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What determines administrative capacity in developing countries?

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Abstract: While it is recognized that effective state institutions are pivotal for economic development, it is not well understood what their origins are and what explains their cross-country differences. We focus on budget institutions in developing economies, as efficient public finance planning in such countries is crucial for public goods and services provision. We argue that political institutions, seen as stronger system of checks and balances on the executive, are a key ingredient to build such capacity. Exploiting a recent database on public financial management performance in developing economies and an Instrumental Variable strategy, we generally find that stronger constraints on the executive have a positive effect on the ability of states to design, implement and monitor the budget. Our findings are robust to different specifications, controls, and estimation methods.

Keywords: state capacity, administrative capacity, public finance management, governance, economic development, budget institutions

JEL Classification: H61, H83, P48

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1 Introduction

There has been a revival of interest in the role of the state in economic development (Centeno et al. 2017; Dincecco 2017). The analysis of *state capacity*, defined as the institutional capability of the state to carry out various policies that deliver benefits and services to households and firms (Besley and Persson 2011), has emerged as the cutting edge of research on the relationship between governance, institutions, and long-term economic development.

The focus has been on two dimensions: fiscal and legal capacity, which are defined as the capability of raising revenues from taxes and the capability of enforcing contracts and property rights, respectively. Besley and Person (2011) argue that such capacities are complements and give rise to 'development clusters': groups of countries that are rich and have well developed fiscal and legal capacities, or groups of countries that are ridden by poverty and have weak state capacity. Up to this point, the literature has mainly been concerned with the causal effect of state capacity on economic development (Dincecco and Katz 2016; Dincecco and Prado 2011). However, it has also highlighted that building fiscally capable states is at the heart of state formation and performance in providing public goods (e.g., Acemoglu 2005a).

This paper is also on fiscal aspects, but concentrates on the financial planning side: with the capability of states to manage revenues efficiently.[1] Strengthening such ability is strategically important to economic development, since achieving greater efficiency in public financial management implies more efficient public goods provision.[2] In doing so, the state needs a well-organized bureaucracy[3] with Weberian characteristics, which means autonomy from the government and professionalization of its ranks (e.g., Evans and Rauch 1999).[4]

Less developed countries have much larger needs than high-income countries for investments in infrastructure and basic public goods and services. However, whether revenues raised are channelled towards the highest needs depends on how checks and balances on incumbents can help create a preference for more common-interest spending, primarily through two mechanisms: i) a strong legislature which finds the need to generate broad-based coalitions, which can offset the narrow focus of the executive; and ii) an independent judiciary which promotes broad-based access to public services through statutory-service obligations or rights-based arguments and rulings.

We test this hypothesis using a recent data set on public financial management performance measures in developing countries constructed by the Public Expenditure and Financial Accountability (PEFA) project, a consortium of The World Bank and other donor agencies. For a sample of 47 developing countries, we find a substantial positive effect between institutions that place constraints on the executive power and current quality of budget institutions. Addressing identification concerns, we show that our results are robust to different specifications, controls,

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[1] The existence of first-order differences between investment cost and capital value in developing countries – where public investment account for more than 50% of total investments - is stressed by Pritchett (2000).

[2] In a companion paper, we have explored the role of the rule of law in determining taxation in developing countries (Ricciuti et al. 2016).

[3] Our approach complements more established areas of research on bureaucracy, such as frontline service delivery (see Pepinsky et al. (2017) for a review).

[4] Throughout the paper we interchangeably use administrative and bureaucratic capacity.

and estimation methods. Our findings indicate that, to build financially capable states, it is important to build *cohesive* political institutions, providing strong checks and balances on the discretionary power of the executive.

This paper contributes to a thin literature on the long-run determinants of state capacity. Such literature has mainly been based on conditional correlations and has hitherto independently assessed the role of historical factors, such as the incidence of external and internal conflicts (Besley and Persson 2011) and the length of statehood (Bockstette et al. 2002), and the effects of geography, such as natural resources abundance (Isham et al. 2004) or the conditions affecting population density (Herbst 2000). It has also considered the role of political systems, arguing that executive power subject to checks and balances will tend to promote common interests rather than using the state to retain power (Besley and Persson 2011). But such political economy explanations remain an underexplored area in empirical research. We contribute to this literature by looking for the first time at the functioning of state institutions for public financial management.

The paper is organized as follows. Section 2 provides the conceptual framework on the relationship between political institutions and administrative capacity. Section 3 discusses our measures of administrative capacity. In Section 4 the empirical strategy, data and the results are presented. Section 5 concludes.

2 Bureaucracy, capacity and checks and balances

In this Section, we selectively review the literature linking bureaucratic quality and political systems, that are related with our analysis: indicators that have been devoted to the measurement of institutional quality, and economic approaches to the role of bureaucracy in achieving desirable outcomes, focussing on the effects on expenditure and budget institutions.

An early approach to the state in economic development has been the one called 'Developmental state' (Johnson 1982), which refers to state-led macroeconomic planning in East Asia in the late twentieth century, first in Japan and then in other countries. A developmental state is characterized by strong state intervention, as well as extensive regulation and planning. The term has subsequently been used to describe countries outside East Asia that satisfy the criteria of a 'developmental state'. In the case of Japan, there is little government ownership of industry, but the private sector is rigidly guided by bureaucratic government elites. These elites are not elected officials and are thus less subject to influence by either the corporate-class or working-class through the political process. The argument from this perspective is that a government ministry can have greater freedom for economic planning and look at long-term national interests, without having their economic policies disrupted by either corporate-class or working-class short-term or narrow interests.

The notion of 'developmental state' has lost popularity over the last thirty years, as 'neo-liberalism' — and its corollaries of no public ownership and industrial policy — became the main tenet of economic policy. Since then an emphasis on the preconditions to economic growth based on 'good governance' has taken the stage, and the measurement of this multifaceted notion has become an important research issue. To highlight the multiplicity of dimensions, and therefore the inherent difficulties in measurement, consider the World Bank's definition of governance as 'the manner in which power is exercised in the management of a country's economic and social resources for development' (World Bank 1992: 1). It may include the power of the state, as well as the quality of its institutions and policies, which historically plays a crucial role in the functioning of economies.

