

Savings and Investment in Namibia¹

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ABSTRACT

This paper reviews the developments in saving and investment in Namibia over the past seventeen years. An attempt was made to establish factors that have been most influential to these developments and to determine their respective impacts. The paper employs recent techniques in time series econometrics, namely cointegration (CI) analysis and error correction modelling (ECM) to determine the long and short-term impacts of determinants of saving and investment in Namibia. The results reveal that private saving in Namibia is only significantly influenced by real income, while bank deposit rates exerts little, if any, influences. Further, factors such as real lending rates, inflation, and real income and government investments are important determinants of investments in Namibia. It is also revealed that Namibia savings level has been satisfactory by international standards, but the investment performance has been disappointing, resulting in a slower economic growth than expected. While the poor performance of investment is attributable to various factors, the shortage of skilled labour is a major problem that must be addressed as a priority for Namibia to attain higher growth targets in the future.

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Introduction

Overview

As capital formation is an important factor in economic growth, countries that were able to accumulate high levels of investment achieved faster rates of economic growth and development. The effects of investment on economic growth are two-fold. Firstly, demand for investment goods forms part of aggregate demand in the economy. Thus a rise in investment demand will, to the extent that this demand is not satisfied by imports, stimulates production of investment goods which in turn leads to high economic growth and development.

Secondly, capital formation improves the productive capacity of the economy in a way that the economy is able to produce more output. Also investment in new plant and machinery raises productivity growth by introducing new technology, which would also lead to faster economic growth.

To finance investment required for economic growth, the economy needs to generate sufficient saving or it should borrow abroad. However, borrowing from abroad may not only have adverse effects on the balance of payments as these loans will have to be serviced in the future but it also carries a foreign exchange risk. Therefore, sufficient domestic saving is necessary for economic growth because it

provides the domestic resources needed to fund the investment effort of a country. Namibia's ratio of saving averaged around 25 per cent of GDP between 1990 and 1997, in line with the NDPI target and therefore sufficient to finance investment required to achieve the average economic growth rate of 5 per cent envisaged in the plan. This ratio compares favourably with countries such as South Africa and Chile with ratios of 21 per cent and 25 per cent respectively but lags behind Botswana and Malaysia with 30 per cent and 36 per cent respectively.

The latter countries have been able to register high economic growth rates over the past decades. This implies that countries with high savings ratios generally enjoy high rates of economic growth. However, Namibia has not been able to stimulate sufficient investment to absorb all savings generated in the country. The surplus funds have been transferred to South Africa, largely in the form of portfolio investment. This demonstrates that high economic growth rates in Namibia are not constrained by insufficient saving but rather by the poor investment record.

Research objectives

- to examine the main determinants of savings and private investments in Namibia
- to measure elasticities of these

determinants and

- to suggest policy measures to strengthen domestic saving and private investment.

Methodology

Two approaches will be followed. First, a descriptive approach will be followed where the broad developments in domestic saving and investment will be discussed. The second approach will employ quantitative techniques to estimate the coefficients of the determinants of domestic saving and private investment in Namibia. Unit root tests (stationarity tests) will be performed on all variables to be estimated to avoid spurious regressions. The data will also be tested for cointegration and the *error correction model (ecm)* will be used to estimate the short-run equations where cointegration exists. Two notes of caution should be sounded here: - first the time span covered by this study is somewhat short. Secondly, so far there has not been an independent estimate of GDP by expenditure in Namibia and therefore the final domestic consumption expenditure used to derive the saving data is a residual. This means all errors and omissions are included in the figures for final domestic consumption and may therefore distort the country's savings data. Thus the empirical findings of this study should be interpreted with caution.

The structure of the paper is as follows: the first section provides a brief overview of the main developments in domestic saving and

investment. The second section describes the theoretical determinants of saving and investments and constructs the model to be estimated for Namibia, while Section 3 will describe the data to be used. Section 4 covers stationarity tests, model estimations and the discussion of the results. In section 5 policy implications for Namibia are discussed, while section 6 suggests measures to strengthen domestic saving and private investment. Finally section 7 will draw some conclusions.

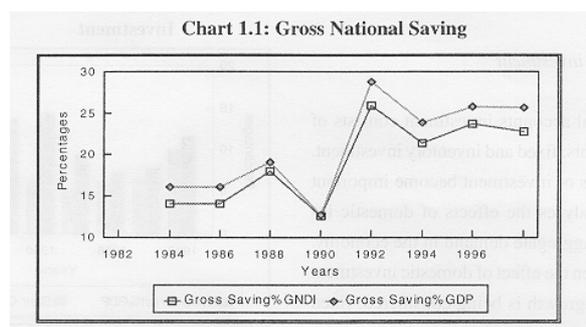
1 Historical trends in saving and investment

1.1: Domestic saving

Gross Domestic savings (GDS) is defined in the national income accounting context as net of gross national disposable income after accounting for consumption (GNDI-C). These are therefore domestic resources that feed in the monetary system as sources of funds to finance investment. The balance between domestic saving and investment reflects the foreign saving position of the country. Thus, excess saving would lead to foreign lending reflected by an outflow of capital while the deficiency in national saving would lead to an import of capital through foreign borrowing.

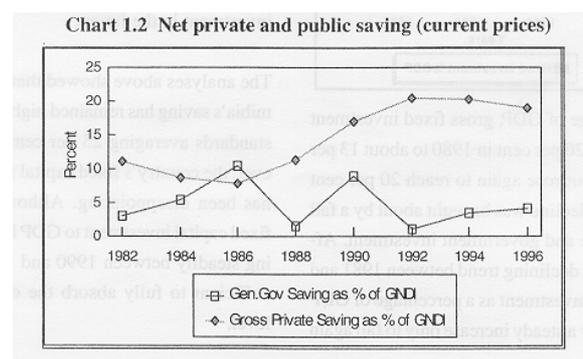
Namibia's gross saving as percentage of gross national disposable income has been rising in the early 1980s, increasing from 11 in 1982 to

18 per cent in 1986. It fell sharply to 13 per cent in 1988, largely due to a decline in the saving of the general government. However, it recovered in the 1990s reaching a peak of 26 per cent in 1990 and remaining around 23 per cent in the ensuing years. As the percentage of GDP, gross domestic saving followed the same pattern throughout the period and averaged about 16 per cent in the 1980s and about 25 per cent in the 1990s. Because of high transfers from SACU and development aid, gross national disposable income in Namibia remained higher than GDP for virtually the entire period under review. This explains why the ratio of gross domestic saving to GDP has always been above that of gross domestic saving to GNDI (Chart 1). Much impetus in national saving came from government and contractual institutional saving as households' accounts only for a small percentage of national saving.



