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Sheffield Economic Research Paper Series.

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ISSN 1749-8368

SERPS no. 2017004

January 2017

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This draft: January 2017

Abstract. The theoretical literature around effective tax systems, which are a precondition of an effective state and therefore of development, has coalesced around the idea of a 'fiscal social contract', in which beneficial expenditures are delivered to taxpayers in return for their tax payments, rather than a coercive relationship existing between them and the government. However, these ideas about governance have with few exceptions not been incorporated into empirical analyses of tax yield and how to increase it. In this paper, we attempt to fill this gap.

Our starting-point is the model of the (fundamentally) democratic social contract proposed by Rousseau 250 years ago, which suggests that increased democracy will be good for many state-building functions including fiscal mobilisation. We develop this idea by means of a prisoner's dilemma model, which shows that a 'fiscal contract' between taxpayers and the government (in the sense of a top left-hand corner, 'win-win' solution of the prisoner's dilemma) will be most likely to emerge not only as a result of greater democratic accountability, but also if taxpayers feel that they are getting good value from, and are well informed about, government expenditures in exchange for their tax payments. This model is then estimated empirically against a sample of 62 developing countries between 1980-2008 (with the share of human capital expenditures in public expenditure used as an indicator of the value which taxpayers derive from that expenditure), backed by two case studies of Ghana and Zambia. Our results, both from econometric analysis and the case-studies, suggest that increasing levels of democratic accountability and the quality of public expenditure are correlated, and causally connected, with increasing tax/GDP ratios, and that in countries where competitiveness is blunted by high levels of rent-seeking, the tax ratio will be less buoyant. Also, the process by which fiscal contracts are constructed is important. The government needs to send the taxpayer an effective signal, or bona-fide, illustrating the benefits to be derived from paying their tax bills. Illustrations of effective bona-fides are provided.

Keywords: fiscal policy, tax ratios, fiscal contracts, bona-fides, democracy

JEL classifications: D72, D78, E62, O23

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1. Introduction

It is widely accepted that development is impossible without the construction of an effective state, and that a crucial element in building an effective state is building an effective tax system (di John 2006, Brautigam et al. 2008, Besley and Persson 2013)[2]. But especially in the poorest countries, building an effective tax system is no straightforward or easy matter, because it is precisely the poorest countries that are also the most politically fragile (OECD 2014: figure 1.3) and hence it is in these countries that it is politically most risky and administratively most difficult to introduce new taxes, broaden the taxpayer base, raise tax rates or even get existing taxpayers to pay the taxes that are due[3]. Therefore, there is a tendency for the poorer countries to remain trapped with low and near-static levels of revenue to income whilst middle-income countries develop their tax ratios at a faster rate (Moore 1998, Mosley 2015)[4] – and since state-building drives development, there is also a risk that the gap between the poorest and other countries may therefore widen.

For several decades the development community has been aware of this problem, and has sought to analyse and tackle it. International development agencies, with the IMF in the lead, have sought to wean LDC governments away from dependence on their traditional source of revenue, taxes on international trade, which is low-yielding, distortionary and unstable (Greenaway and Milner 1991), and towards taxes on other bases, and in particular VAT, which has now been adopted by a majority of emergent and developing countries. Both independent researchers and, again, the IMF have also explored the effectiveness of these measures by means of regressions on the determinants of tax yields: as shown in Table 1, these exercises began in the 1960s with analyses of macro-economic influences such as inflation, income and openness to foreign trade, but by the 1980s had broadened their scope to consider also the composition of the tax base[5],and by the millennium indicators of governance quality had also entered the picture, including corruption, rule of law and, in one very recent case (Langford and Ohlenburg 2016), democratic accountability. The picture

[2] Besley and Persson's study of 'pillars of prosperity' argues that one of the pillars of an effective state is a well-functioning tax system, not least because the tax system underpins other institutions, public expenditure and legal institutions in particular. They argue that 'Countries that have better fiscal capacity also trend to have better legal capacity. Both measures are also correlated with contemporaneous GDP per capita' (Besley and Persson 2013: 7, see also pages 31-33, 40-102, 131-138.) The case for the primacy of taxation as a development instrument has also been made by Deborah Brautigam: 'Taxation is an underrated tool in the effort to build more capable and responsive states…Democracies are built not only on periodic elections but also on a social contract based on bargaining over the collection and spending of public revenue. [Indeed we can argue] that taxation may play the *central* role in building and sustaining the power of states.' (Brautigam 2008a; also Brautigam, Fjeldstad and Moore 2008:1-2).

[3] For (mostly theoretical) discussions of tax evasion and its determinants, see Rablen (2010) and Hashimzade et al (2012)

[4] In the sample examined by ourselves for the period 1990-2010(Mosley 2015, Table 1) nine out of twenty low-income countries were able to raise their tax ratios over that period, achieving an end-of-period tax ratio of 11.1%, whereas 35 out of 41 middle-income countries were able to raise their tax ratios, achieving an end-of-period ratio of 19%.

[5] Especially the share of mining, which tends empirically to have a significant negative influence on tax revenue; this has been seen as one manifestation of the 'natural resource curse'.

emerging from these regressions is not completely clear: in most cases, inflation and the share of mining in GDP have a negative impact on the tax ratio, but those are just about the only robust findings. Amongst the few studies which include governance indicators in their analyses[6], the only consistent story is that corruption generally impacts negatively on the tax ratio, which is very nearly a tautology, because a large part of corruption consists of people and companies illegally failing to pay their taxes.

Table 1 here

For some while, analysts have been aware that the roots of poor revenue generation performance are, as noted above, political – governments especially of weak states are frightened to raise taxes if they fear that the consequences of doing so will be immediate loss of office or worse, influential (corporate and individual) taxpayers in such societies will seek to use any leverage they can muster to avoid paying tax, and all taxpayers will resent paying tax more particularly if they can see that others much richer than them are not doing so. This is well illustrated by the case of Bolivia in February 2003, when at a time of severe economic crisis, following an IMF recommendation, the government proposed to widen the income-tax net so as to include sections of the middle class not then liable to pay tax. This proposed tax increase had to be abandoned after a violent revolt, in which over thirty people were killed, including several members of the La Paz police (who were in the group newly included in the tax net under the IMF's proposals, and were themselves seeking to throw the proposals out). A key factor underlying the insurrection was that it became widely known that most upper-income people, especially oil and mining executives, who were due to pay income tax were not actually doing so, and this had been widely publicised in the press and on the internet[7]. In order to mitigate the anger and political turmoil caused by tax increases especially in fragile political environments, efforts have therefore been made by many governments to depoliticise the process of revenue collection by transferring tax collection from the direct control of the ministry of finance and other political authorities to autonomous revenue authorities (Bergman 2003, Chand and Moene 1999 , Fjeldstad and Moore 2009); and also, more fundamentally, to frame the process of revenue collection as part of a fiscal 'social contract' (Moore 1998, 2013; Brautigam et al. 2008) in which government commits itself to provide public services in exchange for the revenue provided by taxpayers, rather than as a coercive process in which the state extorts taxes where it can without needing to justify or be held to account for the way in which this is done. Such a reconceptualization of the government-taxpayer relationship has, especially in Africa and Latin America, often been seen as an important element in the transition of those countries towards greater democratic accountability, and in their transition towards higher tax ratios as reported above. But, for the moment, this is all supposition: we do not have any systematic evidence concerning the

[6] Only seven of the thirty-one regression-based studies listed in Appendix 1 use any measure of governance (usually corruption) as a covariate of tax yield, and only one (Langford and Ohlenburg 2016) examines the influence of democratic accountability on tax revenue.

[7] For further detail of this episode, see Mosley (2012), chapter 10, Lora (2013) and Laserna (2011).

processes by which the political barriers to higher tax ratios have been overcome, and, as we can see from table 1 and Appendix 1, the issue of how such fiscal contracts can be formed, and what impact they have had, has scarcely been tackled by the empirical literature on revenue generation (few regression studies include governance variable on the right-hand side, and those that do mostly consider only corruption indices). Our main purpose here is to begin to fill this gap, by constructing and testing a picture of the process by which social contracts emerge and impact on the capacity of fiscal systems in developing countries.

Table 1. Regression studies of drivers of tax ratios (selection)

Investigator	Dependent variable, sample and time period	Estimation method	Independent (right-hand side) variables in regression(*denotes significance of this variable at the 5% level or higher)				Remarks
			Macro-economic	Economic structure and	Governance	Other	
Williamson(1961)	T/Y(33 LDCs 1950-59)	OLS	Per capita GNP*				
Lotz and Morss(1970)	T/Y(50 developing countries, 1962-66)	OLS	Per capita GDP(private)*, openness* ([X+M]/Y)		'Government centralisation' (i.e. autocracy)		
Chelliah et al (1975)	T/Y (all LDCs 1972-76)	OLS	GDP, Openness (exports/GDP*)	Mining exports/GDP*			
Tait, Grätz, Eichengreen (1979)	T/Y (all LDCs 1972-76)	OLS	GDP(net of exports), Openness (exports/GDP)	Shares of agriculture and mining* in GDP			
Leuthold (1991)	T/Y (eight African countries 1973-81)	OLS, also Autoregressive	Desired tax share, , openness* ([X+M]/Y)	Shares of mining and agriculture* in income			Optimising model: public decision maker maximises private disposable income and value of public goods and services
Baunsgaard and Keen(2005)	T/Y (111 developed and less developed countries, 1975-2000)	Panel data (fixed and random effects); instrumental variables; GMM	Per capita GDP, openness*[(X+M)/GDP],	Agriculture/GDP ; share of trade taxes and VAT in total revenue		Overseas aid*	
Gupta(2007)	T/Y (1980-2004)	Panel data with fixed- and	Per capita GDP*	Agriculture/ GDP*	Corruption*, political stability, rule of law	Aid/GDP*	

		random-effects specifications, also difference-GMM and system-GMM	(significant in low income countries only) Openness (goods and services/GDP)				
Drummond et al (2012)	Total revenue/GDP (including social contributions and non-tax revenue) (1980-2009)	Panel data with fixed- and random-effects specifications	GDP/capita* Agriculture/GDP Inflation rate*	Share of trade taxes	Corruption, oil/natural resource rents*, size of shadow economy	Aid/GDP	
Fenocchietto and Pessino(2013)	Tax effort (using stochastic frontier method)	Panel data with fixed- and random-effects specifications	Inflation, agriculture/GDP*, educational level (secondary enrolment rate?), Openness (goods and services/GDP)*		Corruption*	Gini coefficient of inequality*	Uses stochastic-frontier analysis to incorporate optimality considerations
Langford and Ohlenburg(2016)	T/Y (excluding natural resource revenue and social security contributions)		GDP/capita, inflation* educational level (secondary enrolment rate?), educational level, openness (imports/GDP)	Industrial structure (manufacturing/ output)	Corruption*, law and order*, democratic accountability		Uses stochastic-frontier analysis to incorporate optimality considerations

Sources: as listed in left-hand column and in bibliography. *Notes:** against a coefficient denotes significance of the relevant variable in the model indicated at least the 5% level. A fuller review of tax revenue regressions is provided in Appendix 1.

By what process can effective governance, and in particular the construction of fiscal 'social contracts' between taxpayers and governments, impact on the growth of tax revenue? We propose, as an initial hypothesis, that three main processes are relevant: the evolution and maintenance of liberty, equality and fraternity in relation to fiscal policy, or more precisely the subjection of governments to democratic accountability, the development of social equity within communities and the development of intra-community trust between taxpayers and governments. All of these, of course, are contested concepts, which we need to explore.

The idea that effective social contracts must be *democratic* originated with the Enlightenment philosopher Jean-Jacques Rousseau (1762, 1986), who argued that only the people, and not autocratic authorities, should be allowed to legislate: 'might does not make right, and…we are obliged to obey none but legitimate powers' (Rousseau 1986: 7). Dictatorship, therefore, was in his view no way of achieving a social contract; however, the delegation of decision-making powers to citizens, in Rousseau's view, would only take make possible the expression of private interests, and not of the social optimum, or 'general will' as Rousseau called it, which 'looks only to the common interest, whereas (the will of all) looks to private interest, and is simply a sum of particular wills' (Rousseau 1986:29)[8]. For Rousseau, what was required to achieve the social optimum was, in the first instance, a very strict form of democracy, not typical of any modern state, in which, in the first instance all legislative decisions were decided by the majority view of all adult citizens, as in Rousseau's native city-state of Geneva (Rousseau 1986: 71-73, Rosenblatt 1997), modified by the actions of an enlightened executive, or president, who would act in the interests of the general will, but 'was supposed to refrain entirely from the use of coercive power' (Rousseau 1986, editor's introduction by Frederick Watkins, page xxxvii)[9]. Rousseau's view was put forward as a riposte to the view put forward by Thomas Hobbes, who had argued a century earlier that the preservation of social order required the imposition of a social contract enforced through the autocratic power of a sovereign (Hobbes 1651, Cervellati et al 2008), but it will be clear from the above that his approach finesses the problem of how to create representative political institutions, not to mention accountable bureaucracies and effective judicial institutions, and cannot be exactly represented by democratic accountability in the sense of one adult, one vote.

