

Determinants of Private Investment in The Gambia

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Abstract

This paper tries to model determinants of private investment in The Gambia. The model attempts to capture the effects of external financial constraint, domestic and international risk variables, public investment on infrastructure and output on the private investment. The result of the model suggests that real interest rate in the long run have positive impact on private investment. Also, real GDP growth rate is shown by the result to have a positive impact on private investment in the long run. This suggests that macroeconomic instability affects private investment negatively. Important policy implications can be drawn from the empirical findings. The stabilization policies in the form of monetary, fiscal and exchange rate policies reduce macroeconomic instabilities, which in turn may increase private investment, by reducing inflation which is a major source of uncertainty which in our model was subsumed under real interest rate. Thus since real interest rate which in itself is a derived variable has both inflation and exchange rates as the major components, the policy option is to ensure appropriate macroeconomic policy mix that will guarantee low inflation and by extension high real interest rate. Since private investment is dependent upon the growth rate of output, the growth rate of private investment might be retarded as a result of inappropriate stabilization policy. Thus, exercising excessive contractionary policies may endanger the private investment. Since the nominal interest rate is to a larger extent determine by the cost of doing business, another implication of the results is that public investment on infrastructure that has positive externality on private investment will bring down nominal interest rates and thus encourage private sector investment.

JEL Classification: E22, E31 and E60

Keywords: Private Investment; Foreign Direct Investment; Capital Flows

Investment is critical to economic growth. Studies including (Ben-David, 1998; Collier and Gunning, 1999; and Barro, 1995) have established empirically the linkage between investment and economic growth. Further more, Beddies, (1999) also have shown that private investment has a stronger, more favourable effect on growth relative to public investment. This is probably because private investment is more efficient and less closely associated with corruption. For instance, the rapid economic growth in Asia and Latin America in the 1970s through 1990s correlated a high rate of investment during the period. In the sub-Saharan Africa where the rate of economic growth in the 1990s was dismal, the ratio of private investment to GDP was below 10.0 per cent compared to 16 percent in Latin America, 18 percent in advanced countries and 16.5 percent in newly industrialised countries in Asia (Hernandez-Cata 2000).

Over the past two decades private capital flows have had a dramatic effect on developing countries. Until the early 1990s most international resource flows to developing countries came from governments. Now these flows are primarily private. The shift began in 1992, when foreign direct investment and financial markets took off in emerging economies-and private flows exceeded official development finance for the first time. Private capital flows peaked in 1996 at \$273 billion, or 78 percent of resource flows to developing countries. Foreign direct investment proved resilient, reaching a high of \$188 billion in 1999. Growth in private investment and lending meant that emerging economies were attracting the kind of capital

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that creates and sustains development. Progress has been made in improving trade, governance, financial systems, and political and macroeconomic stability and in creating a receptive environment for private business.

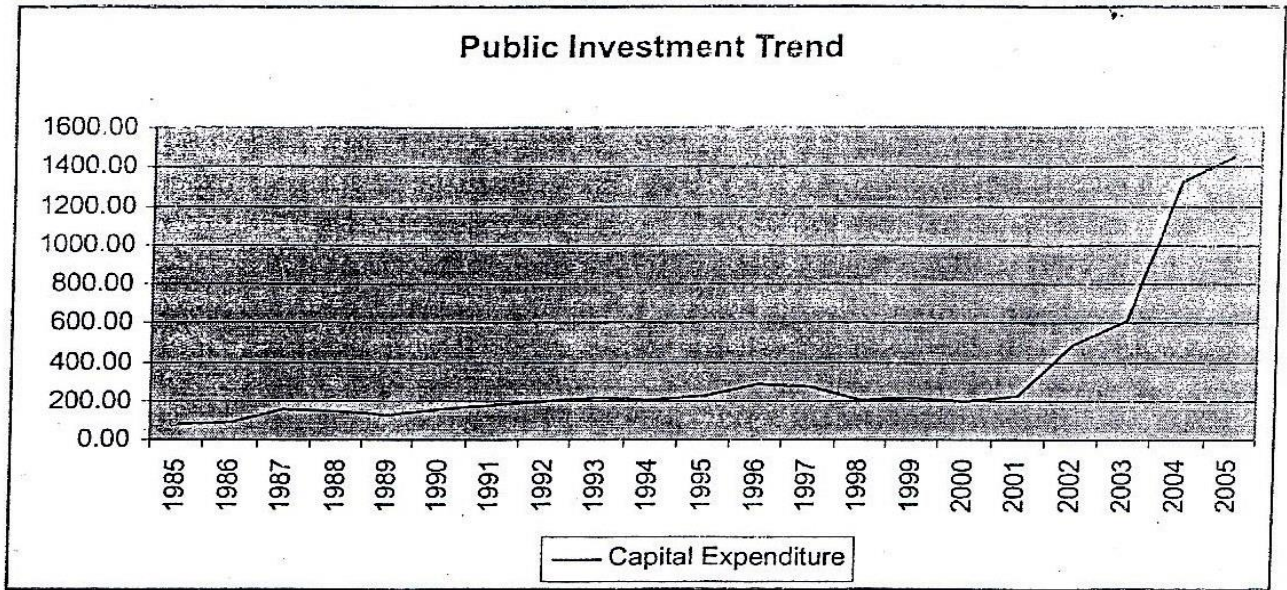
In 2000 resource flows to developing countries dropped sharply, reflecting the global recession. ODA fell 5 percent, though ODA to the least developed countries rose slightly to 22 percent of the total. But net private flows from DAC donors were \$117 billion, down dramatically from 1999 and the lowest since 1993. Foreign direct investment fell somewhat but remained the largest transfer. Despite the downturn in 2000, private investment in the developing countries still far exceeded government aid. Even at their lowest level since 1993, private capital flows are still more than twice government aid to developing countries.

