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World Development Report

Office of the Vice President
Development Economics
The World Bank
August 1988
WPS 31

Background Paper for the 1988 World Development Report

Public Finance and Economic Development

Bela Balassa

Budget deficits tend to lead to a deterioration of the balance of payments. Furthermore, increases in government consumption and in public investment have adverse effects on economic growth.

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This paper reports on tests of alternative hypotheses as to the effects of a budget deficit, examines the influence of the size of the government on economic growth, and investigates the impact of public investment on private investment, total investment, and economic growth.

The econometric results provide evidence that a substantial part of the budget deficit of the developing countries is externally financed. Also, the budget deficit appears to adversely affect private investment. However, a correlation between the budget deficit, on the one hand, and the money supply, inflation rates, and economic growth, on the other hand, has not been observed.

At the same time, there is a negative correlation between the ratio of government consumption to GDP and economic growth. This relationship applies to all developing countries as well as to the regional subsamples of countries in Africa, Asia, and Latin America.

Finally, there is a negative correlation between public investment, on the one hand, and private investment, total investment, and economic growth, on the other. It further apppears that the negative effects of public investment on economic growth can be decomposed in two parts: their adverse impact on total investment and their unfavorable influence on the efficiency of investment.

These findings have important implications for the developing countries. They show that budget deficits have adverse effects on the balance of payments as well as on domestic investment. It further appears that increases in government consumption adversely affect economic growth. Finally, increases in public investment not only crowd out private investment but tend to lower the efficiency of investment, with adverse effects on economic growth.

The conclusions point to the need for reducing budget deficits in developing countries. They further favor lowering government consumption as well as public investment in these countries.

This paper, a product of the Office of the Vice President, Development Economics, is a background paper for the 1988 World Development Report. Copies are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Norma Campbell, room S9-047, extension 33769.

Public Finance and Economic Development

by
Bela Belassa

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PUBLIC FINANCE AND ECONOMIC DEVELOPMENT

Introduction

This paper will analyse the interrelationships of public finance and economic development. The following aspects of public finance will be considered: the budget deficit (or surplus), the size of the public sector, and public investment. Apart from the financing of the budget deficit, the paper will examine its possible effects on various economic variables. The relationship between the size of the government budget and economic growth will also be analyzed. Finally, the impact of public investment on private investment, total investment, and economic growth will be investigated.

A budget deficit may be financed through external borrowing, money creation, or internal borrowing; in the latter two cases, there is a corresponding savings surplus in the private sector. According to the Cambridge School, private savings equal private investment ex ante as well as ex post, so that a budget deficit will generate a trade deficit of equal magnitude, necessitating external borrowing to finance it. This proposition may be transformed into testable hypotheses. One may test for the existence of a positive relationship between the budget deficit and the trade deficit. Furthermore, if the propositions of the Cambridge school hold, one would expect a negative correlation to obtain between the cumulated budget deficit and changes in the foreign debt over time, with allowance made for official and private transfers that do not increase a country's indebtedness.

Alternatively, the budget deficit may be financed through the issue of money. In this event, there will be a positive correlation between the budget deficit and the growth of the (narrowly-defined) money supply. As

money creation leads to inflation, it can further be hypothesized that budget deficits will contribute to increases in prices.

The inflationary financing of a budget deficit will absorb private savings. This will also be the case if the budget deficit is financed through domestic borrowing. In either eventuality, the availability of funds for private investment will be reduced and it can be expected that the budget deficit will unfavorably affect private investment. It may further be hypothesized that declines in private investment will have an adverse influence on the rate of economic growth, giving rise to a negative relationship between budget deficits and economic growth.

Thus far, we have been concerned with the economic effects of a budget deficit. Further questions concern the economic implications of the size of the government budget. According to traditional Keynesian textbooks, in the short run there is a balanced budget multiplier: increased government expenditures, financed by taxation, add to national income by their full amount. More recently, it has been shown that the balanced budget multiplier is negative in developed countries as higher taxation reduces profits that, in turn, leads to lower investment. Another channel is the incentive effects of taxation, with higher taxes discouraging work and risk-taking. One may, then, test the hypothesis that the size of the government budget is negatively correlated with economic growth.

