



DISCUSSION PAPER

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Trends in Private Investment in Developing Countries

Statistics for 1970–1998

Lawrence Bouton
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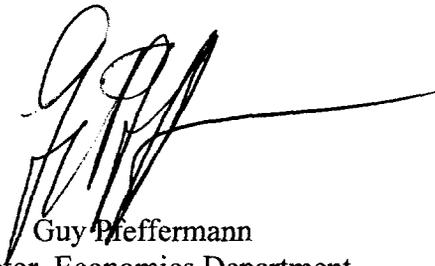
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Foreword

This eleventh annual edition of Trends in Private Investment in Developing Countries provides private and public investment data through 1998. Information on the breakdown of total investment into its public and private components is not readily available from standard national account statistics. Where it may be available, the concept of public investment is not always precise. Most standard measures classify capital expenditures of state owned enterprises as private investment. Pulling together information provided by national organizations, the World Bank and IMF, this publication defines public investment in a consistent manner across all included countries to ensure that data on private investment represent only the capital expenditure decisions of the private sector.

A handwritten signature in black ink, appearing to read 'Guy Pfeffermann', with a long horizontal line extending to the right.

Guy Pfeffermann
Director, Economics Department
& Economic Adviser of the Corporation

Abstract

The first part of the discussion paper examines the role of private investment in economic growth. While theoretical growth models developed in the economics literature make no distinction between private and public components of investment, there is an emerging appreciation that private investment is more efficient and productive than public investment. Results from the recent empirical literature, updated here with the recent data on private investment, suggest that private investment has a stronger association with long run economic growth than public investment.

The second part shows trends in private and public fixed investment in fifty developing countries. On average, the ratio of private investment to GDP continued its upward trend reaching record levels in 1998, the most recent year for which comparable data exist. That year average private investment reached 14.3 percent of GDP, but public investment, fell to only 7.0 percent of GDP, its lowest level since 1974.

Chapter 1 - Private Investment and Economic Growth

One of the indisputable stylized facts of economic development has been the wide disparity in economic performance across countries of the world. Over the past 40 years, economic performance of a small number of countries has been remarkable, with per capita GDP increasing fivefold if not more. At the same time, a number of countries have experienced a startling decline in per capita GDP.

Attempts to explain these divergent outcomes have generated a voluminous theoretical and empirical literature. A key element in this literature has been the debate over the role of capital accumulation. As summarized in the Annex, the relative importance this literature places on the role of investment in the economic growth process has gone through several phases. Theoretical work of the mid-1950s, for example, suggested that growth in per capita income was ultimately driven by technological progress and was independent of the rate of physical capital accumulation. The more recent endogenous or “new” growth literature has refined our understanding of the sources of economic growth. In addition to expanding the concept of capital to include knowledge, human skills and technology, this literature has emphasized that physical capital itself is not homogeneous. This latter finding has led some researchers to explore in greater detail various definitions of capital. Some researchers have concentrated on the potentially different impact of capital depending on its use, such as manufacturing plant and equipment.¹ A more general distinction, however, is the one between public and private capital.

The theoretical growth models developed by the economics literature make no distinction between the private and public components of investment. Given the widely different incentives faced by private and public agents, there is an emerging appreciation (driven largely by the recent work on privatization) that private investment is in general more efficient and productive than public investment. As a result, there has been an increased recognition that private and public investment might have different roles in the growth process. This chapter examines some of the recent findings of this empirical literature, updates some of the results with the recent data on private investment contained in this publication and presents some possible explanations for the results. Chapter 2 presents updated statistics about trends in private and public investment.

¹ Perhaps the best known of these research efforts is the work by De Long and Summers (1991). They argue that countries with the fastest growth rates are those in which plant and equipment investment is the highest.

Recent Evidence

Information on the breakdown of total investment into its private and public components is not readily available from the standard national account statistics. Where it may be available, the concept of public investment is not always precise. Most standard measures classify capital expenditures of state owned enterprises as private investment. An effort is made in this publication to define public investment in a consistent manner across all countries. In particular, the investment of public enterprises is consolidated with those of general government. This effort is made to ensure that the data on private investment represents only the capital expenditure decisions of the private sector.