[8] This distinction between the general will and the will of all can be interpreted as awareness of public-goods problems – in other words, the existence of particular services, including political stability and environmental protection, which are in the public interest even though they are not perceived by citizens to be in their private interest.

[9] This is the way Rousseau put the point:

'In order… that the social compact may not be a meaningless formality, it includes the tacit agreement, which alone can give force to the rest, that anyone who refuses to obey the general will shall be forced to do so by the whole body; which means nothing more or less than that he be forced to be free. For this is the condition which, by giving each citizen to his country, guarantees him against any form of personal dependence; it is the secret and the driving force of the political mechanism; and it alone gives legitimacy to civil obligations, which otherwise would be absurd, tyrannical, and subject to the gravest abuses.' (Rousseau 1762/1986: 19).

One element in the achievement of social order and development, as discussed earlier, in which the conflict between general will/social optimum and private optimum emerges particularly sharply, is of course the provision of public goods financed by taxation. Taxation, of course, can only be imposed by legislative authority, and it therefore seems to follow axiomatically that ability to impose taxes varies with the degree of democratic accountability, but subject to the caveat made above concerning the distinction between the will of all individuals and the social optimum; because private individuals, considered purely as taxpayers, dislike paying tax, and can only be expected to be willing to do so if either they see themselves getting something in return (such as benefits from public expenditure) or an 'enlightened executive, or president' persuades them that it is worth entering into a social contract which provides such benefits in return for tax payments. An initial piece of evidence in supporting the idea that democratic governance may be good for the formation of social contracts is provided by two-variable regressions such as that depicted in Figure 1, for a sample of developing countries between 1990-2010, which suggest a significantly positive relationship between increases in democratic accountability and the tax-to-GDP ratio.

Figure 1 here

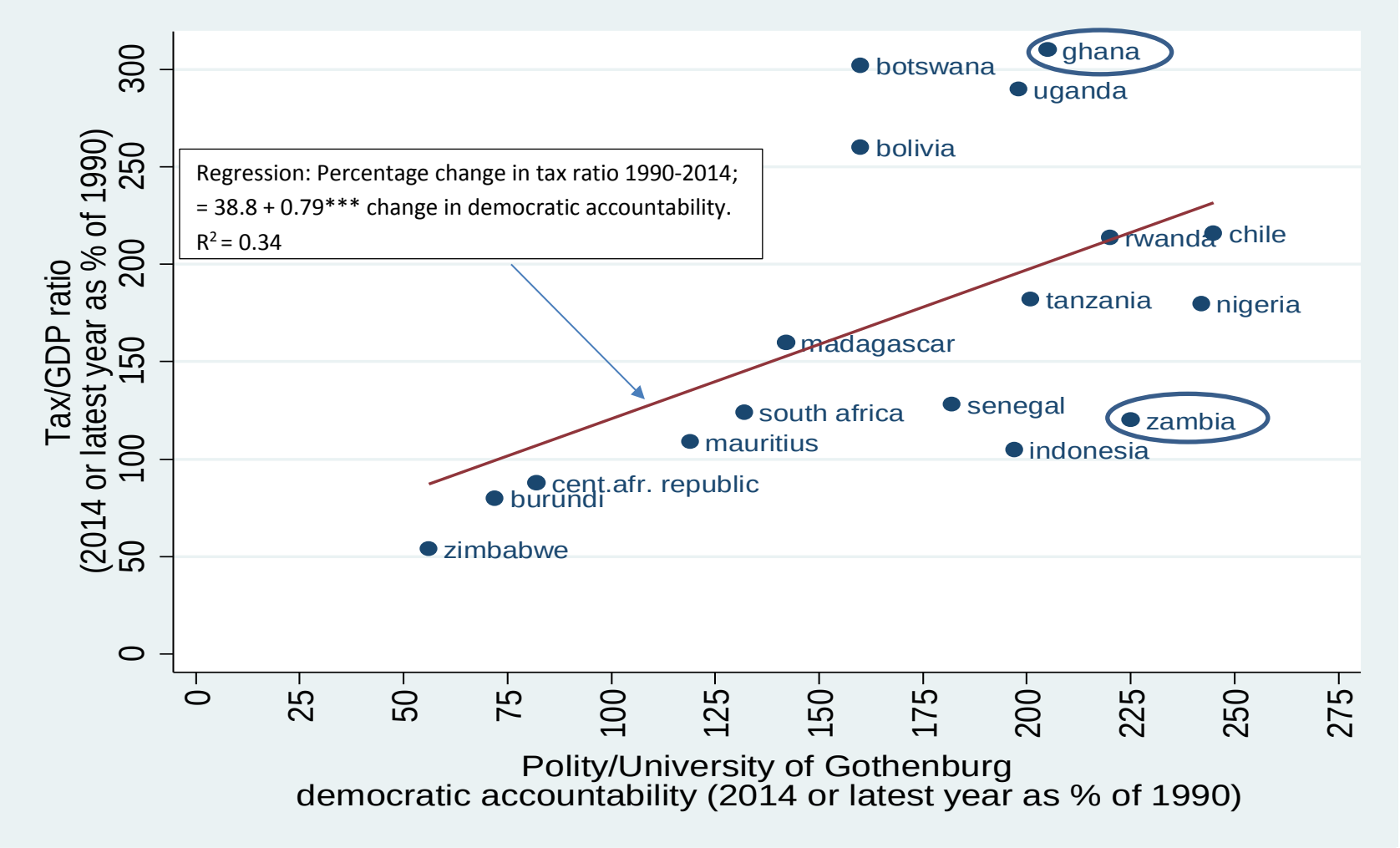
In addition, the recent literature on the emergence and effectiveness of 'fiscal contracts' suggests that, although there is clearly two-way causation at work, the sequence of causation may be evolving: according to Fjeldstad and Therkildsen, historically 'taxation contributed to political development and democratisation by catalysing "revenue bargaining", i.e. a process in which the state exchanged influence over public policy with tax revenues from citizens' *but* more recently in LDCs, and specifically in Tanzania and Uganda, 'democratisation drives tax reform – not the other way round' (Fjeldstad and Therkildsen, in Brautigam et al (eds) (2008), pp. 128-129); in this context, see also Baskavan (2014).

Our second proposition is that the likelihood of forming of a satisfactory and stable social contract between taxpayers and government depends on the establishment of *mutual trust,* or social capital, between those parties – an expectation by the government that taxes will be paid, in return for an expectation by taxpayers that the government will be trustworthy, i.e. that they in return will receive public services that will benefit them. In other words, to understand the amount of tax which is paid (the tax ratio), we have to consider factors influencing not just the size and incidence of the tax bill, but the amount and quality of public services which are provided in return, as essential elements in the fiscal social contract. Jeffrey Timmons goes further than this, insisting that 'The contemporary practice of studying spending and taxation in isolation from one another is fundamentally flawed because half of the equation (either taxes or spending) is left out of the analysis' (Timmons 2005:531).

Developing this idea, Timmons explains the growth of trust between governments and taxpayers in terms of a game between these two groups, and we build on his approach here. His model, which we present in adapted form as Table 2, is a 2x2 matrix, with both parties

having two options: the truster, or taxpayer, may either comply or not with demands to pay tax presented by the government, and the trustee, or government, may either offer public services in exchange for the tax revenue provided, or simply extort this revenue from the taxpayer, using threats or sanctions if necessary, without offering anything in return.

Figure 1: Sample of 62 less developed countries: scatterplot, tax/GDP ratio in relation to democratic accountability



Source: democratic accountability data from University of Gothenburg Quality of Government database (www. qog. pol. su.se); tax/GDP ratio from World Bank, *World Development Indicators* database. (Not all data points shown in the scatterplot).

Table 2. The generic 'taxpayer's dilemma'

		Options for government ('trustee')	
		Implement delivery of services and *'trade'* this for payments of taxes	*Coerce* the taxpayer without offering any benefits in return
Options for taxpayer ('truster')	Pay tax (*'Comply'*)	*Quadrant I* $\alpha G^* - \beta T, T - G_c$	*Quadrant II* $-\beta T, T$
	Not pay tax (*'Not comply'*)	*Quadrant III* $G^*, -G_c$	*Quadrant IV* $p(-T-S), p(T+S)-S_c$

Entries in cells are presented in the order: (taxpayer, government).
Source: adapted from Timmons(2005), figure 1, p.535. Meanings of symbols are presented both in the text and also in Table 4 below.

[G*= government expenditure, α = 'quality of government expenditure', T= tax revenue, β = disutility attached to tax payments, S=penalty paid by non-taxpayers who are 'caught', p= probability of being caught]

In Table 2, we imagine that the state is bargaining with the taxpaying population for revenue. T is the total amount of public revenue (including revenue from nontax sources such as user charges), and β is the utility(characteristically negative) attached by taxpayers to paying them; G* is the amount of government expenditure (and α is taxpayers' estimated valuation of those benefits); G_c is the cost of producing the goods and services financed by public expenditure; p is the probability that the state is able to identify and bill those who are liable to pay tax; S is the amount of the penalty imposed on defaulting taxpayers; and S_c is the cost of imposing that penalty. As Timmons (2005:537) notes, if the payoffs satisfy the conditions $\alpha G^* - T > p(-T-S) > -T$ for taxpayers and $T - G_c > p(T+S) - S_c > G_c$ for the state, the game is a prisoner's dilemma. Of course, in the conventional (one-shot) prisoner's dilemma, the equilibrium solution is in the bottom right-hand corner (quadrant IV) – in other words, no agreement or contract is reached and as a consequence, both parties are worse off than they would have been in the situation where they would have been able to communicate and bargain. In Table 2, where we set the values of the parameters at the level G*=4, T=2, G_c= α= 1, β= -1, S = -2, S_c = 0, p=0.5, the outcome of the taxpayer's dilemma is of this sort: the taxpayer's dominant strategy is always to play *Not Comply* rather than comply (since 4>2 and 0>-2) *;* the government's dominant strategy is always to play *Coerce* rather than trade services for compliance (since 2>1 and 0>-1); hence no fiscal contract materialises.

Table 3a. The 'taxpayer's dilemma': the pre-fiscal contract situation

		Options for government ('trustee')	
		Implement delivery of services and *'trade'* this for payments of taxes	*Coerce* the taxpayer without offering any benefits in return
Options for taxpayer ('truster')	Pay tax (*'Comply')*	*Quadrant I* 2,1	*Quadrant II* -2,2
	Not pay tax *('Not comply'*)	*Quadrant III* 4,-1	*Quadrant IV* 0,0

Entries in cells are presented in the order (taxpayer, government)

Note: the shaded area denotes the dominant-strategy equilibrium outcome.

However, if we imagine a reform in the tax base, for example, that it evolves from being principally based on trade taxes to being increasingly based on income and consumption taxes, such as occurred in many developing countries in the 1990s and 2000s under the impetus of economic crisis and IMF adjustment loan packages, then that can be expected, especially if accompanied by evidence of increasing social expenditure and less misuse of tax revenue, to lead to sustainably higher tax ratios and higher and better-quality public expenditure, and these can bring about a shift to the top left-hand (fiscal contract) equilibrium. If for example, we imagine that following reforms of the type described, G* increases from 4 to 6, the sanction attached to non-payment of tax (S) increases from 0 to 2, and the utilities attached by taxpayers to government expenditure (α) and payment of tax (β) move to 2 and -0.5 respectively, then the payoffs are as indicated in Table 3b, and the dominant strategy equilibrium moves towards a 'fiscal contract' in the top left-hand corner.

Table 3b. The solution to the 'taxpayer's dilemma'?: a possible post-fiscal contract equilibrium.

		Options for government ('trustee')	
		Quadrant I Implement delivery of services and *'trade'* this for payments of taxes	*Quadrant II* *Coerce* the taxpayer without offering any benefits in return
Truster (taxpayer) Options	Pay tax ('comply')	*Quadrant I* 10,3	*Quadrant II* -1, 2
	Not pay tax ('not comply')	*Quadrant III* 6, -1	*Quadrant IV* -4, -2

Entries in cells are presented in the order (taxpayer, government)

Note: the shaded area denotes the dominant-strategy equilibrium outcome (which may be interpreted as a form of fiscal contract).

