Issues On The Zambian Economy

Bank *of* Zambia

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Foreword

Since the negative copper price shock of 1974, Zambia has experienced twin problems of high inflation and a deterioration in the balance of payments. In order to resolve the current economic difficulties, it is imperative that all stakeholders have a clear understanding of the functioning of the Zambian economy.

In the past, there has been inadequate literature and debate on the functioning of the Zambian economy. In order to fill this gap in the literature, the Bank of Zambia has undertaken to publish a Bank of Zambia Reader series. The Reader will be published once every year to bring together the thinking of individuals on economic and financial issues.

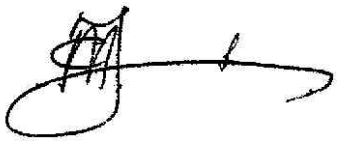
It is directed at a national and international readership to ensure informed analyses and choices by economists and other social scientists in government, business, international agencies, universities and other research institutions.

In this first publication of the Bank of Zambia Reader, articles are drawn solely from work done by Bank of Zambia staff. However, future publications will include articles from researchers outside the Bank of Zambia. In this regard, we invite articles for inclusion in the next publication.

In order to enrich the Reader, comments or brief notes on published articles are invited. All correspondence should be addressed to the Director, Economics Department, Bank of Zambia, P.O. Box 30080, Lusaka, Zambia. Alternatively, comments can be sent by e-mail to pr@boz.zm.

We are grateful to all those who have contributed articles for publication in this Reader. Our thanks also go to the members of the Editorial Committee without whose commitment this work would not have been possible.

The views and interpretations expressed in this Reader are those of the authors and do not necessarily represent the views and policies of the Bank of Zambia.



Caleb M. Fundanga
Governor
Bank of Zambia
July 2003

CHAPTER ONE

The Feldstein Horioka Puzzle: Does it Apply to Zambia?

Mulenga Emmanuel Pamu

1. INTRODUCTION

In the last two decades, there has been growing interest in testing the intertemporal implications of open economy models. The distinctive feature of an open economy is the ability to borrow and lend in international capital markets in response to cyclical disturbances. As a result, domestic income and spending can be different as countries run current account surpluses or deficits. This behavior emanates from consumption smoothening and capital flows to those countries where investment opportunities exist. These two forces shape the dynamics of saving and investment and thus the response of the current account.

However, there are imperfections in international capital markets arising from factors such as a high sovereign debt, especially for low-income developing countries. The Zambian economy became increasingly indebted after the negative copper price shock of 1974, exacerbated by the debt crisis of 1982. The existence of a huge debt can qualify the intertemporal implications of open economy models. This paper applies the intertemporal model of the current account to a heavily indebted small open developing country, Zambia.

The intertemporal approach to the current account has the following implications: (Obstfeld and Rogoff, 1996)

- Investment and domestic savings should have a low correlation when the economy is highly integrated in world capital markets. When a shock to output is permanent, the current account surplus (deficit) decreases (increases). The investment response to an output shock is reinforced by the consumption response. The effect of the shock on the current account is therefore higher than the investment response.
- Whether the current account will be procyclical or countercyclical depends on the magnitude of the savings response relative to the investment response to an output shock.
- Consumption smoothing implies that output will be more volatile than consumption. However, with non-stationarity of output, consumption responds more than income to a permanent income shock.

There are two significant stylised facts about modern economies (developed economies in particular). First, domestic savings (S) and domestic investment (I) are positively correlated. Second, that the trade balance and the current account tend to move countercyclically to output. The savings-investment relationship has been the subject of intensive debate because of its alleged implication on the degree of international capital mobility. Martin Feldstein and Charles Horioka (1980) documented a strong correlation between savings and investment for a cross sectional sample of (Organisation for Economic Cooperation and Development) OECD countries as evidence against perfect capital mobility. Most economists, however, believe that the world is characterized by an

increasingly high degree of capital mobility. The significantly positive relationship between saving and investment has proved to be robust to virtually all alterations of the Feldstein-Horioka test and has been detected in time-series and cross-section data for many countries.

The paper is organized as follows: in section 2 we describe the statistical properties of the data; in section 3 we determine the savings-investment correlation; in section 4 we describe the determinants of the savings-investment correlations; section 5 measures the persistency of output shocks in Zambia while section 6 concludes.

2. Statistical Properties of the Data

Before determining whether these stylized facts apply to Zambia, and therefore other developing countries with similar characteristics, we first describe the statistical properties of the data we are using.

The data used in the analysis comprise annual data from 1964 to 1999. The data was obtained from the International Financial Statistics of the International Monetary Fund (IMF). The variables used in the analysis are gross domestic product (Y), private consumption *(C_p)*, government consumption *(C_G)*, total consumption *(C)*, investment (I), savings (S) and the trade balance *(TB)*. For all these variables, we carry out augmented Dickey Fuller tests to determine their order of integration. The results are presented in Table 1

Table 1: Results of Unit Root Tests

Variable	Y	C_P	C_G	C	I	S	TB
Order of Integration	1	2	1	2	1	1	0

The results presented in the table indicate that all the variables of interest are I (1) apart from the trade balance, which is I(0), private consumption which is I(2) and total consumption is also 1(2).

3. Savings - Investment Correlation

The starting point in determining whether the intertemporal model of the current account is applicable to Zambia is to estimate the correlation between savings and investment. An implication of the intertemporal model is that the correlation between savings and investment should be low. A high correlation between savings and investment is generally interpreted as evidence against perfect capital mobility. To assess the relation between savings and investment for a sample of industrialised countries, Feldstein and Horioka (1980) estimated the following equation:

$$\left(\frac{I}{Y}\right)_i = \alpha + \beta\left(\frac{S}{Y}\right)_i \qquad (1)$$

I refers to investment, *S* to savings and *Y* to GDP for country i. With perfect capital mobility, an increase in savings in country i would cause an increase in investment in all countries. The distribution of incremental capital among countries would vary positively with each country's capital stock and inversely with the country's marginal product schedule. In the extreme case in which the country is infinitesimally small relative to the world economy, the value of implied by perfect world capital mobility would be zero.

In contrast, estimates of close to one would indicate that most of the incremental savings in each country remain there. Since the excess of gross domestic investment over gross domestic savings is equal to the net inflow of foreign investment, a regression of the ratio of net foreign investment to GDP on the domestic savings ratio would have a coefficient of -1. Testing the hypothesis that equals one is therefore equivalent to testing the hypothesis that international capital flows do not depend on domestic savings rates. Alternatively, that the current account does not depend on the savings rate.

The estimated was 0.89 with a standard error of 0.07. According to Feldstein and Horioka, this was evidence that nearly all of the incremental savings remain in the country of origin. These results are quite incompatible with the assumption of complete arbitrage in a perfect world capital market. The result also implies that in the presence of positive productivity shocks, investment is constrained by the amount of domestic savings. In other words, investors have no access to international capital markets.

Feldestein and Horioka suggested the following explanations for the immobility of capital:

- For most investors, the uncertainties and risks associated with foreign investment are perceived as so great that investment is restricted to the domestic economy.
- There are incidences of restrictions on capital exports.
- There are also institutional rigidities that tend to keep a large segment of domestic savings at home. In the USA for instance, savings institutions (insurance companies, pension funds etc.) are required by law to invest in mortgages on local real estates.

We estimate a similar equation for Zambia. In comparing the predictions of the theory with the data, it is necessary that theoretical constructs measure the same economic variables as the data. Savings is measured as output less private and government consumption. The national income accounts measure of savings can differ markedly from true savings. The difference arises when foreigners own shares in domestic firms and firms finance expenditure from retained earnings. The discrepancy is wider when the share of foreign ownership is large.

The national income accounts measure of savings adopted in this paper is simple and it has been used extensively in most of the empirical literature on savings-investment correlation (Baxter and Crucini, 1993). Baxter and Crucini (1993) refer to this measure as "the basic saving" constructed as:

$$S = Y_t - C_t - G_t \qquad (2)$$

The variables used in the estimation are I(1) so that first differences of these variables in equation (1) are used in the regression. The estimation results are shown in the equation below:

$$\Delta\frac{I}{Y} = \underset{0.013}{0.007} - \underset{0.11}{0.09}\,\Delta\frac{S}{Y} \qquad (3)$$

$$R^2 = 0.024$$

The figures below the coefficients represent standard errors. We have seen that the specification of the Feldstein and Horioka equation can be reformulated to a regression of the excess of domestic investment over savings i.e. external inflows or the current account deficit on savings. The coefficient on savings using this reformulation is -1 so that the hypothesis of = 1 is equivalent to the hypothesis that -1 = 0. This means that the current account balance does not depend on savings. We estimate this reformulation of the original equation and get the following results:

$$\frac{TB}{Y} = \underset{0.024}{0.026} - \underset{0.2}{0.44}\,\Delta\frac{S}{Y} \qquad (4)$$

To ensure robustness of our results, we re-estimated equation (4) with the inclusion of one lag. The estimates with the inclusion of one lag are presented in Table 2 below.

TABLE 2: Regression of the trade balance on savings: Sample Period: 1964-1999

Variable	Coefficient	t-value
Constant	-0.0014	-0.109
$\Delta\frac{S}{Y}$	0.98	8.37
$\Delta\frac{S}{Y}_{-1}$	-0.06	0.56
$\Delta\frac{TB}{Y}_{-1}$	0.89	8.1

We observe from equation (3) that, in Zambia, the correlation between savings and investment is low. We also see from equation (4) and Table 2 that domestic savings are important in determining the current account in contrast with the Feldstein Horioka result, where the coefficient on savings was zero.

This result suggests that transitory income shocks that increase savings reduce the current account deficit. We should therefore expect the trade balance and the current account to be procyclical since savings have little effect on investment but a significant effect on the trade balance. In other words, domestic savings are transferred abroad in the form of debt repayment. This result is in contrast with that of Kraay and Ventura (2000) who predicted that for a debtor country such as Zambia, an increase in savings should increase the current account deficit.

The specification used by Feldstein and Horioka ignores the potential endogeneity of the savings ratio. This would clearly be inappropriate in a short run Keynesian framework. A random shock to investment or any other component of aggregate demand would also affect the savings ratio; the estimate of could not be interpreted as a measure of the effect on investment of exogenous changes in saving behaviour. In order to ensure robustness of our results, we test for the hypothesis that savings do not Granger cause investment.

The idea behind Granger causality is that the cause cannot come after the outcome has occurred. If variable Xt affects a variable *Zt,* the former should help make predictions of the latter variable. If *Zt* can be predicted more efficiently if the information in the Xt process is taken into account in addition to all the other information in the universe, then Xt is Granger causal for *Zt.* Instantaneous causality simply implies the existence of non-zero correlation between the variables. The interpretation of this term is problematic because it does not say

anything about the cause and effect relationship. The direction of causality cannot be derived from the Moving Average or VAR representation of the process but must be obtained from further knowledge on the relationship between the variables, which may exist in the form of economic theory. The results of Granger causality tests are presented in Table 3.

TABLE 3. Granger Causality Tests

LR Test of Block Granger Non-Causality in the VAR
Based on 28 observations from 1970 to 1997. Order of VAR = 2 List of variables included in the unrestricted VAR: DSGDP, DIGDP List of deterministic and/or exogenous variables: INPT Maximized value of log-likelihood = 62.5719 **********
List of variable(s) assumed to be "non-causal" under the null hypothesis: DSGDP Maximized value of log-likelihood = 62.0047 **********
LR test of block non-causality, CHSQ(2)= 1.1344[.567] **********
The above statistic is for testing the null hypothesis that the coefficients of the lagged values of: DSGDP in the block of equations explaining the variable(s): DIGDP are zero. The maximum order of the lag(s) is 2.
1.1.1 LR Test of Block Granger Non-Causality in the VAR
LR Test of Block Granger Non-Causality in the VAR **********
Based on 28 observations from 1970 to 1997. Order of V AR = 2 List of variables included in the unrestricted VAR: DSGDP DIGDP List of deterministic and/or exogenous variables: INPT Maximized value of log-likelihood = 62.5719 **********
List of variable(s) assumed to be "non-causal" under the null hypothesis: DIGDP Maximized value of log-likelihood = 62.1691 **********
I LR test of block non-causality, CHSQ (2)= .80557[.668] **********
The above statistic is for testing the null hypothesis that the coefficients of the lagged values of: DIGDP in the block of equations explaining the variable(s): DSGDP are zero. The maximum order of the lag(s) is 2.

The results presented above show the absence of Granger causality from savings to investment and vice versa (DSGDP and DIGDP refer to the first differences of the ratios of savings to GDP and investment to GDP respectively). The low correlation between investment and savings implies that domestic investment in Zambia is mainly foreign financed. International financial institutions such as the World Bank have recognized the important role of foreign financing. The World Bank Revised Minimum Standard Model (RMSM) focuses on the relationship among savings, external capital flows and investment with particular emphasis on the financing gap. The financing gap is the excess of financing requirements for the targeted growth in real income over domestic savings and the predicted capital inflows from the private sector.