Using the latest data on private and public investment, a quick examination of the data suggests that private and public investment have different associations with economic growth. Table 1 shows the relationship between private and public investment (as a share of GDP) and growth rates and income levels in the fifty developing countries contained in our investment data set.

Average Annual Share of GDP, 1970-98	Average Annual Growth Rates, 1970-98		
	High (greater than 5% pa)	Middle (between 3% and 5%)	Low (Less than 3%)
Total Investment	24.6	19.9	18.3
Private Investment	15.0	11.9	9.9
Public Investment	9.5	8.0	8.4
	Per Capita Income Levels, 1998*		
	Upper Middle (\$3,031-\$9,360)	Lower Middle (\$761-\$3,030)	Low (\$0-\$760)
Total Investment	21.6	21.4	19.0
Private Investment	14.1	12.8	9.7
Public Investment	7.5	8.6	9.3

Source: World Bank Data.
* Income classification is from *World Development Report*, 1998

Based on average annual growth rates over the period 1970-1998, the 50 countries are divided into three groups - high, middle and low growth countries. Those countries that have, on average, grown faster over this period also have a higher average share of total investment to GDP. Looking at the two components of investment, it is readily apparent that differences in the overall investment ratios are driven largely by the difference in private investment ratios. Further, statistical tests indicate that these differences are statistically significant.² The average ratio of public investment, on the

² The hypothesis that there is no difference in the sample means across the various groups is tested using a t-test at the 5% level of significance.

other hand, does not vary appreciably across these three groups of countries and, in any case, are not statistically different from one another.

Similarly, using the classifications found in the *World Development Report*, the sample of countries is divided according to 1998 income levels into three groups – upper middle, lower middle and low income countries. As can be seen from the table, higher income countries tend to have higher average private investment ratios than lower income countries. The average ratio of private investment between the three income categories are also significantly different. In contrast, public investment ratios appear to move in the opposite direction. That is, these ratios are higher, though not significantly, in lower income countries than in higher income ones.

As shown in Table 2, the differences in investment ratios across growth and income categories are even more pronounced during the period 1990-1998. As can be seen in the various country charts in Appendix 2, during the 1990s private investment was accelerating in many countries around the world as a result of liberalization and market reform efforts, while public investment was declining as a result of privatization efforts and tighter budgetary constraints.

Average Annual Share of GDP, 1990-98	Average Annual Growth Rates, 1990-98		
	High (greater than 5% pa)	Middle (between 3% and 5%)	Low (Less than 3%)
Total Investment	25.3	19.9	18.0
Private Investment	17.5	12.2	9.2
Public Investment	7.8	7.8	8.7
	Per Capita Income Levels, 1998*		
	Upper Middle (\$3,031-\$9,360)	Lower Middle (\$761-\$3,030)	Low (\$0-\$760)
Total Investment	22.6	22.0	19.4
Private Investment	16.3	14.0	10.3
Public Investment	6.3	8.0	9.1

Source: World Bank Data.
* Income classification is from *World Development Report*, 1998

Existing Empirical Literature

While such casual evidence on the relationship between private investment and growth is suggestive, the more appropriate method of empirical research has been cross-section growth regressions. The explosion of recent empirical research has been made feasible by the availability of suitable data sets - due largely to the work of Summers and Heston (1988 and 1991) - that make analysis of growth rates across a large number of countries possible. For its part, this publication was the first to make private and public investment data available on a consistent basis.

The typical empirical paper regresses average long run growth rates against a set of variables that is expected to determine those growth rates. Economists have employed a tremendous number of variables in their quests to explain cross-country growth differences. While theory does offer some advice, the choice of variables to include in these regressions has largely been ad hoc, determined to a significant extent by the specification of earlier econometric results in the literature.³ For the most part, this body of empirical work has concentrated on the role of aggregate investment in economic growth. Levine and Renelt (1992) examined a large number of these studies to determine the robustness of the statistical relationship between growth and a wide array of other variables. They found that total investment is one of the few variables that remains statistically significant (and with a positive impact) across the various growth equations.