For the taxpayer, compliance is now better than non-compliance whatever riposte the state makes (since 10>6 and -1 > -4) and for the state, it is now better to improve service delivery and 'trade' that for higher tax payments than to coerce (since 3>-2 and -1 <-2). Thus better service delivery, in association with changes in tax structures and democratisation, has played a key part, in this model, in incentivising trust between taxpayers and governments (Lenton and Mosley, 2011): that is, in bringing about patterns of behaviour (which we can style as fiscal contracts, even though they are most often unspoken and implicit, rather than explicit) which then make possible sustained improvements in tax ratios, in defiance of the short-term political risks associated with raising taxes especially in fragile states. Empirical evidence has gradually built up, initially for the United States (Scholz and Pinney 1995, Scholz and Lubell 1998) and more recently at micro-level for parts of Africa (Bodea and Le Bas 2013, Ali et al 2014) which suggests that taxpayers are more willing to pay taxes if they evaluate related public services as being satisfactory. Of course, 'satisfactory' is a subjective and often ambiguous term. Two of the meanings which have been attached to it relate to improved quality of outcomes (as in the case of reforms in public health services which reduce mortality rates, or educational reforms which increase pass rates in examinations) and improved breadth of coverage (as in the case of services which used to be made available to privileged social groups only and are now much more widely available), and we shall make use of the second of these meanings in our modelling below. In recent years, a number of developing-country governments, initially in Latin America but now spreading to Africa, have sought to capitalise on the second of these meanings by proposing 'fiscal contracts' which are explicit rather than implicit: e.g. tax increases which are earmarked to specific increases in expenditure which are expected to yield political benefits, often targeted on lower income groups[10]. Explicit fiscal contracts of this sort we refer to as *linked taxation*, and we discuss them further below.

In achieving this transition from deadlock without trust to a fiscal contract with mutual trust, the sequence of moves is once again important. In particular, in the game portrayed above, it is the government, which is relatively powerful and unlike taxpayers directly controls the instruments of fiscal management, which needs to make the opening move, by portraying itself through its actions as trustworthy: thus the taxpayer's dilemma is a dilemma for government also. In the example portrayed above, this opening move is executed through actions on the expenditure side, i.e. the delivery of better public services. However, it can also

[10] In a number of Latin American countries legislators have shown an increasing tendency to promise that new taxes will be committed to particular forms of social expenditure, often as a way of softening the blow. Often these commitments are purely informal, as in the case of Brazil and Chile (Barrientos 2013:192-193), but in three cases, Bolivia, Ecuador and Venezuela, the commitment is contractual (Mosley and Abdul-Gafaru 2016). In the case of Bolivia, there is evidence that two of the main social welfare payments which are earmarked to be paid out of specific tax revenues – the *Renta Dignidad*, or universal old-age pension, , and the *Bono Juancito Pinto*, an educational subsidy for lower income children, both of which are mainly financed out of taxes on oil and gas production, there is evidence that these specific tax-linked social benefits have impacted heavily and favourably on both headcount poverty and the popularity of the government (Arauco 2014). More recently, this kind of earmarking of tax revenues has spread to Africa, and in section 4 below we examine attempts to construct fiscal contracts of this kind in Ghana and Zambia.

be done by reforms on the tax side, which show that the burden of taxation is being borne more by richer than by poor people. An example of this is provided by Ghana and Uganda, both of which in the early 1990s reduced (in the case of Uganda completely removed) implicit taxes on exports of, respectively, cocoa and coffee, which fell heavily on low-income producers of crops and their employees[11]. These low-income taxpayers thus received evidence of government's commitment to a fairer distribution of the tax burden which proved an important bargaining tool in building their trust and laying the basis for future extensions of the tax base and increases in the tax ratio[12]. Other first moves are possible, including amending the structure of taxation away from consumption taxes and towards income taxes, which may be expected to make the distribution of income more progressive (di John 2006) and as we have seen in the Bolivian case above, closing tax loopholes, notably exemptions from corporate income tax enjoyed by multinational corporations.

In all of these cases, it has been argued that inequality of income and assets, especially if that can be seen as having been aggravated by tax and expenditure reforms, increases the difficulties associated with building trust between government and taxpayers and moving from a 'deadlock' (bottom left-hand corner) equilibrium, as in Table 3a, to a social contract with consensus over a higher tax ratio, as in Table 3b. The paper by Cervellati et el. (2008), which models the transition from a Hobbes-type coercive social contract to a Rousseau-type democratic social contract, formally shows that under certain conditions, as the level of inequality increases, democratisation is delayed, the absence of good institutions is prolonged and the likelihood of people freely entering into a social contract with government diminishes[13]. Income inequality, therefore, may be proposed as a third influence on the formation of fiscal contracts, alongside quality of public expenditure and democratic accountability, needing to be put to the test.

[11] In both cases, these implicit taxes arose from a government policy, imposed from the 1930s onward, of paying producers a fixed on- farm price for their deliveries of export crops, which was always less than the realised export price and in some years was as little as 10% of the export realisation. This policy and its reform are discussed further in section 4 below.

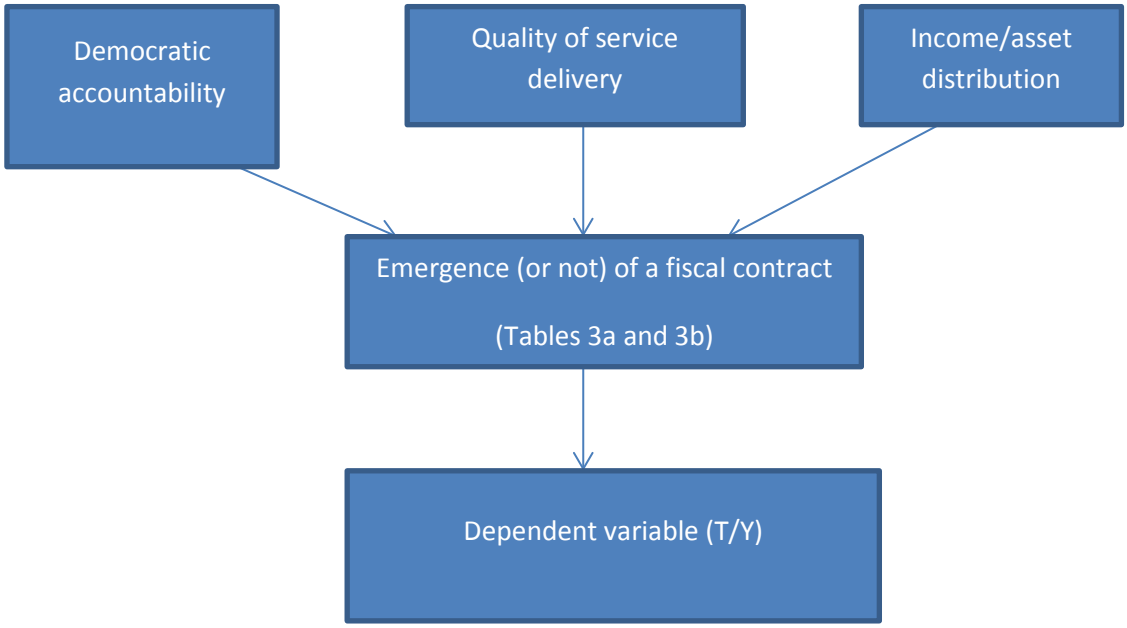
[12] It must be emphasised that especially in Ghana, the transition from a low-tax coercive equilibrium to a high-tax contractual equilibrium was not smooth. Shortly after the cuts in export taxation described, the Ghana government tried to raise VAT too fast, to 17.5% in 1995, and without sufficient explanation, and there were riots in 1995 in which several people were killed. However, the government learned from this and has extended the practice of linking tax increases to particular classes of expenditure, (as with the 'talk tax' of 2004 which was earmarked for measures to reduce unemployment, and the National Health Insurance levy of 2008). Prichard (2009:8) has described Ghana as having achieved 'the most dramatic and prolonged improvement in tax collection of any country in sub-saharan Africa (Prichard 2009:8)

[13] '(Our model shows that) a social contract can only emerge under a democratic regime if inequality is sufficiently small.' Cervellati et al.(2008): 1378. But, they emphasise, oligarchic regimes can be efficient in equilibrium since concentrating power in the hands of a rich ruling elite may represent the only available option to avoid wasteful social conflict' (*ibid.:* 1355). The second of these findings recalls Rousseau's appeal for an enlightened oligarch who would act in the interests of the general will, but would avoid the use of coercive power. The words 'social contract' (rather than 'fiscal contract') in the above should be noted; the authors are concerned with the formation of contractual relationships encompassing the state as a whole, rather than simply the fiscal policy variables with which we are concerned.

2. Empirical strategy

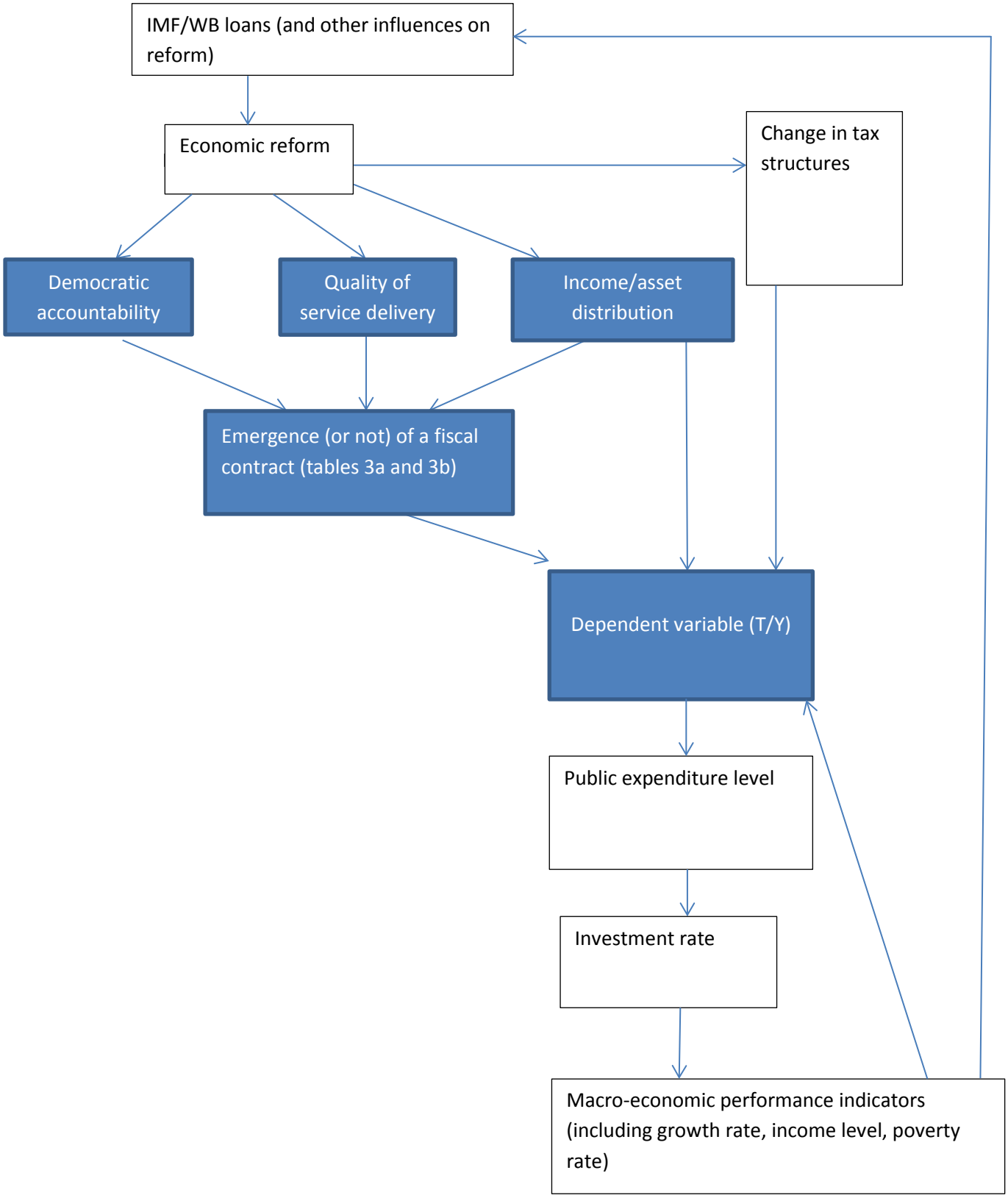
Our argument so far has been that improvements in democratic accountability, in the ability of governments to deliver services to taxpayers (G*, in the prisoner's dilemma model above) and in the equity of distribution of income and assets are likely to facilitate the establishment of a stable 'fiscal contract' in which the tax base is broadened and, thereby the tax ratio is raised in a way that makes the provision of developmental services possible. Thus, the core of our explanatory story is:

Figure 2a: The core model



This is our starting point, which defines the variables whose influence on tax ratios we need to explore. However, to convert this basic story into a formulation which will give us a picture of how governance impacts on tax ratios, we need to bring into the story, as controls, those influences which have long been recognised as impacting on tax yields, such as the composition of taxation and the state of the macro-economy. We also need to acknowledge the simultaneities in the system, notably the fact that all of the main independent variables in figure 2a – democratic accountability, income distribution and quality of service delivery – are determined by fiscal and other policies, which in less developed countries the IMF and other international financial institutions including aid agencies will at least attempt to influence. Relatedly, some of the main variables in the system are endogenous: in particular, the justification for seeking to improve tax performance is that it will improve the developmental performance of public expenditure, which will in turn influence the growth rate, which will impact back on, in particular, the behaviour of the international financial institutions and their aid flows (and reform recommendations) to developing countries. If we feed these ideas into the core model, we derive the expanded model depicted as Figure 2b:

Figure 2b: The extended model, incorporating simultaneities and control variables.