Finally, the relationship between public and private investment may be analyzed. This raises questions of complementarity and competition between the two types of investment as well as their relative efficiency. In the first case, the hypothesis is tested if public and private investment are positively or negatively correlated. In the second case, one tests the

hypothesis put forward in the development literature that a higher share of public investment is associated with lower investment efficiency. The two hypotheses may also be combined in correlating the relative share of public investment and the rate of economic growth.

Apart from reporting on available empirical results, the stated hypotheses will be tested in a cross-section framework for the 1973-84 period. In the regression equations, we will experiment with the introduction of per capita income to test if the relationship is affected by the level of economic development. The sample used in Section I of the paper includes 21 developed and 94 developing countries, except that a more limited sample has been used in regressions that require data on official and private transfers. Furthermore, in Sections II and III, the number of countries covered has been limited by the availability of data on the relevant variables.

I. The Financing and the Economic Effects of Budget Deficits

As noted in the introduction, a budget deficit may be financed through external borrowing, money creation, and internal borrowing. For lack of data on internal borrowing, only the first two hypotheses could be tested for the entire sample of countries.

The Cambridge School hypothesis on a one-to-one correspondence between the budget deficit and the trade deficit does not receive confirmation from the empirical results. Thus, all the regression coefficients in the estimates linking the trade deficit to the budget deficit are significantly different from (less than) one.

Nevertheless, the results reported in Table 1 show that the budget deficit and the trade deficit are positively correlated. This is the case for

Table 1

The Relationship between the Budget Deficit and the Trade Deficit
(t-values in parenthesis)

	Constant	Budget Deficit	R^2
(1) Developed countries	1.37 (1.91) Δ	0.44 (3.19) **	0.349
(2) Developing countries	-5.53 (1.97) Δ	0.75 (2.54) *	0.066
(3) All countries	-4.13 (2.44) *	0.73 (2.77) **	0.063

Note: ** 1 percent, * 5 percent, and Δ 10 percent level of significance.

Source: World Bank economic and social data base.

the developed countries, for the developing countries, and for the two together. The regression coefficients are statistically significant (different from zero) at the 1 percent level in the total and the developed country regressions and at the 5 percent level in the developing country regression.

In the case of the developed countries, a dollar increase (decrease) in the budget deficit appears to lead to a 44 cent increase (decrease) in the trade deficit. The apparent effect is larger, 75 cents, for developing countries; it is 73 cents for developed and developing countries, taken together.

The explanatory power of the developing countries and total regressions is, however, very low, with R^2's of 0.07 and 0.06, respectively; it is higher for the developed country regression (0.35). It would appear that data for the developing countries include a lot of statistical noise. Also, funds for the external financing of the budget deficit may be readily available in some countries but not in others, thereby affecting the results obtained.

In the case of a more limited number of developing countries, for which the relevant data are available, the effects of government budget deficits on changes in the external debt have been investigated over time in the 1973-78 and 1978-82 periods. 1/ This has been done under two alternatives: including official and private transfers (for short, transfers) with the change in the external debt as the dependent variable or introducing transfers as an explanatory variable in the regression equation. In the first

Table 2

Government Budget Deficits and the External Debt
(t-values in parenthesis)

Dependent variables	Independent variables			
Change in the external debt plus sum of transfers (percent of GNP)	Sum of Government budget deficits (percent of GNP)	Sum of official and private transfers (percent of GNP)	Per capita GNP initial year ($ million, logs)	R^2
(1a) 1973-78	1.082 (7.953)**			0.657
(1b) 1978-82	0.719 (6.740)**			0.594
(2a) 1973-78	0.899 (4.565)**		1.328 (1.277)	0.664
(2b) 1978-82	0.421 (2.952)**		2.120 (2.830)**	0.669
Change in the external debt (percent of GNP)				
(3a) 1973-78	0.433 (3.688)**	-0.208 (2.352)*	0.864 (1.545)	0.536
(3b) 1978-82	0.205 (2.026)*	-0.228 (1.838) Δ	1.442 (2.823)**	0.506

Note: The change in the external debt refers to the difference between terminal and initial year values; per capita GNP pertains to the initial year of the period; government budget deficits and transfers are cumulated values for each period.