General government saving increased steadily during the early 1980s, but fell sharply in 1988, as a percentage of gross national disposable income. It recovered thereafter, but declined again in 1992 as a result of higher current transfers necessitated by the drought. Although it improved in the years that followed, it

remained at low levels. Unlike general government saving which depicts large swings, private sector saving as a percentage gross national disposable income registered a steady growth almost through out the entire period. It rose from 11 per cent of gross national disposable income in 1982 to about 19 per cent in 1997.

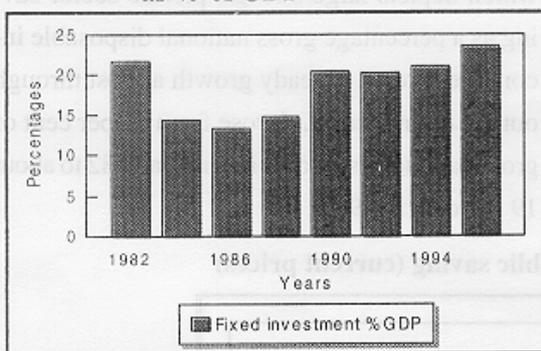


It therefore follows that the deterioration in domestic saving during the late eighties and the subsequent recovery in the early 1990s was largely influenced by savings patterns of the general government as private savings on the other hand recorded almost a steady increase during the same period.

1.2 Domestic investment

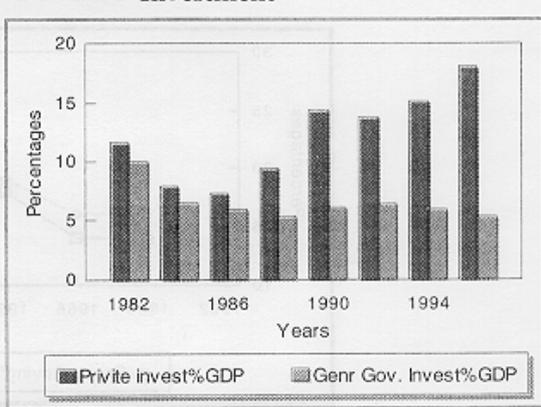
In the national accounts investment consists of two components: fixed and inventory investment. Both elements of investment become important when one analyses the effects of domestic investment on aggregate demand in the economy. However, when the effect of domestic investment on economic growth is being considered, fixed investment is the appropriate aggregate.

Chart 1.3: Fixed Capital Investment as % of GDP



As a percentage of GDP, gross fixed investment fell from over 20 per cent in 1980 to about 13 per cent in 1986 but rose again to reach 20 per cent in 1997. This decline was brought about by a fall in both private and government investment. After recording a declining trend between 1981 and 1986, private investment as a percentage of GDP started to show a steady increase only to fall again in 1991 but accelerated thereafter to about 16 per cent in 1997. General government investment dropped by about 3-percentage point of GDP to 6 per cent and remained around that level hitherto.

Chart 1.4: Private and Government Fixed Investment



This indicate that the increase in gross domestic investment over the years has been brought about by increased investment of the private

sector as government investment remained virtually constant over the same period. Government investment in infrastructure helps to foster private investment, thus the present low level of public investment could become a hindrance to private investment in the future.

The analyses above showed that since 1991 Namibia's saving has remained high by international standards averaging 25 per cent of GDP. However, the country's fixed capital investment level has been disappointing. Although the ratio of fixed capital investment to GDP has been increasing steadily between 1990 and 1997, it was not sufficient to fully absorb the country's saving level.

1.3 Savings – Investment Gap

The excess of saving over investment has been reflected in continues surpluses on the external current account and hence explains the outflow of saving to South Africa. This is an untypical situation for a developing country. Developing countries, because of their low initial income save less than they invest, resulting in a current account deficit. The saving-investment gap is financed by an inflow of saving from abroad. However as the country's income improves, the foreign saving is gradually replaced by domestic saving. And eventually the country becomes an exporter of saving. Namibia's case defies international experiences, as the country has

been exporting saving while economic growth has been poor, especially since 1995.

While the poor economic performance can in part be blamed on external factors such as the drought, reduced fish stock and weak commodity prices, the slow pace of investment growth explains much of it. A recent study indicated that Namibia's productivity as measured by Total Factor Productivity is on the decline, implying that for every unit of capital employed less and less output is received in return.² The underlying issue explaining this decline in productivity is the acute shortage of skills of the labour force, the gradual shift to high cost deposit in the mining industry and the large government consumption expenditure. Some of these and other factors relating to the falling productivity levels will be discussed in detail in the later section of this paper.

2. Theories and Models of Saving and Investment

2.1 Theoretical Determinants of Saving and Investment

Several studies have estimated the saving and investment function in developing countries, particularly on sub-Saharan Africa, e.g. Schmidt-Hebbel, et al (1992), Hadjimichael, et

al (1995). Many of these studies have used national saving and investment figures while only few focused on private saving and investment. However, it is of great importance to determine factors that influence changes in private saving and investment, as these are the main components of aggregate saving and investment in many countries. Further, policies that are geared to raise the level of saving and investment generally focus on these two aggregates. Unfortunately no attempt has been done so far to estimate the saving and investment functions for Namibia. Several briefing papers on the historical trends of savings and investment have been prepared so far but none of these papers have used econometric tools to estimate the determinants of saving and investment in Namibia. The absence of earlier work presents a challenge to this study, as there are no existing results against which a comparison could be made.