Note: the blue-shaded boxes represent the 'core model' of figure 2a.

The core model (figure 2a) may be represented as a single equation, which will be estimated by OLS:

$$T/Y = a_1DA + a_2IPE + a_3GINI + a_4(T_a/T) + a_5(\text{inflation rate}) \quad (1)$$

where:

T = total government revenue, including elements of revenue not typically classified as taxes such as user charges, tolls, school fees levied by government, etc.;

T_a =value of tax revenue derived from duties imposed on agricultural exports and imports:

Y= GDP at constant 2000 prices;

Inflation rate = percentage rate of change of retail prices;

DA=democratic accountability measure. This is the measure of institutionalised accountability (p_democ) produced by the Polity index (Teorell et al. 2009:54) and is derived as an aggregate of Polity's measures of competitiveness of political participation, openness and competitiveness of executive recruitment, and constraints on the president or chief governmental executive. Note that data on civil liberties are not included in this measure.

IPE = indicator of effectiveness or impact of public expenditure. As an indicator of the effectiveness of public expenditure, we use the share of public expenditure spent on human capital (health and education), which we interpret as a measure of the productivity of the social wage, following the approach taken in Mosley(2015). This indicator is derived from the approach of new growth theory, in which expenditures which create new knowledge, notably health and education, make an additional contribution to growth (Romer 1986, Levine and Renelt 1992 , Hendry and Krolzig 2004) because they impact both on GDP and on the growth of productivity, and thus exhibit increasing returns. For this reason, as noted above, many social protection schemes throughout the developing world have been made conditional on 'increased effectiveness of spending' in precisely this sense (Barrientos 2013, etc).

GINI = Gini coefficient of inequality;

The extended model (figure 2b) may be represented as a simultaneous five-equation model, to be estimated by instrumental-variables methods (3SLS in Tables 5 and 6 below) to take note of the simultaneities in the system.

The first equation is simply the core model:

$$T/Y = a_1DA + a_2IPE + a_3GINI + a_4(T_a/T) + a_5(\text{inflation rate}) \quad (1)$$

The second equation estimates the impact of tax effort on public expenditure:

$$G^*/Y = a_6(T/Y) + \text{controls} \quad (2)$$

where G* = total government expenditure;

The third equation estimates the effort of public expenditure on the ratio of investment to income, I/Y:

$$I/Y = a_7(I/Y) + \text{controls} \quad (3)$$

The fourth equation estimates the impact of investment and other standard 'new growth theory' variables (including educational enrolment rates, PENROL and SENROL, and base-year income $GNIPK_{1988}$), the real exchange rate as a measure of competitiveness, and aid flows) on growth:

$$GDPG = a_8(I/Y) + a_9(\text{PENROL and/or SENROL}) + a_{10}(GNIPK_{1980})$$

$$+a_{11}RER + a_{12}(A/Y) \quad (4)$$

Where PENROL = primary school enrolment rate,

SENROL = secondary school enrolment rate,

$GNIPK_{1980}$ = per capita national income at 1980 prices,

RER = real exchange rate,

A/Y = aid disbursements as a proportion of GNP;

$$A/Y = a_{12}(GNIPK_{1980}) + a_{13}(POP) \quad (5)$$

where POP is population size, and both it and base-year income, $GNIPK_{1980}$ are of course exogenous with respect to growth of income.

Table 4. Notation

Symbol	**Meaning**	**Source** (if included in empirical estimation)
T	Total public revenue (including revenue from nontax sources such as user charges)	IMF, *International Finance Statistics*
T_a	Value of public revenue derived from taxes on exports or imports of agricultural commodities	IMF, *Government Expenditure Statistics Yearbook*
B	Disutility attached to payment of tax by taxpayers	
G*	Total government expenditure	IMF, *Government Expenditure Statistics Yearbook*

G_c	Cost of goods and services financed by public expenditure	
IPE	Effectiveness (impact) of public expenditure' (here defined as share of health and education expenditures in total expenditure)	IMF, *Government Expenditure Statistics*
GINI	Gini coefficient of inequality	World Bank, *World Development Indicators*
A	Taxpayers' valuation of benefits from government expenditure	
S	Penalty (e.g. fine) imposed on defaulting taxpayers	
S_c	Cost (to exchequer) of penalty imposed on defaulting taxpayers	
I	Gross investment expenditure	World Bank, *World Development Indicators*
Y	GNP at constant 2000 prices	World Bank, *World Development Indicators*
$GNIPK_{1980}$	GNP per capita in 1980	World Bank, *World Development Indicators*
DA	Democratic accountability: indicator of extent of democratic decision-making within government	World Bank/University of Gothenburg Quality of Government database (www.qog.gu.se)
INFL	Inflation rate	World Bank, *World Development Indicators*
RER	Real exchange rate	World Bank, *World Development Indicators*
PENROL	Primary school enrolment rate	World Bank, *World Development Indicators*
SENROL	Secondary school enrolment rate	World Bank, *World Development Indicators*
POP	Population	World Bank, *World Development Indicators*

3. Results: quantitative

We analyse the two models described above by regression methods: the model of figure 2a (equation (1)) as a single equation by ordinary least squares and the model of figure 2b (equations (1) through (5)) as a simultaneous system by instrumental variables (3SLS) methods against a sample of 62 less developed countries between 1980 and 2008. The results are presented in Table 5. From both the OLS and the 3SLS analysis, the trust, or effectiveness of public expenditure variable (IPE) and the democratic accountability variable (demacc), but

not the Gini coefficient of inequality or either of our controls, inflation and the ratio of agricultural taxes to GDP[14], emerge as significant correlates of the tax ratio. In the instrumental- variables analysis, public expenditure, and thence investment, are significantly correlated with the tax ratio, and this then has a significant influence on investment and growth, suggesting support for the idea of the tax ratio as a driver of growth indicated above. The Sargan-tests suggest that none of the five equations in the instrumental-variables analysis suffers from over-identification biases. Therefore, although the Gini coefficient of inequality has often been treated as a likely influence on tax ratios and indeed has been reported as a significant influence in several regressions,[15] it plays no further part in our analysis.

It will be useful to explore whether the results presented in Table 5 can be seen as a chain of causation, as in Figure 3b, in which the formation of a 'fiscal contract' makes possible the building of a fiscal foundation in defiance of the political risks associated with a higher tax ratio. Therefore, in equation (1) of Table 6, we lag by one year the offer of improved services by government (modelled here as the share of health and education in total government spending, IPE) on the response of a higher tax ratio - the process which unlocked the door to a fiscal contract, or 'top left-hand corner equilibrium' in the prisoner's dilemma model of table 3b above. We also allow, as is realistic, a lag between the paying in of higher tax payments and increases in total government expenditure. With this change, the goodness of fit (r^2 and t-statistic) of equations 1 and 2 in the 3SLS estimations improve further (as shown by table 6). This suggests that the correlations between governance variables, tax ratios, expenditure ratios and the macro-economy hypothesised in Table 5 do indeed indicate the presence of causal processes underlying the formation of fiscal contracts and their consequences. However, the assumption of one-period lags made in Table 5 is somewhat arbitrary, and we discuss the underlying processes of causation in more detail in the next section.

Table 5. Possible drivers of the tax ratio: regressions

[14] This unexpected negative measured impact of agricultural taxation reflects(we believe) the conflicting pull of two influences: (1) in the long run (too long a run to be captured by these regressions) a shift from trade taxation to sales and income taxation enables a shift to more buoyant tax bases, but (2) it takes time to replace old and saturated tax bases with buoyant new ones, so that in the short run, 'the replacement of trade taxes by VAT has resulted in significant losses of revenue for the governments of the poorest countries' (Fjeldstad and Moore 2008:239, drawing on Baunsgaard and Keen 2005)

[15] For example, Bird et al (2004) (reference 19 in the Appendix), Cyan et al(2013) (reference 28) and Fenocchietto and Pessino(2013) all report a significant impact of the Gini coefficient of inequality in their regressions.

Estimation Method	**OLS**	**3SLS**				
Equation	(1)	(1)	(2)	(3)	(4)	(5)
Dependent variable	Tax ratio(T/Y)	Tax ratio(T/Y)	Public expenditure (G*)	Total investment as percentage of GDP(I/Y)	GDP growth(GDPG)	Aid/GDP (A/Y)
Regression Coefficients on independent variables:						
Constant	5.51*** (3.38)	6.84*** (5.30)	2.07* (1.66)	17.26*** (13.67)	-2.02 (1.44)	41.64*** (10.78)
Democratic accountability(DEMACC)	0.47** (2.04)	0.36* (1.79)				
Effectiveness of public spending/share of health and education in total government spending(IPE)	0.75*** (7.66)	0.73*** (9.51)				
Gini coefficient of income inequality(GINI)	0.03 (1.15)	0.005 (0.24)				
Tax ratio(T/Y)			1.35*** (15.36)			
Share of commodity taxes in total tax revenue(T_a/T)	0.017 (0.59)					
Public expenditure (G*)				0.15*** (2.61)		
Inflation rate(INFL)	0.0007 (0.12)	0.0002 (0.45)			-0.001** (2.18)	
Total investment(I/Y)					0.37*** (5.02)	
Trade openness score					-0.02*** (2.78)	
GNP per capita in 1988($GNIPK_{1988}$)					-0.0004 (1.08)	-0.005 (1.39)
Aid/GNP					0.011 (0.35)	
Population						-0.047*** (5.94)
'r^2'	0.25	0.29	0.36	0.04	0.24	0.09
Prob>F	0.0000	0.0000	0.0000	0.0090	0.0000	0.0000
Sargan overid test: Score (chi-square) (p-value)		2.1669 0.1410	2.4334 0.1188	3.4178 0.0645	3.1618 0.0754	0.1253 0.7233
Number of observations	257	288	288	288	288	288

Sample: Data for the years 1984-2008 for 62 countries (listed in Appendix 2). *Sources:* principally from IMF *Government Expenditure Statistics* and World Bank *World Development Indicators* for 1980-2008; for further detail see Table 4 above. ***/**/* indicates statistical significance at the 1%/5%/10% level.

Table 6 Tax ratio regressions (3SLS), embodying lags between expenditure quality, tax ratios and expenditure ratios.