** 1 percent, * 5 percent, and Δ 10 percent level of significance.

Sources: External Debt: Organization for Economic Cooperation and Development, External Debt of Developing Countries, various issues. Government Budget Deficit, Official and Private Transfers, Gross National Product, and Population: World Bank economic and social data base.

case, it is hypothesized that government budget deficits are financed through foreign borrowing and transfers; in the second case, it is hypothesized that transfers influence the extent to which the financing of government budget deficits entails foreign borrowing.

Equation (1) of Table 2 shows that the sum of the change in the external debt and cumulative transfers is highly correlated with the sum of government budget deficits in both the 1973-78 and the 1978-82 periods. The explanatory power of the regression equation rises - in particular in the second period - if per capita GNP is added as an explanatory variable. As shown in equation (2), this variable has a positive sign, indicating that the possibilities of financing budget deficits by foreign borrowing increase at higher levels of development. 2/

In equation (3), the change in the external debt was regressed on the sum of government budget deficits, the sum of transfers, and per capita GNP. The level of statistical significance of the regression coefficients is relatively high and they have the expected sign, with the negative coefficient for transfers indicating that, for a given budget deficit, higher transfers give rise to less borrowing (significance levels are lower, however, in the second period).

In turn, the effects of the budget deficit on the money supply, inflation, and economic growth could not be ascertained by the econometric investigation of developed and developing countries. However, statistically significant estimates have been obtained as regards the negative effect of the budget deficit on private investment, expressed as a ratio of GDP, in the case of developing countries for which such data are available. The estimates, made for the 24 developing country sample used in Section III, show the

regression coefficient of the budget deficit variable to be statistically significant at the 5 percent level.

All in all, available evidence points to the external financing of a substantial part of the budget deficit. And while its monetary financing could not be ascertained from the data, there is evidence that the budget deficit adversely affects private investment. But, the effects of the budget deficit on the money supply, inflation, and economic growth could not be ascertained from the data.

II. The Government Budget and Economic Growth

Knoester [9] examined the consequences of the postwar expansion of the public sector, financed by direct taxes and social security taxes, in Germany, the Netherlands, the United Kingdom, and the United States by the use of macroeconomic models. He found that in all four countries rates of economic growth declined owing to the shifting forward of these taxes, which reduced profits and ultimately investment.

These results are supported by Eltis [6] who attributed the "destabilization" of Britain between 1964 and 1973 to the rapid expansion of public spending, accompanied by rapid increases in wages to compensate for higher taxes that financed the rise of public spending. [3/] Finally, one may cite the results for Japan, derived by Ihori in a model of utility maximization, according to which "the level of government spending was regarded as too little in the 1960s, but is regarded as too much in recent years for the Japanese economy" [8, p. 95]. Yet, Japan has the lowest share of government spending in GDP among the developed countries.

While his time series investigation led to inconclusive results, in a cross-section investigation of the developed countries in the 1965-77 period,

Peterson [12] also established that tax rates (average as well as marginal) and economic growth rates are negatively correlated. The relationship apparently finds its origin in the high negative correlation between direct tax rates and economic growth rates, while there is a positive correlation (albeit not statistically significant) between indirect taxes and growth rates. The author purports to explain these results with reference to the greater "visibility" of direct taxes as well as by the fact that indirect taxes do not bear on savings.

Marsden [11] utilized data for 7 developed and 13 developing countries for the 1970-79 period. He found a strong negative correlation between the tax-GDP ratio and the GDP growth rate for the entire group of countries as well as for two subgroups of equal size, classified by per capita incomes. The extent of the correlation is reduced if the growth rates of gross domestic investment and the labor force are added as explanatory variables. However, these variables themselves are negatively correlated with the tax-GDP ratio.

