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TAXATION AND DEMOCRATIZATION

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Taxation and democratization

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Abstract

Anecdotal evidence from pre-modern Europe and North America suggests that rulers are forced to become more democratic once they impose a significant fiscal burden on their citizens. One difficulty in testing this “taxation causes democratization” hypothesis empirically is the endogeneity of public revenues. I use introductions of value added taxes and autonomous revenue authorities as sources of quasi-exogenous variation to identify the causal effect of the fiscal burden borne by citizens on democracy. The instrumental variables regressions with a panel of 122 countries over the period 1981-2008 suggest that revenues had on average a mild positive effect on democracy.

Keywords: Taxation, democracy, democratic transition, tax innovations

JEL codes: H20, P14, O23

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1 Introduction

One defining feature of a state is its capacity to raise revenues. Whether a state is strong or weak, whether it is determined or yielding, even whether it survives or disintegrates depends ultimately on its balance sheet. Public finances are thus more than a purely economic phenomenon. Following Joseph Schumpeter's conception of a *fiscal sociology* they can be perceived as essential determinants of social and political developments, in fact "... public finances are one of the best starting points for an investigation of society, especially but not exclusively of its political life" (Schumpeter, 1991, p.101).

The level and composition of public revenues, in particular, is likely to have a decisive influence on the character of the state. Rulers who depend on revenues from taxation will rule differently than rulers who rely on their own lands or on the exploitation of natural resources. Taxation implies a direct and noticeable transfer of resources from citizens to the state. Most other revenue sources affect citizens less or not at all. Given this critical distinction between tax and non-tax revenues, it can be conjectured that rulers who impose a large fiscal burden on their citizens must offer them in return a voice in policy making. Once citizens feel the financial weight of the state, they are less likely to tolerate an autocratic and unaccountable government.¹

Historical evidence appears to be consistent with this argument. There are several famous examples where attempts to increase taxation by autocratic rulers resulted in revolution and eventually more accountable government. During the early conflicts between Parliament and the Crown in England, the former rebelled against repeated attempts by the kings to expand taxation and simultaneously model the English state into an absolutist monarchy. The French Revolution began as a revolt against the large tax burden imposed by the Ancien Régime to fund its costly wars and sumptuous court life. The American Rebellion even had as its seminal demand that there should be no taxation without representation.

The "taxation causes democratization" hypothesis has recently reemerged in the context of development policies.² According to some authors, improvements in the state's capacity to tax

¹That this link between taxation and democracy may exist has been argued by several economic historians. Charles Tilly, for example, notes that as states "... have extracted taxes, they have often initiated cycles of intervention, resistance, repression, and bargaining: state agents demand payment, citizens resist, the government applies armed force, but in the process of overcoming resistance kills of some leaders, buys off others, and announces justifications for the present intervention that imply rules for proper interventions in the future – in short, repression combined with bargaining" (Tilly, 2009, p. 180). See also the references in Ross (2004).

²For recent theoretical work see Amegashie (2012).

could lead to more democracy in developing countries (Moore, 2007; Di John, 2009). Yet while the case for the hypothesis appears strong in view of the historical evidence, it is ultimately based on a few admittedly dramatic but perhaps unrepresentative cases.

I study in this paper whether taxation has a casual effect on democracy with a panel dataset consisting of macroeconomic data for 122 countries³ over the period from 1981 to 2008. As sources of quasi-exogenous variation, I rely on two tax innovations that have seen wide-spread adoptions in the last three decades: the value added tax (VAT) and autonomous revenue authorities (ARA). I argue that countries adopted these two tax innovations primarily for fiscal and economic reasons, i.e. reasons unrelated to their level of democracy. Dummy variables indicating the year of their adoptions can therefore serve as quasi-exogenous instruments for levels of taxation.

The closest methodological predecessor to this paper is the study by Keen and Lockwood (2010) on the causes and consequences of the introduction of value added taxes. These authors explore why countries adopt a VAT and whether revenues increase after the adoption. In terms of the research question, the closest precedent is Ross (2004) who studies the link between taxation and representation for a large panel of countries. However, since his results rely on pooled cross-section regressions, there remains doubt whether he has identified a causal effect. Subsequent contributions on the taxation-democracy link devote more attention to identification, but have a narrower geographical focus. Berger (2009) studies whether regional differences in the investment in administrative capacity by the British colonial authorities in Nigeria affect the contemporaneous quality of government. Baskaran and Bigsten (2013) investigate with panel data from 23 sub-Saharan Africa how fiscal capacity affects the quality of the government. McGuirk (2011) tests with micro-level public perception data from 15 sub-Saharan African countries whether natural resource rents incentivize rulers to reduce taxation, and whether this effect in turn diminishes the demand for democratic accountability.

A related literature focuses on how natural resource wealth in general and oil abundance in particular – sources of public revenue that do not require the participation of citizens – affect democracy and the quality of government. Notable studies are Ross (2001), Herb (2005), Treisman (2007), and Tsui (2011). Another related literature investigates whether aid has the same consequences as natural resource income for democracy (Collier, 2006; Bermeo, 2011). This

³A list of the countries included in the sample can be found in Table A.3 in the appendix.

paper is also related to the extensive empirical literature on the determinants of democracy. A seminal contribution that explores different channels is Barro (1999). Much of the subsequent literature studies specific causes. For example, Acemoglu et al. (2005) explore the role of education, Acemoglu et al. (2008) study the link between income and democracy, and Persson and Tabellini (2009) study the effects of past experiences with democracy.

The remainder of this paper is structured as follows. In Section 2, I provide a short description of the elementary features of value added taxation and autonomous revenue authorities and discusses the causes of their spread during the last three decades. I introduce the empirical model in Section 3 and discuss the data in Section 4. The results are collected in Section 5. I conclude in Section 6.

2 VATs and ARAs as tax innovations

The main idea of this paper is to use quasi-exogenous variation in the efficiency of the revenue collection technology to identify how the fiscal burden imposed on citizens affects the level of democracy in a country. Two remarkable developments in the field of taxation over the last three decades can provide such quasi-exogenous variation: the spread of value added taxes and the increased adoption of autonomous revenue authorities.

The value added tax, first introduced in France in 1948⁴, is in principle a tax on sales. In contrast to retail sales taxes which are charged on the final sale of a product, the VAT is levied at each stage of the production process. However, each producer receives a refund for the VAT he has to pay for input goods. There is hence no cumulative effect of the VAT, a feature that distinguishes it from turnover taxes. The efficiency of the value added tax, when compared to turnover taxes, derives from this feature. When compared to retail sales taxes, the VAT has the benefit of avoiding a complete loss of revenues if a retailer is unable to pay or manages to evade taxation. Value added taxes differ between countries in rates, in exemptions, and in assessment thresholds, yet it is possible to make the case that its defining features make it a particularly efficient tax when compared to other consumption taxes.

Since histories of the adoption the VAT are available elsewhere (see for example Ebrill et al. (2001) and Bird and Gendron (2007)), I provide here only a short summary of its spread in the

⁴ Bird and Gendron (2007) list 1948 as the introduction date. Other sources make a distinction between the VAT in its modern form, which was introduced in 1954 in France, and the earlier variant.

countries included my dataset. As Figure 1 shows, 27 of the 122 countries in the sample had a value added tax in 1981.⁵ By 1990, the number had risen to 43. Most adoptions took place during the 1990s. By 2000, the number of countries with a VAT stood at 85. In 2008, 95 of the 122 countries in the sample had introduced the VAT.⁶ The geographical spread of the VAT is depicted in Figure 3. This figure shows that there are no specific regional patterns. The VAT is truly a global phenomenon. The most notable exception is the United States, which is the only OECD country without a value added tax.

