

**Aid, Revenue, and Fiscal Space:
Considerations for the Least Developed Countries with Application to Mozambique**

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ABSTRACT

The principle that increases in domestic financing are needed to secure fiscal sustainability in low income countries is well established. This paper considers the appropriate timeframe and strategy for realizing such increases in the context of prolonged aid inflows. Focussing principally on Mozambique, but also drawing on cross-country evidence, we question a prevailing view in which: (i) aid is preferred as a temporary financing vehicle; and (ii) significant short-term revenue gains are expected from technical taxation reforms. We show that these propositions are not empirically justified and adherence to them can generate real costs. Aid has been and will continue to be core funding and taxation outcomes depend on deep, slow-moving institutional and structural constraints. Under this perspective, aid provides essential fiscal space to implement a tax system that is conducive to growth and builds a more positive social-fiscal compact. This may be achieved via a relatively simple and transparent tax code, scrupulous application of the principles of horizontal and vertical equity, and competent administration.

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1. Introduction

As a general long-run principle there should be a balance between domestic revenues and total expenditures in order to assure a sustainable fiscal position. For the least developed countries, this principle is often violated for extended periods of time due to high volumes of foreign assistance. It is not uncommon for aid to finance 25 to 50 percent of total government expenditure. Clearly, these countries lie a considerable distance from achieving a long-run balance between domestic revenues and expenditures. Here, we wish to address the path to this long-run balance in the context of an overall development strategy.

While drawing on international evidence, we focus on the case of Mozambique. The paper is structured as follows. Background on Mozambique and the tax system in Mozambique is provided in sections 2 and 3. Persistent pressure to increase revenue as a share of GDP in the relatively short-term is also documented in section 3. Section 4 summarizes a series of propositions that provide the analytical foundations of this pressure, and section 5 articulates an alternative viewpoint with respect to these propositions. Evidence for and against these competing views of the world set forth in section 4 and 5 is reviewed in section 6. Following the analysis in this section, we conclude that, for the case of Mozambique, pressure to increase domestic revenues as a share of GDP in the short-term has been excessive. In section 7, we present evidence that the (unsuccessful) drive to increase revenues imposed real costs and was inconsistent with the paradigms currently driving foreign assistance.

We conclude that, while the technical reforms implemented over the past decade and a half are largely to be applauded, the heavy emphasis on revenue gains in the short-run imposed needless costs. Perhaps more importantly, we diagnose a large measure of opportunity lost. Rather than a focus on short-term revenue gains, programs to develop

the tax system should have focused much more strongly on efficiency and equity in the system. The fiscal space that aid provided (and continues to offer) should have been employed to support the development of a social compact on taxation, with heavy emphasis on efficiency and, especially, fairness. We believe that, at the cost of little to no revenue relative to the path actually followed, this approach would have resulted in a healthier tax system providing a more solid base for both economic growth and for revenue gains in the future.

2. Mozambique in context

After Independence in 1975 Mozambique rapidly became embroiled in a prolonged and complex civil war. The conflict period was marked by severe economic decline. This was accompanied by substantial internal dislocation and structural changes in the economy related to attempts at socialist control (until 1985) followed by gradual market liberalisation (1985 onwards). With peace in 1992, confirmed by democratic elections in 1994, Mozambique has witnessed rapid economic growth and poverty reduction. Aggregate real income has grown at an average rate of 7.7% per annum (1993-2005) with notable improvements evident across a wide range of development indicators (Government of Mozambique, 2006). Nevertheless, the long-term dimensions of the developmental challenge cannot be ignored. Despite the progress realized to date, the country still ranks 168 out of 177 countries in terms of overall human development, the poverty headcount remains over 50%, complete primary school enrollment by 2015 is unlikely,¹ and average life expectancy is among the lowest in the world at around 42 years (UNDP, 2006).

In this environment, economic growth is clearly fundamental such that public and private investment requirements have been and will remain massive. At the same time, domestic savings mobilization is constrained by poverty and weak institutions. Aid has stepped into this breach. For about two decades, aid volumes have represented between

¹ Mozambique has registered impressive progress in the education sector; nevertheless, it is still unlikely to attain the millennium development goal of complete primary school enrollment by 2015 largely due to the extremely low starting point when progress finally became possible with the peace accords in 1992.

15 and 20 percent of GDP and approximately half of total government spending. The other half is domestically funded. We turn to an examination of the tax system.

3. Taxation in Mozambique

Three important aspects of Mozambique's tax system can be highlighted.² First, over the last 20 years Mozambique's tax system has undergone two main periods of reform. With the dismantling of socialist central planning in favour of market-based reforms in the mid-1980s, a new taxation system was implemented from 1987 including a modified sales tax and various income taxes. According to an IMF report (Lopes et al., 1991), these reforms were integral components of the Economic Recovery Programme (stabilization and structural adjustment) pursued under World Bank and IMF auspices. From 1996, however, a further wave of reforms was initiated leading to the replacement of the majority of the principal taxation instruments with 'improved' variants such as a VAT (instead of a cascading sales tax) and comprehensive income taxes. Wide-ranging reforms to customs duties and administrative procedures were also introduced, including the employment of external consultants as temporary administrators of the entire customs organization. Two large taxpayers units have been created and, more recently, responsibility for taxation collection, including customs, has been placed under a semi-autonomous body within the Ministry of Finance. As before, this second period of reform has been heavily supported by external actors, with IMF experts providing detailed advice. As a result of these changes the IMF has recently concluded that the country possesses "a comprehensive tax system that is broadly in line with best practice" (IMF, 2005: 20).

Second, it is evident that tax revenues have remained relatively stable as a percentage of GDP since the first phase of reforms. This is depicted in Figure 1, which plots trends in total revenues and tax revenues for the period 1980-2005. Although there is some short-term volatility, the long-term trend in both these revenues has been flat

² For further detail regarding the reforms and historical performance of Mozambique's tax system see IMF (2005) or Byiers (2007).

during the post-war period (1992-date) with averages of 12.1% and 11.0% respectively. One also notes that the increase in total revenues registered in 2005 was primarily a non-tax phenomenon, partly associated with the inclusion of certain sectoral revenues (user-fees) previously not captured at a central level, and thus should not be taken as indicative of improved taxation performance. Despite the stability of the tax share, it is nevertheless the case that real revenue growth has been robust at around 7% per annum for the past decade. This is shown in Figure 2, which indicates taxation revenues have doubled in real terms since 1996. Thus, real revenues have grown *pari passu* with rapid real income growth during the post-war period.

Thirdly, in light of the stability of the revenue share and the high intensity of aid (also see Figure 2), there is a widely shared opinion that domestic revenues should increase as a share of GDP. This is patent in two recent IMF studies for Mozambique (Varsano et al., 2006; IMF, 2005). While these avoid defining concrete targets for overall revenues, both reports suggest that the tax ratio potential of the country is around 20% of GDP. Varsano et al. (2006), for example, cite Kenya as a suitable comparator due to its apparently similar economic structure and strong revenue effort of around 22%. It is important to stress that this preoccupation is not at all new. The perception of inadequate domestic revenue mobilization was a principal motivation behind tax reforms and is consistently repeated in both World Bank and IMF reports covering the country since the early 1990s (e.g., Landau, 1998; World Bank, 2001). This is not to say that the government does not share this perception. The government's first Poverty Reduction Strategy Paper (PRSP) forecast an increase in taxation revenues from 12.0 to 15.4 percent of GDP over a 5 year period, or almost 0.7 percentage points per year (Government of Mozambique, 2001).³ Despite the fact that revenues have remained broadly flat, Mozambique's current PRSP targets additions to domestic revenues of 0.5 percentage points per year (Government of Mozambique, 2006). These projections demonstrate that the pursuit of tax reforms has been accompanied by the explicit expectation that improvements can be realised in the near-term. An example of this is the 1.9 percentage point increase in domestic revenues

³ Note the same strategy projects corresponding reductions in aid to 8% of GDP by 2010. See Section 7.4 for discussion of the realism of this implied relationship between aid and tax revenues at low levels of income.

projected to be achieved in 1996 alone (IMF, 1996). In summary, over the past decade both the government and external donors have consistently agreed to target substantial increases in the revenue share (over three percentage points of GDP) over a five year horizon. Such targets have never been achieved nor has significant progress been made; even so, they have never adjusted the target.

4. Analytics of revenue pressure

To deepen our understanding of the pressure on domestic revenue mobilization it is useful to expose its analytical foundations. Three inter-linking propositions can be identified here; while these are found specifically for Mozambique they are also encountered more generally in the literature and, as such, might be described as an integrated perspective on the role and nature of taxation systems. The first building-block accords a key role to domestic resource mobilization in the context of achieving a ‘sound’ fiscal stance. This is encountered consistently in official IMF guidance and need not be reiterated here. By way of example, in their presentation of the IMF’s approach to stabilization Mussa and Savastano (1999) observe that fiscal reforms to boost revenue generation are typically essential (structural) counterparts of demand-constraining stabilization measures such as budgetary expenditure cuts.⁴

Secondly, a broadly skeptical view of foreign aid reinforces the necessity of domestic revenue generation to achieve macroeconomic and fiscal sustainability. While one of the stated roles for the IMF is to mobilize external assistance during fiscal adjustment, external financing is mainly seen as a temporary ‘gap-filler’ (below-the-line financing) rather than a long-term, core component of the fiscal landscape. As expressed by Sun (2004), the relatively high volatility and potential costs of external aid (as credits) mean that it cannot be a solid basis for fiscal balance. Other concerns commonly associated with external aid include its potential to distort prices as well as to undermine the revenue

⁴ Also, Davis et al. state: “As private sector savings are often low in developing (especially low-income) countries, fiscal policy can play a central role in mobilizing resources by raising revenue and reducing less productive spending.” (2006: 3).

base and crowd-out private sector financing (e.g., Davis et al., 2006). Collier (1999) discusses this skeptical view in detail and points out that arguments of this kind are frequently employed in relation to critiques of ‘aid dependency’. If aid cannot be counted upon, fiscal and external sustainability depend on mobilizing sufficient domestic revenues. For Mozambique this skepticism of aid is neatly captured by the IMF’s press statement at the initiation of a new facility in 1996: “Mozambique's external position remains fragile, inasmuch as the high levels of foreign aid inflows of recent years may not be forthcoming in the future” (1996: 1).

