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Fiscal policy, expenditure composition, and growth in low-income countries

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Abstract

This paper assesses the effects of fiscal consolidation and expenditure composition on economic growth in a sample of 39 low-income countries during the 1990s. The paper finds that strong budgetary positions are generally associated with higher economic growth in both the short and long terms. The composition of public outlays also matters: countries where spending is concentrated on wages tend to have lower growth, while those that allocate higher shares to capital and nonwage goods and services enjoy faster output expansion. Finally, initial fiscal conditions also have a bearing on the nexus between fiscal deficits and growth.

JEL classification: E62; E23; H50

Keywords: Fiscal policy; Economic growth; Public expenditure composition

1. Introduction

A large body of empirical research supports the notion that healthy budgetary balances are, over the long run, good for growth (Easterly et al., 1994). The effect of fiscal consolidation on growth in the short run, however, remains open to question as

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a number of studies—largely for industrial countries—have drawn the conclusion that under some circumstances fiscal contractions can stimulate growth.[1] A central theme in these works is that the composition of fiscal adjustment plays a key role in determining whether fiscal contractions lead to higher growth and are also sustainable over time. These studies show that improving fiscal positions through the rationalization of the government wage bill and public transfers, rather than increasing revenues and cutting public investment, can foster higher growth even in the short run.

The purpose of this paper is to assess whether fiscal consolidation and improvements in the composition of public expenditure have positive repercussions for growth in low-income countries. While some aspects of this issue have been assessed in other studies,[2] an in-depth econometric evaluation—drawing on a wide sample of low-income countries—has yet to be undertaken. For example, in the group of 36 different empirical studies that Kneller et al. (1998) identify as the core of the empirical research on the effects of fiscal policy on growth, only three studies (including Landau, 1986; Easterly et al., 1994) were based on developing countries, and none were based on low-income countries alone.

A number of important related issues have not yet been fully examined in the literature. None of these studies, for example, have addressed whether deficits that are financed from abroad have a different impact on growth than those financed from domestic sources. In addition, the important issue of whether the macroeconomic effects of fiscal policy differ in low-deficit countries—as opposed to those that have yet to achieve a modicum of macroeconomic stability—has yet to be assessed for a wide sample of countries.[3]

This paper attempts to fill some of these gaps and aims to provide some empirical evidence of the effects of fiscal adjustment and expenditure composition on economic growth. More specifically, the paper addresses the following two questions:

- What is the impact of the fiscal stance, expenditure composition, and the nature of budget financing on economic growth in low-income countries?
- Are these effects independent of initial fiscal conditions?

This paper does not restrict its analysis to episodes of fiscal adjustment as has been done in studies for industrial countries. Instead, it assesses the effects of both fiscal expansions and fiscal consolidations on growth in 39 low-income countries with IMF-supported programs in the 1990s.[4] These programs, on average, have

[1] See, for example, McDermott and Wescott (1996), Alesina and Perotti (1996), Alesina et al. (1998), Alesina and Ardagna (1998), Buti and Sapir (1998), Von Hagen and Strauch (2001), Alesina et al. (2002).

[2] See Mackenzie et al. (1997), Abed et al. (1998), Gerson (1998), Kneller et al. (1999).

[3] See Adam and Bevan (2000) for a study based on 17 low-income countries.

[4] This includes countries that have obtained concessional loans from the Fund since 1999 under the Poverty Reduction and Growth Facility (PRGF), which replaced the Enhanced Structural Adjustment Facility (ESAF). One of the basic tenets of the PRGF is that a stable macroeconomic position is critical for promoting growth and reducing poverty. For further information on the characteristics of PRGF, see http://www.imf.org/external/np/exr/facts/prgf.htm.

targeted relatively small reductions in budget deficits.[5] Furthermore, the elimination of budget imbalances has not been the sole aim of these IMF-supported programs, which also sought, inter alia, to improve the composition of public expenditure and revenues. As such, an exclusive focus on episodes of fiscal adjustment—defined as periods of sharp deficit reduction—would be of only limited interest in examining the impact of fiscal policy on growth in low-income countries.

The results of this study confirm that there is a strong link between public expenditure reform and growth, as fiscal consolidations achieved through curtailing current expenditures are, in general, more conducive to growth. Fiscal consolidations tend to have the most positive effects on growth when they lead to a reduction in the domestic borrowing requirement of the government. When public investment is also protected, the positive effect of fiscal adjustment on growth is further accentuated. The fiscal consolidation-growth nexus is also influenced by a country's initial fiscal conditions—in particular, whether a country has reached a certain degree of macroeconomic stability or not.

The rest of the paper is structured as follows: Section 2 surveys the literature on the effects of fiscal policy and budget composition on economic growth; Section 3 describes the data used in the empirical sections; and Section 4 presents some baseline econometric results of the effects of fiscal policy and expenditure composition on economic growth. Particular attention is given to examining the robustness of the results, and whether results differ for low-deficit (''post-stabilization'') countries. Finally, Section 5 concludes the paper and elaborates on some policy implications of the results.

2. Literature review

The effects of fiscal policy on economic growth have been the subject of long debate. With respect to short-term effects, a large body of empirical research, primarily for industrial countries, has been devoted to understanding under which conditions fiscal multipliers can be small (and even negative) (Alesina and Perotti, 1996; Alesina and Ardagna, 1998; Perotti, 1999). Perotti (1999), for example, shows that consolidations tend to be expansionary when debt is high or growing rapidly, while Alesina and Perotti (1995) and Alesina and Ardagna (1998) find that, in addition to the size and persistence of the fiscal impulse, budget composition matters in explaining different private sector responses to fiscal policy (and, hence, the effect on growth). Fiscal adjustments that rely primarily on cuts in transfers and the wage bill tend to last longer and can be expansionary, while those that rely primarily on tax increases and cuts in public investment tend to be contractionary and unsustainable (Von Hagen and Strautch, 2001).

[5] For example, for ESAF-supported programs over the 1986–1995 period, the deficit was targeted, on average, to decrease by about one percentage point of GDP relative to the preprogram year (Abed et al., 1998).

The potential effects of fiscal policy on long-term growth have also generated substantial attention (Tanzi and Zee, 1996). Most recently, the burgeoning work in the field of endogenous growth suggests that fiscal policy can either promote or retard economic growth as investment in physical and human capital—both of which can be affected by taxation and government expenditures—can affect steady-state growth rates (Chamley, 1986; Barro, 1990, 1991; King and Rebelo, 1990; Jones et al., 1993; Barro and Sala-ì-Martin, 1995; Mendoza et al., 1997).