Generally, a number of macroeconomic variables have been included in the saving and investment models to account for the effects of monetary, fiscal and exchange rate policies. The inclusion of macroeconomic stability factors in the saving and investment models is done on recognition that these factors have significant influences on saving and investment. This includes, the rate of inflation, the standard deviation of inflation, the overall budget deficit as a ratio of GDP, government investment as a

²Findings in the report of the 1998 World Bank Team and the NAMAC Working group.

ratio of GDP, the standard deviation of the percentage changes in the real effective exchange rate, the stock of foreign debt as a ratio to exports, and broad money as a ratio of GDP. Apart from these macroeconomic stability measures, the following variables are also included in the saving and investment models: income or income per capita, real interest rates, and the dependency ratio. The theoretical support for the inclusion of the above factors and their expected signs will be discussed below.

2.1.1 Macroeconomic Stability

Inflation

The direction of the effects of inflation on savings and investment is ambiguous in the theoretical literature. The Tobin-Mundell effect, suggests that higher inflation leads to lower real interest rates and causes a portfolio adjustment from real money balances towards real capital. This means that higher anticipated inflation would be expected to lead to increased investment. However, this may not be the case in developing countries such as Namibia with relatively underdeveloped capital and financial markets. In such a case portfolio adjustment would be most likely from real money balances to real assets (land, livestock and consumer durables), which are not usually included in private investment in the National Accounts or to foreign assets through capital flight. Thus,

higher anticipated inflation in these countries could reduce savings and investment.

In developing countries inflation also serves as a measure of the authorities commitment to macroeconomic stability. Higher and variable inflation therefore lowers the credibility of the authorities and as a result discourages saving and investment.

Further, when inflation is highly variable, it becomes difficult for economic agents to extract right signals from relative prices. This creates uncertainty, which could lead to inefficient allocation of resources (including investment and saving) and to capital flight. It is often noted that the uncertain macroeconomic environment which prevailed in Latin American countries in the late 1970s and early 1980s was the main cause of massive capital flight from the region and policies pursued in the 1990s to stabilise the macroeconomic environment have succeeded in bringing back a sizeable amount of funds from abroad (Hadjimicheal et al 1995). The implication is that high and variable inflation is expected to lower saving and investment.

The overall budget deficit

The high budget deficits are associated with declining public saving. In the theoretical literature a rising budget deficit would stimulate private saving. This takes place through two

channels: first, in the simple Keynesian view an increase in the budget deficit would raise income via the multiplier and consequently saving.

Second, according to the “Ricardian equivalence” theory, an increase in the budget deficit would stimulate private agent’s savings as they expect an increase in their future tax liabilities. As a result they would reduce their current consumption level and increase saving. Thus, a rising deficit would leave national saving unaffected but could stimulate private saving. The Ricardian equivalence theorem does not seem to hold empirically in developing countries (Hadjimicheal et al 1995). This is because the strict conditions required, such as the existence of efficient capital markets, are unlikely to be met in these countries.

The budget deficit is generally used as a measure of the government’s borrowing requirement. Thus, a rise in the budget deficit could crowd out private investment by reducing bank credit and/or by raising real interest rates. Higher budget deficits could therefore reduce private investment.

Public investment

Government investment, particularly investment in infrastructure, is seen to have complimentary effects on private investment. There is overwhelming evidence that public investment

in infrastructure development has significant positive effects on private investment. For example, recent studies using a pooled sample of twenty-four developing countries for the period 1970-79, showed that a \$1 increase in infrastructures development would raise real private sector investment by about \$0.25. The same studies also indicated that an equivalent increase in other forms of public investment reduces private investment by about \$0.3 (Agonor et al 1996).

Exchange rate policy

The theoretical literature is also ambiguous about the direction of the effects of real exchange rate changes. On one hand, in the context of developing countries, a large part of capital goods is imported. Thus, to the extent that real depreciation raises the price of imports, it also raises the price of capital goods and therefore domestic investment is expected to fall. However to the extent that real depreciation increases the profitability of the tradable sector, it is expected to stimulate private investment in this sector.

On the other hand real appreciation of the exchange rate is expected to lower the competitiveness of the export sector thereby reducing its profitability. This would lead to a decline in export volumes. The consequent decline in international reserves might induce the authority to impose restrictions on imported

goods including capital goods, which are important for investment and economic growth. Therefore, a real appreciation of the exchange rate might reduce investment and saving.

Public External Debt

Generally there seem to exist a negative relationship between high ratios of the external public debt to exports and savings and investment. This is because first, the resources used to service the debt impinge negatively on public investment, which because of its complementary nature, will reduce private investment. Second, high total external debt ratio could give signals to economic agents of future tax liabilities for servicing the debt, the so-called debt overhang. This could induce capital flight instead of saving domestically, thus raising domestic interest rates. However, in anticipation of future tax liabilities economic agents, concerned about the welfare of their heirs could reduce consumption in the current period thereby increasing saving so that the welfare of their heirs is not affected. Thus, the theoretical literature does not provide a clear position on the direction of the effects of external debt on saving.

2.1.2 Other determinants

Income and wealth

The literature suggests a strong positive relationship between saving and income. High

incomes improve the per capita income of households, which will induce them to save more. Thus, richer people can afford the luxury of saving for their future consumption. The poor on the other hand, have low incomes that only allow them to consume at the minimum level. In addition, the poor usually do not have a stock of wealth, which can cushion them from future fluctuations in income. It therefore follows that higher income enhances the saving's ability of households and consequently raises the country's saving. Higher income growth rates are also associated with higher investment. This is because raising income boosts business confidence, which in turn increases investment.

Real interest rates

The effect of rates of return on saving is an empirical question. On the one hand, higher real interest rates on saving raises the stream of future income and wealth, thus raising the current consumption level. On the other hand, higher returns on savings are expected to encourage economic agent to increase saving because postponing the current consumption would imply larger future consumption out of current income. If the substitution effect of the rise in rates of returns on savings dominate the income effect, saving could increase and vice-versa.