Third, and critically, we find a predominant characterization of taxation as primarily a technical question. This is demonstrated by the recommendations that often accompany calls for increases in domestic revenues. Low taxation ratios are considered to result from weaknesses in underlying taxation instruments (a narrow tax base) and ineffective administration (poor compliance). Legal and administrative reforms of the tax system have been standard features of IMF structural reform programmes as noted by the IEO (2002). Analysts describe the content of these reforms as being relatively uniform (Stewart, 2002), reflecting what Adam and Bevan (2004) describe as a ‘conventional wisdom’. A good example is the introduction of the VAT, commended for its wide effective base and self-enforcing properties (Ebrill et al., 2001). With regard to tax administration, the creation of specialized units to deal with large tax payers (McCarten, 2004) and a semi-autonomous revenue authority also are frequent recommendations (Taliercio, 2004). With respect to Mozambique, the studies which hold that domestic revenues are low also typically identify technical-administrative measures as appropriate responses (e.g., Varsano et al., 2006; IMF, 2005).

This focus on technical solutions, *per se*, does not necessarily imply that taxation is viewed primarily in technical terms. After all, technical issues are the job of tax specialists, such as IMF economists; and, tax systems are undoubtedly characterized by complex technical issues. Rather, it is the combination of a focus on technical solutions and a high degree of confidence in their potency that characterizes the viewpoint. The tax reforms introduced in Mozambique to date and the expectations associated with these

reforms support this analysis. And, Mozambique is by no means unique – for example, the programs agreed with the IMF by countries benefiting from the poverty reduction and growth facility (PRGF) forecasted growth in the revenue share of more than two percentage points of GDP over three years on average (IEO 2007).

5. Reconsidering short run revenue pressure

This section offers an alternative perspective on the propositions advanced in section 4. While we do not take issue with the first proposition, we question the appropriate timeframe in which fiscal soundness is to be achieved as well as the efficient pathway to do so in the context of aid inflows. As a result, the focus is on propositions two and three: foreign aid scepticism and taxation as a purely technical issue. The latter proposition is considered first. Evidence for and against the alternative perspectives is considered in section 6.

5.1. Taxation as structurally constrained

There is a well-known and extensive literature showing how available ‘tax handles’ (Musgrave, 1969) act as fundamental constraints to taxation potential.⁵ While these arguments need not be repeated at length, they refer to the depth and diversity of the economic (taxation) base. For example, it stands to reason that the existence of a large informal sector, a poorly diversified production structure and financial shallowness will substantially narrow the effective tax base and increase the costs of taxation enforcement. Tanzi and Zee (2000) acknowledge that the primary direction of causation is likely to run from developmental levels to the taxation share. Similarly, Gray and Chapman’s (2001) review of outcomes of taxation reform projects concludes that taxation performance, as measured by the share of taxation in GDP, is strongly determined by overall economic structure and conditions rather than the content of reforms *per se*.

⁵ See for example Burgess and Stern (1993), Stotsky and WoldeMariam (1997) and Teera and Hudson (2004) for further discussion and empirical analysis.

5.2. *Taxation as a social compact*

In addition to the above, a more recent strand of literature highlights the role of political and institutional drivers of taxation performance. Of course, such factors were never considered to be irrelevant, however the ‘institutional turn’ in economics has heralded a deeper examination. The connection between institutions and taxation performance derives from the observation that taxation is a government activity and therefore may be subject to the generic problems in public sector behaviour often identified in developing countries (corruption, poor incentives, incomplete markets etc.). Going further, as taxation is inherently contested (Slemrod, 1991) its nature and effectiveness can be understood as reflecting the political relationship, or social compact, between tax payers (society) and tax raisers (state).

The above line of argument, supported by a considerable weight of historical evidence in both developed and developing countries (Moss et al., 2006; Bird et al. 2006), is supported by the notion of a ‘fiscal commons’ (Poterba and von Hagen, 1999; Wagner, 2002). The activity of taxation transforms private property (income) into public resources; thus its effectiveness ultimately depends on the perceived legitimacy and equity of how this transformation takes place and what is done with these resources. This is fundamental – fiscal outcomes reflect the interaction between equity and efficiency effects of fiscal policies on *both* the revenue and expenditure sides of the system. Put another way, actual taxation collections reveal the preference of economic actors to pay after weighing-up the perceived costs and benefits of doing so. For example, efforts to widen the tax base may become frustrated where there is substantial ‘implicit taxation’ in the form of legal and illegal payments to government officials at the local level that are not reflected in government accounts (e.g., Fjeldstad and Rakner, 2003; Bird, 2003). In these cases the perceived costs of government may be already high, generating resistance to payment of central government taxes as required by law. Other costs relating to inflation, price controls and bureaucratic requirements can have similar effects, as can the existence of inefficiencies and inadequacies in public service provision especially where they lead agents to seek private solutions.

It is relevant to highlight that this alternative perspective potentially diagnoses the same evidence, a low domestic revenue share, as an entirely different challenge. In the technical viewpoint, ‘poor’ revenue to GDP ratios reflect technical problems such as inappropriate instruments and lax enforcement, both of which are amenable to relatively short-term technical fixes. In reality, therefore, a low tax take is an opportunity to rapidly increase revenues. In some instances, this is clearly a valid diagnosis.⁶ On the other hand, a low tax take may be symptomatic of a problematic underlying social compact. In this instance, sustained and substantial improvements in the revenue ratio are very likely to be contingent upon repair and continued development of a healthier social compact, which will take time.⁷ Even if revenue pressure achieves some success here, this may well be at the cost of damaging the social compact or weakening longer-term growth prospects. These points are discussed in Section 7.

5.3. *Foreign aid as core funding*

The sceptical view which restricts foreign aid to the role of temporary financing is also open to question. There is a large literature examining this issue. For example, Collier (1999) explicitly rejects the view that aid is a temporary financing vehicle. The evidence for the case of Mozambique is considered in the next section. Overall, we believe the weight of international evidence clearly points to aid playing a core financing role in numerous cases. For example, in the least developed countries, foreign assistance frequently permits expenditure levels 50% to 100% higher than domestic revenues and has done so for decades. Under these conditions, it is difficult to deny that many countries have come to rely on foreign aid as a core financing component. In other words, there is a revealed preference both for countries to use aid in this way and for donors to supply it. This is reflected in the emerging aid agenda (e.g., the Paris Agenda and the

⁶ The large jump in taxation revenues achieved in Uganda in the mid-1990s, for example, may be a case in point (see Section 6.2; Table 1).

⁷ The appropriate timeframe in which fiscal expectations should be framed has been discussed by the IEO (2002). They criticise a mismatch in IMF programmes between short-term quantitative revenue targets associated with fiscal reforms, including revenue growth, and the longer period required to achieve complementary institutional changes.

Millennium Development Goals) which decidedly views aid flows as long-term and as core financing.

Even historically, the claim that aid is inherently more volatile than domestic revenues does not find consistent empirical support (Collier, 1999). There is also extremely mixed evidence regarding the extent to which aid inflows dampen domestic revenue collection. Gupta et al. (2003), for example, find that the size and direction of the relationship between aid and revenue depends on both the composition of aid and the institutional framework of the aid recipient. As such, a generalised scepticism of aid does not hold up; what matters is how aid is applied and managed at the country level (also see Yang et al., 2005).

6. Assessing the alternative views

6.1. Cross-country evidence

There is good evidence to reject the characterization of taxation as predominantly a technical matter. First, the historical record in low income countries reveals a generalised phenomenon of fiscal inertia both in the presence and absence of fiscal reform programmes (Heady, 2001; Bird et al., 2004). For example, based on a large sample of countries that have undergone stabilization, Adam and Bevan (2004) note that 5 years after the introduction of such stabilization measures, tax revenues as a share of GDP remain unchanged for low income countries at 12.2% (on average) while they had fallen from 15.9% to 15.5% for middle income countries. The IMF's Independent Evaluation Office (IEO) concludes that among both temporary and permanent low income users of IMF funds, sustained increases in the tax revenue to GDP ratio time have not been seen over the long-term (IEO, 2003). Based on their figures, by the end of the 1990s tax revenue shares among these countries were substantially lower on average compared to during the 1980s.

The fiscal performance of HIPC Completion Point countries similarly reveals that limited progress has been made in revenue mobilization during the 1990s and that

average taxation shares continue to be lower than among non-HIPC low income countries (Sun, 2004). Extending the dataset used in the latter study to include more recent data points for sub-Saharan countries only, see Table 1, the same conclusions appear to remain broadly valid. Not only has average annual growth in revenue been low at around 0.16 percentage points per annum, but one also notes substantial revenue volatility at over 10% per year; equal to well over 1 percentage point in GDP in most cases.⁸ In addition, when one takes into account both the improvement in growth rates in the sub-continent as well as the global boom in primary commodities, the evidence for recent improvements in taxation shares should be interpreted with caution. Strong performers such as Ethiopia, which increased central government revenue collection from 10.6% to 18.4% of GDP from 1992 to 1996, have had difficulty in sustaining revenue shares following such periods of expansion. In other words, the pattern shown in Figure 1 for Mozambique may not be that uncommon.