Nonetheless, both perspectives share a similar emphasis on bureaucratic quality, i.e., the Weberian bureaucracy, seen as an actor of development that implements the policy choices made by the political authorities in the 'developmental state' approach, and as a provider of a level playing field in the more recent 'good governance' literature. Indeed, recent literature has shifted the focus on state institutions and the notion of state capacity. Amongst the long-run factors affecting the functioning of state institutions, the literature has emphasized the role of political systems placing checks and balances on the incumbents.

Limits on executive power promote a *common interest* environment, in which the ruling minority is unable to hand out favours to cronies or themselves (Besley and Persson 2011). In this paper, we assess whether political institutions placing checks and balances on executive power foster the ability of states to deliver timely and effective financial planning. Subject to checks and balances, a ruler has less discretion over the use of fiscal revenues compared to one who is not. Hence, he or she may be more likely to promote an effective independent civil service (rather than one based on patronage, which may undermine the competence of the state bureaucracy) and so maintain or innovate the state's financial infrastructures and the state's ability to manage revenues. Similarly, subject to clear limitations to his or her powers, a ruler is more likely to follow the rule of law, so that the judicial system may counter rent seeking more effectively, and to have a more transparent policy process, so to reduce waste and corruption.

The existing empirical literature neither focussed on the ability of states to deliver effective financial planning, nor satisfactorily measured bureaucratic quality. For example, Knack and Keefer (1995) constructed the IRIS database from International Country Risk Guide data (ICRG 1997). Its variables are the most commonly used measures of institutional quality in the empirical literature on institutions and development. The data comes from subjective assessments of foreign investors and business experts. It includes the government repudiation of contracts, the expropriation risk, rule of law, corruption in government, and bureaucratic quality indices. The first three are indicators of legal capacity of the state; the last two capture the level of bureaucratic and administrative capacity.

Rodrik et al. (2004) have also used data from WGIs (World Bank 2011). Four indicators may be seen as proxies for administrative/bureaucratic capacity: rule of law, regulatory quality and government effectiveness, and control of corruption. These are all subjective measures that try to improve on country coverage by aggregating the ratings from over thirty organisations.

The Quality of Government index assembled by Samanni et al. (2008) extends the IRIS database, but focuses only on three of its variables. It is calculated as the average of rule of law, corruption in government, and bureaucratic quality indices from various editions of the International Country Risk Guide (the other two components seen above were discontinued after 1997) and is rescaled to lie between 0 and 1.

Traditionally, state capacity indicators would focus on the competence and ability of bureaucracy. Knack and Keefer (1995) used ratings by the International Country Risk Guide (ICRG) for 'corruption in government' and 'bureaucratic quality' and 'bureaucratic delays' from Business and Environmental Risk Intelligence as measures of institutional quality. They find positive and significant effects of both of their indices on growth in per capita GDP. Mauro (1995) used ratings by Business International of 'bureaucracy and red tape' and 'corruption' in his index of bureaucratic efficiency, also finding a significantly positive effect on growth.

Keefer and Knack (2007) show that public investment is higher in countries with low-quality governance and limited political checks and balances or no competitive elections. Governance is a composite variable including bureaucratic quality, the risk of expropriation and of repudiation of

contracts by government, corruption, and the law and order tradition of the country. They claim that these governments use public investment as a vehicle to increase their rent-seeking,[5] therefore is oversized and gives low social yield. Another way to rationalize this behaviour is provided by Dixit (2010): given that both democratic and autocratic rulers must use a bureaucracy to implement policy, the optimal policy is a second-best solution, giving the bureaucrat some economic rent for information revelation and effort incentive. However, autocrats are less willing to sacrifice rents, and therefore accept a worse second-best than democrats.

In Cavallo and Daude (2011) public investment crowds-out private investment because weak institutions and restricted access to financing diminish the positive effects of public investment projects. The empirical results show that this crowding-out effect is dampened (or even reversed) in countries with better institutions – where the marginal productivity of public investment is conceivably higher – and that are more open to international trade and financial flows.

Rajkumar and Swaroop (2007) study the links between public spending, governance (level of corruption and the quality of bureaucracy), and human development outcomes. They show that the differences in the efficacy of public spending can be largely explained by the quality of governance. In particular, both public health and primary education spending lowers child mortality and increase attainment rates more in countries with good governance.

Evans and Rauch (1999) surveyed 35 emerging economies to collect data with time-invariant values representing the period 1970–90. Their 'Weberianness Scale' provides a measure of the degree to which these agencies employ meritocratic recruitment and offer predictable, rewarding long-term careers.[6] They find that these 'Weberian' characteristics significantly enhance economic growth, after controlling for initial levels of GDP per capita and human capital. Rauch and Evans (2000) used the same index to explain variations in the institutional quality indicators analysed by Knack and Keefer (1995) and Mauro (1995). They find that their indicators are significant determinants of three out of five measures of bureaucratic performance. In particular, meritocratic recruitment is the element of bureaucratic structure that is most important for improving bureaucratic performance. Internal promotion and career stability are at best of secondary importance, whereas competitive salaries do not appear to have any effect on bureaucratic performance.

Cingolani et al. (2015) use objective data on the politicization of removals of central bank governors, in countries where central banks enjoy formal autonomy and fixed mandates for their head executives. They compute whether removals occur before the governor's legal mandate is due, which allows to capture a more general correlation between political and bureaucratic cycles. This strategy is based on the assumption that the de facto degree of autonomy enjoyed by central banks is a good proxy for the same feature in other areas of the bureaucracy. They estimate the separate effect of state capacity and bureaucratic autonomy on child mortality and tuberculosis prevalence. The evidence suggests that bureaucratic autonomy has a stronger impact than commonly used measures of state capacity or traditional macroeconomic variables.

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[5] Governments engage in significant rent-seeking because they believe that their share of the long-run rents from high citizen effort are lower than the short-run rents that they can extract at the expense of citizen effort.

[6] Drawing on the work of Max Weber (1968), Evans (1992, 1995) argues that a professional state bureaucracy is a necessary condition for a state to be 'developmental'. The key institutional characteristics of what he calls 'Weberian' bureaucracy include meritocratic recruitment through competitive examinations, civil service procedures for hiring and firing rather than political appointments and dismissals, and filling higher levels of the hierarchy.