The above picture clearly demonstrates the importance of private investment in the development process especially of the developing countries, including The Gambia. However, despite the importance of private investment in the economic development matrix of the Gambia there is no empirical study on the issue. This paper seeks to fill this gap. The objective of this paper is to identify the determinants of private investment in The Gambia. The rest of the paper is organized as follows: Section 2 presents a brief review of the trend in public and private investment in the Gambia. Section 3 dwells on theoretical as well as empirical issues. Section 4 contains the empirical methodology and analysis of the results while Section 5 outlines some concluding remarks.

II. PRIVATE AND PUBLIC INVESTMENT IN THE GAMBIA: AN OVERVIEW

In The Gambia, available data suggest the dominant role of public relative to private investment. Public investment in nominal terms which is predominantly externally financed has witnessed significant improvement in recent years. There have been substantial investments in infrastructure especially in health, education and road construction sectors. While domestic revenue allocated to public investment accounts for about 10 percent of total public investment, the depth of domestic savings (as a percentage of GDP), is weak and account for only about 15 percent per annum. Gross fixed capital formation (as percentage of GDP) constitute about 20 percent per year of which of which the share of public sector is greater. Private fixed capital formation (as percentage of GDP) is close to 15 percent each year. The share of public investment as a percentage of GDP is marginally increasing but not large enough to offset the rise in private investment.

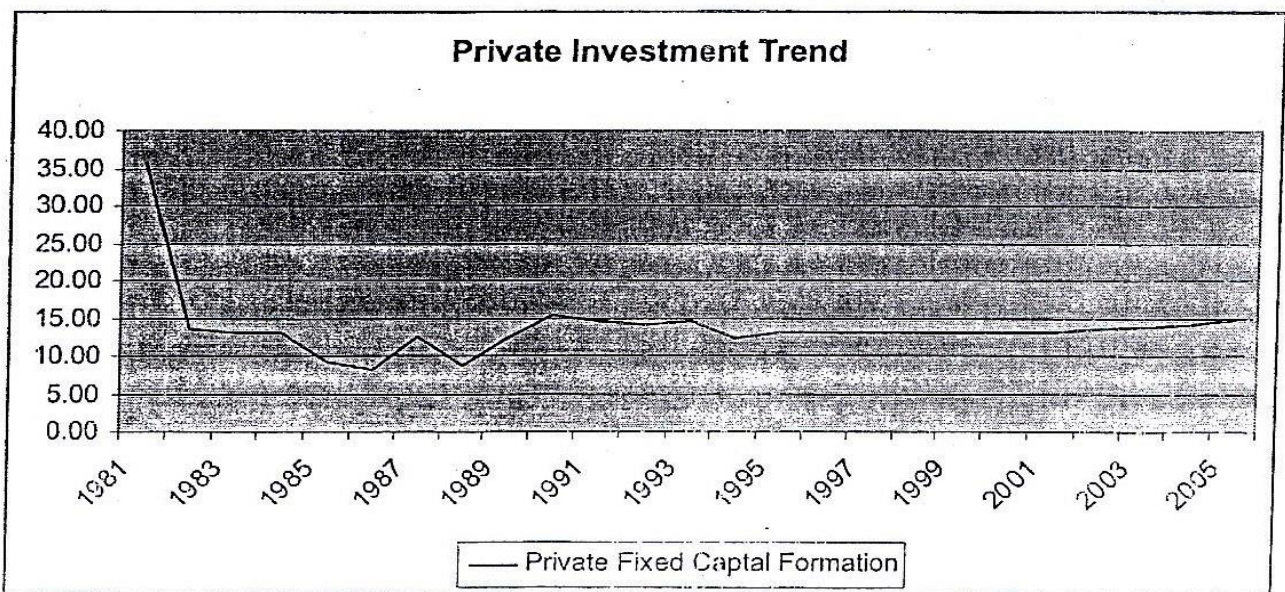
Fig. 1



Using government capital spending as proxy for public investment, it can be seen from the graph above that capital expenditure was fairly constant over an extended period of time (1985-2001) until in 2002, when capital spending started increasing at an increasing rate. The rise in capital spending was as a result of increased donor support.

Private fixed capital formation (as percentage of GDP) is steadily increasing overtime. Growth in private investment has decelerated due to high cost of borrowing. Availability of credit to the private sector is constrained by huge public sector borrowing requirement. This eventually led to high interest rates and crowded out the private sector as well as build-up of domestic debt. The volume and direction of credit to the private sector is in trade financing. Self raised capital and foreign direct investments are the major sources of capital in the private sector.

Fig. 2



From the Fig. 2 above private investment has plummeted from a high of 36 percent in 1981 to 14 percent in 1982. It remained constant for about two years before it further dipped to less

than 10 percent in 1986. Thereafter, it fluctuated within a band of 9 to 15 percent for the two subsequent years. It remained fairly constant for the rest of the rest of the period under review.

