect of war in the recent four years is estimated as the sum of coefficients of the first two dummies, and the effect of war anytime since 1950 is estimated as the sum of all three coefficients. *NSWAR*, *NSWARlast4Y* and *NSWARsince1950* similarly code wars fought against non-state organizations (taken again from the COW database).

High cabinet turnover shortens the decision-making horizon of cabinet members, making them more likely to pursue opportunistic shortsighted decisions (Ennser-Jedenastik, 2016; Guardiancich and Guidi, 2016). In such an environment, default may be likelier (Hallerberg, 2004; Sadeh, 2006). *EXCUTV_TRNVR* is the number of top executives in office in the ten years preceding the observation year (including years of non-democracy and including transition, caretaker and technocratic governments), or since independence (in the country's first decade). Its coefficient is expected to be positive.

The more open a country is to international financial flows the less captive its local banks are and the harder the government must try to win their trust (Hallerberg, 2016). In addition, the more an economy is open to foreign finance, the more volatile its financial markets are, and the more professional the DMO must be to manage sovereign debt (Wheeler, 2004, 3). *INT_FIN_OPN* is an index of financial openness, based on Quinn and Toyoda's (2008) *cap100* series. We expect its coefficient to be positive. To avoid endogeneity with other variables in our model, we instrumented this index, using ordered logit regression run on a dataset with similar countries and years as described above, but including non-democracy years too (for the sake of greater variation in all variables). *INT_FIN_OPN* is a nine-notch ordinal scale (both in the original *cap100* series and in our predicted values), transformed to range between 0 and 1. The set of

instruments includes the ratio of the country's population relative to world population (as a proxy for country size – based on World Bank data), as well as sets of geographical, cultural and institutional variables.

The last control variable is *INCOME* – the country-year GDP per capita, in current US dollars, based on *IFS* data. We expect rich countries to have a stronger constituency in favor of international financial openness, as wealthy households and firms seek better financial opportunities and stand to lose more from a government with poor debt credibility. This variable is also important to control for different levels of DMO professionalization among rich and poor countries.

Other potentially relevant control variables, such as a legacy of credit defaults (which increase the need to win the trust of lenders), size of public debt (which would make debt management more important)[20] and left-right government bias, were not included due to insufficient data coverage within our data countries and years.

Results

We ran logit regressions with robust standard errors. For each of the three variants of the dependent variable, we are interested in running regressions with two combinations of independent variables – one relating aid data to recipient country's GDP, and the other relating it to its government's consumption. However, calculation of robust

[20] See Wheeler, 2004, 1-3, Hallerberg, 2016.

standard errors failed for the latter regression of *AUTO1*, and for the former regression of *AUTO3*. Hence, we are left with four regressions.[21] Each of the two combinations of independent variables was tested for collinearity, and the mean Variance Inflation Factor (VIF) scores were 2.11 for the GDP combination and 2.17 for the combination based on government consumption.[22]

For convenience, Table 3 reports the results of these regressions in three parts, the first focusing on World Bank aid, the second on IMF aid, and the third part reporting on the control variables. The results in Table 3a are mixed. Some of the results are not supportive of our hypothesis. In Regression (1), the likelihood of having a highly autonomous DMO (*AUTO1*) in the 2000s is negatively associated with the value of all open World Bank projects, according to the negative sum of coefficients of *WB_API_GDP* and *WB_API_GDP00*, in contrast with our hypothesis. That sum of coefficients is admittedly not very significant, but the coefficient of *WB_API_GDP00* is. In order to explore this relationship further, Figure 1 shows the marginal effect of the *2000s* dummy on *AUTO1* as a function of *WB_API_GDP*. In other words, the solid line in the figure demonstrates how the likelihood of highly autonomous DMOs

[21] We also combined *AUTO1* and *AUTO2* into a three-notch ordinal scale and tried to run ordered logit regressions. However, fitting the full model with robust standard errors took many iterations and the process could not be completed within reasonable time.