With the appearance of the first *Trends in Private Investment in Developing Countries*, published in 1989, researchers have begun to explore the respective roles of private and public investment in the growth process of developing countries using cross-country growth regressions. The volume of studies on this topic, however, is still rather limited. Using relatively small sample sizes and narrower time periods, a number of studies [Khan and Reinhart (1990), Coutinho and Gallo (1991) and Serven and Solimano (1990)] have concluded that private investment has a larger positive impact on growth than public investment.

A more recent study by Khan and Kumar (1997) substantially broadened the range of sample countries examined and looked across a relatively long time period. Their results are reported in the first column of Table 3. For the period 1970-1990 both private and public investment have a positive association with growth and are statistically significant. The magnitude of these two types of investment, however, differ considerably with private investment having a much stronger impact than public investment. The estimated coefficient on private investment suggests that a one-percentage point higher average private investment ratio over the 1970-90 periods associated with an increase in the per capita growth rate of four-tenths of a percentage point.

The study by Khan and Kumar included data on ninety-five countries, many of which are not found in our data set. As the various editions of this publication have emphasized over the years, it is difficult to obtain private and public investment data that maintains a consistent definition across countries. Since our data strives to maintain that precision, we have re-estimated their regression equation using only the smaller sub-sample of countries that have data in this publication to see if their results still hold.

³ See Temple (1999).

	Khan & Kumar (1997)	Restimated Results	
	1970-90	1970-90	1970-98
Number of observations	95	41	42
Constant	-1.72 (0.83)	-0.16 (0.68)	0.06 (0.72)
Private Investment (Percent of GDP)	0.40 (0.09)	0.56 (0.17)	0.71 (0.18)
Public Investment (Percent of GDP)	0.29 (0.09)	0.15 (0.14)	0.13 (0.15)
Initial per capita GDP (1970)	-0.23 (0.06)	-0.27 (0.07)	-0.31 (0.07)
Population Growth	-0.79 (0.39)	-0.36 (0.18)	-0.70 (0.20)
Average years of schooling (secondary)	0.02 (0.01)	0.27 0.12	0.23 0.13
Fiscal balance	0.03 (0.01)		
R ²	0.44	0.45	0.61

Using the same time period for comparative purposes, the re-estimated regression equation is shown in the second column of Table 3.⁴ The results are qualitatively similar - private investment has a greater impact on growth than public investment. In the re-estimated equation, however, the coefficient on private investment is larger and the coefficient on public investment is smaller. The results indicate, for example, that over the 1970 to 1998 period, those countries with a private investment to GDP ratio which was 1% point higher (average, over 1970-98), had a GDP growth rate which was 0.71% point higher. Over the 28 year period, this 0.71% higher growth rate translates into a per capita GDP which is 22% higher than it otherwise would have been. In contrast, if the resources had gone into 1% point higher public investment, the GDP growth rate would have been just 0.13% higher (as a best estimate, but in fact the difference with zero is not statistically significant). A 0.13% higher growth rate accumulates into a per capita GDP which is just 3.7% higher than otherwise after 28 years.

The final column in Table 3 expands the time period to include the newer data for the 1990s. Inclusion of the more recent 1990s data results in a further increase in the coefficient on private investment. As with other researchers, such as Ram (1996), Khan and Kumar found that the distinction between private and public investment varied across various sub-periods. During the 1970s, for example, the coefficient on the two types of investment was very similar. The authors suggest that, given the lower public stock of capital during the 1970s, the returns to public investment were higher during that period. It is also likely that the returns to private investment were lower as a result of the more

⁴ Kahn and Kumar include a fiscal variable in their regression equation. These authors note that the inclusion of this variable, along with human capital (proxied by average years of schooling) led to only a slight decline in the coefficient on private investment. Data on fiscal balances was not available for many of the countries in our sample and hence was not included in our regression results.

distorted policy environment found in many countries of the world during that time period.