III. THEORETICAL FRAMEWORK / LITERATURE REVIEW

A plethora of theories have been proffered to explain variations in private investment, within the country, and among countries. Earlier approaches include; the submission that investment depends on the prospective marginal efficiency of capital relative to some interest rate reflecting the opportunity cost of the invested funds; the accelerator theory which makes investment a linear proportion of changes in output; the neoclassical theory stressed that the desired capital stock depends on the level of output and the user cost of capital (which in turn depends on the price of capital goods, the real interest rate, including the depreciation rate). Samuelson stressed the reciprocal relationship between investment and production, and proposed the "accelerator" hypothesis. Similarly, the value of the desired capital stock for a typical firm depends positively on the demand level according to Jorgenson, (1963). The output of the country (GDP) would be a reasonable proxy to aggregate demand as a determinant of private investment in a country (Blomstrom et al. 1996).

Another possible determinant is the rate of return on investment. The literature usually approaches this through a real interest rate as representative of the cost of capital. However, as suggested by Jorgenson, real interest rates would have a negative impact on the desired capital stock but not on investment flows, as early empirical findings seemed to suggest the *Tinbergen approach*. Hence, it is not clear that real interest rates should be included in an investment function. Instead, another approach for controlling for the opportunity cost of investment is by looking at the relative price of capital goods with respect to consumption goods. It is natural to expect that in periods characterized by relative lower cost of equipments agents should be investing relatively more.

The theory of investment irreversibility suggests that the cost of investing in machinery and equipment is sunk and would usually not be recovered by a future resale. This "sector specific" characteristic of investment would imply that the higher degree of "uncertainty" that prevails in countries is relevant in investment decisions, since any abrupt fall in aggregate demand would generate an unsustainable excess in installed capacity (see Caballero 1991, Caballero and Pindyck 1996, and Bloom et al. 2001). From measurement stand point, most empirical studies, used the inflation rate as a reasonable proxy for the uncertainty level in the economy, since stable prices improve the informative content of the price system, allowing a favorable allocation of resources (the best opportunities are easily identifiable).

The restrictions on investment financing are a problem broadly documented in the literature on the determinants of investment. Loungani and Rush, (1995) opine that the basic idea is that some agents, typically small and medium enterprises (SMEs), are unable to get financing directly through open market debt. Hence, these agents are strongly dependent on bank credit, a market that is usually characterized by lack of financial depth, low level of savings, as well as imperfections due to asymmetric information between lenders and borrowers.

In developing countries like The Gambia, this problem of access to credit is critical, due to the absence of futures markets and inadequate access to long term financing. The evolution of the

credit amounts destined for the private sector would be a good indicator of the restrictions operating in the domestic financing of investment. On the other hand, the external debt level (as a share of GDP), is a variable that can represent the evolution of external credit in investment financing. A higher external debt level could signal the lack of viability and sustainability of current macroeconomic policies in the long term and negatively impact investors' expectations due to the increase in the degree of uncertainty on future policies. However, a country can have a large debt for a good reason, as a good credit rating, hence signaling a higher level of credit availability. A similar problem exists at the firm level (Petersen and Rajan 1994). For both reasons, external debt is included in the analysis, although its impact on investment decisions may be a priori unpredictable.

The real exchange rate can also affect the evolution of private investment. On one hand, just as suggested in Froot and Stein (1991), not only would devaluation reactivate the exportable sector of the economy, but it would also be favorable to the acquisition of local assets by foreign companies at a much lower price. Other authors like McCulloch (1989) reject this link between investment and exchange rate, suggesting that it is not the price of a domestic asset, but the rate of return that determines investment. When a country's currency is depreciated in real terms, not only the asset price falls, but also the nominal gain of the investment.

Another variable that is usually included in the model of measurement of investment is the degree of trade liberalization of an economy. Here, a priori, an ambiguous effect can be expected. On one hand, an economy highly integrated to the world is expected to attract investments in tradable sectors in order to increase productivity and competitiveness. However, an abrupt increase in exposure to external competition in certain sectors can make these sectors less attractive as a destination for new capital flows (Serven 2002). The ratio of exports plus imports to GDP (trade liberalization coefficient) is used in this study.

The macroeconomic environment is critical for investment both domestic and foreign in an economy. Monetary, fiscal and exchange rate policies directed at correcting unsustainable macroeconomic imbalances do affect private investment. For instance, earlier measures in response to the economic crisis in sub-Saharan African countries attempted to reduce resource gap through autonomous cuts in aggregate demand and reduction in economic activity. Because of the import dependency in both production and investment, reduced import capacity from the decline in exports and cuts in net foreign resource inflow led to import compression and strangulation of economic activity. This had negative effect on the investment activity in these countries. In addition, stabilization packages that advocate restrictive monetary and credit policies affect investment. This occurs in two ways: (a) they raise the real cost of bank credit, and (b) by raising interest rates; they increase the opportunity cost of retained earnings. Both mechanisms raise the user cost of capital and lead to reduction in investment (Serven and Solimano, 1992).

However, some studies have found a more direct effect of credit policy on investment, i.e. through preferential credit allocation in the case of repressed financial markets, a feature common in developing countries (Bleger and Khan, 1984). Equally important is the institutional structure of financial markets. It has been observed that interest rates do not affect firms that borrow in the unofficial money markets (Van Wijnbergen, 1983).