[22] The highest VIF scores were 3.59 in the GDP combination (*WB_API_GDP00*) and 4.08 in the government consumption combination (*WB_API_GOV00*). Exclusive of the interacted variables, the highest scores were 2.84 and 2.85 respectively (NSWARlast4Y in both)

changed in the 2000s for a given level of World Bank open projects relative to GDP.[23] The dashed lines show the 95 percent confidence intervals. The upper dashed line crosses the horizontal axis at about *WB_API_GDP* =0.008, which means that the effect of the 2000s becomes significant when the value of open projects exceeds 0.8 percent of GDP, where about 47 percent of the observations of the 2000s fall. For these observations with relatively high World Bank influence, more such influence discouraged high DMO autonomy in the 2000s.

In Regressions (2)-(4) the likelihood of having a moderately autonomous DMO (*AUTO2* or *AUTO3*) increased with the number of World Bank aid projects before the 2000s (see positive and significant coefficient of *WB_AID_NUM*), but in contrast to our hypothesis, not in the 2000s (see the insignificant tests for the sums of its coefficients).[24] These results suggest a tendency to transfer power from a single elected member of cabinet in favor of other veto players but not at the expense or in favor of statutorily independent DMOs or powerful appointed ministers of finance. Such changes are coded as falling DMO autonomy in *AUTO2* and *AUTO3*, but as shifts within the 0 category in *AUTO1*.

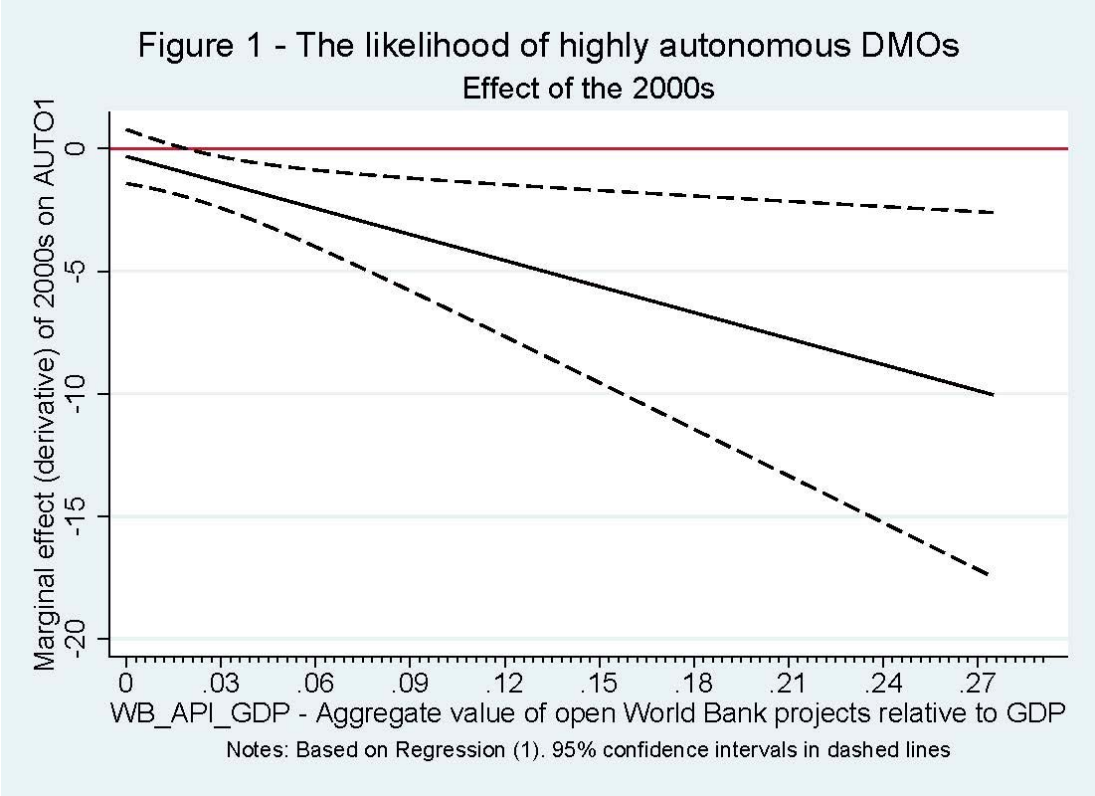
[23] The coefficient of *2000s* in Regression (1) is the intercept of the solid line, while the coefficient of *WB_API_GDP00* is its gradient.

[24] We spare the reader of a marginal effect analysis similar to the one in Figure 1, as only less than 12 percent of the observations of the 2000s lay within the range of significance.