The empirical literature on developing countries

does not provide clarity on the ambiguity of the effects of changes in real interest rates on the country's saving. Fry (1978 and 1980) suggests that higher real interest rates have positive effects on saving. However, Giovannini (1983 and 1985) found the effects of real rates on savings to be negligible. However the lack of clarity on the effects of real interest rates on saving in developing countries may be a problem of measurement rather than a real problem with the theory of McKinnon and Shaw³. It is well known that the data on savings in developing countries are not very reliable.

Demographic variables

The life cycle and permanent income models of consumption and savings suggest that demographic variables should affect the savings rate. In fact, empirical literature on the effect of demographic variables on savings rate is widespread. The dependency ratio - those under age 15 or over 60 as a share of the total population- is mostly used as an explanatory variable. In the life cycle hypothesis, older people dis-save (consume from their saving) as they do not work to receive income. These models also suggest that households with more children at home save less because saving for retirement is postponed until children have left

³The McKinnon and Shaw model stipulates that in a repressed interest rates environment, the liberalisation of interest rates will encourage saving and investment.

home which would raise the per capita income of the household. Further, parents with children will tend to save less, as they would expect old-age support from their children. Thus it is expected that saving would be negatively affected by the rise in the dependency ratio.

Early research work on developing countries, Leff (1969) and Hadjimicheal et al (1995), found a strong negative relationship between the dependency ratio and saving. Some other studies challenged the robustness of these findings and have examined both the theory and measurement of demographic variables more carefully. These studies suggested that the results depend on the data used and other explanatory variables included in the regressions. The evidence regarding the effects of demographic variables to this date remains controversial.

2.2: The Model for Estimation

Due to lack of data for Namibia, not all variables discussed earlier will be included in the savings and investment models to be estimated in this paper. The estimations will cover long run and short-run functions of saving and investment.

The following long-run saving function will be estimated as follows:

$$\ln S = \alpha + \beta_1 \ln GNDI_t + \beta_2 \ln R_t + \beta_3 \ln P_t + \mu_t \text{ where } \mu_t = NID(0; \sigma^2)$$

(+) (+) (+-) (1)

The dependent variable $\ln S$ represents the log of real national saving

$\ln GNDI$, the log of real gross national disposable income

$\ln R$ is the real deposit rate

$\ln p$ is the rate of inflation.

The signs below the variables indicate the expected signs for the coefficients, as discussed in the theoretical section above.

Estimating equation 1 directly with Ordinary Least Square (OLS) may lead to simultaneity biases because of the endogeneity of some explanatory variables. For the above equation the potential simultaneity, which is suspected, is between saving and the growth of real gross disposable income. However, saving does not seem to have significant direct influence on gross disposable income, because even though it affects GDP from which household income is derived, its effects are suspected to be minimal.

Hence the variable real gross disposable income in the above equation will not be instrumented. The following long-run investment function will be estimated as follows:

$$\ln I = \alpha + \gamma_1 \ln Y_t + \gamma_2 \ln P_t + \gamma_3 \ln R_t + \gamma_4 \ln GIY_t + v_t \quad (2)$$

(+) (+-) (-) (+)

Where $v_t = NID(0; \sigma^2)$

The dependent variable $\ln I$ is the log of real private investment

$\ln Y$ is the log of real income

$\ln GIY$ is the log of the ratio of government investment to GDP.

All other variables remain as specified above.

The only variable suspected to cause simultaneity bias in equation 2 is real income, which is also partly determined by private investment. However, since other factors other than private investment also have important influences on real income, no endogeneity will be assumed in this study.

2.3: Empirical findings in Sub-Saharan Africa

As mentioned earlier, several research studies were undertaken to estimate the influence of the variables discussed above on saving and investment in the sub-Saharan African countries. These studies produced interesting results, which can be useful for comparisons in the absence of similar studies on the Namibian data.

The studies indicate that a stable macroeconomic environment is important for stimulating saving and private investment. Thus the rates of saving and investment are enhanced in an environment where the budget deficits and the rates of inflation are low. In addition, macroeconomic uncertainty, as measured by the standard deviation of inflation has negative influences on saving and investment (Hadjimicheal, at al 1995).

Another interesting result is the support for the complimentary effects of public investment on private investment, thereby indicating that

government investment in Sub-Saharan Africa, through their positive externalities, stimulates private investment and economic growth. Real interest rates were found to have negligible effects on savings, while per capita income plays an important role in stimulating saving. However, as expected, real interest rates were found to have a negative effect on investment.

3. Data Analysis

3.1.1 Data Definitions

Saving

The dependent variable in the saving equation, Logsave is the logarithm of real saving. In the context of this paper real saving is defined as nominal gross domestic savings adjusted for inflation by using the GDP deflator. The variable INPT represents the intercept or the constant term. LOGRGNDI is the logarithm of real gross national disposable income. Dividing gross national disposable income by the GDP deflator arrived at this. A third variable of importance in the savings equation is the real deposit rate. The real deposit rate is the Namibian nominal deposit rate minus the inflation rate. Infl2 is the inflation rate for Namibia.

Investment

For the investment function, LOGRINV represents the logarithm of real private investment. Real private investment is defined as investment from other sectors excluding central government adjusted for inflation

making use of the GDP deflator. The variable INPT represents the intercept, while LY represents the logarithm of real gross domestic product.(GDP) LGIY is the logarithm of the ratio of government investment to GDP. LR represents of Namibia’s real prime lending rates. D88 and D84 are dummy variables as explained in Table 3.2.

Table 3.1: Data Definitions of Variables

Variables	Definitions
Saving function	
Logsave	Logarithm of real saving
Inpt ⁴	The intercept or constant term
Logrgndi	Logarithm of real gross national disposable income
Realdepr	Real deposit rates. (Namibia deposit rates minus the inflation rate.)
Infl ⁵	Inflation rate for Namibia
Investment function	
Logrinv	Represents the logarithm of real private investment
Ly	Logarithm of real GDP.
Lr	Lr represents the real prime lending rates of Namibia.
LGiy	Logarithm of the ratio of government investment to GDP.