The significance of economic, institutional and political drivers of taxation performance can be tested empirically. The hypothesis is that differences in these factors explain a considerable share of the observed long-term variation in tax ratios. Remaining unexplained variation would then be attributable to differences in tax policy and administration, as well as to idiosyncratic country-specific effects of either a long- or short-term nature. In the absence of a fully specified model developed from first principles, the choice of a parsimonious and complete set of variables to reflect these drivers is obviously problematic. A further complication is the plausible endogeneity of policies and institutions to economic conditions. While adequate public resources are required to finance a sound tax administration system, low tax revenues may engender weak public institutions thus setting in motion a vicious circle. In order to minimize these problems, the economic drivers are given by standard variables used to capture the key 'tax handles' available to the government. Political and institutional factors are captured by a set of 'deep' variables that are logically both prior to current taxation performance and often associated with institutional quality in the research literature. As their values

⁸ Taking as a guide the average annual growth in revenues shown in Table 1, it would take around 4 to 6 years to achieve a one percentage point increment in the revenue share.

are time invariant, they represent a set of background factors or fixed effects on cross-country taxation performance. Appendix A describes the variables and data sources in detail.

The regression model is run for a set of 88 low- and middle-income countries defining the dependent variable as the domestic taxation ratio as a share of GDP.⁹ Note that taxation revenues are selected as being relatively well-defined in contrast to total government domestic revenues which are considerably wider in scope, capturing a broad range of non-tax revenues such as fees, service charges and natural resource rents which are likely to more dependent on policy choices and country endowments. With respect to the time series nature of the data our interest is in long-term determinants of taxation performance. Also, on the assumption of moderate fiscal inertia, the effects of our explanatory variables are expected to be most clearly discernible across (between) countries in the absence of extremely long data horizon (the data spans the period 1980-2003). For these reasons, as well as to reduce problems of auto-correlation, a static specification is chosen comprising of non-overlapping 4-year period averages for the variables.¹⁰

With regard to the model estimator, a fixed effects (within) panel estimator is unsuitable primarily because the research interest embraces the static influence of observed structural variables, including time invariant effects, rather than changes over time *within* each country. In the absence of consensus theoretical guidance as to the correct (panel) estimator to apply for these kinds of models, a range of estimators regularly employed in the literature are used. These include a standard OLS estimator with robust standard errors, a GLS random effects (RE) estimator, and a Prais-Winsten panel-corrected standard errors (PCSE) estimator which adjusts for the effects of autocorrelation and heteroskedasticity in the residuals (see Beck, 2001).¹¹

⁹ 'Below the line' financial resources such as external grants, loans or internal debt-financing are not included in these measures and are not in focus here.

¹⁰ This is a fairly standard practice in empirical cross-country research (e.g., Dalgaard et al., 2004).

¹¹ All estimations are run in STATA. The PCSE estimator is applied via the *xtpcse* command using options for auto-correlation (not panel-specific) and heteroskedasticity. This is preferred to a (panel) Feasible Generalized Least Squares estimator due to the more conservative disposition of the results.

Table 2 shows the results, distinguishing between a ‘restricted’ model containing only the core economic drivers and a ‘full’ model of all variables. Two key findings are apparent – the estimated coefficients are highly consistent across all estimators and the coefficients for the economic drivers (under the restricted model) are stable to the inclusion of the deeper structural variables, in terms of both their size and directions.¹² Of interest is the result from a Hausman test (1978) used to distinguish between the suitability of a random-effects versus fixed-effects estimator (not given). This suggests that although the random-effects estimates are inconsistent under the restricted model, they are both efficient and consistent once the full set of variables is included. In other words, country fixed-effects become obsolete once the structural variables enter. This is confirmed by the greater explanatory power of the full model; under the RE and robust OLS estimators the restricted model explains approximately 30% of variation in tax ratios, rising to around 65% under the full specification.¹³

While extensive interpretation of the results is not necessary, the message is that *both* economic and deeper political-institutional factors represent robust correlates of tax ratios across countries and over time. Particularly in light of the significance of the deep structural variables, the primary direction of causation would appear to run from these drivers to taxation outcomes. Note that the model contains no (direct) information concerning fiscal policy choices or how taxation administration is designed. Thus, the definition of taxation as a predominantly technical problem is not supported. Moreover, assuming these core drivers change only slowly, the timeframe to achieve substantial and permanent increases in the taxation share would extend significantly beyond the near-term.

¹² The findings conform to expectations – for example, the strong positive result for the resource-poor dummy supports our hypothesis that these countries face relatively stronger incentives to raise revenue via taxation. The results are also coherent with previous studies (e.g., Teera and Hudson, 2004).

¹³ This is a strong result for cross-country panel data. The even higher R-squared for the full model under the PCSE estimator essentially derives from the AR(1) autocorrelation parameter of 0.642. This may be interpreted as evidence of substantial ‘fiscal inertia’ in the observed tax ratios; also tests for serial autocorrelation under the OLS specification a significant degree of non-stationarity in the residuals.

6.2. *Mozambican evidence*

The same cross-country results can be applied to Mozambique to assess whether comparatively low levels of revenue mobilization can be attributed to technical as opposed to structural and institutional factors. Table 3 gives Mozambique's actual and predicted tax ratios for each of the four-year periods in the panel, the latter being based on the PSCE estimator results. Using the same estimator, and for illustrative purposes only, Figure 3 plots the predicted and actual annual tax ratios. In both cases the results are highly informative. In support of the regression results, movements in the predicted tax ratio for Mozambique closely correspond to actual changes throughout the period shown. The model correctly determines (predicts) the direction of all major changes in Mozambique's tax ratio over the last 25 years, including the drop in tax revenue in the early 1980s, its rise from 1986 to 1993, as well as the subsequent decline from 1993 to 1996.

Given the explanatory power of the model for the Mozambican case, it is therefore reasonable to conclude that observed shifts in the tax ratio have been driven principally by movements in the explanatory variables (e.g., 'tax handles') rather than changes in policy or administrative efficiency. Once one takes into account the expected effect of exogenous influences on Mozambique's institutional performance, which act to reduce the predicted tax ratio, actual collections appear to have been slightly above predictions. Accordingly, Mozambique's past performance is not an outlier in comparative terms once the effects of structural and institutional conditions are taken into account. Thus, while marginal gains may well be achieved by further technical reforms, only gradual improvements in the tax share corresponding to 'deeper' changes reasonably should be expected.¹⁴

The argument that aid should not be considered a core component of government funding also contradicts the Mozambican experience to date. Since the early 1980s, total inflows of net aid (excluding debt relief) have averaged around US\$800m per annum,

¹⁴ Of course, significant production shifts, such as the discovery and exploitation of natural resources, would invalidate such a conclusion.

equivalent to approximately 20% of GDP.¹⁵ Taking data from the government budget, Figure 2 shows that the real value of (net) aid inflows has consistently matched domestic revenues. In other words, to date a large share of the budget has been funded by aid. This is reflected in the very process of budget formulation – the government’s investment budget is stated as the sum of the majority of aid financing, whether used for capital investment or not, plus a much smaller domestic contribution. However, once budget support is included it follows that aggregate external financing supports at least 50% of government expenditure, which is typically larger than the value of total public investment. Taking the 2007 budget as an example, total external financing at 18.3% of GDP represents 54% of projected spending, which is greater than the projected investment budget set at 15.9% of GDP (Government of Mozambique, 2007: 6).

The share of aid in the budget demonstrates that aid has been an essential component of the public purse over the long-term in Mozambique. Of course one might argue that given donors have a strong preference for funding investment activities, which are well-defined and time delimited, it remains appropriate even in Mozambique to consider aid as non-core financing. This is a misleading perspective, based on a fallacious separation of recurrent and investment spending. For example, reasonably assuming some level of public investment would occur in the absence of aid, the fungibility literature suggests that where aid supports investment spending this liberates domestic resources to be channelled to recurrent spending. This point is reflected in arguments in favour of budget support, which represents a growing share of the aid budget in Mozambique. More importantly, both donors and the government identify continuous and substantial public investments as essential for developmental progress in Mozambique, including achievement of the MDGs. This is reinforced by the simple observation that access to essential public infrastructures and social services remains comparatively low despite robust progress in recent years (Government of Mozambique, 2006). Thus, given that the investment budget is approximately equal in size to domestic revenue generation in

¹⁵ These are figures from the Balance of Payments. However, due to weak and inconsistent data there are significant problems involved in making accurate estimates of aid inflows, especially that part accruing directly to the government. For a full discussion and presentation of differing estimates see Arndt et al. (2006).

Mozambique, it would seem entirely sensible to explicitly treat aid as a core component of funding over the long-term.

In light of the above arguments, concerns regarding the comparatively highly volatility of aid versus domestic revenues might be a stronger basis on which to reject aid as a core component of total public funding. While the evidence for Mozambique would seem to support this view, it needs to be interpreted with caution. Based on a transformation of the series depicted in Figure 2 into annual rates of change, the coefficient of variation for real government revenues is 0.14, approximately a third of that for net aid in the budget at 0.64. Although alternative estimates for the value of net aid (such as those coming from Balance of Payments figures) give a slightly lower coefficient of variation, in all cases they remain substantially higher than the domestic revenue coefficient. This higher volatility of aid, however, derives in part from the large short-term humanitarian inflows associated with the end of the civil war and establishment of peace (under UN supervision), as well as disastrous floods in 2000/01. In these cases the observed volatility of aid might be assessed in a positive light. Finally, and as shown in Arndt, Jones and Tarp (2007), the components of aid are shifting towards longer-term developmental needs consonant with the post-stabilization conditions in which Mozambique now finds itself. As such, past volatility in aid may not provide a good basis for future fiscal planning. This is certainly reinforced by international movements towards a more predictable aid environment with longer-term commitments.

7. Implications of revenue pressure

The alternative perspective developed above does not advocate that technical and administrative taxation reforms adopted in low income countries are invalid. The essential point is that, in the absence of an appropriate social compact, expectations surrounding what that these reforms (in themselves) can deliver in terms of increased revenues should be moderate. This begs the question whether pressure on revenue mobilization really should be considered a problem. If there were evidence to suggest that

revenue pressure is costly, particularly in the sense of weakening or forestalling the development of an appropriate social compact, this would constitute reasonable grounds for concern.

