How Do Political Institutions Affect Fiscal Capacity? Explaining Taxation in Developing Economies

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ABSTRACT

A central aspect of institutional development in less developed economies is building tax systems capable of raising revenues from broad tax bases, i.e., fiscal capacity. While it is recognized in the literature that fiscal capacity is pivotal for state building and economic development, it is less clear what its origins are and what explains its cross-country differences. We focus on political institutions, seen as stronger systems of checks and balances on the executive. Exploiting a recent database on public sector performance in developing economies and an IV strategy, we identify their long-run impact and we 'unpack' the concept of fiscal capacity, distinguishing between the accountability and transparency of fiscal institutions (*impartiality*) and their *effectiveness* in extracting revenues. We find that stronger constraints on the executive foster the *impartiality* of tax systems. However, there is no robust evidence that they also improve its *effectiveness*. The impact of political institutions on the *impartiality* dimension works through the rule of law and the performance of the bureaucracy.

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1. Introduction

There has been a revival of interest on the role of the state in economic development, both in the economics and political science literature (Kohli 2009, Besley and Persson 2011). At the intersection between political economy and development economics, 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). However, based on the interdisciplinary work on the historical origins of states (Spruyt 2002), 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 2005, Osafo-Kwaako and Robinson 2013, and Charron et al 2012).

The strengthening of the fiscal capacity of the state is strategically important to economic development for two reasons. Firstly, greater fiscal capacity implies in most cases, greater access of the state to resources that are needed for public goods provision. Developing countries are only able to raise a small share of taxes over GDP relative to advanced market

economies (Besley and Persson 2014), whereas they would need higher revenues in order to invest in a number of economic and social areas that are crucial for their growth.[1] Secondly, greater fiscal capacity is usually associated with the creation of a large, civilian bureaucracy that can itself become a distinct and powerful societal force, and provide an enabling environment for more capable states, with greater territorial reach (Moore 2004).[2]

However, in spite of the importance of understanding the determinants of fiscal capacity, especially in the developing world, the existing evidence on the determinants of fiscal capacity is fairly limited and based mainly on conditional correlations (see Savoia and Sen 2015). In this paper, we make two contributions to this literature. Firstly, we provide a systematic econometric analysis of the long-run determinants of fiscal capacity in developing economies, specifically identifying the effect of political institutions on variations in fiscal capacity across developing countries. We focus on the political economy of fiscal capacity, looking at the role of political institutions that provide a system of checks and balances on the executive power.[3] While the literature acknowledges that historical and geographical determinants may well explain cross-sectional differences in fiscal capacity, they have weak policy implications (Savoia and Sen 2015). Compared to history or geography, political economy explanations appear a more promising avenue to understand reforms or the inertia of fiscal systems in developing economies.

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[1] For example, Osafo-Kwaako and Robinson (2013) show that state centralization in Africa was associated with better public goods and development outcomes.

[2] As Schumpeter (1917/1918) observed, the historical transformation in modern Western European history was neither the emergence of capitalism (Marx) nor the rise of the modern rational bureaucracy (Weber). Instead, it was the transition from the domain state, in which government activities were funded through surpluses derived from the ruler's own properties, to the *tax state*, where such activities were funded through regularised taxes on private incomes of citizens.

[3] Previous studies that have examined the relationship between political institutions and extractive capacity of the state (as measured by the tax revenues to GDP ratio) find no clear relationship between democracy and the level of taxation (Cheibub 1998, Timmons 2010).

The second contribution we make to the literature is that we 'unpack' the concept of fiscal capacity, distinguishing between two aspects of taxation power: the accountability and transparency of fiscal institutions (*impartiality*) and their *effectiveness* in extracting revenues. Drawing from the institutional economics and political science literature, we posit that political systems that place strong constraints on the executive would be more likely to lead to taxation systems that have a higher degree of *impartiality*. In such political systems, non-state actors can control and limit elites' access to resources, and are able to demand greater accountability on the part of the state with respect to the taxes they pay (Moore 2007). Therefore, greater constraints on the executive are expected to have a positive effect on the *impartiality* of the taxation system. In contrast, rational political elites, in both authoritarian regimes with limited constraints on the executive and democratic regimes with stronger constraints on the executive, are likely to invest in the *effectiveness* of the tax system in order to mobilize greater revenues, either for their own benefit or for greater public goods provision. Therefore, we would not expect any clear relationship between greater constraints on the executive and the *effectiveness* of the tax system.

To test the above hypotheses, we use a recently created set of indicators provided by PEFA (2006), the Public Expenditure and Financial Accountability project developed by a number of national and international organizations (such as the International Monetary Fund and the World Bank).[4] In particular, these indicators allow us to unpack fiscal capacity and evaluate its two core dimensions – the *effectiveness* and *impartiality* of the taxation system. Because political economy factors often evolve endogenously with fiscal capacity itself, so making hard to disentangle spurious correlation and causal effects, we resort to historical settlers'

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[4] See www.pefa.org for a presentation of the project, its aims and the data.

mortality as an instrument to identify the effect of political institutions (as proposed in Acemoglu et al 2001, 2002 and 2003). Using cross-national data for 47 developing countries and a variety of estimation methods to address the possible endogeneity of political institutions, we find the existence of constraints on the executive (our measure for a limited government) increases the *impartiality* in the tax system, whereas this variable is often insignificant in explaining the *effectiveness* of the tax system. We also provide evidence on the channels though which the effect of political institutions works, finding that the impact of constraints on the executive on the *impartiality* dimension of fiscal capacity works through the rule of law and the performance of the bureaucracy.

The paper is organized as follows. Section 2 discusses our measures of fiscal capacity, and explains how we will capture its *impartiality* and *effectiveness* dimensions. Section 3 provides the conceptual framework on the relationship between political institutions and fiscal capacity. Section 4 presents the empirical strategy, and Section 5 the results of our empirical analysis. Section 6 concludes.

2. Fiscal Capacity and Its Measurement

Fiscal capacity is defined as the capability of a fiscal system of raising tax revenues from a broad tax base (Besley and Persson 2011). This concept has often been proxied in cross-section of countries as the tax-to-GDP ratio or similar tax effort indicators. Slightly more refined measures are the share of income taxes on total taxes, the share of nontrade taxes on total taxes, the income-tax bias (the difference between income and trade taxes) and the formal sector share, which is inversely related with the ability of the government to raise taxes (Besley and Persson 2011). These alternatives are based on the observation that income is more difficult to tax than goods, and therefore it requires a more structured administration.

However, the total tax revenue as a share of GDP measure poses a number of problems. First, it strongly depends on the political preferences of a polity towards the size of the public sector, and the scope of redistribution, especially if we compare similar countries (Lieberman 2002). Second, consider two countries with the same tax-to-GDP ratio. They can afford that level in very different ways. One country could tend to expropriate its citizens, imposing a high administrative burden and giving them few or no rights to appeal; and once revenues have been raised, it could be inefficient in transferring the money to the spending ministers that will provide public services. If one country has these features that another one does not have, even if they have the same tax-to-GDP ratio, their fiscal capacity is arguably different. Other tax-effort based indicators do not provide better measures of fiscal capacity either. A higher share of income taxes in total taxes may simply reflect a culture of tax compliance (that is, lack of tax evasion) in the country and does not tell us anything on the efficiency and effectiveness in which taxes are raised, and on the power that taxpayers have with respect to the revenue office.

More importantly, from our perspective, outcome based measures of fiscal capacity, such as the tax to GDP ratio, cannot differentiate between two quite different dimensions of fiscal systems related to the exercise of taxation powers. One has to do with their effectiveness in raising tax revenues, i.e., the ability to coerce citizens to pay taxes. We call this the *effectiveness* dimension. The other has to do with the fairness of the exercise of taxation powers: it is the ability of tax systems to make the state accountable and transparent to its citizens. We call this the *impartiality* dimension.

In this paper, we use six indicators selected from the Public Expenditure and Financial Accountability (PEFA 2006) Program database, which provide a clear way of differentiating between the *impartiality* and *effectiveness* of tax systems. They are described below:[5]

1. *Transparency of taxpayer obligations and liabilities*, which evaluates taxpayers' access to information on tax liabilities and administrative procedures;

2. *Tax appeals*: assessing the functioning of a tax appeals mechanism;

3. *Controls in the taxpayer registration system*, assessing the quality and maintenance of a taxpayer database;

4. *Effectiveness in collection of tax arrears*: it is the collection ratio for gross tax arrears, being the percentage of tax arrears at the beginning of a fiscal year, which was collected during that fiscal year;

5. *Effectiveness of penalties for non-compliance*: it addresses failures in registration and tax declaration obligations assessing whether penalties for all areas of non-compliance are set sufficiently high to act as deterrence and are consistently administered;

6. *Effectiveness in collection of tax payments*: looking at the frequency of complete accounts reconciliation between tax assessments, collections, arrears records and receipts by the Treasury.

The first three indicators capture the *impartiality* aspect of fiscal capacity, since they hinge on the relationship between the State and the public: empowering it against the taxation power of the former or making such power clearly defined and not subject to discretion. The last three measures assess the coercive aspects of the tax system: they are all desirable features of a tax

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[5] Appendix 1 reports detailed definitions and scales of assessment of our six PEFA indicators. Full details of the PEFA framework, indicators and assessment method are given in the database codebook at http://www.pefa.org/sites/pefa.org/files/attachments/PMFEng-finalSZreprint04-12_1.pdf.

machine aiming at raising revenues.[6] Table 1 provides descriptive statistics for the key variables of interest. Higher scores indicate greater levels of fiscal capacity: both *impartiality* and *effectiveness*.