Our brief review of the literature on state capacity highlights two limitations of the literature. Firstly, while much of the literature has focused on the outcomes of high state capacity, less is known on how countries acquire the high levels of state capacity that are necessary for positive development outcomes. The lack of knowledge on the determinants of state capacity is particularly true for developing countries, while there is an extensive literature on the long-run determinants of state capacity in advanced societies (see Dincecco 2017 and Tilly 1975). Secondly, scholars have tended to look at state capacity in the aggregate (as in the ICRG measures commonly used in the empirical analysis) without paying particular attention to the capacity of the bureaucracy to devise and implement efficient public financial management systems. Arguably, it is the administrative capacity of the state to allocate public expenditures efficiently that matters the most for public goods delivery in the developing world. In our paper, we address these two limitations by examining the determinants of the state's administrative capacity to efficiently manage budgetary institutions in developing countries, focusing in particular on political economy factors. We next discuss how we measure administrative capacity with respect to public financial management in developing countries using a novel data-base that is the first of its kind in providing comparable measures of public financial management quality for a large number of developing countries.

3 Measuring administrative capacity

The survey in the previous Section has highlighted the importance of political institutions limiting the executive power for the ability to states to develop efficient financial planning and the limitations of empirical research attempting to measure the effects of bureaucratic quality. In this paper, we use four indicators selected from the Public Expenditure and Financial Accountability (PEFA) database, which is a unique source providing a granular view of public financial management performance in developing countries. The PEFA Program was founded in 2001 as a partnership between seven donor agencies and international financial institutions to assess the condition of country public expenditure, procurement and financial accountability systems and develop a practical sequence for reform and capacity-building actions.[7]

With the selected indicators, we aim to give a more fine-grained picture of some activities performed by the bureaucracy, namely those related with expenditure and budget, with respect to the more general picture provided by other indicators. We see the effective budgeting as a means to provide valuable planning and to assess outlays after they have been disbursed, in order to evaluate the efficiency of the process. Should expenditure not be in line with the budget, the professional bureaucracy would be able to reassess the process and to improve its behaviour in the future. Should the government trying to interfere with the bureaucracy in the timing and allocation of resources, the independent civil servants would prevent them to extract private benefits. The four indicators are described below and their complete definition and coding is given in Appendix 1:

[7] These indicators are a way to measure processes and outcomes in line with the New Public Management approach (Osborne and Gaebler 1992) that has become dominant in the field since the '90s. While there may be some tensions between the Weberian bureaucracy, based on formal merits and procedures and the newer approach based on the efficiency of private firms, Bäck and Hadenius (2008) claim that the supposed superiority of the former can be viewed in a stepwise function. Only after the patrimonial stage is left behind, as in the Weberian world, then efficiency-enhancing features would further improve on the delivery of outcomes. This creates a common ground for our measures across different bureaucracy approaches.

1. *Aggregate expenditure out-turn compared to original approved budget*. It captures the ability to implement the budgeted expenditure by assessing the difference between actual primary expenditure and the originally budgeted primary expenditure.

2. *Composition of expenditure out-turn compared to original approved budget*. This assesses to what extent the composition of expenditure varies from the original budget, during the last three years, and so expresses whether the budget is a useful statement of policy intent.

3. *Aggregate revenue out-turn compared to original approved budget*. This captures the ability to produce accurate domestic revenue forecasts in the preparation of the budget by assessing the difference between actual revenues to those in the originally approved budget.

4. *Recording and management of cash balances, debt and guarantees*. This variable assesses the quality of debt management, by looking at the maintenance of a debt data system and regular reporting on the debt portfolio.

Table 1 gives the descriptive statistics of these variables.

Table 1: PEFA Measures of Administrative Capacity

Variable	Mean	Std. Dev.	CV	Max.	Min.	N
Aggregate expenditure out-turn compared to original approved budget	1.63	0.86	0.53	3.00	0.00	45
Composition of expenditure out-turn compared to original approved budget	1.19	1.02	0.86	3.00	0.00	42
Aggregate revenue out-turn compared to original approved budget	2.21	0.96	0.44	3.00	0.00	47
Recording and management of cash balances, debt and guarantees	1.62	1.12	0.69	3.00	0.00	36

Source: Authors' calculation based on PEFA (2006) data

These indicators do not provide a measure of public investment efficiency as in Dabla-Norris et al. (2012), who construct an index that captures the institutional environment underpinning public investment management across four different stages: project appraisal, selection, implementation, and evaluation. However, as these measures are based on surveys undertaken by qualified public financial management experts and are subject to careful cross-checking and internal and external validity tests by PEFA, these measures provide an accurate picture of the quality of public financial management in the surveyed countries. Further, the fact that the PEFA data-base provides numerical scores rather than just a summary of expert opinion of the country's quality of public financial management makes the data amenable for quantitative analysis, and we next describe the methodology that we will use for the econometric analysis.

4 Methodology, data and results

This section first discusses the empirical strategy and the key variables. Then we illustrate the results, accounting for potential endogeneity concerns.

4.1 Methodology and data

Since we look at the structural conditions under which countries develop capable states, regressions based on cross-section averages are a suitable approach as they test relationships whose mechanisms have long-run characteristics.[8] The regression specification takes the form:

$$FC_{i,T,T-1} = \beta_0 + \beta \cdot W_{i,t,t-1} + X'_{i,t,t-1} \cdot \phi + \varepsilon_{i,t,t-1} \qquad (1)$$

where, $FC_{i,T,T-1}$ captures the quality of current budget institutions as the average of each PEFA indicator for country i between the end of the sample period, T, and T-1.