The extent to which revenue pressure is costly cannot be evaluated satisfactorily on a cross-country basis. Even so, our analysis of the Mozambican case reveals three distinct costs related to revenue pressure which may undermine the development of a social compact around taxation. The first cost is a proliferation of tax waivers and exemptions that has accompanied taxation reform. The second relates to optimistic revenue forecasts and their downstream implications. The third considers tax evasion. A final subsection speculates on the implications of successful revenue in the prevailing aid environment.

7.1. Tax waivers and exemptions

‘Exemption creep’ is identified by the IMF as a major outstanding problem in its recent analysis of current taxation law in Mozambique (Varsano et al., 2006). This is despite the concerns regarding extensive exemptions voiced by external donors over the years.¹⁶ In addition, there is substantial anecdotal evidence to suggest that waivers and exemptions are frequently granted on an *ad hoc* basis at the Ministerial level in response to direct requests from individuals or companies. A brief review of the relevant literature certainly suggests that this is not uncommon in low income countries – numerous reports raise the concern that fiscal reforms are blocked or undermined (e.g., Gray and Chapman, 2001; Fjeldstad and Rakner, 2004). In a multi-country review, for example, the IMF’s IEO (2003) notes that fiscal reform initiatives show only limited progress on average, with only a small number of countries making significant progress overall. These go to support Bird’s (2003) conclusion that politics ultimately rules when it comes to taxation matters.

¹⁶ For example, in 2001 the World Bank stated: “Continuing to reverse the declines in tax revenue collections will require broadening the tax base, eliminating most exemption regimes, continuing to reduce reliance on trade taxes for revenue ... ” (2001: 33)

While exemptions are obviously costly to the objective of augmenting the revenue share, it is important to underline that their persistence and prevalence is explained by an absence of a social compact which supports an increased revenue share (tax burden). Moreover, their existence undermines both the administrative efficiency and horizontal equity of the taxation system, in turn holding implications of its perceived efficacy and fairness. This is corroborated in Mozambique by the private sector in complaints that the tax system is distorted in favour of larger, import- and capital-intensive firms who also are comparatively well-resourced in terms of their administrative capacity. Bolnick (2004a; 2004b), for example, notes the existence of high effective tax rates by regional standards, which are only softened if a company is able to gain access to fiscal benefits and/or tax exemptions. In agreement, FIAS (2006) estimate that small businesses operating in full compliance with the normal tax system face a marginal effective tax rate (METR) of over 70% against 11% for a manufacturing firm operating under the investment incentives regime.

Analysis of the investment projects approved under the current investment incentives legislation (for an overview see Byiers, 2007) confirms this effective skew in incentives. As shown in see Table 4, even excluding projects over US\$10m the average size of investment is around US\$1.3m, corresponding to an investment of US\$12,000 for every job promised. Simple calculations also reveal that 'hidden' fiscal expenses associated with these incentives are extremely large in comparison to effective tax collections. A prominent example is the 1% sales tax levied on the production of aluminium versus the 32% standard rate on profits. As the beneficiary firm (MOZAL) makes over US\$350mn in annual profits, on sales of around US\$1.2bn, the effective net fiscal expenditure here is around US\$100mn, equivalent to double the value of total corporate taxation collections in 2005.

7.2. *Optimistic revenue forecasts*

In Mozambique, optimistic fiscal forecasts, which directly reflect the high expectations surrounding the speed of fiscal adjustment (including domestic revenue growth), have been a feature for more than a decade. Once again, numerous studies

suggest this is commonplace in other low income countries. Bird (2005) provides a review of the literature and corresponding evidence with regard to official forecasts under IMF programmes. He shows that for a sample of 115 arrangements, average actual increases in government revenues over a three year period were only 0.2 percentage points of GDP versus 0.4 points projected. Golosov and King (2002) also find a significant upward bias of over one percentage point in IMF forecasts of total tax revenue as a percentage of GDP. Various reports of the IEO (2002, 2003) confirm that there has been a general tendency within the IMF towards optimistic forecasts across a range of key variables such as GDP growth and domestic tax revenue.¹⁷

It is worthwhile to point out why optimism may be costly.¹⁸ In the context of IMF programmes, the IEO (2002) recognises that overly optimistic fiscal targets can generate problems in terms of both programme design and implementation. Based on the government's budget constraint, a revenue shortfall must correspond to either a cut in expenditures or an increase in domestic debt (holding external financing constant).¹⁹ Thus, the sustainability and stability of fiscal balance can be put at risk. Even if there are no economic costs arising from forecast optimism, transaction costs are likely to accrue from frequent adjustments to fiscal plans. Furthermore, forecast optimism also can damage the credibility of public financial management, weakening its overall quality and effectiveness. As Bird (2005) puts it, optimism can create a 'psychology of institutional failure' which may limit the success of any reforms envisaged. In each of these cases these costs can hold negative implications for the social compact.

Turning to Mozambique, the existence of forecast optimism and downstream costs is evaluated using the forecast error analysis methodology described in Appendix B. On this basis we find statistical support for the existence of consistent forecast optimism for 1

¹⁷ For example, with respect to episodes of fiscal adjustment, the IEO states: "There is a tendency to adopt fiscal targets based on overoptimistic assumptions about the pace of economic recovery leading inevitably to fiscal underperformance and frequent revisions of targets." (2002: vii).

¹⁸ See Danninger (2005)

¹⁹ Note that from a budgeting perspective nominal values matter. Thus, even if revenues reach a given target share of GDP, optimism in the associated forecast of nominal GDP growth will mean that there is a nominal revenue shortfall.

year ahead budget projections covering the period 1995-2005.²⁰ This is found for the underlying macroeconomic aggregates (growth and inflation) as well as on both sides of the budget envelope (revenues and expenditures). Moreover, the evidence suggests that domestic revenue forecast errors are positively correlated with domestic (non-aid related) expenditure forecast errors. This is in keeping with the observation that Mozambique operates within tight internal debt targets, which effectively amount to the operation of a cash budget. In other words, the impact of over-optimistic revenue forecasts is seen directly in the behaviour of domestic expenditures.

Figures 4 through 6 depict the trends in the forecast errors across the six variables analysed. Note that a positive value generally denotes an optimistic forecast (i.e., the forecast is higher than the outcome), except in the case of inflation where what is known as optimistic is depicted as a negative value as the outcome is higher than the forecast. In virtually all cases the forecast errors appear to err on the optimistic side. There is also visual indication of a positive relationship between domestic revenue forecast errors and those on the domestic expenditure side (see Figure 6). However, the external component of the budget – comprising total external aid on the resource side and externally-financed investment expenditure – does not conform to a clear pattern.

The regression-based tests for forecast evaluation (Appendix B) generally support these conclusions. Equations A to F of Table 5 give these results, distinguishing between bias, serial autocorrelation and trend effects in the forecasts. It is worth highlighting that the regression methodology employed here follows Zellner's (1969) Seeming Unrelated Regression (SUR) approach with appropriate corrections to significance tests due to the small sample size. The rationale is that although the dependent and explanatory variables differ, there are good reasons to expect interrelationships between the equations (disturbances), especially as we are examining the two sides of the government budget

²⁰ This is the same method as set out in Jones (2007) which focuses on the revenue side; the addition here is that the analysis extends to expenditure behaviour. As described in Annex B, the underlying data are budget forecasts and outcomes based on official government planning documents (principally the budget and its final execution report).

constraint and forecasts are based on a shared set of macroeconomic assumptions.²¹ As a result, separate OLS estimates are unlikely to be efficient. Table 6 provides summary results for each of the equations entering the SUR system. The F-statistic gives the joint probability that all regressors are equal to zero, which is equivalent to a combined test for forecast optimality. All but two equations are significant at the 5% level.

Taking the macroeconomic aggregates (equations A and B; Figure 4) first, we note that the degree of optimism appears to be roughly one percentage point in both cases. Inflation forecasts appear to be the weaker (less optimal) of the two in the sense that they also exhibit a small degree of negative autocorrelation. The external budget variables (equations C and D; Figure 5) are less straightforward to interpret. While forecasts of aid inflows appear to be (on average) biased downwards, the evidence from Figure 5 would suggest that this is driven by the outlier result in 1997. In any case the joint significance of the equation does not hold at the 5% level. Also the forecasts errors pertaining to aid-related investment spending, which excludes budget support, do not show any statistical regularity whatsoever.

The results for domestic resources and expenditures (equations E and F; Figure 6) are strong and remarkably similar. Not only do we see upward bias in the forecasts (optimism), but there is evidence of weak positive autocorrelation and positive trend effects (not significant on the expenditure side). Both separate and joint Wald tests confirm there is no significant difference in the parameter values between these two equations, clearly indicating a relatively direct transmission of domestic revenue forecast errors to expenditure behaviour. This is confirmed by the final two equations which show the extent to which forecast errors for the two main components of domestic expenditures, (recurrent spending and domestically-financed investment), correlate with domestic revenue forecast errors. The latter regressor explains around 40% of variation in both of the dependent variables and the correlation coefficients do not significantly differ from one at the 5% confidence level. However, looking at Table 6 we note that

²¹ The disaggregation methodology, however, does attempt to correct for the influence of forecast errors in the macroeconomic aggregates on the budget revenue and expenditure errors (see Appendix B).

the fit of the equation, given by the root mean square error (RMSE) and the F-statistic, appears considerably better for recurrent spending. This would be consistent with the proposition that budget support, being the main alternative source of funding for domestic revenues, is largely channelled towards investment. In other words, the transmission of revenue forecast errors to expenditure behaviour may be felt more in domestic recurrent spending than on the investment side.

These results show not only that pressure on domestic revenues may result in optimistic forecasts but also that this has direct implications for expenditure behaviour. While the final economic costs associated with this optimism cannot be estimated, these findings provide explanatory support for various public financial management inefficiencies frequently noted in Mozambique, such as delays in salary payments and inter-governmental transfers, as well as within-year budget cuts. With regard to VAT, for example, Orlowski (2007) argues that the well-known problem of late repayments is likely to be passed on to the government in the form of increased contract costs. While this is not to argue that revenue pressure is the *principal* cause of such problems, it may well be an important contributory factor.