In both strands of the literature, the effect of fiscal policy on growth can be nonlinear. This may occur, for example, because the private sector's response to fiscal policy may be nonlinear, implying a complex relationship between the size and the composition of public spending and revenues and growth. Giavazzi et al. (2000), for example, find that in industrial and developing countries the nonlinear effects of fiscal policy on national savings tend to be associated with large and persistent increases in the primary deficit.

There are good reasons to believe that for some (but not all) low-income countries fiscal contractions may also be expansionary. As in the industrial countries, expansionary contractions are more likely to be observed in countries that have not yet achieved a degree of macroeconomic stability.[6] For these countries, the overriding imperative of reining in inflation and achieving low budget deficits are such that increases in public spending—even if potentially productive—may not have a salutary effect on growth. By contrast, countries in a "post-stabilization" phase can exercise more choice over expenditure priorities, including by allocating resources to important structural reforms, such as the decompression of the civil service payscale. In these countries, higher public spending—even if it results in higher deficits—could raise, rather than contract, economic activity. In sum, the relationship between the fiscal policy stance and growth will differ across countries depending on their initial fiscal conditions. This also has important implications for the econometric specifications used to link fiscal policy and growth (see below).

Another important issue to be considered in the analysis is the nexus between the composition of fiscal deficit financing and growth. Many studies found that fiscal consolidations can have an indirect impact on private investment (and thus growth) by affecting the level of aggregate demand and monetary variables. Deficits largely financed by domestic sources may also lead to inflationary pressures. High levels of inflation have been found to reduce growth and can lead to macroeconomic and financial instability (Fischer, 1983; Sarel, 1996; Khan and Senhadji, 2001).

In sum, the theoretical framework underlying the empirical analysis carried out in this paper assumes that fiscal policy can affect the steady-state and short-run growth rate through its effects on private sector behavior and on human and physical capital formation. It also acknowledges that initial and accompanying macroeconomic and fiscal conditions are important.

[6] For an empirical analysis of the impact of initial conditions on the effectiveness of fiscal policy during recessions in industrial and middle-income countries, see Baldacci et al. (2001).

3. Statistical data and descriptive analysis

3.1. Data

In this paper, three aspects of a country's fiscal policy are examined in relation to their impact on growth: the fiscal policy stance as measured by the level and changes in the general government budgetary balance; the financing of budgetary deficits; and expenditure composition. Data for these variables were constructed on the basis of the World Economic Outlook (WEO) database as well as a database for 39 ESAF and PRGF-supported countries during the period 1990–2000.[7]

The fiscal policy stance is measured by the general government budget balance on a cash basis. This is defined as total revenues and grants minus total expenditures and net lending.[8] A positive change in the budget balance can be interpreted as a consolidation and a negative change as an expansion. As reported in Table 1, the average budget deficit for the sample is 6.3% of GDP. Deficits were generally reduced during the period with an average annual improvement of approximately ½ percentage point of GDP.

The deficit can be financed either from domestic or from external sources. Domestic financing includes both bank and nonbank financing, with the latter measure including privatization receipts. For the countries included in the sample external financing predominated while domestic financing averaged less than 2% of GDP.

Fiscal deficits are also used to identify "post-stabilization" countries. Post-stabilization countries are defined as those that had an average budget deficit (after grants) below 2.5% of GDP in the 1990–2000 period.[9] Based on this criterion, only seven countries can be considered post-stabilizers (Benin, The Gambia, Lesotho, Macedonia, Mauritania, Senegal, and Tanzania).

Macroeconomic indicators have also been extracted from the WEO database. Following earlier studies, growth is measured on a real per capita basis.[10] Other variables used in the regression analysis to control for initial and accompanying conditions include: the labor force (as a percentage of total population); terms of trade; and private investment. These variables are used to control the effects of

[7] The countries are: Albania, Armenia, Benin, Bolivia, Burkina Faso, Cambodia, Cameroon, the Central African Republic, Chad, Djibouti, Ethiopia, The Gambia, Ghana, Georgia, Guinea, Guinea-Bissau, Guyana, Honduras, Kenya, the Kyrgyz Republic, Laos, Lesotho, Macedonia (FYR), Madagascar, Malawi, Mali, Mauritania, Moldova, Mozambique, Nicaragua, Niger, Rwanda, São Tomé and Príncipe, Senegal, Tajikistan, Tanzania, Vietnam, Yemen, and Zambia.

[8] The difference between revenues and expenditures can be different from the cash deficit for countries which measure expenditures on a commitment basis.

[9] This roughly corresponds to the low-deficit country group identified in the ESAF Review (Abed et al., 1998).

[10] Growth of per capita GDP is used most frequently in the empirical literature assessing the effects of fiscal policy on growth, as this controls for differences among countries in the population growth rate. See, for example, Aschauer (1989), Barro (1990, 1991), Easterly and Rebelo (1993), Devarajan et al. (1996), Easterly et al. (1997), Kneller et al. (1999, 2000).

Table 1
Descriptive statistics (as percent of GDP, unless otherwise specified)

Variable	Observations	Mean	Standard deviation
Budget balance	429	−6.30	7.9
Tax revenue	425	15.00	7.5
Nontax revenue	423	2.50	2.2
Grants	426	4.20	4.6
Current spending	425	19.70	9.5
Capital spending	425	9.00	7.2
Domestic financing	372	1.70	4.9
External financing	372	4.60	6.1
Per capita real GDP growth	429	−0.50	8.3
Change in			
Budget balance	390	0.40	5.8
Tax revenue	386	0.02	3.2
Nontax revenue	384	−0.06	1.2
Grants	386	0.03	2.6
Current spending	386	−0.50	4.8
Capital spending	386	0.05	3.4
Domestic financing	333	−0.20	4.8
External financing	333	−0.10	5.2
Per capita GDP growth	390	0.50	10.1

Source: Authors' calculations.
Note: Sample averages using data from 1990 until 2000.

private sector and external sector activity on growth. We also control the level of initial primary and secondary enrollment as indicators of human capital endowment in each country. Data are taken from World Development Indicators of the World Bank.

3.2. Fiscal policy and growth: bivariate analysis

Simple correlations reported in Table 2 show a significant association between deficit reduction, expenditure composition, and growth consistent with previous findings in the literature on industrial countries. For example, stronger budget balances are positively associated with per capita growth. The composition of public expenditure also matters for growth; higher capital outlays are associated with more buoyant growth, while higher current expenditures and domestic financing of the deficit are associated with less favorable economic performance.