Regarding fiscal policy, high fiscal deficits push up interest rates or reduce the availability of

credit to the private sector, or both, thus crowding out private investment. Hence it is argued that the reduction of the public deficit during macroeconomic adjustment should encourage expansion in private investment. However, the financing mechanism of fiscal deficits is crucial in the directional impacts. The prevalence of large fiscal deficits constitutes another important source of uncertainty as they signal the likelihood of policy changes. Fiscal deficits constitute a significant indicator of lack of sustainability and credibility of macroeconomic policy reforms, and thus can impact negatively on private investment.

Dailami and Walton (1989) have suggested that the sluggish performance of investment in the corporate sector cannot be attributed solely to the standard macroeconomic factors. Rather, conflicting signals over macroeconomic policy tend to increase the risk and uncertainty perceived by the private sector, leading them to adopt delaying attitude with respect to investment. Thus the prevalence of macroeconomic instability plays a crucial role in the evolution of private investment in many developing countries

Reduction in public investment on infrastructure like roads, communication networks, electricity, etc., has been found to be detrimental to private investment. Such investments are complimentary to private investment. Existence of poor infrastructure presents a disincentive to investment. Bleger and Khan (1984) confirmed this based on a cross-country study which indicated that government investment in infrastructure is complementary to private investment while other types of government investment are not (Serven and Solimano, 1991).

Other studies on investment in developing countries indicate that variations in output are the most important determinants of private investment (Blejer and Khana, 1984; and Greens and Villanuerva, 1991). It is argued that the contraction in demand induced by adjustment measures is likely to have an adverse short-run effect on investment because of its negative effect on output growth.

Other important findings relate to the quality of investment expenditure. These are that: most investment expenditures involve sunk cost that cannot be recovered; capital takes time to build and once built it is irreversible; and investment can be delayed, giving a firm an opportunity to wait for new information to arrive about prices, costs and other market conditions before it commits resources (Pindyck, 1991). Thus, investment decisions made by firms today bind them for several periods in the future. This makes investments sensitive to uncertainty about future economic situation, such as product prices, interest rates, trade regimes, exchange rate variability, inflation, future tax and regulation policy, and the cost and timing of investment itself.

Osuagwu (1982) found that the expected rate of return; the supply of funds; the absorptive capacity; and government policies; are the major determinants of investment in Nigeria and concluded that the inadequacy of investments in the economy was caused by government policies, limited supply of investment fund and slow rate of expansion of the absorptive capacity, due to lack of innovation in technological development.

Serve and Solimano, (1993) identify inflation as one of the most important determinants of investment. Caballero et al (1988) examined exchange rate viability in the context of irreversible investment in developing countries and reported that uncertainty over the future

of the exchange rate can depress exports. Krugman (1988) has also shown that exchange rate uncertainty combined with sunk costs may prevent firms from entering the market even though current exchange rate would make entry profitable. In general, the exchange rate will affect private investment through several conflicting channels. First, exchange rate devaluation will be followed by an increase in the overall price level, leading to a reduction in the real value of private assets, and therefore a reduction of domestic and private investment. Secondly, a devaluation of the exchange rate increases the cost of imported inputs, and given that a large part of capital stock in the developing countries is imported, a fall in private investment may follow a devaluation of the exchange rate.

On the other hand, devaluation leads to an increase in the relative price of tradables to non-tradables, suggesting that investment actually increased. This channel works through an improvement in the competitiveness of exports, where devaluation makes the production of tradables (specifically exportable) more profitable, thus stimulate investment in exportable while depressing it in non-tradables. In addition, if profits are correlated across sectors, overall investment in the economy will increase.

While a devaluation or depreciation of the currency may benefit the tradable goods sector, the volatility of the exchange rate may have adverse effect on the production decisions of firms, especially those producing for export. Volatile exchange rates affect the domestic costs of an export programme, especially where the production structure is highly dependent on imported inputs as in The Gambia. Firms, thus, become reluctant to get into export production. Exchange rate changes also contribute to uncertainty through its effect on the domestic value of a country's external debt.

Borensztien (1990) identified two channels through which foreign debt will affect investment. The first is termed the "debt overhang" channel, and the second is the credit-rationing channel. The "debt overhang" channel will arise if a country is not able to meet the full contractual value of its debt such that actual debt repayments become subject to some negotiation between the country and its creditors. In this case the debt will have a negative effect on the debtor country's ability to adjust, which in turn may affect the private sector incentive to invest. External transfers of this nature depend on a number of factors including the level of world interest rates, and the terms of trade, and may require changes in domestic policies such as the exchange rate change, fiscal and monetary constraints. Secondly, an indebted country also faces credit constraints in the international markets, which will discourage investment. Through these channels, the foreign debt may become a major source of uncertainty. Agents face uncertainty regarding the interest on variable loans and the possibility of future rationing by creditors. In addition, factors that account for international risks, human capital formation, international competitiveness and the country's financial depth are important in investment decisions (Jasperson et al, 1995).

Onwioduokit (2002) shows that real interest rate, interest rate spread, growth in broad money supply, debt service and political instability variables were highly significant in explaining private investment in Nigeria. However, growth in exports and growth in government expenditure on public infrastructures were wrongly signed and not significant in explaining private investment. He attributed the behaviour of the variable in the model to the era of wasteful projects that characterized Nigeria's capital expenditure outlay during most period of analysis.

IV. METHODOLOGY

The empirical methodology adopted in this study to investigation of private investment follows Blejer and Khan (1984) and Onwioduokit (2002). The econometric procedures employed have recognized the limitations imposed by several problems, including data limitations and constraints posed by the limited number of observations. Furthermore, arising from the theories of investment outlined above and coupled with the empirical works reviewed earlier, modeling private investment in The Gambia may not strictly depend on any one theory but an eclectic model reflecting the reality of The Gambian economic environment.