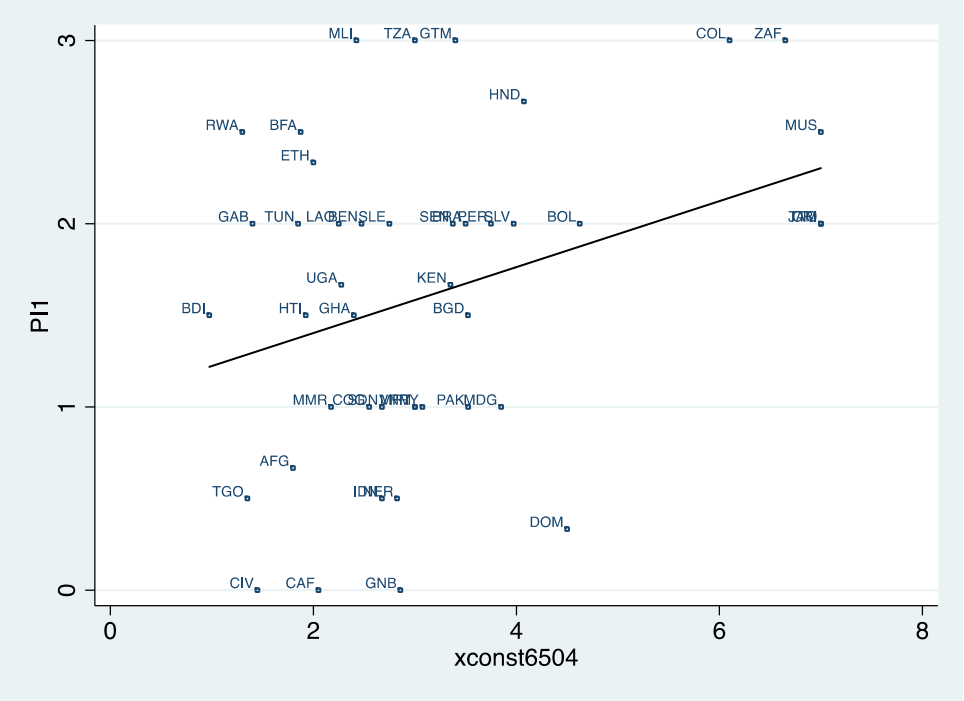
On the right-hand side, $W_{i,t,t-1}$ is the determinant of interest, averaged between times t and t-1, with $t<T$-1, and β represents its long-run effect on bureaucratic capacity. It is measured as the average value of *Constraints on the Executive* from the Polity IV dataset from 1965 (or independence year, if later) up to 2004 (Marshall et al. 2011), as we are interested in the long-run component of these constraints (and not in the annual fluctuations). This variable measures the extent of constitutional limits on the exercise of arbitrary power by the executive (on a scale from 1 to 7, where 1 indicates unlimited authority of the chief executive and 7 indicates executive parity or subordination, with intermediate values indicating moderate to substantial power limitations). $X_{i,t,t-1}$ is a set of controls including *Incidence of external conflict*, *Incidence of civil war*, *Total natural resources rents*, *Urban population* (share).[9] Appendix 2 reports definitions and sources. Finally, $\varepsilon_{i,t,t-1}$ is the error, capturing all other omitted factors. Appendix 3 provides the countries involved in the analysis.

[8] Prominent examples following this approach are Besley and Persson (2009, 2011) and Acemoglu et al. (2001, 2003). The potential consequence of averaging the variables over years is that it tends to obscure episodes of institutional change within countries, reflecting changes in the political and economic conditions. If this is the case, one could complement the evidence from regressions based on cross-section averages with a panel approach concentrating on the *within* variation to investigate whether the cross-sectional relationship between the variables of interest disappears when country-fixed effects are included in the regression. The relationships under scrutiny, however, are fairly stable (both the dependent and the explanatory variables evolve slowly over time), so casting doubts on the scope for a panel approach. Such approach would become appealing if one could obtain a panel covering an extensive period of time.

[9] Besley and Persson (2011) suggest that state capacities have common determinants and that investing in one dimension of state capacity simultaneously reinforces the other, i.e., there are complementarities.

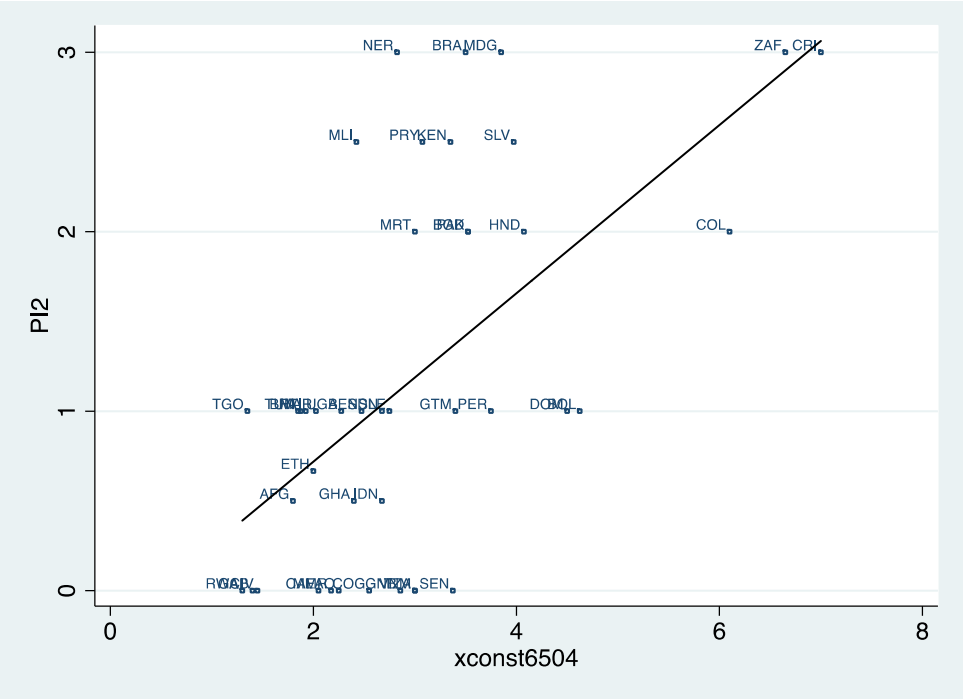
Figure 1 presents preliminary evidence, suggesting that there is a positive correlation between Constraints on the executive and each of the PEFA measures. However, while useful to illustrate the behaviour of key variables, one should not be tempted to give any causal interpretation to such correlations yet.