Table 1: PEFA Measures of Fiscal Capacity

Variable	Mean	Std.Dev.	CV	Max.	Min.	N
Transparency of taxpayer obligations and liabilities	2.10	0.81	0.39	3.00	0.00	47
Tax appeals	1.68	0.71	0.42	3.00	0.00	47
Controls in the taxpayer registration system	1.50	0.78	0.52	3.00	0.00	47
Effectiveness in collection of tax arrears	0.90	1.04	1.17	3.00	0.00	45
Effectiveness of penalties for non-compliance	1.76	0.83	0.47	3.00	0.00	46
Effectiveness in collection of tax payments	1.69	1.26	0.75	3.00	0.00	47

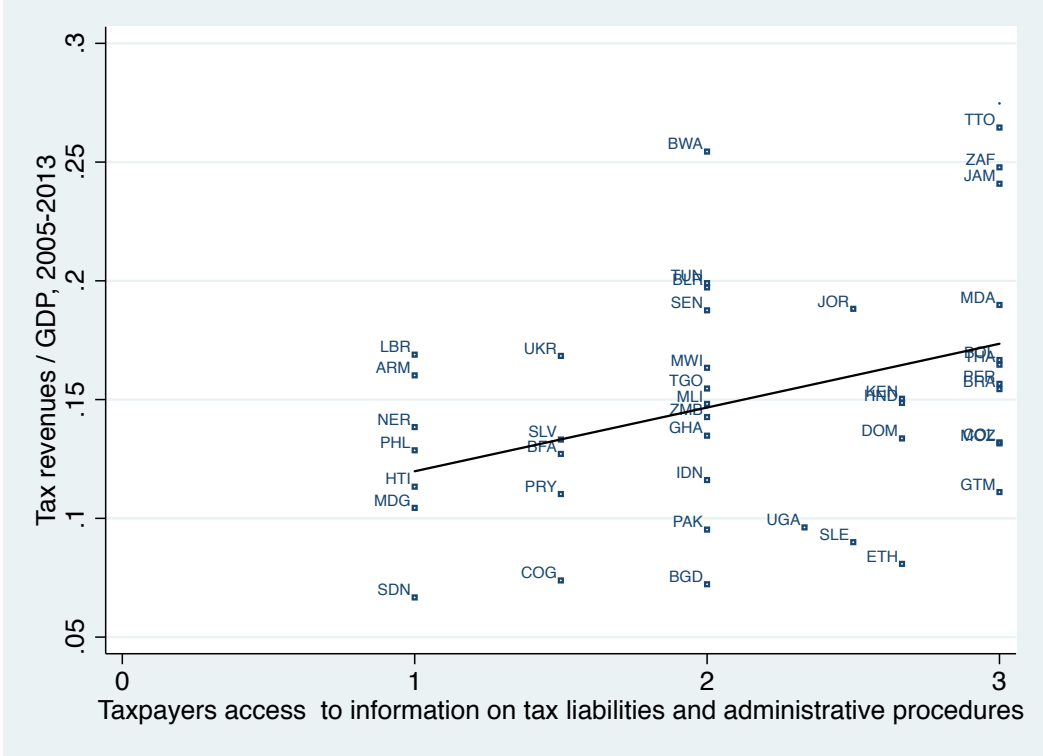**Source: PEFA (2006),** our calculations.

How correlated are the six PEFA measures of fiscal capacity with the more conventional measure of fiscal capacity – that is, tax revenues as a percentage of GDP? In Figures 1a-1f, we present scatter plots of the six measures against tax revenues/GDP for our sample of countries.[7] We find a clear positive relationship between four of the six PEFA measures capturing the *impartiality* and *effectiveness* of the tax system and tax revenue mobilization. In particular, the strongly positive correlation between the first three PEFA measures and tax revenue mobilization suggests that how a developing country does in the impartiality dimension is a good predictor of its government ability to raise tax revenues. Previous work by political scientists and fiscal sociologists on successful examples of tax reforms in developing countries also supports this point (see Brautigam et al 2008). In the next section, we discuss the political determinants of the *impartiality* and *effectiveness* dimensions of a taxation system.

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[6] As discussed in Andrews (2011), these are *de facto* measures. This is clearly important in our framework, since for effectiveness what matters is the actual working of the system and not what is merely written in the law. In fact, Andrews (2011) shows that reforms based on these indicators often fail to deliver, as they are pushed by external authorities (being *de jure*, written in the law) and not internalized by those who have to implement them.

[7] Tax revenues are defined as total revenues, excluding social contributions, accruing to the central government. This variable is from Government Revenue Dataset (ICTD 2015), which improves on coverage and precision compared to existing sources.

Figure 1a: The Relationship between *Transparency of Taxpayer Obligations and Liabilities* and Tax Revenues/GDP

Source: PEFA (2006) and ICTD (2015); our calculations.

Figure 1b: The Relationship between *Quality of Tax appeals System* and Tax Revenues/GDP
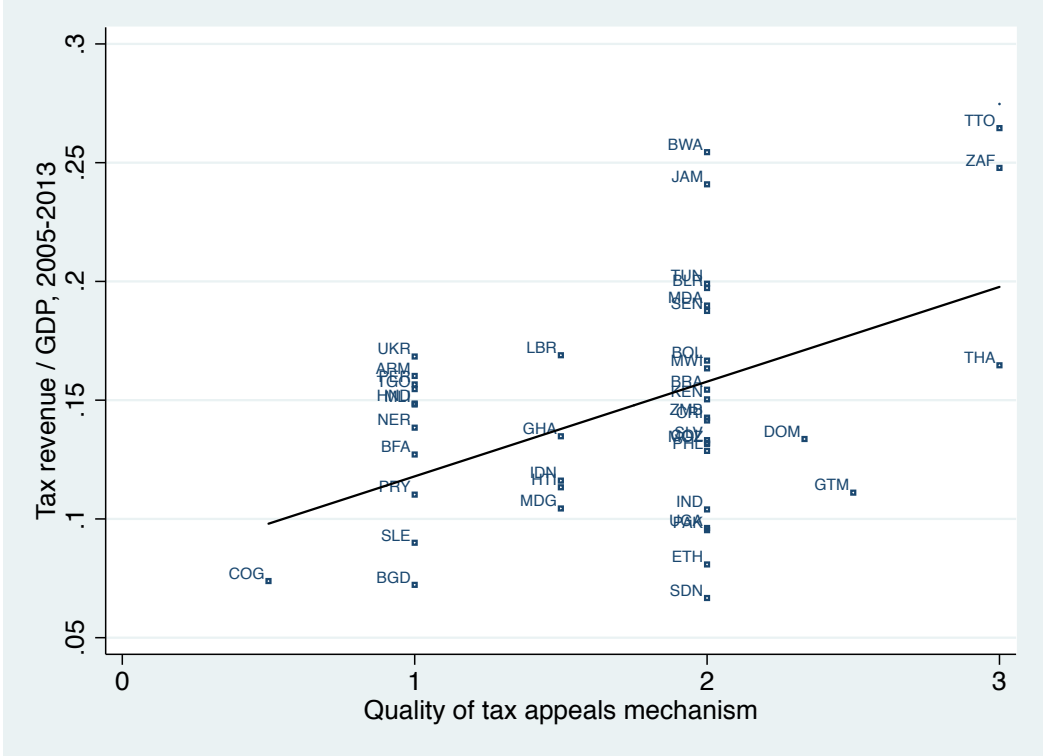
Source: PEFA (2006) and ICTD (2015); our calculations.