Table 3a: DMO autonomy by type of DMO and signal

Variable	(1)	(2)	(3)	(4)
	AUTO1	*AUTO2*	*AUTO2*	*AUTO3*
WB_AID_NUM	-0.01	0.31***	0.26*	0.49 **
	(0.24)	(0.10)	(0.13)	(0.20)
WB_AID_GDP	0.53	-36.7***		
	(31.53)	(14.1)		
WB_AID_GOV			-4.11**	-2.93
			(1.72)	(2.24)
WB_API_GDP	8.13	-10.38		
	(11.10)	(7.56)		
WB_API_GOV			0.28	-1.82
			(1.10)	(1.40)
2000s	-0.87	0.51	0.72	1.32
	(0.59)	(0.69)	(0.69)	(0.99)
WB_AID_NUM00	0.25	-0.27***	-0.22***	-0.46 ***
	(0.24)	(0.08)	(0.08)	(0.13)
WB_AID_GDP00	13.1	1.38		
	(58.1)	(29.11)		
WB_AID_GOV00			-3.96	-10.47
			(5.56)	(7.05)
WB_API_GDP00	-35.4 **	-13.88		
	(14.6)	(6.86)		
WB_API_GOV00			-2.06**	0.12
			(0.99)	(1.31)
Tests for sums of coefficients				
Aid in the 2000s				
WB_AID_NUM + *WB_AID_NUM00*	0.23	0.04	0.03	0.03
	(0.15)	(0.08)	(0.12)	(0.12)
WB_AID_GDP + *WB_AID_GDP00*	13.6	-35.3		
	(58.6)	(31.5)		
WB_AID_GOV + *WB_AID_GOV00*			-8.07	-13.41 *
			(6.11)	(7.49)
WB_API_GDP + *WB_API_GDP00*	-27.2 *	-24.3**		
	(15.5)	(10.3)		
WB_API_GOV + *WB_API_GOV00*			-1.78	-1.70
			(1.74)	(1.77)

Notes: See more regression results in tables 2b and 2c. Coefficient estimates from logistic regressions with robust standard errors in parentheses. Dependent variable is a dummy for DMO autonomy. * $.05 < p \leq .10$. ** $.01 < p \leq .05$. *** $p \leq .01$.



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However, other results are supportive of our hypothesis. While the likelihood of moderately autonomous DMOs tended to fall with World Bank aid disbursements before the 2000s (see negative and significant coefficients of *WB_AID_GDP* and *WB_AID_GOV* in Regressions 2 and 3), that tendency disappeared in the 2000s (see the mostly insignificant tests for the relevant sums of coefficients). This is true even if, perhaps as a legacy, in Regression 2 the outstanding value of open projects became negatively associated in the 2000s with moderate DMO autonomy (negative and significant coefficient of the sum of coefficients of *WB_API_GDP* and *WB_API_GDP00*).[25]

[25] Note that the negative and significant coefficient of *WB_API_GOV00* in Regression (3) means that in a marginal effect analysis similar to the one demonstrated in Figure

Notice that the likelihood of moderate DMO autonomy when all cabinet members are considered political decision-makers (*AUTO3*) was mostly unaffected by the size of World Bank disbursements relative to government consumption even before the 2000s. This refines our interpretation to the results in Regressions 2 and 3. Before the 2000s, countries tended to respond to large aid disbursements relative to government consumption by replacing powerful appointed ministers of finance with powerful elected ones (such changes are coded as shifts within the 0 category in *AUTO3*). Possibly, World Bank aid may have involved important income-distributing decisions, which political decision-makers wanted to manage.

Turning to Table 3b, in Regression (1) the likelihood of a highly autonomous DMO was not affected by IMF aid. The likelihood of moderate DMO autonomy before the 2000s fell with the size of IMF aid disbursements (*IMF_AID_GOV*) for both *AUTO2* and *AUTO3*. Notice that in Regression 3 the likelihood of moderate DMO autonomy when only elected cabinet members are considered political decision-makers was mostly unaffected by the size of IMF disbursements relative to government consumption. This could mean that before the 2000s, countries tended to respond to large IMF aid disbursements mostly by expanding the authority of appointed ministers of finance. According to *AUTO3*, all ministers are considered political decision-makers, so such legislation reduces DMO autonomy. However, according to *AUTO2*, appointed ministers are not considered political decision-makers, so expanding their authority

1, the gradient of the solid line is significantly steep. However, the upper margin remained above the horizontal axis for all *WB_API_GOV* values in the 2000s, leaving it with no significant effect.

amounts to shifts within the 1 category.[26] Perhaps the IMF emphasized debt management centralization even before the 2000s, which some recipient countries interpreted as recommendation to empower appointed ministers of finance.