7.3. *Tax evasion*

Pressure to augment revenue in the near term implies maintenance or increases in tax rates. Similar to nearly all developing countries, Mozambique relies heavily on indirect taxes to support domestic revenue collection. Given the paucity of “tax handles”, the rates applied are often fairly high. For example, the authors know from direct experience that the choice of the Mozambican VAT rate of 17 percent was driven almost entirely by revenue considerations. It is well known that, for indirect taxes, allocative inefficiencies rise geometrically with tax rates. Hence, the marginal cost of funds at the rates applied in developing countries tends to be high.

Tax evasion, which is uniformly thought to be large in macroeconomic terms in developing countries, is also relevant. What has long been suspected but has only recently begun to be demonstrated in developing countries is the relationship between tax

rates and evasion. For example, Fisman and Wei (2004) estimate an elasticity of evasion with respect to tax rates of about three for Chinese imports from Hong Kong. This suggests that reductions in the total tax burden applied by China at the border would actually increase revenue. Similarly, Desai et al. (2007) find evasion is highly sensitivity to corporate tax rates in environments where corporate governance is weak. They also find a hump shape relationship between rates and total revenue. For the specific case of Mozambique, van Dunem and Arndt (2006) employ the approach pioneered by Fisman and Wei (above). They estimate an elasticity of evasion of about 1.3 for Mozambican imports from South Africa. At this level, rate reductions at the border, even on more highly taxed consumer products, would likely reduce revenues; however, reductions in evasion resulting in increases in official import volumes would substantially offset the revenue losses.

7.4. *A negative aid-revenue relationship?*

In the very long run, a negative relationship clearly holds between aid and domestic revenue. As countries develop, revenues as a share of GDP tend to increase and aid volumes tend strongly to decline both as a share of GDP and in absolute terms. However, for the least developed countries and under even the most optimistic scenarios, per capita income levels are at least a decade away from attaining levels where donors begin to readjust support levels. This begs the question: what would have happened to aid levels and total government expenditure had Mozambique attained a revenue share in GDP approximately four to five percentage points greater than the actual as was consistently targeted?

Ceteris paribus, holding the current share of government expenditure in GDP constant would have required aid budgets to be cut in real terms in response to domestic revenue growth. Who would have done this? Taking the donor side first, in the minimum any proactive reduction in aid presumes that collective action problems among donors are solved and that the expansion of domestic revenue is considered permanent. More critically perhaps, it also implies that aid allocation calculations are based solely on the observed gap between target total expenditures and domestic sources of financing, to the exclusion

of welfare measures. A review of the relevant literature (e.g., McGillivray, 2006; Alesina and Dollar, 2000), however, reveals there is no empirical evidence that donors allocate aid on this basis, nor are there theoretical suggestions that they should do so. More credible is the opposite case where revenue growth is taken to indicate an improved policy environment, thus tapering-in aid as Collier and Dollar (1999) have proposed. This kind of scenario is consistent with the approach, described in Kanbur (2005) and Barder and Birdsall (2006), where aid allocation is determined by national income and a composite performance rating which includes an assessment of fiscal policy and the efficiency of resource mobilization. In summary, there is no reason to believe that aid levels supplied would have declined in the presence of more robust revenue growth and some reason to believe that they would have actually increased.

Alternatively, the expenditure share could be held constant if the Mozambican government were to pro-actively constrain aid, thereby rejecting offers of external assistance driven by the above welfare-based aid allocation rules. Such behaviour implicitly portrays the government as a kind of unified social planner with the capacity and will to implement policies in a consistent fashion under a fixed expenditure target.²² This schematic view of government not only is becoming increasingly obsolete as a basis for understanding actual behaviour (Hettich and Winer, 2006) but also assumes that the government will prioritise strict adherence to its expenditure target above other considerations. There is no evidence to lead us to expect that the government of Mozambique would behave in this manner.

In short, the most likely result of an expansion of revenues along the lines actually targeted would have been an increase in expenditure commensurate with the revenue gain, at least on a three to five year time frame. While formal modeling could be helpful here, it is not at all clear *a priori* that this expansion in expenditure would have been a good thing. The share of government in GDP is already fairly large at about 30 percent. Arndt, Jones, and Tarp (2007) document legitimate absorptive capacity issues even at this

²² Such a model is evident in much of the fiscal response literature which assumes governments act according to the results of a utility maximization problem. See Tanzi (2004) for a critique.

level. Expansion to approximately 35 percent would almost surely render these problems more severe. Over time, a manifest inability on the part of the government to effectively absorb available total resources would likely result in reductions in assistance levels thus establishing, eventually, a negative aid-revenue relationship. However, this hardly appears to be a desirable chain of events from a development perspective.

8. Summary and conclusion

Over the past 15 years, Mozambique has been a development success story. Substantial progress has been realized across nearly every major development indicator. Throughout this period, aid volumes have been very large, registering around 15-20% of GDP and accounting for about 50% of the government budget. Due to the share and volume of aid, the performance of aid and overall developmental performance are essentially inseparable. Both receive positive marks to date (Arndt, Jones, and Tarp 2006). Despite the significant progress realized, the development challenges remain massive. All signs point to continued large inflows of aid over the next decade at least.

One area where both donors and government have performed poorly, at least relative to their own benchmarks, has been in the area of revenue mobilization. Government and donors have consistently targeted substantial increases in revenue as a share of GDP, yet the revenue share has remained essentially constant. The desire to raise significant additional revenue in the short run stems primarily from two factors. First, aid is viewed as untrustworthy; hence it cannot form a part of core revenue. Second, increasing revenue is mainly a technical problem that is solvable via technical solutions that can be implemented in the short-run.

We take an alternative view. We review the international evidence and the evidence for Mozambique for both propositions. With respect to aid volatility, we find that aid has historically been no less trustworthy than domestic revenue. The simple reality for many of the least developed countries, including Mozambique, is that aid already forms a substantial percentage of core government revenue. Furthermore, institutional

innovations recently implemented by donors are likely to make aid flows more stable and more focused on the long run.

On revenue increases, we agree that technical solutions are an integral part of the package; nevertheless, we believe that excessive faith is often placed in the potency of technical solutions. The evidence, in our view, indicates that the revenue share is determined primarily by structural factors within the economy and the state of a social compact between the state and society. Both of these factors are unlikely to change in the short-term. Expectations surrounding the implications of technical reform should be commensurately modest.

Unfortunately, the failed drive to increase revenues appears to have exacted real costs. The available evidence indicates that relatively high rates, imposed with the goal of increasing revenue, are at least partially responsible for the universally decried proliferation of official exemptions. In addition, for border taxes, evasion rates have been rigorously linked to border tax rates. Finally, the desire to increase revenue has led directly to pervasive optimism in the formulation of revenue forecasts with negative implications for the execution of programmed expenditures.

Finally, had the drive to increase the revenue share succeeded, it may not have been a good thing. The most likely outcome of increased revenue would have been increased expenditure. Given the existing size of government and current concerns related to absorptive capacity, a further increase in the size of government may not have been the best way to attain long-run development goals.

Based on these observations, we take an inverse view to the policies applied. As revenue policy represents one of the fundamental instruments for development strategy, we believe that efficiency and equity of the system should be of paramount concern. Rather than representing a gap that must be filled in the short run, aid provides the medium run fiscal space to implement a tax system that is conducive to growth, particularly in the formal sector, and builds a positive social compact through a relatively simple and

transparent tax code, scrupulous application of the principles of horizontal and vertical equity, and competent administration. We believe that had this alternative approach been applied over the past 15 years, receipts would not have been substantially lower than the levels actually obtained and current prospects for growth in both the overall economy and the revenue share in GDP would be improved.

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TABLES AND FIGURES

Table 1: Central government revenues as share of GDP for selected sub-Saharan African HIPC Completion Point countries

	1992-96	1997-01	2002	2003	2004	2005	Annual change		Volatility	
							Median	Average	St. dev.	CV
Benin	13.7	15.7	16.3	15.2	16.5	16.5	0.20	0.18	1.5	10.0
Burkina Faso	10.4	11.8	11.3	11.4	11.8	12.3	0.50	0.15	1.0	8.4
Ethiopia	14.5	18.3	16.4	18.1	17.3	15.8	0.10	0.27	2.5	15.5
Mali	12.1	13.1	15.9	12.4	15.2	17.9	0.20	0.25	2.2	16.2
Mozambique	12.5	12.3	12.4	11.5	12.9	14.0	0.10	0.03	1.1	8.9
Niger	7.3	8.8	10.6	8.3	9.9	9.7	0.60	0.11	1.4	15.9
Senegal	16.6	17.4	17.9	16.8	18.1	19.4	0.30	0.09	1.1	6.5
Tanzania	11.5	11.2	11.1	11.4	11.3	12.5	0.20	0.04	0.6	5.6
Uganda	8.7	11.2	12.2	10.8	11.9	12.8	0.50	0.33	1.9	17.5
Average	11.9	13.3	13.8	12.9	13.9	14.5	0.30	0.16	1.5	11.6
Median	11.8	12.6	12.4	11.9	12.8	14.0	0.20	0.15	1.4	10.0

Source: 1992-2000 taken from Sun (2004); 2001-2005 from IMF (2007)

Notes: 'CV' represents the coefficient of variation (standard deviation / mean); 'Annual change' refers to percentage points with the average value calculated to exclude the maximum and minimum movement.