External inflows or external transfers can be expressed as the excess of domestic Investment *(I)* over private and government savings using the following national income identity:

$$\Delta I - s(Y - T) - (T - G) = aY - X \qquad (5)$$

Y refers to GDP, s to the marginal propensity to save, T to lump sum tax, G to government expenditure and *a* to the marginal propensity to imports and X to exports. An alternative formulation of the national income identity is:

$$\Delta I = (s + a)Y + (1 - s)T - G - X \quad (6)$$

In more compact form, we have:

$$I = S + (M - X) \quad (7)$$

The above formulation expresses investment as a function of savings (S) and net imports *(*M -X), which provide a measure of external inflows. Since domestic savings play an insignificant role in determining investment in Zambia (from savings-investment correlation results), external financing must play an important role. The importance of external financing for domestic investment in Zambia is supported by an estimation of the correlation between investment and the trade balance. We estimate the following regression:

$$\Delta \frac{I}{GDP} = a_0 + b_0 \frac{TB}{GDP} + U_t \quad (8)$$

The investment to GDP ratio (I/GDP) is regressed on the trade balance to GDP ratio (TB/GDP*).* Since we know, from the national income identity, that foreign savings are transferred to the domestic economy through imports, we also run a regression of investment on imports:

$$\Delta \frac{I}{GDP} = a_0 + b_1 \Delta M + U_t \quad (9)$$

Where M refers to the log of imports. The results of the above regressions are tabulated in Table 4:

TABLE4: OLS Regression of Investment on the Trade Balance and Imports Independent Variable is $\Delta \frac{I}{GDP}$. Sample Period: 1964-1999

Dependent Variable	Coefficient	Standard Error	t-value
TB/ GDP	-0.22	0.09	-2.4
M	0.09	0.03	2.45

The results presented in Table 4 show that the trade balance has a negative correlation with investment, in other words external outflows *(X > M)* have a negative effect on investment while external inflows *(M > X)* have a positive effect. We also see in Table 4 that the import variable is statistically significant in the OLS regression of Investment on Imports. We can interpret this result in two ways, first that an increase in investment

prospects leads to a worsening of the current account through increased imports, particularly of capital and intermediate goods. This would be the interpretation suggested by the traditional models of the current account. The second interpretation simply supports our earlier proposition that domestic investment in Zambia is financed mainly by external resources rather than domestic savings. Since most developing countries in sub-Saharan Africa have limited access to private capital flows, foreign investment financing must come in the form of aid. The second interpretation is consistent with the "three gap model"[1] of development with a binding foreign exchange constraint. Domestic savings, which have an insignificant effect on investment, are a slack variable.

The low correlation between savings and investment in Zambia seems to suggest that the Feldstein Horioka (1980) result does not apply to small open developing countries like Zambia. Paradoxically, this relationship would be expected to be stronger in developing countries because they have less access to international capital markets compared to developed economies on which the original result was based.

Several investigators who have constructed such tests -(Dooley, Frankel, and Mathieson (1987)- included a number of developing countries in their cross section samples and investigated the effect of including such countries on their results. These authors concurred in finding that the inclusion of developing nations reduced the strength of the saving-investment correlation in their samples. This result was unexpected because these countries were perceived ex ante as less integrated with world capital markets than industrial countries.

Lensink and White (1998) estimated an econometric model from which they concluded that developing countries in Sub-Saharan Africa have little access to private capital flows despite the remarkable increase in private capital flows since 1987. Private capital flows are concentrated in a small number of countries, which are mostly reasonably affluent. Their econometric analysis of the determinants of private capital flows indicated that a combination of per capita GDP growth, financial development (as indicated by the broad money to GDP ratio) and the openness of a country are important factors in explaining whether a country would be able to attract enough private capital to become independent of aid. Their results are consistent with our findings, showing that Zambia is in the group of countries, which are aid-dependent. What this implies is that most of the foreign financing for investment in Zambia comes in the form of aid. International financial institutions like the World Bank and the IMF use the Harrod-Domar model to calculate the financing gap between the required investment and available resources. This financing gap is then filled up with foreign aid (Easterly 1999). The Harrod-Domar model died out of the academic literature long ago so that Easterly refers to it as the "ghost of the financing gap".

Recent theoretical work has cast doubt on the inference of imperfect capital mobility drawn from the observed saving and investment correlations. Obstfeld (1986) has shown that a deterministic dynamic-equilibrium model with perfect capital mobility produces positive correlations between savings and investment as a result of persistent productivity changes or population growth. Persistent productivity changes and population growth increase both investment and savings. Modigiliani (1970) showed that the traditional life cycle model of consumption implies that a country's saving will be higher where the rate of growth of private income is high and where the working age population is higher relative to the numbers of retirees and younger dependants. Baxter and Crucini (1993) showed that the observed positive correlation between savings and investment rates arises naturally within

[1]The three gap model of development deals with the interaction of the savings constraint, the foreign exchange constraint and the fiscal constraint in the determination of growth of a developing country.

a quantitatively restricted general equilibrium model with perfect mobility of financial and physical capital. Their simple model is consistent with the fact that savings-investment correlations are higher for larger countries but are still substantial for smaller countries. Their model is also consistent with the finding that current account deficits are associated with investment booms. Sachs (1981) presents empirical evidence that current account deficits are associated with investment booms implying that increases in investment are at least partially financed by capital inflows. Baxter and Crucini's paper are an attempt to reconcile Sach's evidence with high time series correlations between savings and investment.

In order to explain the low savings-investment correlation in Zambia and developing countries in general, it would be useful to analyse the determinants of the saving-investment correlation.

4. Determinants of Savings-Investment Correlations

We briefly discuss the central determinants of the savings-investment correlations using the basic measure of savings. Let $ó_x$ denote the standard deviation of the variable X, and let *(*X, *Y)* denote the correlation between X and *Y.* The correlation between saving and investment is the variance weighted average of the correlation between income and investment and the correlation between consumption and investment. For simplicity, we assume that government consumption is constant. The correlation is then given by

$$\rho(Y - C, I) = \frac{\sigma_y}{\sigma_{sb}} \rho(Y, I) - \frac{\sigma_C}{\sigma_{sb}} \rho(C, I) \qquad (10)$$

which simplifies to

$$\rho(S_B, I) = \rho(Y - C, I) = \frac{\sigma_y}{\sigma_{sb}} \left[\rho(Y, I) - \frac{\sigma_C}{\sigma_y} \rho(C, I) \right] \qquad (11)$$

Thus the correlation between basic saving and investment is based on

- The correlation between output and investment
- The correlation between consumption and investment and
- The volatility of consumption relative to income.

The equation presented above implies that for a given degree of correlation between consumption and investment, the less volatile consumption is relative to income, the higher is the savings-investment correlation.

In the model by Baxter and Crucini (1993) (Y, I*)* and (C, I*)* tend to be positive but the consumption investment correlation tends to be weaker than the investment output correlation because of international risk pooling. Further, the relative volatility of consumption, $ó_c/ó_y$ is less than one. The combination of these factors means that the correlation between basic saving and investment is expected to be positive and that the output investment correlation is the dominant term.

The correlation between investment and output in Zambia is low and the relative volatility of consumption to output is far greater than one (Pamu, 2002). These factors partly explain the low correlation between basic saving and investment in Zambia. These results differ from those obtained by Baxter and Crucini for OECD countries. In contrast with developed economies, consumption in developing countries is not smooth. An explanation from the theoretical model suggests that this could be a consequence of non-stationarity in the GDP series. With non-stationarity, consumption smoothing implies that an unexpected increase in output causes an even greater increase in consumption. When there are permanent shocks to output, which have a protracted impulse response, output adjusts to its permanent level gradually while consumption jumps to the new level directly. However, imperfections in domestic capital markets and limited access to international capital markets cause consumption to be closely linked to current income.

According to the model by Baxter and Crucini (1993), the savings-investment correlation is sensitive to the persistence of output shocks parameter . The basic savings-investment correlation decreases with decreases in essentially because the correlation between investment and output declines with decreases in . When shocks are less persistent, the incentive to move investment goods in response to a shock is decreased. Therefore, it is important that we measure the persistence of output shocks in Zambia in order to determine whether this factor could help explain the observed low income-investment correlation.

As discussed below, we find that the persistence of output shocks is not a factor and argue that the existence of an unsustainable debt has created a disincentive to investment in Zambia and other heavily indebted developing countries.

5. Persistency of Output Shocks

In measuring the persistence of output shocks in Zambia, we use the approach suggested by Campbell and Mankiw (1987). Campbell and Mankiw questioned the conventional view that fluctuations in output represent temporary deviations from trend. Their argument is that if fluctuations in output are dominated by temporary deviations from the natural rate of output growth, then an unexpected change in output today should not substantially change one's forecast of output in say five or ten years. In measuring the impact of innovations, therefore, we ask the question: suppose real GDP falls by 1 % lower than one would expect from its past history, how much should one change one's forecast of GDP five or ten years from now?

We model the change in real GDP as the stationary ARMA (p, q) process:

$$\phi(L)\Delta Y_t = \theta(L)\varepsilon_t \qquad (12)$$

where

$$\phi(L) = 1 - \phi_1 L - \phi_2 L^2 - ..\phi_P L^P \qquad (13)$$

and

$$\theta(L) = 1 + \theta_1 L + \theta_2 L^2 + ...\theta_q L^q \qquad (14)$$

Where *L* is the lag operator. The equation can be rearranged to arrive at the moving average representation (or impulse response function) for ÄY$_t$

$$\Delta Y_t = \phi(L)^{-1}\theta(L)\varepsilon_t \quad (15)$$

$$\Delta Y_t = A(L)\varepsilon_t \quad (16)$$

If the change in the log of GDP is stationary, $\sum_{i=0}^{\infty} A_i^2$ then is finite, implying that the limit of A_i as i approaches infinity is zero. In other words, stationarity of the differenced series implies that an innovation does not change one's forecast of the growth over a long horizon. We can derive the moving average of the level of Y_t by inverting the difference operator (1 -L);

$$Y_t = (1 - L)^{-1} A(L)\varepsilon_t \quad (17)$$

$$Y_t = \beta(L)\varepsilon_t \quad (18)$$

Where

$$\beta_i = \sum_{j=0}^{i} A_j \quad (19)$$

Of course, Y_t need not be stationary, and thus $\hat{a}_i$ need not approach zero as i approaches infinity. Instead, the limit of β_i is the infinite sum of the A_j coefficients, which can also be written as *A(1)*. The value of β_i is exactly what we wish to estimate, since it measures the response of $Yt_{+}i$ to an innovation at time t. One of the important features of unit root processes lies in the fact that the effect of shocks on the series (or random deviations from their trend) does not die out. In the case of random walk models, the long run impact of shocks is unity. For more general I (1) processes, this long run impact could be more or less than unity.

Estimates of the Campbell and Mankiw Persistence Measure based on Real GDP Data:

We use a measure of persistence using the ARMA modeling approach in Microfit. PCM refers to a measure of persistence based on the ARIMA method described above as suggested by Campbell and Mankiw (1987). We estimate an ARIMA (1,1,2) process. The estimation results are presented in Tables 5 and 6. The orders for the autoregression and moving average are selected using the Akaike Information Criteria and the Shwarz Bayesian Criteria.

TABLE 5:Model Parameter Estimates ? In Real GDP Sample Period: 1964-1999

	ϕ_1	ϕ_2	θ_1	θ_2
Parameter	0.77186	-	0.6137	0.14848
Standard Error	0.22190		1.7740	0.42758

TABLE 6: Model Impulse Responses in log Real GDP: Sample Period: 1964-1999

Function	Estimate	Standard Error	T-Ratio
PCM	0.99452	0.34725	2.8640

The PCM estimate is close to unity, which is the persistence measure for a pure random walk model. The t- statistic for this latter test is computed as

$$t_{Pcm} = \frac{(P_{cm} - 1)}{SE(P_{cm})} = \frac{0.99452 - 1.0}{0.34725} = -0.015781137 \qquad (20)$$

Based on the above measure suggested by Campbell and Mankiw, shocks to GDP in Zambia are persistent but not fully permanent. Since the persistence of output shocks does not provide an explanation for the low correlation between investment and output in Zambia, an alternative explanation is provided by the disincentive effects of external debt. This is discussed by Pamu (2002).

6. CONCLUSION

Results from econometric tests show that the savings-investment correlation in Zambia is low. This is contrary to the Feldstein Horioka result. Since we cannot interpret this as evidence in favour of perfect capital mobility, we conclude that investment in Zambia and other developing countries depends crucially on Aid inflows. The low correlation between savings and investment is caused by the low correlation between investment and output and the high volatility of consumption relative to output. An explanation for the low correlation between investment and output provided by the intertemporal models of the current account is the low persistence of output shocks. We have tested for the persistence of output shocks in Zambia and found them persistent. An alternative explanation for the low correlation between output and investment arises from the effects of the debt overhang. Debt can be a disincentive to investment. Even if shocks were persistent, the relevant margins considered for production and investment decisions are distorted by debt, which operates as a tax on investment.

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CHAPTER TWO

Reasons For Bank Failures In Zambia

Lameck Zimba

1. INTRODUCTION

When the Movement for Multi-party Democracy (MMD) Government came into power in 1991, it embarked on a number of economic reforms, which included financial sector liberalisation. The banking sector was opened up and this consequently saw a proliferation of new banks. A total of 12 banks were licensed and became operational between 1991 and 2001 (within ten years) compared to 14 banks, licensed between 1906 and 1991 (85-year period). This happened against a backdrop of a weak legal framework for the supervision and regulation of banks. Prior to 1994, Bank of Zambia (BoZ) supervisors depended on the Banking Act of 1970, which was too rudimentary and inadequate to address the inherent risks in the banks.

Between 1990 and 1995, the macro-economic environment was unstable and characterised by unpredictable macro-economic fundamentals such as high interest (Tbs 1993:124.03%, 1990:25.92%) and inflation rates (1993:188.08%, 1990:111.07%) and unstable foreign exchange rates. The unstable macro-economic environment coupled with a weak and inadequate banking regulatory framework contributed to the bank failures.