Figure 1a –Aggregate expenditure out-turn compared to original approved budget and executive constraints



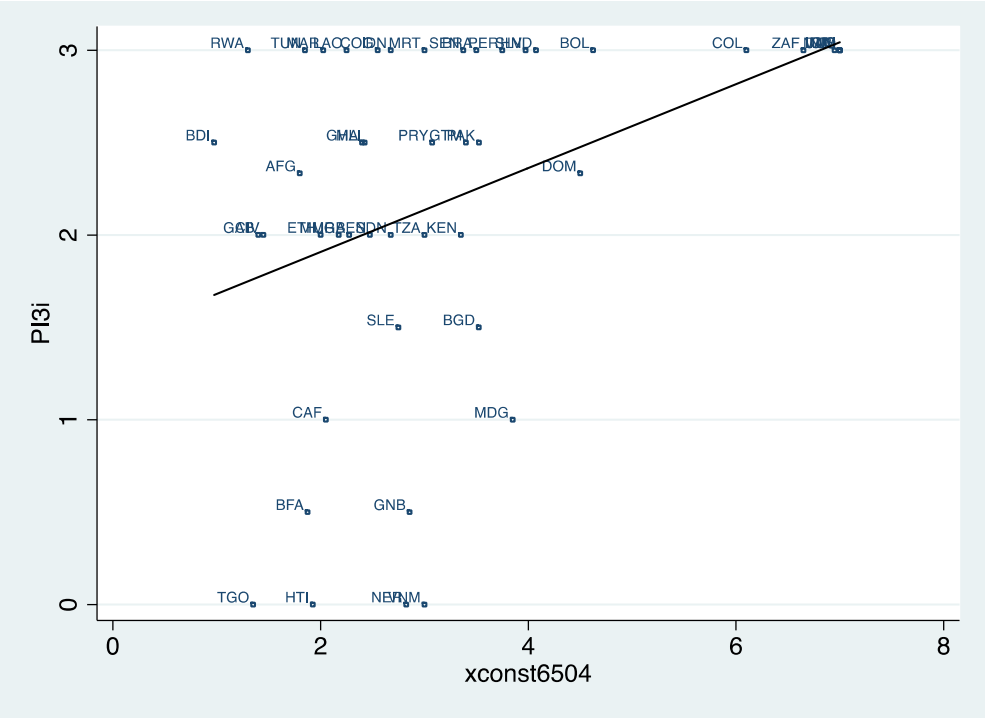
Source: Authors' illustration based on data PEFA (2006) and Polity IV (Marshall et al. 2011) data.

Figure 1b – Composition of expenditure out-turn compared to original approved budget and executive constraints



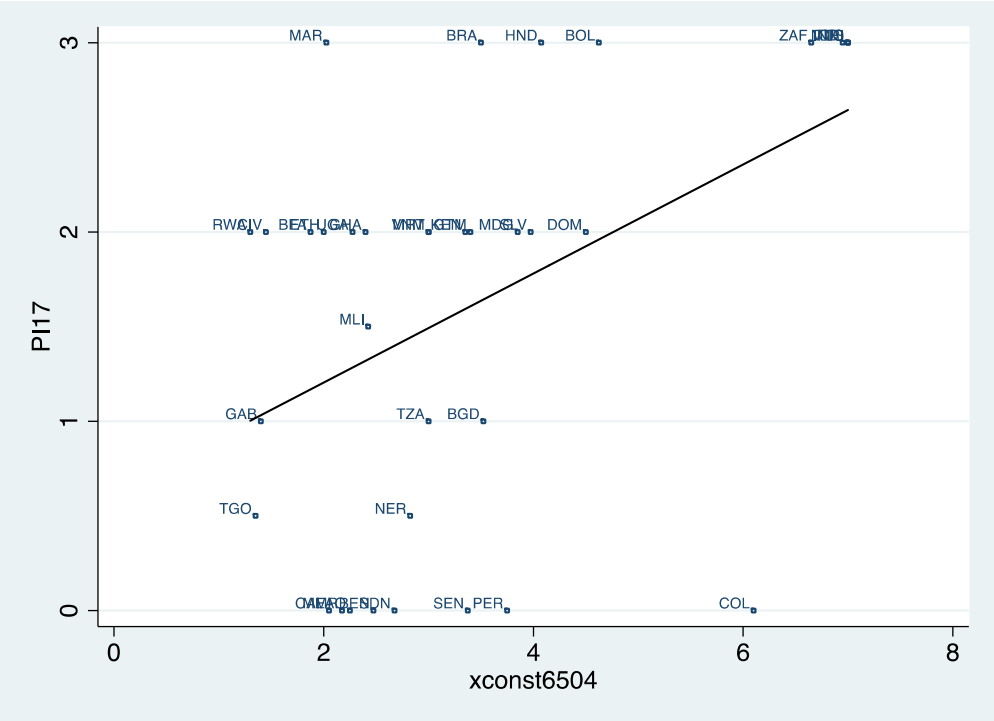
Source: Authors' illustration based on data PEFA (2006) and Polity IV (Marshall et al. 2011) data.

Figure 1c – Aggregate revenue out-turn compared to original approved budget and executive constraints



Source: Authors' illustration based on data PEFA (2006) and Polity IV (Marshall et al. 2011) data.

Figure 1d – Recording and management of cash balances, debt and guarantees and executive constraints



Source: Authors' illustration based on data PEFA (2006) and Polity IV (Marshall et al. 2011) data.

Before estimating (1), we should discuss whether estimating the impact of the political economy hypothesis is subject to identification problems. Although there are good reasons to expect a causal relationship between rulers' accountability and high administrative capacity, OLS estimates are insufficient to document such a relationship. Building a political system is clearly an endogenous process, driven by a variety of social forces, including state actors. When estimating the relationship from the data, the effect of constraints on the executive could then be affected by reverse causality, hence subject to bias. Another concern is also that the effect of political systems may be endogenous also in the statistical sense, namely correlated with the regression disturbances because of measurement error. Therefore, one might expect the coefficients on Constraints on the executive both to be biased away from zero and toward zero. The magnitude of the two types of bias, and their combined effect, is an open question, but here we attempt to address the problem using an instrumental variable (IV) approach.

Our instrument has a prominent place in the literature: historical settler mortality, as captured by the (log of) mortality rate due to the disease environment at the time of colonization. Acemoglu et al. (2001) documented that such variable picks the exogenous variation in the type of institutions built in the former European colonies. Where Europeans settled in mass, life was organized around inclusive institutions, i.e., subjecting the ruling elite to binding limitations to their power. Where they could not settle, due to adverse sanitary conditions, institutions were extractive, i.e., subject to little or no constraints on the rulers. Compared to its alternatives, this instrument had a more plausible justification (see Acemoglu 2005b). Perhaps for this reason, it has proved to be resilient to criticism, which came on the grounds of data quality and associated historical records (Albouy 2012). Since it was proposed, it has been successfully exploited to identify the effect of the *constraints on the executive* variable (Acemoglu et al. 2001, 2003). While we rely on Acemoglu et al.'s (2001) natural experiment argument that *settlers' mortality* does not directly affect level of fiscal capacity (other than through its effect on *constraints on the executive*), we also address exclusion restriction concerns through econometric testing.

