State Capacity and the Quality of Policies:

Revisiting the Relationship between Openness and the Size of Government

María Franco Chuaire
Carlos Scartascini
Mariano Tommasi

August 2014

Inter-American Development Bank
Department of Research and Chief Economist

State Capacity and the Quality of Policies:

Revisiting the Relationship between Openness and the Size of Government

María Franco Chuaire *
Carlos Scartascini*
Mariano Tommasi**

* Inter-American Development Bank
** Universidad de San Andrés

http://www.iadb.org

Abstract[*]

The literature has identified that countries with higher levels of openness tend to present a larger government sector as a way to reduce the risks to the economy that openness entails. This paper argues that there are a number of policies that can mitigate trade-induced risks, many of which do not have the necessary implication of increasing public spending. Yet, many such policies require governmental capabilities not available to any country. For that reason, the relationship between openness and the size of government might be mediated by the quality of its public sector. While countries with weak government capabilities will tend to rely on spending expansions to deal with trade-induced volatility, countries with stronger governmental capabilities might address such challenges by more efficient and less costly means. The empirical analysis in this paper shows that the effect of openness on government consumption is mediated by the quality of government institutions.

JEL classifications: D73, F19, H11, O16, O19, P16
Keywords: Government capabilities, Quality of policies, Openness, Government size

1. Introduction

The issue of government capabilities or, more broadly, of state capacity is a complex one, and it has given rise to important analytical, measurement, and evaluation efforts, as well as lively methodological debates. The concept of "state capacity" is very salient in studies of economic development, and its presence or absence has been associated with development successes and failures. Countries with low state capabilities have difficulties in implementing complex economic policies. This situation in effect reduces the set of policies from which countries can choose and makes them more vulnerable to both internal and external shocks. Countries with strong state capabilities might be able to draw from a broader menu of policies, and pick and successfully implement those policies that best suit the nature of their challenges.

One of the challenges countries face are external, trade-induced, shocks. Countries that are more open, or that are more vulnerable to terms of trade shocks due to the structure of their economy, have to find ways to reduce the incidence and impact of those shocks. One way for countries to respond is by a variety of government programs and policies that may affect public sector size. This is the intuition behind the so-called *compensation hypothesis*, which has been part of the academic debate for more than two decades. According to this hypothesis, the government's attempt to compensate for the risks of increased exposure to international trade results in a positive correlation between trade openness and the size of the public sector. The empirical pattern relating trade openness with larger governments was first unveiled by Cameron (1978) for 18 OECD countries, expanded by a very rich political science literature (including Katzenstein, 1985, and others), and popularized by Rodrik (1998). The logic of the compensation hypothesis is that government spending can provide insurance against external risk, i.e., a higher level of openness brings increased exposure to external risk and, therefore, expanding the role of the government in the economy helps reduce the level of exposure. The mechanisms suggested by Rodrik and other authors include welfare programs, public employment, and the overall macroeconomic stabilization role of public spending.

Those insights have spurred a rich and varied literature, not without debates, as many authors have questioned aspects of the theoretical reasoning, as well as the empirical generality of the results; Section 2 provides a glimpse to those discussions. By and large, however, the compensation hypothesis has been quite accepted within the literature in international political economy, and the potential positive correlation between openness and government spending has

become a staple consideration in exercises exploring the determinants of the size of government. Because of its saliency in the political economy and comparative politics literature we focus on the compensation hypothesis to highlight the importance of considering the relevance of state capabilities for the selection and implementation of public policies.

In this paper we build upon an ample political science and economics literature that shows the relevance of state capabilities for the selection and implementation of public policies to argue that there are a variety of different policy responses to the additional economic volatility induced by trade openness, not all of which imply increasing public spending.[1] While almost any government can reduce volatility by increasing its size through hiring more people, countries with stronger governmental capabilities might address such challenges by more efficient and less costly means by introducing more suitable macro, fiscal, micro, and social policies.[2]

Using the quality of the bureaucracy as a proxy for government capabilities, we show that the marginal effect of openness on the size of government is only positive and significant for low levels of government quality. As bureaucratic quality increases, and hence the set of policy options at the disposal of authorities increases, the effect of openness on government size decreases and even dissipates. Therefore, our results indicate that the effect of openness on government consumption is mediated by the quality of government institutions.

This finding constitutes another step in building a stronger case on the relevance of state capacities for economic development, and an agenda attempting to build bridges between the study of institutions and policymaking in contexts of high and of low government capabilities.[3] These results open up new avenues of research for the comparative politics literature.[4]

---

[1] The fact that countries may react differently to economic integration is not new. See for example Bates, Brock and Tiefenthaler (1991) and Garrett (1998a, 1998b, 2001).

[2] Some of these policies include stronger budget institutions that favor countercyclical adjustments, better financial management systems, more flexible exchange rates, deeper credit markets, industrial and labor-market policies that favor a more rapid adjustment in the use of factors, and more efficient welfare policies, among others.

[3] It complements a related literature on the study of institutions and policymaking in contexts of different degrees of institutionalization. See Scartascini and Tommasi (2012) for a model along those lines, and Caruso, Scartascini and Tommasi (2013) for an empirical study arguing that standard results on the effects of political constitutions on fiscal outcomes (à la Persson and Tabellini, 2003) apply only for countries with high levels of institutionalization of their political institutions.

[4] Our results complement a long tradition of articles dealing with policymaking in the context of differing abilities. For example, Bates, Brock and Tiefenthaler (1991) identify the ability to offer transfers to compensate for risk as a determinant of openness. We argue here that for a given level of openness, different levels of government capabilities allow access to different insurance mechanisms. These results should feed back into a broader literature that will incorporate them.

The paper proceeds as follows. The next section briefly discusses the literature that relates openness and size of the government. It highlights the original discussion brought forward by Rodrik (1998), as well as the extensions, clarifications, and criticisms it has received. Section 3 discusses the relationship between government capabilities (or state capacity) and the vector of risk-reducing policies that each type of country can access. The concept, measures, and related literature on state capacity are presented in Section 4. Section 5 presents the empirical analysis and discusses the results, and Section 6 concludes.

2. More Open Economies and Bigger Governments

Following Cameron (1978) and Katzenstein's (1985) work, the compensation hypothesis has arisen as an important benchmark for the analysis of the effects of trade openness on domestic policy. Cameron was the first to observe that trade openness was one of the most important determinants of government size in OECD countries. Katzenstein argued that small European states such as Sweden, Austria, and the Netherlands complemented their international liberalization with strategic domestic compensation aimed at countering its harmful effects (i.e., instabilities in investment and employment). Policies of compensation included support for employment, special tax legislation favoring enterprises that were affected by fluctuations in the business cycle, wage control, and public expenditures (Balcells, 2006).

The empirical pattern relating trade openness with larger governments first unveiled by Cameron (1978) for 18 OECD countries was extended to a broader international sample by Rodrik (1998). In Rodrik's analysis, the positive association was not limited to the cross section; on average, international trade and public sectors had tended to grow together.

Alesina and Wacziarg (1998) confirm the correlation using government transfers as the dependent variable but argue that country size is a mediating factor: the fact that smaller countries have larger shares of government consumption on GDP and tend to be more open to trade, may explain why more open economies have larger governments. However, Ram (2009) revisits this idea using a panel data setting, and concludes that "the estimates are consistent with the possibility of a direct link between openness and government size along the lines suggested by Rodrik (1998)."[5]

---

[5] Epifani and Gancia (2009) also find that the correlation between government size and openness is robust to the inclusion of country size.

Adserà and Boix (2002) propose a model where the level of openness and government consumption are simultaneously chosen by politicians according to the political regime in place. They estimate a pooled cross-sectional time-series model where they include a measure of democratic institutions both individually and interacted with openness. Although their results confirm the compensation hypothesis, they find democracy to be an important intermediary: as openness to international trade increases, the size of the public sector increases in democratic regimes.

Some authors have reversed the causal arrow, claiming that the political sustainability of globalization in open societies requires a thick, compensating welfare state or, at least, government-sponsored efforts to redistribute (Garrett, 1998a; Adserà and Boix, 2002; Hays, Ehrlich, and Peinhardt, 2005; Scheve and Slaughter, 2007; Martin and Steiner, 2013). This "reverse compensation hypothesis" argues that that once a country has a large welfare state, trade liberalization becomes more likely. Noorruddin and Rudra (2014), for example, show that less developed countries use public employment to protect citizens from the economic insecurities coming from the exposure to global markets. However, the type of public employment used, focused on civil services and administration, tends to favor the politically prominent groups that are, at the same time, those that show the most support for openness.

The discussion on the relationship between trade openness and the size of the public sector is embedded in a broader discussion about the effects of "globalization," including financial openness and integration (Garrett 1998b, 2001). The core issue is whether governments respond to the challenges of globalization with policy choices that are oriented more towards cutting costs (efficiency hypothesis) or protecting people's welfare (compensation hypothesis) (Avelino, Brown and Hunter, 2001). In the context of that discussion there are related efforts looking at the effects of financial openness, often thought to limit the scope of government, as postulated by the "efficiency hypothesis."[6]

Various studies have delved deeper into the microfoundations of the demand and supply of "compensation," looking at a more disaggregated level of policies (including varieties of welfare states) and different politics. For instance, studies such as Rehm (2009), Baker (2008),

---

[6] Some of the works that have incorporated the impact of financial openness into the analysis include, Garrett (2001), Avelino, Brown and Hunter (2005), Kittel and Winner (2005), Garrett and Nickerson (2005), Liberati (2007), Kimakova (2009), and Erauskin (2011). Similarly, Gemmell, Kneller and Sanz (2008) have tried to explore the effects of globalization by focusing on FDI, as opposed to trade openness.

and Walter (2010) study individual level demand for redistribution in the context of open economies. Burgoon (2001) looks the level of specific government programs and argues that each one can be a more or less significant source of compensation and hence is subject to different politics. Mares (2004 and 2005) argues that the individual demand for different types of social policy depends on relative risk exposure across sectors, as well as on deeper political economy considerations.

Despite all these rich and nuanced considerations, at the macro level, the correlation between trade openness and government size has become fairly established, to the point that important studies exploring the determinants of the size of government commonly include openness as a control. Such works include Milesi-Ferreti, Perotti and Rostagno (2002), Persson and Tabellini (2003), Mueller (2003), Blume, Müller and Voigt (2009), and Rockey (2012), among many others.

3. Openness, State Capacity, and the Size of Government

3.1 The Compensation Hypothesis

As argued in the previous section, in spite of vibrant controversies and fine-grained discussion at the level of micro political economy, the big picture of the compensation hypothesis connecting openness to government size still stands. For concreteness, we focus here on the compensation hypothesis as stated by Rodrik (1998) in order to anchor our argument on alternative policies to deal with trade-induced economic insecurity and on the conditional effect of state capacity on the ability to implement such policies.

Having identified a robust correlation between openness to trade and the size of the public sector, Rodrik postulates that the main reason for that connection is "compensation" for higher risk exposure. In his view, more open economies have a greater exposure to risk from the turbulence of world markets, and government spending serves an insulation function.[7] He considers the government sector as the "safe" sector of the economy, especially compared to tradables; hence, the government can mitigate the shocks from international markets by taking command of a larger share of the economy's resources.

---

[7] He observes not only that there is a positive and robust partial correlation between openness and the scope of government, but also that the relationship between openness and government size is strongest when terms of trade risk is higher.

Rodrik postulates a simple framework with three sectors: private tradables, private nontradables, and the government. Assuming that a representative household owns streams of income from all sectors, a higher share of (permanent) government consumption can provide some ex ante insurance to external risk. Rodrik asks when (i.e., under what conditions) "will it be optimal for the government to reduce risk in this fashion?" (p. 1011). Reducing risk by enlarging the government is optimal in the stylized set-up presented by Rodrik; a key assumption there is that the decision on how many resources to allocate to the public and to the private sectors is made before the realization of the terms of trade shocks. Given standard assumptions on production and utility functions and the fact that the government is the "safe asset," in such a set-up it is optimal to allocate more resources to the government, the higher the (trade-induced) risk in the private sector. In this way, the model generates the correlation between openness and spending—or more generally, the correlation between external risk (openness times terms of trade volatility) and spending.

The set of policy instruments available in Rodrik's framework is a rather restrictive one. In the real world, there is a large set of potential macro, micro, and social policies that might mitigate or alleviate the effects of external shocks, and many of them do not have obvious budgetary implications. In terms of Rodrik's model, some of those policy instruments might be equivalent to allowing part of the adjustment to take place after the realization of the shock to terms of trade; others are equivalent to finding cheaper ways to insure ex ante. Some operate at the stage of softening the macroeconomic implication of those shocks, others at the level of permitting more efficient and less costly microeconomic adjustment, and yet others at providing more efficient and less costly social protection. Many of the potential policies might be relatively demanding in terms of government capabilities, and hence not equally available to all polities. We list below some of those possible policies and their connection to having a more capable public sector, in particular a high-quality bureaucracy.