Interpreting the Results

The results presented here are consistent with the notion that private investment has a stronger role than public investment in long-run economic growth. As the annex attempts to show, however, there remains considerable controversy over the role of capital accumulation in economic growth. The essential question remains whether these results reflect a higher level of efficiency on the part of the private sector or if they capture some other factors not included in the analysis. In particular, is the improved business environment that tends to promote higher private investment itself generating higher economic growth.⁵ The “new” growth literature tends to highlight the role of knowledge and innovation in the growth process. One conceivable explanation for the stronger role of private investment in the empirical literature is the possibility that private investment tends to embody newer technologies and that it has a newer “vintage” of capital. Public investment, for its part, tends to be in projects that have longer gestation periods, such as infrastructure and basic education.

Specific to the work that focuses on the private/public dichotomy, there has also been a debate about whether public investment raises or lowers the efficiency of private investment. Some components of public investment, for example, may be complementary to private investment and, insofar as private investment has a positive impact on growth, would be beneficial to growth. This complementarity is likely to arise in the case of public investment in infrastructure and education. It is generally acknowledged, however, that not all public investment in infrastructure has a beneficial impact on private investment and growth. In the past, many infrastructure projects in developing countries were of dubious quality.⁶ Further, since public investment utilizes scarce resources - physical and financial - or produces output that competes directly with the private sector, it can also “crowd out” private investment. An increase in public investment in these circumstances may have adverse consequences for private investment and growth.

In his much cited work, Aschauer (1989) found that for industrial countries public sector investment in infrastructure has had a very strong positive effect on private sector productivity. Focusing on developing countries, a recent study by Odedokun (1997) finds that public investment in infrastructure facilitates private investment and growth whereas non-infrastructure public investment does the reverse. With liberalization, increased globalization and the changing nature of the regulatory environment in developing countries, it is no longer the case that only the public sector undertakes infrastructure investments. In many countries, such investment is now being done by the private sector. IFC has helped finance many private investments in roads, ports,

⁵ One of the frequently cited concerns about the empirical growth literature is the probable endogeneity of some regressors. Do our results suggest that investment causes growth, that growth causes investment or that some other variable causes both?

⁶ See Krueger and Orsmond (1990).

telecommunications, and electricity generation and transmission. As the work on privatization suggests, the competitive business environment of most market economies subjects private investors to very different incentives than those of the public sector.

Last year's *Trends in Private Investment* (Pfeffermann, Kisunko and Sumlinski (1999)) showed there is a link between private investment and the various obstacles to doing business encountered in developing countries (i.e., unpredictability of the judiciary, tax and labor regulations, etc.). Not surprisingly, those countries in which these obstacles were less onerous had higher levels of private investment. That a better business environment leads to higher private investment relative to public investment could be among the factors explaining the empirical results cited above. Clearly, more work is needed linking the analysis of the business environment with that of the growth literature.

In addition, one can hypothesize that a more favorable and competitive business environment will lead firms to invest in new technologies, ideas and innovations that allows them to retain their competitive edge.⁷ It has long been understood and accepted that "vicious" forces of competition brought on by a dynamic private sector improve the allocative efficiency of a market economy – resources are channeled to those sectors/industries/firms that can use them in the most productive manner. The endogenous growth literature suggests that there is a relationship between investment in innovation and knowledge, technological progress and economic growth.

Finally, the level of private investment in an economy can be viewed as a proxy for a dynamic private sector and hence for the extent of technology progress in an economy. In a competitive environment, a higher level of private investment, therefore, not only represents the increased accumulation of physical capital, it also represents the replacement of old inferior technologies with newer more efficient technologies - not just more capital but a newer "vintage" of capital. Insofar as private investment embodies newer technology, it captures two things: capital accumulation and the effects of technological progress. Technological innovation increases the productivity of capital and hence alters an economy's underlying long run growth rate.

⁷ The public sector, on the other hand, doesn't often face these competitive pressures and hence doesn't need to continuously update its capital stock.