Keen and Lockwood (2010) study why countries adopt a VAT. According to their results, the importance of the agricultural sector, the number of countries in the neighborhood that already have a VAT, participation in IMF programs, and adverse revenue shocks are positively related to the likelihood that a country introduces a value added tax. A separate study by Desai and Hines (2005) indicates that the reliance on VAT revenues (as share of total revenues) is lower for more open countries. While these studies do not rule out the possibility that political variables, and in particular the level of democracy, affect the adoption of a VAT (they do not include appropriate control variables in their regressions), it nonetheless appears that the prime determinants of the adoption of a VAT are economic and fiscal. Advocacy by international organizations, the structure of the economy, and fiscal considerations seem to be the forces that push countries into introducing value added taxes.

The second notable tax innovation in recent years are autonomous revenue authorities.⁷ The idea behind an autonomous revenue authority is to divide tax policy from tax administration, and thereby to professionalize the latter. In practice, the establishment of an autonomous revenue authority has the consequence that tax administration – i. e. assessment, collection, and auditing – is spun off from the Ministry of Finance and given to a separate organization that offers salaries which are competitive with the private sector and that recruits its personnel according to merit rather than political loyalties. The expectation was that this division of tax policy and tax administration would reduce corruption and increase efficiency.

The first revenue authority was introduced in Jamaica in 1981, but its subsequent spread took place primarily in Latin America and sub-Saharan Africa (Brautigam et al., 2008). Figure 2 shows the spread of the ARAs. In 1988, four countries in the sample had an autonomous revenue

⁵See Section 4 for data sources.

⁶Overall more than 140 countries have introduced by now a VAT.

⁷Also known as *semi-autonomous revenue authorities* or simply as *revenue authorities*.

authorities. But in 1989 one of these countries, Bolivia, abolished its ARA (it subsequently reintroduced an ARA in 2001). By 1991, there were six countries with an ARA. Thereafter, there was a steady increase until the end of the sample period. By 2008, 27 countries had an autonomous revenue authority. In contrast to the VAT, there are noticeable regional patterns in the adoption of the ARAs as suggested by Figure 3. Most autonomous revenue authorities have been introduced in Latin America and Sub-Saharan Africa. Beyond these two continents, there have been two ARAs in the Caribbean (Jamaica and Guyana) and two in Asia (Malaysia and Singapore). Most countries with an ARA have also introduced the VAT. There are only four exceptions (Gambia, Guyana, Malaysia, Sierra Leone).

I am not aware of a study analyzing the causes and consequences of the adoption of an ARA that is as comprehensive as the one by Keen and Lockwood (2010) for the VAT. There is, however, some evidence available from disparate sources. Relying on survey data from several South-American countries and Mexico, Taliencio (2004) argues that ARAs were introduced by the respective governments to signal commitment to a “more competent, effective, and fair” tax administration. Kidd and Crandall (2006) note that the spread of autonomous revenue authorities can be perceived as one example of the global trend toward privatization during the last few decades. They point in particular to international development agencies and private sector consulting firms as the main advocates for the establishment of ARAs. The primacy of fiscal considerations and international advocacy is also stressed by Fjeldstad and Moore (2009), who provide an overview of sub-Saharan African ARAs. Such observations indicate that the ARAs were primarily implemented for administrative and fiscal reasons. Consequently, it can be conjectured that democracy or other political variables are no significant determinants of whether and when a autonomous revenue authority is introduced.

3 Empirical model

The empirical strategy to study the causal effect of taxation on democracy is based on a recursive four-equation model that relates democracy to government revenues, and government revenues to the introduction of value added taxes and autonomous revenue authorities. The model is an extension of the one used by Keen and Lockwood (2010) to explain the causes and consequences of the VAT. It is specified as follows:

$$\text{Democracy}_{i,t} = \beta_1 \text{Revenues}_{i,t} + \beta \mathbf{V}_{i,t} + \epsilon_{i,t} \quad (\text{E.1})$$

$$\text{Revenues}_{i,t} = \delta_1 \text{VAT}_{i,t} + \delta_2 \text{ARA}_{i,t} + \delta \mathbf{W}_{i,t} + \nu_{i,t} \quad (\text{E.2})$$

$$\text{VAT}_{i,t} = \gamma \mathbf{Y}_{i,t} + \mu_{i,t} \quad (\text{E.3})$$

$$\text{ARA}_{i,t} = \varphi \mathbf{Z}_{i,t} + \eta_{i,t} \quad (\text{E.4})$$

I am primarily interested in Equation E.1. This equation states that democracy is a function of revenues, a vector of additional variables \mathbf{V} , and an error term ϵ . However, revenues might be endogenous, resulting in inconsistent OLS estimates. Consider Equation E.2 to see what type of endogeneity problems may emerge. This equation explains revenues as a function of the two tax innovations, a vector of variables \mathbf{W} , and an error term ν . The revenue variable in the democracy equation, i.e. Equation E.1, will suffer from endogeneity if either democracy is an element of the \mathbf{W} -vector (reverse causality) or if there are omitted variables that result in a correlation between the error terms in the democracy and revenue equations. Both sources for endogeneity are likely to exist in the current case and will lead to inconsistent OLS estimates.

One way to obtain consistent estimates for the revenue variable in the democracy equation is to use only the part of its variation that is uncorrelated with ϵ . Under certain assumptions, the adoption of a value added tax and an independent revenue authority can provide such quasi-exogenous variation. Dummy variables indicating when a country has adopted either of these tax innovations can then serve as instruments in instrumental variables estimations of Equation E.1.

To see which assumptions are needed for these variables to be valid instruments consider the adoption equations, i.e. Equation E.3 and E.4. These equations state that the adoption of the two tax innovations is a function of the vector of variables \mathbf{Y} and \mathbf{Z} and the error terms μ and η , respectively. The two tax innovations can induce quasi-exogenous variation in the revenue variable if two requirements are fulfilled. First, democracy should not be an element of the \mathbf{Y} – and \mathbf{Z} – vectors. Second, there should be no correlation between the error terms in the adoption equations and the democracy equation.

The first requirement implies that democracy should not influence the likelihood of the introduction of a value added tax or of an autonomous revenue authority. This assumption would be invalid if, for example, democracies would like to have higher levels of redistribution and therefore introduce VATs to raise more revenues. Alternatively, democracies could also be more likely to introduce ARAs as part of a general strategy to improve governance. As indicated above, while the extant literature does not point toward the existence of a link from democracy to VAT or ARA adoptions, it does not confirm the absence of such a link either. To address this shortcoming and establish the validity of this instrument, I will adopt several strategies. First, I will show that the instruments pass standard over-identification tests. Second, I will explore in robustness tests whether any link between government revenues and democracy remains robust if I use lagged values of the instruments, thereby limiting the possibility for reverse causality. Finally, I will also explore in robustness tests whether controlling for past shocks in non-tax revenue sources (oil or natural resource rents), or the size of the middle class, or past surges in the level of democracy affects the results.

The requirement that there is no correlation between the error terms in the adoption equations and the democracy equation implies that there should be no omitted variables that influence both the level of democracy and the likelihood that a value added tax or an autonomous revenue authority is introduced. This assumption is tenable if the list of control variables in Equation E.1 includes all variables that have an effect on both the level of democracy and the likelihood of the adoption of a VAT and an ARA.