3.2 The Vector of Policies

A number of different macroeconomic policies have been discussed and tried as ways to cope with various sources of macroeconomic volatility. One set of policies particularly relevant with regards to external shocks are *exchange rate policies*. It is often argued that flexible exchange rates might provide better insulation to trade shocks than fixed exchange rates. For instance,

Broda and Tille (2003) find, in a sample of 75 developing countries, that countries with a flexible exchange rate tend to experience much milder contractions in output than their counterparts with fixed exchange rate regimes. Since exchange rate choices do not map very easily into the size of the public sector, they constitute one example of non-budgetary insulation. Also, it is possible that instrumenting a flexible exchange rate regime in the real world requires some form of administration that might be institutionally more demanding than a fixed regime.[8] This relates to the tendency of countries with weak institutions to choose fixed exchange rate regimes as way of pumping up their scarce credibility (Canavan and Tommasi, 1997; Herrendorf, 1999; Keefer and Stasavage, 2003; Bearce and Hallerberg, 2011).[9]

Different types of *fiscal policies* might also help mitigate the exposure to the risks associated with international economic integration. For instance, well-designed fiscal rules may alleviate the effects of terms of trade volatility by contributing to reduce procyclical fiscal policies and related "Dutch Disease" problems (UNCTAD, 2011). But the ability to properly implement adequate fiscal policies is not so readily available. Various studies have documented differences in the quality of fiscal policy across countries (Gavin and Perotti, 1997; López, Thomas and Wang, 2010; Céspedes and Velasco, 2013). Furthermore, several studies have established that the ability to implement proper fiscal policies (and in particular, policies that facilitate coping with shocks) is dependent upon institutional capabilities. Calderón, Duncan and Schmidt-Hebbel (2012) find that fiscal and monetary policies tend to be significantly procyclical in countries with weaker policymaking capabilities. Filc and Scartascini (2012) find that countries with better implementation capabilities are able to design better fiscal frameworks. Céspedes and Velasco (2013) find that improvements in institutional quality have led commodity-rich countries to be more able to respond adequately to commodity price shocks. Notice that the type of fiscal policy required is one that adjusts better to shocks, i.e., a form of ex post "insurance" such as countercyclical funds, as opposed to blindly increasing spending as a form of ex ante insurance.

In addition to the fiscal policy framework, *the depth of financial markets* can significantly influence the way in which economies react to terms of trade volatility. In particular, higher

---

[8] Another macroeconomic example in which government capabilities permit better adjustment to terms of trade shocks is provided by Gelos and Ustyugova (2012), who show that countries with more independent central banks and higher governance scores seem to have contained the impact of commodity price shocks better.

[9] See Carmignani, Colombo and Tirelli (2008) for a dissenting view.

financial development can help mitigate the effect of terms of trade volatility on consumption volatility (Andrews and Rees, 2009), and broader access to financing allows firms to better manage macroeconomic volatility (Cavallo et al., 2010). In this context, higher government capacities play an important role as they can provide deeper financial markets: Becerra, Cavallo and Scartascini (2012) show that financial development is higher in countries with enhanced government capabilities as, among other channels, they tend to abuse less the financial system in order to finance government operations.

Looking at a slightly more disaggregated level, it is clear that the effects of terms of trade shocks operate differently through different sectors of the economy. Focusing at that level, it is clear that there are a number of horizontal and sectorial policies that have an impact on the performance of various economic sectors, both on average, as well as in terms of how well they respond to various shocks.[10] Such *industrial, financial, labor-market policies* are also likely to demand important government and bureaucratic capabilities in order to be implemented properly. For instance, Cornick (2013) provides a detailed analysis of the government capabilities necessary in order to implement various productive development policies. Scartascini and Tommasi (2010) show that higher government capabilities are positively correlated with policies that are associated with long term gains in productivity, such as less distortive tax systems and government subsidies, a larger formal sector, higher quality infrastructure, labor market flexibility, and ease of firm entry. The last two are described by Loayza and Raddatz (2007) as structural characteristics that can be policy driven and can dampen the impact of negative terms of trade shocks on aggregate output and magnify the positive ones.

Also, as argued by Mansfield and Reinhardt (2008), governments of open countries also try to insulate their economies from the exposure to global markets volatility through *membership in international trade organizations*, particularly the World Trade Organization (WTO) and preferential trading arrangements (PTAs). Using annual data on exports for all pairs of countries from 1951 through 2001, the authors find that PTAs and the WTO regime significantly reduce export volatility. Once again, effective participation in such arrangements is not likely to induce large amounts of public spending, while playing such international games

---

[10] This relates to the notion of "transformative capacity" (Weiss, 1998) that we discuss in the next section.

tends to be quite demanding in terms of having a capable bureaucracy (Lecomte, 2002; Bouzas 2004, Pasadilla, 2005).[11]

Most of the policies mentioned so far tend to operate between the external shock and the macro and micro economic consequences of the shock. After all of that is said and done, there will still be *social* consequences of the remaining effects of external shocks. And there, again, there are various *policies* to deal with that. Most of them will indeed have budgetary implications, but one might speculate that more effective governments will obtain a better "bang for the buck," being able to mitigate the social costs of economic volatility more effectively and more efficiently (i.e., at a lower cost). In terms of a model with aggregate and idiosyncratic shocks, a more capable government will be better able to target its social policies at those times and to those individuals that need it the most. Programs that might have such characteristics include training programs (which also facilitate sectorial adjustment), unemployment insurance, targeted social programs, as well as a number of health and education policies (which also might matter for general productivity and for better microeconomic adjustment). Niles (2001) studies the incentives and capabilities of governments to implement targeted social spending during economic adjustment. Cingolani et al. (2013) report how bureaucratic autonomy and state capacity allow governments to advance more rapidly in achieving development policy goals in social sector areas. Scartascini, Stein and Tommasi (2008) report that health and education spending are more effective in countries with better policymaking capabilities; some of their results could be interpreted as indicating that policymaking capabilities might be more important than money for improving education outcomes at high levels of governmental capacity.[12]

The examples above illustrate the fact that *various* policies which might allow to handle different effects of economic shocks could be quite demanding in terms of the capabilities of governments to implement them. Countries with low state capabilities might not be able to deliver in some of these more demanding policies (i.e., they would not have the fiscal space ex-post, the ability to pursue them, or be less efficient at doing so), and hence might be forced to deal with increased volatility by blunt methods such as enlarging the state ex ante. On the other

---

[11] According to Lecomte (2002) and Pasadilla (2005), best practices have revealed three critical elements needed to achieve an efficient trade policy, namely government leadership, inclusion of all actors, and institutional capacity. Institutional capacity includes, among others, the capacity to prepare technical backgrounds, research, and analysis, and the capacity to carry out negotiations.

[12] Brambor and Lindvall (2014) present evidence that countries with higher capabilities are able to pursue more efficient fiscal and social protection policies.

hand, countries with high capabilities will be able to deal effectively with a wider menu, and since some good policies not necessarily require much public spending, they might be able to cope with the extra volatility induced by trade without necessarily increasing public spending.

What specific policies each country chooses to reduce ex ante volatility and what policies each country pursues to reduce the social impact of external shocks will depend on the specific characteristics of its economic and social environment and of its policymaking. Some countries may choose to deepen financial markets and credit availability for a more efficient and automatic adjustment of private agents, while others may prefer to concentrate their efforts on ensuring the countercyclicality of fiscal adjustments in order to jumpstart the economy during bad times. In every case though, those with higher government capabilities will have access to a superior vector of policies than those with low capabilities; and the budget implications of those policies will vary. For those reasons, in what follows we use a measure of governmental capabilities (the quality of the bureaucracy) as a conditioning variable in the empirical exercises relating openness and terms of trade volatility to the size of government.

4. State Capacity

The various policies that we discussed in the previous section are quite demanding in terms of technical and political capabilities. A country with strong state capabilities might be able to draw from the full menu and pick and successfully implement those policies that best suit the nature of the shocks the country faces as well as its economic and social fabric. Countries with lesser capabilities might have to deal with the risks induced by volatility in more blunt manners. For that reason, we need to look into the governmental capabilities of each case.

The issue of government capabilities or, more broadly, of state capacity is a complex one, and it has given rise to important analytical, measurement, and evaluation efforts, as well as lively methodological debates.[13] The concept of "state capacity" is very salient in studies of economic development, and its presence or absence has been associated with development successes and failures. It has many dimensions, such as coercive or military capacity, fiscal or extractive capacity, administrative or implementation capacity, and legal capacity.[14] The emphasis on each of its dimensions depends on the issue at hand.

---

[13] See, for instance, the debate in the journal *Governance* surrounding an article by Francis Fukuyama (2013): http://governancejournal.net/2013/03/04/fukuyama-asks-what-is-governance/.
[14] See Cingolani (2013) for a very comprehensive recent survey of the concept and of its measurement.

The type of economic and social policy implementation capabilities we are referring to, come closer to the notion of administrative or implementation capacity. This dimension, perhaps the most widely referred to in the literature (Cingolani, 2013), is largely rooted in the Weberian tradition regarding the modern state and the existence of a professional and insulated bureaucracy. The bureaucratic/administrative dimension of state capacity has been emphasized by classic authors such as Huntington (1968) and Skocpol (1979). Weaver and Rockman (1993) conceive state capacities as policymaking capabilities, including the capacity to effectively implement policies. In Knutsen (2012) state capacity is understood as the successful implementation of public policies through and efficient rule-following bureaucracy.

The notion of capabilities we have in mind also relates to the idea of the "transformative" capacities of states, conceived as "the ability of a state to adapt to external shocks and pressures by generating ever-new means of governing the process of industrial change" (Weiss, 1998). This aspect is also present in the work of Evans (1989) and (1995) who refers to embedded autonomy, a combination of administrative insulation power and a certain level of state embeddedness in the productive structure. According to Rueschmeyer and Evans (1995), the effectiveness of state intervention in the economy depends upon a capable bureaucracy and good coordination and coherence among state organizations.

The question of where does state capacity come from has also received substantial attention. Cingolani (2013) provides a review of studies on the determinants of state capacity, from the historical accounts of state formation processes and its impact on subsequent types of administrative infrastructure, to the more recent emphasis on the incentives to invest in state capacity. A common theme among these various arguments and strands is that capacity is a multidimensional object that accumulates slowly over time, as a function of various investments.[15]

Not surprisingly, the measures of state capacity found in the literature are quite varied, some of them aiming at capturing state capacity in a broad generic way, others acknowledging the existence of several aspects or dimensions, and trying to measure each of them. Among those attempting to measure bureaucratic/administrative/implementation capacity, for the purpose of this study where we need a large coverage in terms of countries and years, we rely on the indicator of quality of the bureaucracy from the International Country Risk Guide (ICRG). The

---

[15] See for instance Besley and Persson (2009) and Enriquez and Centeno (2012).

variable "bureaucratic quality" (*burquality*) reflects the institutional strength, quality, and expertise of the bureaucratic structure.[16] Countries that score high in this variable have the ability to accumulate knowledge over time, to invest in the development of the workforce, and to pursue long-term policies. Policy decisions accumulate over time and policymakers are able to learn from previous mistakes.

ICRG's "bureaucratic quality" has been used to measure state capacity in articles particularly interested in administrative features of the state (Cingolani, Thomsson and de Crombrugghe, 2013; Van de Walle, 2005; Hanson and Sigman 2013), and in studies such as this one that attempt to capture how government capabilities affect the supply or demand of certain types of policies (see for example Becerra, Cavallo and Scartascini, 2012). This indicator of bureaucratic quality also correlates well with other dimensions of state capabilities that have been shown to relate to higher quality of policymaking in smaller country samples (within Latin America); see, for instance, Scartascini and Tommasi (2010), Scartascini, Stein, and Tommasi (2013), and Franco Chuaire and Scartascini (2014).

5. Empirical Analysis

As stated earlier, for concreteness and easiness of the comparison, we take Rodrik's empirical framework as the baseline, and we add the possibility that the quality of the bureaucracy may affect public policy. In particular, we evaluate the hypotheses of whether the connection between openness and public spending is conditional on the level of government capabilities. While governments with low bureaucratic capacities may have to deal with the effects of globalization in rudimentary ways, governments with higher capabilities may be able to access a set of policies that reduce the size of external shocks and ameliorate their consequences with a relatively low effect on public expenditures. We do not argue in this paper about the *level* of government expenditures, which depend upon a myriad of factors, but about the *conditionality* of the relationship between external risk and size of the government.[17]

---

[16] "High points are given to countries where the bureaucracy has the strength and expertise to govern without drastic changes in policy or interruptions in government services. In these low-risk countries, the bureaucracy tends to be somewhat autonomous from political pressure and to have an established mechanism for recruitment and training. Countries that lack the cushioning effect of a strong bureaucracy receive low points because a change in government tends to be traumatic in terms of policy formulation and day-to-day administrative functions." (ICRG, 2009)

[17] In other words, we are not implying that Paraguay would have a larger public sector than Sweden, but that both countries would react differently to the potential negative consequences coming from unfavorable external conditions. In the margin, a country like Sweden would be able to implement policies to reduce the possibility of

5.1 Specification

The basic model we test is presented in equation (1), which includes an additional term, enclosed in brackets, to Rodrik's (1998) baseline regression:

$$\log(g_j) = \beta_0 + \beta_1 open_j + [\beta_2 burquality_j + \beta_3(open_j \times burquality_j)] + \gamma X_j + \varepsilon_j \quad (1)$$

where g_j denotes general government final consumption in real terms as a share of GDP for country j expressed in international prices and averaged over the period 2000-2004.[18] The second main variable of interest is $open_j$ which measures the degree of openness of economy j using the ratio of imports plus exports to GDP, averaged over the preceding decade (1990-1999). The main data source for these variables is the World Development Indicators from the World Bank. Bureaucratic Quality (*burquality*), which comes from the International Country Risk Guide (ICRG), takes values between 0 (low) and 4 (high) and is averaged over the preceding decade (1990-1999). X_j represents a set of control variables that includes the log of per capita GDP and the log of the dependency ratio in the population and urbanization rate from the World Bank data, and dummy variables for socialist countries, OECD members, and geographical regions.[19] The set of variables is later expanded in the robustness section, as we move away from Rodrik's original specifications.

Since we are interested in the conditional effect, we will usually concentrate the analysis on the marginal effect of openness on government size:

$$\frac{\partial \log(g_j)}{\partial \log(open_j)} = \beta_1 + \beta_3 burquality_j \quad (2)$$

While openness proxies exposure to economic volatility, estimating the effect of having a higher exposure to external risk is more complex than looking only at openness. Equation (3) takes this into account by adding terms of trade volatility (*TOTvolatility*) as a proxy for external risk as done by Rodrik. Once more, the term in brackets reflects an addition made in this paper.

---

having to face an external shock and reduce the social impact of the shock if it realizes more efficiently than a country with the state capacities of Paraguay.