Table 2: Cross-county panel regression results

Dependent variable: Natural logarithms of average tax revenue as % GDP						
Variables:	RE		OLS		PCSE AR(1)	
	Restricted A	Full B	Restricted C	Full D	Restricted E	Full F
Constant	11.88*** (2.67)	11.07** (2.52)	21.17** (2.12)	12.29 (1.56)	14.57** (2.13)	10.39* (1.81)
GDP per capita	0.14*** (4.17)	0.16*** (3.84)	0.12*** (5.22)	0.10*** (3.11)	0.12*** (4.72)	0.12*** (3.36)
Imports % GDP	0.30*** (4.09)	0.28*** (3.89)	0.34*** (4.27)	0.26*** (5.03)	0.33*** (4.41)	0.28*** (4.70)
Resource poor	0.17** (2.00)	0.29*** (3.68)	0.20*** (4.46)	0.27*** (6.13)	0.18*** (3.18)	0.28*** (5.27)
Time trend	-0.01** (-2.53)	-0.01** (-2.45)	-0.01** (-2.11)	-0.01 (-1.52)	-0.01** (-2.05)	-0.01* (-1.75)
% Land tropics	...	-0.17* (-1.83)	...	-0.26*** (-4.18)	...	-0.22*** (-3.37)
Landlocked (dummy)	...	0.14* (1.83)	...	0.09 (1.61)	...	0.12** (2.00)
Belgium (colony)	...	0.21 (1.06)	...	0.28** (2.46)	...	0.23** (2.06)
China (colony)	...	0.83*** (2.82)	...	0.80*** (8.35)	...	0.79*** (7.87)
Germany (colony)	...	0.53*** (2.66)	...	0.53*** (5.09)	...	0.56*** (3.97)
France (colony)	...	0.41*** (3.03)	...	0.38*** (4.04)	...	0.42*** (3.64)
Great Britain (colony)	...	0.38*** (3.30)	...	0.39*** (5.16)	...	0.40*** (4.24)
Netherlands (colony)	...	0.51* (1.89)	...	0.49*** (4.75)	...	0.52*** (4.05)
Portugal (colony)	...	0.24 (1.08)	...	0.27** (2.45)	...	0.26* (1.83)
Asia (continent)	...	-0.32*** (-3.43)	...	-0.32*** (-5.01)	...	-0.30*** (-4.53)
N	235	235	235	235	235	235
R squared	0.30	0.64	0.31	0.66	0.90	0.93
Chi squared	55.6	151.1	107.6	1116.8

* p<.1, ** p<.05, *** p<.01; t-statistics given in parentheses

Source: author's estimates

Notes: variables are as described in Appendix A – specific countries (colonizers) and continents are specified as (0 / 1) dummies; panels are 4 year averages; variables which are not significant in any specification are excluded; RE, OLS and PCSE refer to the different regression estimators, described in the text.

Table 3: Observed and predicted values for Mozambique's tax ratio by panel period

		1990-93	1994-97	1998-01	2002-03	Average
Restricted	Tax ratio	10.4	11.6	11.1	10.9	11.0
	std. err.	1.1	1.1	1.1	1.1	1.1
	Tax effort	103.0	89.4	101.2	104.5	99.3
Full	Tax ratio	9.3	10.3	10.0	10.2	10.0
	std. err.	1.1	1.1	1.1	1.1	1.1
	Tax effort	115.2	100.5	111.3	111.8	109.5
Observed	Tax ratio	10.8	10.4	11.2	11.4	10.9

Source: author's calculations

Notes: results derive from the PCSE estimator for the full sample of countries using the restricted and full model specifications; 'std. err.' refers to the standard error of the prediction; 'Tax effort' is the observed tax ratio divided by the predicted ratio (as a percentage).

Table 4: Approved investments under the fiscal benefits code by categories of project value (1996-2005)

Value, US\$ millions	Av. value (US\$ '000s)	No.	Promised employment	Investment per employee (US\$ '000s)	Av. domestic capital content (%)
<1	419.7	1,070	40,055	10.5	25.4
1 – 10	1,628.6	539	73,568	22.1	15.6
>10	10,638.8	120	104,573	101.7	8.5
Total	12,687.2	1,729	218,196	58.1	21.1

Source: CPI database (unpublished)

Notes: 'Promised employment' gives total for all projects; 'domestic capital content' refers to average stated value of domestic investment capital (not credits) in total approved project size.

Table 5: Evaluation of forecast errors based on Seeming Unrelated Regression (SUR)

Equation	Effect	Coef.	Std. Err.	t-stat.	Prob.
A. Inflation	Serial AC	0.29	0.08	-3.47	0.00
	Trend	-0.05	0.15	-0.36	0.72
	Bias	1.41	0.48	-2.98	0.00
B. Real growth	Serial AC	0.23	0.16	-1.44	0.16
	Trend	0.17	0.13	1.39	0.17
	Bias	0.74	0.38	1.94	0.06
C. External resources	Serial AC	0.05	0.19	0.27	0.79
	Trend	4.16	1.78	2.33	0.02
	Bias	11.25	5.43	-2.07	0.04
D. External spend	Serial AC	0.21	0.21	1.01	0.32
	Trend	1.82	2.42	0.75	0.45
	Bias	2.99	7.09	0.42	0.68
E. Domestic resources	Serial AC	0.25	0.13	1.92	0.06
	Trend	1.00	0.49	2.04	0.05
	Bias	3.32	1.64	2.02	0.05
F. Domestic spend	Serial AC	0.26	0.11	2.42	0.02
	Trend	0.66	0.44	1.48	0.14
	Bias	3.02	1.44	2.10	0.04
G. Recurrent expenditure	Dom recs.	0.67	0.17	3.87	0.00
H. Domestic investment	Dom recs.	1.21	0.37	3.23	0.00

Source: authors' calculations

Notes: see Section 7.2 and Appendix B for methodological discussion. All results derive from a single SUR; equations A-F reflect the test stated in equation (B-4); equations G and H test the relationship between components of domestic expenditure and domestic revenues ('Dom recs'); 'Prob.' gives the probability that the coefficient is equal to zero.

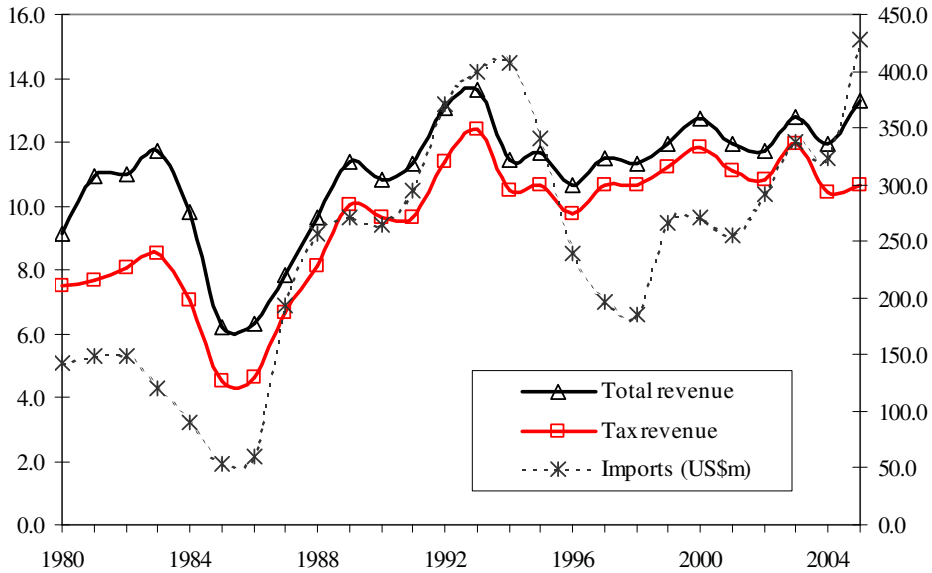
Table 6: Summary of SUR equation results

Equation	RMSE	R-sq	F-stat.	Prob.
A Inflation	1.90	0.71	36.60	0.00
B Real growth	1.86	0.45	9.32	0.00
C External resources	23.69	0.21	2.94	0.06
D External spend	26.98	0.06	0.79	0.46
E Domestic resources	5.61	0.41	3.50	0.04
F Domestic spend	11.53	0.16	3.43	0.04
G Recurrent expenditure	7.81	0.38	14.98	0.00
H Domestic investment	15.07	0.38	10.45	0.00

Source: authors' calculations

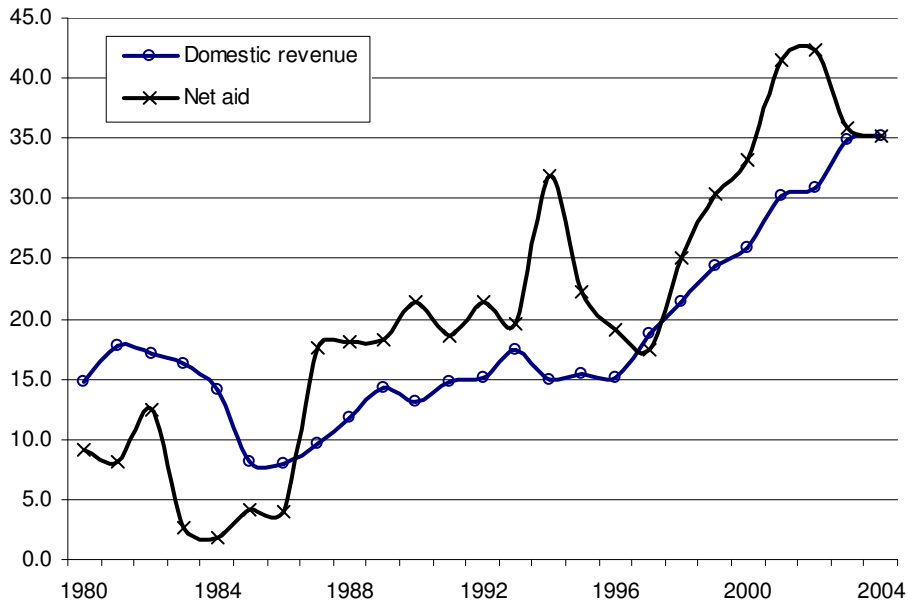
Notes: see Table 5 above; 'Prob.' gives the probability that the F-stat. is equal to zero.