2. CAUSES OF BANK FAILURES

The reasons for bank failures in the country can be classified into five broad categories as described below:

(I) UNFAVORABLE MACRO-ECONOMIC ENVIRONMENT

As alluded to above, since the 1990s, the Zambian economy has been characterised by persistent high inflation rates, high lending interest rates and weak economic performance; at times recording negative economic growth. As a result of this, banks' lending was particularly risky as most businesses experienced difficulties in repaying their loans. Normally, banks lend money on the expectation that the borrower will generate sufficient cash flow to pay not only normal business expenses such as employee salaries but also service bank loans. The high and volatile interest rates raised the cost of credit and made loans which were serviceable at the initial point of contracting become unserviceable. It is worthwhile to note that banks give floating rate loans and advances or credit to their customers. When interest rates rise, loans automatically reprice at new and higher lending rates resulting in increased borrowers' debt service burdens. Meanwhile, the customers expected rate of return on their businesses is exceeded by the new higher cost of funds thereby squeezing the borrowers net interest margins and profitability.

To the extent that the company's scale of operations remain the same, the envisaged cash

inflows at the point of procuring finance will be insufficient to cover the cash outflows that have increased due to higher debt service obligations. This phenomenon tends to impair the borrower's debt service ability ultimately resulting in the borrower defaulting on his or her loan obligations. This situation tends to worsen if the bank or the banking sector is heavily exposed to one sector of the economy such as the mining or agricultural sector. Therefore, the adverse macroeconomic variables are finally transmitted onto the commercial bank's balance sheet in form of bad loans. Borrowers fail to pay, loans turn bad, banks cannot collect the money and finally the banks have to bear capital losses. Simultaneously, the bank's liquidity is adversely affected, as it is unable to collect its dues from borrowers to meet its various obligations. Eventually, capital losses and illiquidity force the banks into insolvency and inevitably into closures. In other words, when the prevailing economic conditions are not favourable, it is not only non-bank businesses that fail but banks too.

(ii) Weak Entry Requirements and Outdated Bank Legislation[1]

Prior to 1994, the minimum capital required to open a bank was fixed by legislation at K20 million. However, due to the persistent high inflation during this period, the minimum capital requirement was substantially eroded. With the erosion of the minimum capital requirement, many people found it attractive to invest in commercial banking business as they could easily raise the required amount of capital. Since the process of amending legislation is slow and lengthy, the minimum capital to register a bank could not be revised upward in spite of the recognized need to do so at the time. As a result, many banks that opened in the early 1990s were under-capitalized, in real terms, despite meeting the minimum legal start-up capital. As a consequence banks assumed higher risks than their capital could support and such banks eventually failed.

(iii) Poor Management and Corporate Governance

Poor management and weak corporate governance practices also contributed to the failure of banks. For example, although most of the entrepreneurs who set up banks during this period had the financial muscle, they nonetheless, did not have the requisite banking experience or risk management skills to operate a commercial bank. At this time, not even the propriety and fitness of the shareholders and management of banks was ascertained. The situation was compounded further, by lack of legislation to limit insider borrowing. This led to widespread borrowing by bank directors and their associate companies without due regard to strict lending procedures and policies.

The BoZ was unable to check imprudent bank lending due to lack of necessary legal backing. Consequently, many bank loans failed to perform and caused some banks to fail. Further, the existing law had a number of loopholes, which contributed to the failure of banks. For instance, the law was silent on the number of shares an individual could have in a bank as well as the number of boards an individual director could serve on. Under such an environment, it was extremely difficult to impose banking discipline and uphold proper corporate governance.

[1]Corporate Governance is a system by which companies are directed and controlled whereby shareholders who own the company appoint, or elect directors to monitor and protect their interest in the company, which retain independent auditors to validate the financial results produced by the company, that serve as a report card on the performance of the directors.

(IV) FLIGHT TO QUALITY

After the closure of Meridien Biao Bank Limited in 1995, three other local banks failed concurrently. One of the reasons that led to the closure of these small banks was the loss of depositor confidence in the financial system and a strong perception that local banks were unsafe. This led to a substantial flight to quality (safety) to the big, foreign banks, resulting in the loss of substantial deposits from the small local banks.

(V) REPUTATION RISK

Reputation risk arises from negative perceptions by the public about an institution which adversely affects its performance. It can arise from adverse press reports. For example, two of the failed banks were on account of adverse press reports that linked the concerned banks to money laundering[2]. The banks in question experienced depositor runs, which led to serious liquidity problems and ultimately, failure.

3 STRENGTHENING OF SUPERVISORY FRAMEWORK

To ensure stability in the Zambian financial system and bolster public confidence, the Government enacted the Banking and Financial Services Act (BFSA) in 1994. The enactment of the BFSA brought about significant changes to the supervision and regulation of the banking sector. This helped to seal many loopholes that existed before. The BFSA was amended in 2000 to among other things allow the BoZ to take prompt supervisory action on problem banks.Under this Act, the Bank of Zambia's supervisory functions have been expanded to include the supervision of non-bank financial institutions except insurance companies. In addition, the minimum capital required to set up a bank is now fixed by regulation and can be amended through a statutory instrument, in a much shorter period.

Other salient features of the BFSA Chapter 387 of the Laws of Zambia are as follows:

- **Large Loans Regulations**
  These regulations are aimed at reducing concentration risk. A loan is considered large if it exceeds 10 percent of a bank's regulatory capital[3]. Lending limit to any one customer has been set at 25 percent of regulatory capital.

- **Insider[4] Loans Regulations**
  Loans to insider borrowers are limited to 10 percent of a bank's regulatory capital to minimize connected parties from taking due advantage of the lending process.

[2]Money laundering may be described as any technique, which is designed to make dishonestly earned money appear to have been derived from honest and legitimate sources. The prime purpose is to avoid attention of law enforcement agencies and taxation.

[3]BoZ recognizes the following elements as regulatory capital: paid-up share capital plus share premium accounts, reserves of different types (i.e. general and statutory reserves), 40% revaluation reserve, eligible preferred shares, eligible subordinated term debt and eligible loan stock/capital.

[4]Insider means- (a) any officer, director or principal shareholder of a company, bank or financial institution; (b) any person who participates or has the authority to participate in major policy-making functions of a company, bank or financial institution whether employed or not by that institution; (c) a company where an insider of a bank or financial institution owns, directly or indirectly, alone or together with one or more other insiders, more than twenty per centum of the shares of the company or exercises control over the management of the company; (d) a company where the bank or financial institution owns more than ten per centum of the outstanding shares of the company or, in the opinion of the BoZ, is likely to exercise influence over the management of the company.

- **Classification and Provision of Loans Regulations (CPLR)**
  These regulations aim at making banks recognize the fair value of the loan portfolio by taking out a capital reserve on the portfolio that is not collectable. This ensures that the financial statements present a true and fair view of the financial position of the bank. Before these regulations came into effect, banks could not make prudent provisions on their loan portfolios thereby overstating their profitability. This led to higher capital payments in the form of dividends to shareholders than would have otherwise been the case.

  A loan is considered as non-performing when interest or principal payment or both are overdue for more than 90 days. Once an account has been classified as non-performing, interest is not allowed to accrue and a bank should reverse entries of interest that have been previously credited to the profit and loss account. It is for this reason that CPLR requires that banks put in place effective loan review and monitoring systems that would ensure that loans are classified at a minimum into four main categories, pass[5], substandard[6], doubtful[7] and loss[8].

- **Other Measures**
  In addition, BoZ introduced Fixed Assets Investments Regulations, Foreign Exchange Regulations and shareholding limitation to minimize excessive exposure in these areas. Further, early warning system for offsite monitoring of banks and risk forecast supervisions was introduced.

5. Conclusion

In Zambia, banks failed mainly as a result of under-capitalization, poor management, weak legal framework and the unstable macroeconomic environment. Despite measures taken by the BoZ and Government, for example, the enactment of the BFSA, bank closures are likely to continue if bank management does not manage their institutions prudently. It has been acknowledged worldwide that no amount of supervision can completely prevent the occurrence of a bank failure. Supervisory authorities can only minimize the risks of such an occurrence.

Finally, it must also be noted that the Bank of Zambia would take possession of a bank in financial difficulties to, primarily, protect depositors' interests. However, it is not possible to prevent some loss of depositors' funds from occurring in instances of insolvency.

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[5]A loan is classified in the "pass" category if it is considered current and performing in accordance with its contractual terms and expected to continue doing so. No provisioning is required on such a loan.

[6]A loan is classified "substandard" if it is in arrears as to the principal or interest for ninety days or more, but less than one hundred and twenty days. Such a loan should be inadequately protected by the current sound worth and paying capacity of the borrower or of the collateral pledged. A loan loss provision of 20% is made on all loans classified as substandard.

[7]A loan is classified "doubtful" if it is in arrears as to principal or interest for one hundred and twenty days or more but less than one hundred and eighty days and such a loan should have all the weaknesses inherent in a substandard loan. A loan loss provision of 50% of the outstanding loan is required to be made.

[8]A loan is classified loss if it is considered uncollectable and is in arrears as to principal or interest for one hundred and eighty days or more. A loan loss provision of 100% on such a loan is supposed to be made.

2. Bank of Zambia, Financial Market Department 1990 to 1993 interest rates and inflation rate;
3. Stephen R Schuster, Resident Advisor Bank of Uganda (US Treasury, Office of Technical Assistance 2002 FSI-ESAF Regional Workshop Paper on Corporate governance;
4. The Prohibition and Prevention of Money Laundering Bill, No. 14 of 2001, 76;
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CHAPTER THREE

Can Product Branding Help African Countries Break Into Export Markets?

Caleb M. Fundanga

1. INTRODUCTION

After many years of undertaking IMF/World Bank sponsored structural adjustment programmes, many African countries are starting to question whether implementation of the prescriptions of the development model provided by these institutions is the cure for all their problems.

In a caricature of the usual approach adopted under the popular development model promoted by the Bretton Woods Institutions, Peter Coy[1] has observed that if you asked an average economist how a country can lift itself out of poverty the answer will be: "educate your populace, squelch inflation, open your economy to free trade and investment, and then sit back and watch gross domestic product soar."

In their book "Plowing the Sea", Fairbanks and Lindsay argue that these macroeconomic prescriptions for growth are necessary but not sufficient. What is needed is a radical change at the *microeconomic level*. Company managers and government bureaucrats remain imprisoned by old fashioned thinking: over-reliance on cheap labour and abundant natural resources and ignorance of the demands of a sophisticated world market place.

Drawing on their vast experience in Latin America, Fairbanks and Lindsay have noted that Andean companies are trapped into being suppliers of inexpensive commodities because companies compete on price instead of quality and innovation. They pay slim wages and living standards remain low. Meanwhile they sell natural resources to countries that use them to make higher margin goods.

This paper draws on the important work by Fairbanks and Lindsay to argue that as long as African countries continue to rely on the theory of comparative advantage to determine their production, they will not benefit from macroeconomic reforms they might undertake. The paper also draws on the lessons from the workshop "Made in Mozambique" which was held in Maputo on 12th and 13th September, 2000 to put forth the argument that by refocusing on microeconomic fundamentals, African producers can improve the quality of their output and thus start to produce goods with higher margins. This process, as the Maputo workshop showed, can be achieved through product differentiation, branding and aggressive marketing. Product branding and differentiation confers upon producers, additional responsibilities to ensure that their products retain the qualities they had been proclaimed

[1]Peter Coy: "What's a Poor Country to do" a review of three books:

-M. Fairbanks and Stace Lindsay (1997) Plowing the Sea, Harvard Business Press
-Robert J. Barro (1997) Determinants of Economic Growth, MIT Press
-P. Kotler, Somkid Jatusripikat and Suvit Maesincee (1997) The Marketing of Nations, Free Press.

to possess and propels them to work even harder so that their competitors cannot catch up with them.

This is in stack contrast to widespread practice in many countries of Africa where raw material production is the predominant activity. Many of these countries are producing what can be termed as faceless products. The only way these products can compete against each other is through price. To offer a lower price than the competitor often requires lowering wages of the workers. It is not surprising that some of the most successful export performers in Africa are also associated with very low and repressive wage regimes. This is in contrast with developments in other parts of the world where export prosperity has been associated with rising individual worker incomes. The key to understanding this dilemma lies in knowing how comparative advantage works.

2. Theory Of Comparative Advantage And Consequences Of Overreliance On Basic Factors

The theory of comparative advantage was first promulgated by the Englishman David Ricardo[2] in his book "The Principles of Political Economy." Ricardo's thesis was that a country will have comparative advantage in the production of goods that require the use of its abundant factor(s) of production. A country specialising on the basis of comparative advantage will be able to sell its goods at lower prices and thus be able to achieve higher export volumes as its goods will outsell those of other countries. The factors of production identified in the Ricardian model were labour and natural resources. If a country has abundance of a mineral resource such as copper, for example, it will specialise in producing copper, which it will export to foreign lands. And if a country has abundance of cheap labour it will concentrate on producing labour intensive goods that it will export to foreign lands at good profit.

The keys to wealth creation in the Ricardian world were the existence of abundant raw materials such as oil, copper, gold, diamonds, coal, agricultural commodities namely; coffee, cocoa, tea, and the abundance of cheap labour and strategic location. Location became important because if a country had to export it was vital to have a developed infrastructure comprising roads, railways and ports. A less developed export infrastructure added to costs and therefore the final price of the commodity. In this form, the Ricardian world was composed mainly of countries exporting commodities. In the world of commodity exports, the key to success in export performance is price. As the quality of each product is assumed to be uniform (homogeneous product), the only differentiating factor that can attract buyers is the price. Coffee is coffee and the only factor that will determine whether a customer will buy Brazilian or Kenyan coffee is the price. The most important cost component in the prices of many of these commodities is labour. The higher the cost of labour in an economy, the higher will be the prices of commodities exported from that economy. Success in the world of commodity exports to a large extent will be determined by the ability of the exporting country to keep labour costs (wages) low.