⁴The intercept occurs in both functions. It has the same meaning in both functions. Therefore it is not defined in the investment function.

⁵This variable appears in both functions. Because its definition is the same in both functions, it is not defined in the investment function.

3.1.2 Data sources and transformation

All data, with the exception of interest rates figures, were obtained from the *National Accounts (1980-1996)* published by the *Central Bureau of Statistics (CBS)*. Interest rates data were obtained from the *South African Reserve Bank* and *Bank of Namibia Quarterly Bulletins*. The GDP deflator was used to convert nominal variables to real variables with the exception of interest rates for which the CPI was used. All data are in million Namibia dollars, unless otherwise specified.

Table 3.2 Dummies

D88	Political uncertainty in 1989
D 84	Sharp depreciation in 1985
D94	Reduction in corporate tax in 1993
D87	Sharp decline in government saving

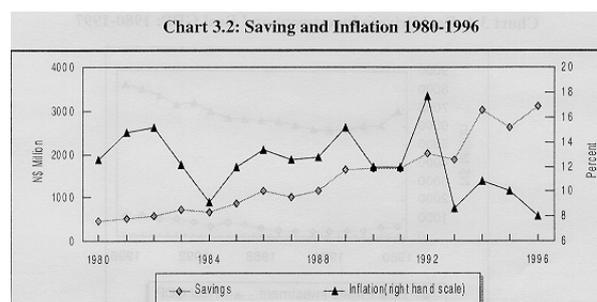
3.1.3 Data trends

This section analyses the time profiles of the key variables used in the estimation. An attempt is made to establish whether developments in the dependent variable can be explained by developments in the independent variables. The conclusions drawn in this section are only indicative as proofs of whether or not a relationship exists between the two variables can only be confirmed by regression results. In comparing real saving with the real deposit rates, the empirical data seems to support the theoretical literature that the relationship between saving and the real interest rates is ambiguous. In *chart 3.1* an increase in real deposit rates does not produce a corresponding

increase in the real rate of saving. For instance in 1984, real interest rate was at its peak level and the level of saving did not increase dramatically. Further, in 1992 and 1994 real interest rates fell, while the level of real saving continued to increase. The conclusion that can be drawn from this chart is that saving does not seem to be highly responsive to the level of real interest rates and that the relationship between the two variables seems ambiguous.



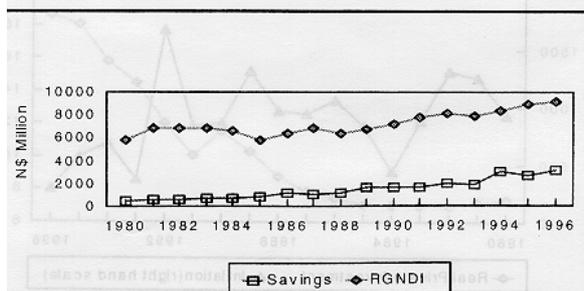
The negative relationship between saving and inflation described in the literature is not supported by data (*Chart 3.2*). In 1984 for example, inflation fell sharply by about 4 percentage points but saving continued on a steady growth path as before. The same can be said about 1992 when the inflation rose by almost the same magnitude but the savings level still increased. It seems therefore that inflation does not have discernable influences on savings in Namibia.



Data also indicates that there is a positive relationship between real private investments

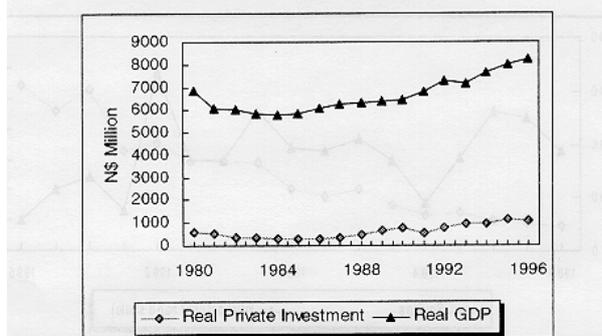
and real gross domestic product in Namibia (Chart 3.4). This is particularly visible in the early eighties and nineties. However there are some periods during which the two variables move in different directions, especially during the year 1990, real GDP declined, while real private investments increased.

Chart 3.3: Saving and Real National Disposable Income



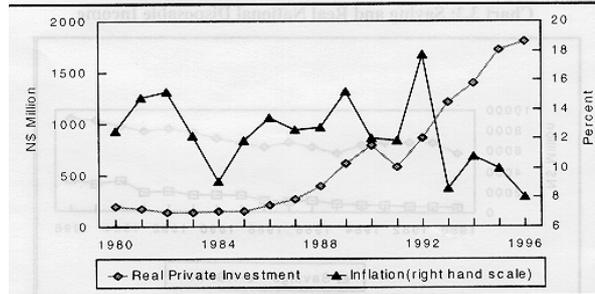
This is perhaps so because real GDP growth is not solely dependent on investment spending and it could be that the increases in investment spending were not strong enough to offset negative effects from other determinants.

Chart 3.4: Real Private Investment and Real GDP: 1980-1997



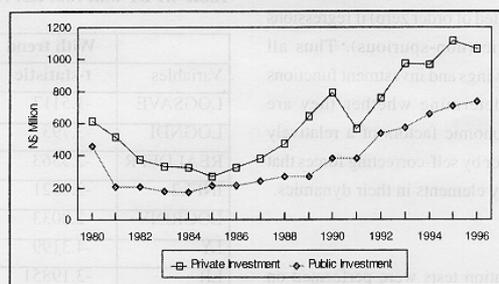
The opposite relationship between investment and the inflation rate appears weak in the early 1980s, but seems to have become stronger in the recent years (Chart 3.5). This is especially true after 1992 when inflation has been on a constant decline while private investment has been showing a strong rise.