The above review suggests that private investment is determined by the size of domestic market, potentiality of export market, growth of GDP (buoyancy in demand), rate of public sector investment (rendering support to private investment, vital for investment productivity), interest rate (cost of capital), domestic inflation (stability of economic environment), debt service ratio (external obligations), exchange rate premium (to capture direction of capital flows) and credit to private investors (financing possibilities). Other factors include reserves to import ratio (international risk), rate of completion of both secondary and tertiary education (human capital formation), growth rates of exports and imports (international competitiveness) and the ratio of M2 to GDP (financial depth). Uncertainty, as captured by the index of uncertainty (real interest rate). Thus the model is specified implicitly following Blejer and Khan (1984) as well as Onwioduokit (2002), as follows;

$$P_{inv,t} = \alpha_0 + \alpha_1 gdp_t + \alpha_2 puinv_t + \alpha_3 RR_t + \alpha_4 trade_t + \alpha_5 credit_t + \alpha_6 drs_t + \varepsilon_t, \dots \dots \dots (1)$$

Where

$P_{inv,t}$ = Private Investment

gdp_t = Real GDP Growth

$PUINV_t$ = Public Investment

RR_t = Real Interest Rate (Inflation minus deposit rate)

$trade_t$ = Import plus Export/ GDP

$credit_t$ = Growth rate of banking sector credit to the private sector

drs_t = Debt service Ratio

ε_t = is the error term

Data/Method of Analysis

All the variables used in this study are annual time series. Co-integration technique is used to determine dynamic long-run relationship between private investment and its determinants. Other time series properties of the data set will be examined through the use of descriptive statistics, and unit root test using ADF approach.

Univariate Statistics of The Variables

Before any empirical analysis was undertaken, we assessed the properties by analysing the univariate statistics, including means, standard deviation, sums, variances, skewness, kurtosis, and minimum and maximum values for all the series.

Table 1: Univariate statistics of the variables

	CP	ED	PI	PIN	RGDP	RR	XMP
Mean	9.25	99.13	262.36	13.76	2258308	1.945833	108.87
Median	10.6	97.30	198.09	13.0	2275852	4.555	105.10
Minimum	23.5	56.70	39.74	8.23	1285261	-39.40	83.40
Standard Deviation	27.5	19.2	23.36	5.00	593120.2	11.03	16.08
Skewness	0.28	0.34	3.66	3.66	0.062828	-2.37	0.65
Kurtosis	1.77	2.27	7.4	7.24	2.139908	9.3166	2.66
Jarque-Bera	2.80	0.83	256.86	256.69	0.755548	62.38	1.81
Probability	0.24	0.65	0.00	0.00	0.685385	0.00	0.40
Observations	24	24	24	24	24	24	24

After checking the moments or distribution properties of the variables for the model it's been found out that nearly all the variables are well behaved. Private investment for example has a mean value of 13.76, a median of 13.0 and relatively large standard deviation. The probability of 0.00 for private investment indicates that it is normally distributed. Real GDP was normally distributed with of 2258308, a median of 2275852 and standard deviation of 593120.2. Real interest rate was negatively skewed with a value of -2.37. It has a mean, median and standard deviation of 1.945833, 4.555 and 11.03 respectively.

Table 2: Correlation Matrix

	CPG	ED	PI	PIN	RGDP	RR	XMP
CPG	1.00	-0.28	-0.05	-0.09	-0.01	0.05	-0.10
ED	-0.28	1.00	0.64	-0.06	0.73	0.30	-0.36
PI	-0.05	0.64	1.00	-0.03	0.71	0.30	-0.05
PIN	-0.09	-0.06	-0.03	1.00	-0.21	0.16	0.11
RGDP	-0.01	0.73	0.71	-0.21	1.00	0.52	-0.11
RR	0.05	0.30	0.30	0.16	0.52	1.00	0.16
XMP	-0.10	-0.36	-0.05	0.11	-0.11	0.16	1.00

From the results of the correlation as shown in the matrix above, private investment for example is negatively correlated to growth in credit to the private sector, external debt service ratio, public investment and real GDP. This relationship as indicated by the results is inconsistent with economic theory. However, the matrix has indicated that private investment is positively related to real interest rate and volume of trade.

Overall, the results of the correlation matrix would be of information value when we embark on empirical analysis.

Table: 3 Unit root test for stationarity

VARIABLES	LEVELS & DIFFERENCE	ADF		Conclusion
		With Trend	Without Trend	
PIN	Level	-3.3360 [-3.6219]	-2.6421 [-2.9969]	I(1)
	1 st Diff.	-5.6642 [-3.6330]	-5.7296 [-3.0038]	I(0)
RGDP	Level	-1.7132 [-3.6219]	-2.9547 [-2.9967]	I(1)
	2 nd Diff.	-4.2442 [-3.6454]	-4.3619 [-3.0111]	I(0)
RR	Level	-3.7386 [-3.6330]	-3.8199 [-3.0038]	I(1)
	1 st Diff.	3.2351 [-3.6330]	3.3291 [-3.0038]	I(0)
PI	Level	-2.1568 [-3.6454]	-2.8386 [-3.0114]	I(1)
	1 st Diff.	-2.0310 [-3.6219]	-1.9435 [-2.9969]	I(0)
XMP	Level	-2.7585 [-4.3185]	-2.3422 [-3.6765]	I(1)
	1 st Diff.	-4.1512 [-3.6330]	-4.1362 [-3.0038]	I(0)