Although the Ricardian theory has been challenged by neo-classical theorists in the now famous Cambridge capital controversy, Ricardo's influence in determining patterns of trade in all developing countries has remained unshaken over centuries. Countries perceive a

[2]David Ricardo (1817) - The Principles of Political Economy

gloomy economic future unless they have raw materials (natural resources) to exploit and so far much of international development effort is also centered on exploiting basic factors like raw materials.

In spite of its resilience in determining patterns of specialisation in developing countries, the Ricardian model is, unfortunately, associated with failure. Fairbanks and Lindsay have constructed a graph showing the relationship between natural resource exports and wealth as measured by Purchasing Power Parity Per Capita[3]. The relationship that emerges is one where countries with small percentages of natural resources in exports such as Switzerland, Germany and Japan have higher levels of per capita incomes compared to countries with high percentages of exports in natural resources such as most of the countries of Africa. Why is it that this seemingly popular approach to development has failed to deliver development to countries that have adopted it?

They have further noted that competition between resource rich countries creates pressure to keep costs low, which creates an incentive for producers to keep wages low. Increased volumes of exports in this situation can only be maintained through keeping wages low in real terms. The average worker in this situation will not reap the benefits of growth. There are numerous examples in Africa to support this observation. In recent years, we have even had cases where some commodity producers in Africa have managed to remain viable only through the use of slave labour. A more common feature is to have a repressive regime, which crushes any demands for salary/wage increments. This is in stark contrast to the path taken in the now developed countries where export prosperity went hand-in-hand with unprecedented increases in workers' incomes. There must be something fundamentally wrong in a strategy, which impoverishes workers. Fairbanks and Lindsay[4] have observed that there is a double loss if countries try to improve their export of natural resources at devalued exchange rates. These resources become depleted, and wealthy customers who can afford to buy these products at competitive prices are able to buy them at subsidised, artificially reduced rates. This situation can get to absurd levels when producers of natural resources try to out do each other through competitive devaluations. This process, which severely reduces the real earnings of the workers also severely curtails the foreign exchange to be earned by each of the competing countries.

From the foregoing, it is clear that using comparative advantage as an approach to development is not a winning formula and unless African countries can move away from it, they will not be able to benefit from globalisation. Fairbanks and Lindsay add that[5] "research has confirmed that those nations which export manufactured goods are wealthier than those which export simple materials; the market pays a premium for the knowledge imbedded in manufactured goods."

To a large extent it is surprising that countries in the developing world would still be dependent on commodity exports. In Africa, starting from the early 1960s when most countries gained their nationhood, the cry to avoid over-dependency on natural resources was a familiar one. It therefore begs an explanation as to why this strategy has persisted. Fairbanks and Lindsay[6] have provided two reasons for this:

a) Lack of awareness - few leaders realise how dangerous this type of competition is for their economies; and
b) Politics - the pain of continuing to use past behaviour is less than the pain required to fundamentally restructure the way firms in developing countries compete.

[3]Fairbanks and Lindsay (1997) - Plowing the Sea - Harvard Business School Press - P22
[4]Fairbanks and Lindsay - ibid - P23
[5]Fairbanks and Lindsay - ibid - P225
[6]Fairbanks and Lindsay - ibid - P23

To these must also be added the roles that development partners like the World Bank have played and continue to play. All development partners continue to encourage developing countries to specialise along the Ricardian model - new resources are being provided to increase the production of raw materials and minerals for export. Macro-economic adjustment programmes advanced by the Bretton Woods institutions typically push for devaluation as a way of boosting exports while wage restraint is always a key part of the package. Are these erstwhile institutions not aware that this approach is not sustainable?

3. Overcoming The Commodity Trap

James Anderson and Gregory Carpenter[7] have characterised commodity markets as ones where customers perceive few differences amongst suppliers' offerings and hence make purchase decisions solely on the basis of price. This, they add, puts severe pressure on suppliers to cut prices, which harms profits. The typical commodity market, therefore, consists of a homogeneous product. In a typical cocoa, tea or coffee market for example, the base product will be the same. Variations in the quality will be reflected through the grading of the product with each finer grade commanding a slight premium over the lower grade. In such a market structure, it would be proper to describe each such commodity as a faceless product i.e. each commodity does not have a distinct identity other than the generic name by which that commodity is known. This implies that the Brazilian coffee is no different from Kenyan coffee. For Brazilian coffee growers to sell more of their produce they will have to offer it at a price slightly lower than that of other coffees. If there is a slump in demand, it would affect all producers equally. "A supplier's smartest response to this situation", according to Anderson and Carpenter[8] "is to differentiate its offerings in a way that customers will value."

According to Michael Porter[9], a firm differentiates itself when it provides something unique that is valuable to buyers beyond simply offering a low price. Differentiation allows a firm to command a premium price, to sell more of its product at a given price, or to gain equivalent benefits such as greater buyer loyalty during cyclical or seasonal down turns. Fairbanks and Lindsay[10] add that differentiated strategies can be based on brand name, design, technology, service, features or other dimensions required by the customer. They add that the key to building a differentiated strategy is to invest heavily in understanding what product attributes a customer will value and that differentiation is in the eyes of the purchaser and not the manufacturer.

In a typical differentiated market, you can have a product selling under different identities or brands. Coffee, for example, will sell under different names and variations such as instant and granulated. Each brand name will convey different attributes and on the basis of the differences perceived - some real and some imaginary - a basis for differential pricing is created. In such a differentiated market structure, it may well be possible for the price of one brand of coffee to go up while prices of other brands go down. This differentiation makes it possible for producers to target certain segments of the market with products that reflect the characteristics of each segment. For example, in the car market,

[7]Anderson J. and Carpenter G. " Escaping the Commodity Trap in Business Markets" From: Financial Times supplement: Mastering Markets
[8]Anderson J. and Carpenter G. - op cit
[9]Porter M. (1980) - Competitive Strategy - New York Free Press
[10]Fairbanks and Lindsay - op cit

differentiations make it possible for manufacturers to produce expensive cars for the well-to-do and less expensive cars for the low income customers.

Product differentiation is key to capitalist market development. It is what drives firms to triumph over others but most importantly it helps to convey information about a product to the consumer. It helps consumers make informed choices about the products they want to consume. A few years ago, the television channel CNN carried an advertisement in which was shown two pictures of a supermarket. In the first picture, shop shelves were shown filled with boxes, tins and bottles of various consumer products but only with their generic names such as coffee, tea, cooking oil, sugar, etc. In the second picture, the same supermarket shelves were shown filled with consumer products but bearing their brand names. The question underlying the two pictures was: "what could shopping have been without advertising?"

A move towards market differentiation intensifies competition between industries and within sectors. This is good for the country as a whole because it results in greater innovation and creativity. Firms must compete in all aspects of the economy. They must provide good quality products, products must be presentable (well packaged), there must be after sales service, etc. In this environment of fierce competition, a firm gaining advantage over others will tend to guard its success by ensuring that it continues to deliver on quality and service and if possible improve upon them. This is the essence of competitive advantage.

If market differentiation can make this huge difference then there must surely be a big deficit with much of the current effort in many of the poor countries attempting to sell undifferentiated products. Product branding, as noted above, is one way by which product differentiation is achieved. In the next section we examine product branding.

4. BRANDS

A brand can be defined as a mark or logo used for identification of a good. Alternatively, a brand can be defined as a class of goods identified by name or logo as the product of a single firm or manufacturer.

According to Encyclopedia Britannica,[11] the original usage of branding started with livestock. In this usage, a brand is a distinct design made by hot or super-chilled metal, chemical, tattoo or paint for purposes of identification of livestock or goods. Brands are applied to animals principally to establish ownership but they are also used widely to keep records of pure bred lines and for identification in disease control and age differentiation. Professional animal breeders sometimes adopt brands as trademarks to indicate high standards of quality. The modern definition of brand has not lost much of this definition. Today branding has become a high science and is commonly associated with the most successful multinational corporations. Brand names like Coca-Cola, Microsoft, Mercedes Benz, Toyota, Intel, Nike, etc. are household names. To many consumers, just the mention of a name like Mercedes Benz immediately conveys notions about quality and reliability. The big multinational corporations spend a lot of money to build and maintain their brand names. Brands have become big business. Richard Tomkins[12]in an article in the Financial Times has observed that belief in consumer brands has replaced religious faith as the thing that gives purpose to peoples' lives. In recognition of the importance of brands, the advertising agency, Young and Rubican started compiling an annual table of global

[11] Encyclopedia Britannica (1972) P102
[12] Richard Tomkins - "Brands are the new religion, says Ad agency", Financial Times, Thursday, March 1, 2001

consumer brands. Young and Rubican says that "today's brand builders could be compared to the missionaries who spread Christianity and Islam around the world. It was the passion with which they communicated those beliefs that led to people responding in their missions because the religions were based on powerful ideas that gave meaning and purpose to life."

Young and Rubican add that in the same way, the most successful brands today were those that stood not just for quality and reliability, but for a set of beliefs that they refuse to compromise. The Church of England is said to have welcomed these findings of Young and Rubican, especially "if they meant that companies would come under more pressure to incorporate social responsibility into their brand values." The Church of England also added that "Christian faith had one of the oldest and most recognised branding devices in the world, the **Cross**."

In another article Richard Tomkins[13] has termed branding as "The Last Temptation of Capitalism." He has observed that, "if one product is as good as another, people will buy whichever is cheaper. But brands offer a way out of the price squeeze. If people can be persuaded that they are getting a way of life as well as a product, they may well be prepared to pay more."

Tomkins notes that the firm Young and Rubican has constructed a ranking of global brands. The Young and Rubican league table measures brand strength defined as a combination of growth potential and favourable perception. The agency questioned 45,444 adults and teens in 19 countries.

The top ten brands were Coca Cola, Walt Disney, Nike, BMW, Porsche, Mercedes Benz, Adidas, Rolls Royce, Calvin Klein and Rolex. Tomkins observes that Nike is not just a sports shoe: it is a "just do it" attitude and the idea of personal achievement. Microsoft, meanwhile, offers the sky's the limit idea of "where do you want to go today" and Virgin is Robin Hood against the Sheriff of Nottingham.

Not to be outdone, the business magazine, Business-week in conjunction with Inter-brand, the pioneer brand consultancy unit of Omnicom Group Inc. published its first ranking of the best global brands in its edition of 6th August 2001, the editorial of which had this to say:

> **" A brand is more than mere name recognition. A good brand can be decisive in differentiating products and services from an ever-larger array of competitors. A great brand is a promise, a compact with a customer about quality, reliability, innovation and even community."**

The Global top ten brands according to the Business week Inter-brand survey were; Coca Cola, Microsoft, IBM, General Electric, Nokia, Intel, Disney, Ford, Macdonald's and AT&T in that order.

The increasing importance of branding has not been lost on the consulting companies. McKinsey, the US management consultant, is reported to have acquired a Chicago based brand consultant called Envision, much to the annoyance of advertising groups who see themselves as best qualified to advise on branding strategy[14]. Many management consulting firms are likely to follow McKinsey soon. Perhaps nobody has taken the concept of equating brands to religion to the highest level than Reverend James S. Massie Jr. an Episcopal priest in the USA. Reverend Massie Jr. is reported to have carried out a mass outdoor wedding

[13] Richard Tomkins - "The Last Temptation of Capitalism", Financial Times, March 3/4, 2001
[14] Richard Tomkins - "McKinsey moves deeper into branding", Financial Times

ceremony, between man and car in Pennsylvania's Pocomo mountains[15]. At the ceremony the Reverend was uniting 250 love struck people to their new Mazda Miatas, a Japanese sports car that goes for the price of US $21,000. This fanatical love for particular brands is common for other products for example the Harley Davidson motorcycle owners club, Apple computer, etc, a feature that is often referred to as the fanatical fringe of brands.

A brand can be for a single product or for multi-products. A brand can also be for an institution. To position itself strongly in the market, an institution needs to project its image by highlighting those areas of its expertise and competence. The crafting of vision statements by institutions, for example, is all part of the process of creating a brand. The vision statement in a few words puts sharply the institutions' main areas of strength. The ultimate brand is undoubtedly the nation state itself. Countries try to sell themselves either to attract foreign investors or tourists by projecting positive things about themselves. From the point of view of attracting foreign investors, a sound macroeconomic policy environment is perhaps the best selling point, especially for developing countries where policy is often a problem.

In more developed countries where policy issues have already been addressed, issues like the quality of life such as sunny weather or good quality food or wine could be important differentiating points. To attract tourists, a country may perhaps emphasise its rich historical past, traditions or its captivating scenery. The branding of countries is often a complex exercise. In recent times, one leader who has been acknowledged to have worked hard to create a new brand for his country is Tony Blair of England[16].

First, to get to power, Tony Blair had to re-brand his political party the Labour Party into "New Labour." The New Labour Party was supposed to be investor friendly and not associated with the old Labour Party characterised by Trade Union antagonism towards investors. The re-branding of Britain under the slogan: "Cool Britannia" started with activities such as new mission statements for certain ministries, statements of moral goals and included even Chancellor of the Exchequer replacing his battered budget box with a new one. An inquiry into the National Identity was started by a think tank called Demos. In its report Demos suggest that Britain's new brand should be based on:

(i) Britain is a global hub, a place where goods, messages and ideas are exchanged, a bridge between Europe and America;
(ii) The international importance of Heathrow airport and the city of London;
(iii) It is a creative island with an outstanding record of originality from scientific discovery to pop music;
(iv) It is a hybrid nation whose ethnic and cultural diversity is a source of strength;
(v) It is a silent revolution leading the world in managing non-violent change, from privatisation and de-industrialisation to (coming shortly) constitutional reform; and
(vi) It is a nation of buccaneering entrepreneurs and it is a nation of fair play.