Table 3b: DMO autonomy by type of DMO and signal (continued)

Variable	(1)	(2)	(3)	(4)
	AUTO1	*AUTO2*	*AUTO2*	*AUTO3*
IMF_AID_GDP	16.2	-37.30***		
	(24.9)	(9.77)		
IMF_AID_GOV			-3.32	-7.95 ***
			(3.06)	(2.19)
IMF_DBT_GDP	-8.82	8.27		
	(30.77)	(7.36)		
IMF_DBT_GOV			-0.51	0.59
			(1.33)	(1.31)
IMF_AID_GDP00	-26.2	38.1***		
	(26.6)	(10.1)		
IMF_AID_GOV00			3.57	8.45 ***
			(3.15)	(2.40)
IMF_DBT_GDP00	32.6	15.6		
	(24.0)	(13.2)		
IMF_DBT_GOV00			2.64	1.21
			(2.31)	(1.82)
Tests for sums of coefficients				
Aid in the 2000s				
IMF_AID_GDP + *IMF_AID_GDP00*	-9.96	0.76		
	(7.84)	(2.26)		
IMF_AID_GOV + *IMF_AID_GOV00*			0.25	0.49
			(0.34)	(0.39)
IMF_DBT_GDP + *IMF_DBT_GDP00*	23.8	23.9*		
	(19. 7)	(12.3)		
IMF_DBT_GOV + *IMF_DBT_GOV00*			2.13	1.81
			(2.09)	(1.74)

Notes: See more regression results in tables 2a and 2c. See notes in Table 2a.

[26] A marginal effect analysis on Regression 2 (not reported here) shows that for 3.4 percent of the observations with the higher *IMF_AID_GDP* values, IMF influence since 2000 is significantly associated with greater likelihood of moderate DMO autonomy. A similar analysis for Regression 4 shows this for 5.3 percent of the observations with the higher *IMF_AID_GOV* values.

Finally, in Table 3c, moderately autonomous DMOs are likelier under high inflation, as expected, but highly autonomous DMOs are not. These results are similar to those reported for *WB_AID_NUM*, implying a tendency to transfer power from a single elected member of cabinet in favor of other veto players. Legacy of non-democracy has a negative and significant coefficient in Regression 2 but not in Regression 1. This suggests the opposite response: a tendency to concentrate power in the hands of a single elected member of cabinet at the expense of other veto players but not at the expense of statutorily independent DMOs or powerful appointed ministers of finance. However, this tendency is not evident when World Bank and IMF aid is related to government consumption (Regressions 3-4). Perhaps the tendency to respond to large aid relative to government consumption by reducing DMO autonomy, as recorded above, is more likely under a non-democracy legacy, while the response to large aid relative to GDP is not peculiar to previously non-democratic countries.[27] A legacy of extreme dictatorship has stronger such effects.

[27] According to our tests of difference in means, countries with a non-democratic legacy received on average more aid per government consumption, as well as per GDP, than other countries (from both the World Bank and the IMF). Thus, the difference between Regressions 2, 3 and 4 in the coefficient of *NON_DEMOCRACY* cannot be related to this factor.

Table 3c: DMO autonomy by type of DMO and signal (continued)