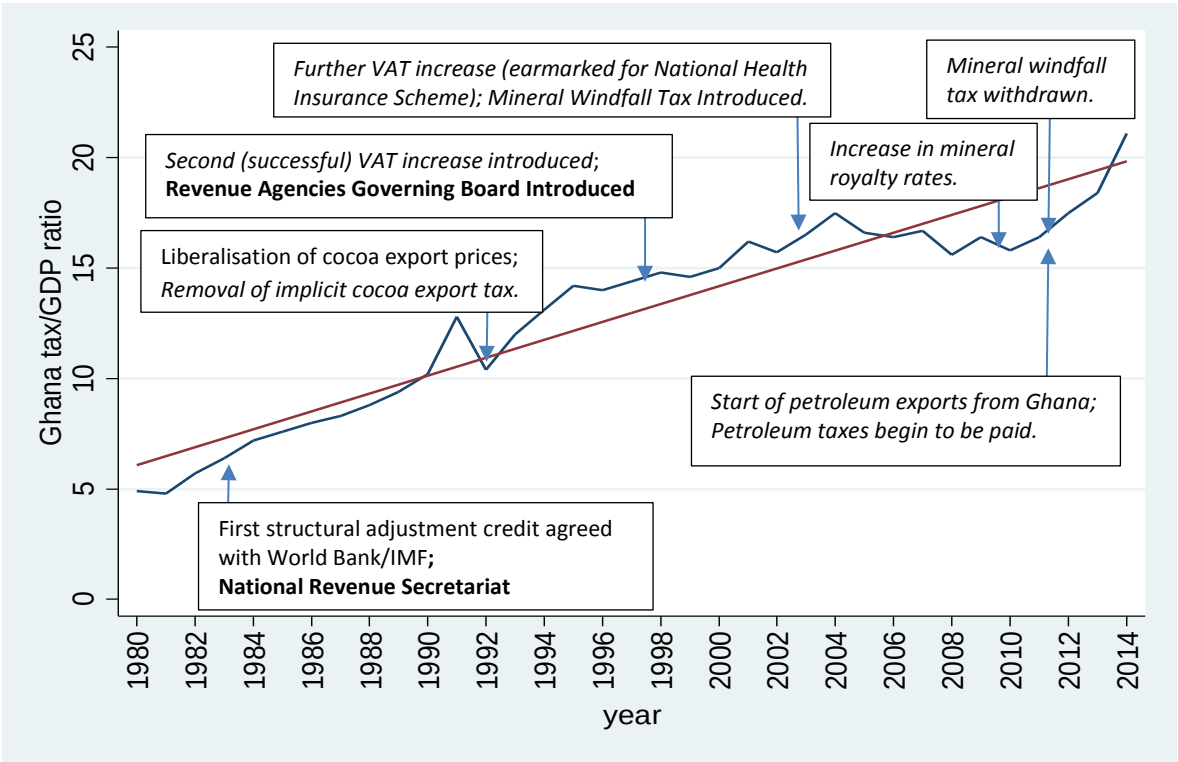
Estimation Method	**3SLS**				
Equation	(1)	(2)	(3)	(4)	(5)
Dependent variable	Tax ratio(T/Y)	Public expenditure (G*)	Total investment as percentage of GDP(I/Y)	GDP growth	Aid/GDP
Regression coefficients on independent variables:					
Constant	5.41*** (3.96)	6.31*** (7.48)	19.34*** (17.29)	-2.32* (1.63)	42.18*** (11.54)
Democratic accountability(demacc)	0.51** (2.40)				
Effectiveness of public spending(ipe) *lagged one period*	0.73*** (9.26)				
Gini coefficient of income inequality(Gini)	0.025 (0.96)				
Tax ratio(T/Y) *lagged one period*		1.02*** (18.17)			
Share of trade taxes in total tax revenue					
Public expenditure (G*)			0.055 (1.06)		
Inflation rate(INFL)	0.007 (0.79)			-0.012* (1.72)	
Total investment(I/Y)				0.39*** (5.39)	
Trade openness score				-0.025*** (3.02)	
GNP per capita in 1988				-0.0003 (0.82)	-0.005* (1.72)
Aid/GNP				0.014 (0.46)	
Population					-0.045*** (6.28)
'r^2'	0.29	0.49	0.04	0.23	0.11
Prob>F	0.0000	0.0000	0.2870	0.0000	0.0000
Sargan overidentification test:					
Score (chi-square)	0.0004	1.0185	0.8471	3.1618	0.1253
(p-value)	0.9830	0.3129	0.3574	0.0754	0.7233
Number of observations	275	275	275	275	275

Sources: principally from IMF *Government Expenditure Statistics* and World Bank *World Development Indicators* for 1980-2008; for further detail see Table 4 above. *Notes:****/**/* indicates statistical significance at the 1%/5%/10% level.

4. Results: qualitative. A case study of Ghana and Zambia

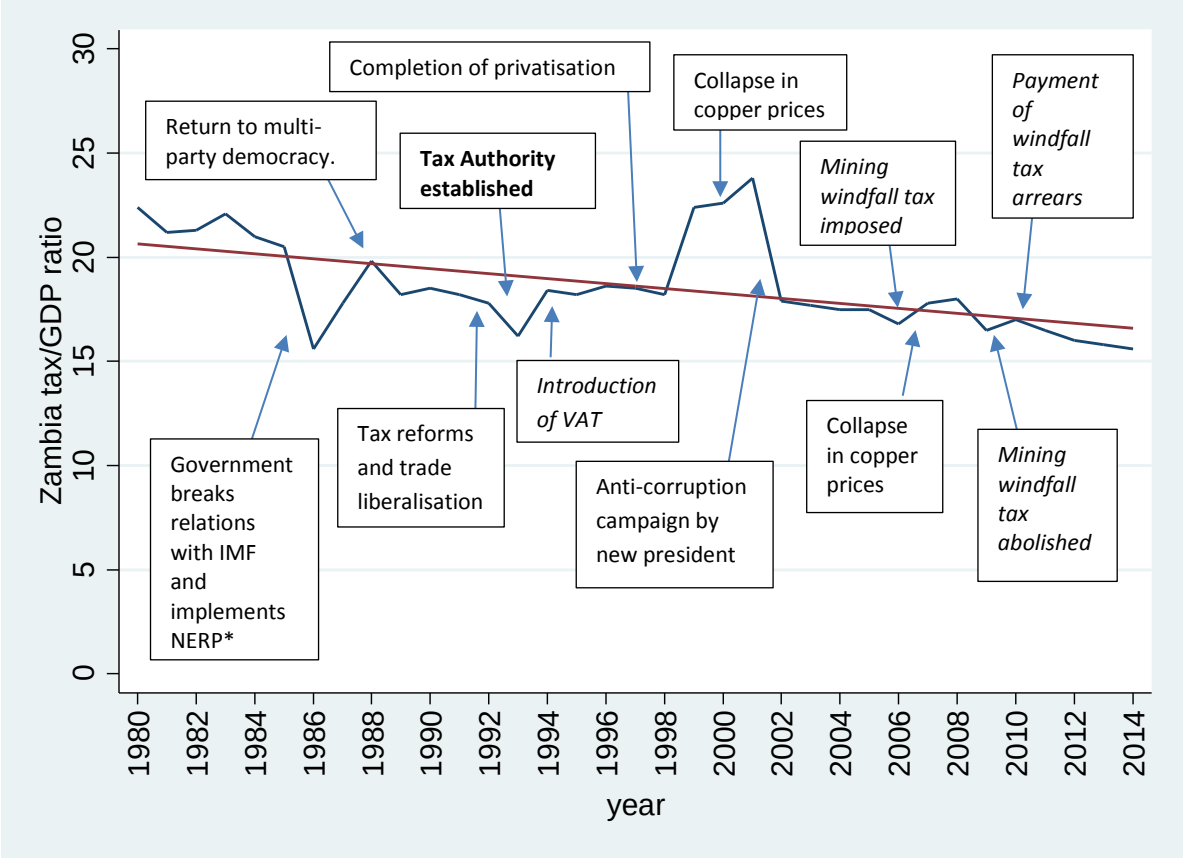
We can better understand the causal processes underlying the development of tax capacity by examining two country cases. Ghana and Zambia both fall in the middle of the income range covered by our sample countries, with per capita incomes between $1200 and $1800 during the 2000s; both are mineral-exporting economies; and in terms of democratisation, one of the key drivers of tax ratios according to our analysis, both have experienced a similar progression, with Ghana's military-authoritarian regime of the 1970s and Zambia's dominant-party government of the 1990s having given way to multi-party democracy. Both countries, moreover, introduced independent revenue authorities early in the reform process which followed the global crisis of the 1980s (Ghana in 1983 and Zambia in 1991). However, the evolution of the two countries' tax performance has been very different, as shown by the two contrasted parts of Figure 3: Ghana's tax ratio, between 1980 and 2014, rose from just under 5% to 20%, a process which Prichard described as 'the most dramatic, and prolonged, improvement of any country in Africa' (Prichard 2009:8), whereas Zambia's, in spite of the favourable political environment, fell during the same period from 22% to 17%, and appears, it will be recalled, as a 'negative outlier' on Figure 1 which plots the relationship between democratic accountability and fiscal performance: tax effort here has deteriorated in spite of liberalisation, the spread of democratic practice, and the establishment of an independent tax authority. Why this difference?

Figure 3(a) Ghana: Chronology of tax ratio changes



Source: IMF, *Government Expenditure Statistics Yearbooks.*
Notes: Entries in italics (bold) represent tax changes (changes in the regulatory regime).

Figure 3(b) Zambia: chronology of tax ratio changes



Source: Masiye (2016)

Notes: *NERP= National Economic Recovery Programme.

Entries in italic (bold) represent tax changes (changes in the regulatory regime).

We suggest that the divergence is largely due to two factors of great importance to the two countries' political economies: Ghana, unlike Zambia, had a politically potent smallholder export sector and Ghana, unlike Zambia, achieved a close working relationship with the IMF and other key aid donors. These differences, we shall argue, fed directly into the evolution of the fiscal contracts which emerged in the two countries.

Ghana's exports of cocoa, and to a lesser extent other tropical export crops such as pineapple, have since early colonial times been the mainstay of the economy alongside gold and other minerals, by contrast with Zambia which since the 1920s has been wholly mineral-dependent. From 1930 until 1992, however, lacking a political leverage corresponding to their economic contribution[16], Ghanaian cocoa producers were subjected to an implicit tax, at a rate varying between 30% and 90%, consisting of the difference between the export price of

[16] There is one exception to this tendency: between 1969 and 1972 Kofi Busia's National Liberation Congress, whose elite was dominated by representatives from Ashanti, the main cocoa-growing area, did win power and attempt to roll back the implicit cocoa export tax: but they were forced out of power by a military coup before they were able to make any progress with repealing export taxes.

cocoa and the price paid to cocoa farmers[17]. This 'cocoa industry development fund', as it was formally known, thus became a key element in Ghana's public revenue, which has no parallel in Zambia, where public revenue is and has always been composed less of commodity taxes and much more of taxes on sales and personal income[18].

Both economies were hit hard by the global depression of the 1980s, and by the consequent collapse of commodity prices and foreign investment. Ghana, however, was much the quicker of the two administrations to acknowledge its dependence on, and form working relationships (ESAFs) with, the aid donors: in particular, it had accepted by the mid-1980s that priority that needed to be given to the restoration of foreign investment and liberalisation, whereas Zambia continued until almost the millennium to cling to the idea of state participation in strategic industries including mining[19]. Even more importantly, Ghana embraced with much more conviction than Zambia the pro-poor, redistributive rhetoric emanating from the international development agencies and embodied in the Multilateral, later Millennium, Development Goals and their associated apparatus of Enhanced Structural Adjustment Facilities (ESAFs), which eventually morphed into Poverty Reduction Strategies, because it was ahead of the game in being able to foresee the political and fiscal advantages which might flow from broader-based development.

A crucial milestone in cementing the Ghana government's alliance with both cocoa producers and aid donors was the liberalisation of cocoa marketing in 1992. This reform removed the implicit export tax on cocoa, gave approximately half of it back to cocoa producers[20] and channelled the remaining half into programmes of subsidy and technical development programmes designed to increase the productivity and competitiveness of the cocoa industry. The impacts even of the half which was distributed to cocoa producers were very widely diffused, since cocoa is a labour-intensive crop grown by small as well as large farmers, and account for a substantial part of Ghana's achievement in halving poverty between 1990 and 2014, and substantially reducing inequality (by contrast, in Zambia, poverty scarcely changed over this twenty-five year period, and inequality has risen slightly)[21].

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[17] Data illustrating the gap between the on-farm price and the export realisation from the 1950s through the 1980s is provided by Bates (1981), appendix B.

[18] The ratio of commodity taxes to total tax revenue in Ghana is estimated at 30-35% in the 1980s, falling to between 15 and 20% by 2005-10; in Zambia, it is estimated at 25-30% in the 1980s, falling to just under 10% between 2005-10 (source: IMF, *International Financial Statistics*)

[19] In Ghana the ratio of aid to GNP was around 13% in the first half of the 1990s, rising to around 21% in the first half of the 2000s; in Zambia the ratio was around 10% in the first half of the 1990s, rising to 16% in the first half of the 2000s; in both countries, the aid-to-GNP ratio has fallen back into single figures since the beginning of the present decade under the impetus of economic growth. However, the key difference between the aid relationships of the two countries resides not in these numbers, but rather in the quality of the relationship (and in particular the poverty reduction commitment of the Ghana government), which made possible the exchange of ideas on tax reform (for example concerning 'linked taxation', user charges, and the taxation of the informal sector), on a scale which did not occur in Zambia.

[20] The proportion of the export price received by Ghanaian cocoa growers rose to 58% in 1992, fell to around half in the mid 1990s and rose again to 60% during the early 2000s. See Mosley(2012) figure 5.2.

[21] In Ghana, headcount poverty across the country as a whole fell from 51% to 24% between 1990 and 2014, according to successive reports of *Ghana Living Standards Surveys*, and the Gini coefficient of inequality has

They were also important fiscally, because, by cutting taxes on a large and politically outspoken section of the population, in combination with the aid-led structural shift of public expenditure into health, education, agricultural extension and rural infrastructure (which raised the pro-poor expenditure ratio from around 5% to around 35% between 1990 and 2014 ; see table 7) they provided the government of Ghana, as already mentioned, with an eloquent down payment towards the formation of an equitable fiscal contract. Both the shift towards pro-poor human capital expenditure and even the formal part of the fiscal contract, the earmarking of particular taxes to particular expenditure headings, were, for a period, emulated by the Zambia government also, but with less conviction, less effective publicity and less impact[22].