In the regressions reported below, I will always control for country fixed effects to account for unobserved heterogeneity between countries and time fixed effects to account for global developments that have affected all countries in the sample similarly. In addition, I include all variables considered by Keen and Lockwood (2010) when explaining public revenues: GDP per capita, openness, the value added in agriculture as percent of GDP, population size, the population share of over 65- and under 14-year olds, and dummy variables for IMF crisis and non-crisis programs. The sources and definitions of these variables can be found in Table A.1 in the appendix. Given this exhaustive list of control variables, it is a reasonable conjecture that the results are not driven by omitted variables.

If reverse causality and omitted variables bias can be ruled out, dummies indicating the presence of the tax innovations are valid instruments for government revenues. But in order to apply these instruments in the current context, two additional requirements must be fulfilled. First, the tax innovations should not be elements of \mathbf{V} , i.e. they should not have a direct effect on democracy. This assumption cannot be explicitly tested, but it is plausible in the current context. There is little reason to expect that the adoption of rather technical tax innovations has a direct effect on democracy. Second, the tax innovations must be related to government revenues to be useful instruments. As I will show below, this requirement is fulfilled as well.

4 Data

Data on the introduction of value added taxes are primarily taken from Bird and Gendron (2007). There have been five countries that have abolished a once introduced VAT (Belize, Ghana, Grenada, Malta, Vietnam). Three of these have subsequently re-introduced the VAT (Ghana, Malta, Vietnam). For these countries, Bird and Gendron (2007) provide either only the date of the initial introduction (Malta) or the date of the re-introduction (Ghana, Vietnam). For one of these countries, Belize, Bird and Gendron (2007) provide no information. I therefore complement their data with information taken from International Tax Dialogue (2005). Based on these two sources, I construct a dummy variable that is 1 when a country has or introduces a value added tax and else 0.

Data on autonomous revenue authorities are primarily taken from Brautigam et al. (2008), who provide information on the introduction dates of autonomous revenue authorities in sub-Saharan Africa, Latin America, and the Caribbean. The data is complemented with information provided in Mann (2004). As for the value added tax, I construct a dummy variable that is 1 when a country has or introduces an autonomous revenue authority.

In order to measure democracy, I use the POLITY IV project's institutionalized democracy score (Marshall and Jaggers, 2002).⁸ This variable captures whether there are institutions in place through which citizens can influence public policies, whether there are formalized constraints on the power of the government, and whether the civil liberties of citizens is ensured. The democracy score ranges from 0 to 10, with higher values indicating more democracy.

⁸The data is provided in Teorell et al. (2010).

To measure levels of taxation, I follow Keen and Lockwood (2010) in using the general government revenues to GDP ratio provided by the IMF in the World Economic Outlook (WEO) database. General government revenues are derived from “taxes, social contributions, grants receivable, and other revenue”. This ratio is a less accurate proxy for the government’s tax policy than the tax to GDP ratio, but it has the important advantage that it is available for a large number of countries from 1981 onward. Data on tax to GDP ratios, for example from the IMF’s Government Finance Statistic database (GFS) or the World Bank’s World Development Indicators (WDI), are only available from 1990 onward for a comparably large cross-section of countries as provided in the WEO database. While the use of an inaccurate measure for the government’s tax policies might result in attenuation bias, this bias can be addressed through instrumental variables (Greene, 2003, Ch. 5). Since I will rely on instrumental variables regressions to account for reverse causality and possible omitted variable bias anyway, the use of the general government revenue to GDP ratio instead of the tax to GDP ratio should be unproblematic. Moreover, in many cases the distinction between taxes and other revenues sources is a purely legal one. For example, there are only minor (if any) economic differences between social security contributions and taxes.

In line with Keen and Lockwood (2010), I drop all countries from the former Eastern Bloc from the sample since there are concerns regarding the reliability of the data in the pre-1992 period for these countries. Moreover, many of them have introduced their VATs while simultaneously implementing several additional reforms, some of which led to significant decreases in government revenues. Leaving these countries in the sample would therefore induce some degree of negative correlation between government revenues and the VAT that reflects the special circumstances of these countries during their transformations to a market economy rather than the true revenue effects of the VAT. The final dataset consists of 122 countries and covers the period 1981-2008. Each country provides on average 16 observations to the regressions (see the summary statistics in Table A.2 in the appendix).

5 Results

5.1 Baseline results

Table 1 collects the baseline results. The first three columns reports the first stage effects of the tax innovations on government revenues. These models are estimated with OLS. Hypothesis tests are based on heteroscedasticity and autocorrelation (Newey-West) robust standard errors.

The first stage results suggest that both the value added tax and the revenue authority dummy are positively and significantly related to government revenues when they are included one at a time (Model I and II). The revenue authority dummy becomes insignificant when it is included jointly with the VAT dummy (Column III), but the coefficient displays large z-statistics and is almost significant at the 10% level. Overall, the first stage results indicate that countries experience on average an increase in revenues by about 1 percentage point of GDP after the introduction of a VAT or an ARA. The introduction of these two tax innovations did not lead to huge revenue increases, but still had noticeable effects.

After establishing that the two tax innovations are positively and significantly related to government revenues, I focus on their reduced form relationship with democracy. The reduced form results obtained by OLS are collected in Columns IV-VI of Table 1.⁹ As in the previous regressions, hypothesis tests are based on heteroscedasticity and autocorrelation robust standard errors. I find that both the introduction of a value added tax and of an autonomous revenue authorities display a positive coefficient, even though the coefficient is only significant for the VAT but not for the ARA dummy. Nevertheless, it appears that both tax innovations enhance democracy. It is, however, unlikely that these rather technical tax innovations have a direct effect on democracy. In view of the results from Columns I-III, it appears more likely that the tax innovations affect democracy only indirectly by leading to higher revenues.

To establish the validity of this argument formally, I instrument government revenues with the VAT and ARA dummies. To assess how instrumenting for government revenues affects the results

⁹I estimate the reduced-form regressions (and in fact all models estimated further below) with estimators developed for linear models (notably OLS and TSLS) even though the dependent variable is ordinal. The traditional approach would be to use an estimator such as ordered probit. However, the ordered probit estimator is problematic in the current context. That is, it is important here to include country fixed effects in order to account for omitted country specific effects. Yet the ordered probit estimator is not consistent if country fixed effects are included, especially when the number of groups is large relative to the number of observations within groups (Greene and Hensher, 2010). This problematic feature of ordered probit renders linear estimation methods clearly preferable here. Previous studies that specify ordinal measures for democracy as dependent variables also use linear estimators, for example Barro (1999) and Acemoglu et al. (2005, 2008).

I report first in Column VII results obtained by OLS. The OLS results suggest that revenues are negatively related to democracy. However, it is unlikely that this finding is indicative of a causal effect. It is, for example, possible that non-democratic governments find it more difficult to collect revenues because of citizens' tax morale is lower. Indeed, the TSLS results with the tax innovations as instruments reported in Columns VIII-X suggests that government revenues have a positive effect of democracy. An increase in government revenues by one percentage point increases the democracy score by about 0.20 to 0.56 points. The coefficient is insignificant when the VAT or the ARA dummies are used one at a time as an instrument (Column IX and X). When both are used, the coefficient is significant and has a value of 0.39.

The Hansen-J over-identification test in Column X indicates that the instruments are valid. To assess possible weak identification, I report the Cragg-Donald Wald F-statistics. The Cragg-Donald Wald F-statistic is not robust to non-i.i.d. errors, but critical values are available for this test statistic. In general, a value of 4 for this statistic is sufficient to rule out significant biases due to weak identification (Stock and Yogo, 2005; Clemens et al., 2011). The Cragg-Donald F-statistic in the regressions is between 4.4 and 5.0.