[18] General government final consumption expenditure includes all government expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation (WDI, 2014).

[19] All the control variables except for the dummy variables are also averaged over the 1990-1999 period. See all summary statistics in Table A1 of Appendix A.

$$\log(g_j) = \beta_0 + \beta_1\, open_j + \beta_2 TOTvolatility_j + \beta_3\left(open_j \times TOTvolatility_j\right) +$$
$$\left[\beta_4 burquality_j + \beta_5\left(open_j \times burquality_j\right) + \beta_6(TOTvolatility_j \times\right.$$
$$\left. burquality_j) + \beta_7 open_j \times TOTvolatility_j \times burquality_j)\right] + \gamma \boldsymbol{X}_j + \varepsilon_j \qquad (3)$$

$TOTvolatility_j$ is defined as the standard deviation of the log-differences in terms of trade for the period 1980-1999 and all the other variables have the same meaning as in the baseline regression. The interaction term between openness and terms of trade volatility aims to capture that external risk depends not only on how open each country is but also on how exposed it is because of that level of openness and the characteristics of its economy *vis-à-vis* the rest of the world.[20]

In addition to the cross-sectional analysis, we also work with a panel for the period 1980-2004. Following the literature, we divide this period into five sub-periods by collapsing the data into five-year averages, which allows us to remove business cycle variations.[21] The panel regressions are run using both fixed effects and random effects, and including and excluding period dummies and additional controls. The core results are presented in the paper and the rest in the appendix. The complete model specification is given by:

$$\log(g_{jt}) = \alpha_0 + \alpha_1 \log(open_{jt-1}) + [\alpha_2(burquality_{jt-1}) + \qquad (4)$$
$$+\alpha_3(open_{jt-1} \times burquality_{jt-1})] + \delta \boldsymbol{X_{j\bar{t}}} + \vartheta_j + \eta_t + \epsilon_{jt}$$

$$\log(g_{jt}) = \alpha_0 + \alpha_1 \log(open_{jt-1}) + \alpha_2(TOTvolatility_{jt-1}) + \qquad (5)$$
$$+\alpha_3(open_{jt-1} \times TOTvolatility_{jt-1}) + [\alpha_4(burquality_{jt-1}) +$$
$$+\alpha_5(open_{jt-1} \times burquality_{jt-1}) + \alpha_6(TOTvolatility_j \times burquality_{jt-1}) + \alpha_7(open_{jt-1} \times$$
$$TOTvolatility_j \times burquality_{jt-1})] + \delta \boldsymbol{X_{j\bar{t}}} + \vartheta_j + \eta_t + \epsilon_{jt}$$

The dependent variable is again the share of government consumption in GDP for country *j* averaged over the five-year period *t* (g_{jt}). The regressors include a lagged measure of openness to international trade ($open_{jt-1}$) and bureaucratic quality $\left(bureaucracy_{jt-1}\right)$, and the same controls as in the cross-country analysis. $\boldsymbol{X_{j\bar{t}}}$ includes the regressors at the beginning of

---

[20] Note that openness is not in logarithms in this version of the benchmark, to allow for the inclusion of terms of trade volatility in levels both individually and in interacted with openness (Rodrik, 1998).
[21] See for example Rodrik (1998), Andrews and Rees (2009), and Becerra, Cavallo and Scartascini (2012).

each period such as the log of real per capita GDP, log urbanization rate, and log dependency ratio, and dummy variables for OECD members and socialist countries. ϑ_j and η_t denote country-specific and time-specific effects, respectively. We run these exercises using both fixed and random effects and perform the respective Hausman tests to choose the appropriate model (the fixed effects model figures are included in the text and the random effects models in Appendix B).

5.2 Regression Results

Table 1 presents the first set of results. The dependent variable is the average of the log of government consumption for the period 2000-2005.[22][23] The independent variables use the averages over the previous decade.[24] In column 1 we replicate Rodrik's baseline cross-country regression for openness and we include the new terms in column 2. As it can be observed in that column, the coefficients are statistically significant and they go in the direction that we expected. Absent any bureaucratic capacities, openness has a large, positive and significant effect on government consumption—similar in size to Rodrik's findings. A 10-percentage point larger share of total trade in GDP is associated with a 5 percent larger share of government consumption in GDP.

---

[22] Denoted as *t-1* in the tables.

[23] Using long-term averages reduces the concerns from picking up short-term fluctuations. While we have run the regressions in a recent sample, which was chosen according to data availability, we have also performed the same exercises in several other periods—as shown later in the paper—and in Rodrik's sample period (replicating the original dataset to the best of our ability), finding the same qualitative results (even though Rodrik's specification results tend to be stronger in the original sample period than in more recent periods). These results are also presented in Appendix B. Consequently, our results do not depend on the period chosen for the analysis.

[24] In all the exercises reported in the paper, we use the largest possible sample of countries. In Appendix B, we include the results for a smaller sample, which includes those countries that are thought to belong to Rodrik's sample according to the data sources used in his empirical analysis. Unfortunately, the final dataset used by the author is not available and given the amount of time that has passed since the paper was first published, some of the sources have been updated using new methodologies. Acquiring the actual data used to create the original dataset thus proved to be difficult. However, our results are qualitatively similar, i.e., the direction and statistical significance of the coefficients are close to those estimated and reported by Rodrik.

Table 1. The Effects of Openness and External Risk on Government Size, Accounting for Government Capabilities: Cross-Section

VARIABLES	Log Government Consumption (% of GDP) 2000-05			
	(1)	(2)	(3)	(4)
Openness (t-1)	0.0004	0.005***	-0.001	0.005
	(0.001)	(0.002)	(0.001)	(0.004)
Bureaucratic Quality (t-1)		0.174***		0.374***
		(0.058)		(0.131)
Openness (t-1) x Bureaucratic Quality (t-1)		-0.002***		-0.002
		(0.001)		(0.001)
ToT Volatility (t-1)			-1.840*	1.011
			(1.095)	(2.331)
Openness (t-1) x ToT Volatility (t-1)			0.009	0.000
			(0.013)	(0.034)
Bureaucratic Quality (t-1) x ToT Volatility (t-1)				-1.456
				(1.245)
Openness (t-1) x Bureaucratic Quality (t-1) x ToT Volatility (t-1)				-0.005
				(0.017)
Observations	127	127	67	67
Adjusted R-squared	0.300	0.350	0.097	0.185

Note: Other controls not shown in the table: log GDP per capita (t-1), log dependency ratio (t-1), log urbanization rate (t-1), and dummy variables for OECD, Sub-Saharan Africa, Latin America, East Asia, and Socialist countries. *t-1* corresponds to the period 1990-99, except for ToT Volatility where the period 1980-99 is considered. A constant term was included in all regressions.

Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

However, countries differ in their ability to pursue policies and how to respond to higher external risk, which is picked up in a negative (and significant) coefficient for the interaction term between openness and bureaucratic quality. That is, openness has a positive effect, but this effect tends to be attenuated by higher levels of bureaucratic capacities.

The marginal effect of openness on government consumption at different levels of bureaucratic capacity is represented in Figure 1; the marginal effect of openness on government size is high for low levels of bureaucratic quality (mimicking Rodrik's compensation hypotheses results) but it decreases as these capacities increase to the point of becoming insignificant. As can be observed in the summary statistics, this effect takes place around the mean of the distribution. In other words, openness has a positive effect on government consumption for those

countries with a bureaucratic quality score approximately below 2.2 out of 4 points (such as Sierra Leone and Paraguay) and no effect for countries on the higher end of the distribution (such as Canada and Germany).[25]

Figure 1. Marginal Effect of Trade Openness on Government Consumption along Bureaucratic Quality: Cross Section
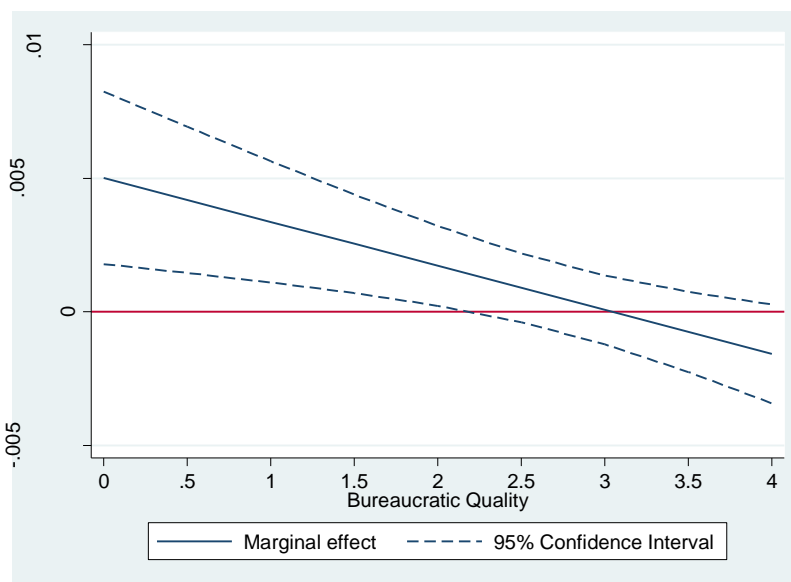
Note: The figure corresponds to the regression in column 2 of Table 1.

Column 3 incorporates the notion of external risk by adding terms of trade volatility and the interaction with openness. Similarly to Rodrik's original results, the interaction term between openness and volatility is positive which implies that the key aspect is not necessarily the degree of openness of the economy but the actual increase of external risk measured by the combination of openness and TOT volatility. It is important to note, once more, that results are not as significant in this period as they were in the original sample period studied by Rodrik (which in part may be explained by higher sophistication in the part of countries in the way they react to external risks—more efficient ways of coping with external risk have become available over time for those with high capacities). Figure 2 summarizes the marginal effect of openness at different levels of bureaucratic quality taking TOT volatility at its 50th percentile. Corresponding figures at other values of the distribution are very similar. As expected, the effect of external risk

---

[25] We do not believe this result is driven by multicollinearity because of the significant simple correlation between size and openness and the absence of outliers driving the results (the same results are obtained in different samples as described later). See Chatelain and Ralf (2012).

on government consumption is decreasing on bureaucratic quality (the significantly smaller sample size may be affecting the significance of the coefficients).

Figure 2. Marginal Effect of Trade Openness on Government Consumption along Bureaucratic Quality (taking ToT Volatility at 50th Percentile)
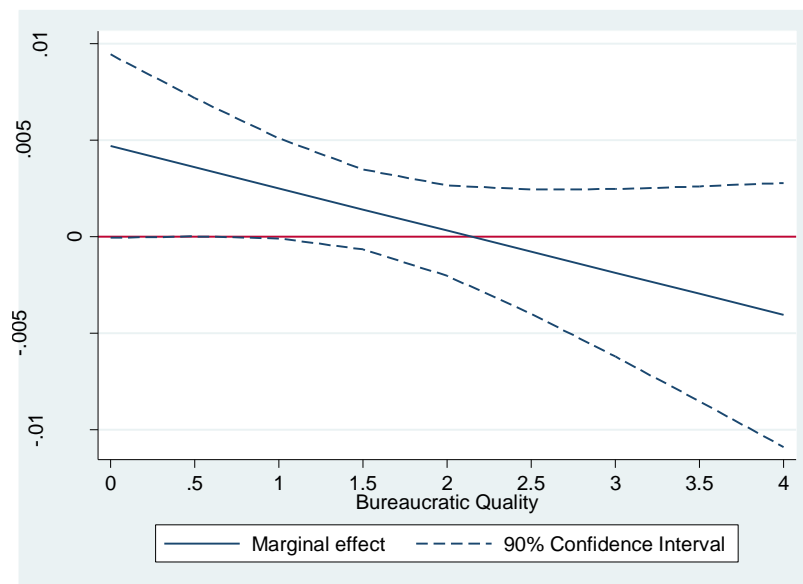
Note: The figure corresponds to the regression in column 4 of Table 1.

Table 2 presents the results for the panel data. Using this data allows us to capture also the dynamics of change and controlling for unobservables. A priori, a random effects estimation would seem to be preferred, as bureaucratic quality should not vary much and it would provide more degrees of freedom in the estimation. Still, a fixed effect models would reduce the potential for biased estimations. We have performed both fixed effects and random effects estimations, and the results are qualitatively equivalent. After performing the Hausman test which favors the former, we report in Figure 3 the results from the fixed effect models, which includes the full set of time and country fixed effects, and the random effect results are included in Appendix B.[26] The left panel of Figure 3 corresponds to the results in column 1 and the right panel to those in column 2 (once again, evaluated at TOT's 50th percentile). Similar to the cross-section, the marginal effect of openness on the share of government consumption in GDP is decreasing with

---

[26] The graphical representation of the results is important because in a model with interactive terms, the significance of the constituent terms of an interaction cannot be fully assessed independently from the interaction term (Brambor, Clark, and Golder 2005), and the results are not independent of the underlying distribution of the conditional variable.

19

bureaucratic quality and positive and significant for countries with weak bureaucracies. Hence, past exposure to external risk is a statistically significant determinant of government size conditional on state capacity, and this result is not purely cross-sectional; it holds within countries even when year and country fixed effects are included as well.

Table 2. The Effects of Openness and External Risk on Government Size, Accounting for Government Capabilities: Panel Data

VARIABLES	Log Government Consumption (% of GDP)			
	(1)	(2)	(3)	(4)
Openness (t-1)	0.004**	0.005**	0.006***	0.007***
	(0.002)	(0.002)	(0.001)	(0.002)
ToT Volatility (t-1)		0.093		0.262
		(0.644)		(0.613)
Openness (t-1) x ToT Volatility (t-1)		-0.011		-0.013
		(0.011)		(0.011)
Bureaucratic Quality (t-1)	0.075	0.086	0.140***	0.163***
	(0.046)	(0.061)	(0.035)	(0.048)
Openness (t-1) x Bureaucratic Quality (t-1)	-0.001	-0.001	-0.002***	-0.002***
	(0.001)	(0.001)	(0.000)	(0.001)
Bureaucratic Quality (t-1) x ToT Volatility (t-1)		-0.193		-0.376
		(0.376)		(0.348)
Openness (t-1) x Bureaucratic Quality (t-1) x ToT Volatility (t-1)		0.005		0.007
		(0.006)		(0.006)
Hausman Test (Prob>chi2)			0.008^	0.000^
Observations	246	246	246	246
Number of countries	67	67	67	67

Note: Regressions in columns 1 and 2 correspond to a Fixed Effects (within) model with time (period) dummies. Regressions in columns 3 and 4 correspond to a Random Effects model with time (period) dummies. Data are period averages for 1980-84, 1985-89, 1990-94, 1995-99, 2000-04 (except for the additional controls which belong to the beginning of each period).