Marsden's extended specification was applied by Ram [13] to all developed and developing countries for which data are available, as well as to developing countries, but he used data on government consumption rather than taxes, the investment-GDP ratio rather than its growth rate, and the rate of population growth rather than the growth of the labor force. The results show the ratio of government consumption to GDP (the government consumption ratio) to be negatively correlated with GDP growth in the 1970-80 period at the 5 percent signficance level while a negative sign was obtained but the results were not statistically significant for the 1960-70 period. At the same time, Ram did not follow Marsden in testing for the correlation between government

consumption and gross domestic investment. 4/

Ram suggests, however, that an appropriate test would involve using the growth rate of government consumption or that of the government consumption ratio instead of the ratio itself in the estimating equation. In both cases, the estimated coefficients were positive and statistically significant, leading Ram to conclude that "the overall impact of government size on growth is positive in almost all cases" [13, p. 191].

Ram's conclusion cannot be accepted because of his neglect of the intercorrelation between the growth of output and that of government consumption. In the application of Wagner's law, the result can be reinterpreted as indicating that the growth of output leads to higher levels of government consumption. 5/ Thus, Ram's preferred result appears to show a demand relationship while using the government consumption ratio will indicate a supply relationship. It is the latter, however, that is relevant for the problem at hand.

Landau [10] correlated the share of government consumption in GDP with the rate of economic growth, including per capita GDP, investment, education, and dummy variables for the Mediterranean Climate Zone and for the Tropical Rain Forest Climate Zones as additional variables. For longer and shorter periods, with population weighted or unweighted, the results show a negative correlation between government consumption shares and GDP growth rates for a group of developed and developing countries. The statistical results are slightly weaker if only developing countries are considered; within this group, they are stronger for middle income countries while the hypothesis is not confirmed by low-income countries.

Table 3

Factors Affecting Intercountry Differences in GDP Growth Rates, 1973-80
(t-values in parenthesis)

	Constant	Government Consumption Share	Per Capita GNP	Population Growth Rate	Investment Share	R^2
Africa						
(1)	8.17 (2.85)**	-0.23 (1.74) Δ				0.08
(2)	9.49 (2.75)**	-0.26 (1.86) Δ	0.76 (-0.70)			0.09
(3)	2.21 (0.59)	-0.31 (2.50)*		1.74 (1.56)	0.18 (2.86)**	0.27
Asia						
(1)	10.91 (5.23)**	-0.27 (2.43)*				0.28
(2)	8.88 (3.41)**	-0.21 (1.80) Δ	0.94 (1.26)			0.36
(3)	4.50 (1.10)	-0.20 (1.92) Δ		0.81 (0.73)	0.17 (2.53)*	0.52
Latin America						
(1)	9.13 (4.43)**	-0.29 (2.44)*				0.21
(2)	12.06 (5.00)**	-0.33 (2.97)**	-1.21 (-2.03) Δ			0.34
(3)	6.84 (2.00) Δ	-0.26 (2.08) Δ		0.62 (1.13)	0.02 (0.19)	0.26
LDC						
(1)	8.16 (5.74)**	-0.19 (2.68)**				0.07
(2)	8.87 (5.11)**	-0.20 (2.76)**	-0.30 (-0.72)			0.08
(3)	2.89 (1.58)	-0.20 (3.03)**		0.96 (2.08)*	0.16 (4.01)**	0.24

Note: ** 1 percent, * 5 percent, and Δ 10 percent level of significance.

Source: World Bank economic and social data base.

This author also used the government consumption share as an explanatory variable in examining the sources of differences in GDP growth rates among developing countries. This variable has been employed by itself, in conjunction with per capita GDP, as well as in conjunction with the population growth rate (representing the growth of the labor force) and the share of investment in GDP in a production function-type relationship.

The results for 90 developing countries show a negative relationship between the government consumption share and the rate of economic growth in all the regressions, statistically significant at the 1 percent level. Adding per capita GNP or the growth of population and the share of investment does not affect the regression coefficient of the government consumption share variable. At the same time, while the per capita GNP variable is not significant statistically, the coefficients of the population growth and investment share variables are positive and statistically significant at the 5 percent and 1 percent levels, respectively, and their introduction increases the explanatory power of the regression equation to a considerable extent.

The government consumption share variable is also shown to be negatively related to economic growth in the regional subsamples, including Africa, Asia, and Latin America. At the same time, the significance level of this variable varies between 1 and 10 percent. For more detailed results, the reader is referred to Table 3.