Demos argues that redefining Britain's national brand will boost the economy. It claims that, already, business and cities have benefited from sharper branding.

The opposite of what Tony Blair has been trying to do in Britain is the brand destruction that has characterised Zimbabwe in recent times. Originally, one of the stronger economies in Sub-Saharan Africa, Zimbabwe is today embroiled in a bitter land struggle, which has

[15] Melanie Wells - "Cult Brands", In Forbes Global, April 16, 2001
[16] "A new brand for Britain", in The Economist, Friday, 16 March, 2001

Severely destroyed its once very strong agricultural base. In the process, Zimbabwe has become ineligible to a lot of donor resources thus aggravating its precarious financial situation. Its once strong tourism sector cannot attract visitors due to the daily reports of violence. The BBC[17] reports that recent troubles in Zimbabwe have seen the number of visitors plunge from an estimated 1.4 million visitors in 1999 to a quarter of that in 2000. The story of Zimbabwe's brand destruction is common in much of Sub-Saharan Africa.Côte d'Ivoire, once regarded as the star economy in political-strife torn West Africa had its brand destroyed in the coup d'état of December, 1999. It will take many years to rebuild the brand.

5. Brands And Economic Development

The success of transnational corporations, who are the biggest users of brands, in capturing global markets probably says a lot about the power of brands to deliver. As a result, much of the opposition to branding has centered not on their inability to capture the markets but on their mischiefs[18], from threatening our health and destroying the environment to corrupting children. Brands have been accused of seducing people to look alike, being spiritually empty and undermining moral values.

This bad picture of branding has been popularised by a number of books.[19] By far the most influential anti-branding personality has been Naomi Klein, whose book has been translated into many languages. Naomi Klein's argument has been summarised as follows[20]:

> **"In the new global economy, brands represent a huge portion of the value of a company and increasingly its biggest source of profits. So companies are switching from producing products to marketing aspirations, images and lifestyles, shedding physical assets by shifting production from their own factories in the first world to other people's in the third."**

Naomi Klein adds that:

> **"These image mongers offer a 'Barbie world for adults', integrating their brands so fully into our lives that they cocoon us into a 'brandscape'. No space is untouched: schools, sports stars and even youth identity are all being co-opted by brands, directly and often violently."**

Brands have also been accused of creating monopoly markets. As advertising for particular brands increases, it will reach a certain high level where new entrants into that particular product market will find it impossible to have an impression on the consumers.
Are all these concerns of the anti-branding lobby justified? Critics of the lobby argue that Klein and her group overstate the power of brands. They are not as powerful as their opponents allege and the public is not as easily manipulated.

[17] African tourism hit by terror fears: BBC News, Wednesday, 28th November, 2001
[18] See "Who is wearing the trousers" - Special report on Brands in The Economist, September, 8th, 2001
[19] Prominent anti-branding literature includes:-
(i) Naomi Klein (2000) No space, no choice, no jobs, no logo: Taking aim at the Brand Bullies Eric Schlosser (2001) Fast Food Nation: The dark side of the All-American meal
(i) Robert Frank (1999) Luxury Fever: Why money fails to satisfy in an era of excess
(ii) Bové José and Dufour François (2001) The World is not for sale: Farmers against junk food
(iii)Vance Packard (1957) The hidden persuaders
[20] The Economist, September 8th, 2001 - P27

No one brand, for example, has remained at the top of the league table of brands for a long time suggesting that consumers ultimately are the decision makers. Consumers increasingly are not remaining loyal to one brand. Therefore, most of the big brand names have to struggle to remain in business.

The relevance of branding to the development process is unfortunately lost in the current anti-branding struggle going on in the countries that have already benefited enormously from branding. By concentrating mainly on the branding activities of the multinational companies, the subject of branding is made to appear remote to the needs of small producers in third world countries. Should this be the case?

Small scale producers, such as peasant farmers, can also benefit enormously from product branding just like the ordinary consumer who buys their produce. This is easily seen from an example in Côte d'Ivoire where a number of farmers produce pineapples of varying quality. Some of these are processed into juice and chunks while the majority of the output is sold as whole fruit in markets. In these markets it is impossible to know which pineapple is sweeter than the other because all the pineapple fruits look alike.

There is apparently one region of the country that produces very good pineapples. The only people who are able to know definitively when to buy these good pineapples are those who personally know vendors of pineapples from this region. As a result of a lack of a mark (brand) to distinguish the good pineapple from the bad ones, most people are not willing to gamble by buying pineapple fruit whose quality they cannot guarantee. If only there was a mark to distinguish the good pineapples, it is quite clear that they would outsell the bad ones. The producers of these pineapples would benefit a lot, financially, from this process and would in time increase their output. It is also clear that consumers would be willing to pay a little more for this high quality fruit. Regarding the overall pineapple market, this development would most likely force the producers of poor quality pineapples to start producing the good type or be forced out of business altogether. Branding can also work in an opposite way. Consumers can be assisted greatly if they are able to pick out a bad product and thus avoid wasting their money. In an undifferentiated market, even producers of bad quality commodities may gamble to take their products to the market since the buyers are unlikely to know the quality until after they had made the purchase. This can be characterised as the consumer information role of branding.

There are many examples where branding can be shown to have a lot of relevance to small scale producers, especially in their quest for access to the better organised upscale markets, which can offer them better prices for their produce. For small scale producers, it may indeed be prohibitive to develop an individual brand because the small size of output would not justify the high cost of developing a brand. These producers can however come together and develop a brand under which they can sell their produce. The organisation required to get small producers to come together and develop a common logo and packaging, guarantee uniformity in their produce and deliver the goods to wholesalers or retailers is complex but feasible if there is a determination to have a business approach to doing things. In fact, this has been the approach adopted by most small farmers in developed countries. The case of the vegetable farmers on the Island (Insel) of Rechenau in Germany illustrates this.

Insel Rechenau lies on the river Rhine just outside the town of Konstanz in the Southern State of Baden Wüttemberg. The island is famous for its vegetables, which sell under the name Rechenauer Gemuße (Rechenauer vegetables). Almost every resident of this small island community grows vegetables; tomatoes, peas, spring onions, Brussels sprouts, etc. in greenhouses throughout the year. Greenhouses are important in this community and over the years greenhouse technology has advanced so much so that many of them are fully automated. This is necessary to guarantee good quality vegetables, especially in winter. A local cooperative union ensures that the produce is collected from each homestead, stored

and eventually sold to supermarkets. The role of the cooperative is also to ensure that all produce is packaged properly, in well labeled containers and boxes. In addition, the cooperative ensures that the quality of each producer selling under the brand conforms to what has come to be universally accepted as the Rechenau high quality vegetable. No one single small scale producer on the island could have been able to develop such a brand name and yet collectively their vegetable brand is a household name in the whole of the state of Baden Wüttemberg. Although the land holding of each producer is small, the value of their produce on these small holdings is very high thus affording the residents individual incomes far higher than industrial wages in the neighbouring town of Konstanz.

Small producers can benefit from simple differentiation that takes place when each producer attaches an identification mark to their product. This apparently simple process can set in motion fierce competition as the various owners of different identification marks set out to convince consumers that their product is the best. This process will benefit the consumer greatly. As the process gets more complex there be will need for better ways of handling the activities. In the case of the vegetable growers of Rechenau, we have seen that their cooperative society has provided the technical muscle required to run the brand. In the agricultural sector, it has increasingly come to be accepted that the Agribusiness Development Center provides the best opportunity for improving the competitive advantage of small producers[21].

Lamb and Brower[22] point out that Agribusiness Development Center is a generic name that covers different types of entities created to promote the growth and prosperity of the agricultural business sector. While Agribusiness Development Centers (ADCs) may be privately or publicly owned, it is generally accepted that a public/private sector partnership seems to be the most viable format. This permits the private sector to be the driving force for the activities while allowing the public sector to assist in mobilising resources to meet those development costs that cannot be met through pricing of services, particularly in the initial phase of each center. Amongst the many things that ADCs can do, Lamb and Brower have listed the following:[23]

- Expansion and diversification of economic activity in the Agribusiness arena;
- Stimulating and supporting technology development, adaptation and transfer;
- Adding value to existing crops and products;
- Fostering new crop and product development;
- Increasing market share in existing markets and penetrating new markets;
- Enhancing productivity and competitiveness at the enterprise and industry level;
- Removing or alleviating infrastructural, technical or marketing constraints;
- Helping to increase the volume and value of domestic and export sales;
- Improving the profitability of agro enterprises;
- Creating direct and indirect employment; and
- Adding to the income of owners, workers and suppliers.

ADCs will usually comprise a small number of experts that will provide technical advice to a group of farmers on how to improve their businesses. The advice can cover a wide range of issues or will be focused on a few issues. For example, if the focus was to be on branding of a product produced by a certain group of farmers, the ADC would help to define the name

[21] John E. Lamb and Bruce Brower, (2000) - Agribusiness Development Centers, Chemonics International Inc.
[22] John E. Lamb and Bruce Brower, Ibid.
[23] John E. Lamb and Bruce Brower, Ibid.

of the brand, packaging and marketing of the product. This collective approach through ADCs helps to surmount the barriers that individual farmers are likely to face in launching a brand of their own.

By far the most successful approach to ADCs has been by Fondación Chile (Chile Foundation). This is not a one ADC initiative but an arrangement where the foundation has initiated a number of business development activities in agriculture, fisheries and forestry. The Chile Foundation has even been able to establish demonstration factories to process some of the agricultural produce as a way of adding value. Once firmly established, these factories have been sold off to the private sector. The sale of one such project - the Salmon processing project - raised US $21 million for the foundation. The success of Chile in the export of raw agricultural products as well as processed goods can be explained mainly by the work of Fondación Chile. The Foundation has been lucky in that it received an initial endowment of US $25 million, reportedly from ITT company which was matched by an equivalent sum from the government. This solid financial base has enabled Fondación Chile to undertake a lot of initiatives, which similar organisations in other countries have not been able to do. Funding has also given the Foundation a large measure of independence and freed it from the pressures of donors and government. In recent years, Fondación Chile has been able to offer assistance to other countries.

A business approach, which has worked well to promote brands globally seems to be franchising. In a recent article Lai Jinchang[24] has pointed out the importance of franchising in the development process. Franchising which he defines as a form of business organisation whereby the franchisee pays the franchisor for the right to operate the latter's business format and its name, has expanded rapidly in all the developed western economies since the 1950s. In U.S.A., he estimates that about 40% of all retail sales are now done through franchise outlets. The good thing about franchising is that apart from the product being sold it also involves the transfer of technology, management methods as well as supply and marketing systems. This makes it very ideal for the promotion of small and medium enterprises. For our purpose, however, it is important to note that this popular and rapidly expanding business method is based on branding. All franchise businesses have a branded product at the center of their arrangements. Typically, franchising is very underdeveloped in Africa. Jinchang has identified South Africa and Egypt as the only African countries with sizeable franchising activity. South African franchise businesses have recently started to expand to neighbouring countries in Africa. While the most common franchises are in the product sector, especially fast foods such as Macdonalds, Kentucky fried chicken, etc. franchising embraces many sectors and it has been applied to the job market, education, health care, car rentals, etc. Because of the low level of development of branding in Africa, almost all the products being sold through franchises in Africa are foreign brands.

6. Made In Mozambique Workshop

The "Made in Mozambique Workshop" held in Maputo on 12th and 13th September, 2000 was organised by Technoserve Inc. Mozambique, an American business promotion organisation registered in Mozambique. The parent company of Technoserve in USA boasts the Board Membership of Stace Lindsay, co-author of the book "Plowing the Sea", quoted earlier in this paper. Stace Lindsay gave a key note address at the beginning of the workshop on the theme "competitive advantages and clusters."

[24] Jinchang L. (2001) - "The Need for Franchising Development in Africa" in ADB Bulletin Vol. IV No. 4

The workshop was also addressed by Mr. Lucas Ferraira, Chairman, Young and Rubican South Africa, Dr Peter Jaeger and Mr. Graham Dixie of Accord Associates, UK, Mr. Patricio Galeb, former Vice President for Agro-industry, Fondación Chile, Mr. Joham Louw, Director of Freshmarks, a subsidiary of South Africa's giant Shoprite supermarket and businessmen working in the agricultural sector of Mozambique.

The purpose of the workshop was to review the achievements of Technoserve Inc. in the field of branding two Mozambican agricultural products. With the help of Young and Rubican South Africa, a subsidiary of a well known global marketing company of the same name, Technoserve had set about the task of establishing brand names for Mozambican grown bananas and pulses (peas). The task of determining the names for the two products as well as the appropriate packaging for each product was given to Young and Rubican, South Africa. In his presentation, Mr. Lucas Ferraira, Chairman of Young and Rubican, South Africa explained what factors they took into account in selecting the name Sweet Mozambique for the banana brand and Nakala Gold for the peas brand.The two presentations by the experts from Accord Associates, UK concentrated on very detailed analyses of the global markets for bananas and peas to illustrate what opportunities and obstacles the Mozambican farmers were likely to face if they were to seek to sale in the global market. Other presentations from Mozambican farmers highlighted the practical difficulties the farmers went through in order to implement their branding strategy including what they were doing to improve the quality of their produce. In the case of bananas, the workshop was informed of extension programmes aimed at eliminating banana skin diseases and therefore the prolongation of the shelf life of bananas. Many of the losses incurred by traditional banana growers arise from shortened shelf life due to disease. In the case of peas, the workshop was told of the problem of smuggling to Malawi where a processing plant currently exists. There are plans to establish a processing plant in Mozambique in future. This will add value to the local produce.