Additional controls: log GDP per capita, log urbanization rate, and log dependency ratio all at the beginning of each period, and OECD and socialism dummies. A constant term was included in all regressions.

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

^Hausman test: Ho (difference in coefficients not systematic), rejected in both cases. Therefore, the test favors the fixed effects model when both, a single interaction term and a three-way interaction term, are included.

**Figure 3. Marginal Effect of Trade Openness on Government Consumption
along Bureaucratic Quality: Panel Data**
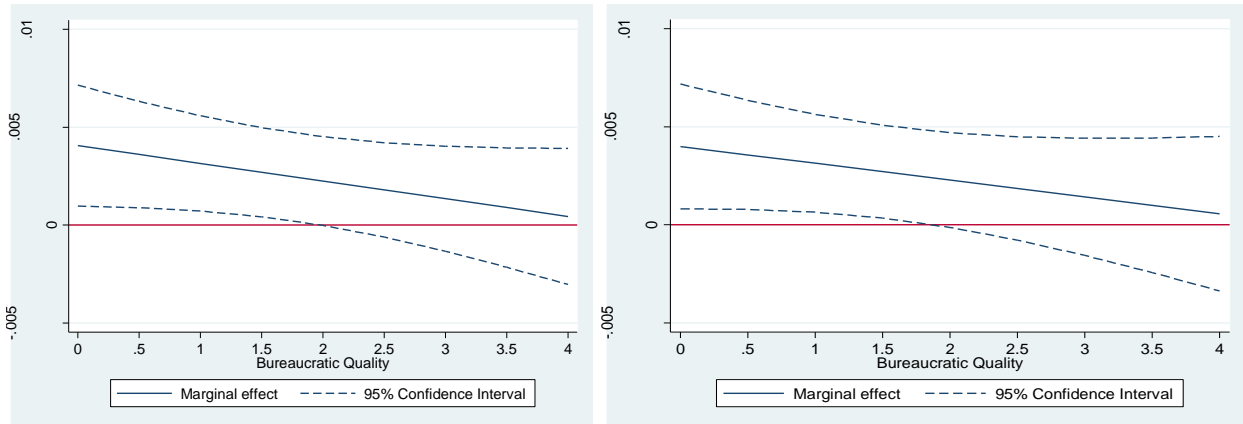
a. Column 1 of Table 2.   b. Column 2 of Table 2 (TOT Volatility 50th p.)

   Are these effects stable over time? In order to check this we run a series of cross-sections evaluating the dependent variable in the five-year periods 90-94, 95-99, and 00-04. As can be observed in Table 3 and Figure 4, while we obtain the same qualitative results, the intercept and slope of the conditional relationship change over time, particularly between the first two sub-periods. In the 1995-99 period, the intercept (the coefficient of openness) is smaller and the slope is shallower. This evidence may be consistent with a pattern in which there is learning and policy diffusion, which allows more countries to pursue more efficient policies. This evidence may serve as a first indication of why the statistical and economic significance of Rodrik's results has fallen over time.

Table 3. The Effects of Openness on Government Size over Time

VARIABLES	Log Government Consumption (% of GDP) for the period:					
	1990-94	1990-94	1995-99	1995-99	2000-04	2000-04
Openness (t-1)	0.001	0.008***	0.000	0.004***	0.000	0.004*
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
Bureaucratic Quality (t-1)		0.261***		0.176***		0.160**
		(0.052)		(0.057)		(0.078)
Openness (t-1) x Bureaucratic Quality (t-1)		-0.003***		-0.002***		-0.001*
		(0.001)		(0.001)		(0.001)
Observations	103	103	103	103	103	103
Adjusted R-squared	0.342	0.493	0.345	0.421	0.318	0.353

Data are period averages for 1990-94, 1995-99, 2000-04, for the dependent variable (in t), and 1985-89, 1990-94, 1995-99, for the independent variables in (t-1); except for the controls which belong to the beginning of each period. Additional controls: log GDP per capita, log urbanization rate, and log dependency ratio all at the beginning of each period, and dummy variables for OECD, Sub-Saharan Africa, Latin America, East Asia, and Socialist countries. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Figure 4. Marginal Effect of Trade Openness on Government Consumption along Bureaucratic Quality over Time
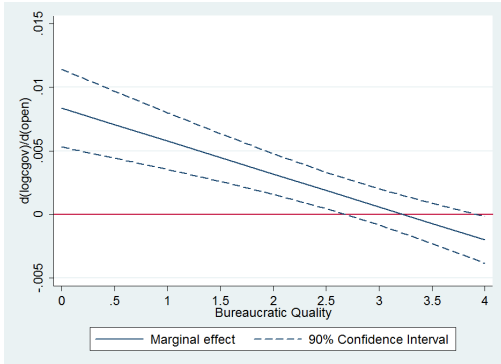
a. Column 2 of Table 3 (1985-89 − 1990-94)   b. Column 4 of Table 3 (1990-94 − 1995-99)
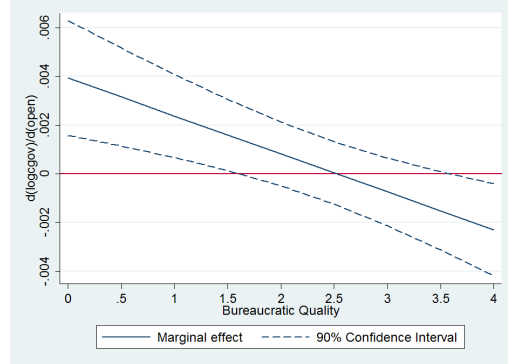
5.3 Robustness Checks

So far we have evaluated our hypothesis in the context of Rodrik's framework in order to facilitate comparisons. However, as surveyed in Section 2, Rodrik's results have been widely revisited and concerns have been raised about the omission of relevant variables that may be affecting the discussed relationship between openness and government size such as population size and democratic institutions. Moreover, the broad literature on the size of the government has

established effects of constitutional rules on the size of government: presidential systems have been found to lead to smaller governments while proportional representation systems (compared to majoritarian systems) lead to larger governments.[27] As a first robustness check we test our hypothesis in the context of an expanded set of controls to avoid omitted variable biases.

Furthermore, the inclusion of our variable of interest, namely bureaucratic quality, may raise a potential concern regarding causation and biases due to endogeneity. Could causality be running from government size to quality of the bureaucracy? Even though it is not immediately clear why this would be generating the previous set of results, we use an instrumental variables approach in order to reduce this concern.

5.3.1 Expanded Controls

Table 4 presents the same exercises as in Table 1 using a set of expanded controls that includes population size (*log population*), the freedom house score (*GASTIL*) on political rights and civil liberties, average effective tariffs (*tariff rate*) given by the percentage of total import duties as a share of the total value of imports, a dummy variable equal to 1 when the form of government is presidential (*pres*) and 0 otherwise, and a dummy variable that is equal to 1 when the electoral rule for the lower or only house is majoritarian (*maj*).[28] As can be observed in the table, including additional controls does not change the direction of the results. Again, the marginal effect of openness (or exposure to external risk) on government consumption seems to be lower for countries with higher bureaucratic capacities. Figure 5 presents this information graphically showing that the positive effect of openness seems to be relevant only for low levels of capacities (when the quality of bureaucracy is approximately below 2 out of 4 points). Similar results are found when we look at the three-way interaction term even though these results are less precise because of sample issues (including additional controls reduces the sample size substantially).

---

[27] See, in particular, Persson, Roland and Tabellini (1997 and 2000) and Persson and Tabellini (2003).
[28] We also run the same exercises including a dummy variable for countries with a federal structure. However, this variable presents several problems such as the reduction of our sample size. After including it, the marginal effect of openness on government size remains decreasing with bureaucratic quality and positive for low scores of the latter. However, the results are not as significant as before.

Table 4. Accounting for Government Capabilities and Terms of Trade Volatility: Expanded Set of Controls

VARIABLES	Log Government Consumption (% of GDP) 2000-05	
	(1)	(2)
Openness (t-1)	0.007**	0.023**
	(0.003)	(0.010)
Bureaucratic Quality (t-1)	0.229***	0.308
	(0.074)	(0.193)
Openness (t-1) x Bureaucratic Quality (t-1)	-0.002***	-0.005*
	(0.001)	(0.003)
ToT Volatility (t-1)		2.385
		(4.318)
Openness (t-1) x ToT Volatility (t-1)		-0.071
		(0.071)
Bureaucratic Quality (t-1) x ToT Volatility (t-1)		1.102
		(2.069)
Openness (t-1) x Bureaucratic Quality (t-1) x ToT Volatility (t-1)		-0.017
		(0.029)
Observations	77	38
Adjusted R-squared	0.517	0.441

Note: Other controls not shown in the table: log GDP per capita (t-1), log dependency ratio (t-1), log urbanization rate (t-1), log population (00), pres, maj, GASTIL, tariff rate, and dummy variables for OECD, Sub-Saharan Africa, Latin America, East Asia, and Socialist countries. *t-1* corresponds to the period 1990-99, except for ToT Volatility where the period 1980-99 is considered. A constant term was included in all regressions.
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Figure 5. Marginal Effect of Trade Openness on Government Consumption along Bureaucratic Quality: Expanded Set of Controls
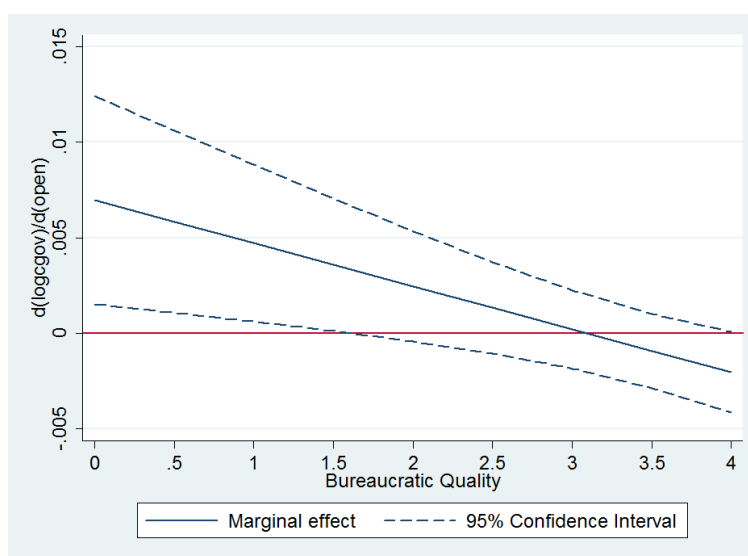
Note: The figure corresponds to the regression in column 1 of Table 4.

5.3.2 Instrumenting for Bureaucratic Quality

To address potential reverse causality problems between bureaucratic quality and size of the government, we use an instrumental variables approach. Finding good instruments for bureaucratic quality is not an easy task as the process of institutionalization of the bureaucracy has not been an issue that has received much attention; most of the literature has concentrated instead on the consequences of having professional and independent bureaucracies, and on the legal framework that would seem to favor it. Given that bureaucratic capacity is not a feature that can be built overnight but it depends on a series of investments done by the polity overtime on a third-party that would help to enforce commitments and long-standing rules, it seems natural to use variables that proxy for the stability of the political system and democratic heritage.[29] Among those, the variables that have been used by other authors in regressions that have size of government as a dependent variable seem to be the safer bet for complying with the exclusion restriction.

A first set of potential instrument variables includes age of democracy (*age*) and its square, and a dummy variable for former colonies (*ex-colony*); see Persson and Tabellini (2003) and Rockey (2012). The idea behind these instruments is that they allow isolating institutional decisions that may be more conducive to investing in the bureaucracy from those that may influence investments and consumption at the same time (e.g., preferences). Colonized countries were likely to inherit institutions similar to those of their colonial rulers; therefore, these institutional choices are not endogenous to national preferences that may drive expenditures at the same time Rockey (2012: 315). Constitutional reforms are often adopted during political regime transitions, and the contents tend to depend on the timing of constitutional adoption (i.e., fads), so there is little reason to expect a systematic effect on fiscal performance (Persson and Tabellini 2003: 130).[30] Including *age^2* as well as *age* provides a parsimonious way to capture any non-linearities in the history of constitutional fashion (Rockey, 2012: p. 314). Rockey (2012) has improved upon the proxy for age of democracy by constructing two additional measures: the date of first democratic elections (*me*) and the date of first democratic constitutions (*mc*). These variables help to differentiate better formal democracies from working democracies. The different measures of democratic history have an additional potential (and probably more

---

[29] See for instance Besley and Persson (2009) and Enriquez and Centeno (2012).

[30] Palanza, Scartascini and Tommasi (2014) find a positive correlation between age of democracy and the institutionalization of Congress, which provides additional support for using these variables in this fashion.

relevant) channel of influence over bureaucratic quality, which is that they would allow the polity to invest on the development of institutions over time that continuous political regime change would weaken—which would not necessarily correlate to government size. A measure of political stability could be another proxy for this ability to invest in the institutionalization of the bureaucracy that should not be related to the size of the government.[31] Additionally, we use, as many before us have done, the measure of European settler mortality during colonization by Acemoglu, Johnson and Robinson (2001), as a source of exogenous variation in state capacity. The authors argue that colonization strategies, which relied on different types of institutions, were influenced by the feasibility of settlements. In places where disease was more likely, European powers set up more extractive states that favored a weaker system of checks and balances and protection for private property.