However, the importance of smallholder exports (in Ghana, by the cocoa industry) goes beyond their fiscal role. Once liberalised, the Ghana cocoa industry was able to assert itself as a key player in political debate, and began to use its muscle to countervail the policies of 'urban bias' (i.e. cheap food and cheap inputs, in the interests of importers, especially multinational companies) which had afflicted Ghana, Zambia and most other African countries since colonial times. In particular, the previous pattern of a state dominated by rent-seekers, able to insist on cheap-input policies in return for the provision of support to the government, was replaced by a 'strategic alliance' in which both cocoa exporters and government jointly agreed, as the outcome of a bargaining process, that they have more to gain than to lose by the preservation of free-market policies in specific markets, including most particularly the preservation of a competitive real exchange rate[23], in defiance of the wish of importers and rent-seekers for a higher exchange rate and lower input prices. As Table

fallen from 45% to 33%. In Zambia, the national poverty headcount rate has been static at just over 60% from 1990 to the early 2000s (Data published in April 2016 by the Central Statistical Office suggest that national headcount poverty in 2015 may have fallen to 54%, but these data are apparently contradicted by rural poverty data from the Indaba Agricultural Policy Research Unit(IAPRI), see Mosley(2017 forthcoming), notes to table 4.4, page 118.) The Gini coefficient has risen slightly since 1990 from 61% to 64%, see Table 7 below.

[22] Zambia increased the share of its public expenditure devoted to health and education from 24% to 34% between 1990 and 2014, by comparison with Ghana's increase of that percentage from 5% to 35% over the same period (see Table 7 below). Ghana, as described earlier, committed monies derived from increases in VAT in 2000 and 2003 to the Ghana Education Trust and the national health insurance scheme respectively; it also applied the same principle to a 'talk tax' on mobile phone calls, earmarked to expenditures for the reduction of youth unemployment. All of these measures can be seen as attempts to make the fiscal contract between taxpayers and government explicit. Zambia also attempted this kind of earmarking with respect to mineral taxation in 2008, when a windfall tax on copper was earmarked to be spent one-half on health and education in the poorer districts of Zambia, and one-half on local councils. This tax was however dropped in 2009, and in spite of governments that it was being reintroduced in 2011, there has been no sign of this being implemented.

[23] Our argument concerning the determination of policy in Ghana is inspired by Kang (2002), who explains the economic success of South Korea in the last quarter of the twentieth century, by contrast with the Philippines, in terms of a politics in which business and government were equally matched, rather than government being overwhelmed by the pressure of rent-seekers, leading to the preservation of openness in key markets, especially the market for foreign exchange. In Zambia, by contrast with Ghana, there has never existed any interest group with the political muscle to force government to keep the real interest rate competitive in defiance of the pressures of rent-seekers, although signs are emerging that Chinese firms in the manufacturing and construction industries are beginning to exercise pressures of this sort: see Hinfelaar and Achberger(2015:12-13)

7 shows, the Ghanaian real exchange rate has depreciated steadily since the reforms of the 1990s, thereby boosting exports and their diversification[24], the growth rate and, eventually, tax revenue. By contrast, as may be seen in the same table, the Zambian real exchange rate has gone in the opposite direction, and hence growth and tax revenue have been *pro tanto* lower. Fundamentally, this is because the Zambian government is not confronted by any interlocutor as powerful as the Ghanaian cocoa producers' lobby to restrain it from policies of urban bias, and in particular from policies of pegging the exchange rate and other key prices. In the absence of such restraints, exchange controls have been reintroduced in Zambia (in 2013), accompanied by other policies in restraint of free trade, such as controls on the export of maize. An additional lesson which we learn from these case-studies is that political pressure to maintain urban bias, when surrendered to, generates upward pressures on the real exchange rate which damage competitiveness[25]; and if these pressures can be countervailed, as they have been in Ghana, that will impact on the growth and thus the tax-earning potential of the economy.

Our story so far, then (see Table 7), is that the superior tax performance of Ghana in relation to Zambia is partly owing to causes already discussed, including the trend towards providing a better quality of public expenditure as a down-payment towards a durable fiscal contract, but also due to more fundamental factors not so far incorporated in the model, in particular the bargaining relationship between government and private interests (especially exporters) and its implications for the real exchange rate and competitiveness. However, there are two elements in this story which need closer attention.

Table 7. Ghana and Zambia: comparative trends 1990-2014

	Ghana	**Zambia**

[24] As shown in Table 7, the Ghana real exchange rate, setting 1990 at 100, has depreciated to 186, whereas the Zambian RER, using the same measure, has risen from 100 to 79.

[25] If equation (3) in table 5 (and figure 2b) is amended to incorporate the real exchange rate on the right-hand side, the estimated equation, within that five-equation model, becomes:

GDP growth =-1.05 + 0.13**public expenditure/GDP ratio +0.47***public investment/GDP ratio
(0.73) (2.19) (7.38)
-0.029**primary school enrolment rate +0.0003**real effective exchange rate -0.00008$GNIPK_{1980}$, obs=143,
(2.46) (2.01) (0.12)
r^2=0.23. Figures in parentheses beneath coefficients are Student's t-statistics.(Note that the real exchange rate in this formulation is the number of dollars that can be exchanged for a unit of local currency, in other words an increase in this number implies a depreciation of the real exchange rate.)

Tax ratio, 1990-2014	11 → 21	21 → 18
Governance: **Democratic accountability, 1990 versus 2014:** **Polity score**(p_democ) **Narrative**	2 → 5 Multi-party democracy since 1992	2 → 4.5 Dominant party (Movement for Multi-party Democracy) 1990-2005; multi-party democracy since 2005
Tax structure: **Revenue authorities**	Ghana National Revenue Secretariat established 1983, converted into Revenue Agencies Governing Board 1998	Zambia Revenue Authority established 1991
Tax exemptions	None, but two larger mining corporations (Newmont and Anglo Gold) pay lower rates of royalty	Multiple: Only two mining corporations (Kansanshi and Lumwana) pay corporate income tax
Public expenditure: **Pro-poor expenditure/effectiveness of public spending, 1990 versus 2014:**	4.7 → 35.0	24.3 → 36.9(2008) ~~34.0~~(2014)
Macro-economic environment: **Real exchange rate(1990=100)***	186	79
Gini coefficient of income inequality	45 → 33	61 → 64

*Our measure of the real exchange rate denotes the amount of foreign currency that can be exchanged for a US dollar: therefore it increases as the real exchange rate depreciates.

The first of these is the implementation of tax policies and their visibility, in particular towards the corporate sector. We shall focus on mining tax policies.

In both Ghana and Zambia, governments have followed broadly similar policies of increases in the standard rates of corporation tax and royalty during the boom years (2003-08), accompanied by flirtations with windfall taxes, 'linked' as earlier described to specific items of public expenditure. These tax increases are integrally linked with the consolidation of democratic governance: when the Ashanti-dominated National Patriotic Party, the successor to Busia's National Democratic Council of the late 1960s, took over the government of Ghana in 2000 it immediately brought in a windfall profits tax on mining in order to shift the burden of taxation off the shoulders of rural businesses (and cocoa in particular) on to mining, and when the Zambian Movement for Multiparty Democracy(MMD) which previously

had enjoyed dominant party status, started to experience serious competition from the rival Patriotic Front (PF), it too used a windfall profits tax in order to counteract the PF's increasingly powerful argument that the privileges of the multinational mining corporations needed to be restrained in favour of a fairer deal for the economically insecure (Cheeseman and Hinfelaar, 2009).

What is crucial, however, is that whereas in Ghana all companies paid corporation tax (albeit with concessions for the largest producers, Newmont and Anglo Gold) in Zambia, only two mining companies, First Quantum(at Kansanshi) and Barrick Gold Mining (at Lumwana) ever paid income tax[26] . This fact has become widely known and has begun to infect the political debate. Not only has it impaired the ability of the Zambian government to motivate compliance with the current fiscal contract, as in the Bolivian case previously discussed[27]; it has also caused NORAD (the Norwegian international development authority), the donor agency most concerned with the mining industry, having failed to persuade the Zambian ministry of finance after much pressure to enforce credible mineral taxation policies, to withdraw from Zambia in mid-2015[28]. The consultants appointed to review Zambia's mineral policies had previously reported that 'the government revenue instruments for mining developed for Zambia…failed by a large margin to deliver what could be considered an effective 'benefit sharing' of revenues' (Lundstöl 2014:1). In other words, observed tax compliance especially in relation to high-profile taxpayers, and not only advertised tax rates and bases, are crucial for determining trust, and thence trusters' (i.e. taxpayers'), willingness to participate in fiscal contracts.

The second issue requiring further discussion is the role of regulatory bodies, i.e. autonomous revenue authorities such as the Zambia Revenue Authority (ZRA) and Revenue Authorities Governing Body (RAGB) in Ghana. Since the beginning of the structural adjustment process in the 1980s, it has been an axiom of reformers – and the IMF in particular – that the office responsible for revenue collection needs to be uncoupled from the national ministry of finance, and the apparatus of central government more generally, in order to prevent privileged taxpayers from making corrupt deals with central government staff which breach the tax code. Autonomous revenue authorities have been the main focus for the reform efforts of aid agencies and IFIs, and independent revenue authorities have sprung up all over Africa and Latin America[25]. Ghana was very early in accepting this prompt from the international funding agencies: in 1983, in the early reform period before the advent of democracy, it established a semi-autonomous National Revenue Secretariat (NRS) , including a new Minister of National Revenue, to oversee the newly formed IRS (Internal Revenue Service) and CEPS (Customs, Excise and Preventive Services), 'each of which were granted

[26] Lundstöl et al. (2013), pp24-31 and especially graph 4.4 on page 24.
[27] See passage keyed by note 5, page 3 above.
[28] *Zambia Weekly,* 15 June 2015.
[25] For a discussion of the influence of autonomous revenue authorities in Africa see Ayee and Joshi(2009) and for Latin America see Bergman(2003).

greater autonomy from the main civil service, including salary flexibility' (Prichard 2009: 19, drawing on Osei and Quartey 2005). In 1998, a Revenue Agencies Governing Board (RAGB) provided a mechanism for integrating the work of these authorities, which was eventually amalgamated into an over-arching Ghana Revenue Authority. Zambia eventually followed suit, establishing the Zambia Revenue Authority in 1991.

It might be expected that these independent revenue authorities would have exercised a significant impact on tax collections, and in the case of Ghana such an independent impact has been asserted by Chand and Moene (1999), who insist that the increase in Ghana's tax ratio from 4% to 17% between 1983 and 1994 was largely due to reforms in tax administration. However, there is no evidence of the Zambia Revenue Authority having had a similar impact, as by contrast with the Ghanaian case the trend of tax ratios has been downward since the ZRA was established (as shown by figure 3b). Two more fundamental problems raised by Fjeldstad and Moore (2008) are that autonomous revenue authorities are in fact, not at all homogeneous, and that they may not function in the impartial manner visualised by donors because in some cases ' the label "autonomy" has disguised the fact that they have been answerable to only one person, the president' (Fjeldstad and Moore 2008: 251). Taking together these two problems, they conclude that 'there is little sign that the creation of revenue agencies has increased public revenues' (Masiye, 2016: 10, drawing on Fjeldstad and Moore). Cross-section regressions conducted by Mike Masiye on a more recent dataset than that used by Fjeldstad and Moore suggest, however, that their conclusion may be over-pessimistic, and that a significant impact of independent revenue authorities on tax ratios is observable across LDCs as a whole (Masiye, 2016: see both fixed-effects and random-effects regressions). Thus, although there are strong *a priori* reasons for casting doubt on autonomous revenue authorities as a panacea for improving revenue performance, there is currently unresolved controversy concerning their true impact.

5. Conclusions and next steps

We have tried to find out what kind of institutions and policies can be expected to encourage the construction of a tax base capable of providing an impulse to development, even in the poorest countries, even in fragile states where any extension in taxation is politically risky. Starting from Rousseau's idea that increased democratic accountability, in the form of a fiscal 'social contract', will be good for effective tax collection and thence state-building, we also argue, in common with a number of recent empirical findings, that a 'fiscal contract' between taxpayers and government (much of it consisting of implicit understandings but some of it consisting of explicit covenants linking specific tax payments and public expenditures) will be most likely to emerge not only as a result of democratic participation and good bureaucratic practice within the tax system , but also if taxpayers trust the fiscal system as a whole, i.e. they feel that they are getting good value from government expenditures in exchange for their tax payments. These ideas go beyond the macro-

economic, structural and even governance issues featured in the majority of empirical estimates of tax yields, as summarised in Appendix 1.

We tested this basic hypothesis in two forms against a sample of 62 developing countries between 1980-2008: a single-equation model which examines the impact on tax ratio of democratic accountability and the value provided by public expenditure (measured in terms of the share of human capital expenditures in total government expenditure) and an instrumental-variables model which traces the causal influence of tax ratios on government expenditure, and thence on investment and growth. In both these formulations, the two governance variables mentioned emerge as significantly associated with the ability to build 'fiscal contracts' and generate public revenue; and this can be seen as a causal relationship, because the associations continue to be significant when a lag is inserted into the link between the pro-poor expenditure ratio and the tax ratio, and into the link between the tax ratio and total government expenditure.