Figure 1c: The Relationship between *Quality of the Taxpayer Registration System* and Tax Revenues/GDP
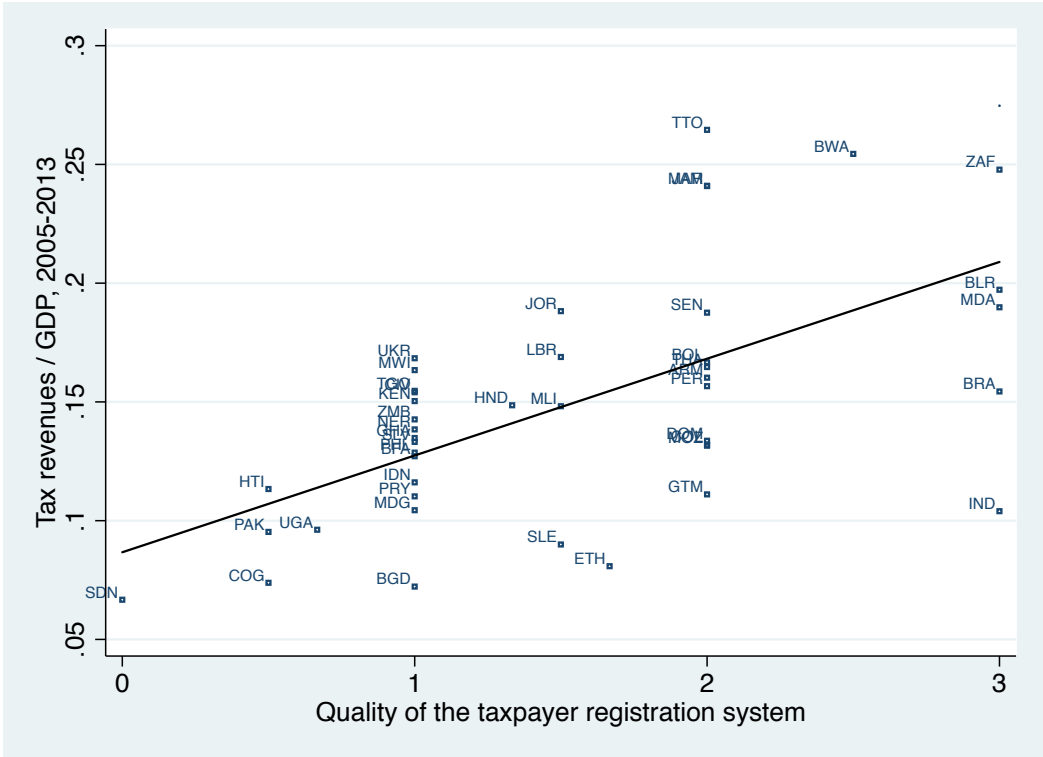
Figure 1d: The Relationship between *Effectiveness in Collection of Tax Arrears* and Tax Revenues/GDP
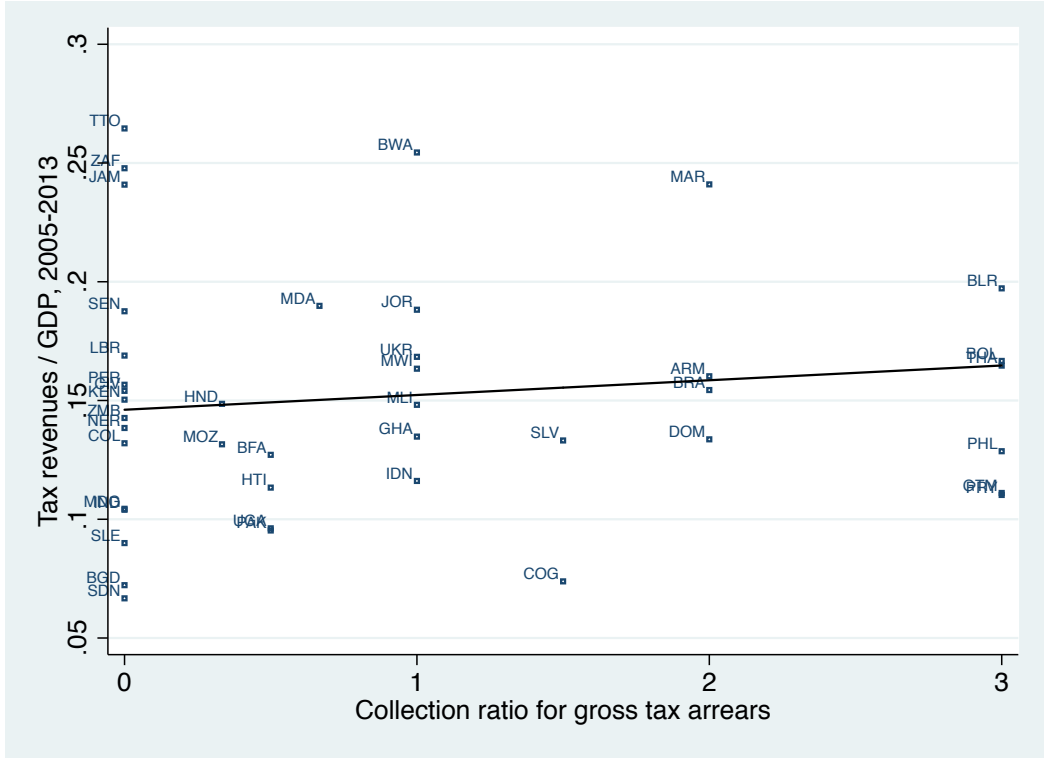
Figure 1e: The Relationship between *Effectiveness of Penalties for Non-compliance* and Tax Revenues/GDP
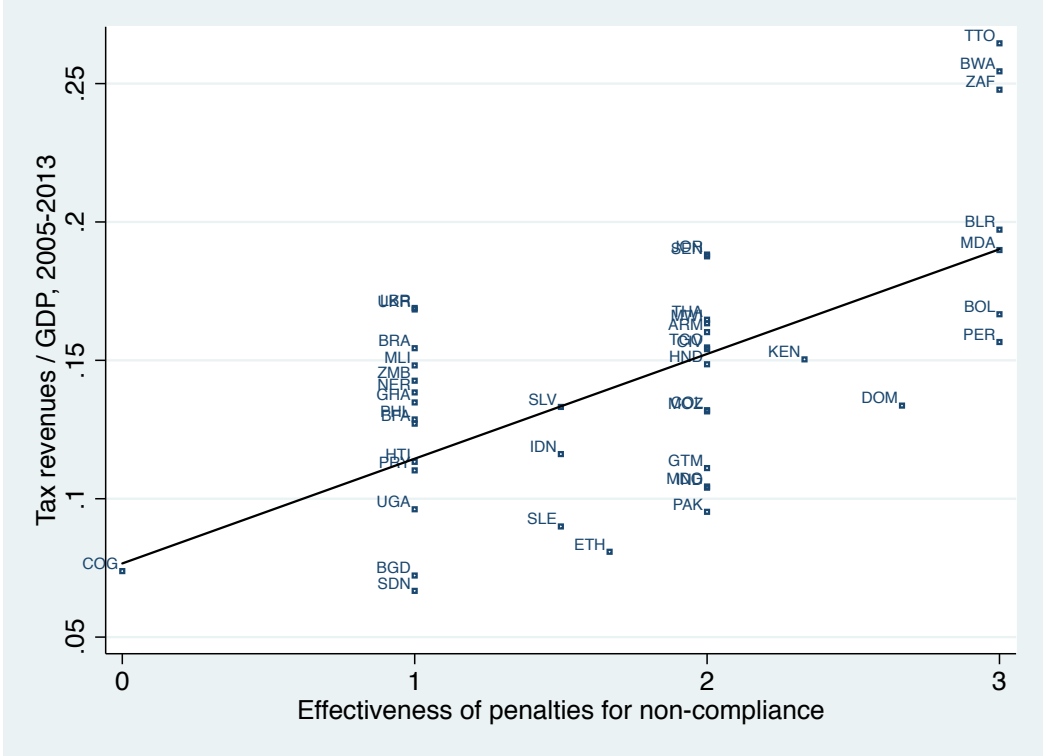
Figure 1f: The Relationship between *Effectiveness in Collection of Tax Payments* and Tax Revenues/GDP
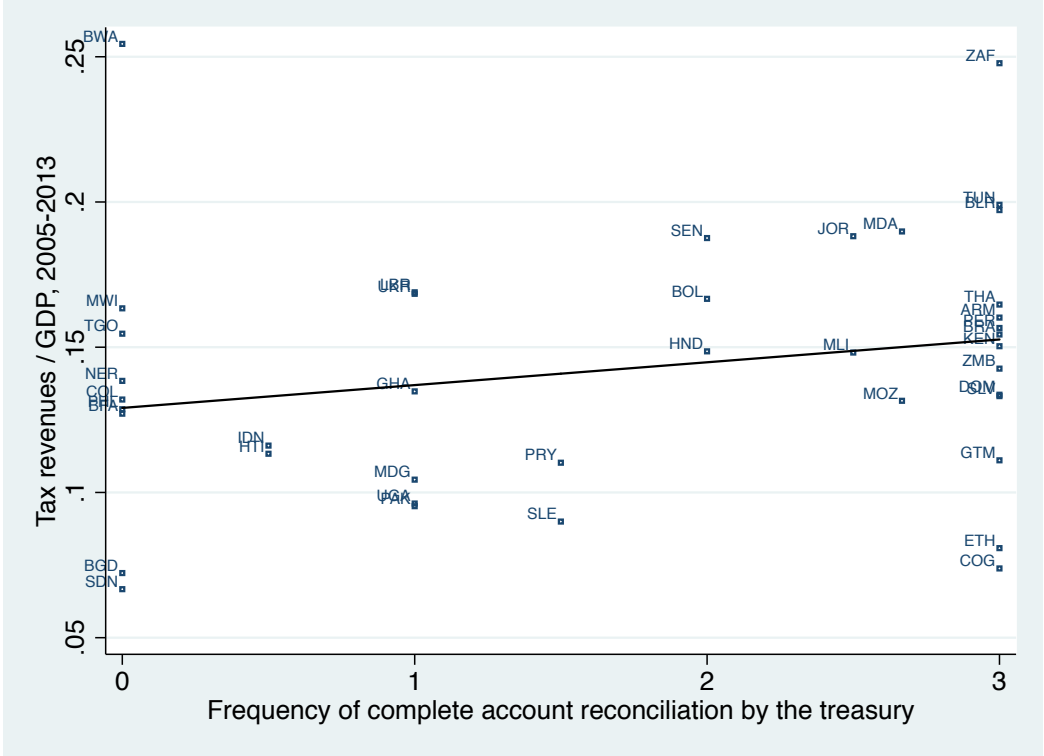
3. The Political Determinants of Fiscal Capacity

In the recent literature on the political economy of development, fiscal capacity is seen as a "pillar" of economic development as the expansion of the tax base allows states to invest in the public goods essential for economic development (Acemoglu 2005, Besley and Persson 2011). Cohesive political institutions, seen as stronger system of checks and balances on the executive, are believed to be one key ingredient to improve tax systems, so developing infrastructures that can raise taxes from a broad base. Where subject to effective checks and balances, incumbents will tend to promote common interests rather than using the state to retain power or redistribute to their own cronies (Besley and Persson 2009). Thus, it follows from this literature that placing limitations on the executive power are an essential condition to develop fiscally (and legally) capable states. However, this literature does not differentiate been different aspects of a taxation system, and in particular, the *impartiality* and *effectiveness* of a taxation system: this is important to understand how political institutions affect the ability to raise revenues. We argue below that the causal effect of political institutions (as captured by the degree of constraints on the executive) may have on fiscal capacity may differ, depending on whether the effect is on the *effectiveness* dimension of fiscal capacity or on the *impartiality* dimension of fiscal capacity. In particular, we argue that the causal effect of political institutions on the *impartiality* dimension of fiscal capacity is likely to be positive, while the causal effect of political institutions on the *effectiveness* dimension of fiscal capacity is ambiguous, with no clear relationship between the degree of constraint on the executive and the *effectiveness* of taxation systems.

We first discuss the relationship between the nature of constraints on the executive and the *effectiveness* of taxation systems. Consider two types of rulers: an autocrat, who is a "stationary bandit (that) has an encompassing interest in the territory he controls and

accordingly provides domestic order and other public goods" (Olson 1993, p. 569), and the other, a ruler in a democratic system, who may also have a similar interest in providing law and order, and other public goods. In an authoritarian system, with little checks and balances on the ruler's authority, "wherever the dictator has a sufficiently short time horizon, it is in his interest to confiscate the property of his subjects, to abrogate any contracts he has signed in borrowing money from them, and generally to ignore the long-run economic consequences of his choices" (ibid, p. 572). However, for the rational autocrat (who is interested in staying in power, as well as maximizing long-term income to mobilize tax revenues both to provide public goods to his own citizens and to extract some of the revenues for his personal benefit), there is a strong incentive to invest in the *effectiveness* of the taxation system. By doing so, the autocrat can maximize tax revenues for a given tax rate. For rulers in democratic systems, the median voter hypothesis suggests that there will be an additional incentive to invest in effective tax systems, so that the party in power can provide the public goods necessary for re-election. In this case, there is no reason to expect why executives that have limited checks on their authority may behave differently than executives with significant constraints on their power with respect to making taxation systems effective in collecting more revenues for the state. Therefore, the relationship between constraints on the executive and tax system *effectiveness* is ambiguous – authoritarian and democratic regimes are equally likely to invest in the *effectiveness* dimension of taxation systems.

What about the relationship between the degree of constraints on the executive and the *impartiality* dimension of taxation systems? Here, we may expect authoritarian regimes may behave differently than democratic systems. Fairness in taxation systems may be seen as part of a "fiscal contract" between the state and its citizens (Moore 2004). Transparency and accountability of taxation systems are about state-society relations, involving an exchange of

tax revenues for services.[8] Creating mechanisms of accountability and placing constraints on rulers facilitate the existence of a fiscal bargain, at the heart of the relationship between citizens and rulers. According to Levi (1988), it should reduce the transaction costs of taxing by making compliance "quasi voluntary" and by building "tax morale" (Doerrenberg and Peichl 2013; Luttmer and Singhal 2013). Citizens should be more willing to enter into a fiscal contract with the state, as they have more control over its actions and greater belief in its legitimacy (Bates and Lien 1985). Accountability and responsibility processes in tax systems "engage taxpayer-citizens collectively in politics and leads them to make claims on government for reciprocity, either through short-term conflict or long-term increases in political engagement" (Prichard 2010, p. 13). Such processes are more likely to emerge in cohesive political systems where there are significant constraints on the power of the executive, and where politicians have an incentive to signal the legitimacy of the state through making the tax system more transparent and non-discriminatory (Cheibub 1998). Furthermore, transparency in taxation systems is more likely to emerge in regimes where political elites are more constrained in their powers to evade taxes or bend tax rules in their favour (while in regimes with limited checks on the executive, elites face little constraints in avoiding taxes or in devising a non-transparent tax system that discriminates in their favour). This suggests that the Besley-Persson argument on the role of cohesive political systems in building fiscal capacity of the state applies more to the *impartiality* dimension of fiscal capacity rather than to its *effectiveness* dimension. We can re-state our argument on the

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[8] As Moore (2007, p. 26) argues, "taxation is always potentially coercive: state agents have authority to require citizens to hand over money, with no firm guarantee of reciprocity, in situations where they are perceived to have little or no choice". In states where rulers have low constraints on their power to coerce, it is less likely that political elites will have an interest in fostering the contractual and consensual basis of the fiscal contract between the state and the citizen, and state tax agencies will face relatively few constraints on how treat citizens in the tax contract. This raises the question: if dictators are revenue-maximizing actors, and if *impartiality* in the tax system leads to greater revenues, why are not dictators incentivized to adopt measures of transparency and accountability? There are two possible reasons why dictators may not prefer more *impartiality* in the tax system. Firstly, impartiality could threaten the dictator's interests in other ways by removing tools that he finds useful for maintaining power (Acemoglu and Robinson 2009). Secondly, greater transparency may reduce the ability of rulers to extract revenues for themselves (Shleifer and Vishny 1993)

differing role that political institutions play in augmenting the various dimensions of fiscal capacity, by means of two propositions:

Proposition 1: There is no clear relationship between the degree of constraints on the executive and the effectiveness dimension of fiscal capacity. The effect of the higher constraints on the executive on the effectiveness of a taxation system is ambiguous.