Another potential instrument comes from Cruz and Keefer (2013). According to the authors, when politicians are bound together by the existence of programmatic parties, they are more likely to develop organizational arrangements that limit free-riding and promote collective action, such as those reforms that promote a well-functioning public administration. Therefore, because public sector reforms are more likely to succeed in countries with programmatic political parties (Cruz and Keefer, 2013), the characteristics of the party system—which should not be significantly correlated with public spending—can be a good instrument for the quality of the bureaucracy. To create the relevant variable we follow Cruz and Keefer (2013).[32]

Finally, we also use several variables from the Comparative Constitutions Project, CCP (Elkins, Ginsburg and Melton, 2008) that can explain bureaucratic quality while meeting the exclusion restriction. First, we use the variable *civil* to measure whether the constitution of a given country includes provisions for the meritocratic recruitment of civil servants. We would expect these provisions to be positively correlated to bureaucratic quality and to affect government consumption only through its effect on the instrumented variable. Second, countries in which politicians invest in the development of the bureaucracy tend to be countries in which there are similar investments made in other third party enforcement mechanisms. Consequently, those countries that vest legislatures with oversight powers and insure the judiciary from

---

[31] See Besley and Persson (2009).
[32] We create a variable that measures the share of parties (from the largest three government parties and the largest opposition party) that is identified as having right, left, or center orientation *(rlc_avg) using data from* the Database of Political Institutions, DPI (Beck et al., 2001).

manipulation from the executive tend also to invest in stronger bureaucracies. We use the variable *intexec* to measure whether the legislature has the power to interpellate members of the executive or if the executive must report to the legislature at regular intervals,[33] and the variable *jundind* reports whether the constitution contains an explicit declaration regarding the independence of the central judicial organs (Elkins, Ginsburg and Melton, 2008).

Finding a strong instrument for the quality of the bureaucracy has proven to be difficult. Although the second stage results are similar for all the instruments considered in this analysis, those that perform better in the first stage are Rockey's *me,* which records the number of months since the inception of democracy as measured by the date of first democratic elections, and *civil* from the CCP, which measures the existence of meritocratic conditions for the recruitment of civil workers.[34] For the former, we use both *me* and *me* squared. We also follow Rockey (2012) and use Fuller's modified limited-information maximum likelihood estimator, which performs better than 2SLS in the presence of weak instruments and has good finite sample properties. Table 5 presents the second stage results of the instrumental variables approach, and Figure 6 plots the marginal effect of interest for different levels of bureaucratic quality.[35] Again, the marginal effect of openness on government size turns out to be positive and significant for low levels of quality of policymaking but decreasing as the latter increases. The results do not change across specifications.

---

[33] In the CCP (Elkin, Ginsburg and Melton, 2008) *Intexec* is equal to 1 if the legislature can call the executive to report as it sees fit; 2 if the executive must report to legislature at regular intervals; 3 if both; and 4 if neither applies. We have built a variable that ranges from 0 to 2, where 2 indicates that both conditions apply, 1 that only one applies, and 0 that neither is stipulated in the constitution.

[34] Note that our sample size decreases significantly when *civil* is used as the instrumental variable.

[35] See Table A2 in Appendix A for the first-stage results. In Appendix B, we also present the first and second stage results when the other instruments are used.

Table 5. Instrumental Variables (Second Stage): Fuller Estimator

VARIABLES	Log Government Consumption (% of GDP) 2000-05					
	(1)	(2)	(3)	(4)	(5)	(6)
Openness (t-1)	0.007*	0.009***	0.008***	0.007*	0.011**	0.019***
	(0.004)	(0.003)	(0.003)	(0.004)	(0.005)	(0.004)
Bureaucratic Quality (t-1)	0.128	0.255**	0.119	0.091	0.179	0.314***
	(0.110)	(0.102)	(0.111)	(0.112)	(0.110)	(0.073)
Openness (t-1) x Bureaucratic Quality (t-1)	-0.002***	-0.003***	-0.002***	-0.002*	-0.003***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Expanded Controls	No	No	No	Yes	Yes	Yes
Excluded Instruments	me, me*openness	me, me*openness, me^2, me^2*openness	civil , civil*openness	me, me*openness	me, me*openness, me^2, me^2*openness	civil , civil*openness
Observations	86	86	52	77	77	34
Adjusted R-squared	0.472	0.510	0.304	0.476	0.450	0.753

Fuller(4) estimator.
Note: Other controls not shown in the table: log GDP per capita (t-1), log dependency ratio (t-1), log urbanization rate (t-1) and dummy variables for OECD, Sub-Saharan Africa, Latin America, East Asia, and Socialist countries. Expanded set of controls: log population (00), GASTIL, pres, maj, and tariff rate. *t-1* corresponds to the period 1990-99. A constant term was included in all regressions.
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Figure 6. Marginal Effect of Trade Openness on Government Consumption along Bureaucratic Quality: Instrumental Variables
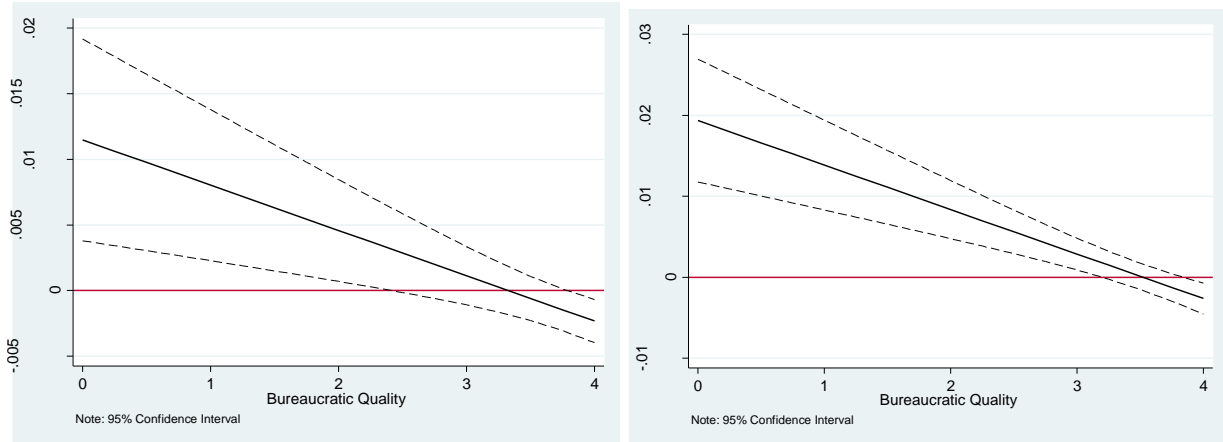
a. Column 5 of Table 5: *me & me^2*   b. Column 6 of Table 5: *civil*

6. Concluding Remarks

A well-known hypothesis in international political economy argues that government spending acts as a cushion against external risk volatility for countries with high exposures to international trade. We argue that the ability of different countries to properly deal with various risks and uncertainties introduced by the volatility of international markets is conditioned by their governmental capabilities. Some countries might develop more effective ways to cope with

economic volatility, ways that do not necessarily require important increases in public spending. While some countries have very few policy alternatives at their disposal, others can make use of better fiscal, financial, and monetary policies to reduce exposure to shocks, and better labor, financial, industrial, and social policies to reduce the impact of the shock. Of course, this does not imply that these countries would have a smaller government overall, but that their larger size would not be a consequence of exposure to external risk but to a myriad of other factors.

In this paper we revisit the results connecting openness to international trade to the size of public spending, and find that there is a positive connection only for countries with weak government capabilities. In general, we find that the relevance of the compensation hypothesis for explaining the size of the government is conditional on the government capabilities of a country. The marginal increase of government size because of higher exposure to external risk takes place only in those countries with low bureaucratic capabilities and it tends to disappear for those countries that have a stronger bureaucracy. This result holds in the cross-section, panel, and instrumental variables regressions, and across different samples. The result is also robust to different specifications.

This finding constitutes another step in an agenda attempting to build bridges between the study of institutions and policymaking in contexts of both high and low institutionalization, as well as contexts of high and low government capabilities. The results suggest various areas in which further research seems warranted. It would be desirable to develop a broader class of theoretical models that incorporate the relevance of government (and bureaucratic capabilities) for the policy choice set in the context of external risk.

On the empirical side, the exercise we have performed in this paper is only one out of many. As government capabilities affect the vector of policies countries are able to choose from, its relevance goes beyond the specific confines of the relationship between openness and size. Additionally, the measures of capabilities we have used in this paper were those that we could construct from readily available data, but there is ample room to improve upon our definitions and to develop richer, broader, and more accurate measures. Those measures may also help to run models that help to understand how capabilities relate to specific policy choices within the vector of policies discussed here—that is, not only that some countries choose superior vectors of policies but also to identify the composition within those vectors.

We also believe that deeper studies of experiences at the country level should be developed. The study of specific dynamics of specific policies in specific countries seems to be a prerequisite for understanding the mechanisms through which government capabilities affect the design and implementation of public policies, and hence social welfare.

The findings in the paper offer additional insights into the relevance of increasing government capabilities. Such governmental capabilities do not evolve overnight, and they cannot be constructed by fiat by writing an institutional reform law. They are the outcome of actions of key political players over time, in the context of country-specific political equilibria. Still, there are plenty of investments that can be pursued that may lead to better-functioning bureaucracies and more efficient policies.

References

Acemoglu, D., S. Johnson, and J. Robinson. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Economic Review* 91(5): 1369-1401.

Adserà, A., and C. Boix. 2002. "Trade, Democracy, and the Size of the Public Sector: The Political Underpinnings of Openness." *International Organization* 56: 229-262.

Alesina, A., and R. Wacziarg. 1998. "Openness, Country Size and Government." *Journal of Public Economics* 69: 305-321.

Andrews, D., and D. Rees. 2009. "Macroeconomic Volatility and Terms of Trade Shocks." Working Paper 2009-05. Sydney, Australia: Reserve Bank of Australia.

Avelino, G., D.S. Brown and W. Hunter. 2001. "Globalization, Democracy, and Social Spending in Latin America, 1980-1997." Mimeographed document. Available at: http://www.colorado.edu/ibs/pec/gadconf/papers/avelino_brown_hunter.pdf

----. 2005. "The Effects of Capital Mobility, Trade Openness, and Democracy on Social Spending in Latin America, 1980-1999." *American Journal of Political Science* 49: 625-641.

Baker, A. 2008. "Public Opinion and the Compensation Hypothesis." Boulder, United States: University of Colorado at Boulder, Department of Political Science. Available at: https://ncgg.princeton.edu/IPES/2008/papers/F13_paper3.pdf

Balcells, L. 2006. "Trade Openness and Preferences for Redistribution: A Cross-National Assessment of the Compensation Hypothesis." *Business and Politics* 8: 1-50.

Bates, R.H., P. Brock and J. Tiefenthaler. 1991. "Risk and Trade Regimes: Another Exploration." *International Organization* 45(1): 1-18.

Bearce, D., and M. Hallerberg. 2011. "Democracy and de Facto Exchange Rate Regimes." *Economics & Politics* 23(2): 172-194.

Becerra, O., E. Cavallo and C. Scartascini. 2012. "The Politics of Financial Development: The Role of Interest Groups and Government Capabilities." *Journal of Banking & Finance* 36: 626-643

Beck, T. et al. 2001. "New Tools in Comparative Political Economy: The Database of Political Institutions." *World Bank Economic Review* 15(1): 165-176.

Besley, T., and T. Persson. 2009. "The Origins of State Capacity: Property Rights, Taxation, and Politics." *American Economic Review* 99(4):1218-1244.

Blume, L., J. Müller and S. Voigt. 2009. "The Economic Effects of Direct Democracy: A Frst Global Assessment." *Public Choice* 140(3-4): 431–461.

Bouzas, R. 2004. "Mercosur's Experiences of Preparing Trade Negotiations with the EU." ECDPM Discussion Paper 50. Maastricht, The Netherlands: European Centre for Development Policy Management. Available at: http://ecdpm.org/wp-content/uploads/2013/11/DP-50-MERCOSUR-Experiences-Preparing-Trade-Negotiations-With-EU-2004.pdf

Brambor, T., W. Clark and M. Golder. 2005. "Understanding Interaction Models: Improving Empirical Analyses." *Political Analysis* 14(1): 63-82.

Brambor, T., and J. Lindvall. 2014. "Fiscal Capacity, Domestic Compensation, and Trade Policy: A Long Term View." Lund, Sweden: Lund University. Mimeographed document.

Broda, C., and C. Tille. 2003. "Coping with Terms-of-Trade Shocks in Developing Countries." *Current Issues in Economics and Finance* 9(11). New York, United States: Federal Reserve Bank of New York. http://www.newyorkfed.org/research/current_issues/ci9-11.pdf

Burgoon, B. 2001. "Globalization and Welfare Compensation: Disentangling the Ties that Bind." *International Organization* 55(3): 509-551

Calderón, C., R. Duncan, and K. Schmidt-Hebbel. 2012. "Do Good Institutions Promote Counter-Cyclical Macroeconomic Policies?" Working Paper 118. Dallas, United States: Federal Reserve Bank of Dallas, Globalization and Monetary Policy Institute.

Cameron, D.R. 1978. The expansion of the public economy. *American Political Science Review* 72: 1243-1261.

Canavan, C., and M. Tommasi. 1997. "On the Credibility of Alternative Exchange-Rate Regimes." *Journal of Development Economics* 54 (1):101–22.

Carmignani, F., E. Colombo and P. Tirelli, P. 2008. "Exploring Different Views of Exchange Rate Regime Choice." *Journal of International Money and Finance*, 27(7): 1177-1197.

Caruso, G., C. Scartascini and M. Tommasi. 2013. "Are We All Playing the Same Game? The Economic Effects of Constitutions Depend on the Degree of Institutionalization." Working Paper IDB-WP-237. Washington, DC, United States: Inter-American Development Bank.