These results hold for the short-run correlations as well. Annual changes in the budget balance are positively correlated with changes in per capita growth. Correlation coefficients[11] are also significant for the various measures of public expenditure (including capital outlays) and for domestic financing.

[11] Correlation coefficients are calculated using the Spearman rank correlation formula to avoid the effect of outliers.

Table 2
Bivariate correlations (variables expressed as percent of GDP, unless otherwise specified)

Variables	Per capita real GDP growth	Observations
Budget balance	0.23***	429
Tax revenue	−0.03	425
Nontax revenue	0.03	423
Grants	0.05	425
Current spending	−0.24***	425
Capital spending	0.16***	425
Domestic financing	−0.25***	372
External financing	−0.07	372
Change in		
Budget balance	0.20***	390
Tax revenue	0.09**	386
Nontax revenue	0.08*	386
Grants	0.11**	384
Current spending	−0.16***	386
Capital spending	0.12***	386
Domestic financing	−0.16***	333
External financing	−0.01	333

Source: Authors' calculations.
Note: Bilateral correlations using annual data from 1990 through 2000.
*Significant at 10%; **significant at 5%; ***significant at 1%.

These preliminary findings are consistent with the empirical results obtained by Easterly and Rebelo (1993) and Kneller et al. (1999, 2000), who found that balanced budgets and investment in transport and communications are consistently correlated with growth in a sample of low-income countries.

4. Econometric analysis

4.1. The econometric models

The relationship between expenditure composition, fiscal adjustment, and growth can be estimated by regressing the annual rate of real per capita GDP growth on a set of regressors, including fiscal variables and other control variables. Three specifications of the relationship are used here. In Model A, fiscal variables are measured as a share of GDP without a variable included on the fiscal balance; this allows us to capture the effects of a particular expenditure item (e.g., wages) not only on the composition of expenditure, but also on the deficit. In Model B, we measure fiscal variables in relation to total expenditures or total revenues so as to assess directly the impact of expenditure or revenue composition on growth, while, at the same time, including a variable for the budget balance. In Model C, we address how the nature of the financing of the deficit affects growth by substituting the budget

balance variable with variables for domestic and external financing of the deficit. Each of the three models is formulated as follows.

- Budget components (revenue and expenditure) measured as a share of GDP (Model A):

$$g_{i,t} = \alpha + \sum_{l=1}^{k} \beta_l Y_{ilt} + \sum_{h=1}^{q} \beta_h \mathrm{XGDP}_{iht} + u_{it} \tag{1}$$

where $g_{i,t}$ is the growth rate of real per capita GDP; Y_{ilt} is a vector of nonfiscal independent variables (initial level of GDP per capita, private investment ratio, terms of trade, labor force, and initial level of primary and secondary enrollment rates); and XGDP_{iht} is a vector of independent fiscal variables aimed at capturing the effect of the composition of the budget. These variables are measured in percent of GDP and include: public sector wages and salaries, expenditures on other goods and services, transfers and subsidies, interest payments on government debt, capital expenditures, tax revenues, nontax revenues, and grants. In order to avoid perfect collinearity among regressors, the budget balance is not included.[12,13]

- Fiscal balance as share of GDP and expenditure composition by economic category (Model B):

$$g_{i,t} = \alpha + \sum_{l=1}^{k} \beta_l Y_{ilt} + \sum_{h=1}^{q} \beta_h \mathrm{XBALEXP}_{iht} + u_{it} \tag{2}$$

where $g_{i,t}$ and Y_{ilt} are defined as before and $\mathrm{XBALEXP}_{iht}$ is a vector of independent fiscal variables aimed at capturing the effect of the budget balance and the composition of expenditures. The budget balance is measured as a percentage of GDP, while all expenditure items are measured as shares of total public expenditures. The expenditure categories include: public wages and salaries, public transfers and subsidies, interest payments on government debt, public expenditures on other goods and services, and public capital expenditures.

[12] Theoretical models have generally incorporated government budget constraint, which implies that a change in revenues or spending of a given magnitude has to be matched by offsetting changes elsewhere. This has not, however, been the approach taken in the empirical literature. In many cases, applied studies estimate the effect of selected expenditures and revenues on growth, which implicitly assumes that the effect of the excluded items on growth is neutral. We avoid this by including all budget items in the specification. In this respect, we follow Kneller et al. (1999), who emphasize the need to include all fiscal policy variables in the equations to avoid omitted variables bias.

[13] For example, adjustment based on selective increases in import tariff rates would most likely have a more adverse effect on growth than raising revenues from a broad-based VAT.

- Sources of deficit financing expressed as a share of GDP and expenditure composition by economic category (Model C):

$$g_{i,t} = \alpha + \sum_{l=1}^{k} \beta_l Y_{ilt} + \sum_{h=1}^{q} \beta_h \mathrm{XFINEXP}_{iht} + u_{it} \tag{3}$$

where $g_{i,t}$ and Y_{ilt} are defined as before and $\mathrm{XFINEXP}_{iht}$ is a vector of independent fiscal variables aimed at capturing the effect of the deficit financing (both domestic and external financing in percent of GDP), and the composition of expenditures as shares of total public expenditures. This specification is the same as the previous one, but it replaces the budget balance with its financing sources (expressed as ratios to GDP).

The baseline regressions use a fixed-effects estimator. The results are then tested for robustness by running a Generalized Method of Moments (GMM) estimator to address potential problems with endogeneity and serial correlation arising from the dynamic specification of the models above. A pooled mean-group estimator (PMG) is also used to capture the effects of both short-run and long-run dynamics and relax the assumption of homogeneity of short-run coefficients. The relative merits of these methods are discussed in the respective sections.

4.2. Baseline regressions

The models above are estimated in levels and in first differences (changes) in order to capture both long- and short-run effects of fiscal policy on growth. An alternative formulation of this model, involving a nested specification in which both short-run and long-run effects are estimated simultaneously, is found in Bassanini et al. (2001). This model could not be fully estimated in the present context due to the relatively short length of our sample. The results from an abridged version of the Bassanini, Scarpetta, and Hemmings model are discussed in section 4.3.

An important problem that is encountered in panel data estimation is the presence of unobserved country-specific effects (Easterly et al., 1997).[14] Excluding unobservable country-specific effects could lead to serious biases in the econometric estimates, notably when these effects are correlated with the other covariates. To address this, we used a Least Squares Dummy Variable (LSDV) estimator that allows the intercept in the regression to be country-specific for the estimation of Models A, B, and C.[15,16]

Results from the baseline regressions (Table 3) are consistent with the empirical literature and show that on average, fiscal adjustments have not been harmful for growth, both in the long and in the short term. According to these results, a 1% improvement in the fiscal balance has a positive and significant impact in the long term on the rate of GDP growth, raising it by one-half of one percentage point

[14] Unobservable time-specific effects are less common. In fact, following Greene (2000), when such effects do exist, it would be more efficient to include an explicit linear or nonlinear time trend in the equation.