4.2 Results

To account for potential instrument weakness, we estimate (1) by Limited Information Maximum Likelihood (LIML), using Fuller's version (Baum et al. 2007; Fuller 1977)).[10] This is more robust than 2SLS in the presence of weak instruments, as shown in the simulations carried out in Hahn et al. (2004), and appears to have lower small-sample variability. We set the user-specified constant (denoted by *alpha* in Fuller (1977)) to a value of four. While the Fuller 1 estimator yields the most unbiased estimator, the Fuller 4 version minimizes the mean squared error of the estimator (Fuller 1977).

Table 2 regressions show that *Constraints on the executive* have a significant and consistently positive effect on administrative capacity, in three of its measures. The magnitude of the effect of IV estimates is comparable to OLS estimates, suggesting that perhaps the bias introduced by reverse causality and measurement error is such that they offset each other. However, constraints on the

[10] The first stage regressions generally show a highly significant relationship between the log of *settlers' mortality* and *constraints on the executive*, but the F-statistics for the first stage regressions are occasionally borderline or weak in some regressions, signaling potentially weak instrumentation. They are usually above 10, a rule of thumb suggested by Staiger and Stock (1997). Most specifications pass the Stock-Yogo test for weak instruments for 15 percent maximal relative bias at the 5 percent significance level, but not for 10 percent maximal relative bias. With weak instruments, the estimated coefficient of interest could be biased towards OLS even if the instrument is weakly correlated with the error term, and especially in small samples. As a remedy, there is general agreement in the literature to use Limited Information Maximum Likelihood (LIML) estimation (e.g., Cameron and Trivedi (2005), pp.190-192).

executive are irrelevant, in IV estimates, when it comes to predicting the level of *Aggregate expenditure out-turn compared to original approved budget.*

Table 2: Administrative capacity and constraints on the executive: OLS and IV estimates

Dependent variable:	*Aggregate expenditure out-turn compared to original approved budget*			*Composition of expenditure out-turn compared to original approved budget*		
Estimator:	OLS	LIML	LIML	OLS	LIML	LIML
Constraints on the executive	0.180***	0.222	0.188	0.469***	0.337*	0.398**
	(0.061)	(0.143)	(0.156)	(0.061)	(0.189)	(0.185)
Length of statehood			0.004			0.001
			(0.005)			(0.005)
Inciden. of external conflict			-1.399			5.782
			(5.997)			(7.324)
Inciden. of internal conflict			0.520			-1.244***
			(0.586)			(0.396)
% urban population			0.001			-0.008
			(0.008)			(0.010)
Tot. resource rents			0.001			-0.028*
			(0.014)			(0.014)
Constant	1.044***	0.905*	0.519	-0.220	0.179	0.544
	(0.261)	(0.520)	(0.697)	(0.211)	(0.621)	(0.629)
F-stat	8.789***	2.404	0.850	59.604***	3.183*	9.714***
1st-stage F		10.820	6.695		6.788	2.817
R-Sq.	0.117	0.111	0.177	0.349	0.322	0.513
Obs.	45	45	42	42	42	39
RMSE	0.819	0.822	0.807	0.849	0.867	0.777
Dependent variable:	*Aggregate revenue out-turn compared to original approved budget*			*Recording and management of cash balances, debt and guarantees*		
Estimator:	OLS	LIML	LIML	OLS	LIML	LIML
Constraints on the executive	0.227***	0.372***	0.250**	0.288***	0.295***	0.316***
	(0.052)	(0.111)	(0.108)	(0.088)	(0.105)	(0.103)
Length of statehood			0.007			0.009*
			(0.006)			(0.005)
Inciden. of external conflict			-5.495			21.312***
			(9.076)			(7.076)
Inciden. of internal conflict			0.649			-1.730**
			(0.481)			(0.744)
% urban population			0.016*			-0.021*
			(0.009)			(0.012)
Tot. resource rents			0.021**			0.014
			(0.009)			(0.015)
Constant	1.454***	0.974**	0.089	0.628*	0.603*	0.297
	(0.280)	(0.436)	(0.690)	(0.355)	(0.354)	(0.599)
F-stat	19.092***	11.326***	3.156**	10.625***	7.853***	5.398***
1st-stage F		11.885	7.800		11.477	9.299
R-Sq.	0.161	0.095	0.314	0.201	0.201	0.462
Obs.	47	47	44	36	36	34
RMSE	0.893	0.927	0.857	1.013	1.014	0.898

Notes: Heteroskedasticity-robust standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: Authors' calculation based on PEFA (2006) data

How much do *Constraints on the executive* matter? One standard deviation increase (approximately 1.5 points) increases by over half standard deviations three of the four measures of budget institutions (Table 3). Considering that in about 20 per cent of developing economies *Constraints on the executive* is above one standard deviation, its effect seems economically meaningful, as well as statistically significant.

Table 3: Magnitude of effect of a change in Constraints on the executive

Dependent variable:	Coefficient on constraints on the executive in IV regression	Change in dependent variable in response to 1 standard deviation change in Constraints on the executive	Ratio to 1 standard deviation dependent variable
Aggregate expenditure out-turn compared to original approved budget	0.188	0.317	0.386
Composition of expenditure out-turn compared to original approved budget	0.398	0.538	0.621
Aggregate revenue out-turn compared to original approved budget	0.250	0.438	0.525
Recording and management of cash balances, debt and guarantees	0.316	0.561	0.638

Source: Authors' calculation based on PEFA (2006) data

The key results are robust to checks for omitted variables. The literature on state capacity has proposed plausible alternatives (not exclusive) to the political institutions hypothesis. Some are historical in nature, i.e., length of statehood and the incidence of external and internal conflicts. Others are geographical, i.e., the reliance of the economy on natural resources rents and population density. Following Besley and Persson (2009, 2011), we use the proportion of years at war from independence up to 2000 and the proportion of years in civil war over 1950–2000 to capture the incidence of external and internal conflict, respectively. *Length of statehood* is captured by the *state antiquity index,* proposed by Bockstette et al. (2002) and based on the intuition that longer histories of statehood lead to higher quality administration due to 'learning by doing' effects. Introducing such variables leaves the significance of *constraints on the executive* unchanged.