That the weak identification statistic is only barely above the threshold of 4 might be perceived as problematic. Note, however, that weak instruments will tend to bias the coefficient estimates toward the OLS results. Since the OLS results reported in Column VII indicated a negative effect of taxation on democracy, the positive effect found in the TSLS regressions will be – if at all – biased downward. To explore whether this is true, I report in Model XI estimates obtained by limited information maximum likelihood (LIML) which is more robust to weak instruments than TSLS but comes at the cost of making the assumption of normally distributed i.i.d. errors (Staiger and Stock, 1997; Baum et al., 2002). The LIML estimates are virtually identical to the TSLS estimates, in fact the estimated coefficient for the revenues to GDP ratio is slightly larger than in the corresponding TSLS regression.

Overall, the estimates from the preferred model (Column X) indicate that an increase in the revenues to GDP ratio by one percentage point increases the POLITY democracy score by around 0.4 points. These values imply that taxation has a mild positive effect on democracy. If Rwanda, which is at the 25th percentile of average government revenues to GDP ratio (18.58%) were to increase its level of revenues to that of Switzerland, which is at the 75th percentile

for the government revenues to GDP ratio (33.84%), it could improve its democracy score by around 6.1 points. Since Rwanda's average democracy score was 0 during the sample period, the results suggest that by increasing the revenues to GDP ratio by about 15 percentage points Rwanda could reach a level of democracy that is on par with Namibia (average democracy score of 6.0) or Mali (average democracy score of 6.75).

5.2 Robustness checks

5.2.1 Quasi-randomness of tax innovations

One concern with the baseline results is that there remain omitted variables that affect both the likelihood that a country adopts either of the tax innovations and the level of democracy. It is possible that countries are more likely to invest in enhancing the capacity of the tax administration if they experienced a sudden decrease in oil or natural resource revenues in the recent past. At the same time, shocks to natural resource incomes might increase political instability and result in revolutions (leading to either more or less democracy). Alternatively, countries that are on a path to become more democratic might also be more likely to adopt a VAT or an ARA. That is, countries that experience increases in democracy might introduce value added taxes to increase their revenues because they want to expand redistributive spending. Another possibility is that countries which become more democratic might want to improve governance in general and introduce an ARA for this reason.

A similar concern is that the structure of the economy has an effect on both democracy and the likelihood of introducing a VAT or an ARA. In particular, it is possible that the emergence of a manufacturing sector will result in the formation of a middle class. It has been argued by some authors that a large middle class will result in more demands for democratic accountability (Johnson et al., 2007). At the same time, the existence of a middle class makes it worthwhile for the government to invest in its tax administration. The GDP per capita variable and the country dummies alone may not sufficiently control for these effects.

To address such concerns, I collect in Table 2 regressions where I relate the likelihood that either a VAT or an ARA is introduced to variables measuring possible revenue or democracy shocks in period $t - 1$ and the importance of the middle class in period t . That is, I estimate

Equation E.3 and E.4 in order to observe whether the types of shocks listed above or the importance of the middle class affect VAT or ARA adoptions.

To account for natural resource revenue shocks, I control for lagged change (i.e. lagged first difference) in oil rents as share of GDP and lagged change in natural resource rents as share of GDP. To account for past shocks to the level of democracy, I control for the lagged change in the democracy index. As proxy for the importance of the middle class, I use the contribution of the manufacturing sector to value added as share of GDP. All models are estimated with OLS.

The upper panel of Table 2 presents the results for the VAT. I find that none of the four additional control variables are significant. Neither revenue nor democracy shocks nor the importance of the middle class affect the likelihood that a value added tax is adopted. The lower panel of the table presents the corresponding regressions for autonomous revenue authorities. The results again indicate that none of the additional variables are significantly related to the likelihood that an ARA is adopted.

The results in Table 2 suggest that the exclusion of the variables measuring revenue or democracy shocks or the size of the middle class from the second stage (i.e. Equation E.1) is appropriate. To confirm this conjecture, I report re-estimations of the baseline regressions where I explicitly control for each of these variable. Table 3 collects the result. I find that only past democracy shocks are significantly related to the level of democracy in period t . This is, however, expected as countries that had a significant increase in democracy in the past should have higher levels of democracy today. None of the revenue shocks nor the manufacturing share variable are significantly related to democracy. On the other hand, the government revenues variable is consistently positive. While the coefficient turns insignificant when all control variables are included, it does so presumably because of a significant degree of multicollinearity.

Overall, these results suggest that the baseline findings regarding the effect of government revenues on democracy are not driven by omitted variables, a conclusion that is consistent with the overidentification tests reported for the baseline regressions. Controlling for four possible sources of omitted variable bias, I find that the estimated coefficients for the government revenues to GDP variable remain positive and are either significant or almost significant.

5.2.2 Lagged revenues

Another option to explore the robustness of the results is to exploit the temporal dimension of the dataset. In particular, lagged values of the tax innovations dummies should be less affected by possible reverse causality than contemporaneous values. If the baseline findings were obtained because increases in democracy lead to the introduction of VATs or ARAs, then using lagged values of the dummies to instrument for lagged government revenues should have a large effect on the estimated coefficient for the effect of revenues on democracy. On the other hand, if the coefficient remains of similar magnitude and significance as in the baseline regressions, then the confidence in the baseline estimates should be strengthened.

Therefore, I reestimate Equation E.1 by replacing government revenues variable with its lags. As instruments for lagged revenues, I use appropriately lagged values of the instruments. Table 4 reports the results for lag lengths up to a degree of five. While the size and significance of the coefficient declines with lag length, the effect of the revenues to GDP ratio remains positive and is in the same order of magnitude as in the baseline models. Increasingly limiting the possibility of reverse causality does not dramatically affect the estimated effect of taxation on democracy, thereby suggesting that the baseline models have identified a causal effect.

5.2.3 Development aid

Another reason why the baseline estimates might be spurious is because of donors' aid policies. Donors might use aid allocations to persuade recipient countries to become more democratic. On the other hand, larger aid receipts could in turn reduce the need to implement tax reforms. The country fixed effects may not sufficiently control for the aid dependence of a country, especially if donors change their aid policies.

In Table 5, I report different TSLS regressions where I control for aid receipts as share of GDP. The data is taken from the OECD'S DAC database. One problematic feature with this data is that non-aid receiving countries are not included. Consequently, re-estimating Equation E.1 with this variable included reduces the sample size considerably (this is the reason why the aid variable is not included in the baseline specification). Nonetheless, the effect of government revenues on democracy remains positive irrespective of whether the VAT or the ARA dummy are used as instruments one at a time (Column I and II) or jointly (Column III).

One notable effect of including the development aid variable is, however, that the government revenues variable becomes insignificant. At the outset, it is unclear whether the estimate is insignificant because the development aid variable is correlated with both the introduction of the tax innovations and democracy or because of the drop in sample size. To explore this issue, I replaced the missing values in the development aid variable with 0 for all high-income countries. The results from re-estimating Equation E.1 with this redefined aid variable are collected in Column (IV). The results indicate that government revenues have a positive and statistically significant effect on democracy when this redefined aid variable is used.