Variable	(1)	(2)	(3)	(4)
	AUTO1	*AUTO2*	*AUTO2*	*AUTO3*
INFLATION	-0.004	0.005***	0.004***	0.006***
	(0.002)	(0.001)	(0.001)	(0.001)
NON_DEMOCRACY	-0.01	-6.76**	2.79	2.14
	(3.74)	(2.08)	(3.38)	(2.65)
EXTRM_DICTATOR	-1.31	-6.58***	-6.23*	-7.98***
	(5.33)	(2.10)	(3.28)	(2.85)
SOCIALIST	2.16	-1.36	-5.71*	-6.26**
	(3.36)	(2.30)	(3.26)	(2.45)
ISWAR	-1.98	-0.54	-0.98***	-1.28***
	(1.61)	(0.39)	(0.35)	(0.32)
ISWARlast4Y	2.54	1.37***	1.66**	2.24***
	(1.76)	(0.50)	(0.68)	(0.87)
ISWARsince1950	-2.96	-2.03	-2.93*	-5.41**
	(2.73)	(1.34)	(1.77)	(2.21)
NSWAR	1.99*	0.79	1.24	-0.24
	(1.07)	(1.18)	(1.35)	(0.75)
NSWARlast4Y	-0.30	-0.69	-0.51	-0.18
	(0.76)	(1.17)	(1.37)	(1.52)
NSWARsince1950	1.79	1.82	1.97	1.22
	(1.69)	(1.65)	(1.86)	(1.87)
EXCUTV_TRNVR	0.36*	-0.04	-0.11	-0.31*
	(0.21)	(0.09)	(0.11)	(0.18)
INT_FIN_OPN	-0.001	0.03**	0.03**	0.06***
	(0.019)	(0.01)	(0.01)	(0.01)
INCOME	0.00010***	0.00005	0.00006*	-0.00008**
	(0.00004)	(0.00003)	(0.00003)	(0.00003)
Constant	-11.22***	9.12**	7.06**	5.19**
	(4.04)	(3.75)	(3.24)	(2.08)
Observations	2,439	2,439	2,373	2,373
Wald test	220.06***	93.06***	201.05***	285.82***
Tests for sums of coefficients				
Extreme dictatorship				
DICTATORSHIP + *EXTRM_DICTATOR*	-1.32	-13.34***	-3.44	-5.84**
	(5.58)	(4.44)	(2.43)	(2.42)
Interstate war				
ISWAR + *ISWARlast4Y* + *ISWARsince1950*	-2.40	-1.21	-2.24	-4.45*
	(2.50)	(1.50)	(1.73)	(2.38)
ISWARlast4Y + *ISWARsince1950*	-0.42	-0.67	-1.27	-3.17
	(2.36)	(1.36)	(1.61)	(2.31)
Non-state wars				
NSWAR + *NSWARlast4Y* + *NSWARsince1950*	3.48**	1.91**	2.70**	0.80
	(1.63)	(0.95)	(1.19)	(0.79)
NSWARlast4Y + *NSWARsince1950*	1.49	1.13	1.46	1.04
	(1.32)	(1.11)	(1.32)	(1.15)

Notes: See more regression results in tables 2a and 2b. See notes in Table 2a.

A Marxist-Leninist legacy has an additional effect of reducing DMO autonomy, but this is evident only when assuming all cabinet members are political decision-makers (*AUTO3*). This result is similar to the one reported for *IMF_AID_GOV*, implying a tendency to give extensive debt management authority to a single appointed member of cabinet.

Interstate wars are mostly not influential on DMO autonomy according to the sums of the relevant coefficients. The only significant effect is the negative coefficient of *ISWARsince1950* in Regression 4, which means that countries with a history of interstate wars have similar tendencies to those with a Marxist-Leninist legacy. In contrast, wars with non-state actors have immediate effect of increasing DMO autonomy (see sum of the three relevant coefficients in Regressions 1-3). This effect is not evident in Regression 4, which suggests that DMO autonomy is increased by replacing powerful elected ministers of finance with powerful appointed ones. Apparently, in this way the need to increase debt repayment credibility during such wars is balanced with the need to concentrate power. [28]

[28] Shea and Poast (2017) argue that states that are likely to default are unable to acquire the financing necessary to fight a war, and will select away from it. This could be an alternative explanation to the results for wars with non-state actors in Regressions 1-3, if states with autonomous and hence professional DMOs are likelier to obtain wartime financing, and hence likelier to select into war. However, this does not explain the result in Regression 4, nor the results for interstate wars.

Executive turnover has no significant effect in any of the regressions. International financial openness has a positive effect on DMO autonomy as expected but not in Regression 1, as with *WB_AID_NUM* and *INFLATION*. Income affects highly autonomous DMOs as expected, but is also associated with non-autonomous DMOs in Regression 4. This suggests that high income is associate with less authority for multiple veto players and more authority for either statutory debt management agencies (a shift from the 0 category to the 1 category only in *AUTO1*), or for appointed ministers (again a shift from 0 to 1 in *AUTO1* but also an opposite shift in *AUTO3*).