Geography-based robustness checks are particularly important, as the settler mortality rate could be proxying for 'resource curse' mechanisms or population density. For example, disease conditions may well be a determinant of where urban areas arise. So we can examine whether the *constraints on the executive* results survive when we independently control for geographical variables. To capture such effect, we use the share of urban population from World Bank (2013). And to capture 'resource curse' mechanisms, we use the 1970–2004 average share of GDP accruing from total resource rents (as the sum of oil, natural gas, coal, mineral, and forest rents), from World Bank (2013). Introducing such controls do not greatly affect the significance and magnitude of the coefficient of interest. We experiment also with a number of other controls, including political democracy, legal origins, aid dependency, fractionalization, and regional dummies. Introducing such variables in our regressions does not significantly alter our findings (results are available on request).

Finally, we test whether the instrument meets the exclusion restriction by running a test of over-identification. Apart from a priori intuition, the is the other way to support the exclusion restriction. This approach is useful since it is a direct test of our exclusion restriction. However, it is only partially satisfactory as such tests may have weak power (it may not lead to a rejection of the exclusion restriction if all instruments are invalid, but still highly correlated with each other). Hence, the responses from these tests are not definitive, but could nonetheless give us additional confidence that settler mortality is a valid instrument. With this caveat in mind, and following Acemoglu et al. (2001), we choose distance from the equator an additional instrument for *constraints on the executive*. For such variable to be valid here, its effects also must go through political institutions rather than through any other mechanism. This is potentially problematic, as it is not based on a natural experiment, but it is consistent with most arguments in the literature stressing that geography affects development outcomes through political institutions, rather than directly (see Acemoglu 2005b).

The results of the overidentification tests are reported in Table 4. For each dependent variable, we rerun the third regression in Table 2 using both latitude and mortality rates as instruments. The first encouraging piece of evidence is that the new estimated coefficients are always quite close to those reported in Table 2. In addition, the results on the over-identification tests do fail to reject the exclusion restriction at the conventional levels in all cases, and by a large margin in three out of four regressions. Hence, this exercise provides no evidence that the sanitary conditions, as captured by *settlers' mortality*, affect administrative capacity by any other channel than through political institutions.

Table 4 – Accounting for instrument validity: overidentification tests with distance from the equator as an additional IV

Dep. Variable:	*Aggregate expenditure out-turn compared to original approved budget*	*Composition of expenditure out-turn compared to original approved budget*	*Aggregate revenue out-turn compared to original approved budget*	*Recording and management of cash balances, debt and guarantees*
Constraints on the executive	0.223	0.355*	0.248**	0.300**
	(0.174)	(0.196)	(0.108)	(0.117)
Constant	0.430	0.617	0.095	0.339
	(0.725)	(0.634)	(0.692)	(0.617)
Hansen J statistic (p-value):	0.213	0.742	0.801	0.557

Notes: Heteroskedasticity-robust standard errors in parentheses. All regressions include the full set of controls. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: Authors' calculation based on PEFA (2006) data

5 Conclusions

Whatever benefit–cost case economists can make for investing in broad-based spending programs like infrastructure, health, and education, in many low-income countries there is little problem identifying the need for such public programs; the problem comes in delivering them. Starting from these premises, in this paper we claimed that checks and balances on the executive should provide a stronger basis for scrutinizing public spending decisions, which are implemented by an effective bureaucracy, and initiating systems of auditing that are essential for delivering public goods in developing countries.

Our findings indicate that political institutions limiting the executive power tend to improve the transparency and accountability of fiscal systems. Our findings have important policy implications as they suggest that the fundamental cause of weak public financial management institutions lies in the absence of cohesive political institutions that constrain the power of the executive in developing countries. While much of donor support for more efficient public financial management institutions tend to focus on technocratic solutions such as reforming recruitment and promotion practices in the public sector, our paper suggests that an important component of donor support to Southern governments should also be to build stronger and more cohesive political institutions.

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Appendices

Appendix 1: Dependent variables definitions

Aggregate expenditure out-turn compared to original approved budget (PEFA PI1)	Definition – The difference between actual primary expenditure and the originally budgeted primary expenditure (i.e. excluding debt service charges, but also excluding externally financed project expenditure). Average score over 2005-2013. Scoring method: 3. In no more than one out of the last three years has the actual expenditure deviated from budgeted expenditure by an amount equivalent to more than 5% of budgeted expenditure. 2. In no more than one out of the last three years has the actual expenditure deviated from budgeted expenditure by an amount equivalent to more than 10 % of budgeted expenditure. 1. In no more than one of the last three years has the actual expenditure deviated from budgeted expenditure by more than an amount equivalent to 15% of budgeted expenditure. 0. In two or all of the last three years did the actual expenditure deviate from budgeted expenditure by an amount equivalent to more than 15% of budgeted expenditure. Source: variable PI.1, *Public Expenditure and Financial Accountability Performance Measurement Framework*, PEFA (2006), at pefa.org/content/pefa-framework (accessed on 11 September 2017)
Composition of expenditure out-turn compared to original approved budget (PEFA PI2)	Definition – This variable is composed of: (i) Extent of the variance in expenditure composition during the last three years, **excluding** contingency items (the methodology to rate this dimension is set out in the footnote7); (ii) The average amount of expenditure actually charged to the contingency vote over the last three years. Average score over 2005-2013. Scoring method: 3. (i) Variance in expenditure composition exceeded 5 % in no more than one of the last three years. (ii) Actual expenditure charged to the contingency vote was on average less than 3% of the original budget. 2.(i) Variance in expenditure composition exceeded 10 % in no more than one of the last three years. (ii) Actual expenditure charged to the contingency vote was on average more than 3% but less than 6% of the original budget. 1. (i) Variance in expenditure composition exceeded 15 % in no more than one of the last three years. (ii) Actual expenditure charged to the contingency vote was on average more than 6% but less than 10% of the original budget. 0. (i) Variance in expenditure composition exceeded 15 % in at least two of the last three years. (ii) Actual expenditure charged to the contingency vote was on average more than 10% of the original budget.