CPI	Level	-5.2585 [-3.6219]	-5.2575 [-2.9969]	I(0)
	1 st Diff.	-5.1429 [-3.6330]	-5.2909 [-3.0038]	I(0)
DIP	Level	-3.2335 [-3.6219]	-1.3490 [-2.9967]	I(1)
	1 st Diff.	-4.80316 [-3.2535]	-5.2974 [-3.0038]	I(0)

1/ Figures in parentheses are the critical values

If the test statistic is greater than the 95% critical value (the figure in parentheses) it implies that there is insufficient evidence against the null hypothesis and it is therefore not rejected. This indicates that the variable is non-stationary. But if the test statistic is less than 95% critical value, the null hypothesis is rejected meaning the variable is stationary.

Using the ADF unit root test for stationarity in the time series of each of the variables, the results generated are tabulated in the matrix above. Overall, the findings are consistent with economic theory. Nearly all the variables are found to be non-stationary in their levels and stationary after first difference. It is only credit to private sector variable that is stationary at both levels and first difference. It is rare for economic time series data to be stationary at levels but it is possible. Real GDP became stationary after second differencing. On the basis of these results we can rely on the data for further economic analysis.

Significance Test For The Variables

We used a general-to-specific iterative procedure. First we explored the lag structure of the model, and then iteratively estimate the model to eliminate variables which were insignificant and bear an incorrect sign. After running the regression, some of the explanatory variables were found insignificant and therefore dropped from the model. After a number of iterations, real interest rate was found to be significant and with the appropriate sign. Real GDP has the appropriate sign but insignificant. The dummy variable, representing structural change in the model was also significant.

Test For Co Integration

Using Engel-Granger cointegration method, the residuals of the regression of real interest rate, real GDP growth, credit to private sector and the dummy, on private investment confirms cointegration between the regressor and the regressand. This indicates that there is a stable long-run dynamic relationship between private investment and the explanatory variables i.e. the linear combination of the variables has a stationary error.

Formulation and Estimating of Error Correction Mechanism

This is a means of reconciling the short-run behaviour of private investment with its long-run behaviour. The general-to-specific Error Correction Mechanism procedure was used. We iteratively estimate the model to eliminate variables which are insignificant and bear incorrect sign. The ECM term ties the short-run behaviour of private investment to its long-run value. The coefficient of the regressors captures the short-run disturbances in private investment. The statistical significance/insignificance of the ECM term tells us what proportion of the disequilibrium in private investment in a year is corrected/not corrected in the following year. After showing that our variables are I(1) and found to be cointegrated. The Error Correction Mechanism is thus formulated as:

$$\Delta PIN = \pi_{01} + \pi_{11} \Delta RR_{t-1} + \pi_{12} \Delta CPG_{t-1} + \pi_{13} \Delta RGDPG_{t-1} + \pi_{14} \Delta DUM_{t-1} + \alpha ECM_{t-1}$$

Long-run Static Equation

$$PIN = 20.35 + 0.004PI + 0.192RR + 0.014XMP - 0.027CPG + 0.050ED - 6.40E-06RGDP$$

(0.45) (0.124) (0.857) (0.733) (0.632) (0.077)

$$R^2 = 0.227, DW \text{ Stat} = 1.499, F \text{ Stat} = 0.835$$

The figures in parentheses are the p-values. All the variables are insignificant. Real interest rate, credit to private sector growth and real GDP carry the wrong sign. The coefficient of determination of 22.7 percent is very low.

Dynamic Error Correction Model

$$DPIN = 0.406 - 0.112DRR(-1) - 0.008DCPG(-1) + 0.090DRGDPG(-1) - 1.1820DUM(-1) - 0.134ECM(-1)$$

(0.364) (0.018) (0.159) (0.315)

(0.620)

The figures in parentheses are the p-values

$$R^2 = 0.34, DW \text{ Stat} = 1.864, F \text{ Stat} = 1.697$$

Real interest rate is properly signed and statistically significant. The results shows that real GDP is insignificant but has positive relationship private investment.

The error correction speed of 0.13 implies that economic agents adjust their investment patterns gradually upon realizing changes in the real interest rate thus only changes in real interest sustained for a long period of time can be expected to affect private investment in The Gambia. The negative interest elasticity indicates that, as real interest rate rises, rational economic agents would wish to save more, hold less cash balances and invest less. As real interest rate falls people will switch to alternative non-financial assets i.e. real estate property, consumer durables, etc thus giving rise to real money balances.