Cavallo, E. et al. 2010. "The Role of Relative Price Volatility in the Efficiency of Investment Allocation." Working Paper IDB-WP-208. Washington, DC, United States: Inter-American Development Bank.

Céspedes, F., and A. Velasco. 2013. "Was This Time Different? Fiscal Policy in Commodity Republics." NBER Working Paper 19748. Cambridge, United States: National Bureau of Economic Research.

Chatelain, J-B., and K. Ralf. 2012. "Spurious Regressions and Near-Multicollinearity, with an Application to Aid, Policies and Growth." MPRA Paper 42533. Available online at http://mpra.ub.uni-muenchen.de/42533/

Cingolani, L. 2013. "The State of State Capacity: A Review of Concepts, Evidence, and Measures." UNU-MERIT Working Paper 2013-053. Maastricht, The Netherlands: United Nations University-Maastricht Economic and Social Research Institute on Innovation and Technology.

Cingolani, L., K. Thomsson and D. de Crombrugghe. 2013. "Minding Weber More than Ever? The Impacts of State Capacity and Bureaucratic Autonomy on Development Goals." UNU-MERIT Working Paper 2013-052. Maastricht, The Netherlands: United Nations University-Maastricht Economic and Social Research Institute on Innovation and Technology.

Cornick, J. 2013. "Public Sector Capabilities and Organization for Successful PDPs." Washington, DC, United States: Inter-American Development Bank. Mimeographed document.

Cruz, C., and P. Keefer. 2013. "The Organization of Political Parties and the Politics of Bureaucratic Reform." Policy Research Working Paper 6686. Washington, DC, United States: World Bank.

Elkins, Z., T. Ginsburg and J. Melton. 2014. "Characteristics of National Constitutions, Version 2.0." *Comparative Constitutions Project.* Last modified: April 18, 2014. Available at: http://www.comparativeconstitutionsproject.org.

Enriquez, E., and M. Centeno. 2012. "State Capacity: Utilization, Durability, and the Role of Wealth vs. History." *International and Multidisciplinary Journal of Social Sciences* 1(2): 130-162

Epifani, P., and G. Gancia. 2009. "Openness, Government Size and the Terms of Trade." *Review of Economic Studies* 76, 629-668.

Erauskin, I. 2011. "Financial Openness, Volatility, and the Size of Productive Government." *SERIEs* 2(2): 233-253.

Evans, P.B. 1989. "Predatory, Developmental, and Other Apparatuses: A Comparative Political Economy Perspective on the Third World State." *Sociological Forum* 4(4): 561-587.

Evans, P.B. 1995. *Embedded Autonomy*. Princeton, United States: Princeton University Press.

Filc, G., and C. Scartascini. 2012. "Budgeting for Results in Latin America: Conditions for its Deployment and Development." Policy Brief IDB-PB-160. Washington, DC, United States: Inter-American Development Bank.

Franco Chuaire, M., and C. Scartascini. 2014. "The Politics of Policies: Revisiting the Quality of Public Policies and Government Capabilities in Latin America and the Caribbean." Policy Brief IDB-PB-220. Washington, DC, United States: Inter-American Development Bank.

Fukuyama, F. 2013. "What is Governance?" *Governance* 26(3): 347-368.

Garrett, G., 1998a. "Shrinking States? Globalization and Policy Autonomy in the OECD." *Oxford Development Studies* 26(1): 71-97.

Garrett, G., 1998b. "Global Markets and National Politics: Collision Course or Virtuous Circle?" *International Organization* 52(4) 787–824

Garrett, G. 2001. "Globalization and Government Spending around the World." *Studies in Comparative International Development* 3: 3-29.

Garrett, G. and D. Nickerson., 2005. "Globalisation, Democratization and Government Spending in Middle-Income Countries." In: M. Glatzer and D. Rueschemeyer, editors. *Globalization and the Future of the Welfare State*. Pittsburgh, United States: University of Pittsburgh Press.

Gavin, M. and R. Perotti. 1997. "Fiscal Policy in Latin America." In: B.S. Bernanke and J. Rotemberg, editors. *NBER Macroeconomics Annual 12*. Cambridge, United States: MIT Press.

Gelos, G., and Y. Ustyugova. 2012. "Inflation Responses to Commodity Price Shocks: How and Why Do Countries Differ?" IMF Working Paper 12/225. Washington, DC, United States: International Monetary Fund.

Gemmell, N., R. Kneller and I. Sanz. 2008. "Foreign Investment, International Trade and the Size and Structure of Public Expenditures." *European Journal of Political Economy* 24: 151-171.

Hanson, J., and R. Sigman. 2013. "Leviathan's Latent Dimensions: Measuring State Capacity for Comparative Political Research." Paper presented at the World Bank Political Economy Brown Bag Lunch Series, March 21, 2013, Syracuse University, Maxwell School of Government.

Hays, S., D. Ehrlich and C. Peinhard. 2005. "Government Spending and Public Support for Trade in the OECD: An Empirical Test of the Embedded Liberalism Thesis." *International Organization* 59: 473-494.

Herrendorf, B. 1999. "Transparency, Reputation, and Credibility under Floating and Pegged Exchange Rates." *Journal of International Economics* 49(1): 31–50.

Huntington, S. 1968. *Political Order in Changing Societies*. New Haven, United States: Yale University Press.

ICRG. 2009. "International Country Risk Guide (ICRG) Researchers' Dataset and Codebook." [computer file]. 2009 ed. East Syracuse, NY: The PRS Group, Inc.

Katzenstein, P.J. 1985. *Small States in World Markets: Industrial Policy in Europe*. Ithaca, United States: Cornell University Press.

Keefer, P., and D. Stasavage. 2013. "The Limits of Delegation: Veto Players, Central Bank Independence, and the Credibility of Monetary Policy."*American Political Science Review* 97(3): 407-23.

Kimakova, A. 2009. "Government Size and Openness Revisited: The Case of Financial Globalization." *Kyklos* 62: 394-406.

Kittel, B., and H. Winner. 2005. "How Reliable is Pooled Analysis in Political Economy? The Globalization-Welfare State Nexus Revisited. *European Journal of Political Research* 44: 269-293.

Knutsen, C.H. 2013. "Democracy, State Capacity, and Economic Growth." *World Development* 43: 1-18.

Lecomte, H.B.S. 2002. "Building Capacity to Trade: What are the Priorities?" Paper presented at the International CTA Seminar 2002: "Meeting the Challenge of Effective ACP

Participation in Agricultural Trade Negotiations: The Role of ICM," Brussels, Belgium, November 27-29.

Liberati, P. 2007. "Trade Openness, Capital Openness and Government Size." *Journal of Public Policy* 27: 215-247.

Loayza, N., and C. Raddatz. 2007. "The Structural Determinants of External Vulnerability." *World Bank Economic Review* 21(3): 359-387.

López, R.E., V. Thomas and Y. Wang. 2010. "The Effect of Fiscal Policies on the Quality of Growth." Evaluation Brief 9. Washington, DC, United States: World Bank Independent Evaluation Group. Available at: http://ieg.worldbank.org/Data/reports/eb9_web.pdf

Mansfield, E., and E. Reinhardt. 2008. "International Institutions and the Volatility of International Trade." *International Organization* 62(4): 621-652.

Mares, I. 2004. "Economic Insecurity and Social Policy Expansion: Evidence from Interwar Europe." *International Organization* 58(4): 745-774.

----. 2005. "Social Protection Around the World. External Insecurity, State Capacity, and Domestic Political Cleavages." *Comparative Political Studies* 38(6): 623-651.

Martin, C., and N. Steiner 2013. "Public Spending and Trade Liberalization: The Compensation Hypothesis Revisited." Paper prepared for presentation at the 71st Midwest Political Science Association (MPSA) Annual Conference, Chicago, United States, April 11-14.

Milesi-Ferreti, G.M., R. Perotti and M. Rostagno. 2002. "Electoral Systems and Public Spending." *Quarterly Journal of Economics* 127: 609-57.

Mueller, D. 2003. *Public Choice III*. Cambridge, United Kingdom: Cambridge University Press.

Niles, K. 2001. "Economic Adjustment and Targeted Social Spending." Paper prepared for the World Development Report 2001 meetings, August 16-17, Castle Donington, United Kingdom.

Noorruddin, I., and N. Rudra. 2014. "Are Developing Countries Really Defying the Embedded Liberalism Compact?" Forthcoming in *World Politics* 66(4).

Palanza, V., C. Scartascini and M. Tommasi. 2014. "Congressional Institutionalization: A Cross-National Comparison." Washington, DC, United States: Inter-American Development Bank. Mimeographed document.

Pasadilla, G. 2005. "Strengthening Trade Research Capacity for Policymaking and Negotiations." ARNeT Policy Brief 2. Bangkok, Thailand: United Nations Economic and Social Commission for Asia and the Pacific. Available at: http://artnet.unescap.org/pub/polbrief2.pdf

Persson, T., G. Roland and G. Tabellini. 1997. "Separation of Powers and Political Accountability." *Quarterly Journal of Economics* 112(4): 1163-1202.

Persson, T., G. Roland, and G. Tabellini. 2000. "Comparative Politics and Public Finance." *Journal of Political Economy* 108: 1121-1141.

Persson, T., and G. Tabellini. 2003. *The Economic Effects of Constitutions*. Cambridge, United States: MIT Press.

Ram, R. 2009. "Openness, Country Size, and Government Size: Additional Evidence from a Large Cross-Country Panel. *Journal of Public Economics* 93: 213-218.

Rehm, P. 2009. "Risks and Redistribution: An Individual-Level Analysis." *Comparative Political Studies* 42(7): 855-881.

Rockey, J. 2012. "Reconsidering the Fiscal Effects of Constitutions." *European Journal of Political Economy* 28: 313–323.

Rodrik, D. 1998. "Why Do More Open Economies Have Bigger Governments?" *Journal of Political Economy* 106: 997-1032.

Rueschemeyer, D., and P. Evans. 1985. "The State and Economic Transformation: Toward an Analysis of the Conditions Underlying Effective Intervention." In: P.B. Evans, D. Rueschemayer and T. Skocpol, editors. *Bringing the State Back In*. Cambridge, United Kindgom: Cambridge University Press.

Scartascini, C., E. Stein and M. Tommasi. 2008. "Political Institutions, State Capabilities and Public Policy: International Evidence." Research Department Working Paper 661. Washington, DC, United States: Inter-American Development Bank.

----. 2013. "Political Institutions, Intertemporal Cooperation, and the Quality of Policies." *Journal of Applied Economics* 16(1): 1-32.

Scartascini, C., and M. Tommasi. 2010. "The Political Economy of Productivity." In: C. Pagés, editor. *The Age of Productivity*. Development in the Americas Report. Washington, DC, United States: Inter-American Development Bank/Palgrave.

----. 2012. "The Making of Policy: Institutionalized or Not?" *American Journal of Political Science* 56(4): 787-801.

Scheve, K. and M. Slaughter. 2007. "A New Deal for Globalization." *Foreign Affairs* 86(4): 34-47.

Skocpol, T. 1979. *States and Social Revolutions: A Comparative Analysis of France, Russia, and China*. Cambridge, United Kingdom: Cambridge University Press.

UNCTAD. 2011. "Policy actions to mitigate the impact of highly volatile prices and incomes on commodity-dependent countries, and to facilitate value addition and greater participation in commodity value chains by commodity-producing countries." Note by the United Nations Conference on Trade and Development (UNCTAD) secretariat, Geneva, Switzerland, February 2. Available at: http://unctad.org/en/docs/cimem2d14_en.pdf

Van de Walle, S. 2005. "Measuring Bureaucratic Quality in Governance Indicators." Paper prepared for the 8th Public Management Research Conference, Los Angeles, United States, September 29-October 1.

Walter, S. 2010. "Globalization and the Welfare State: Testing the Microfoundations of the Compensation Hypothesis." *International Studies Quarterly* 54(2): 403-26.

Weaver, R.K., and B.A. Rockman. 1993. *Do Institutions Matter? Government Capabilities in the United States and Abroad*. Washington, DC, United States: Brookings Institution Press.

Weiss, L. 1998. *The Myth of the Powerless State*. Ithaca, United States: Cornell University Press.

World Development Indicators (WDI). 2014. Washington, DC: World Bank. doi:10.1596/978-1-4648-0163-1. License: Creative Commons Attribution CC BY 3.0 IGO.

APPENDIX A.