[15] Tests for serial correlation for the three models revealed no first order autocorrelation of the residuals.

[16] The number of countries includes in the regression varies according to the specification. On average, about 28 countries are included.

Table 3
Budget composition and growth in low-income countries: fixed effects

	Model A: budget composition (as percent of GDP)		Model B: budget balance and composition of expenditures		Model C: budget financing and composition of expenditures	
	Real per capita GDP growth	Change in real per capita GDP growth	Real per capita GDP growth	Change in real per capita GDP growth	Real per capita GDP growth	Change in real per capita GDP growth
Initial GDP per capita level[a]	0.205 (0.92)	0.203 (0.10)	−0.816 (−0.39)	0.475 (0.23)	−0.314 (−0.14)	0.332 (0.16)
Labor force	0.837*** (2.88)	2.894*** (5.24)	0.618** (2.21)	2.799*** (4.68)	0.687** (2.33)	2.329*** (3.85)
Terms of trade	−0.003 (−0.52)	0.001 (0.18)	−0.005 (−0.90)	−0.362 (−0.04)	−0.005 (−1.01)	−0.005 (−0.55)
Private investment	0.267* (1.77)	0.279 (1.44)	0.396*** (2.75)	0.582*** (2.81)	0.391** (2.28)	0.75*** (3.27)
Initial primary enrollment	−0.136 (−0.99)	−0.006 (−0.05)	−0.159 (−1.21)	−0.016 (−0.11)	−0.211 (−1.54)	−0.031 (−0.21)
Initial secondary enrollment	0.057 (0.51)	−0.048 (−0.037)	0.162 (1.51)	−0.051 (−0.36)	0.150 (1.33)	−0.034 (−0.25)
Budget balance (as percent of GDP)			0.458*** (4.22)	0.551*** (3.39)		
Domestic financing (as percent of GDP)					−0.797*** (−5.08)	−1.336*** (−5.94)
External financing (as percent of GDP)					−0.383*** (−2.93)	−0.595*** (−3.22)
Wages and salaries (as percent of GDP)	−0.525* (−1.78)	−0.396 (−0.87)				
Wages and salaries (as percent of total expenditure)			−0.213** (−2.23)	−0.229 (−1.53)	−0.250** (−2.38)	−0.235 (−1.51)
Transfers and subsidies (as percent of GDP)	0.110 (0.42)	−0.424 (−1.08)				
Transfers and subsidies (as percent of total expenditure)			0054 (0.49)	0.033 (0.19)	−0.047 (−0.37)	−0.008 (−0.05)
Interest payments (as percent of GDP)	−0.293 (−0.90)	−0.367 (−0.73)				
Interest payments (as percent of total expenditure)			−0.118 (−1.11)	−0.370*** (2.20)	−0.227* (−1.92)	−0.415*** (−2.35)
Other goods and services (as percent of GDP)	0.420 (1.36)	1.722*** (3.96)				

Other goods and services (as percent of total expenditure)			0.015 (0.16)	0.068 (0.45)	0.043 (0.44)	0.175 (1.10)
Capital expenditure (as percent or GDP)	0.567*** (2.96)	0.874*** (3.52)				
Capital expenditure (as percent of total expenditure)			0.154* (1.96)	0.282** (2.25)	0.072 (0.82)	0.237* (1.81)
Tax revenue (as percent of GDP)	−0.056 (−0.29)	0.053 (0.17)				
Nontax revenue (as percent of GDP)	0.095 (0.81)	1.49*** (2.63)				
Grants (as percent of GDP)	0.079 (0.33)	0.209 (0.71)				
Number of observations	249	220	250	221	225	197
Adjusted *R*-squared	0.10	0.33	0.16	0.21	0.17	0.31
F test	1.77	3.86	2.41	2.62	2.30	3.50
Probability	0.00	0.00	0.00	0.00	0.00	0.00

Note: *t* statistics in parentheses. *Significant at 10%; **significant at 5%; and ***significant at 1%.

[a] Multiplied by 100.

(Model B). An even larger coefficient is estimated for the short-term effect of a change in the fiscal balance on growth. The composition of deficit financing also matters. Domestic financing of the budget tends to be more harmful for growth than external financing (Model C): in the long term, an increase in domestic financing by 1% reduces the per capita growth rate by three-fourths of a percentage point. The estimated coefficient for the short-term relationship is even larger.

Expenditure composition is also critical for growth. In Model A, a one percentage point of GDP increase in spending on wages and salaries reduces growth by half a percentage point, while a one percentage point increase in the ratio of capital outlays to GDP increases growth by more than half a percentage point. Expenditures on other goods and services are also found to raise the growth rate, but only in the short term. Interest payments have a statistically insignificant impact on growth. Finally, in the models that assess the impact of expenditure composition directly (Models B and C), the coefficients for spending on wages are significant, but only in the long run. The share of capital expenditures in total outlays is positively related to growth under all model specifications, except for the long-run coefficient estimated in Model C. The results suggest that a 1% increase in the allocation of public spending to capital outlays can raise the growth rate by 0.1 percentage point in the long term and by almost one-fourth of one percentage point in the short term. The share of public outlays devoted to the interest bill is also negatively correlated with growth. A 1% increase in the ratio of interest to total public spending tends to reduce growth by one-fourth of a percentage point in the long run and by more than one-third in the short term.

4.3. Sensitivity analysis

In order to assess the sensitivity of the econometric results presented above, this section reports the main results of the robustness analysis.