5.2.4 Subsamples

Another concern relates to whether the results are driven by individual countries or specific regions of the world. In particular, almost all developed countries have value added taxes and have been at the same time democratic during the sample period. On the other hand, autonomous revenue authorities have primarily been introduced in Latin-America and Africa. To check to what extent the results are dependent on a particular region, I re-run Equation E.1 after dropping all countries from that region.

Table 6 collects the results. The results in the first column (labeled *LA*) are obtained from a sample where all Latin-American countries have been dropped. The coefficient on government revenues is positive and in the same order of magnitude as in the baseline regressions. Dropping Middle-Eastern and North-African countries results in a positive and significant coefficient, too (Column *ME-NA*). Dropping sub-Saharan African countries, on the other hand, has a large effect on the coefficient. The coefficient becomes insignificant and is virtually 0. Dropping Western-European and North-American countries (and the Neo-Western-European countries: Australia and New-Zealand) turns the coefficient insignificant, but it remains positive and is of the same order of magnitude as in the baseline regressions (Column *NA-WE*). Dropping East-Asian and South East-Asian countries does not affect the coefficient estimate for the government revenues variable significantly either (*EA-SEA*). Dropping the remaining set of countries (South-Asia, Pacific, and Caribbean) turns the government revenues variable insignificant, but the coefficient remains again positive.

Overall, it appears that the results rely on the inclusion of sub-Saharan African countries. While the instruments remain strong when the countries from this region are dropped, the coefficient of the government revenues variables drops to essentially 0. One explanation for this finding might be that African countries have witnessed in recent times both considerable tax reforms and changes in their level of democracy. The variation in other regions of the world during the sample period, both with respect to government revenues or with respect to democracy, might be insufficient to detect meaningful effects once sub-Saharan African countries are excluded from the sample.

6 Conclusion

Does taxation cause democratization? This paper studies this question with cross-country data by exploiting arguably quasi-exogenous variation induced by two tax innovations that have swept the globe during the last three decades: the value added tax and autonomous revenue authorities. Consistent with the anecdotal evidence from pre-modern Europe and North-America, the results suggest that the magnitude of the fiscal burden has on average a mild positive effect on democracy. This finding survives a number of robustness tests. It appears, however, that especially countries from sub-Saharan Africa drive the results.

From a policy perspective, these findings indicate that development agencies and donors should perceive taxation as one channel through which they can foster democracy. Investing in tax capacity can not only increase the amount of revenues that developing countries can raise, but may also result in more accountable government.

Future empirical work on how taxation affects democracy at the cross-country level should explore additional sources of quasi-exogenous variation in national tax policies. Alternatively, it may be worthwhile to study why the effect of taxation on democracy appears to be particularly dependent on the inclusion of sub-Saharan African countries in the sample. Investigating such questions can provide further insights regarding the link between taxation and democratization.

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Table 1: TAX INNOVATIONS, REVENUES AND DEMOCRACY, 1981-2008

	First stage			Reduced form			Second stage				
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
Revenues to GDP ratio							-0.022** (-2.171)	0.561 (1.529)	0.202 (0.769)	0.391* (1.865)	0.452* (1.736)
Value added tax	0.929* (1.919)		0.868* (1.783)	0.521*** (2.879)		0.510*** (2.793)					
Revenue authority		1.224* (1.787)	1.136 (1.629)		0.248 (0.901)	0.195 (0.702)					
Estimation method	OLS	OLS	OLS	OLS	OLS	OLS	OLS	TSLS	TSLS	TSLS	LIML
VAT instrument	-	-	-	-	-	-	-	Yes	No	Yes	Yes
ARA instrument	-	-	-	-	-	-	-	No	Yes	Yes	Yes
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1952	1952	1952	1952	1952	1952	1952	1952	1952	1952	1952
Countries	122	122	122	122	122	122	122	122	122	122	122
F	4.891	4.873	4.997	4.309	4.046	4.180	4.190	1.312	2.711	1.833	1.611
Hansen-J (p-value)										0.441	0.476
Cragg-Donald Wald F statistic								4.962	4.515	4.420	4.420

^a This table collects the first stage, reduced form, and second stage regressions relating democracy to government revenues and the two tax innovations. The dependent variable in columns I-III is the government revenues to GDP ratio. The dependent variable in columns IV-XI is the POLITY IV democracy index. Model I-VII are estimated with OLS. Models VIII-X is estimated with TSLS, Model XI is estimated with LIML.

^b Control variables in all models (results omitted): GDP per capita, Openness, Agriculture, Population, Dependency share old, Dependency share young, IMF crisis program, IMF non-crisis program.

^c Stars indicate significance levels at 10% (*), 5% (**) and 1%(***).

^d z-statistics in parentheses.

^e z-statistics and hypothesis tests based on heteroscedasticity and autocorrelation (Newey-West) robust standard errors.

Table 2: POSSIBLE DETERMINANTS OF VAT AND ARA ADOPTIONS, 1981-2008, OLS ESTIMATIONS

	I	II	III	IV	V
Value added tax introduction					
Oil rent shock _{t-1}	-0.003 (-1.044)				-0.004 (-0.714)
Natural resource rent shock _{t-1}		-0.001 (-0.549)			0.002 (0.472)
Democracy shock _{t-1}			-0.005 (-0.676)		-0.007 (-0.926)
Manufacturing				-0.002 (-0.570)	-0.001 (-0.122)
Autonomous revenue authority introduction					
Oil rent shock _{t-1}	-0.001 (-1.054)				-0.000 (-0.067)
Natural resource rent shock _{t-1}		-0.001 (-0.892)			-0.001 (-0.344)
Democracy shock _{t-1}			0.000 (0.035)		0.001 (0.191)
Manufacturing				-0.003 (-1.109)	-0.002 (-0.830)
Control variables	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
N	1694	1694	1699	1832	1596
Countries	119	119	119	122	118

^a This table presents OLS regressions relating the adoption of a VAT and an ARA to the baseline control variables (results unreported) and additional variables measuring possible revenue shocks (oil rents and natural resource rents), democracy shocks, and a variable measuring the size of the middle class (share of manufacturing value added as % of GDP). The dependent variable for the results presented in the upper panel is the dummy indicating the adoption of a VAT and for the results presented in the lower panel a dummy indicating the adoption of an ARA.

^b Stars indicate significance levels at 10% (*), 5% (**) and 1%(***)

^c z-statistics in parentheses.

^d z-statistics and hypothesis tests based on heteroscedasticity and autocorrelation (Newey-West) robust standard errors.

Table 3: REVENUES AND DEMOCRACY, 1981-2008, CONTROL VARIABLES FOR POSSIBLE DETERMINANTS OF VAT AND ARA ADOPTIONS, TSLS ESTIMATIONS

	I	II	III	IV	V
Revenues to GDP ratio	0.433* (1.709)	0.429* (1.707)	0.509* (1.696)	0.471 (1.422)	0.678 (1.230)
Oil rent shock _{t-1}	-0.014 (-0.443)				0.208 (1.180)
Natural resource rent shock _{t-1}		-0.040 (-1.273)			-0.199 (-1.221)
Democracy shock _{t-1}			0.412*** (4.996)		0.353*** (3.516)
Manufacturing				0.009 (0.159)	0.007 (0.096)
VAT instrument	Yes	Yes	Yes	Yes	Yes
ARA instrument	Yes	Yes	Yes	Yes	Yes
N	1906	1906	1866	1832	1758
Countries	122	122	120	122	119
F	1.471	1.487	1.898	1.172	1.111
Hansen-J (p-value)	0.678	0.663	0.324	0.922	0.625
Cragg-Donald Wald F statistic	3.434	3.464	2.901	2.158	1.333

^a This table collects TSLS regressions relating democracy to government revenues. The dependent variable is the POLITY IV democracy index. These regressions are intended to test whether the coefficient for government revenues changes when additional control variables related to the introduction of value added taxes are included.