Chart 3.5: Real Private Investment and Inflation:1980-1996



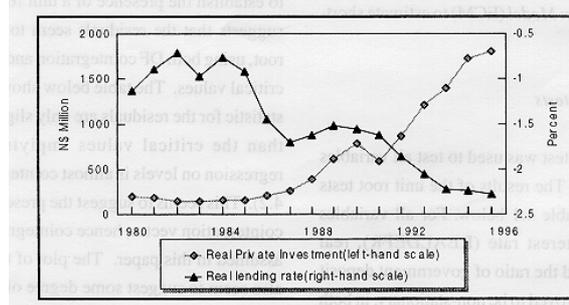
The positive relationship between private investment and public investment discussed in the literature is supported by the data (Chart 3.6). This is so because public investment, particularly investment in infrastructure is expected to crowd in private investment.

Chart 3.6: Public Investment and Private Investment:1980-1996



The negative relationship between lending rates and real private investments is strongly supported by data (Chart 3.7). In the 1980s when real lending rates were relatively high, investment levels remained low. But as soon as real rates started to fall in the 1990s, the investment level picked strongly. This therefore confirms the theoretical expectations that interest rates are important determinants of real private investment.

Chart 3.7: Real Private Investment and Real Lending Rates: 1980-1996



4. Model Estimation

4.1 Time series characteristics of the data

Econometric theory requires all variables to be stationary (integrated of order zero) if regressions are to be realistic (non-spurious). Thus all variables in the savings and investment functions were tested to determine whether they are influenced by economic factors of a relatively permanent nature or by self-correcting forces that indicate temporary elements in their dynamics.

Second, cointegration tests were performed on real saving and real investment using the Dickey- Fuller (DF) unit root test on the residuals of the long-run equations. Cointegration tests indicate whether or not a long-run relationship exists between the dependent variable and its regressor. If variables are cointegrated, then the regressions on levels of variables will be meaningful and valuable. Long-term information will not be lost if their differences, which are stationary, were to be used. In this case we are guided towards the *Error Correction Model* (ECM) to estimate short-run elasticities.

4.1.1 Unit root tests

The simple DF test was used to test all variables for stationarity. The results of the unit root tests

are shown in table 4.1 below. For all variables tested only interest rate (REALDEPR), real income (LY) and the ratio of government deposit to GDP (GIY) proved to be non-stationary, in both cases while inflation came out stationary, I(0). The tests for the rest of the variables were I(1)⁶. This was confirmed by the first differences of all variables which came out to be stationary, I(0).

Table 4.1 DF unit root test results

Variables	With trend t-statistics	Without trend t-statistics
LOGSAVE	-1.5117	-3.9615
LOGNDI	-3.793	-2.46
REALDEPR	-2.5563	-2.6635
INFL2	-3.7521	-3.2897
LOGRINV	-2.8033	-0.33678
LY	-4.3199	0.55364
LR	-3.19851	-3.6164
LGiy	-3.1351	-1.0828

Critical Values with trend 5%=-3.7347; without trend 5%=-3.0659

4.1.2 Test for cointegration

Saving

The savings function was tested for cointegration using the DF test. Residuals from the regression on the levels of the savings equation were tested to establish the presence of

⁶Estimating levels of variables that are non-stationary with Ordinary Least Square (OLS) could result in unreliable estimated values.

a unit root. The test suggests that the residuals seem to have a unit root, using both DF cointegration and Mackinnon critical values. The table below shows that the t-statistic for the residuals is only slightly smaller than the critical values implying, that the regression on levels is almost cointegrated (table 4.2). This seems to suggest the presence of weak cointegration vector hence cointegration will be assumed in this paper. The plot of the residuals also seems to suggest some degree of stationarity, which is an indication of the presence of cointegration. If the cointegration relationship is genuinely absent, then the coefficient of the adjustment factor in short-run regression will be insignificant and the ECM can be dropped. This is the ultimate proof of whether cointegration existed in the first place. The apparent absence of cointegration in saving regression could be attributed to the data problems discussed in the introduction.

Table 4.2: Cointegration test statistics (without trend) for saving and investment

Variables	t-statistic	DF Critical values	Mackinnon critical values ⁷
Saving (Res1)	-4.2323	-4.2806	-4.2799
Investment (Res3)	-5.7629	-4.0867	-4.8066

⁷The Mackinnon critical values are calculated from the Mackinnon table in R. Harries (1995)

Investment

As it can be seen from the table above, the investment equation shows a clear presence of cointegration. This is so by applying both the DF and Mackinnon critical values. The presence of cointegration supports the application of the *ECM* for the estimation of the short-run coefficients of the investment equation.

4.2 Regression Results

4.2.1: Long-run cointegration saving and investment elasticities

Saving

The results of the long-run cointegration static (OLS levels) savings equation are shown in Table 4.2. The results suggest that real saving in Namibia is only significantly influenced by real gross national disposable income (RGNDI). This variable is significant at both 5% and 10% significance level. The coefficients for both inflation and the real deposit rate are insignificant at both 5% and 10% level of significance and the coefficient for inflation has positive sign contrary to expectations. The dummy D87 which marks a sharp decline in public saving in 1987 is significant at both 5% and 10% significance level has the expected negative sign. The other dummy (D94), which represents a reduction in the corporate tax rate

in 1993 from 40% to 38%, is also significant at both levels and has an expected positive sign. The R^2 of 70% is reasonably high suggesting that in the long run about 70% of the variations in saving is largely explained by the variations in gross national disposable income. The equation is free of heteroscedasticity and serial correlation while the normality and functional form tests produced favorable results.

$$\text{Logsave} = 4.8 + 0.3 \text{Loggrndi} + 0.001 \text{Realdepr} + 0.008 \text{Infl} \quad (4)$$

t-values (4.4) (3.0) (0.2) (0.9)

$R^2 = 0.71$; $F(5,11) = 5.4088(0.009)$; $DW = 2.2$; $N = 17$

$LM \text{ test} = 0.85(0.355)$;

$ARCH \text{ test} = 0.62(1.0)$;