Reverse causality is not found to affect significantly the parameter estimates. A common issue in the literature on fiscal policy and growth is the likely presence of endogeneity or reverse causality. It could be the case that economic growth itself influences fiscal variables. For example, when economic growth slows down, the ratio of government spending to GDP is likely to increase if the nominal level of expenditure is fixed, or if the revenue effort is sensitive to cyclical developments. Moreover, some degree of reverse causality could also be present in the relationship between growth and investment.[17] If economic growth is a determinant of any of the right-hand side variables in our model, estimation techniques that do not take into account this endogeneity will yield biased and inconsistent parameter estimates. To

[17] A related issue is whether the model fully captures the effect of the budget balance on growth, as the inclusion of private investment (as an independent variable) de facto blocks the indirect effects of the budget deficit on growth via its effects on private investment. Estimates that omit private investment from the specification, however, do not lead to significantly different results, including for the fiscal balance. This assessment should be viewed as preliminary, however, given the need to assess the deficit–investment relationship in a model especially specified for that purpose.

address this concern, we estimate the previous models using a GMM estimator,[18] instrumenting for the investment rate, fiscal balance ratio and the shares of government spending and revenues to GDP. We use as instruments the lagged values of these variables, the other exogenous variables in the model, and a set of instruments not included in the model.[19] Results are presented in Table 4 and broadly confirm the findings of the previous section. Accounting for the endogeneity of fiscal balances leads to the same positive effect of fiscal consolidations on growth as in the baseline regressions. However, a difference in the results is that the coefficient for the share of wages and salaries becomes insignificant in Model A, although it remains significant and negatively correlated with growth in the remaining specifications. The short-run effect of capital outlays on growth is not affected by the use of the GMM estimator; however, the long-run coefficient turns insignificant.

The specification used in the regression above does not allow for any dynamics between the dependent and the independent variables. However, growth relationships are dynamic in nature, as growth in a given period is not uncorrelated with past growth trends. If the true model is not static, parameter estimates based on a static fixed-effects estimator are biased and inconsistent, even when the error terms are not serially correlated. Thus, we estimated Models A, B, and C using unobserved country-specific effects and allowed for the lagged growth rate to be included among the determinants of economic growth. These models can be estimated using the GMM estimator proposed by Arellano and Bond (1991). The GMM estimate also controls for endogeneity by using the lagged values of the levels of the endogenous and the predetermined variables as instruments. Both the validity of the instruments and the presence of serial correlation in the residual, which would eliminate the consistency of the estimator, can be tested once the equation is estimated.

Introducing a dynamic specification does not lead to significantly different results from the baseline, while it improves the results compared to the static GMM estimator. GMM estimates of the dynamic model with country-specific effects are reported in Table 4. The results are, in general, consistent with the static fixed-effects estimates presented in the previous section. The effect of fiscal consolidation on growth is larger and more significant than under the GMM and LSDV estimates of the static model. The contributions of capital outlays and government spending on wages are still correctly signed and statistically significant, and in most cases larger in size than in the baseline and GMM regressions. The negative effect on growth of an increase in domestic financing is larger, while the effect of external financing of the deficit is broadly unchanged. The coefficient of the lagged dependent variable is negative and significant, as expected,[20] for all models. Finally, both the Sargan test

[18] The GMM estimator used here deals with a heteroskedastic error process. This estimator is more efficient than the traditional instrumental variables estimator.

[19] The instruments include total revenue, current government spending and total government spending, all as a ratio to GDP. All instruments were found to be valid according to the Hansen–Sargan test.

[20] A negative coefficient for the lagged growth rate can be interpreted as the tendency of the annual growth rate to converge toward an average long-run trend. Countries would still tend toward different, specific growth rates as a result of the error component structure in the equation.

Table 4
Fiscal policy, budget composition, and growth in low-income countries: controlling for reverse causality, 1990–2000

	Model A: budget composition (as percent of GDP)				Model B: budget balance and composition of expenditures				Model C: budget financing and composition of expenditures			
	Real Pc. growth (GMM-IVREG)	Real Pc. growth (GMM-ABond)	Change growth (GMM-IVREG)	Change growth (GMM-ABond)	Real Pc. growth (GMM-IVREG)	Real Pc. growth (GMM-ABond)	Change growth (GMM-IVREG)	Change growth (GMM-ABond)	Real Pc. growth (GMM-IVREG)	Real Pc. growth (GMM-ABond)	Change growth (GMM-IVREG)	Change growth (GMM-ABond)
Per capita growth ($t-1$)		−0.109**		−0329***		−0.265***		−0371***		−0.229***		−0.424***
		(−2.05)		(−9.24)		(−21.78)		(16.38)		(−6.18)		(−16.21)
Initial GDP per capita level[a]	0396*		0.039		−0.041		0.033		−0.061		−0.006	
	(1.96)		(031)		(−0.22)		(0.34)		(−0.32)		(−0.06)	
Labor force	0.847*	1.784***	2.89***	2.669***	0.75	0.936***	2.120**	2.18**	0.802*	1.149***	1.76**	1.69***
	(1.74)	(9.60)	(3.12)	(11.30)	(1.60)	(4.32)	(2.03)	(16.72)	(1.74)	(5.38)	(2.05)	(5.90)
Terms of trade	−0.003	0.003***	0.001	0.004	−0.005***	−0.002***	−0.001	0.003	−0.005***	−0.004***	−0.004	−0.001
	(1.34)	(3.66)	(0.42)	(1.47)	(−2.94)	(−2.64)	(−0.29)	(1.01)	(−3.18)	(−3.38)	(−0.73)	(−0.62)
Private investment	0.266*	0.106	0.279*	0.167	0.383***	0.393***	0.466**	0.642***	0.356**	0.760***	0.602**	0.533***
	(1.69)	(1.49)	(1.69)	(1.30)	(2.84)	(5.28)	(2.29)	(5.97)	(2.36)	(3.90)	(2.26)	(3.14)
Initial primary enrollment	−0.797		−0.068		−0.546		0.006		−0.519		0.072	
	(−1.80)		(−0.89)		(−1.27)		(0.09)		(−1.24)		(0.67)	
Initial secondary enrollment	0.346		−0.021		0.352		−0.052		0.335		−0.072	
	(1.45)		(−0.23)		(1.58)		(−0.77)		(1.51)		(−0.87)	
Budget balance (as percent of GDP)					0.435***	0.536***	0.462***	0.662***				
					(4.24)	(9.59)	(2.21)	(17.35)				
Domestic financing (as percent of GDP)									−0.606***	−0.929***	−0.977***	−0.991***
									(−3.06)	(−6.80)	(2.73)	(−6.79)
External financing (as percent of GDP)									−0.415***	−0.459***	−0.511**	−0.605***
									(−3.54)	(−7.07)	(−2.57)	(−8.86)
Wages and salaries (as percent of GDP)	−0.521	−0.385*	−0.396	−0.511*								
	(−0.86)	(−1.89)	(−0.58)	(−1.92)								
Wages and salaries (as percent of total expenditure)					−0.214*	−0.350***	−0.244*	−0.263***	−0.220*	−0.280***	−0.255*	−0.344***
					(−1.85)	(−7.09)	(−1.76)	(−6.26)	(−1.65)	(−3.58)	(1.83)	(−3.14)