Further insight was gained by examining in more detail two countries with opposite over-time tendencies in their tax ratios over the same thirty-year period: Ghana and Zambia (which, over that period, increased their democratic accountability score by almost the same amount). This comparison enabled us to observe some of the processes by which effective fiscal contracts were built: in particular the offer by government of a bona-fide, or incentive to take part in a contract – either a tax cut designed to buy bigger tax increases in future (as in Ghana in 1992), or evidence of effective public expenditure, or a formal or informal link between a particular tax base and a particular form of favoured public expenditure (as in the windfall taxes levied in the 1990s and 2000s in both countries). Our analysis has also revealed other possibilities for bona-fides which may consolidate social contracts, including the focussing of public expenditure on the poorest and/or politically most sensitive groups (which the significant coefficient on *ipe* in Tables 5 and 6 suggests would have a positive influence on tax yields) and establishing a level playing field for tax liability which publicly brings the large and powerful into the tax net. Comparative analysis of which of these bona-fides provides the most effective incentive for raising tax yields at the lowest cost constitutes an important horizon for future research.

Our case-studies also suggested that in cases such as Ghana where a 'strategic alliance' forms between government and a powerful exporting business, that will act as a liberalising influence on the real exchange rate (and thence, as our regressions show, on GDP growth rates and tax yields). Finally, it illustrated that if there is widely-disseminated evidence that big players (in particular multi-national corporations) are not paying what they owe, that will act as a disincentive to all the other players seeing their tax liability as contractual. Other issues, however, remain unresolved, in particular the ability of autonomous revenue authorities to reduce corruption and increase tax yields.

There is now abundant evidence that several low-income countries (not only Ghana as illustrated by our case-study, but also Uganda, Tanzania, Rwanda; see Figure 1 above) have

been able to break out of the low income – weak government - fragile state – low tax capacity – low income trap, and that the formation of a fiscal contract, often with the assistance of the IMF and aid donors, is therefore possible in poor as well as middle-income countries. However it remains the case that low-income countries still, on average, have worse tax performance than lower-middle and middle- income countries, and this holds their entire development back. The particular aspect of this that we would like to raise in conclusion is that the formation of fiscal contracts is not a one-shot action, but a process, often long-drawn out in time and often requiring experimentation and policy reversal (the case of Ghana's botched and excessive initial VAT increase in 1995 is relevant here). Moreover, it is a process requiring the slow building of trust, and this requires in turn the making of down payments or bona-fides which require risk-taking and financial sacrifices exceeding the capacity of the poorest developing- country administrations, -especially if they are also fragile, conflict-vulnerable states. To take a specific example, the crucial move made by Ghana in 1992, of liberalising its cocoa industry, was important in presenting the Ghana government as a credible partner in a fiscal contract and politically enabling the raising of taxes elsewhere in the economy; but it was a move with considerable short-term financial costs (note the dip in Ghanaian public revenue after 1992 on figure 3a) and this implies costs, and political risks, not necessarily affordable by a state with a weaker bureaucracy and less access to aid donors: for example, an Afghanistan, a Burundi, a Southern Sudan, a Central African Republic or a DRC[29]. The question what kind of 'down payments' towards a fiscal contract can feasibly be made by governments in this predicament represents, in our opinion, an important frontier for future research.

[29] The question of how to best target expenditure (and, by our argument, increase tax yield) in 'fragile states' is addressed by the recent OECD report on those states (OECD 2014). This draws particular attention (OECD 2014: 45, box 5.1) to the One Cow per Poor Family programme in Rwanda, which being targeted, asset-based and decentralised, satisfies several of the conditions for a positive bona-fide towards the making of a fiscal contract.

References

Adam, Christopher, D. Bevan and G. Chambas (2001) Exchange rate regimes and revenue performance in sub-saharan Africa, *Journal of Development Economics,* **64,**

Ali, Merima, Odd-Helge Fjeldstad and Ingrid Hoem Sjursen(2014) 'To pay or not to pay?' Citizens' attitudes towards taxation in Kenya, Uganda, and South Africa', *World Development,***64,** 828-842.

Arauco, Veronica Paz(2014) *Nuevos caminos de la política social en Bolivia: el rol de las transferencias en efectivo 2006-2012* [New directions for social policy in Bolivia: the role of cash-transfers 2006-2012]. Vice-Presidency of Bolivia/UNDP.

Bahl, Roy W. (1972) 'A representative tax system approach to measuring tax effort in LDCs', *IMF Staff Papers* **19** (March), 87-122.

Barrientos, Armando(2013) *Social assistance in developing countries,* Cambridge: Cambridge University Press.

Baskava, Thushyanthan(2014) 'Taxation and democratisation', *World Development* **56,** 287-314**.**

Baunsgaard, T.and M. Keen(2005), *Tax revenue and (or?) trade liberalisation,* Washington DC: International Monetary Fund, IMF Working Paper WP/05/112.

Bates, Robert (1981) *Markets and States in Tropical Africa.* Boston: Little, Brown.

Besley, Tim, and Louise Cord(2007)*Delivering on the promise of pro-poor growth: insights and lessons from country experiences.* Basingstoke: Palgrave Macmillan.

Besley, Tim, and Torsten Persson(2013) *Pillars of prosperity: the political economy of development clusters*, Princeton NJ: Princeton University Press.

Bird, Richard, Jorge Martinez-Vazquez and Benno Torgler(2008) 'Societal Institutions and Tax Policy in Developing Countries: the impact of corruption, voice and accountability', *Economic Analysis and Policy,* **38,** 55-71.

Bodea, Cristina and Adrienne Le Bas (2013), *The origins of social contracts: attitudes towards taxation in urban Nigeria,* Oxford: Centre for the Study of African Economies (CSAE), CSAE working paper WPS/.2013-02.

Brautigam, Deborah, Fjeldstad, O.-H, and Moore, M. (2008) *Taxation and state-building in developing countries,* Cambridge University Press, Washington DC.

Cervellati, Matteo, Piergiuseppe Fortunato, and Uwe Sunde(2008), 'Hobbes to Rousseau: inequality, institutions and development', *Economic Journal,* **118,** 1354-1385.

Chand, R. and K.O. Moene(1999)'Controlling fiscal corruption', *World Development,* **27,**1129-1140.

Cheeseman, Nick and Marja Hinfelaar(2010) 'Parties, platforms and political mobilisation: the Zambian presidential election of 2008', *African Affairs,* **109**, 51-76.

Chelliah, R.J. (1971) 'Trends in taxation in developing countries' *IMF Staff Papers,***18,**254-327.

Chelliah,R.J., H.J. Baas and M.R.Kelly(1975) 'Tax ratios and tax effort in developing countries 1969-71' *IMF Staff Papers,* **22**,

Cyan, M., J. Martinez-Vasquez and V. Vulovic(2013) 'Measuring tax effort: does the estimation approach matter and should effort be linked to expenditure goals?', International Centre for Public Policy, Working Paper 13-08.

Di John, Jonathan(2006), *The political economy of taxation and tax reform in developing countries,* Helsinki: UNU/WIDER, Research Paper 2006/74.

Drummond, Paulo, Wendell Daal, Nandini Srivastava and Luiz Edgard Oliveira(2012), *Mobilising revenue in sub-saharan Africa: empirical norms and key determinants,* IMF working paper 12/108.

Ebeke, Christian (2010) *Remittances, VAT and tax revenue in LDCs.* Clermont-Ferrand: CERDI (Centre d'Etudes and de Recherche sur le Développement International) working paper.

Ebeke, Christian and Hélène Ehrhart(2011) 'Tax revenue instability in sub-saharan Africa: consequences and remedies', *Journal of African Economies…*

Eltony , M. (2002) 'Determinants of tax efforts in Arab countries', Arab Planning Institute, Working Paper 207.

Fjeldstad, O.-H. and M. Moore(2009) 'Tax reform and state-building in a globalised world', Chapter 10 in Bräutigam et al(2008).

Greenaway, David, and Chris Milner(1991) 'Fiscal dependence on trade taxes and trade policy reform', *Journal of Development Studies,* **27**, 95-132.

Gupta, Abhijit Sen(2007) *Determinants of tax revenue efforts in developing countries,* Washington DC: IMF working paper WP/07/184.

Gupta, Sanjeev, and Shamsuddin Tareq (2008), 'Mobilising revenue: strengthening domestic revenue bases is key to creating fiscal space for Africa's developmental needs', *Finance and Development,* September,44-47.

Hashimzade, Nigar, Gareth Myles and Binh Tran-Nam(2012) ' Applications of behavioural economics to tax evasion', *Journal of Economic Surveys* **26,** 1-37.

Hendry, David, and H.–M. Krolzig(2004), 'We ran one regression', *Oxford Bulletin of Economics and Statistics,* **66**.

Kang, David C. (2002) *Crony capitalism: corruption and development in South Korea and the Philippines*, Cambridge: Cambridge University Press, 2002.

Hinfelaar, Marja and Jessica Achberger(2015) 'The politics of natural resource extraction in Zambia', unpublished paper, Lusaka: Southern Africa Institute for Policy Analysis and Research (SAIPAR) and Manchester: Effective States and Inclusive Development Research Centre (ESID).

Hinrichs, H.H.(1966) 'The changing level of the government revenue share', chapter 2 in *idem, A general theory of tax structure change during economic development,* Cambridge, Mass: Harvard University Press.

Hobbes, Thomas(1651/1985) *Leviathan: or, The Matter, Forme and Power of a Commonwealth.* Original 1651 edition: Andrew Crooke, London, reprinted 1985 by London: Penguin Books (ed. C.B. Macpherson).

Hudson, John, Pamela Lenton and Paul Mosley (2016), 'The "social efficiency wage", unpublished paper, University of Sheffield.

Joshi, Anuradha and Joseph Ayee(2008), 'Associational taxation: a pathway into the informal sector?', Chapter 8 in Brautigam, Fjeldstad and Moore(2008).

International Monetary Fund (IMF) (2015) *Zambia: Article IV Consultation – Press Release; Staff Report; and Statement by the Executive Director for Zambia, IMF Country Report no 15/152, June 2015.*

Keen, M. (2012) *Taxation and development – again,* Washington DC: IMF Working Paper WP/12/220.

Keen, M., and Mario Mansour(2009) *Revenue mobilisation in sub-saharan Africa: challenges from globalisation.* Washington DC: IMF Working Paper 09/157.

Langford, Ben and Tim Ohlenburg(2016), *Tax revenue potential and effort: an empirical investigation,* International Growth Centre working paper, S-43202-UGA-1.

Le, T.M., B. Moreno-Dodson and N. Bayraktar(2012) *Tax capacity and tax effort: extended cross-country analysis,* Washington DC: World Bank Policy Research Working Paper 6252.

Laserna, Roberto, with José Gordillo and Jorge Komadina(2011) *La trampa del rentismo y como salir de ella* (The rent-seeking trap and how to escape from it). Cochabamba: Fundación Milenio and Washington DC: Center for International Private Enterprise.

Lenton, Pam, and Paul Mosley (2011) 'Incentivising trust', *Journal of Economic Psychology,* **32**, 890-897.

Levine, R. and D. Renelt, 'A sensitivity analysis of cross –country growth regressions', *American Economic Review*, **82**(1992), 942-963.

Lotz, Jurgen, and E.R. Morss(1967), 'Measuring 'tax effort' in developing countries', *IMF Staff Papers* **14**,478-499.

Lotz, Jurgen, and E.R. Morss(1970) 'A theory of tax level determinants for developing countries', *Economic Development and Cultural Change* **18** (April), 328-341.

Lundstöl, Olav, Gael Raballand and Fuvya Nyirongo(2013) 'Low revenue from the mining sector in Zambia and Tanzania: fiscal design, technical capacity or political will?, International Centre for Tax and Development (ICTD), Working Paper 9, April.

Masiye, Mike(2016), 'The growth of taxable capacity', Chapter 2 in M.Masiye, *Essays on the Political Economy of Zambian Fiscal Policy*, draft PhD thesis, University of Sheffield.

McNabb, K., and Philippe LeMay-Boucher(2014) *Tax structures, economic growth and development,* International Centre for Tax and Development, ICTD Working Paper 22.

Moore, Mick(1999) 'Death without taxes: democracy, state capacity and aid dependence in the Fourth World' in G. White and M. Robinson(eds) *Towards a democratic developmental state*, Oxford: Oxford University Press.

Moore, Mick(2013) *Revenue reform and statebuilding in Anglophone Africa,* Brighton: Institute for Development Studies, IDS Working Paper 428.

Mosley, Paul (2015) 'Fiscal composition and aid-effectiveness: a political economy model', *World Development,* **69** (May), 106-115.

Mosley, Paul (2017 forthcoming) *Fiscal policy and the 'natural resource curse': how to escape from the poverty trap,* London: Routledge.