Mr. Galeb from Fondación Chile gave a detailed account of how his foundation had transformed Chilean agriculture. Chile today is a major exporter of both fresh and processed agricultural produce. He also explained the Foundation's work in African countries such as Morocco where the Foundation's assistance has already resulted in significant increases in agricultural exports such as vegetables and fruits.

The session of Mr. Johan Louw, Director of Freshmarks, was the most instructive because it provided a conclusion to what happens once a successful branding strategy has been implemented. Here, perhaps, it is necessary to give some background information on the Shoprite supermarket chain.

Shoprite is a South African supermarket chain with headquarters in Cape Town. It is by far the largest supermarket chain in Africa with over 1000 shops. Initially domiciled in South Africa, the company has experienced phenomenal expansion in recent years and is now present in almost all the countries of Southern Africa and is expanding into East Africa. The company has benefited from recent privatisation of the state trading sector. In countries like Zambia, Shoprite has taken over a huge state retail network, which extends well into all the rural provinces. In almost all the countries of the region where Shoprite has extended its operations, there have been complaints that it does not want to sell local produce. Shoprite has been accused of importing produce like tomatoes, onions, eggs, chickens, etc. all the way from South Africa when similar produce was available locally.

Mr. Louw explained the dilemma that a conglomerate like theirs faces when they enter into a new market. As an established supermarket chain, they have built a reputation for quality. They have to maintain this reputation if they are to survive the stiff competition in the groceries business. This requires provision of all food items of proven quality and

consistent supplies. In all the countries where the company had established, it initially requested for suppliers to tender for supply of various food products. Its experience was that whereas there is intially a rush by local suppliers, many of these fail to fulfill their contractual obligations both in terms of delivered quantities as well as quality. This was obviously not good for Shoprite business. In fact, the company risked being accused of supplying poor quality goods to neighbouring countries i.e. dumping poor quality goods on South African neighbours. It was this threat which forced Shoprite to import from its home base. Transporting fresh vegetables across Africa is not good business so Shoprite had to address the problem. This led to the establishment of Freshmarks. Freshmarks procures fresh foods for Shoprite supermarkets. It enters into supply contracts with local farmers and inspects their capacity to execute contracts they enter into. Freshmarks also provides advice on how the farmers can improve the quality of their produce. In the case of Zambia, Freshmarks has contracted Zambeef, a local beef supplier, to run all the butcheries in its Zambian supermarkets. This is a big break for the local meat suppliers. Similar deals in other countries were improving the local content of Shoprite supermarkets.

In the case of Mozambique, Mr. Louw informed the workshop that on 14th September, 2000 a supply contract was to be signed between the Mozambique Banana Growers Association and Freshmarks. This would make it possible, for the first time, to have Sweet Mozambique Bananas sold in the two Shoprite supermarkets existing in Mozambique at that time. This, in a way, was the crowning of a successful effort to commercialise a product, which for decades was only good for selling along streets.

The "Sweet Mozambique" experience has even greater implications. If the Mozambican banana proves to be good there is no reason why Shoprite cannot introduce it in supermarkets in other countries of the region. This immediately opens opportunities to over 1000 large supermarkets for Mozambican banana growers. This could represent a big export potential for small Mozambican growers. There are numerous products produced by small farmers that could easily find a large regional market through participation in established retail outlets like Shoprite. The deficit at the moment is that policy has not focused on this important linkage and neither is modern retail trade seen as a development catalyst worth promoting. When African governments formulate their incentives to investors, investments in retail trade are not targets of these incentives. If anything, most governments regard retailers as looters who must be kept out at all costs. This was the point Shoprite and their parent company Pepkor Group were putting across during their phase of expansion in the Southern African region during the mid 1990s[25]. In the correspondence, the company explained that a successful involvement of their company in any African economy can lead to benefits such as inflow of foreign investment, income creation, employment creation, exports, transfer of skills, transfer of modern business technology, enhancement of services to rural areas, access to international business networks, stimulation of auxiliary industries, etc.

With proper branding strategies, it is possible for products from small producers to find their way into well established retail chains within the region. Well established regional retail networks can therefore serve as vehicles for the expansion of African intra-regional trade. The financial muscle of the big retail chains like Shoprite coupled with the technology available to them can greatly assist the small producers break into even higher markets overseas. Big retail chains can, for example, repackage products or even sell them under their special brand names. But before this can happen, the retail trade sector itself

[25] Pepkor Memorandum sent to the author by one of the company's Executive Directors.

will need to be reorganised. While most African countries had some form of organised retail trade in the period immediately after independence, many of these businesses have over the years collapsed. For those countries that had chosen the socialist path of development, most of the promising private retail businesses were taken over by the burgeoning state sector and in time were run down. In other countries, the drastic decline in the economies simply made it unviable to run organised retail businesses. Instead, much of Africa saw the emergence of street vendors. The black market economy has over time become so strong that almost all household requiremens can be bought from the streets. In some African cities motorists have to fight for road space with vendors at major road junctions. Because this business is untaxed, and has few overheads, it has easily outpaced the legal retail business. This situation needs to be reversed. In some countries recent macroeconomic reforms, together with concerted efforts to allow the rule of law are helping to reverse the situation. Shoprite's expansion into the Southern African region, for example, would not have been possible without the liberal foreign exchange regimes recently introduced in the countries of the region. There is, however, need to strengthen this process especially through specific measures that are targeted at retail trade. For example, the big retail chains like Shoprite could be offered tax incentives for marketing the produce of small producers throughout their network by the country of origin of the product. They could also be given incentives for helping in the packaging of the products of small producers.

7. The Role Of Development Agencies

So far, many of the institutions that promote economic development in backward countries have failed to focus on branding as a particular aspect that can enhance export performance. The typical literature on globalisation[35] talks about the need to put the macroeconomic environment right, the need to develop infrastructure, training, etc. The situation at the firm level and the need to actually produce products with identity has never been an issue. The argument here is not that these other issues are not important but rather that it is pointless to have a very sound environment, good infrastructure, etc. but no product to sell. All these elements need to be present for the export strategy to succeed.

The biggest deficit, regrettably, seems to be with multilateral development banks (MDBs), the very institutions charged with ending global poverty. Marketing and branding, in particular, are subjects in which these institutions have not shown any interest. It is easy to prove this. Check any rural development project of any MDB for the component on marketing. Usually there will be a short section just describing the existing marketing environment in which the output of the project will be sold. Projects never aim at going beyond the existing market structure and targeting the regional or global market. If there had been this target, marketing expertise would have been part of the required manpower in all MDBs.

As it is, you will never see advertisements for marketing experts by any of these institutions. Part of the problem could be with how they interpret development. It appears as if self-sufficiency for rural communities is the ultimate goal. Projects aim at assisting villagers to produce enough food for self-sustenance and nothing more. So, the need to conquer other markets is not important. The consequences of this approach have been devastating on some communities. There have been some projects, such as artisanal fisheries, for example, where successful implementation i.e. increase in fish catches has

[35] See for example articles in Finance and Development, December, 2001, vol. 38 number 4 which focused on globalisation and Africa.

often led to depression in the price of fish in the community, thus worsening the incomes of the local people, particularly those not touched by the project.

This deficit in the roles of multilateral development banks seems to have been missed even in important debates relating to the reform of the institutions. In the debate generated by the recent Meltzer Report[27], most of the commentators were more concerned with how these institutions can handle financial crises but said nothing about what they can do to assist backward countries to play a useful role in the globalising world. The exception to this was the contribution by Kaja and Mistry[28]. They advocated for the regional development banks taking over more of the ground level development support; poverty reduction, human resource development, infrastructure, regional integration activities that the World Bank currently tries to monopolise. The World Bank on the other hand, was assigned to focus more on institutions, markets and market supporting structures and other enabling conditions. The global reach of the World Bank makes it better placed to advise developing countries on strategies for effective participation in a globalising environment. The African Development Bank has recently shown some interest in supporting franchising business as indicated in the paper by Jinchang[29] where it is said that the Bank was mobilising resources to initiate a study aimed at addressing issues relating to promotion of franchising in Africa. It is to be hoped that this is the beginning of the process that will see the premier development institution in Africa take a keen interest in product branding. Africa is the only continent that lags behind on this important issue. The expanded private sector windows of MDBs can also play a role in popularising branding.

The MDBs can assist in the marketing and branding strategy by increasingly paying more attention to this aspect in all their projects. Through the engagement of marketing and branding experts to work together with other project professionals, the current shortcomings can be overcome. This process can translate into a small percentage increase in project costs but the resulting quality improvements and increased market access could more than compensate for this cost increase.

The foray into branding will inevitably lead to new problems and challenges especially in the field of patents and trade marks. The new brands that might be developed by the small producers could easily be stolen by big international companies. Patent and trademark law provides a framework for protecting developers of brands and other inventions. This legal framework for protection is unfortunately very underdeveloped or non-existent in most of the African countries. This is another area where MDBs could be of assistance. Programmes aimed to strengthen the legal frameworks of these countries should also include components on strengthening the law relating to patents and trade marks.

The situation at the level of bilateral development agencies is only a little bit different. The majority of them still follow the traditional approach which is often a mirror of the World Bank and its sister institutions, the regional development banks. They often channel their assistance in co-financed projects in which the World Bank often plays a lead role.

Some bilateral donor agencies, such as USAID, have however initiated some changes. In the case of Mozambique, USAID is funding Technoserve Inc. to start branding initiatives for some agricultural produce in that country. Technoserve is also active in Ghana and Kenya. Its work is however, at the infancy level and a lot of funding would be necessary for its activities to start having a visible impact. This, unfortunately, will remain a far cry unless the importance of product branding is embraced by the major economic development

[27] U.S. Congress: Report of the international financial institutions advisory commission, 2000.
[28] G.S. Kaja and P. Mistry: "Streamlining the international financial system" in International Herald Tribune, 18th April, 2000.
[29] Jinchang Lai: "The Need for Franchising Development in Africa. Op. Cit. P27.

agencies such as the World Bank and regional development banks. For this to happen, these institutions will need to take another look at their skills mixes and start working with different expertise such as marketing consultants. In a large number of poor countries there could already be some products that can find a global market if only they were marketed properly. A little investment in marketing could yield significant increases in export revenues. This is true for tourism in most of the African countries. In some countries, such as Mozambique, top quality cashew nuts go to waste while in Zambia acknowledged high grade confectionery groundnuts cannot find their way into the global market. These and many others are opportunities being wasted because of the absence of an effective marketing strategy. MDBs can redress the situation by offering poor countries capacity building grants in the fields of marketing and branding in the same way that they support capacity building in project appraisal and management.

African coffee, tea, cocoa, etc. could fetch the African continent more revenue if properly processed and marketed. Under current arrangements it is the big multinationals that have developed branded products from these raw materials that benefit. Here, it is important to note that each time the price of coffee goes down, the consumer price for instant coffee does not correspondingly go down. Consequently, a crisis in the price of raw coffee is an opportunity for the multinationals to make even higher profits. These profits could accrue to the African coffee producing countries if they had developed their own coffee brands.

8. Conclusion

This paper has argued that product branding has been in existence for a long time. It is the effective tool used in product differentiation and that product differentiation is important for capitalist market development. Differentiation spurs competition and innovation. It facilitates firms to move away from price competition, which characterises much of commodity trade. It has also been argued that countries tied to commodity trade do not achieve economic development and they are characterised by low wages. The paper has further argued that although product branding is associated with large multinational corporations, the process has a lot of relevance to small scale producers. The deficit, however, is that the important development agencies like MDBs have so far had little to do with product branding. For Africa, the case of Mozambique shows that product branding can have tremendous relevance to small scale African producers. The Mozambican case also shows that with proper branding strategies, large scale retail outlets can start to market the produce of small scale producers thus affording them an opportunity to sell to upscale clients and a possible opening to the regional and global markets. Further, the large retail outlets can assist in the branding process. The importance of branding is further reinforced by the realisation that even a successful business method like franchising is in fact crucially anchored on product branding. Due to poor development of branding in Africa, much of the current franchising business is sadly based on foreign brands.

From the above, it is clear that MDBs and other development agencies must undergo some form of transformation so that they can give product branding the attention it rightly deserves. There is urgent need to engage marketing/branding experts in many of these institutions so that all production related projects have in mind the market. A proper focus on marketing/branding is bound to yield better export results. Countries can move out of the commodity trap and thus start exporting goods less susceptible to global commodity price depressions. The paper has also highlighted the importance of governments supporting agro-business centers as well as modern retail outlets, both of which can play a critical role in strengthening benefits from participation in the global economy.

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CHAPTER FOUR

Fractal Structure in the Zambian Kwacha/US Dollar Exchange Rate

Chibelushi M. Musongole

1. INTRODUCTION

The Kwacha/Dollar exchange rate plays a fundamental role in monitoring the Zambian economy. The movement of the exchange rate generally seems to be influenced by many degrees of freedom and thus appears to follow a random walk. This means that the exchange rate is essentially unpredictable. The intention of this study, is to investigate the fractal structure of the Kwacha/US Dollar exchange rate. The study seeks to show that the Kwacha/Dollar rate has underlying patterns and that these patterns persist over time. The main purpose of fractal structure analysis is to describe global determinism and local randomness of a process. Fractal theory is linked to Chaos Theory. The origins of fractal theory, is not known exactly. The early work related to chaos and fractals occurred in the field of biology, meteorology, physics, chemistry and computer science (Chatterjee and Yilmaz 1992). In Meteorology, the work of Lolenz (1963) involving weather predictions popularized fractal and chaos theory. In chemistry chaos theory has been used to analyze the dynamics of chemical reactions (Simoyi, Wolf and Swinney 1982). The literature is now full of many other examples involving turbulence and chaos in many scientific investigations.