Proposition 2: There is a positive relationship between the degree of constraints on the executive and the impartiality dimension of fiscal capacity. The effect of the higher constraints on the executive on transparency/accountability dimension of taxation system is unambiguously positive.

Figure 2 provides some preliminary evidence on the positive relationship between the degree of constraints on the executive and the transparency/fairness dimension of fiscal capacity, in particular compared with the *effectiveness* dimension. There seems to be a stronger correlation of *constraints on the executive* with *impartiality* measures than with *effectiveness* measures. In the next section, we propose an empirical strategy that enables us to test the above hypotheses using cross-national cross-sectional data.

Figure 2a: The Relationship between *Transparency of taxpayer obligations and liabilities* and *Constraints on the Executive*
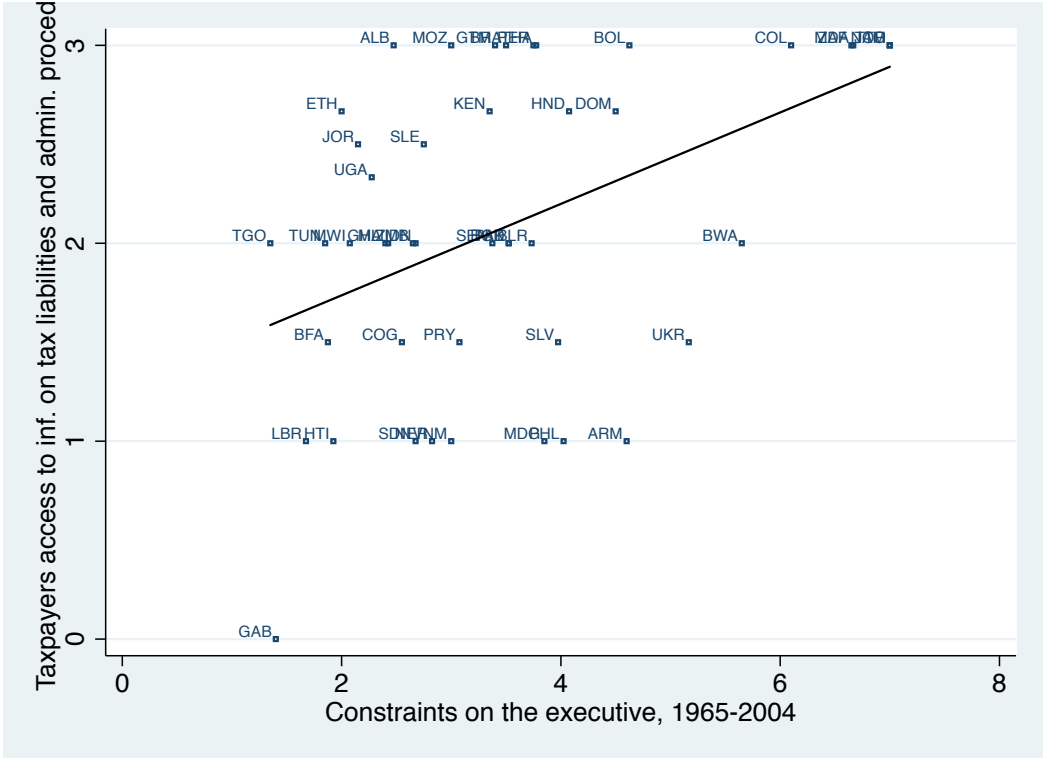
Source: PEFA (2006) and Polity IV (Marshall et al 2011); our calculations.

Figure 2b: The Relationship between *Quality of Tax Appeals Mechanism* and *Constraints on the Executive*
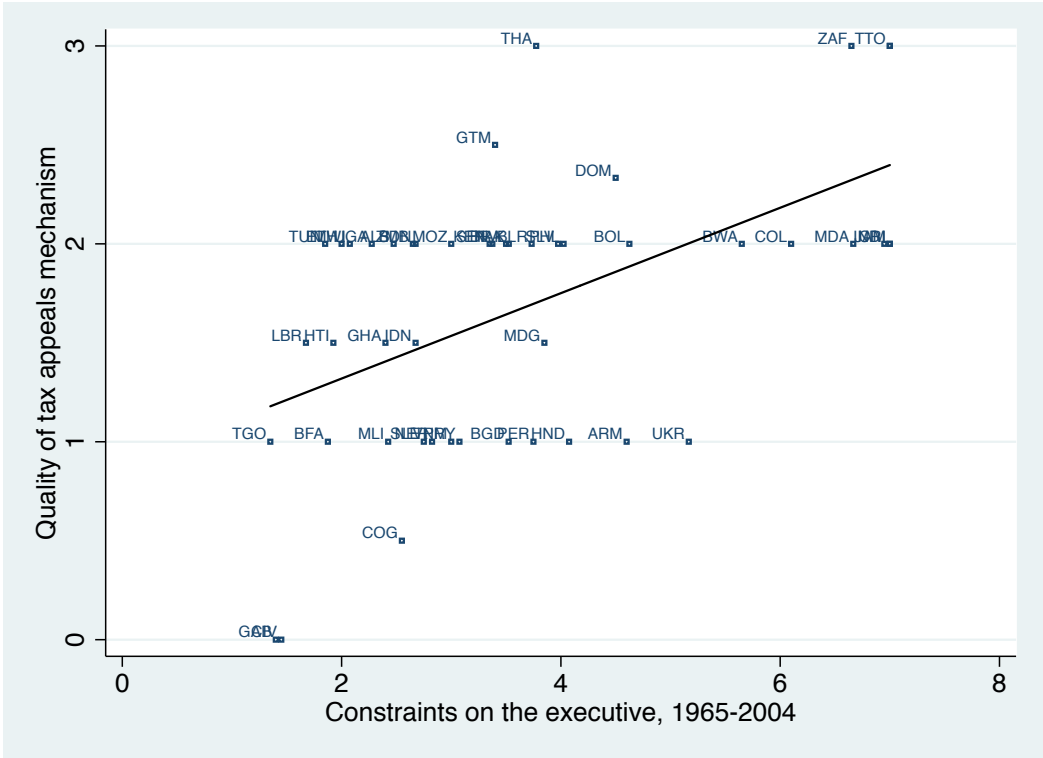
Source: PEFA (2006) and Polity IV (Marshall et al 2011); our calculations.

Figure 2c: The Relationship between *Quality of the Taxpayer Registration System* and *Constraints on the Executive*
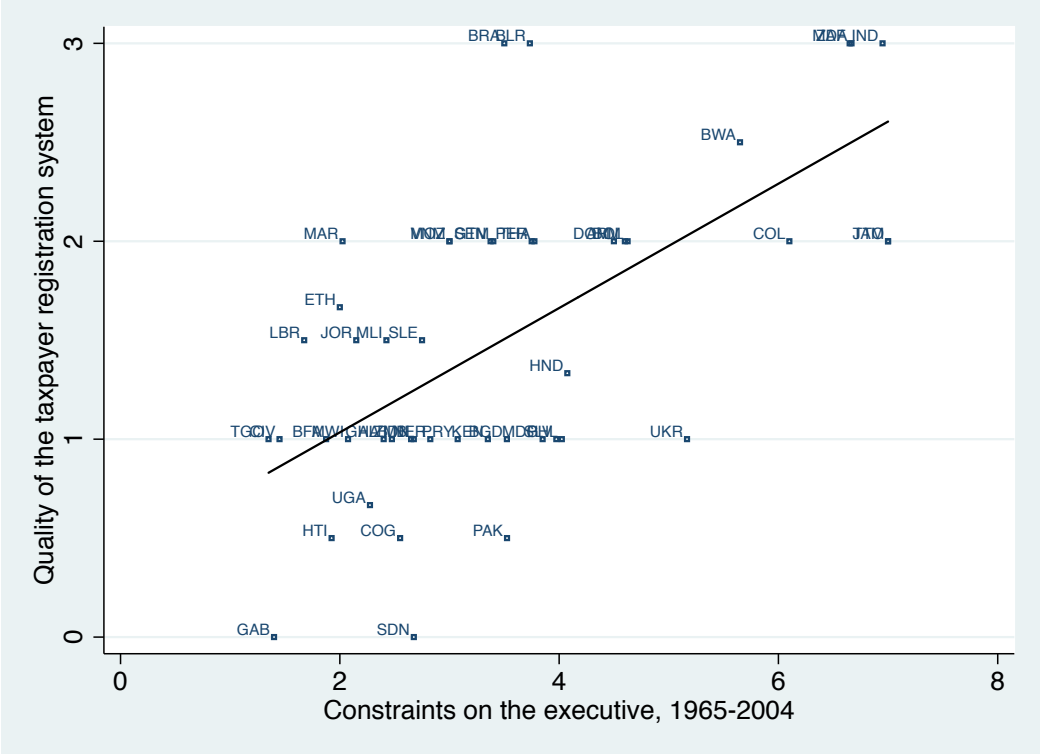
Source: PEFA (2006) and Polity IV (Marshall et al 2011); our calculations.

Figure 2d: The Relationship between *Effectiveness in Collection of Tax Arrears* and *Constraints on the Executive*
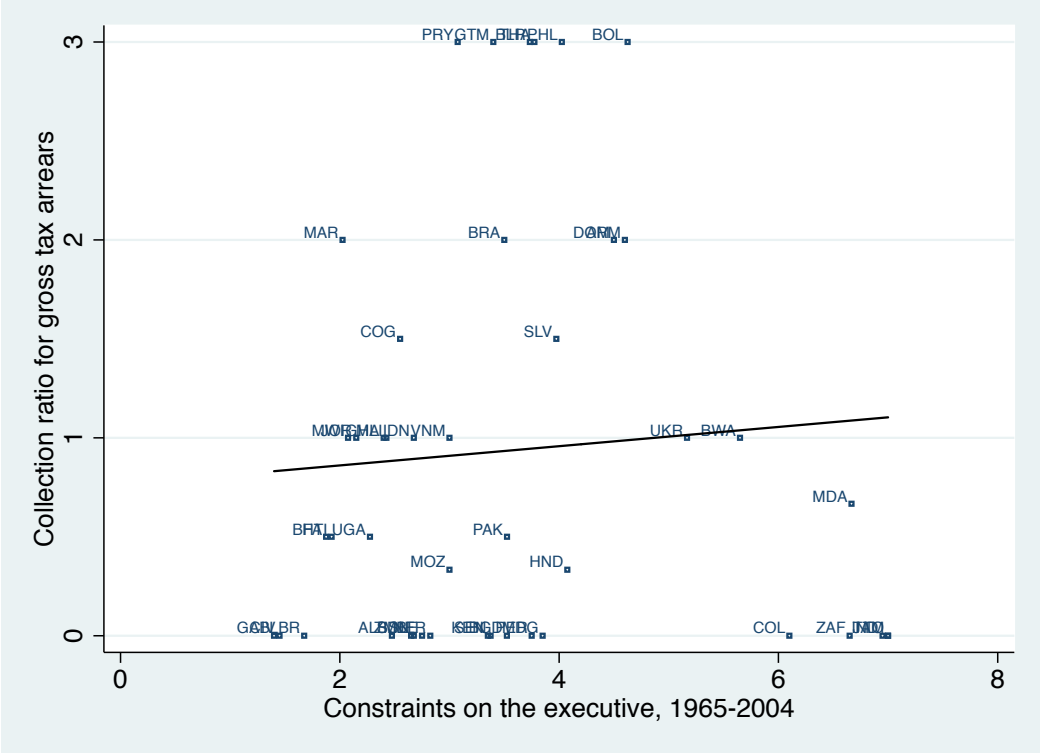
Source: PEFA (2006) and Polity IV (Marshall et al 2011); our calculations.