Figure 1: Domestic revenues (as % GDP) and imports, 1980-2005



Source: Government of Mozambique

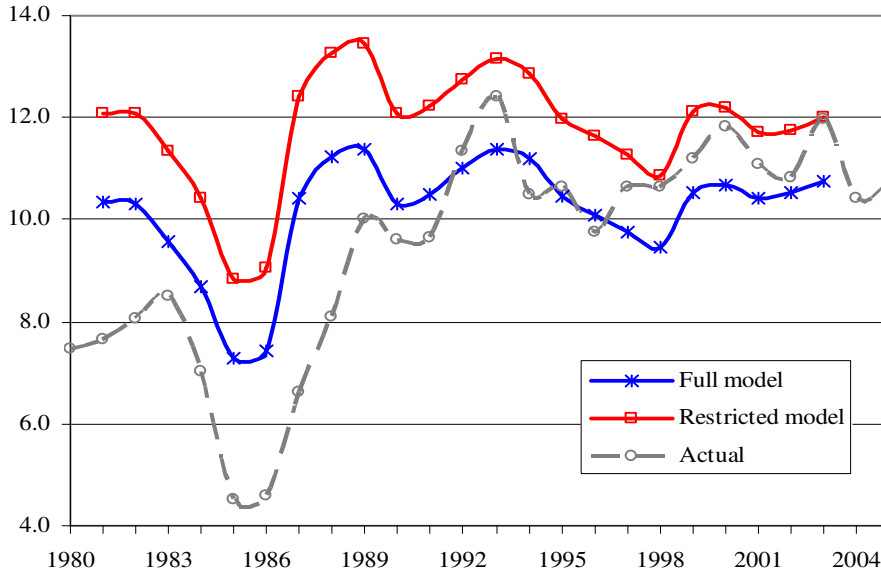
Figure 2: Domestic revenue and net aid in real 1980 prices (1980-2004)



Source: Government of Mozambique (budget execution reports)

Note: Net aid is aid inflows excluding debt relief minus capital amortization. Data only captures aid stated in the government accounts.

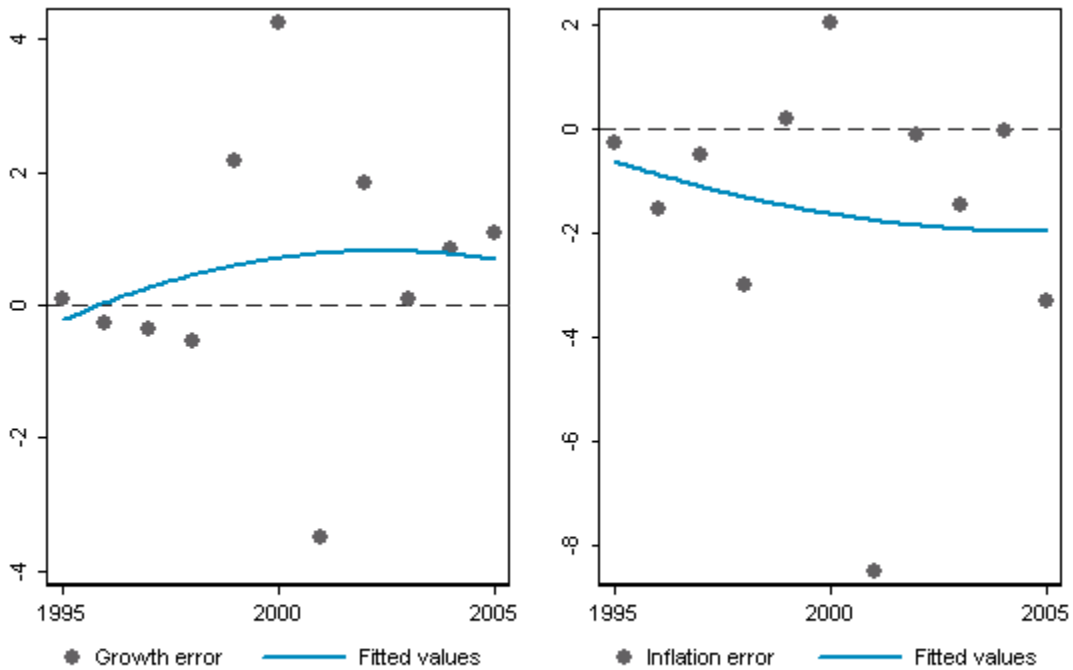
Figure 3: Cross-country regression model predictions of taxation share as % GDP as applied to Mozambique



Source: author's estimates

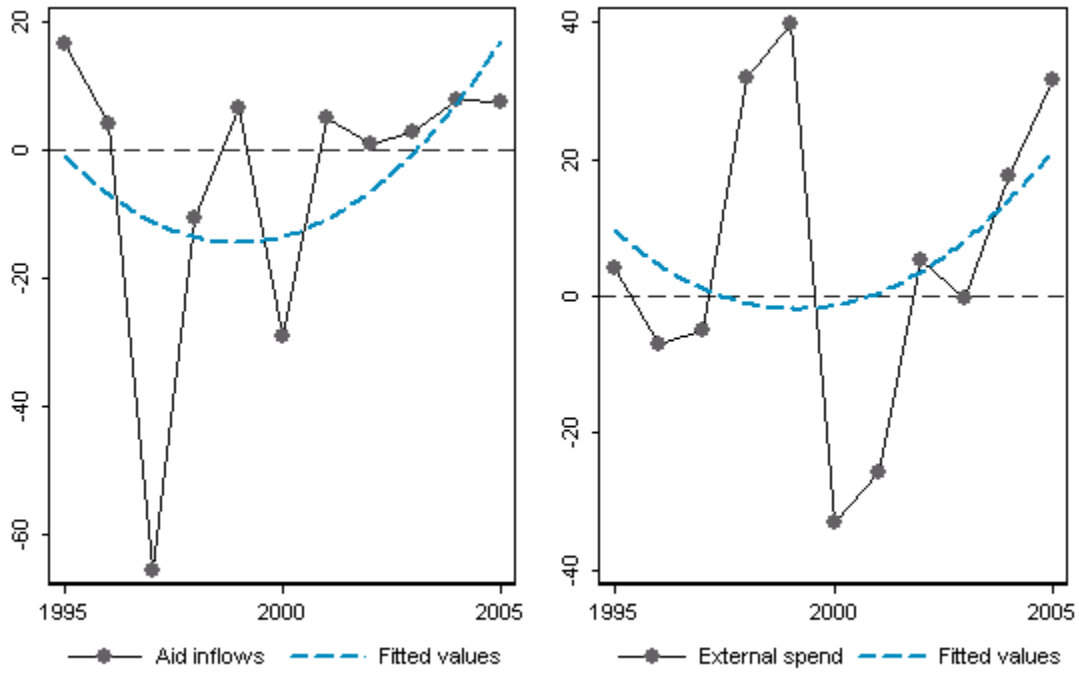
Notes: calculations based on coefficients from PCSE panel model applied to annual data.

Figure 4: Forecast errors for macroeconomic policy variables 1995-2005



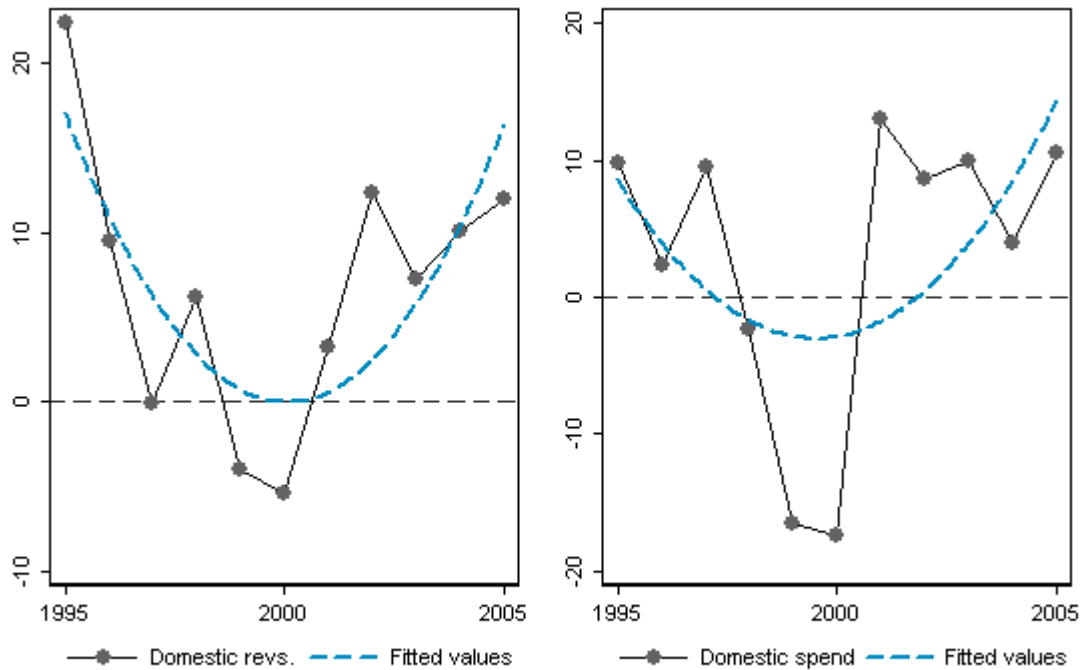
Source: author's calculations

Figure 5: Forecast errors for external component of the budget 1995-2005



Source: author's calculations

Figure 6: Forecast errors for domestic component of the budget 1995-2005



Source: author's calculations

APPENDIX A

The following table details the variables and underlying data sources used in the cross-country regression (Section 6.1). As described in the text, only significant variables are shown in Table 2; full results are available on request from the authors. Also note that due to the panel structure the time variant variables are calculated as period averages (unless otherwise stated).