Conclusions

As global financial markets develop new instruments, governments rely on an increasing degree of debt management expertise and professionalism. Government debt-management professionalization can be measured along four complementary dimensions: Centralization of debt management, DMO autonomy from political decision-makers, the existence of a publicized national debt management plan with numerical benchmarks, and recruitment of well-trained debt-management staff.

The World Bank and the IMF have encouraged the professionalization of public debt management, to reduce political interference and achieve better fiscal outcomes. However, these institutions never explicitly advocated greater autonomy for DMOs from political decision-makers. This is unfortunate not only because autonomy is an important element of debt management professionalism, but also because it is a

credibility mechanism. The silence of the World Bank and the IMF on DMO political autonomy motivates us to explore whether they might be indirectly promoting DMO autonomy. Since we expect the World Bank and the IMF to use their influence to promote professional debt management, we expect them to promote autonomous DMOs, indirectly.

Different levels of *de jure* DMO autonomy from political decision-makers can be identified among countries and over time. Unfortunately, a parsimonious autonomy index, similar to indices used to measure central bank independence or industry-regulators autonomy, is impractical for the study of DMOs. Debt management is carried out in many countries without any legally mandated specialized agency. In such countries, typically the finance ministry is in charge of debt management according to the law, and allocates the task to one of its internal departments, with or without the involvement of other state bodies such as the cabinet, the legislature and/or the central bank.

We analyze any legislation related to debt management, and classify DMOs into three ordered categories of relative autonomy from political decision-makers. We classify DMOs as highly autonomous if by law they have some independent authority in designing the parameters of debt issuance, or if debt management is subject to veto by apolitical players. Moderately autonomous DMOs are mentioned by the law, they have a distinct legal identity, and/or no single political decision-maker can legally dictate the parameters of debt issuance. Non-autonomous DMOs are not explicitly mentioned in any law and are subordinate to a single political decision-maker, who needs no approval from other authorities in managing debt. We use two alternative operational definitions of political decision-makers. According to one definition, we define any member of

cabinet as a political decision-maker. Alternatively, only elected members of cabinet are considered as political decision-makers.

We assembled a new country-year dataset of national debt management legislation for 75 democratic countries in the period 1950-2013. The dependent variable codes DMO autonomy from political decision-makers based on the above three ordered categories. Our main independent variable is World Bank and IMF potential for influence over countries. We proxy for this influence with the number of projects they support in each country-year, and with the size of aid disbursements. We interact these proxies with a dummy for the period since 2000, to estimate the institutions' influence in that period. We use an array of control variables, which proxy for competing explanations for DMO autonomy. These variables include inflation, authoritarian and Marxist-Leninist legacies, engagements in interstate or non-state wars, high cabinet turnover, international financial openness and GDP per capita.

We ran logit regressions with robust standard errors. In contrast to our expectation, we found that the likelihood of having a highly autonomous DMO since 2000 was negatively associated with the value of all open World Bank projects, but was not affected by IMF aid. The likelihood of having a moderately autonomous DMO increased with the number of World Bank aid projects before the 2000s, but paradoxically not in the 2000s. However, while the likelihood of moderately autonomous DMOs tended to fall with the size of World Bank and IMF aid before the 2000s, that tendency disappeared in the 2000s, in line with our expectation.

Our findings also suggest that before the 2000s, countries tended to respond to large World Bank aid disbursements relative to government size by replacing powerful appointed ministers of finance with powerful elected ones. In addition, countries tended

to respond to similarly large disbursements from the IMF by increasing the debt management authority of appointed ministers of finance. Our interpretation for these pre-2000 tendencies is that World Bank aid may have involved important income-distributing decisions, which political decision-makers wanted to manage, while the IMF may have emphasized debt management centralization, which some recipient countries interpreted as recommendation to empower appointed ministers of finance.

Our results are sensitive to the interpretation of the role that appointed ministers of finance play in debt management. If one sees them as sign of more professional debt management then the IMF can be credited with promotion of professionalization even before the 2000s. Alternatively, if appointed ministers were understood to be no different from elected ones, then IMF influence would seem to have been detrimental to professionalization until the 2000s.

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