Normalization

We normalized the model by including lagged dependent variable as one of the explanatory variables.

$$\Delta PIN = \Phi + \alpha \Delta PIN_{t-1} + \beta \Delta RR_{t-1} + \chi \Delta CPG_{t-1} + \gamma \Delta RGDPG_{t-1} + \lambda \Delta DUM_{t-1} + \phi \Delta ECM_{t-1}$$

Parsimonious private investment function

$$DPIN = 0.409485 - 0.109207 DRR(-1) + 0.051523 DRGDP(-1) - 1.62177 DUM(-1)$$

(0.014) (0.226) (0.115)

V. CONCLUSION AND POLICY IMPLICATIONS

The findings of this study have shown that real interest rate is the most significant determinant of private investment in The Gambia. Real GDP growth which is suppose to be an activity was surprisingly less influential in the determination of private investment in The Gambia. However, it was found to be positively related to private investment i.e. as real GDP grows investment rises. A 10 percent fall in real interest rate would increase private investment by 1.09 percent whilst a 10 percent increase in real GDP growth would lead to an increase in private investment by a margin of half a percentage point. Real GDP growth which is suppose to be an activity was surprisingly less influential in the determination of private investment in The Gambia. However, it was found to be positively related to private investment i.e. as real GDP grows investment rises. The current findings is consistent with empirical studies conducted elsewhere, notably in Africa (Ghura and Hadjmichael 1996, Easterly and Levine 1997, Fischer, Hernandez-Cata and M.S. Khan 1999, Hernandez-Cata 2000) which established that uncertainty deters private investment. These studies have brought out in clear terms that the reason for the low level of private investment is the perception by both domestic and foreign investors of a low risk adjusted rate of return on capital (Collier and Patillo 2000).

Important policy implications can be drawn from the empirical findings. The stabilization policies in the form of monetary, fiscal and exchange rate policies reduce macroeconomic instabilities, which in turn may increase private investment, by reducing inflation which is a major source of uncertainty which in our model was subsumed under real interest rate. Thus since real interest rate which in itself is a derived variable has both inflation and exchange rates as the major components, the policy option is to ensure appropriate macroeconomic policy mix that will guarantee low inflation and by extension high real interest rate. Since private investment is dependent upon the growth rate of output, the growth rate of private investment might be retarded as a result of the stabilization policy. Thus, exercising excessive contractionary policies may endanger the private investment. Since the nominal interest rate is to a larger extent determine by the cost of doing business, another implication of the results is that public investment on infrastructure that has positive externality on private investment will bring down nominal interest rates and thus encourage private sector investment.

REFERENCES

- Balassa, B. 1988. "Public Finance and Economic Development" *PPR Working Paper No.31*, World Bank, Washington, D. C.
- Barro, R. J. 1995. "Economic Growth in a Cross Section of Countries" *The Quarterly Journal of Economics*, May, pp. 407-443.
- Beddies, C.1999. "Investment, Capital Accumulation and Growth: Some Evidence from Gambia: 1964-1998." *IMF Working Paper 99/117*, August.
- Ben-David, D. 1998. "Convergence Clubs and Subsistence Economies" *Journal of Development Economics*, 55, pp.155-171.
- Bljer, M and M. Khan .1984. "Government Policy and Private Investment in Developing Countries" *IMF Staff Paper No.131*, International Monetary Fund, Washington, D. C.
- Borensztein, E..1990. "Debt Outhang" *Credit Rationing and Investment Journal of Development Economics*, Vol. 32
- Collier, P. and J.W. Gunning .1999. "Explaining African Economic Performance" *Journal of Economic Literature*, 37, March, pp.64- 111
- Carballero, R and V. Corbo .1988. "Real Exchange Rate Uncertainty and Exports: Multicountry Empirical Evidence" *Working paper 414. Columbia University, Department of Economics*
- Collier, P. and C. Patillo .2000. *Investment and Risk in Africa*, Macmillan.
- Dailami, M and M. Walton 1989. "Zimbabwe: Private Investment and Government Policy" *World Bank Report No. 2646 Zim.*
- Easterly, W. and R. Levine. 1997. "Africa's Growth Tragedy: Policies and Ethnic Divisions" *Quarterly Journal of Economics*, 112, November, pp.1203-
- Fischer, S. E. Hernandez-Cata and M.S. Khan .1998. "Africa: Is this the Turning Point?" *IMF Paper on Policy Analysis and Assessment 98/6*, May.
- Ghura, D. and T. Hadjimichael .1996. "Growth in Sub-Saharan Africa" *Staff Papers, International Monetary Fund*, 43, September.
- Greene, J. and D. Villanueva .1991. "Private Investment in Developing Countries: An Empirical Analysis" *IMF Staff Papers*, 38 (1), *International Monetary Fund, Washington, D. C.*
- Herandez-Cata, E. 2000. "Raising Growth and Investment in Sub-Saharan Africa: What Can be Done?" *Policy Discussion Paper: PDP/00/4, International Monetary Fund, Washington, D. C.*
- Jaspersen, F. Z. etal 1995. "Trend in Private Investment in Developing Countries: Statistics for 1976 1984" *International Financial Corporation, Discussion: PAPER 28.*
- Krugman, P .1988. "Exchange Rate Instability" *MIT Press Cambridge.*
- Muller, T and K. Schmidt hebbel .1991. "Private Investment under Macroeconomic Adjustment in Morroco" *World Bank Working paper 787*
- Oguagwu, H.G.O. .1982. "Determinants of Investment Demand in Nigeria from 1960 1975" *Quarterly Journal of Administration October.*
- Onwioduokit, E. A. 2002. "Push Factors of Investment in Nigeria" *West African Journal of Monetary and Economic Integration (June).*
- Pindyck, R. S. 1991. "Irreversibility, Uncertainty, and Investment", *Journal of Economic literature*, Vol. XXIX

Schmidt-hebble, K. 1994. "Saving, Investment, and Growth in Developing Countries: An overview" *World Bank Policy Research Working Paper No. 1382*.

Serven, L. and A. Solimano, .1991. "Economic Adjustment and Investment Performance in Developing Countries: The Experienced of the 1980's". *World Bank, Country Economic Department, Washington, D. C. Processed*.