One motivation for the use of chaos theory is that it offers a possibility of describing randomness as a result of a known deterministic process. There is no assumption of the distribution of the process. Some models used to present chaotic behaviour of a process include the *logistic function*. May (1985) and Rodgers et al. (1986), have studied in detail the *logistic model* depicting different forms of chaotic behaviour, depending on its parameters and initial conditions. One of the approaches to chaos is through the study of fractals. Fractals are sets that exhibit properties of self-similarity (Mandelbrot 1982). The simplest geometric property of a fractal is measured by its fractal dimension. The fractal dimension of a time series reveals the characteristics of the time series in terms of how it occupies its space. Chatterjee and Yilmaz (1992) and Beliner (1992) have discussed some of the methods used to compute fractal dimensions of times series. Mandelbrot (1982) showed that, the fractal dimension of a time series is computed as the inverse of its Hurst (H) exponent. The Hurst exponent is sometimes computed using the R/S analysis (Peters 1991, 1994). The R/S analysis is a technique applied to natural phenomena to detect any biases in behaviour over time. The technique has been used widely in the analysis of financial time series, for example to determine characteristics of stock indices. Peters (1991, 1994) has applied R/S analysis to investigate trends in Yen/Dollar, Mark/Dollar, Pound/Dollar, and Yen/Pound exchange rate. The results showed persistence in all the exchange rates. Rescaled range analysis has also been used to show that stock and bond market returns mask underlying fractal structures (Peters 1989). Using fractal analysis, Kozma and Kasabov (1999) showed that the daily New Zealand Stock Exchange index (NZSE40) has a memory effect of up to 15 days and that its distribution is far from having a Gaussian behaviour. Musongole (2002) has

also shown using fractal and R/S analysis that the Johannesburg Security Exchange (JSE) Overall Index, the NASDAQ, the DOW JONES, the DAX, the Japanese NIKKEI500, the Brazilian IBOVESPA, and the JSE-GOLD indices have patterns which persist over time. The fractal and R/S analysis have not been applied to the Kwacha/Dollar exchange rate. One of the purposes of this study is to fill up this gap. The study will explore the fractal structure of the Kwacha/Dollar exchange rate using the R/S analysis. The fractal dimension of the exchange rate will also be computed and interpreted. The correlations resulting from the R/S analysis will be used to measure the impact of current events on the future of the exchange rate. The daily Kwacha/Dollar exchange rate data from January 1995 to January 2003 will be used in the analysis.

The paper is divided into five sections of which the first part is the introduction. In the second section, a detailed discussion of the R/S analysis technique is given. The data used in the analysis is described in section three. In section four, the fractal structure of the Kwacha/Dollar rate is computed and the findings are presented and discussed. Concluding remarks are given in section five.

2. Rescaled Range Analysis

This sections outlines the steps necessary to carry out the R/S analysis. The rescaled range analysis was developed by H. E. Hurst. Hurst was a hydrologist who worked on the Nile River Dam Project in the early 20th century. His task was to explore how reservoir capacity of dams fluctuated over time. When constructing dams, the major concern is the storage capacity. The influx of water to the reservoir results from many natural elements, including rainfall. In general the assumption is that the water inflow to the dam is random. By analyzing the 847-year old data of the Nile river, Hurst discovered that the flows were not random and introduced a new statistic: the Hurst exponent (H). Hurst also introduced the rescaled range analysis to compute the Hurst exponent. He found out that most phenomena, including river discharges, temperatures, rainfall, and sunspots, exhibit behaviour characterized by a biased random walk (Peters 1991). The steps to compute the Hurst exponent are outlined in Peters (1989, 1991,1994) as follows:

1. Begin with a time series of length M. Convert this to a time series of length $N = M - 1$ of logarithmic ratios

$$\log(\frac{M_{i+1}}{M_i}), i = 1,2,3,...,M-1 \qquad 2.1$$

2. Divide this time period into A contiguous sub periods of length n such that $An = N$. Label each sub period I_a, with $a = 1,2,3,...,A$. Each element in I_a is labeled $N_{k,a}$ such that $k = 1,2,3,...,n$. For each I_a of length n, the average value is defined as:

$$e_a = \frac{1}{n}\sum_{k=1}^{n} N_{k,a} \qquad 2.2$$

where e_a = average value of the N_i contained in subperiod I_a of length n.

3. The time series of accumulated departures $X_{k,a}$ from the mean value of each subperiod I_a is defined as:

$$X_{k,a} = \sum_{i=1}^{k} (N_{i,a} - e_a), k = 1,2,3,...,n \qquad 2.3$$

1. The range is defined as the maximum minus the minimum value of $X_{k,a}$ within each sybperiod I_a:
$$R_{I_a} = \max(X_{k,a}) - \min(X_{k,a}), \text{ where } 1 \le k \le n. \qquad 2.4$$
2. The sample standard deviation calculated for each subperiod I_a:
$$S_{I_a} = \left(\frac{1}{n} \sum_{k=1}^{n} (N_{k,a} - e_a)^2 \right)^{\frac{1}{2}} \qquad 2.5$$
3. Each range R_{I_a} is now normalized by dividing by S_{I_a} corresponding to it. Therefore, the rescaled range for each I_a subperiod is equal to $\frac{R_{I_a}}{S_{I_a}}$. From step 2 above, we had A contiguous subperiods of length n. Therefore, the average R/S value for length n is defined as
$$(R/S)_n = \frac{1}{A} \sum_{a=1}^{A} \left(R_{I_a} / S_{I_a} \right) \qquad 2.6$$
4. The length n is increased to the next higher value, and $(M-1)/n$ is an integer value. We use values of n that include the beginning and ending of points of the time series, and steps 1 through 6 are repeated until $n = (M-1)/2$. We now perform an ordinary least square regression on $\log(n)$ as the independent variable and $\log(R/S)_n$ as the depended variable. The intercept is the estimate for $\log(c)$, the constant. The slope of the equation is the estimate of the Hurst exponent H.

$H = 0.50$ would imply an independent process. $0.50 \le H \le 1.00$ implies a *persistence* time series, and a persistence time series is characterized by long memory effects. Theoretically current events influence what happens in the future. $0 \le H \le 0.50$ signifies *antipersistence*. An antipersistence process reverses itself more frequently than a random process.

The impact of the present on the future is expressed as a correlation and given by
$$C = 2^{(2H-1)} - 1 \qquad 2.7$$
where C = correlation measure, H = Hurst exponent.

3. The Data

In this section, the data used in the analysis is described. The data used are the middle values of the daily retail weighted average buy and sell rates of the US Dollar from commercial banks for the period January 3, 1995 through January 10, 2003. The data set has 1840 observations and can be considered to large enough. The data also covers a sufficiently long time period for the rescaled range analysis and will povide provide a worthwhile insight in the structure of the Kwacha/Dollar exchange rate. The data with high frequency like this one, generally exhibit significant autoregressive (AR) tendencies. The (AR) processes have been known to bias the Hurst exponent (Peters 1994). Thus, to compute the Hurst exponent of the Kwacha/Dollar rate, the residuals of the AR(1) model of the data will be used. Though the AR(1) residuals method does not remove all the bias, it has been shown in the literature that the method reduces the bias significantly.

The AR(1) models is given by

$x_t = \alpha + \beta x_{t-1} + \xi_t$ where 3.1

$\xi_t = x_t - (\alpha + \beta x_{t-1})$, is the residual of the model at time t.

The plots of the data and the residuals of the AR(1) model of the data are shown in the following figures:

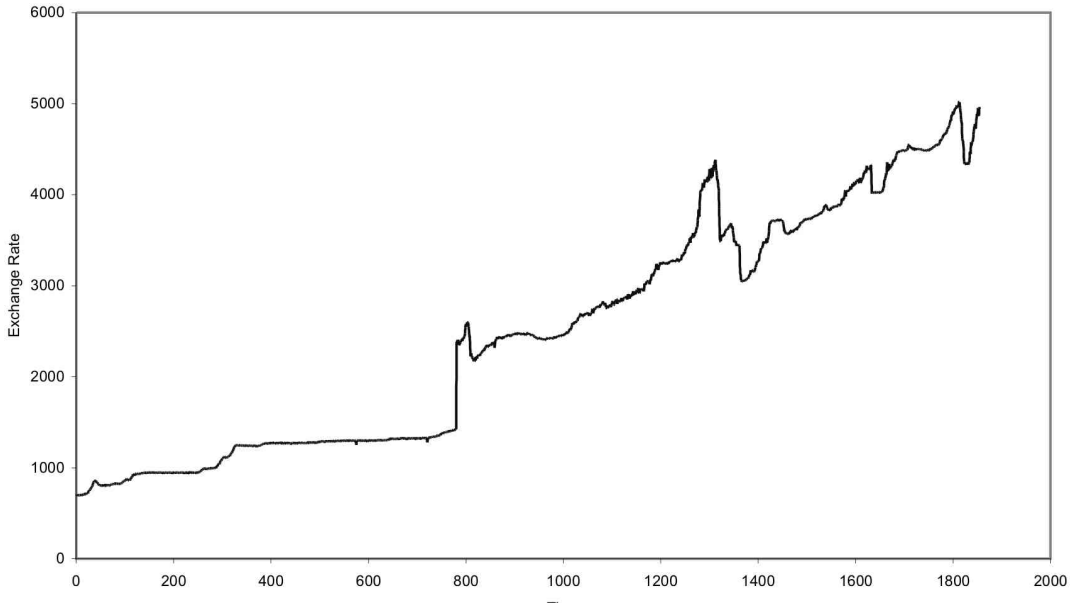

FIGURE 3.1. Kwacha/Dollar Exchange Rate, January 1995 to January 2003

From Figure 3.1, the Kwacha/Dollar exchange rate exhibits in general an upward trend characterized by local fluctuations.

The following figure shows the plot of the residuals of the AR(1) model of the exchange rate.

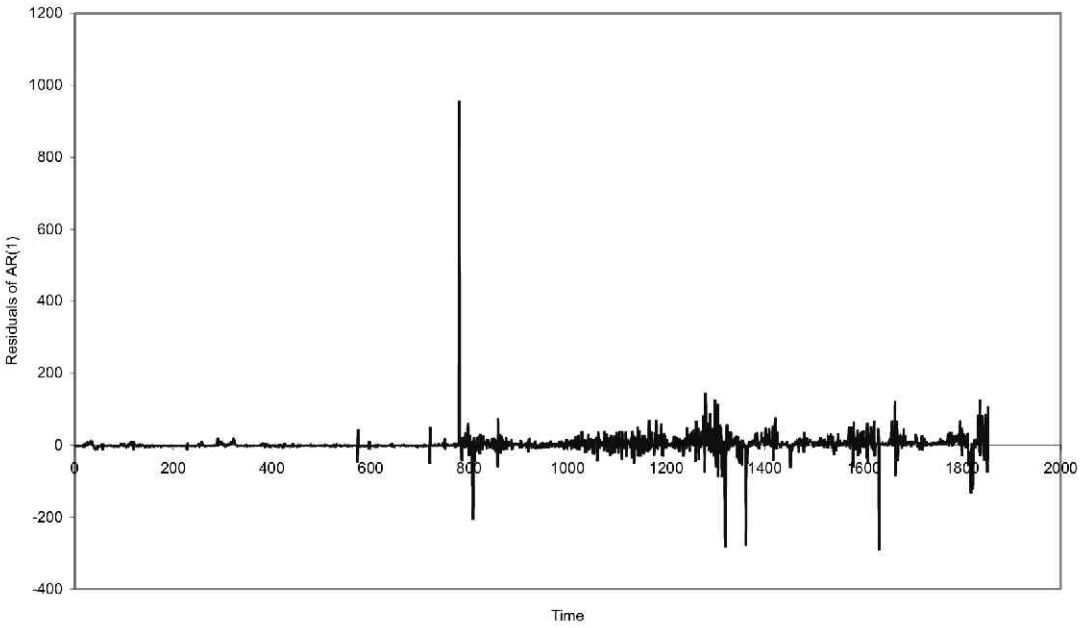

FIGURE 3.2. Residuals of The AR(1) Model of Kwacha/Dollar Exchange Rate

The residuals are generally stationary about the 0 value with irregular but not may spikes.

4. THE FRACTAL STRUCTURE OF THE DAILY KWACHA/DOLLAR EXCHANGE RATE

This section presents the results of the R/S analysis applied to the daily Kwacha/ Dollar rate data from January 3, 1995, through January 10, 2003. The AR(1) residuals of the data have been used.

The values used in the R/S analysis and in the log/log plots are summarized in Table 4.1.

N	log(N)	log(R/S)	log(E(R/S))	(R/S)/Sqrt(N)	E(R/S)/Sqrt(N)
10	1	0.40	0.48	0.79	0.96
16	1.2	0.53	0.61	0.85	1.01
20	1.3	0.60	0.66	0.88	1.03
23	1.36	0.64	0.70	0.91	1.04
40	1.60	0.79	0.84	0.98	1.09
46	1.66	0.86	0.87	1.06	1.10
80	1.90	1.03	1.01	1.20	1.13
92	1.96	1.10	1.04	1.32	1.14
115	2.06	1.16	1.09	1.35	1.15
184	2.26	1.31	1.20	1.51	1.17
230	2.36	1.39	1.25	1.60	1.18
368	2.57	1.50	1.36	1.66	1.19
460	2.66	1.58	1.41	1.79	1.20
920	2.96	1.63	1.57	1.40	1.21

TABLE 4.1. Values used in the R/S Analysis and V Statistic

The regression output of the R/S analysis is shown in Table 4.2.