$F(1,11) = 0.53670(0.479)$

$Normality \text{ CHI-SQ}(2) = 2.1930(0.334)$

Private Investment

The results of the long-run investment function are shown in equation 4. The results indicate that interest rates and the ratio of government investment to GDP are the significant determinants of private investment in Namibia. These two determinants are significant at 5% level of significance. Although the rate of inflation has negative influences on investment in Namibia, these influences are negligible at both 5% and 10% level of significance. Initially, the logarithm of real gross domestic product was included in the long run investment equation, but seems to have created problems apparently due to its correlation with the ratio of public investment to GDP and as a result, this

variable was dropped. The results also show that all the long-run impacts are rightly signed, in line with the theoretical expectations. The dummies D84 and D88, which represent a sharp depreciation and political uncertainty in 1985 and 1989, respectively, also came out to be significant.

$$\text{LOGRINV} = 7.195 + 1.657 \text{LGIY} - 0.5092 \text{IR} - 0.01087 \text{INFL} \quad (5)$$

t-values (9.1) (8.5) (-2.2) (-0.3)

$WALD \text{ test } \text{Chi}^2(3) = 76.776 [0.0000] **$, $N = 16$

Tests on the significance of all lags up to 1

Lag F(num,denom) Value Probability

1- 1 F(4,8) = 5.453 [0.0204] *; AR 1- 1F(1, 7) =

4.4157 [0.0737]; ARCH 1 F(1, 6) = 0.033658 [0.8605]

Normality $\text{Chi}^2(2) = 6.6316 [0.0363]$

The wald test statistic of 76.776 with a p-value of 0.000, indicates that the variables on the right hand side of the equation jointly determine private investment in Namibia. In addition, the AR 1-1 test for serial autocorrelation and the ARCH test for auto regressive conditional heteroscedasticity show satisfactory results, at 5% significance level.

4.2.2 Short-run savings and investment elasticities

Saving

To estimate the short-run saving function both the *Engle-Granger Two-step* and *Unrestricted ecm* methods were estimated. However, the results were statistically insignificant, which is expected given that the cointegration test for the saving function was insignificant.

Private investment

The results of the short-run investment function are shown in equation 6 below, indicating that the ratio of public investment to GDP, the rate of interest and inflation don't only affect investment in Namibia in the long run, but their effects are also felt, to a certain degree, in the short-run. The coefficient of the ratio of public investment to GDP is significant at 5% significance level, while that of the rate of interest and inflation are only significant within the range of 10-25%, suggesting that the impacts of the latter variables are small in the short-run. The signs of variables tested confirm the theoretical hypotheses.

$$\begin{aligned} \log riv_t = & -0.0043 + 0.55 \log y_t + 0.10 i_t + 0.018 \log p_t + \\ & 0.82 res(-1) + e_t \end{aligned} \quad (6)$$

t-values (1.1) (2.4) (1.2) (1.8) (5.0)

$R^2 = 0.73$; $F(4, 10) = 6.7(0.0069)$; $DW = 2.7$; $N = 15$

$L-1(1, 10) = 25.2(0.0005)$; $AR1-1F(1, 9) = 3.04(0.12)$, $ARCH1$
 $f(1, 8) = 0.029(0.8)$

Normality $\chi^2(2) = 5.575(0.0616)$

Of importance, the coefficient of the error-term is highly significant at 5% level of significance, thus confirming the presence of the cointegrating vector in Namibia's investment function. Further the significance of this coefficient suggests that the error correction model (ECM) is the appropriate method of estimating short-run relationships of Namibia's investment function. The coefficient of the error term is about -0.82, implying that 82% of the

errors of the previous period are corrected in the following year. The R^2 is sufficiently large, suggesting that about 73% of the variations in Namibia's investment function are explained by variations in the factors on the right-hand side of equation.

5: Policy implications for Namibia

The results discussed above have several implications for Namibia:

- It is suggested that saving in Namibia is only significantly influenced by real national disposable income. A percentage increase in real national disposable income will lead to about 28 per cent rise in real saving in the long run. The real deposit rate does not have significant influence on saving in Namibia confirming similar findings by A. Soyibo (1996) on Nigeria and Hidjimicheal et al (1995) on several sub-Saharan countries. This suggests that only efforts that are geared to raise real national disposable income will increase the saving level in Namibia. Thus Namibia should step-up the efforts to promote more investment in the country, which in turn will lead to high economic growth and ultimately higher saving.

- The regression results show that private investment is influenced by real interest rates and government investment. The significance of public investment supports the hypothesis of complementary effects of public investment on private investment, suggesting that the reduction of government's current expenditure to generate funds for more capital projects, particularly on infrastructure, will foster private investment, economic growth and saving.

- As expected, the results showed an indirect relationship between interest rates and private investment, thus indicating that higher interest rates discourage private investment. This means Namibia cannot afford to have prolonged high rates of real interest rates without hampering the country's efforts to promote investment, necessary to meet the economic growth targets. This finding supports the traditional Keynesian theory where investment entirely depends on interest rates (the marginal efficiency theory). While interest rate is an important factor influencing private investment, contemporary macroeconomic theories suggest that investment demand is also determined by factors such as the rate of

growth in output (accelerator theory), retained earnings and valuation of firm's equity (Tobin's q theory). These factors may be more important determinants of investment than interest rates in some countries, particularly less developed countries with weak financial markets.

6. Measures to strengthen domestic saving and investment

As already mentioned, Namibia has, over the years, generated saving in excess of investment over the years, suggesting that the immediate problem in Namibia is not the lower savings ratio but a deficiency in private investment. Apart from the need to step-up government investment in infrastructure especially in areas with high business potentials several other measures are important.

The high rates of interest in Namibia could be construed as an obstacle to the much-needed investment to meet the economic growth targets. However, amidst strong inflationary pressures, high interest rates are necessary to contain excess demand for credit and therefore reduce inflation to levels consistent with sustainable growth and development.

Further, a recent research study on Namibia's investment environment identified the following

factors as impediments to investment⁸:

- Little absolute advantage over large South African producers in manufactured products.
- Relatively high import tariffs on imported inputs.
- Exchange controls.
- Small domestic market and a widely dispersed population.
- An unskilled but at the same time highly unionized labour force.
- Long distance from major markets
- A large public sector offering relatively well-paid employment to higher skilled workers.