III. Public vs. Private Investment

We have considered above the relationship between the budget deficit, on the one hand, and private investment and economic growth, on the other, as well as that between the size of the government budget and economic growth. In recent years, attention has further been given to the relationship between

public and private investment; in particular, the question has been raised if the two are complementary or competing. In the former case, public investment engenders more private investment; in the latter, there is financial (in terms of the availability of financial resources) or real (in terms of the availability of real resources) crowding out.

These questions have been examined in the framework of a model estimated for 24 developing countries, with pooled annual data for the 1971-79 period, by Blejer and Khan [4]. The authors have separately considered the effects of variations in the amount of credit and in the volume of public investment on investment by the private sector.

The financing of the public sector will impinge on private investment by encroaching on the availability of credit. Blejer and Khan find that "if the overall quantity of financial resources is given, then any attempt by the government to increase its share in either domestic or foreign financing at the expense of the private sector would lead to crowding out and to a decline in the level of private investment" [4, p. 395]. In reference to the positive relationship between the relative share of private investment and the size of total investment [5, p. 27], they add that "a decline [in private investment] would most likely result in a fall in total investment as well" [4, p. 395].

Turning to real variables, the authors have disaggregated public investment into its trend or expected component and variation around these values. 6/ They conclude that "the level of public sector investment has a positive effect on private investment, whereas the change in government investment has a negative effect" [4, p. 396]. Thus, so they claim, "it is not the level of public investment that crowds out the private sector ...;

rather, it is the change in public investment that appears to have a strong crowding-out effect" [4, p. 396].

The authors interpret the trend or expected component of public investment to represent infrastructural investment and variations around these values to represent noninfrastructural investment. This interpretation may be questioned, however, since infrastructural investment is often undertaken in spurts, in which case it will importantly affect variations in public investment around its trend or expected values. 7/

Alternatively, it may be suggested that the trend or expected component of public investment represents a response to economic expansion. In the process of expansion, we do not find evidence of crowding out because economic growth permits parallel increases of public and private investment.

The introduction of such a "growth effect," then, sidesteps the question of crowding out. This may be re-introduced in terms of the relative magnitudes of private and public investment. Thus, one may inquire if a higher ratio of public investment to the gross domestic product is accompanied by a higher or lower ratio of private investment to GDP.

Utilizing the Blejer-Khan data sample, we find that public and private investment are negatively correlated, with a one percent increase in public investment being associated with a 0.55 percent decline in private investment in a cross-section relationship. The regression coefficient is statistically significant at the 1 percent level.

The result may understate, however, the existence of crowding out because unfavorable (favorable) economic conditions lead to low (high) public as well as private investment. This possible bias can be avoided by examining the relationship between the relative share of public investment and the ratio

of total investment to GDP. According to the regression results, a one percent increase in the relative share of public investment is associated with a 0.28 percent decline in the ratio of total investment to the gross domestic product. The regression coefficient is statistically significant at the 1 percent level (Table 4).

But how can an increase in public investment induce a decline in total investment? This result cannot be explained by crowding out, whether financial or real. It may be rationalized if high public investment is considered an indication of an unfavorable climate for private investors. This may be an objective fact or may be perceived as such by the private sector.

Thus far, we have considered the possible effects of the volume of public investment on the volume of private and of total investment. A further question relates to the relative efficiency of public and private investment. Notwithstanding its well-known shortcomings, lacking a better measure, the incremental capital-output ratio will be used as a proxy for the efficiency of capital.

The estimates provide some evidence of the lower efficiency of public as against private investment. Thus, a one percent increase in the relative share of public investment is associated with a 0.27 percent increase in the incremental capital-output ratio in a cross-section relationship. The regression coefficient is statistically significant at the 10 percent level.

This result conforms to ideas expressed by Vito Tanzi who noted that public investment in developing countries may be unproductive [16, pp. 911, 915]. It may be explained by the fact that while private investors aim at maximizing profits, public investment responds to the preference function of

Table 4

Regression Analysis of Public Investment Shares
(double-log regressions; t-values in parenthesis)

	Dependent Variable	Explanatory Variables		
		Constant	Public Investment Share	Per Capita Income
(1)	Total Investment Ratio	1.74 (5.59)**	-0.28 (3.06)**	0.16 (3.34)**
(2)	ICOR	-0.44 (0.83)	0.27 (1.77) Δ	0.34 (4.17)**
(3)	GDP Growth Rate	2.18 (3.49)**	-0.55 (3.02)**	-0.18 (1.84) Δ

Note: The public investment share refers to the share of public investment in total investment; the investment ratio refers to the ratio of total investment to GDP; the incremental capital-output ratio (ICOR) refers to the ratio of investment to the increment of GDP.