^b Stars indicate significance levels at 10% (*), 5% (**) and 1%(***)

^c z-statistics in parentheses.

^d z-statistics and hypothesis tests based on heteroscedasticity and autocorrelation (Newey-West) robust standard errors.

Table 4: REVENUES AND DEMOCRACY, 1981-2008, TSLS AND LIML ESTIMATIONS

	$t - 1$	$t - 2$	$t - 3$	$t - 4$	$t - 5$
Revenues to GDP ratio	0.277* (1.794)	0.227 (1.628)	0.175 (1.432)	0.129 (1.072)	0.143 (1.129)
Control variables	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
N	1846	1735	1623	1511	1397
Countries	122	121	120	119	118
F	2.212	2.150	2.350	2.321	2.049
Hansen-J (p-value)	0.516	0.689	0.457	0.423	0.511
Cragg-Donald Wald F statistic	5.876	6.494	9.219	9.462	9.004

^a This table collects TSLS regressions relating democracy to government revenues. The dependent variable is the POLITY IV democracy index. The government revenues variable and the instruments are lagged. The lag length is indicated by the column headings.

^b Control variables (results omitted): GDP per capita, Openness, Agriculture, Population, Dependency share old, Dependency share young, IMF crisis program, IMF non-crisis program.

^c Stars indicate significance levels at 10% (*), 5% (**) and 1%(***).

^d z-statistics in parentheses.

^e z-statistics and hypothesis tests based on heteroscedasticity and autocorrelation (Newey-West) robust standard errors.

Table 5: REVENUES AND DEMOCRACY, 1981-2008, TSLS ESTIMATIONS, CONTROL FOR DEVELOPMENT AID

	I	II	III	IV
Revenues to GDP ratio	0.561 (1.142)	0.113 (0.693)	0.273 (1.268)	0.351** (2.162)
Development aid	-6.753 (-0.984)	-0.783 (-0.337)	-2.908 (-0.924)	
Development aid (alternative)				-4.153 (-1.586)
VAT instrument	Yes	No	Yes	Yes
ARA instrument	No	Yes	Yes	Yes
Control variables	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
N	1435	1435	1435	1905
Countries	101	101	101	121
F	1.454	3.547	2.555	1.870
Hansen-J (p-value)			0.252	0.540
Cragg-Donald Wald F statistic	2.921	9.947	6.020	7.748

- ^a This table collects TSLS regressions relating democracy to government revenues. These regressions append the baseline models with a control variable for development aid.
- ^b Additional control variables (results omitted): GDP per capita, Openness, Agriculture, Population, Dependency share old, Dependency share young, IMF crisis program, IMF non-crisis program.
- ^c Stars indicate significance levels at 10% (*), 5% (**) and 1%(***).
- ^d z-statistics in parentheses.
- ^e z-statistics and hypothesis tests based on heteroscedasticity and autocorrelation (Newey-West) robust standard errors.

Table 6: REVENUES AND DEMOCRACY, 1981-2008, TSLS ESTIMATIONS WITH SUBSAMPLES

	LA	ME-NA	SSA	NA-WE	EA-SEA	R
Revenues to GDP ratio	0.281* (1.765)	0.314** (2.002)	0.021 (0.159)	0.275 (0.933)	0.231* (1.684)	0.270 (0.962)
VAT instrument	Yes	Yes	Yes	Yes	Yes	Yes
ARA instrument	Yes	Yes	Yes	Yes	Yes	Yes
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	1696	1740	1320	1523	1741	1740
Countries	104	105	78	103	110	110
F	2.838	2.229	1.510	2.404	2.298	2.252
Hansen-J (p-value)	0.012	0.354	0.000	0.133	0.573	0.875
Cragg-Donald Wald F statistic	5.629	6.617	6.915	1.894	7.489	1.745

^a This table collects TSLS regressions relating democracy to government revenues. Each column collect results from samples that omit countries from one world region. The omitted region is denoted by the heading for the column: "LA" omits countries from Latin America, "ME-NA" from the Middle East and North Africa, "SSA" from sub-Saharan Africa, "NA-WE" from North America and Western Europe, "EA-SEA" from East and South-East Asia, and "R" from the remaining world regions (South-Asia, Pacific, and the Caribbean).

^c The dependent variable is the POLITY IV democracy index.

^d Control variables (results omitted): GDP per capita, Openness, Agriculture, Population, Dependency share old, Dependency share young, IMF crisis program, IMF non-crisis program.

^e Stars indicate significance levels at 10% (*), 5% (**) and 1%(***).

^f z-statistics in parentheses.

^g z-statistics and hypothesis tests based on heteroscedasticity and autocorrelation (Newey-West) robust standard errors.