Figure 2e: The Relationship between *Effectiveness of Penalties for Non-compliance* and *Constraints on the Executive*

Source: PEFA (2006) and Polity IV (Marshall et al 2011); our calculations.

Figure 2f: The Relationship between *Effectiveness in Collection of Tax Payments* and *Constraints on the Executive*

Source: PEFA (2006) and Polity IV (Marshall et al 2011); our calculations.

4. Econometric methods and identification

Since the objective of the paper is to look at the structural conditions under which countries develop capable states, regressions based on cross-section averages are a suitable appr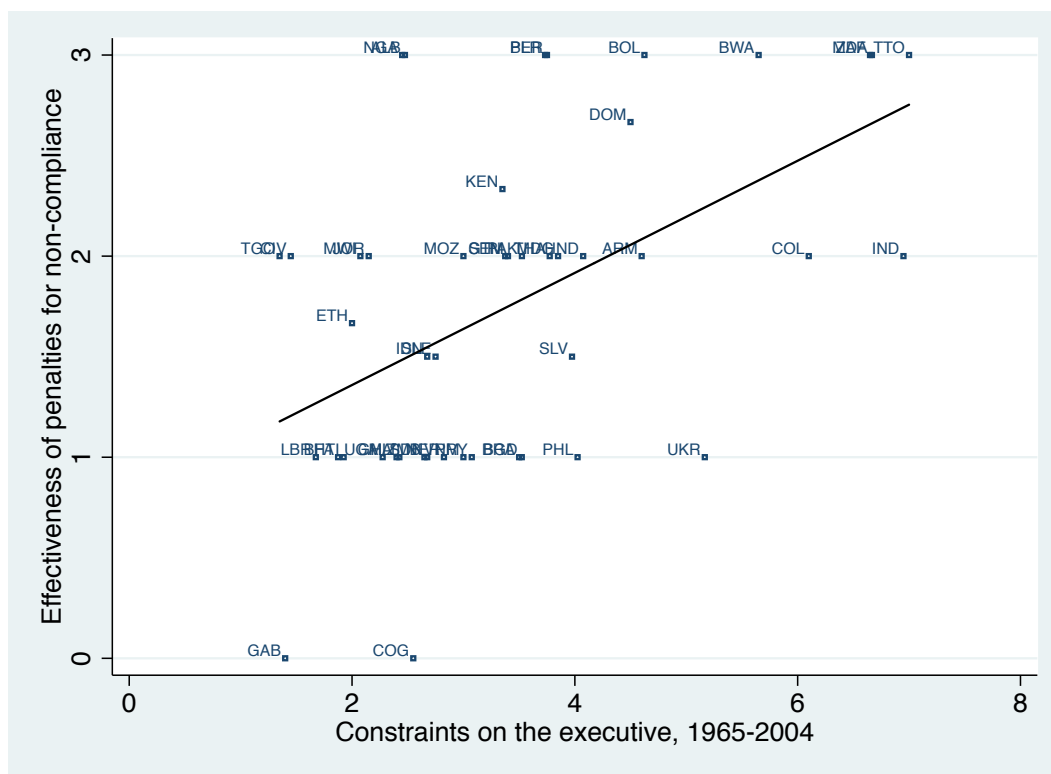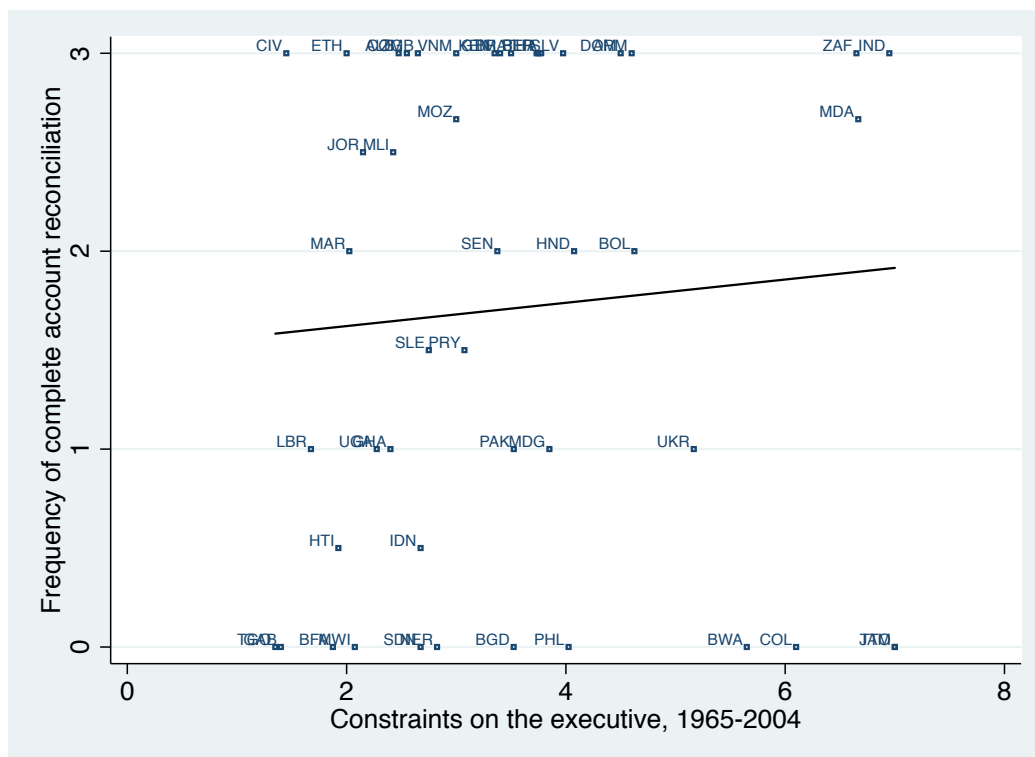oach as they test relationships whose mechanisms have long-run characteristics.[9] Hence, the regression specification takes the form:

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

where, $FC_{i,T,T-1}$ captures the quality of current fiscal institutions as the average of a given dimension of fiscal capacity of interest for country i between the end of the sample period, T, and $T-1$, captured here by the six PEFA indicators. Besley and Persson (2011) suggest that fiscal and legal capacities have common determinants and that investing in one dimension of state capacity simultaneously reinforces the other, i.e., there are complementarities. By extension, we apply this hypothesis to the different dimensions of fiscal capacity.

On the right-hand side, $W_{i,t,t-1}$ is the determinant of fiscal capacity of interest, averaged between times t and $t-1$, with $t<T-1$, and β represents its long-run effect on fiscal 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). This variable

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[9] While a panel analysis may be in principle desirable, it is neither feasible nor fruitful in practice. The potential consequence of a cross-section approach, 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. This would support the case for complementing the evidence from cross-section regressions 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. In practice, this is unlikely to yield any gain, as the relationships under scrutiny are fairly stable (both the dependent and the explanatory variables evolve slowly over time), or be infeasible, given the available observations. In particular, our PEFA variables ranges only from 2005 to 2013 and have a T-bar of 1.5, as well as exhibiting very little variation within countries (they have a standard deviation within countries which is substantively smaller than half the standard deviation across countries, only in two cases reaches half the standard deviation across countries). Hence, even when feasible, methods that remove the effects of time invariant factors also remove most of the variation one wants to explain. The scope for a panel approach becomes substantial only if one could obtain a panel covering a fairly extensive period of time.

measures the extent of constitutional limits on the exercise of arbitrary power by the executive, i.e., whether the executive power is subject to institutionalized checks and balances (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). Similarly, $X_{i,t,t-1}$ is a set of controls (described in the appendix and discussed in the results section). Finally, $\varepsilon_{i,t,t-1}$ is the error, capturing all other omitted factors.

Before estimating (1), we should discuss whether estimating the impact of political institutions is subject to identification problems. Although there are good reasons to expect a causal relationship between rulers' accountability and fiscal capacity development, 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. A concern is also that the effect of political systems may be endogenous 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 approach, presenting estimates from different methods.

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 ex colonies. Where European colonizers 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. This instrument was carefully justified and, perhaps for this reason, has proved to be resilient to criticism, which came on the grounds of data quality and associated historical records (e.g., Albouy 2012). Since it was proposed, it has been successfully exploited to identify the effect of the *constraints on the executive* variable (e.g., Acemoglu et al 2002, 2003).[10] Of course, the exclusion restriction that the instrument does not affect the second stage left-hand-side is always one of the most vulnerable parts of any IV identification strategy. So, while we rely on Acemoglu et al's (2001) intuition on the plausibility 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.

5. Results

This section presents the results, in three steps. We first illustrate the basic results. Then we present a series of robustness checks: for omitted variables, and instrument weakness and validity. Finally, we show evidence on the channels through which the political institutions hypothesis may affect fiscal capacity.