Name	Description / comment	Source
Tax revenue % GDP	Tax revenue as a percentage of GDP (in logarithms)	WDI 2005 ²³
GDP per capita	Measured in constant 2000 US\$ (in logarithms)	WDI 2005
Industry VA	Share of industry in total value added (in logarithms)	WDI 2005
Exports % GDP	Exports as a percentage of GDP (in logarithms)	WDI 2005
Imports % GDP	Imports as a percentage of GDP (in logarithms)	WDI 2005
Resource poor	Dummy variable taking 1 if the country sits in the bottom quartile of the distribution of per capita subsoil and timber resource assets under exploitation	Authors based on World Bank (2006)
Time trend	Trend variable representing the minimum year in each panel period	Authors
% Land tropics	Percentage of the country's territory located in the tropics or sub-tropics	Koepfen-Geiger climate zones dataset ²⁴
Landlocked	Dummy variable taking 1 if country is landlocked	CEPII geodesic distances dataset ²⁵
Colonizer (various)	Set of dummy variables representing the primary, long-term colonial power which historically governed the country	CEPII geodesic distances dataset (see above)
Continent (various)	Set of dummy variables representing the major continent to which the country belongs	WDI 2005

²³ See World Bank (2005). Taxation data points for Mozambique were added based on official government sources.

²⁴ Available from the collection found at: www.ksg.harvard.edu/CID/ciddata/geographydata.htm

²⁵ Available from the *Centre d'Etudes Prospectives e d'Informations Internationales* (CEPII): www.cepii.fr/anglaisgraph/bdd/distances.htm

The choice of these specific variables, particularly on the institutional side, deserves comment. The following notes clarify the research justification and underlying effect that is intended to be reflected in each case:

- the inclusion of a tropics variable captures the influence of tropical geography on both institutional evolution and economic performance more generally as set out in Frankel (2002). Choice of the specific variable ‘% land tropics’ follows Dalgaard et al. (2004) who find it to be a robust predictor of economic performance;
- the colonial variables refer to the impact of colonial systems on current taxation performance. In contrast to the ‘standard’ employment of settler mortality rates to instrument for the overall quality of institutions in developing countries (see Acemoglu, 2000), note that colonial dummy variables are included directly in the model. This strategy reflects the specific interest of this paper in taxation institutions, which in the cases of colonized countries were often directly inherited from the colonial administration;
- both the ‘landlocked’ and continental dummy variables are used to capture aspects of trade openness as well as broader neighbourhood / spillover effects that may relate from regional trade agreements;
- the ‘time trend’ variable is included in order to capture global shifts in taxation policy or ideology, such as international movements toward multilateral trade liberalization;
- the ‘resource poor’ variable is introduced in recognition of the possibility that the level of tax revenues may be endogenous to the availability of non-tax income sources. Assuming this effect is greatest where natural resources are under-extraction, it follows that the availability of substantial natural resource rents may diminish the government’s financial dependence on domestic taxation and thus reduces incentives for the government to develop a constructive (growth-conducive) relationship with the private sector via fiscal policy. Practical measurement of such an effect is not straight-forward as mineral wealth is not homogenous and natural resource access rights can be allocated in numerous ways, in turn influencing government taxation instruments. The corollary argument, therefore, is that resource poor countries may face comparatively greater incentives to raise revenue via taxation alone.

APPENDIX B

This appendix describes the forecast analysis methodology applied in Section 7.2. It is divided into three sub-parts: the first summarizes the dataset, the second describes the nature and estimation of forecast errors, and the third presents a simple forecast error evaluation methodology.

B.1 Dataset

The variables in focus are real GDP growth, inflation as measured by a consumer price index, and aggregate revenues and expenditures in the budget. On the revenue side we distinguish between: (i) domestic revenues, which refer to all taxation and non-taxation financing raised from domestic sources; and (ii) external resources, which represent all aid flows including grants, credits and budget support. In terms of the budget constraint, the only resource not captured is the government's internal deficit. On the expenditure side we similarly separate: (i) domestic spending, which refers to the sum of recurrent expenditures and what is described as the domestically financed component of government investment; and (ii) external spending, which refers to the part of the investment budget financed by aid inflows. Note that according to budget classification, aid inflows corresponding to budget support are excluded from the latter category of external spending and are included in the former.

For each of the variables we hold annual observations of both outcomes and their respective forecasts made in the previous period. The dataset covers the 11 years 1995-2005 and is constructed from official documents including the annual government budget, official execution figures and published planning documents. With respect to budget items the forecast values represent the projections in the government budget (*Orçamento do Estado*) while outcomes are those reported in the official government accounts (*Conta Geral do Estado*). Prior to 1998, however, although government budget documents were produced, no official public record was made of the final execution figures. Thus, for such information one must resort to unpublished data produced by the collection agencies. For the macroeconomic variables, actual values can be gleaned from the national statistics agency while forecasts are taken from an array of official planning documents.²⁶

²⁶ A remark should be made about budget revisions. In certain years budget targets can become dangerously erroneous due to unexpected changes and/or errors in the original budget. In extreme cases this necessitates a formal revision which, for the period under analysis, occurred in Mozambique in 2001. Given the magnitude of the revisions to the revenue forecasts made at this time, the dataset uses the revised as opposed to original figures. For all other years original budget figures are used.

B.2 Forecast error definition

The evaluation of forecasts naturally focuses on the forecast error. For a given fiscal variable n_t , define the forecast error at time t as:

$$e_t = n_t^f - n_t^a \quad (\text{B-1})$$

where superscript f denotes the forecast made at $t - 1$ for the outcome at t , and a indicates the actual outcome value. This is a simplified notation which ignores forecasts made over different horizons for the same period as these are not in focus here. With respect to the comparison of forecast errors both over time and across items, one must be sensitive to the choice of n . In the case of the macroeconomic variables, (real GDP growth and inflation), the range of actual and forecast values in the data is relatively small and scale concerns are not an issue. Thus, the relevant forecast errors refer to the difference in these rates expressed in percentage point terms. Budget items are more problematic as in their nominal, local currency form they are non-stationary and not easily comparable across items. Moreover, budget forecasts also implicitly tend to incorporate forecasts for other variables such as GDP and inflation.

Various responses to the above problem are encountered in the literature, such as the transformation of nominal revenues to a ratio of GDP (e.g., Golosov and King, 2002). For the purposes here, however, none of these methods are ideal. As a result, it is useful to decompose the revenue variable into its component parts. Thus, define the observed nominal outcome for variable n at time t as:

$$n_t^a = n_{t-1}^a \cdot z_t^a \cdot p_t^a \cdot g_t^a \quad (\text{B-2})$$

where p reflects the rate of inflation, g the real growth of output and z the overall elasticity of n to changes in nominal GDP, capturing the tax effort. The forecast for the same period is defined in exactly the same way – i.e., for all variables other than the common base given by the first term on the right-hand side substitute the a superscripts for their forecasts (f). Second, taking natural logarithms and subtracting the forecasts from the actuals one arrives at:

$$e_t = (z_t^f - z_t^a) + (p_t^f - p_t^a) + (g_t^f - g_t^a) \quad (\text{B-3})$$

where each set of parentheses on the right-hand side represent forecast errors in the tax effort, inflation and growth respectively (in log. form). For discussion of the useful properties of this decomposition approach see Jones (2007).

B.3 Forecast evaluation

It is typical to review three distinct characteristics of forecast errors, namely their accuracy, unbiasedness and efficiency (see Schuh, 2001; also the contributions in Hendry and Ericsson, 2001). *Accuracy* refers to the comparison of errors from two forecast models and as such it is not of specific interest here (for explanation see Jones, 2007). *Unbiasedness*, however, holds when the expected value (mean) of the forecast error is equal to zero and therefore captures the degree of optimism (pessimism) in forecasts. Holden and Peel (1990) show that the preferred test for bias is a simple regression of the forecast error on a constant. Under the null of unbiasedness one expects to find the coefficient on the constant is equal to zero. For this test to be valid, however, the forecast errors should be approximately Gaussian; as this is by no means guaranteed, basic distributional tests on the forecast errors must be conducted in advance.

Efficiency refers to the full use of information available to the forecaster at the time of forecasting. This concept is discussed at length in Nordhaus (1987) who distinguishes between strong and weak forms of efficiency. While the former tends to focus on the full information set pertinent to the forecast, it is more typical to test for the latter via a simple regression of the current forecast error on its past values. The point here is that if a significant relationship is found then past forecasts could have been improved by an adjustment in relation earlier forecast errors. In the context of auto-correlation, one also recalls that the econometrics literature frequently distinguishes between different types of time series effects. Among these are trend-stationary processes, defined as a random walk around an underlying (linear) trend. This is relevant here as there is no *a priori* reason to assume that any bias in the errors will be constant. Slow changes to the determinants of forecast quality, including political variables, may translate into forecast error trends. Thus, it may be helpful to distinguish between trended and non-trended inefficiency.

It is possible to define a general test for bias, trend effects and serial auto-correlation in the forecast errors. This derives from a single regression of the form:

$$e_t = \alpha + \beta_0 e_{t-1} + \beta_1 t \quad (\text{B-4})$$

With regards to significance testing, simple parameter tests on the coefficients are appropriate to identify the source of any regularities in the forecast errors. Note, however, that tests applied to the constant term, $\alpha = 0$, do not represent strict tests for bias (i.e., that $E(e_t) = 0$), but rather refer only to the bias remaining after adjusting for the effects of

other variables.²⁷ Given unbiasedness is a logically necessary condition for efficiency, an overall test for weak efficiency is given by the joint significance of the entire equation. Finally, although it is common in the literature to run tests for bias and weak efficiency via two separate regressions, a general specification is preferred for both analytical and econometric reasons. A ‘complete’ specification helps to reduce both omitted variable bias and the risk of spurious results arising from running a large number of regressions. Also, a general specification permits the analyst to distinguish between the separate (partial) influences of bias, serial correlation or trend effects that would not be evident from separate regressions.

²⁷ For further discussion see Barrionuevo (1992). Note that bias here is also tested after the effect of any time-trend; thus in order to ensure the average bias is captured, the trend variable is set to zero for the mid-point in the time series.