Mosley, Paul, with Blessing Chiripanhura, Jean Grugel and Ben Thirkell-White(2012) *The politics of poverty reduction,* Oxford: Oxford University Press.

Mosley, Paul and Abdul-Gafaru Abdulai(2016) *The political economy of progressive export taxation in Latin America,* paper presented to conference on The Political Economy of Social Protection Systems, Mexico City, February 8-10.

OECD (2014) *Fragile States 2014: Domestic revenue mobilisation in fragile states*, Paris: OECD.

Piancastelli, Marcelo(2001) *Measuring the tax effort of developing countries: cross-country panel data analysis 1985-95,* IPEA Working Paper 818.

Plaschaert, Sylvain(1962), *Taxable capacity in developing countries,* Washington DC: World Bank, IBRD report no. EC-103.

Prichard, Wilson (2009) *The politics of taxation and implications for accountability in Ghana 1981-2008,* Brighton: Institute for Development Studies/Centre for the Future State, Working Paper 330.

Prichard, Wilson, Paola Salardi and Paul Segal (2014), *Taxation, non-tax revenue and democracy: new evidence using new cross-country data,* unpublished paper, King's College London International Development Institute Working Paper 2014-02.

Rablen, Matthew (2010) 'Tax evasion and exchange equity: a reference-dependent approach', *Public Finance Review,* **38**, 282-305.

Romer, Paul (1986), 'Increasing returns and long-run growth', Journal of Political Economy, vol. 94(1986), 1002-1037.

Rosenblatt, Helena (1997), *Rousseau and Geneva: from the First Discourse to the Social Contract, 1749-1762,* Cambridge: Cambridge University Press.

Rousseau, Jean-Jacques (1762) *Du contrat social, ou principes du droit politique* (Of social contracts, or principles of political rights). Amsterdam: Marc Michel Rey.

Rousseau, Jean-Jacques (1986) *Political writings* (including *of social contracts*), edited by Frederick Watkins. Madison: University of Wisconsin Press.

Scholz, John T. and Neil Pinney (1995) 'Duty, fear and tax compliance: the heuristic basis of citizenship behaviour', *American Journal of Political Science* **39**, 490-512.

Scholz, John, and Mark Lubell (1998), 'Trust and taxpaying: testing the heuristic approach to collective action', *American Journal of Political Science,* **42**,398-417.

Shin, K. (1969), 'International differences in tax ratios', *Review of Economics and Statistics,* **51,**213-220.

Stotsky, Janet G. and Asgedech Woldemariam(1997),*Tax effort in sub-saharan Africa,* Washington DC: IMF Working Paper 97/107.

United Nations Conference on Trade and Development (UNCTAD) (1970), *Objectives for the mobilisation of domestic resources for development*, TD/B/C, 3/75 Add.1, 23 February.

Tanzi, Vito (1987), 'Quantitative characteristics of the tax systems of developing countries'. In D. Newbery and n. Stern (eds) *The theory of taxation in developing countries,* Oxford: Oxford University Press.

Tanzi, Vito (1992) 'Structural factors and tax revenue in developing countries: a decade of evidence'. In Ian Goldin and L.A. Winters (eds) *Open Economies: Structural adjustment and agriculture,* Cambridge: Cambridge University Press.

Tanzi, Vito, and H. Davoodi(2000) *Corruption, growth and public finances,* Washington DC: IMF Working Paper 97/139.

Teera, J.M. and J. Hudson (2004) 'Tax performance: a comparative study', *Journal of International Development,* **16,**785-802.

Teorell, Jan, Nicholas Charron, Marcus Samanni, Sören Holmberg and Bo Rothstein (2009), *The Quality of Government Dataset*(version 17.06.09). University of Gothenburg: The Quality of Government Institute, http:// www. qog.pol. gu.se.

Timmons, Jeffrey (2005), 'The fiscal contract: states, taxes and public services', *World Politics,* **57**, 530-567.

Thorn, R.S. (1967), 'The evolution of public finances during economic development', *Manchester School,* **35,**19-53.

Wililamson, Jeffrey (1961), 'Public expenditure and revenue: an international comparison', *Manchester School* **29**, 43-56.

Appendix 1. Regression-based studies of drivers of tax ratios

Investigator	Dependent variable, sample and time period	Estimation method	Independent (right-hand side) variables in regression(*denotes significance of this variable at the 5% level or higher)				Remarks
			Macro-economic	Economic structure and shares of specific sectors in total revenue	Governance	Other	
1.Williamson (1961)	T/Y(33 LDCs 1950-59)	OLS	Per capita GNP*				
2.Plasschaert (1962)	T/Y(20 LDCs 1950-59)	OLS	Per capita GNP, import/GNP ratio*				
3.Hinrichs(1966)	T/Y(all available LDCs 1950-65)	OLS	Per capita GNP, openness* (defined as share of imports)				
4.Lotz and Morss(1967)	T/Y (72 developed countries and LDCs, 1962-66)	OLS	Per capita GDP(private)*, openness* ([X+M]/Y)				
5.Shin(1969)	T/Y(LDCs 1962-66)	OLS	Per capita GDP, inflation*	Shares of agriculture and mining in GDP		Population growth*	
6.Lotz and Morss(1970)	T/Y(50 developing countries, 1962-66)	OLS	Per capita GDP(private)*, openness* ([X+M]/Y)		'Government centralisation' (i.e. autocracy)		

7.UNCTAD(1970)	T/Y	OLS	Per capita GDP*, inflation rate*	Share of agriculture in GDP*			
8.Chelliah(1971)	T/Y (developing countries, 1966-68)	OLS	Per capita GDP	Shares of mining* and agriculture in GNP			
9.Bahl(1972)	T/Y(developing countries, 1966-68)	Simulation study	Shares of agriculture, mining and manufacturing in income; tax rates				Not a regression study; therefore no estimates of significance for particular determinants of tax yields
10.Chelliah, Baas and Kelly (1975)	T/Y, net of social security payments (47 LDCs 1969-71)	OLS	Per capita GDP openness (exports/GDP*)	Share of mining in GDP*, share of agriculture in GDP			
11.Tait, Grätz, and Eichengreen (1979)	T/Y (63 LDCs 1972-76)	OLS	Per capita GDP(net of exports), openness (exports/GDP)	Shares of agriculture and mining* in GDP			
12.Tanzi(1987)	T/Y(LDCs 1975-85)	OLS	Per capita GDP	Shares of mining* and agriculture* in income			
13.Leuthold (1991)	T/Y (eight African countries 1973-81)	OLS, also autoregressive methods	Desired tax share, , openness* ([X+M]/Y)	Shares of mining and agriculture* in income			Optimising model: public decision maker maximises private disposable income and value of public goods and services

14.Ghura(1998)	T/Y (38 sub-saharan African countries 1985-96)	OLS and panel-data (random and fixed effects)	Per capita income*, trade openness*,inflation* structural reforms*	Agriculture share of GDP*, share of minerals and mining*	Corruption (Transparency International index)*	Human capital development*	
15.Tanzi and Davoodi(2000)	T/Y (cross-section of countries 1980-97)	OLS	Per capita income*	Agriculture share*, trade share*	Corruption*		
16.Adam, Bevan and Chambas (2001)	T/Y (22 sub-saharan countries 1980-96)	OLS, instrumental variables, GMM	Per capita income*, inflation, real exchange rate*	Agriculture, industry and trade shares			
17.Piancastelli (2001)	T/Y (75 countries 1985-95)	OLS and panel-data (random and fixed effects)	Per capita GDP	Trade share of GDP*, agriculture share*, manufacturing share*, services share*			
18.Eltony(2002)	T/Y (6 oil-producing and 10 non-oil producing Arab countries, 1994-2000)	OLS	Per capita GDP*	Trade share of GDP*			
19.Bird, Martinez-	T/Y and current revenue minus	OLS and panel-data (random	Per capita GDP	Agriculture/ GDP*	'Institutions'*	Population growth*, size of shadow economy,	

Vasquez and Torgler(2004)	grants as share of GNP(110 developing and transitional countries, 1990-99)	and fixed effects)				Gini coefficient of inequality*	
20.Teera and Hudson(2004)	T/Y(116 developed and less developed countries, 1975-98)	OLS and panel-data	Per capita GDP, openness*[(X+M)/GDP], debt/GDP]	Agriculture/ GDP*		Overseas aid; population; size of 'shadow economy' (proxied by the amount of cash held by public as a share of GDP)*	
21.Baunsgaard and Keen(2005)	T/Y (111 developed and less developed countries, 1975-2000)	Panel data (RE and FE); instrumental variables; GMM	Per capita GDP, openness*[(X+M)/GDP],	Agriculture/ GDP; share of trade taxes and VAT in total revenue		Overseas aid*	
22.Gupta(2007)	T/Y (1980-2004)	Panel data with fixed- and random-effects specifications, also difference-GMM and system-GMM	Per capita GDP* (significant in low income countries only) Openness (goods and services/GDP)	Agriculture/ GDP*	Corruption*, political stability, rule of law	Aid/GDP*	

23.Keen (2012)	T/Y excluding natural resource revenues (42 African countries, data up to 2010)	OLS	Per capita GDP*, openness*	Share of VAT in total revenue*		Anglophone country dummy*	
24.Drummond et al (2012)	Total revenue/GDP (including social contributions and non-tax revenue) (72 countries, 1980-2009)	Panel data with fixed- and random-effects specifications	GDP/capita* Agriculture/GDP Inflation rate*	Share of trade taxes	Corruption, oil/natural resource rents*, size of shadow economy	Aid/GDP	
25.Ebeke (2010)	Total revenue/GDP; tax revenue instability(39 countries, 1980-2005)	OLS and IV(both with fixed effects);GMM	GDP/capita, debt/GDP, inflation	Share of trade taxes and domestic taxes in total revenue		Overseas aid	
26.Ebeke and Ehrhart(2011)	Total revenue/GDP; tax revenue instability(39 countries, 1980-2005)	OLS and IV(both with fixed effects);GMM	GDP/capita, debt/GDP, inflation	Share of trade taxes and domestic taxes in total revenue		Overseas aid	
27.Le, Moreno-Dodson and Bayraktar(2012)	Total revenue/GDP (110 LDCs, 1994-2009)	Panel OLS with time and regional dummies	GDP/capita; trade openness*	Agriculture value added*; share of trade taxes	Corruption index*;bureaucratic quality index	Population*; size of shadow economy	

				and domestic taxes in total revenue			
28.Cyan, Martinez-Vazquez and Vulovic(2013)	Total revenue/GDP (94 countries 1994-2008)	OLS with fixed effects; stochastic frontier analysis	GDP/capita*; trade openness/globalisation*	Share of agriculture*, services*, construction *	Corruption index; political fractionalisation (measure of democratic accountability)	Population density*; Education*; Gini coefficient of inequality	Uses stochastic-frontier analysis to incorporate optimality considerations
29.Fenocchietto and Pessino(2013)	Tax effort (using stochastic frontier method)	Panel data with fixed- and random-effects specifications (check)	Inflation, agriculture/GDP*,educational level (secondary enrolment rate?), Openness (goods and services/GDP)*		Corruption index*	Gini coefficient of inequality*	Uses stochastic-frontier analysis to incorporate optimality considerations
30.McNabb and LeMay-Boucher(2014)	Growth of GDP; determinants of T/Y are used as elements in an instrumenting equation	OLS and fixed-effects		Components of tax structure			Examines not only determinants of tax ratios but also their impact on growth; within this framework, finds impact of income taxes to be particularly harmful
31.Langford and Ohlenburg(2016)	T/Y (excluding natural resource revenue and social security contributions);	Simultaneous estimation of parameters of stochastic frontier and inefficiency model within random-	GDP/capita, inflation* educational level (secondary enrolment rate?), educational level, openness (imports/GDP)	Industrial structure (manufacturing/output)	Corruption index*, law and order*, democratic accountability		Uses stochastic-frontier analysis to incorporate optimality considerations

	85 countries 1983-2010)	effects framework					

Appendix 2. List of sampled countries

Africa(24): Angola, Botswana, Burkina Faso, Cote D'Ivoire, Egypt, Equatorial Guinea, Ethiopia, Gambia, Ghana, Kenya, Lesotho, Madagascar, Malawi, Morocco, Mozambique, Nigeria, Rwanda, Senegal, South Africa, Tanzania, Tunisia, Uganda, Zambia, Zimbabwe.

Latin America(16): Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic Ecuador, Guatemala, Jamaica, Mexico, Nicaragua, Paraguay, Peru, Puerto Rico, Venezuela.

South and East Asia(13): Bangladesh, Cambodia, China, Fiji, India, Indonesia, Malaysia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam.

Transitional & other(9): Bulgaria, Czech Republic, Hungary, Jordan, Kyrgyz Republic, Poland, Romania, Russia, Turkey.