Table A1. Summary Statistics

Variable	Units	Source	Obs.	Mean	Std. deviation	Min	Max
Cross section analysis							
Government consumption (1985-89)	% of GDP	WDI	115	16.610	6.624	4.282	34.930
Government consumption (1990-92)	% of GDP	WDI	118	16.284	7.503	3.144	56.840
Government consumption (2000-05)	% of GDP	WDI	127	15.363	5.119	5.082	28.523
Openness (1975-84)	% of GDP	WDI	116	65.777	34.849	13.888	156.739
Openness (1980-89)	% of GDP	WDI	119	64.669	33.453	13.967	163.867
Openness (1990-99)	% of GDP	WDI	127	76.350	46.770	17.218	329.366
Terms of Trade (ToT) Volatility (1980-99)	Standard deviation of the log-differences in terms of trade for the period 1980-99	WDI and own estimates	67	0.118	0.060	0.018	0.262
Bureaucratic Quality Index (1990-99)	0-4	ICRG	127	2.217	1.096	0	4
Instrumental variables							
Age of democracy (age)		Persson and Tabellini (2003)	64	2.181	2.433	0	10
European settler mortality (log) (Settler mort.)	log total	Acemoglu et al. (2001)	62	4.594	1.213	2.146	7.986
Ex-colony	Dummy variable	Persson and Tabellini (2003)	77	0.766	0.426	0	1
First democratic constitution (*mc*)	*	Rockey (2012)	86	1.049	1.054	0.163	4.819
First democratic elections (*me*)	*	Rockey (2012)	86	1.064	1.049	0.054	4.499
Historical political stability (Pol. Stab)	0-1	Besley and Persson (2009)	122	0.310	0.248	0	1
Judicial independence (*judind*) (1990)	Dummy variable	CCP (2008)	53	0.755	0.434	0	1
Legislative oversight power (*intexec*) (1990)	0-2*	CCP (2008)	51	0.961	0.720	0	2
Meritocratic recruitment of civil servants (*civil*) (1990)	Dummy variable	CCP (2008)	52	0.173	0.382	0	1
Programmatic parties (*rlc_avg*) (1990)	Share of parties*	Cruz and Keefer (2013) and DPI (2001)	124	0.373	0.335	0	1
Control variables							
Real GDP per capita, PPP (log) (1975-84)	log total	WDI	116	8.309	1.280	5.959	11.589
Real GDP per capita, PPP (log) (1980-89)	log total	WDI	119	8.296	1.287	5.911	11.398
Real GDP per capita, PPP (log) (1990-99)	log total	WDI	127	8.602	1.267	5.660	10.796
Dependency ratio (log) (1975-84)	% of working-age population	WDI	126	4.366	0.235	3.775	4.724
Dependency ratio (log) (1980-89)	% of working-age population	WDI	126	4.336	0.255	3.830	4.750
Dependency ratio (log) (1990-99)	% of working-age population	WDI	127	4.181	0.267	3.670	4.757
Urbanization Rate (log) (1975-84)	% of total	WDI	126	3.563	0.695	1.423	4.556
Urbanization Rate (log) (1980-89)	% of total	WDI	126	3.639	0.657	1.617	4.575
Urbanization Rate (log) (1990-99)	% of total	WDI	127	3.919	0.522	2.252	4.605
pres	Dummy variable	Persson and Tabellini (2003)	126	0.563	0.498	0	1
maj	Dummy variable	Persson and Tabellini (2003)	123	0.635	0.464	0	1
GASTIL	1-7	Freedom House	77	2.437	1.214	1.000	4.889
Population (log) (2000)	log total	WDI	127	9.293	1.585	5.639	14.050
federal	Dummy variable	Persson and Tabellini (2003)	75	0.173	0.381	0	1
Tariff rate	% of total imports	WDI	127	2.709	4.763	0	27.211
OECD members	Dummy variable		127	0.189	0.393	0	1
Sub-Saharan Africa	Dummy variable		127	0.220	0.416	0	1
Latin America	Dummy variable		127	0.189	0.393	0	1
East Asia	Dummy variable		127	0.087	0.282	0	1
Socialist	Dummy variable		127	0.024	0.152	0	1
Panel Data Analysis							
(5-year averages 1980-2004)							
Government consumption	% of GDP	WDI	246	12.996	5.067	4.080	40.655
Openness	% of GDP	WDI	246	69.207	54.131	13.423	378.825
Bureaucratic Quality	0-4	ICRG	246	1.788	0.967	0	4
Terms of Trade (ToT) Volatility	Standard deviation of the log-differences in terms of trade for each period	WDI	245	0.098	0.084	0.000	0.493
Beginning of the period							
Real GDP per capita, PPP (log)	log total	WDI	246	7.997	1.077	5.562	10.586
Dependency ratio (log)	% of working-age population	WDI	246	3.726	0.551	2.140	4.605
Urbanization Rate (log)	% of total	WDI	246	4.331	0.239	3.614	4.717

Table A2. First Stage Results: Instrumental Variables *me* and *civil*

FIRST-STAGE VARIABLES	Bur. Quality (1)	Open * Bur (2)	Bur. Quality (3)	Open * Bur (4)	Bur. Quality (5)	Open * Bur (6)	Bur. Quality (7)	Open * Bur (8)	Bur. Quality (9)	Open * Bur (10)	Bur. Quality (11)	Open * Bur (12)
me	0.313***	-31.439***	1.133**	-110.276*			0.260**	-20.391**	0.772	-108.211*		
	(0.110)	(10.771)	(0.514)	(64.821)			(0.104)	(10.114)	(0.501)	(54.428)		
me x Openness (t-1)	-0.001	0.637***	-0.005	2.013**			-0.001	0.367***	-0.004	1.483**		
	(0.001)	(0.146)	(0.005)	(0.789)			(0.001)	(0.106)	(0.005)	(0.644)		
me^2			-0.221*	20.092					-0.136	22.054*		
			(0.118)	(15.914)					(0.116)	(13.073)		
me^2 x Openness (t-1)			0.001	-0.335*					0.001	-0.268*		
			(0.001)	(0.188)					(0.001)	(0.150)		
civil					-1.156***	30.643					-1.255*	22.641
					(0.278)	(57.178)					(0.650)	(52.988)
civil x Openness (t-1)					0.014***	-0.935					0.014	-1.145
					(0.005)	(0.962)					(0.010)	(0.879)
Expanded Controls	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Excluded Instruments	me, me*openness	me, me*openness	me, me*openness, me^2, me^2*openness	me, me*openness, me^2, me^2*openness	civil, civil*openness	civil, civil*openness	me, me*openness	me, me*openness	me, me*openness, me^2, me^2*openness	me, me*openness, me^2, me^2*openness	civil, civil*openness	civil, civil*openness
Observations	86	86	86	86	52	52	77	77	77	77	34	34
Adjusted R-squared	0.746	0.895	0.754	0.907	0.882	0.905	0.764	0.922	0.761	0.925	0.900	0.978
F	5.030	9.920	3.440	8.840	9.910	1.460	3.170	6.130	1.800	5.040	4.680	7.340
Prob>F	0.009	0.000	0.012	0.000	0.000	0.245	0.049	0.004	0.141	0.002	0.023	0.005
A-P F test of weak excluded instruments												
F	9.960	19.770	4.590	11.740	19.710	2.580	5.720	11.340	2.120	5.920	4.630	6.680
Prob>F	0.002	0.000	0.005	0.000	0.000	0.116	0.001	0.020	0.107	0.001	0.045	0.019

Note: Other controls not shown in the table: log GDP per capita (t-1), log dependency ratio (t-1), log urbanization rate (t-1) and dummy variables for OECD, Sub-Saharan Africa, Latin America, East Asia, and Socialist countries. Expanded set of controls: log population (00), GASTIL, pres, maj, and tariff rate. *t-1* corresponds to the period 1990-99. A constant term was included in all regressions.
Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

APPENDIX B

This appendix complements the evidence presented in the paper. It includes the following material:

1. Replicating Rodrik's results
2. Running Regressions in the "small" sample
3. Panel data analysis – Random effects regressions
4. Instrumental variables – Expanded set of instruments

1. Replicating Rodrik's Results

Table B1. Rodrik's Results and Replication

VARIABLES	Log Government Consumption (% of GDP) 1985-89		Log Government Consumption (% of GDP) 1990-92	
	Rodrik (1998) (1)	Replication (2)	Rodrik (1998) (3)	Replication (4)
Log Openness (t-1)	0.205***	0.370***	0.223***	0.276***
	(0.057)	(0.053)	(0.064)	(0.062)
log GDP per capita	0.105*	0.109*	-0.030	0.201***
	(0.063)	(0.057)	(0.084)	(0.065)
log dependency ratio	0.630***	0.804***	0.642***	0.579***
	(0.193)	(0.199)	(0.241)	(0.208)
log urbanization rate	-0.136*	-0.048	-0.203**	-0.093
	(0.075)	(0.070)	(0.093)	(0.085)
OECD	-0.014	0.358***	-0.007	0.133
	(0.122)	(0.116)	(0.144)	(0.124)
Sub-Saharan Africa	-0.239**	-0.030	-0.107	-0.010
	(0.101)	(0.095)	(0.118)	(0.107)
Latin America	-0.218**	-0.203**	-0.171	-0.368***
	(0.094)	(0.089)	(0.113)	(0.096)
East Asia	-0.338**	-0.118	-0.206	-0.181
	(0.130)	(0.103)	(0.140)	(0.118)
Socialist	0.092	0.346*	0.169	0.339
	(0.100)	(0.196)	(0.130)	(0.267)
Constant	3.786***	-2.193*	3.289***	-2.193*
	(0.383)	(1.135)	(0.536)	(1.135)
Observations	125	133	103	133
Adjusted R-squared	0.458	0.348	0.430	0.348

Note: *t-1* corresponds to the period 1975-84 in columns (1) and (2) and to the period 1980-89 in columns (3) and (4).
Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

2. Running Regressions in the "Small" Sample

As discussed in the main text, we run the empirical analysis in two different samples, a "large" sample that includes those countries for which data was available in the updated sources and a "small" sample that includes only those countries that are thought to belong to Rodrik's sample according to the data sources used in his work. While in the text we have concentrated on the results based on the first set of countries, here we present the results using the small sample.

In Column 2 of Table B2 we have included the interaction term between bureaucratic quality and openness to Rodrik's baseline regression presented in column 1. Figure B1 plots the marginal effects of interest which, similar to the results with the "large" sample, turns out to be positive and significant for countries with low state capacities but dissipates as these increase. Furthermore, once the three-way interaction term between openness, bureaucratic quality, and TOT volatility is included (Column 4), the effect remains. Figure B2 summarizes the marginal effect of openness for different values of bureaucratic quality when TOT volatility is set at its 50th percentile. Table B3 and Figure B3 show that our results remain in a panel setting even after including a full set of time and country fixed effects.
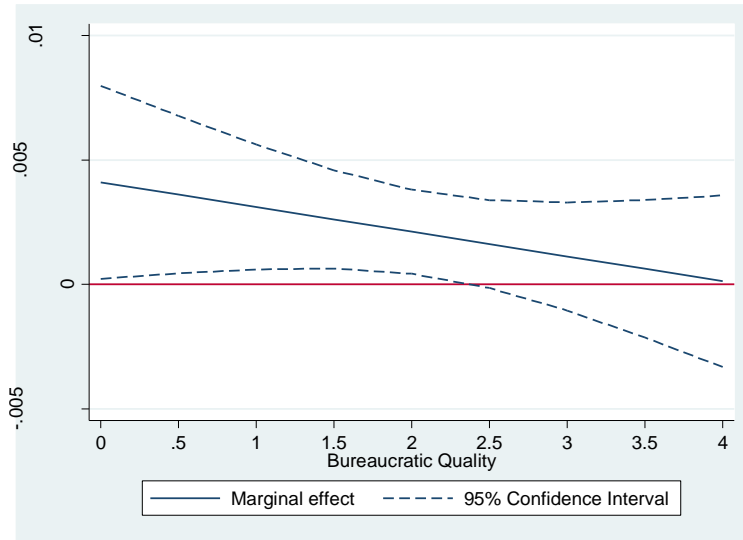
Table B2. Accounting for Government Capabilities and Terms of Trade Volatility: Cross-Section, Small Sample

VARIABLES	Log Government Consumption (% of GDP) 2000-05			
	(1)	(2)	(3)	(4)
Openness (t-1)	0.002**	0.004**	0.004	0.0001
	(0.001)	(0.002)	(0.003)	(0.006)
Bureaucratic Quality (t-1)		0.099		0.008
		(0.073)		(0.204)
Openness (t-1) x Bureaucratic Quality (t-1)		-0.001		0.004
		(0.001)		(0.003)
ToT Volatility (t-1)			0.391	-1.514
			(1.551)	(2.658)
Openness (t-1) x ToT Volatility (t-1)			-0.028	0.051
			(0.023)	(0.045)
Bureaucratic Quality (t-1) x ToT Volatility (t-1)				1.924
				(1.805)
				-0.068**
Openness (t-1) x Bureaucratic Quality (t-1) x ToT Volatility (t-1)				(0.031)
Observations	101	101	63	63
Adjusted R-squared	0.357	0.357	0.122	0.261

Note: Other controls not shown in the table: log GDP per capita (t-1), log dependency ratio (t-1), log urbanization rate (t-1), and dummy variables for OECD, Sub-Saharan Africa, Latin America, East Asia, and Socialist countries. *t-1* corresponds to the period 1990-99, except for ToT Volatility where the period 1980-99 is considered. A constant term was included in all regressions.

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Figure B1. Marginal Effect of Trade Openness on Government Consumption along Bureaucratic Quality: Cross-Section, Small Sample

Note: The figure corresponds to the regression in column 2 of Table B1.

Figure B2. Marginal Effect of Trade Openness on Government Consumption along Bureaucratic Quality: ToT Volatility at 50th Percentile, Small Sample
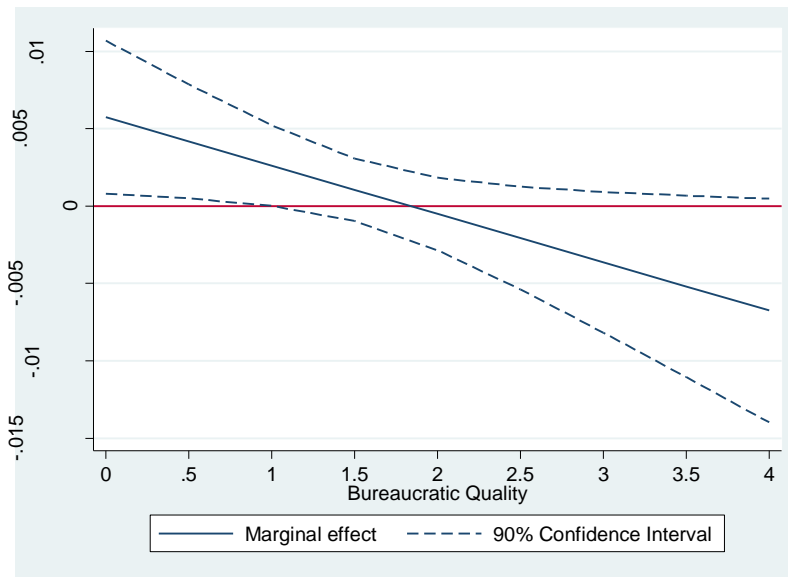
Note: The figure corresponds to the regression in column 4 of Table B1.