Transfers and subsidies (as percent of GDP)	0.109 (0.46)	−0.059 (−0.50)	−0.424 (−0.58)	−0.528***								
Transfers and subsidies (as percent of total expenditure)					0.081 (0.92)	−0.004 (−0.09)	−0.001 (0.00)	−0.005 (−0.09)	0.039 (0.40)	−0.018 (−0.19)	−0.070 (−0.21)	0.230*** (3.00)
Interest payments (as percent of GDP)	−0.298 (−0.74)	−0.188 (−1.63)	−0.367 (−0.87)	0.005 (0.03)								
Interest payments (as percent of total expenditure)					−0.139 (−1.09)	−0248*** (−4.42)	−0.303 (−1.59)	−0.379*** (−6.17)	−0.218 (−1.47)	−0.194** (−2.08)	−0.314* (−1.67)	−0.412*** (−5.16)
Other goods and services (as percent of GDP)	0.400 (0.95)	1.417*** (6.26)	1.72*** (3.05)	0.932*** (4.12)								
Other goods and services (as percent of total expenditure)					−0.002 (−0.03)	0.129** (2.28)	0.048 (0.40)	0.035 (0.87)	0.003 (0.05)	0.149** (2.44)	0.109 (0.89)	0.064 (0.77)
Capital expenditure (as percent of GDP)	0.552 (1.57)	0.710*** (7.10)	0.874** (2.41)	0.735*** (5.48)								
Capital expenditure (as percent of total expenditure)					0.116 (1.35)	0.185*** (5.03)	0.194 (1.38)	0.358*** (10.35)	0.071 (0.69)	0.180*** (3.69)	0.145 (1.00)	0.293*** (4.44)
Tax revenue (as percent of GDP)	−0.043 (−0.18)	0.067 (1.04)	0.053 (0.20)	0.059 (0.31)								
Nontax revenue (as percent of GDP)	0.104 (0.27)	1.518*** (5.01)	1.49** (2.35)	1.44*** (3.88)								
Grants (as percent of GDP)	0.090 (0.25)	0.185 (0.97)	0.209 (0.61)	0328*** (5.10)								
Number of observations	249	201	220	172	250	201	221	172	225	179	197	151
Regression tests — Wald χ^2 (12)	—	3644.13	—	18 158.87	—	26 400.36	—	18 255.63	—	7060.64	—	108 082.74

Note: Absolute value of t and z statistics in parentheses. *Significant at 10%; **significant at 5%; and ***significant at 1%. Model A: Hansen-J test: (GMM 0-levels) = 0.01; (GMM 0-changes) = 0.00; serial of over 2: (GMM-ABond-levels) = 0.41; (GMM-ABond-changes) = 0.25. Model B: Hansen-J test: (GMM 0-levels) = 0.62; (GMM 0-changes) = 1.32; serial of over 2: (GMM-ABond-levels) = 0.08; (GMM-ABond-changes) = 0.21. Model C: Hansen-J test: (GMM 0-levels) = 1.04; (GMM 0-changes) = 2.32; serial of over 2: (GMM-ABond-levels) = 0.12; (GMM-ABond-changes) = 0.10.

[a] Multiplied by 100.

for the validity of instruments and the test for the serial correlation of residuals confirm that the dynamic GMM provides consistent estimates of the parameters.

A variety of other estimators were utilized to test the robustness of the results, including the Generalized Least Squares (GLS) estimate of the random effects model. The results confirm the main findings of the previous section.[21] Results are also consistent with these estimates when we use a robust technique to control for the possible presence of outliers in the data. The method is based on an iterative algorithm that first runs OLS estimates and calculates Cook's D statistics for the residuals, eliminating those observations for which $D > 1$. The second step of the algorithm is to run a regression on the new dataset, and calculate case weights based on the inverse of the residual.[22] The results show that the effect of outliers in our data is not substantial.[23]

A further robustness test was carried out by replicating a modified version of the model used by Bassanini et al. (2001). This specification tries to capture the effect of the simultaneous inclusion of both short-run and long-run effects of fiscal variables in the growth equation using the PMG estimator. We were not able to fully replicate the nested specification used by Bassanini, Scarpetta, and Hemmings, given the short time dimension of our sample. Instead, we included the most important fiscal variables in first differences[24] in the level specification of the three models, and allowed their coefficients to be country-specific to account for differentiated short-term responses of growth to fiscal policy. We estimated this model using a fixed-effects estimator. The results confirm the stability of the fiscal coefficients estimated in the baseline regressions (Table 5). The negative effect of fiscal deficits on growth is confirmed by these estimates. In Model B, the long-run coefficient of the fiscal balance is significant and positively signed, but smaller in size than the corresponding coefficient in the baseline regression. Similar significant and consistently signed coefficients are also found for the share of wages on total government spending and the ratio of capital to total public outlays. Results for Model A show a much larger and significant negative effect of the wage bill on growth. However, the ratio of capital spending to GDP becomes insignificant in this specification. Model C also confirms the main findings of the baseline model. However, in this model, while domestic financing is found to be detrimental for growth, external financing does not significantly affect growth.

Finally, results do not change much when the possible effects of the business cycle and time trends are removed from the data. The possible effects of the business cycle

[21] These and other results not reported in the paper are available from the authors upon request.

[22] For a full description of this procedure, see Hamilton (1991).

[23] Although most results are consistent with the baseline regression for Models A and B, in the case of Model C, the coefficient of the level of domestic financing is not statistically significant. For the majority of the short-run coefficients, the variables are significant and correctly signed.

[24] In Model A, we use the first difference of total government spending and total revenues as a share of GDP. In Models B and C, we use the fiscal balance and domestic and external deficit financing, respectively.

Table 5
Budget composition and growth in low-income countries: nested models with fixed effects[a] (dependent variable: real per capita GDP growth)