Some of these problems are defined by Namibia's demography and geography and therefore not much can be done about them, at least in the short to medium-term. But fortunately, with the right policies, many of the other problems can be addressed.

While it will be difficult for a manufacturer to compete with well-established producers in South Africa, with the right strategy this will not be completely impossible. Namibia Breweries is a true success story for Namibia. This company has been making significant strides in penetrating the regional markets, especially the South African market, over the

past few years. This demonstrates that with an aggressive strategy and vision, Namibian companies have the potential to successfully compete with established producers in South Africa.

The shortage of skills is a great problem in Namibia. Recent evidence showed that productivity as measured by the Total Factor productivity is falling and the unskilled level of the labour force is one of the key contributing factors. This shortage is seen by the NPC draft Human Resource Plan to remain a problem for the next 25 years, this is a worrisome situation, which needs to be addressed as a priority. This calls for the strengthening of education system so to ensure that school/university leavers are equipped with the skills desired by the job market. One way of doing this will be to improve the co-ordination and interaction between the private sector and educational institutions. Subsidizing industry sponsored training programs, along the lines of the EPZ training grant, could also help addressing this problem. The proposal by NPC for an aggressive training abroad may not be a sustainable remedy. Rather, funds should be used to improve and strengthen capacity of schools and universities in the country such that the shortage is permanently addressed.

Despite the inadequacy of skills pointed out above, it is argued that Namibia's wage levels

⁸ Robin Sherboune; (1998); *Saving and Business Investment in Namibia*

are significantly higher than those of her neighbors, excluding South Africa. A study by the Ministry of Trade and Industry showed that, for example a semi-skilled worker in Namibia earns almost three times what his counterpart earns in Botswana. Anecdotal evidence also suggests that parastatals wages are generally way above those paid by the private sector. This means that the private sector will only be able to attract the same level of skills if it can pay likewise. The result could be an upward pressure on wages in the entire economy. The issue is being investigated by the Research Department of the Bank of Namibia. But public sector wage policies can set a good example. By ensuring that wage adjustments in the public sector does not exceed inflation and productivity gains, excessive wage demand in the private sector could be resisted.

It was pointed out above that Namibia's challenge at the moment is the need to raise investment to higher levels as the country's savings rate is sufficient to finance present and future investment demands. However in the longer term, investment may increase to levels that would necessitate a high savings rate. It is often argued that exempting investment income partly or in full from income tax could influence savings behaviour in a country. This is done in order to raise the marginal return on accumulated saving and so to encourage domestic saving. However, the net effects on

the overall savings level of this measure may be limited because of offsetting income and substitution effects. Thus, the ability of the government to influence the after-tax rate of return on saving may be constrained.

Further, granting tax concessions could result in revenue losses and consequently higher budget deficits if it is not accompanied by expenditure cuts or an increase in other forms of revenue. While a higher budget deficit may in itself already be a disincentive to save, tax concessions would mean a probable decline in government saving. With this, the overall saving is likely to fall if the income resulting from the tax cut is not saved fully.

In short, it seems that given the ambiguity on the effectiveness of tax concessions to alter private saving, direct actions to increase domestic saving by cutting budget deficits and raising public saving would appear more effective than tax cuts. However a significant reduction in government expenditure to raise saving may not be justified in the country with excess saving given the implications of the reduced expenditure on employment.

It is also argued that private saving can be raised through compulsory saving. These are compulsory contributions to employees pension fund and/or provident fund schemes. Although many institutions in Namibia have either a

pension or provident fund scheme which form part of domestic saving, it seems private saving could be increased by making it compulsory for all institutions to belong to a certain fund. However this forced saving could replace voluntary saving and the overall private savings level would remain unchanged. In Malaysia, for instance, it was observed that a unit increase in compulsory saving led to a unit decline in voluntary saving.

7 Conclusions

The objectives of this paper were first, to determine whether income, interest rates, inflation and government investment are important determinants of saving and private investment in Namibia. Second, to suggest measures that will strengthen domestic saving and investment. Econometric results suggest that saving is only significantly influenced by real disposable income. Interest rates and government investment do have a significant impact on private investment.

While the current high interest rates in Namibia seem to frustrate effort to promote private investment, it should be noted that investment could only take place in an environment of lower inflation. Therefore at times, high interest rates need to be maintained until the risk of high inflation is significantly reduced.

It was observed that Namibia has been generating saving over and above the present level of investment. This implies that Namibia's present concern is not the insufficient saving but rather the sluggishness in private investment. Private investment could be stimulated through factors that contribute to a stable macroeconomic environment such as fiscal discipline and lower inflation. It is also argued that the low skill levels of the of the labour force constraints investments and has been partly responsible for the decline in total factor productivity in the recent years. Despite this, Namibia's wages seem to be higher by regional standards, with the exclusion of South Africa. This is worrisome and should be addressed as a matter of urgency.

The weakening in aggregate domestic saving during the mid 1980s and early 1990s can mainly be attributed to the deterioration in government saving which almost turned into dis-saving positions in some years. Given the relatively long-term stability in private sector savings and the ambiguity attached to tax concessions and compulsory tax measures aimed at strengthening private sector saving, the appropriate way to raise the country's saving is to reduce government current expenditure and increase public saving.

Finally it should be noted that the major limitations faced by this study were short time

horizon of data and the availability thereof. A comprehensive set of national accounts is only available as from 1980, restricting the number of observations to less than 18. This makes it difficult to include lagged variables in the regressions, as observations would be reduced to a meaningless number. In addition, data on external debt are only available since the early 1990s, while time series on demographic variables hardly exist. Further, all variables used in estimating long run and short-run saving and investment equations were assumed to be exogenous without testing for weak exogeneity and simultaneity. All these are issues that future research initiatives on saving and investment in Namibia should look into, especially when the availability of data improves.

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Appendix