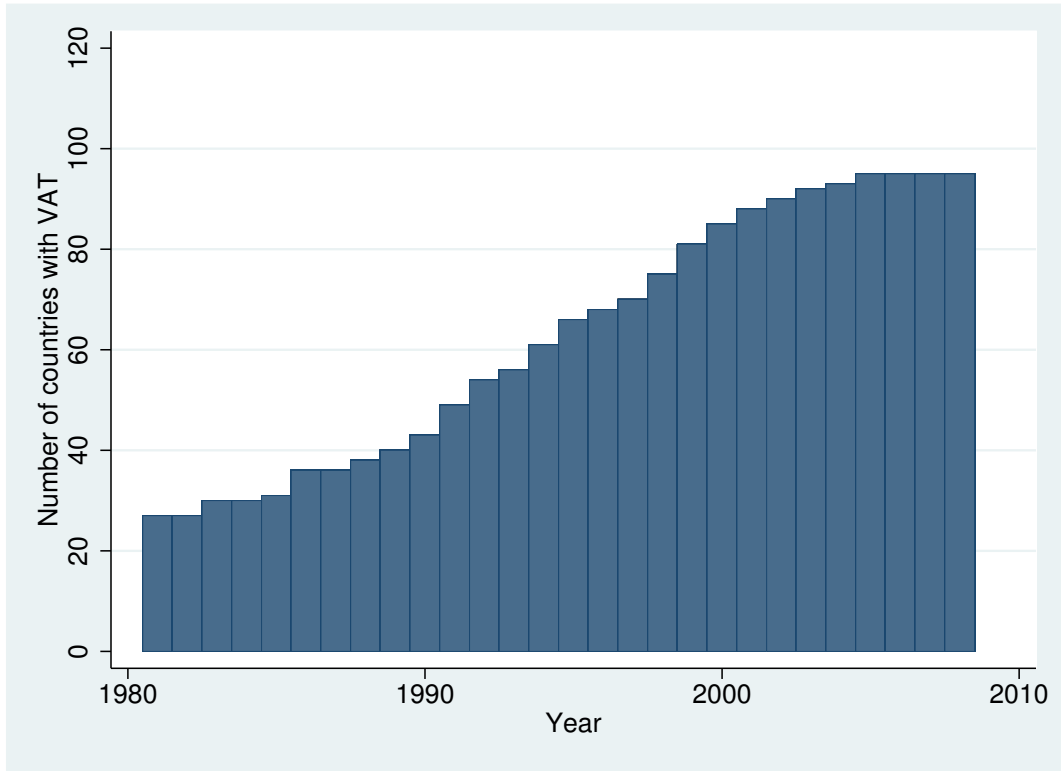


Figure 1: THE SPREAD OF THE VALUE ADDED TAX

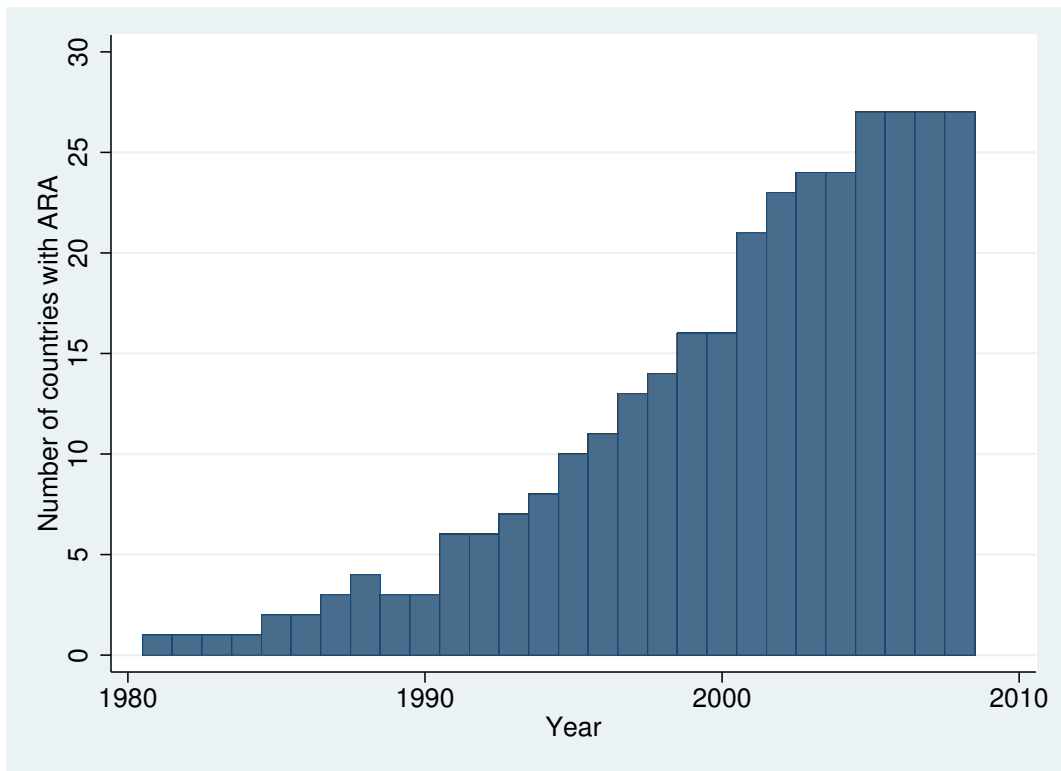


Figure 2: THE SPREAD OF AUTONOMOUS REVENUE AUTHORITIES

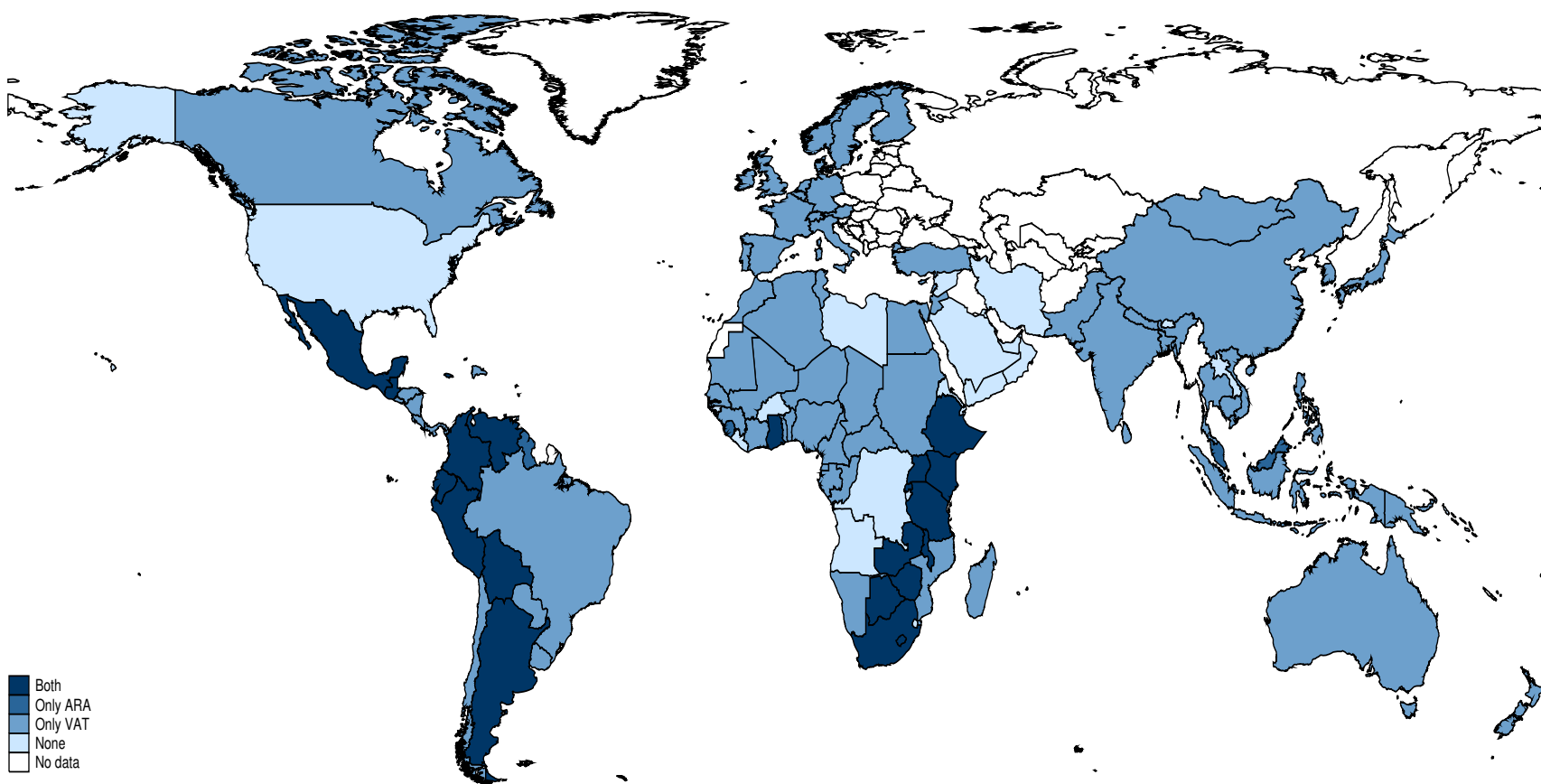


Figure 3: COUNTRIES WITH VALUE ADDED TAXES AND AUTONOMOUS REVENUE AUTHORITIES

Appendix

Table A.1: DEFINITION AND SOURCE OF VARIABLES

Label	Description	Source
Value added tax	Dummy = 1 in country-year pair if value added tax has been introduced, 0 else	Bird and Gendron (2007)
Revenue authority	Dummy=1 in country-year pair if revenue authority has been introduced, 0 else	Brautigam et al. (2008)
Democracy	Institutionalized democracy score from the POLITY IV dataset (scaling 0=low, 10=high)	Marshall and Jaggers (2002)
Revenues to GDP ratio	General government revenues to GDP ratio	IMF / World Economic Outlook
GDP per capita	Real GDP per capita	Penn World Tables
Openness	Openness in constant prices	Penn World Tables
Agriculture	Contribution of agriculture to value-added, % of GDP	World Development Indicators
Population	Population size	Penn World Tables
Dependency share, old	Share of population ≥ 65 years	World Development Indicators
Dependency share, young	Share of population ≤ 14	World Development Indicators
IMF program, crisis	Dummy variable = 1 IMF crisis program (SAF, PRGF) has been in effect for at least five months	Dreher (2006)
IMF program, non-crisis	Dummy variable = 1 IMF non-crisis program (SBA, EFF) has been in effect for at least five months	Dreher (2006)
Oil rents	Oil rents, % of GDP	World Development Indicators
Natural resource rents	Total natural resource rents, % of GDP	World Development Indicators
Manufacturing	Contribution of manufacturing to value-added, % of GDP	World Development Indicators
Development aid	Official development assistance, total gross disbursements, % of GDP	OECD DAC database for aid data, World Development Indicators for GDP data