	Model A: budget composition (as percent of GDP)	Model B: budget balance and composition of expenditures	Model C: budget financing and composition of expenditures
Initial GDP per capita level[b]	0.003 (1.07)	−0.001 (−0.38)	−0.001 (−0.43)
Labor force	0.510* (1.77)	0.443 (1.48)	0.413 (1.06)
Terms of trade	−0.006 (−1.00)	−0.006 (−0.93)	−0.007 (−0.92)
Private investment	−0.026 (−0.15)	0.343* (1.91)	0.452* (1.80)
Initial primary enrollment	−0.139 (−0.36)	−0.130 (−0.91)	−0.139 (−0.67)
Initial secondary enrollment	0.020 (0.10)	0.133 (1.19)	0.135 (0.94)
Budget balance (as percent of GDP)		0.348** (2.54)	
Domestic financing (as percent of GDP)			−0.521* (−1.79)
External financing (as percent of GDP)			−0.378 (−1.63)
Wages and salaries (as percent of GDP)	−0.833*** (−2.82)		
Wages and salaries (as percent of total expenditure)		−0.196* (−1.79)	−0.145 (−0.96)
Transfers and subsidies (as percent of GDP)	0.287 (0.76)		
Transfers and subsidies (as percent of total expenditure)		0.063 (0.50)	0.084 (0.50)
Interest payments (as percent of GDP)	−0.023 (−0.07)		
Interest payments (as percent of total expenditure)		−0.159 (−1.33)	−0.138 (−0.83)
Other goods and services (as percent of GDP)	0.424 (1.28)		
Other goods and services (as percent of total expenditure)		0.032 (0.27)	−0.016 (−0.10)
Capital expenditure (as percent of GDP)	0.214 (1.05)		
Capital expenditure (as percent of total expenditure)		0.172* (1.96)	0.213* (1.71)
Tax revenue (as percent of GDP)	−0.300 (−1.31)		
Nontax revenue (as percent of GDP)	−0.049 (−0.12)		
Grants (as percent of GDP)	0.041 (0.15)		
Number of observations	229	230	201
Adjusted *R*-squared	0.68	0.30	0.17
F test	3.07	2.53	1.47
Probability	0.00	0.00	0.02

Note: *t* statistics in parentheses. *Significant at 10%; **significant at 5%; and ***significant at 1%.

[a] The regressions include the following variables, denoted in changes, and their interaction with country dummies: total expenditure and total revenue (Model A); deficit (Model B); and domestic and external financing (Model C).

[b] Multiplied by 100.

are partially eliminated by smoothing the data using a three-year moving average filter. Once again, the results are not sensitive to this transformation of the original data. The reason why business cycle effects may be weaker in low-income countries than in the industrial countries is the absence of automatic stabilizers. This feature makes it very unlikely that business cycles affect tax collection or public expenditures, and thus the overall budget balance. Moreover, in our sample, we do not find sufficient evidence that unobservable time effects are a serious problem, as evidenced by the results for regressions that include time dummies to control for nonlinear time trends in the data.

4.4. Nonlinear effects of fiscal policy on growth: pre- and post-stabilization countries

The results in the previous sections suggest that fiscal consolidation is not harmful for growth in low-income countries. Quality fiscal adjustments based on the reallocation of public expenditure to more productive uses, and the reduction of the budget deficit, were found to be conducive to higher growth. Of interest is whether these results hold for all countries in the sample, in particular, for countries that have already achieved a modicum of macroeconomic stability (i.e., "post-stabilization" countries (Adam and Bevan, 2001)).

With the purpose of assessing the effect of initial fiscal conditions on the fiscal policy-growth nexus, we split the sample into post- and pre-stabilization countries. A post-stabilization country is defined as a country that maintained an average fiscal deficit (after grants) below 2.5% of GDP during the period 1990–2000.[25]

Results for post-stabilization countries point to the positive effects of capital outlays and selected current expenditures on growth. Econometric results for the two subgroups are reported in Table 6 using LSDV.[26] Interestingly, the results suggest that for countries with low budget deficits additional fiscal consolidation may not yield higher growth. Even more importantly, domestic financing is not harmful for growth in the short run and less harmful than external financing in the long run in these countries, unlike the case of countries that have not yet achieved stabilization. These results should be interpreted with caution, though, as the sample size for post-stabilization countries is small and the poor performance of some of these models in terms of *F*-tests. Nevertheless, the results support the notion that the relationship between budget deficits and growth in these countries differs from that of the sample

[25] The criterion used to group the countries in the sample is similar to the one used in a study of ESAF-supported programs from 1986 to 1995 (see Abed et al., 1998), where "low initial deficit" countries were defined as those with initial deficits (before grants) of 5%, with grants of approximately 2½% of GDP. Post-stabilization countries included in the regressions are: The Gambia, Lesotho, Macedonia (FYR), Mauritania, Senegal, and Tanzania. Benin is the seventh post-stabilization country, but is excluded because data on the other control variables are unavailable.

[26] Results were also replicated using GLS and GMM estimators which broadly confirmed these findings. These results are not included in the paper for the sake of brevity but are available from the authors upon request.

as a whole. Results for pre-stabilization countries are fully consistent with the "expansionary contractions" thesis.

5. Conclusions and policy implications

The empirical evidence provided in this study suggests that in low-income countries fiscal consolidations were not harmful for either long- or short-term growth in the period 1990–2000. This paper sought to shed light on the relationship between fiscal adjustment, expenditure composition, and economic growth in low-income countries. Consistent with the previous findings in the literature on industrial countries, the results point to a significant relationship between fiscal adjustment and per capita growth. A reduction of one percentage point in the ratio of the fiscal deficit to GDP leads to an average increase in per capita growth of a half percentage point both in the long and in the short term. This implies that a reduction in the average deficit in low-income countries from about 4% of GDP to 2% of GDP could boost per capita growth by about one to two percentage points per annum.

Tilting the overall composition of public expenditure toward more productive uses is particularly important for boosting growth. Fiscal consolidations achieved through cutting selected current expenditures tend to trigger higher growth rates than adjustments based on revenue increases and cuts in more productive spending—a result consistent with the findings for industrial countries. According to the results of our analysis, protecting capital expenditures during a fiscal adjustment leads to higher growth. Reductions in the public sector wage bill are not harmful for growth for the sample as a whole.

The composition of deficit financing is also a key factor affecting growth in low-income countries. Fiscal consolidations, especially those leading to a sizeable reduction in domestic financing of the deficit, are likely to trigger higher growth rates. The empirical estimates indicate that adjustments based on reducing domestic financing have about 1½ times the effect on growth as adjustments based on reductions in both domestic and external financing.

The effects of fiscal policy on growth tend to be nonlinear. The results above hold for countries that have not yet achieved stable macroeconomic conditions. In post-stabilization countries, fiscal adjustments no longer have a salutary effect on growth. In this context, an expansion of selected current expenditures for these countries is compatible with higher growth. The design of fiscal frameworks in PRGF-supported programs is consistent with these results, as post-stabilization countries target relatively larger increases in public spending and in the fiscal deficit (IMF, 2002).

Additional research is needed to disentangle the channels through which fiscal policy affects growth. Given the reduced-form model tested here, the paper has not examined the demand and supply side channels through which fiscal policy affects growth, nor the role of accompanying policies (such as monetary and external sector policies) which have been underscored in previous work in this field (Baldacci et al., 2001; Thomas, 2001). Additional research is needed in this area.