5.1 Basic results and robustness checks for omitted variables

With these preliminaries, we begin to assess the validity of the political institutions hypothesis, using the log of *settlers' mortality* as an instrument for *constraints on the*

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[10] Appendix 2 provides a detailed discussion of the explanatory variables and the data sources for these variables, while Appendix 3 provides the list of countries used in the regression analysis.

executive. Table 2 shows that *constraints on the executive* predict a higher level of fiscal capacity in all three of its organizational aspects related to the *impartiality* of taxation power (panel a) and in two aspects of its *effectiveness* (panel b). The magnitude of the effects is higher in instrumental variables than in OLS estimates, suggesting that the causal effect of *constraints on the executive* is actually understated by the OLS relationship. Constraints on the executive are, however, irrelevant when it comes to predicting the level of *collection ratio for gross tax arrears* and *effectiveness of penalties for non-compliance.*

Table 2: Basic results for fiscal capacity and constraints on the executive: OLS and Instrumental Variables (TSLS)

Panel (a) – *Impartiality* of taxation power

Dependent variable:	Transparency of taxpayer obligations and liabilities		Tax appeals mechanism		Controls in the taxpayer registration system	
Estimator:	OLS	TSLS	OLS	TSLS	OLS	TSLS
Constraints on the executive	0.264***	0.364**	0.242***	0.440***	0.301***	0.376***
	(0.057)	(0.136)	(0.057)	(0.109)	(0.046)	(0.091)
Constant	1.149***	0.824*	0.702***	0.049	0.374**	0.128
	(0.257)	(0.469)	(0.241)	(0.356)	(0.184)	(0.281)
F-stat	21.447***	7.173**	17.856***	16.166***	42.977***	16.944***
1st-stage F		9.913		11.806		13.119
R-Sq.	0.281	0.240	0.305	0.101	0.443	0.416
Adj. R-Sq.	0.262	0.221	0.288	0.079	0.429	0.402
Obs.	40	40	42	42	42	42
RMSE	0.686	0.704	0.624	0.709	0.576	0.589

Panel (b) – *Effectiveness* of taxation power

Dependent variable:	Effectiveness in collection of tax arrears		Effectiveness of penalties for non-compliance		Effectiveness in collection of tax payments	
Estimator:	OLS	TSLS	OLS	TSLS	OLS	TSLS
Constraints on the executive	0.076	0.279	0.232***	0.191	0.347***	0.471**
	(0.104)	(0.173)	(0.068)	(0.135)	(0.080)	(0.215)
Constant	0.450	-0.251	0.903***	1.034**	0.652*	0.268
	(0.336)	(0.505)	(0.275)	(0.478)	(0.379)	(0.706)
F-stat	0.537	2.593	11.718***	2.022	19.049***	4.809**
1st-stage F		12.608		13.313		10.475
R-Sq.	0.016	-0.099	0.212	0.206	0.193	0.168
Adj. R-Sq.	-0.010	-0.129	0.192	0.185	0.172	0.147
Obs.	39	39	41	41	41	41
RMSE	1.005	1.062	0.720	0.723	1.110	1.127

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

How much do *Constraints on the executive* matter as a determinant of fiscal capacity? A one standard deviation increase in the index (1.5 points) increases *Transparency of taxpayer obligations and liabilities* by over 0.7 standard deviations, quality of a tax appeals mechanism by 1 standard deviations, and quality of the taxpayer registration system by over 0.8 standard deviations (Table 3). The amount by which *Constraints on the executive* foster fiscal capacity

is economically meaningful as well as statistically significant. However, the magnitudes of the effects are smaller for the other three variables capturing *effectiveness* aspects (and not always significant).

Table 3: Magnitude of effect on fiscal capacity of change in *constraints on the executive*

Dependent variable:	Coefficient on *constraints on the executive* in TSLS regression	Change in dependent variable in response to 1 standard deviation change in *constraints on the executive*	Ratio to 1 standard deviation dependent variable
Transparency of taxpayer obligations and liabilities	0.364	0.582	0.730
Tax appeals mechanism	0.440	0.742	1.004
Controls in the taxpayer registration system	0.376	0.633	0.831
Effectiveness in collection of tax arrears	0.279	0.468	0.468
Effectiveness of penalties for non-compliance	0.191	0.305	0.380
Effectiveness in collection of tax payments	0.471	0.727	0.596

Source: our estimates.

Tables 4 and 5 expand on the basic results by adding a series of robustness 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. The approach here is to control for each of these five determinants, in turn, taking each one as exogenous, while continuing to run an IV regression of fiscal capacity on our *constraints on the executive* measure with the log of *settlers' mortality* rate as an instrument.

In line with a tradition of long-run theory of state formation (e.g., Tilly 1990), Besley and Persson (2009, 2011) argue that, in a society where groups compete for power, the incidence of external wars supports the demand for common-interest public goods (i.e., defense) that, in turn, increases the incentive to invest in fiscal (and legal) capacity. Vice versa, the incidence of civil wars promotes redistributive interests, reducing the incentive to invest in state capacity. To capture the historical relevance of external and internal conflicts, we use the

proportion of years at war from independence up to 2000 and the proportion of years in civil war over 1950-2000. Both variables are from Besley and Persson (2011). Introducing such variables also leaves the significance of *constraints on the executive* unchanged with respect to variables on the *impartiality* of taxation powers. In fact, the magnitude of the *constraints on the executive* effect even increases in some cases, showing that the political institutions hypothesis survives when compared to the alternative conflict hypotheses (Table 4). Interestingly, the incidence of external conflict wipes out its significance for one of dependent variables relating to the *effectiveness* of taxation powers, showing that the coefficient of interest may be picking the effect of another common interest mechanism due to the need of a public good like national defense (Table 5).

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.[11] In this case, the coefficient on *constraints on the executive* drops slightly, when controlling for length of statehood, for our dependent variables relating to the *impartiality* of taxation powers, but it is still highly significant.

Economies where a substantial part of national income accrues from natural resources, and to the extent that such resources flows accrue directly to the government, have less incentive to invest in fiscal capacity. For example, Isham et al (2004) argue that countries rich in resources extracted from a narrow geographic or economic base are predisposed to heightened economic and social divisions and have weakened institutional capacity. To capture such

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[11] 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.

effect, 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). Similarly, inspired by Herbst (2000), it is organizationally more challenging to develop taxation infrastructures in sparsely populated states than in states where the population is concentrated in urban areas. To capture this effect, we use the share of urban population from World Bank (2013). 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. They survive indeed in the case dependent variables relating to the *impartiality* of taxation powers, as such controls do not greatly affect the significance and magnitude of the coefficient of interest.

Table 4: Robustness checks: effect of *constraints on the executive* on *impartiality* of taxation controlling for omitted variables

Dependent variable: *Transparency of taxpayer obligations and liabilities*

Estimator:	TSLS	TSLS	TSLS	TSLS	TSLS	TSLS
Constr. on the executive	0.364**	0.297**	0.327**	0.308***	0.392**	0.349**
	(0.136)	(0.113)	(0.150)	(0.106)	(0.180)	(0.136)
Length of statehood		0.005				
		(0.005)				
Inciden. of external conflict			2.541			
			(6.231)			
Inciden. of internal conflict				0.585		
				(0.441)		
% urban population					-0.004	
					(0.010)	
Tot. resource rents						-0.014
						(0.011)
Constant	0.824*	0.552	0.907*	0.906**	0.854*	0.973*
	(0.469)	(0.567)	(0.486)	(0.401)	(0.463)	(0.488)
F-stat	7.173**	4.458**	3.923**	4.628**	3.485**	4.515**
1st-stage F	9.913	10.221	6.849	12.774	6.024	9.326
R-Sq.	0.240	0.312	0.270	0.306	0.222	0.276
Obs.	40	40	40	40	40	40
RMSE	0.704	0.679	0.700	0.683	0.723	0.697

Dependent variable: *Tax appeals mechanisms*

Constr. on the executive	0.440***	0.401***	0.476***	0.383***	0.535***	0.428***
	(0.109)	(0.109)	(0.141)	(0.099)	(0.141)	(0.111)
Length of statehood		0.003				
		(0.004)				
Inciden. of external conflict			-2.455			
			(4.266)			
Inciden. of internal conflict				0.480		
				(0.451)		
% urban population					-0.015	
					(0.009)	
Tot. resource rents						-0.017***
						(0.005)
Constant	0.049	-0.100	-0.033	0.148	0.237	0.210
	(0.356)	(0.396)	(0.402)	(0.320)	(0.362)	(0.374)
F-stat	16.166***	8.938***	7.044***	9.769***	7.424***	16.077***
1st-stage F	11.806	10.993	7.745	13.177	7.676	11.290
R-Sq.	0.101	0.186	0.027	0.230	-0.010	0.166
Obs.	42	42	42	42	42	42
RMSE	0.709	0.684	0.747	0.665	0.761	0.692

Dependent variable: *Controls in the taxpayer registration system*

Constr. on the executive	0.376***	0.320***	0.200**	0.339***	0.352***	0.359***
	(0.091)	(0.082)	(0.091)	(0.092)	(0.112)	(0.088)
Length of statehood		0.005*				
		(0.003)				
Inciden. of external conflict			12.558***			
			(3.336)			
Inciden. of internal conflict				0.340		
				(0.382)		
% urban population					0.005	
					(0.008)	
Tot. resource rents						-0.018***
						(0.005)
Constant	0.128	-0.186	0.506*	0.184	0.064	0.310
	(0.281)	(0.395)	(0.272)	(0.276)	(0.278)	(0.271)
F-stat	16.944***	8.307***	15.674***	9.049***	9.646***	13.695***
1st-stage F	13.119	14.521	10.776	16.577	8.843	12.383
R-Sq.	0.416	0.481	0.564	0.450	0.441	0.472
Obs.	42	42	42	42	42	42
RMSE	0.589	0.563	0.516	0.580	0.584	0.568

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

Table 5: Robustness checks: effect of *constraints on the executive* on *effectiveness* of taxation controlling for omitted variables

Dependent variable: *Effectiveness in collection of tax arrears*

Estimator:	TSLS	TSLS	TSLS	TSLS	TSLS	TSLS
Constr. on the executive	0.279	0.109	0.083	0.304*	0.149	0.275
	(0.173)	(0.119)	(0.141)	(0.174)	(0.160)	(0.175)
Length of statehood		0.018***				
		(0.005)				
Inciden. of external conflict			19.919***			
			(6.761)			
Inciden. of internal conflict				-0.327		
				(0.807)		
% urban population					0.022**	
					(0.010)	
Tot. resource rents						-0.003
						(0.019)
Constant	-0.251	-1.308**	0.140	-0.282	-0.532	-0.215
	(0.505)	(0.637)	(0.430)	(0.503)	(0.502)	(0.533)
F-stat	2.593	5.942***	5.046**	1.551	3.432**	1.276
1st-stage F	12.608	11.222	11.917	13.249	8.591	11.863
R-Sq.	-0.099	0.245	0.235	-0.123	0.136	-0.094
Obs.	39	39	39	39	39	39
RMSE	1.062	0.893	0.898	1.089	0.955	1.075

Dependent variable: *Effectiveness of penalties for non-compliance*

	TSLS	TSLS	TSLS	TSLS	TSLS	TSLS
Constr. on the executive	0.191	0.156	0.190	0.182	0.211	0.166
	(0.135)	(0.140)	(0.155)	(0.141)	(0.159)	(0.136)
Length of statehood		0.004				
		(0.004)				
Inciden. of external conflict			0.115			
			(5.668)			
Inciden. of internal conflict				0.085		
				(0.334)		
% urban population					-0.004	
					(0.010)	
Tot. resource rents						-0.011
						(0.019)
Constant	1.034**	0.798	1.037**	1.046**	1.098**	1.198**
	(0.478)	(0.568)	(0.512)	(0.483)	(0.458)	(0.459)
F-stat	2.022	1.268	0.987	1.029	0.956	0.815
1st-stage F	13.313	13.284	8.782	15.066	9.865	11.954
R-Sq.	0.206	0.207	0.205	0.203	0.218	0.212
Obs.	41	41	41	41	41	41
RMSE	0.723	0.732	0.732	0.733	0.727	0.730