Table B3. Accounting for Government Capabilities and Terms of Trade Volatility: Panel Data, Small Sample

| VARIABLES	Log Government Consumption (% of GDP)			
	(1)	(2)	(3)	(4)
Openness (t-1)	0.004**	0.007***	0.006***	0.008***
	(0.002)	(0.003)	(0.001)	(0.002)
ToT Volatility (t-1)		0.594		0.613
		(0.704)		(0.667)
Openness (t-1) x ToT Volatility (t-1)		-0.022*		-0.020*
		(0.013)		(0.012)
Bureaucratic Quality (t-1)	0.107**	0.162**	0.139***	0.198***
	(0.049)	(0.069)	-0.042	(0.061)
Openness (t-1) x Bureaucratic Quality (t-1)	-0.001**	-0.003***	-0.002***	-0.003***
	(0.001)	(0.001)	-0.001	(0.001)
Bureaucratic Quality (t-1) x ToT Volatility (t-1)		-0.604		-0.597
		(0.450)		(0.428)
Openness (t-1) x Bureaucratic Quality (t-1) x ToT Volatility (t-1)		0.012		0.011
		(0.008)		-0.008
Hausman Test (Prob>chi2)			0.025^	0.000^
Observations	236	236	236	236
Number of countries	64	64	64	64

Note: Regressions in columns 1 and 2 correspond to a Fixed Effects (within) model with time (period) dummies. Regressions in columns 3 and 4 correspond to a Random Effects model with time (period) dummies. Data are period averages for 1980-84, 1985-89,1990-94, 1995-99, 2000-04 (except for the additional controls which belong to the beginning of each period).

Additional controls: log GDP per capita, log urbanization rate, and log dependency ratio all at the beginning of each period, and OECD and socialism dummies. A constant term was included in all regressions.

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

^Hausman test: Ho (difference in coefficients not systematic), rejected in both cases. Therefore, the test favors the fixed effects model when both, a single interaction term and a three-way interaction term, are included.

Figure B3. Marginal Effect of Trade Openness on Government Consumption along Bureaucratic Quality: Panel Data, Small Sample
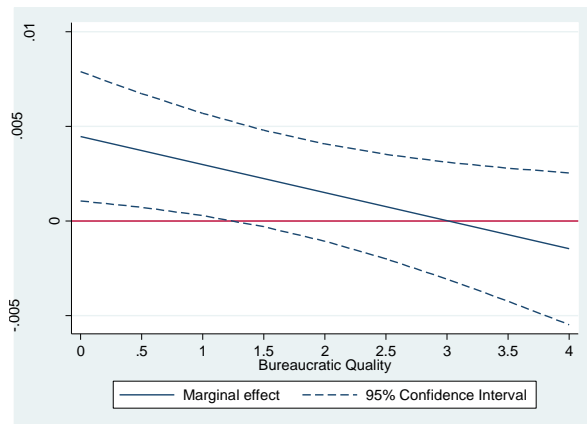
a. Column 1 of Table 3.
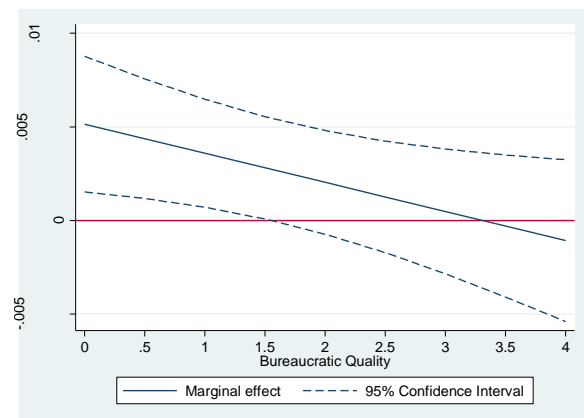
b. Column 2 of Table 3 (TOT Volatility 50th p.)

3. Panel Data Analysis: Random Effects Regressions

The panel regressions were run using both fixed effects and random effects. As mentioned in the paper's core results, the Hausman test favors the fixed effects model. However, we present the random effects model in Table 2 of the paper (columns 3 and 4) and the respective figures in this appendix. Figure B4 shows that past exposure to external risk is a statistically significant determinant of government consumption when the quality of the bureaucracy is low. As in the fixed effects model, this effect dissipates as the state capacities increase.

Figure B4. Marginal Effect of Trade Openness on Government Consumption along Bureaucratic Quality: Panel Data, Random Effects, Large Sample
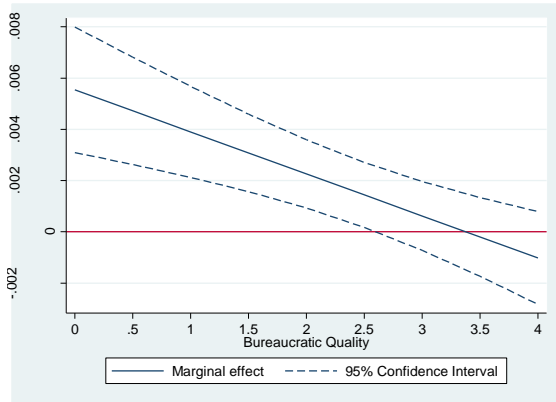

a. Column 3 of Table 2 in the main article
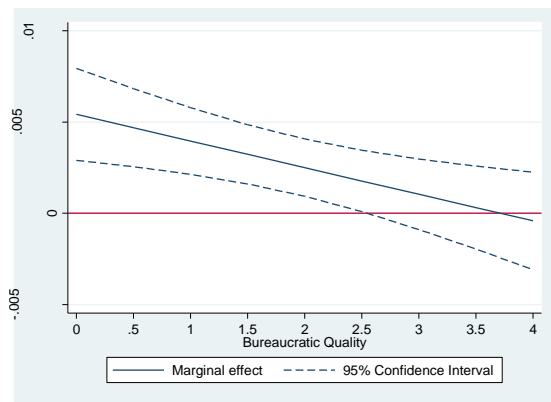
b. Column 4 of Table 2 in the main article (TOT Volatility 50th p.)

4. Instrumental Variables: Expanded Set of Instruments

The following tables present the results using the other instruments mentioned in the main body of our work, namely Persson and Tabellini's (2003) age of democracy (*age*) and its square, and a dummy variable for former colonies (*ex-colony*), Rockey's (2012) date of first democratic constitutions (*mc*) and its square, Besley and Persson's (2009) measure of political stability (*pol. stab*), Acemoglu, Johnson and Robinson's (2001) measure of European settler mortality during colonization (*settler mort.*), Cruz and Keefer's (2013) programmatic parties variable *(rlc_avg),* and CCP's legislative oversight power *(intexec)* and judicial independence *(judind)* measure.

Table B4. Second Stage Results: Instrumental Variables, Expanded Set of Instruments

VARIABLES	Log Government Consumption (% of GDP) 2000-05									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Openness (t-1)	0.002	0.002	0.005	0.009*	0.004	0.008***	-0.002	0.012***	0.019***	0.016***
	(0.004)	(0.005)	(0.005)	(0.005)	(0.003)	(0.001)	(0.003)	(0.004)	(0.003)	(0.003)
Bureaucratic Quality (t-1)	0.016	0.139	0.029	0.082	0.231***	0.118	0.152***	0.353***	0.278***	0.176**
	(0.113)	(0.120)	(0.121)	(0.134)	(0.025)	(0.100)	(0.035)	(0.129)	(0.016)	(0.073)
Openness (t-1) x Bureaucratic Quality (t-1)	-0.000	-0.001	-0.001	-0.003**	-0.001	-0.002***	0.000	-0.004***	-0.005***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
								0.484		
Expanded Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Excluded Instruments	age, age*openness	age, age*openness, age^2, age^2*openness	mc, mc*openness	mc, mc*openness, mc^2, mc^2*openness	ex-colony, ex-colony*openness	pol. stab, pol. stab*openness	settler mort., settler mort.*openness	rlc_avg, rlc_avg*openness	intexec, intexec*openness	judind judind*openness
Observations	64	64	77	77	77	75	34	75	34	34
Adjusted R-squared	0.529	0.595	0.449	0.426	0.494	0.485	0.207	0.484	0.755	0.758

Fuller(4) estimator.

Note: Other controls not shown in the table: log GDP per capita (t-1), log dependency ratio (t-1), log urbanization rate (t-1) and dummy variables for OECD, Sub-Saharan Africa, Latin America, East Asia, and Socialist countries. Expanded set of controls: log population (00), GASTIL, pres, maj, and tariff rate. *t-1* corresponds to the period 1990-99. A constant term was included in all regressions.

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

Table B5. First Stage Results: Instrumental Variables, Expanded Set of Instruments

FIRST-STAGE VARIABLES	Bur. Quality (1)	Open * Bur (2)	Bur. Quality (3)	Open * Bur (4)	Bur. Quality (5)	Open * Bur (6)	Bur. Quality (7)	Open * Bur (8)	Bur. Quality (9)	Open * Bur (10)
age	0.065	-8.231*	0.420**	3.977						
	(0.049)	(4.179)	(0.189)	(15.845)						
age x Openness (t-1)	-0.000	0.153**	-0.001	0.191						
	(0.001)	(0.059)	(0.002)	(0.248)						
age^2			-0.041*	-1.323						
			(0.021)	(1.777)						
age^2 x Openness (t-1)			0.000	-0.007						
			(0.000)	(0.030)						
mc					0.129	-9.263	0.538	-29.729		
					(0.083)	(9.540)	(0.366)	(36.695)		
mc x Openness (t-1)					-0.001	0.304**	-0.002	1.133*		
					(0.001)	(0.128)	(0.005)	(0.678)		
mc^2							-0.090	5.223		
							(0.075)	(8.245)		
mc^2 x Openness (t-1)							0.000	-0.200		
							(0.001)	(0.158)		
Ex-colony									0.604*	100.063***
									(0.337)	(33.891)
Ex-colony x Openness (t-1)									-0.008*	-1.271**
									(0.005)	(0.492)
Expanded Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Excluded Instruments	age, age*openness	age, age*openness	age, age*openness, age^2, age^2*openness	age, age*openness, age^2, age^2*openness	mc, mc*openness	mc, mc*openness	mc, mc*openness, mc^2, mc^2*openness	mc, mc*openness, mc^2, mc^2*openness	ex-colony, ex-colony*openness	ex-colony, ex-colony*openness
Observations	64	64	64	64	77	77	77	77	77	77
Adjusted R-squared	0.771	0.945	0.798	0.946	0.755	0.920	0.755	0.922	0.757	0.918
F	1.700	3.410	3.080	3.170	1.350	4.130	1.540	3.090	1.630	4.380
Prob>F	0.194	0.041	0.025	0.022	0.266	0.021	0.202	0.022	0.204	0.017
A-P F test of weak excluded instruments										
F	3.320	6.820	3.330	3.270	2.700	7.620	1.800	3.360	0.030	0.080
Prob>F	0.075	0.012	0.027	0.029	0.105	0.008	0.157	0.025	0.859	0.772

Note: Other controls not shown in the table: log GDP per capita (t-1), log dependency ratio (t-1), log urbanization rate (t-1) and dummy variables for OECD, Sub-Saharan Africa, Latin America, East Asia, and Socialist countries. Expanded set of controls: log population (00), GASTIL, pres, maj, and tariff rate. *t-1* corresponds to the period 1990-99. A constant term was included in all regressions.

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

Table B5., continued

FIRST-STAGE VARIABLES	Bur. Quality (11)	Open * Bur (12)	Bur. Quality (13)	Open * Bur (14)	Bur. Quality (15)	Open * Bur (16)	Bur. Quality (17)	Open * Bur (18)	Bur. Quality (19)	Open * Bur (20)
Pol. Stab	-0.726	-50.622								
	(0.769)	(72.132)								
Pol. Stab x Openness (t-1)	0.002	0.161								
	(0.011)	(1.057)								
Settler mort.			0.069	-20.347						
			(0.174)	(20.609)						
Settler mort. x Openness (t-1)			-0.006	-1.673						
			(0.181)	(12.752)						
rlc_avg					0.973**	34.244				
					(0.478)	(62.621)				
rlc_avg x Openness (t-1)					-0.006	0.221				
					(0.005)	(0.779)				
intexec							-0.237	-37.118		
							(0.333)	(27.500)		
intexec x Openness (t-1)							0.001	0.177		
							(0.004)	(0.308)		
judind									-0.534	10.408
									(0.445)	(42.453)
judind x Openness (t-1)									0.006	-0.541
									(0.004)	(0.673)
Expanded Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Excluded Instruments	pol. stab, pol.stab*openness	pol. stab, pol.stab*openness	settler mort., settler mort.*openness	settler mort., settler mort.*openness	rlc_avg, rlc_avg*openness	rlc_avg1, rlc_avg*openness	intexec, intexec*openness	intexec, intexec*openness	judind, judind*openness	judind, judind*openness
Observations	75	75	34	34	75	75	34	34	34	34
Adjusted R-squared	0.765	0.916	0.807	0.954	0.770	0.915	0.867	0.973	0.853	0.973
F	1.380	0.940	0.090	0.520	3.060	3.010	0.970	1.470	0.990	1.180
Prob>F	0.259	0.395	0.913	0.600	0.054	0.057	0.398	0.257	0.391	0.330
A-P F test of weak excluded instruments										
F	0.000	0.000	0.000	0.080	2.340	0.870	0.020	0.080	1.220	1.890
Prob>F	0.984	0.989	0.946	0.780	0.132	0.355	0.891	0.784	0.283	0.186

Note: Other controls not shown in the table: log GDP per capita (t-1), log dependency ratio (t-1), log urbanization rate (t-1) and dummy variables for OECD, Sub-Saharan Africa, Latin America, East Asia, and Socialist countries. Expanded set of controls: log population (00), GASTIL, pres, maj, and tariff rate. *t-1* corresponds to the period 1990-99. A constant term was included in all regressions.

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