Table 6
Fiscal policy, budget composition, and growth in low-income countries (pre- and post-stabilization countries), 1990–2000: fixed effects

	Model A: budget composition				Model B: budget balance and composition of expenditures				Model C: budget financing and composition of expenditures			
	Real per capita GDP growth		Change real per capita GDP growth		Real per capita GDP growth		Change real per capita GDP growth		Real per capita GDP growth		Change real per capita GDP growth	
	Pre-stabilization countries	Post-stabilization countries	Pre-stabilization countries	Post-stabilization countries	Pre-stabilization countries	Post-stabilization countries	Pre-stabilization countries	Post-stabilization countries	Pre-stabilization countries	Post-stabilization countries	Pre-stabilization countries	Post-stabilization countries
Initial GDP per capita level[a]	1.466	−1.423	−0.018	−0.012	1.010	−3.402	0.290	−1.483	0.013	−9.726	0.422	−0.132
	(1.55)	(−0.41)	(−0.02)	(−0.05)	(1.21)	(−1.18)	(0.31)	(−0.61)	(1.51)	(−2.75)	(0.48)	(−0.55)
Labor force	0.833**	0.967	2.792***	0.218	0.571*	1.68	2.56***	0.605	0.601*	4.591***	2.10***	4.50
	(2.62)	(0.63)	(4.73)	(0.11)	(1.87)	(1.29)	(4.03)	(0.29)	(1.91)	(2.83)	(3.32)	(1.52)
Terms of trade	−0.004	−0.004	0.002	0.045	−0.006	0.033	−0.001	0.30	−0.007	0.030	−0.006	0.043
	(−0.63)	(−0.09)	(0.23)	(0.73)	(−1.00)	(0.86)	(−0.09)	(0.50)	(−1.13)	(0.79)	(−0.65)	(0.70)
Private investment	0.600***	−0.207*	0.518**	−0.285**	0.650***	−0.192*	0.990***	−0.367***	0.695***	−0.114	1.22***	−0.346**
	(2.83)	(−2.01)	(2.01)	(−2.34)	(3.29)	(−1.91)	(3.71)	(−2.91)	(2.95)	(−0.96)	(4.12)	(−2.48)
Initial primary enrollment	0.052	−0.179	−0.009	−0.015	−0.010	−0.55	0.0197	−0.031	0.018	−1.638**	−0.003	−0.055
	(0.40)	(−0.31)	(−0.10)	(−0.30)	(−0.09)	(−1.12)	(0.21)	(−0.59)	(0.15)	(−2.73)	(−0.04)	(−1.03)
Initial secondary enrollment	−0.469	1.463	−0.045	0.050	−0.273	3.21	−0.151	0.157	−0.527	9.154**	−0.116	0.153
	(−1.57)	(0.44)	(−0.16)	(0.23)	(−1.03)	(1.18)	(−0.48)	(0.69)	(−1.54)	(2.72)	(−0.36)	(0.69)
Budget balance (as percent of GDP)					0.563***	0.118	0.804***	−0.043				
					(4.16)	(1.41)	(4.11)	(−0.36)				
Domestic financing (as percent of GDP)									−1.09***	−0.206*	−1.57***	0.141
									(−5.36)	(−1.98)	(−6.21)	(0.75)
External financing (as percent of GDP)									−0.44***	−0.364***	−0.723***	−0.108
									(−2.81)	(−3.02)	(−3.31)	(−0.70)
Wages and salaries (as percent of GDP)	−0.305	−0.768*	−0.896*	−6.01								
	(−0.86)	(−1.91)	(−1.74)	(−0.82)								
Wages and salaries (as percent of total expenditure)					−0.233*	0.019	−0.300*	−0.064	−0.246*	0.033	−0.283	0.002
					(−1.97)	(0.25)	(−1.68)	(−0.52)	(−1.98)	(0.28)	(−1.58)	(0.02)
Transfers and subsidies (as percent of GDP)	−0.039	0.411	−0.985**	0.862**								
	(−0.11)	(1.28)	(−2.08)	(2.37)								
Transfers and subsidies (as percent of total expenditure)					−0.010	0.338***	−0.110	0.306**	−0.159	0.527***	−0.188	0.429**
					(−0.08)	(3.36)	(−0.53)	(2.11)	(−1.06)	(4.45)	(−0.84)	(2.76)

Interest payments	−0.538	−0.756	−0.526	0.755								
(as percent of GDP)	(−1.44)	(−1.02)	(−0.97)	(0.74)								
Interest payments					−0.150	0.290***	−0.403**	0.444*	−0.260**	0.277	−0.454**	0.313
(as percent of total expenditure)					(−1.25)	(1.79)	(−2.20)	(1.72)	(−2.00)	(1.61)	(−2.41)	(1.07)
Other goods and services	0.667	0.655**	1.932***	0.711*								
(as percent of GDP)	(1.63)	(2.33)	(3.59)	(2.01)								
Other goods and services					0.037	0.142*	0.041	0.197*	0.090	0.060	0.135	0.125
(as percent of total expenditure)					(0.31)	(1.80)	(0.22)	(1.87)	(0.73)	(0.67)	(0.72)	(1.06)
Capital expenditure	0.682***	−0.037	1.327***	−0.032								
(as percent of GDP)	(3.00)	(−0.18)	(4.32)	(−0.18)								
Capital expenditure					0.148	0.139*	0.327**	0.171*	0.044	0.248***	0.221	0.260**
(as percent of total expenditure)					(1.56)	(1.98)	(2.21)	(1.86)	(0.44)	(3.15)	(1.48)	(2.65)
Tax revenue	−0.057	−0.099	0.238	−0.312								
(as percent of GDP)	(−0.21)	(−0.48)	(0.60)	(−1.45)								
Nontax revenue	−0.387	0.524**	1.306*	0.479								
(as percent of GDP)	(−0.58)	(2.08)	(1.85)	(1.16)								
Grants	−0.100	0.487	−0.099	0.554								
(as percent of GDP)	(−0.35)	(0.85)	(−0.31)	(0.94)								
Number of observations	200	49	177	43	201	49	178	43	184	41	161	36
Adjusted *R*-squared	0.13	0.16	0.39	0.14	0.20	0.33	0.28	0.13	0.22	0.51	0.38	0.30
F test	1.97	1.59	4.64	1.45	2.71	2.74	3.37	1.48	2.69	4.08	4.29	2.07
Probability	0.00	0.12	0.00	0.19	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.06

Note: *t* statistics in parentheses. *Significant at 10%; **significant at 5%; and ***significant at 1%.

[a] Multiplied by 100.

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