Table A.2: SUMMARY STATISTICS

Variable		Mean	Std. Dev.	Min.	Max.	N
Value added tax	overall	0.648	0.478	0.000	1.000	1952
	between		0.405	0.000	1.000	122
	within		0.293	-0.307	1.481	16.000
Revenue authority	overall	0.135	0.342	0.000	1.000	1952
	between		0.328	0.000	1.000	122
	within		0.182	-0.749	0.874	16.000
Democracy	overall	5.345	4.079	0.000	10.000	1952
	between		3.737	0.000	10.000	122
	within		1.454	-3.012	10.975	16.000
Revenues to GDP ratio	overall	28.750	12.890	0.036	102.360	1952
	between		11.579	8.185	59.154	122
	within		4.544	9.560	72.644	16.000
GDP per capita	overall	10.585	12.302	0.136	56.414	1952
	between		11.611	0.159	46.652	122
	within		2.640	-1.499	26.284	16.000
Openness	overall	76.079	47.237	14.041	443.175	1952
	between		42.816	19.188	354.007	122
	within		15.940	13.027	165.248	16.000
Agriculture	overall	16.956	14.884	0.043	75.523	1952
	between		15.111	0.129	65.673	122
	within		4.640	-13.856	53.004	16.000
Population	overall	52.227	172.283	0.325	1317.066	1952
	between		142.692	0.438	1194.347	122
	within		15.766	-129.629	220.407	16.000
Dependency share, old	overall	6.613	4.837	0.501	21.461	1952
	between		4.305	0.828	17.480	122
	within		0.755	1.294	13.488	16.000
Dependency share, young	overall	33.585	10.474	13.517	50.895	1952
	between		9.798	14.942	49.163	122
	within		2.254	21.485	43.069	16.000
IMF program, crisis	overall	0.199	0.400	0.000	1.000	1952
	between		0.320	0.000	1.000	122
	within		0.264	-0.690	1.033	16.000
IMF program, non-crisis	overall	0.110	0.313	0.000	1.000	1952
	between		0.212	0.000	1.000	122
	within		0.247	-0.748	1.074	16.000
Oil rents	overall	5.019	12.555	0.000	79.137	1950
	between		12.743	0.000	57.714	122
	within		4.898	-34.008	45.344	15.984
Natural resource rents	overall	8.756	13.985	0.000	79.580	1950
	between		13.918	0.000	59.729	122
	within		5.546	-28.962	47.446	15.984
Manufacturing	overall	14.981	7.541	0.364	44.351	1832
	between		7.038	2.812	34.534	122
	within		2.250	-3.379	35.512	15.016
Development aid	overall	0.089	0.123	0.000	1.941	1435
	between		0.109	0.000	0.618	101
	within		0.079	-0.444	1.412	14.208

Table A.3: COUNTRIES AND ADOPTION DATES

Country	VAT	ARA	Country	VAT	ARA	Country	VAT	ARA
Algeria	1992	-	Gabon	1995	-	Nigeria	1994	-
Angola	-	-	Gambia	-	2005	Norway	1970	-
Argentina	1975	1988	Germany	1968	-	Oman	-	-
Australia	2000	-	Ghana	1998	1985	Pakistan	1990	-
Austria	1973	-	Guatemala	1983	1999	Panama	1977	-
Bahrain	-	-	Guinea	1996	-	Papua New Guinea	1999	-
Bangladesh	1991	-	Guinea-Bissau	-	-	Paraguay	1993	-
Belgium	1971	-	Guyana	-	2001	Peru	1973	1991
Benin	1991	-	Honduras	1976	-	Philippines	1988	-
Bhutan	-	-	India	2005	-	Portugal	1986	-
Bolivia	1973	1987, 2001	Indonesia	1985	-	Rwanda	2001	1998
Botswana	2002	2005	Iran	-	-	Saudi Arabia	-	-
Brazil	1967	-	Ireland	1972	-	Senegal	1980	-
Burkina Faso	-	-	Italy	1973	-	Sierra Leone	-	2002
Burundi	-	-	Jamaica	1991	1981	Singapore	1994	2001
Cambodia	1999	-	Japan	1989	-	Solomon Islands	-	-
Cameroon	1999	-	Jordan	2001	-	South Africa	1991	1997
Canada	1999	-	Kenya	1990	1995	Spain	1986	-
Central African Republic	2001	-	Korea, Republic of	1977	-	Sri Lanka	1998	-
Chad	2000	-	Kuwait	-	-	Sudan	2000	-
Chile	1975	-	Laos	-	-	Swaziland	-	-
China	1994	-	Lebanon	2002	-	Sweden	1969	-
Colombia	1975	1991	Lesotho	2003	2003	Switzerland	1995	-
Comoros	-	-	Liberia	-	-	Syria	-	-
Congo, Dem. Rep.	-	-	Libya	-	-	Tanzania	1998	1996
Congo, Republic of	1997	-	Madagascar	1994	-	Thailand	1992	-
Costa Rica	1975	-	Malawi	1989	1995	Togo	1995	-
Cote d'Ivoire	1960	-	Malaysia	-	2001	Trinidad & Tobago	1990	-
Cyprus	1992	-	Mali	1991	-	Tunisia	1988	-
Denmark	1967	-	Mauritania	1995	-	Turkey	1983	-
Djibouti	-	-	Mauritius	1998	2005	Uganda	1996	1991
Dominican Republic	1983	-	Mexico	1980	1997	United Arab Emirates	-	-
Ecuador	1970	1999	Mongolia	1998	-	United Kingdom	1973	-
Egypt	1991	-	Morocco	1986	-	United States	-	-
El Salvador	1992	-	Mozambique	1999	-	Uruguay	1968	-
Equatorial Guinea	2005	-	Namibia	2000	-	Venezuela	1993	1993
Eritrea	-	-	Nepal	1997	-	Vietnam	1999	-
Ethiopia	2003	2002	Netherlands	1969	-	Yemen	-	-
Fiji	1992	-	New Zealand	1986	-	Zambia	1995	1994
Finland	1994	-	Nicaragua	1975	-	Zimbabwe	2004	2001
France	1948	-	Niger	1986	-			

This table lists the countries included in the sample and notes the years in which they introduced a VAT or an ARA. For Ghana and Vietnam, the two countries included in the sample that have abolished a VAT and subsequently reintroduced it, only the second introduction is noted (the first VATs in these countries were short-lived). Bolivia introduced an ARA in 1989, abolished it in 1989, and reintroduced it again in 2001. Both introduction dates are noted for Bolivia.

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