Dependent variable: *Effectiveness in collection of tax payments*

	TSLS	TSLS	TSLS	TSLS	TSLS	TSLS
Constr. on the executive	0.471**	0.343*	0.259	0.427**	0.369	0.488**
	(0.215)	(0.201)	(0.229)	(0.192)	(0.284)	(0.236)
Length of statehood		0.011*				
		(0.006)				
Inciden. Of external conflict			14.197**			
			(5.550)			
Inciden. Of internal conflict				0.426		
				(0.771)		
% urban population					0.016	
					(0.017)	
Tot. resource rents						0.012
						(0.026)
Constant	0.268	-0.348	0.698	0.328	0.064	0.137
	(0.706)	(0.746)	(0.702)	(0.666)	(0.649)	(0.859)
F-stat	4.809**	4.376**	7.044***	2.590*	5.545***	2.327
1st-stage F	10.475	9.942	7.434	12.737	7.504	10.200
R-Sq.	0.168	0.255	0.268	0.190	0.240	0.168
Obs.	41	41	41	41	41	41
RMSE	1.127	1.081	1.071	1.127	1.091	1.142

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

In further robustness checks for omitted variables, not reported here (but available on request), we experiment with a number of other factors that potentially may still affect fiscal capacity. Drawing on the literature on the determinants of economic institutions, we bring into the analysis the legal origins hypothesis, the impact of aid-dependency, and the role of social divisions. La Porta et al (1999) have argued that developing 'good' governance relates systematically to legal origins. Anglo-Saxon common law legal systems, in particular – which spread through colonization, conquest and cultural influence – historically developed to deliver better protection of property rights, and a more limited, efficient state than civil law systems. The aid-dependency argument maintains that countries receiving greater amounts of foreign aid tend to have less administrative capacity and lower tax effort, as the elite may have less incentive to reform the state apparatus, although the econometric findings regarding the such negative effect of aid do not seem to be robust (Morrissey 2015). Social divisions along ethnic, linguistic and religious lines is associated with less efficient states as the group in power tends to engage in patronage spending and decrease the production of public goods (e.g., Alesina et al 2003). Similarly, a line of research argues that historical economic inequality may lead to oligarchic rather than democratic institutions (e.g., Engerman and Sokoloff 2000) and weak states (Acemoglu et al 2011).

La Porta et al (1999) provide legal origins dummies (French, British, Socialist, German and Scandinavian legal families). To capture social divisions, we use the ethnic fractionalization measure taken from Alesina et al (2003) and the Gini index (1965-2004 average, market income), adjusted for comparability, from Solt (2011). As a proxy for aid-dependency, we exploit the 1965-2004 average per capita aid from World Bank (2013). In addition, to capture unobserved regional effects, we introduced regional dummies for Asia, Sub-Saharan Africa,

Middle-East and North Africa, Latin America and Transition economies (World Bank 2013). Introducing each variable in our regressions also leaves the significance of *constraints on the executive* unchanged at the conventional levels. In fact, the magnitude of the *constraints on the executive* effect even increases in some cases, showing that the political economy hypothesis survives when compared to the alternative hypotheses.

5.2 Accounting for instrument weakness

The next step is to assess whether our instrument is weak. The first stage regressions generally show a highly significant relationship between the log of *settlers' mortality* and the measure of constraints on the executive. The F-statistics for the first stage regressions are usually above the critical values identified by Stock and Yogo (2005) as indicating a problem with weak instruments. And often they are also above the earlier rule of thumb suggested by Staiger and Stock (1997): that the F-statistic in the first stage regression exceeds 10. While this indicates that our instrument is usually strong across specifications, such checks are not always satisfactory: first-stage F-statistics are borderline or a little weak in some regressions.[12]

If our instrument is weak, 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, which is our case. As a remedy, there is general agreement in the literature to use Limited Information Maximum Likelihood (LIML) estimation (see Stock and Yogo (2005) and Cameron and Trivedi (2005), pp.190-192). Therefore, to account for potential instrument weakness, we re-estimate our regressions using Fuller's version of LIML (Fuller 1977; Baum

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[12] The 5 percent significance level Stock-Yogo critical values of the weak instruments test statistic are 16.38, for tests of 10 percent maximal relative bias, and 8.96, for the test of 15 percent maximal relative bias. 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.

et al 2007), which 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 than LIML. 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 6 – Accounting for instrument weakness: Fuller's Limited Information Maximum Likelihood estimates

Estimator:	OLS	LIML	LIML	LIML	LIML	LIML	LIML	LIML
Panel (a): *Transparency of taxpayer obligations and liabilities*								
Con. on the executive	0.264***	0.332***	0.286***	0.298***	0.296***	0.338***	0.318***	0.250***
	(0.057)	(0.098)	(0.086)	(0.101)	(0.082)	(0.114)	(0.097)	(0.091)
Panel (b): *Tax appeals mechanisms*								
Con. on the executive	0.242***	0.378***	0.348***	0.385***	0.337***	0.435***	0.367***	0.369***
	(0.057)	(0.080)	(0.082)	(0.088)	(0.073)	(0.090)	(0.081)	(0.093)
Panel (c): *Controls in the taxpayer registration system*								
Con. on the executive	0.301***	0.356***	0.316***	0.220***	0.328***	0.328***	0.341***	0.193**
	(0.046)	(0.073)	(0.068)	(0.070)	(0.075)	(0.085)	(0.070)	(0.073)
Panel (d): *Effectiveness in collection of tax arrears*								
Con. on the executive	0.076	0.218*	0.095	0.079	0.236*	0.098	0.212	0.019
	(0.104)	(0.128)	(0.093)	(0.113)	(0.129)	(0.112)	(0.127)	(0.086)
Panel (e): *Effectiveness of penalties for non-compliance*								
Con. on the executive	0.232***	0.202*	0.174	0.204*	0.195	0.222*	0.182	0.193
	(0.068)	(0.112)	(0.116)	(0.119)	(0.116)	(0.126)	(0.111)	(0.135)
Panel (f): *Effectiveness in collection of tax payments*								
Con. on the executive	0.347***	0.437**	0.339**	0.269	0.405**	0.336	0.449**	0.121
	(0.080)	(0.169)	(0.161)	(0.174)	(0.156)	(0.210)	(0.181)	(0.225)
Controls:	No	No	Length of statehood	External conflict	Internal conflict	Urban population	Resource rents	All five

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

Fuller's LIML estimates, since they are broadly comparable to TSLS estimates, seem to confirm the previous set of results (Table 6). In particular, the effect of constraints on the executive does not seem to be robust for variables capturing the *effectiveness* aspects of taxation power. It is noteworthy that, in line with TSLS estimates, for such variables the coefficient of interest drops in magnitude and looses significance once we control for external conflict, suggesting that it was picking the effect of another type of common interest mechanism, not due to political cohesiveness, but to the emergence of a common interest consisting in the national defense.

5.3 The exclusion restriction

Apart from a priori intuition, the other way to support the exclusion restriction is based on

econometric testing, i.e., running a test of overidentification. 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, we now need an alternative instrument for *constraints on the executive* to run the test. Following Acemoglu et al (2001), we choose distance from the equator (i.e., latitude). For such variable to be valid here, its effects on fiscal capacity also must go through political institutions rather than through any other mechanism. This is potentially problematic, but it is consistent with most arguments in the literature stressing that geography affects development outcomes through political institutions, rather than directly, as rich elite adopt extractive institutions in tropical areas.

Table 7 – Accounting for instrument validity: overidentification tests in LIML regressions of fiscal capacity on constraints on the executive with *distance from the equator* as an instrument in addition to *settlers' mortality*

Dep. Variable:	*Transparency of taxpayer obligations and liabilities*	*Tax appeals mechanisms*	*Controls in the taxpayer registration system*	*Effectiveness in collection of tax arrears*	*Effectiveness of penalties for non-compliance*	*Effectiveness in collection of tax payments*
Constraints on the executive	0.353***	0.387***	0.365***	0.209	0.191*	0.436**
	(0.120)	(0.084)	(0.076)	(0.127)	(0.108)	(0.174)
Constant	0.860**	0.224	0.162	-0.009	1.035***	0.377
	(0.418)	(0.282)	(0.233)	(0.361)	(0.408)	(0.585)
Hansen J statistic (p-value):	0.104	0.374	0.444	0.570	0.592	0.465

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

The results of the overidentification tests are reported in Table 7. For each dependent variable, we rerun the LIML estimates from column 2 in table 6 of the 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 6. 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 five out of six regressions. Hence, this exercise provides no evidence that the sanitary conditions, as captured by *settlers' mortality*, affect fiscal capacity by any other channel than through political institutions.

5.4 Why does limiting executive power matter to fiscal capacity?

Our findings indicate that political institutions limiting the executive power tend to improve the transparency and accountability of fiscal systems. However, nothing has been done hitherto on identifying the specific channels of causation. This is an interesting task that also deserves careful study. We make a first pass here by considering three channels: (a) rulers subject to checks an balances are more likely to recruit an effective and independent bureaucracy, rather than on the basis of patron-and-client ties; (b) political systems with an effective separation of powers enhance transparency in public processes, hence promoting the integrity of civil servants; and (c) political systems with an effective system of checks and balances follow the rule of law, hence the judicial system may be more effective against any breach of tax laws or abuse in tax levy. These are to some extent overlapping mechanisms, and it may be too much to expect the data to deliver a clear quantitative appreciation for each them. This caveat notwithstanding, the evidence seems to suggest that each explanation may be at work.

Table 8 – Tests of three possible channels of causation from limited executive power to fiscal capacity

Panel (a): *Transparency of taxpayer obligations and liabilities*

	1	2	3	4	5	6
Rule of law	1.053	0.445				
	(0.650)	(0.573)				
Constraints on the executive		0.217***		0.173**		0.185***
		(0.059)		(0.079)		(0.060)
Bureaucratic quality			1.437***	0.805		
			(0.485)	(0.614)		
Corruption in government					2.084**	1.481*
					(0.811)	(0.820)
Constant	0.964*	0.679	1.124***	0.815*	0.896*	0.555
	(0.543)	(0.541)	(0.414)	(0.469)	(0.483)	(0.511)
F-stat	1.903	3.889***	5.875***	5.232***	2.609**	3.596***
Adj. R-Sq.	0.005	0.152	0.116	0.181	0.116	0.216
Obs.	45	45	45	45	45	45
RMSE	0.789	0.729	0.744	0.716	0.744	0.701

Panel (b): *Tax appeals mechanisms*

	1	2	3	4	5	6
Rule of law	1.515**	0.740				
	(0.606)	(0.612)				
Constraints on the executive		0.201***		0.180**		0.176**
		(0.068)		(0.083)		(0.067)
Bureaucratic quality			1.349***	0.618		
			(0.477)	(0.580)		
Corruption in government					2.155***	1.419**
					(0.544)	(0.552)
Constant	0.527	0.378	0.928***	0.644*	0.720*	0.435
	(0.510)	(0.457)	(0.319)	(0.356)	(0.366)	(0.357)
F-stat	2.881**	3.868***	3.197**	3.240***	4.825***	4.983***
Adj. R-Sq.	0.107	0.289	0.180	0.293	0.211	0.347
Obs.	47	47	47	47	47	47
RMSE	0.662	0.591	0.634	0.589	0.622	0.566

Panel (c): *Controls in the taxpayer registration system*

	1	2	3	4	5	6
Rule of law	2.097***	1.362***				
	(0.583)	(0.384)				
Constraints on the executive		0.233***		0.240***		0.229***
		(0.036)		(0.054)		(0.045)
Bureaucratic quality			1.340**	0.424		
			(0.537)	(0.543)		
Corruption in government					2.334***	1.607**
					(0.657)	(0.603)
Constant	0.052	-0.224	0.800*	0.386	0.499	0.051
	(0.391)	(0.341)	(0.435)	(0.381)	(0.454)	(0.373)
F-stat	6.700***	12.979***	5.038***	8.655***	6.871***	11.967***
Adj. R-Sq.	0.302	0.503	0.285	0.452	0.327	0.522
Obs.	47	47	47	47	47	47
RMSE	0.667	0.563	0.675	0.591	0.655	0.552

All regressions are estimated by OLS and controlling for incidence of external an internal conflict, share of urban population, total resource rents and length of statehood. Heteroskedasticity-robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.