_____. 1992. "Private Investment and Macroeconomic Adjustment: A Survey" *The World Bank Research Observer, Vol. 7 (1)*

Serven, L. and A. Solimano (eds) 1993. "Striving for Growth and Adjustment: The role of capital formation" *World Bank Regional Sectoral Studies, Washington DC*

Van Wijnbergen, S. 1983. "Interest Rate Management in LDC's" *Journal of Monetary Economics Vol. 12*.

Variables: Definitions and Sources

RGDP (Real GDP): GDP (in millions of dalasis) at real prices, obtained from line 99b.p of IFS

PI (Public investment) (in millions of dalasis) government capital expenditure used as proxy,

PIN (Private fixed capital formation as a percentage of GDP), WETA/WEO 3/31/05, IMF

RR (Real interest rate) Deposit rate of interest minus inflation rate, World Bank, Gambia data

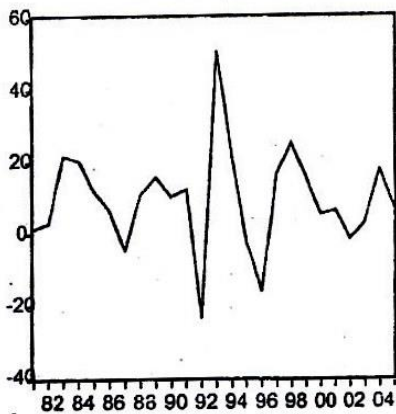
XMp (Exports in goods and services plus imports in goods and services) as a percentage of GDP, WETA/WEO 3/31/05, IMF

CP (claims of the banking sector on the domestic private sector: line 22d of IFS)

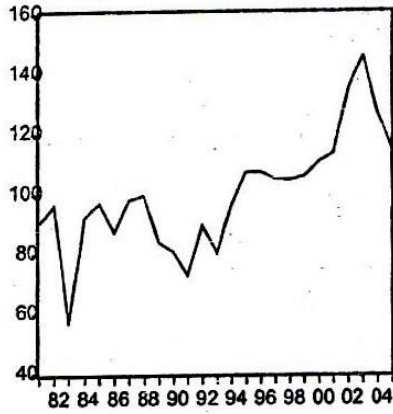
ED External public debt in percentage of GDP, WETA/WEO 3/31/05, IMF

Plot of Variables

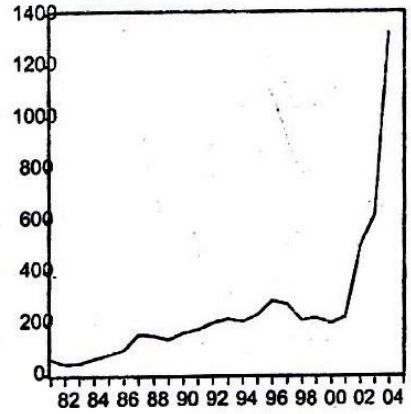
It can be observed from the plot of variables shown below that except real GDP which shows some amount of stability, all other variables exhibit trends and cyclical fluctuations over time.



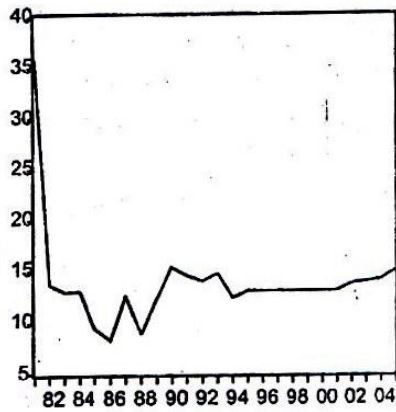
— CPB



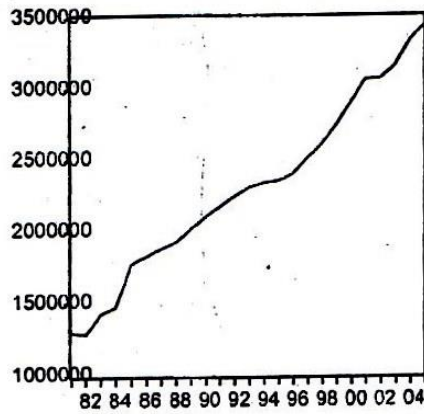
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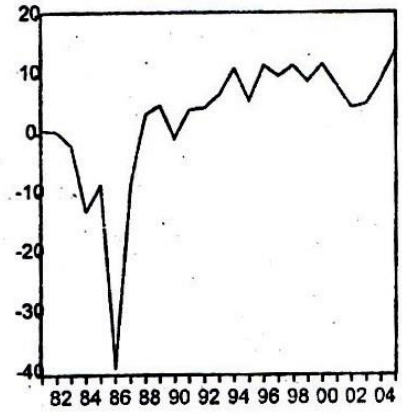
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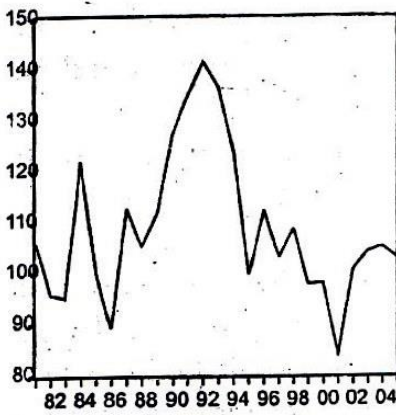
— PIN



— RGDP



— RR



— XMP