	Source: variable PI.2, *Public Expenditure and Financial Accountability Performance Measurement Framework*, PEFA (2006), at pefa.org/content/pefa-framework (accessed on 11 September 2017)
Aggregate revenue out-turn compared to original approved budget (PEFA PI.3)	Definition – Actual domestic revenue compared to domestic revenue in the originally approved budget. Average score over 2005-2013. Scoring method: 3. Actual domestic revenue was between 97% and 106% of budgeted domestic revenue in at least two of the last three years; 2. Actual domestic revenue was between 94% and 112% of budgeted domestic revenue in at least two of the last three years; 1. Actual domestic revenue was between 92% and 116% of budgeted domestic revenue in at least two of the last three years; 0. Actual domestic revenue was below 92% or above 116% of budgeted domestic revenue in two or all of the last three years. Source: variable PI.3, *Public Expenditure and Financial Accountability Performance Measurement Framework*, PEFA (2006), at pefa.org/content/pefa-framework (accessed on 11 September 2017)
Recording and management of cash balances, debt and guarantees (PEFA PI17)	Definition – This variable composed of: (i) Quality of debt data recording and reporting; (ii) Extent of consolidation of the government's cash balances; (iii) Systems for contracting loans and issuance of guarantees. Average score over 2005-2013. Scoring method: (i) Quality of debt data recording and reporting **3**: Domestic and foreign debt records are complete, updated and reconciled on a monthly basis with data considered of high integrity. Comprehensive management and statistical reports (cover debt service, stock and operations) are produced at least quarterly **2**: Domestic and foreign debt records are complete, updated and reconciled quarterly. Data considered of fairly high standard, but minor reconciliation problems occur. Comprehensive management and statistical reports (cover debt service, stock and operations) are produced at least annually. **1**: Domestic and foreign debt records are complete, updated and reconciled at least annually. Data quality is considered fair, but some gaps and reconciliation problems are recognized. Reports on debt stocks and service are produced only occasionally or with limited content. **0**: Debt data records are incomplete and inaccurate to a significant degree. (ii) Extent of consolidation of the government's cash balances **3**: All cash balances are calculated daily and consolidated. **2**: Most cash balances calculated and consolidated at least weekly, but some extra-budgetary funds remain outside the arrangement. **1**: Calculation and consolidation of most government cash balances take place at least

	monthly, but the system used does not allow consolidation of bank balances **0**: Calculation of balances takes place irregularly, if at all, and the system used does not allow consolidation of bank balances. (iii) Systems for contracting loans and issuance of guarantees. **3**: Central government's contracting of loans and issuance of guarantees are made against transparent criteria and fiscal targets, and always approved by a single responsible government entity. **2**: Central government's contracting of loans and issuance of guarantees are made within limits for total debt and total guarantees, and always approved by a single responsible government entity. **1**: Central government's contracting of loans and issuance of guarantees are always approved by a single responsible government entity, but are not decided on the basis of clear guidelines, criteria or overall ceilings. **0**: Central government's contracting of loans and issuance of guarantees are approved by different government entities, without a unified overview mechanism. Source: variable PI.17, *Public Expenditure and Financial Accountability Performance Measurement Framework*, PEFA (2006), at pefa.org/content/pefa-framework (accessed on 11 September 2017)

Appendix 2: Explanatory variables definitions

Executive constraints	This measures the average value of the variable *xconst* in the Poliy IV dataset from 1965 (or independence date if later) up to 2004. The average is taken over non missing values of xconst (values outside [1; 7] are treated as missing). Source: Marshall et al (2011).
Incidence of external conflicts	Proportion years in external conflict up to 2000. This variable captures the parameter _ in the model. It measures the proportion of years in external war from 1816 (or independence if later) until 2000. The two binary measures of interstate war and extrastate war from the Correlates of War (COW) database are used to see whether a country is in war with other countries. Specifically, if any of these measures are showing a war in a given year that country-year is counted as having war and if both of the variables are non missing and zero the country-year has no war. Then the proportion of years in war is calculated as the number of years with war over the total number of non missing (with and without war) years. This variable is defined for 180 countries. Source: Besley and Persson (2011).
Incidence of civil war	Proportion years in civil war 1950-2006. This variable shows the proportion of years with civil war (where war incidence measure is equal to one) over the years without civil war over 1950-2000 for each country (excluding missing values). Source: Besley and Persson (2011), constructed from the measure of civil war incidence taken from UCDP/PRIO Armed Conflict Dataset version 4-2007, 1946-2006 produced by peace research institutes in Oslo and Uppsala. Source: Besley and Persson (2011).
Total natural resources rents (% of GDP)	Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents. Source: World Bank (2013).
Urban population (% of total)	Urban population refers to people living in urban areas as defined by national statistical offices. It is calculated using World Bank population estimates and urban ratios from the United Nations World Urbanization Prospects. Source: World Bank (2013).
State antiquity index	The index is constructed by observing their state history over the period from 1 to 1950 C.E. For each 50-year period, each country has been allocated a score for the existence of a government above tribal level; whether the government is locally based or foreign; and how much of the territory of the modern country was ruled by this government. The scores for each 50-year sub-period have been multiplied by one another and then summed by weighting down the periods in the more remote past. Source: Bockstette et al. (2002).

Appendix 3: Countries

	COUNTRY	CODE
1	ALBANIA	ALB
2	ARMENIA	ARM
3	BURKINA FASO	BFA
4	BANGLADESH	BGD
5	BELARUS	BLR
6	BOLIVIA	BOL
7	BRAZIL	BRA
8	BOTSWANA	BWA
9	IVORY COAST	CIV
10	CONGO	COG
11	COLOMBIA	COL
12	DOMINICAN REP.	DOM
13	ETHIOPIA	ETH
14	GABON	GAB
15	GHANA	GHA
16	GUATEMALA	GTM
17	HONDURAS	HND
18	HAITI	HTI
19	INDONESIA	IDN
20	INDIA	IND
21	JAMAICA	JAM
22	JORDAN	JOR
23	KENYA	KEN
24	LIBERIA	LBR
25	MOROCCO	MAR
26	MOLDOVA	MDA
27	MADAGASCAR	MDG
28	MALI	MLI
29	MOZAMBIQUE	MOZ
30	MALAWI	MWI
31	NIGER	NER
32	PAKISTAN	PAK
33	PERU	PER
34	PHILIPPINES	PHL
35	PARAGUAY	PRY
36	SUDAN	SDN
37	SENEGAL	SEN
38	SIERRA LEONE	SLE
39	EL SALVADOR	SLV
40	TOGO	TGO
41	THAILAND	THA
42	TRINIDAD & TOBAGO	TTO
43	UGANDA	UGA
44	UKRAINE	UKR
45	VIET NAM	VNM
46	SOUTH AFRICA	ZAF
47	ZAMBIA	ZMB