** 1 percent, * 5 percent, and Δ 10 percent level of significance.

Source: See text.

government officials that may reflect economic as well as political considerations.

The negative correlation of the relative share of public investment with the volume of total investment and with its efficiency is reinforced if public investment's share is correlated with the rate of economic growth. According to the estimates, a one percent increase in the relative share of public investment is associated with a 0.55 percent decline in the rate of growth of GDP. The regression coefficient is statistically significant at the 1 percent level.

The results are consistent inasmuch as the 0.55 percent decline in the rate of growth of GDP, associated with a one percent rise in the relative share of public investment, is also obtained by combining the 0.28 percent decrease in the ratio of total investment to GDP and the 0.27 percent rise in the incremental capital-output ratio. It appears, then, that the unfavorable effects of public investment on the volume of investment are matched by its adverse impact on investment efficiency.

The relative share of public investment varies to a considerable extent from country to country, ranging from 15 to 67 percent during the 1971-79 period. According to the estimates, an increase of this share by one-half would be associated with a 14 percent decline in the ratio of total investment to GDP, a 14 percent increase in an incremental capital-output ratio, and a 28 percent decrease in the rate of economic growth.

The results indicate that high levels of public investment have a negative effect on private investment, leading to lower total investment, as well as on the efficiency of investment. Beyond crowding-out, the former result may be taken to provide an indication of the unfavorable investment

climate associated with large public investment while the latter may be interpreted to reflect the neglect of economic considerations in public investment decisions.

Conclusions

This paper has reported on tests of alternative hypotheses as to the effects of a budget deficit, examined the influence of the size of the government on economic growth, and investigated the impact of public investment on private investment, total investment, and economic growth.

The econometric results support the hypotheses put forward in the paper to varying degrees. While the one-to-one correspondence between the budget balance and the trade balance, postulated by the Cambridge School, is not borne out by the results, there is evidence that a substantial part of the budget deficit is externally financed. In turn, a correlation between the budget deficit and the money supply, inflation rates, or economic growth has not been observed. However, the budget deficit appears to adversely affect private investment.

There is a negative correlation between the ratio of government consumption to GDP and economic growth. This relationship applies to all developing countries as well as to the regional subsamples of countries in Africa, Asia, and Latin America. It is invariant to the introduction of per capita incomes and of the rate of population growth and the ratio of investment to GDP as additional explanatory variables.

Finally, there is a negative correlation between public investment, on the one hand, and private investment, total investment, and economic growth, on the other. It further appears that the negative effects of public investment on economic growth can be decomposed in two parts: its adverse

impact on total investment and its unfavorable influence on the efficiency of investment.

This paper has investigated the effects of the public sector on various economic variables, in particular economic growth. Further research in this area would be desirable, both to provide an explanation for the observed relationships and to extend them in a time series framework. Also, the reverse effects of economic growth on the public sector would need to be examined.

Notes

1/ This analysis was first reported in [3].

2/ The per capita income variable has not given significant results, however, for the first period. This was also the case in the equations of Table 1, where these results are not reported.

3/ The paper by Ellis follows the book by Bacon and Eltis [1], a critique of which by Hadjimatheou and Skouras [7] has been effectively answered by the authors [2].

4/ It would have made little economic sense to correlate government consumption and population growth rates.

5/ The same problem arises in Rubinson's [14] estimate who regresses GDP on the ratio of government revenue to GDP without recognizing that the former affects the latter.

6/ Trend and expected values are alternatives in the model but the two exhibit considerable resemblancy and also give similar results. They will not be considered separately in the following.

7/ It may be added that, according to Sundararajan and Thakur, public infrastructure investment is a substitute for private investment. These authors, incidentally, have found crowding-out in the case of India while public investment appears to have positively affected private investment in Korea [15].

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