To test each of the three channels above, we employ three indicators from the International Country Risk Guide (ICRG 1997). They are experts' subjective assessments of the *rule of law*, *bureaucratic quality* and *corruption in government*. Such indices range from 0 to 10, with higher values indicating greater rule of law, reduced corruption and superior bureaucratic institutions (and are calculated as 1985-2004 averages here). The results are reported in Table 8. Compared to a regression that features only *bureaucratic capacity*, *corruption in*

government or *rule of law* (columns 1, 3 and 5), the introduction of *constraints on the executive* often renders such variables insignificant (columns 2, 4 and 6). By contrast, the estimated coefficient on *constraints on the executive* remains statistically significant, and is relatively stable. In all cases, including *constraints on the executive* drastically reduces both the magnitude of the coefficient of the channel variable and its significance.

We do not take these results as a major commentary on the channels, which would clearly require more exploration, but they do show that the political institutions hypothesis could plausibly work through all three. As a tentative conclusion from this, we can say that the evidence supports the idea that this paper's central finding on the relationship between political institutions and fiscal capacity works through the rule of law and the performance of the bureaucracy.

6. Conclusions

It is widely recognized that fiscal capacity is a crucial determinant of economic development as well as state formation in developing countries. However, it is less understood what determines fiscal capacity in a developing country context, with geography, history and political economy seen as complementary explanations of variations in state capacity across the world. In this paper, we examine the role of political economy, focusing on the degree of constraints that executives face as the key determinant of taxation capacity. Drawing from the political economy and political science literature, and differentiating between effectiveness and accountability/transparency dimensions of taxation capacity, we hypothesize that the effect of a higher constraint on the executive on taxation capacity would not be symmetrical across the two dimensions. Constraints on the executive is likely to exert a positive effect on the accountability and transparency of taxation systems, but its effect on the effectiveness of

taxation systems is likely to be ambiguous.

We then test our hypotheses using a recent data set on public financial management of developing countries compiled by the World Bank and other donor agencies to construct measures of taxation capacity for 47 developing countries. We find that there is a substantial positive effect between institutions that place constraints on the executive power and current fiscal institutions relating to the accountability and transparency of taxation power: existence and quality of a taxpayers' database, administrative procedures on tax liabilities and tax appeals mechanisms. We show that our findings are robust to different specifications, controls, and estimation methods. However, we find no robust effect that institutions placing constraints on the executive power affect current fiscal institutions relating to the effectiveness of taxation, as captured by the quality of administrative procedures on the collection of tax payments. We also present evidence indicating that the relationship between political institutions and the transparency and accountability aspects of fiscal capacity works through the rule of law and the performance of the bureaucracy. Our findings indicate that to build fiscally capable states a key route is the consolidation of cohesive political institutions, providing strong checks and balances on the discretionary power of the executive.

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7. Appendices

Appendix 1: Dependent variables definitions

Transparency of Taxpayer Obligations and Liabilities (PEFA PI13(ii))	Definition: Taxpayers access to information on tax liabilities and administrative procedures. Average score over 2005-2013. Scoring method: 3. Taxpayers have easy access to comprehensive, user friendly and up-to-date information tax liabilities and administrative procedures for all major taxes, and the RA supplements this with active taxpayer education campaigns. 2. Taxpayers have easy access to comprehensive, user friendly and up-to-date information on tax liabilities and administrative procedures for some of the major taxes, while for other taxes the information is limited. 1. Taxpayers have access to some information on tax liabilities and administrative procedures, but the usefulness of the information is limited due coverage of selected taxes only, lack of comprehensiveness and/or not being up-to-date. 0. Taxpayer access to up-to-date legislation and procedural guidelines is seriously deficient. Source: variable PI.13(ii), *Public Expenditure and Financial Accountability Performance Measurement Framework*, PEFA (2006), at http://www.pefa.org/en/content/pefa-framework. Accessed in November 2015.
Tax appeals (PEFA PI13(iii))	Definition: Existence and functioning of a tax appeals mechanism. Average score over 2005-2013. Scoring method: 3. A tax appeals system of transparent administrative procedures with appropriate checks and balances, and implemented through independent institutional structures, is completely set up and effectively operating with satisfactory access and fairness, and its decisions are promptly acted upon. 2. A tax appeals system of transparent administrative procedures is completely set up and functional, but it is either too early to assess its effectiveness or some issues relating to access, efficiency, fairness or effective follow up on its decisions need to be addressed. 1. A tax appeals system of administrative procedures has been established, but needs substantial redesign to be fair, transparent and effective. 0. No functioning tax appeals system has been established. Source: variable PI.13(iii), *Public Expenditure and Financial Accountability Performance Measurement Framework*, PEFA (2006), at http://www.pefa.org/en/content/pefa-framework. Accessed in November 2015.
Controls in the taxpayer registration system (PEFA PI14(i))	Definition: quality and maintenance of a taxpayer database. Average score over 2005-2013. Scoring method: 3. Taxpayers are registered in a complete database system with comprehensive direct linkages to other relevant government registration systems and financial sector regulations; 2.Taxpayers are registered in a complete database system with some linkages to other relevant government registration systems and financial sector regulations; 1. Taxpayers are registered in database systems for individual taxes, which may not be fully and consistently linked. Linkages to other registration/licensing functions may be weak but are then supplemented by occasional surveys of potential taxpayers; 0. Taxpayer registration is not subject to any effective controls or enforcement systems. Source: variable PI.14(i), *Public Expenditure and Financial Accountability Performance Measurement Framework*, PEFA (2006), at http://www.pefa.org/en/content/pefa-framework. Accessed in November 2015.
Effectiveness in collection of tax arrears (PEFA PI15(i))	Definition: Collection ratio for gross tax arrears, being the percentage of tax arrears at the beginning of a fiscal year, which was collected during that fiscal year (average of the last two fiscal years). Average score over 2005-2013. Scoring method: 3. The average debt collection ratio in the two most recent fiscal years was 90% or above OR the total amount of tax arrears is insignificant (i.e. less than 2% of total annual collections); 2. The average debt collection ratio in the two most recent fiscal years was 75-90% and the total amount of tax arrears is significant; 1. The average debt collection ratio in the two most recent fiscal years was 60-75% and the total amount of tax arrears is significant; 0. The debt collection ratio in the most recent year was below 60% and the total amount of tax arrears is significant (i.e. more than 2% of total annual collections). Source: variable PI.15(i), *Public Expenditure and Financial Accountability*

	Performance Measurement Framework, PEFA (2006), at http://www.pefa.org/en/content/pefa-framework. Accessed in November 2015.
Effectiveness of penalties for non-compliance with registration and tax declaration (PEFA PI14(ii))	Definition: Effectiveness of penalties for non-compliance with registration and tax declaration. Average score over 2005-2013. Scoring method: 3. Penalties for all areas of non-compliance are set sufficiently high to act as deterrence and are consistently administered; 2. Penalties for non-compliance exist for most relevant areas, but are not always effective due to insufficient scale and/or inconsistent administration; 1. Penalties for non-compliance generally exist, but substantial changes to their structure, levels or administration are needed to give them a real impact on compliance; 0. Penalties for non-compliance are generally non-existent or ineffective (i.e. set far too low to have an impact or rarely imposed). Source: variable PI.14(ii), *Public Expenditure and Financial Accountability Performance Measurement Framework*, PEFA (2006), at http://www.pefa.org/en/content/pefa-framework. Accessed in November 2015.
Effectiveness in collection of tax payments (PEFA PI15(iii))	Definition: Frequency of complete accounts reconciliation between tax assessments, collections, arrears records and receipts by the Treasury. Average score over 2005-2013. Scoring method: 3. Complete reconciliation of tax assessments, collections, arrears and transfers to Treasury takes place at least monthly within one month of end of month; 2. Complete reconciliation of tax assessments, collections, arrears and transfers to Treasury takes place at least quarterly within six weeks of end of quarter; 1. Complete reconciliation of tax assessments, collections, arrears and transfers to Treasury takes place at least annually within 3 months of end of the year; 0. Complete reconciliation of tax assessments, collections, arrears and transfers to Treasury does not take place annually or is done with more than 3 months' delay. Source: variable PI.15(iii), *Public Expenditure and Financial Accountability Performance Measurement Framework*, PEFA (2006), at http://www.pefa.org/en/content/pefa-framework. Accessed in November 2014.

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 measure are showing a war in a given year that country-year is counted as having war and if both of the variables are nonmissing 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).

Net ODA received per capita (current US$)	Net official development assistance (ODA) per capita consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions, and by non-DAC countries to promote economic development and welfare in countries and territories in the DAC list of ODA recipients; and is calculated by dividing net ODA received by the midyear population estimate. It includes loans with a grant element of at least 25 percent (calculated at a rate of discount of 10 percent). 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).
Income inequality: Gini index (market)	Estimate of Gini index of inequality in equivalized (square root scale) household gross (pre-tax, pre-transfer) income, using Luxembourg Income Study data as the standard. Source: Solt (2009).
Ethnic fractionalisation (Alesina et al 2003)	Reflects probability that two randomly selected people from a given country will not belong to the same ethnolinguistic group. The higher the number, the more fractionalized society. It is calculated over 1979-2001 (varies by country), we take the latest available year. The definition of ethnicity involves a combination of racial and linguistic characteristics. The result is a higher degree of fractionalization than the commonly used ELF-index (see el_elf60) in for example Latin America, where people of many races speak the same language. Source: Alesina et al. (2003).
Legal origins dummies	Identifies the legal origin of the Company Law or Commercial code of each country. There are five possible origins: (1) English Common Law; (2) French Commercial Code; (3) Socialist/Communist Laws; (4) German Commercial Code; (5) Scandinavian Commercial Code. Source: La Porta et al (1999).

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   VIETM   VNM
46   SOUTH AFRICA   ZAF
47   ZAMBIA   ZMB