Regression output, Daily Kwacha/Dollar Exchange Rate:	
Constant	-0.2780
Standard error of Y (estimated)	0.0450
R squared	0.9889
Hurst exponent	0.6849
Standard error of coefficient	0.0210
Number of observations	14
Degrees of Freedom	12

Table 4.2. R/S Analysis of the Daily Kwacha/Dollar Exchange Rate

From Table 4.2, The Kwacha/Dollar exchange rate produces the Hurst exponent of H = 0.6849.

The log/log plot is given in Figure 4.1

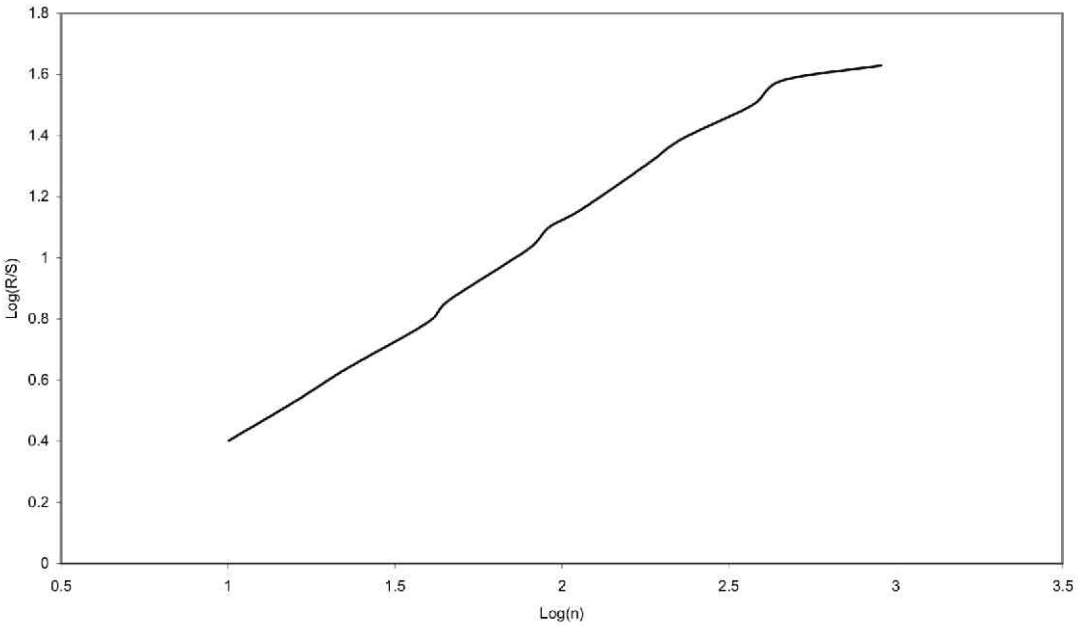

FIGURE 4.1. R/S Analysis, Daily Kwacha/Dollar Exchange Rate

Since this value is greater than 0.50, we may conclude that the Kwacha/Dollar rate is persistent. A hypothesis to test the significance of H = 0.6849 will be carried out. To do this, the expected value of H, denoted E(H) will be computed. The regression output of the E(R/S) is given in Table 4.3.

Regression output, Daily Kwacha-Dollar Exchange Rate:

Constant	-0.0519
Standard error of Y (estimated)	0.0093
R squared	0.9993
Hurst exponent	0.5512
Number of observations	14
Degrees of Freedom	12

TABLE 4.3. E(R/S) Analysis, Daily Kwacha/Dollar Exchange Rate

From Table 4.3, E(H) = 0.5512.

Figure 4.2, shows the log/log plot of R/S for T= 1840 observations. The log/log plot of E(R/S) is also shown in the figure as a comparison against the null hypothesis that the Kwacha/Dollar rate is an independent process.

Figure 4.2, shows the log R/S plot for T= 1840 observations. Log E(R/S) is also shown in the plot as a comparison against the null hypothesis that the Kwacha/Dollar rate is an independent process.

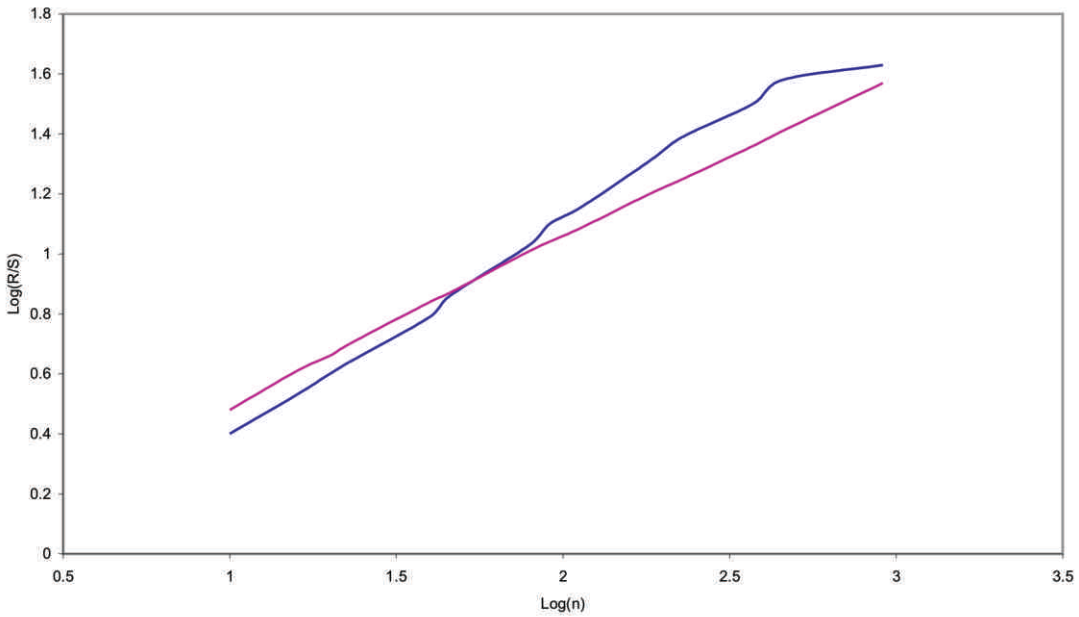

FIGURE 4.2. R/S and E(R/S) Analysis, Kwacha/Dollar Exchange Rate

The regression of R/S gave H = 0.6849, and that of E(R/S) yielded E(H) = 0.5512. The variance of E(H) is given by 1/T for Gaussian random variables (Peters 1994). The variance of E(H) in this case is thus 1/1840 = 0.000543, and the standard deviation of E(H) is 0.0233. The H value for the Kwacha/Dollar rate is thus 5.738 standard deviations above its expected value. This is a highly significant result, implying that the Kwacha/Dollar rate is a persistent process

Figure 4.2, shows a break in the R/S graph which appears to be at Log(n) = 1.96 or n = 91 observations. To estimate exactly where this break occurs we compute the V statistic. The V statistic is the ratio $(R/S)_n/\sqrt{n}$ and is plotted against . If the series exhibits persistence (H greater than 0.5), then the ratio will be increasing. When the slope crosses over to the random walk () or to antipersistence, (H less than 0.50), the ratio will go sideways or will decline respectively (Peters 1994).

The plot of the V statistic is given in Figure 4.3.

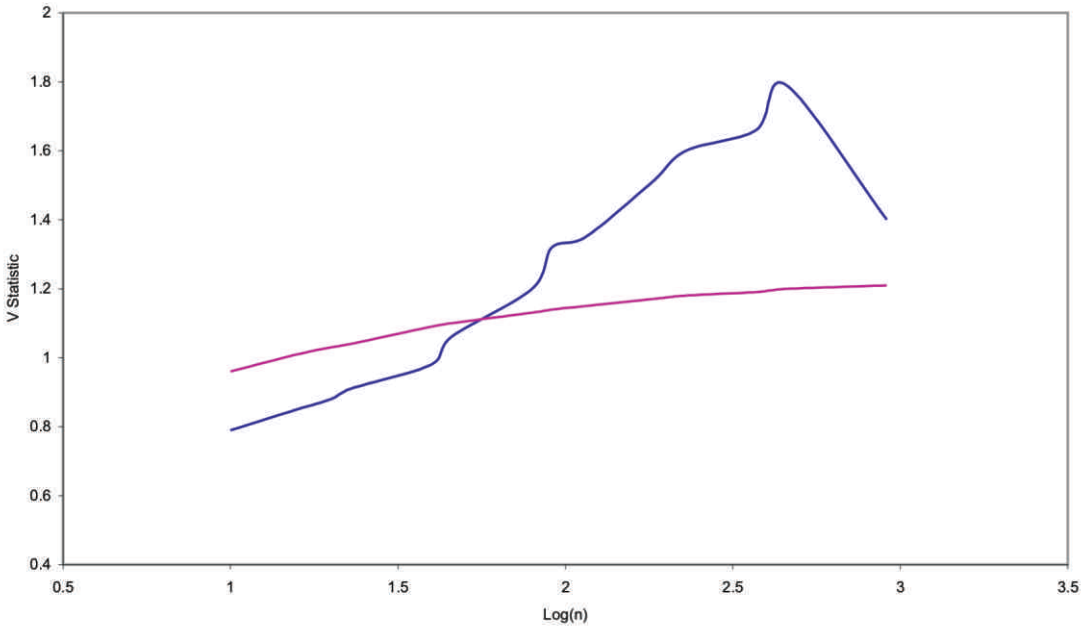

FIGURE 4.3. V Statistic, Kwacha/Dollar Rate January 1995 to January 2003.

In Figure 4.3, the V statistic clearly has a peak and almost stops growing at about N = 91 observations. This may signal a periodic or nonperiodic component in the Kwacha/Dollar exchange rate, with frequency of approximately 91 days or three months period.

The fractal dimension given as the inverse of the Hurst exponent is computed as

$$\frac{1}{0.6849} = 1.46$$

The fractal dimension characterizes how the time series fills its space. It is closely linked to the factors that influence the structure of the time series. The fractal dimension 1.46, shows that the Kwacha/Dollar rate is somewhere between deterministic and random and may be entirely different from a Gaussian process.

The correlation to measure the impact of current events on the future is derived from the Hurst exponent. It also gives the relationship between the time periods of a process. In this study, the correlation 29.22% computed from equation (2.7), measures the extent to which the time periods in the Kwacha/Dollar rate are related.

5. CONCLUSION

The Hurst exponent H = .6849 has shown that the Kwacha/Dollar exchange rate is a persistent or trend-reinforcing process. The persistence scaling occurs for periods of about 91 days or approximately three months. Thus the Kwacha/Dollar rate is a biased random walk and is influenced by past events. The implies that if the Kwacha/Dollar rate has been up(down) in the last period, there is a 68.49% chance that it will continue to be up(down) in the next period. This effect may be caused by various factors such as sentiment, political climate, monetary policy etc. The impact of these factors on the future of the exchange rate, is measured by the correlation derived from the Hurst exponent. The 29.22% correlation shows a relatively high interdependence between the time periods of the Kwacha/Dollar rate. The fractal dimension at 1.46 indicates that the Kwacha/Dollar rate is not a random

process but has an underlying fractal structure. The Hurst exponent results show that there is potential for timing and prediction of the exchange rate. The challenge lies in formulating economic or monetary policies that take account of the underlying fractal structure to enhance future characteristics of the Kwacha/Dollar exchange rate.

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CHAPTER FIVE

Macroeconomic Stability: Can a Currency Board be an Alternative to Central Bank Arrangement?

Dinde Simacheche

1. INTRODUCTION

The achievement of macro-economic stability in general and the stability of the exchange rate of the Kwacha against major foreign currencies has remained a major area of concern to policy makers in Zambia. In an attempt to redress the deteriorating social economic conditions, the country embarked on a comprehensive economic reform programme in 1992. However, after ten years of implementation the macro-economic situation remains unsatisfactory. While relative success has been registered in bringing down inflation from the three digit figures to the average of 23 percent in the last 5 years, the country's economic growth has been sluggish at an average of 2 percent. The external sector viability has also remained unsustainable.

A number of economists have recommended the adoption of currency board arrangements to achieve macro-economic stability including the prevention of instability and re-establishment of currency credibility during a currency crisis. The ability of currency boards to cope with financial crises successfully have recently led to their adoption in a number of countries including Argentina (1991), Estonia (1992), Lithuania (1994), and Bulgaria (1997). The rising number of countries adopting the currency board arrangement raises fundamental issues on how best to conduct macro-economic policy. Currency board arrangements have been recommended for some countries to forestall instability and re-establish currency credibility.

In view of the foregoing, this paper reviews the currency board arrangement and discusses whether they offer an alternative to the central bank arrangement in achieving macroeconomic stability in general and Kwacha stability in particular. We begin in section 2, with a formal definition of a currency board and explain how it differs from a central bank arrangement. A brief history of currency boards follows in section 3. We discuss whether a currency board arrangement would offer Zambia an alternative to the current central bank arrangement in section 4. Section 5 provides a conclusion.

2. BASIC FEATURES OF CURRENCY BOARDS AS COMPARED TO CENTRAL BANKS

Kurt Schuler (1992) defines a currency board as "an institution that issues notes and coins convertible on demand and at fixed rate into a foreign currency." Under such an arrangement, a country maintains a fixed exchange rate against a designated foreign currency, and the monetary base or reserve money a liability of the currency board is backed by its foreign exchange reserves. As these reserves increase for example, through a balance of payments surplus the currency board increases the monetary base, and the money supply in the economy increases. Alternatively, as the foreign exchange reserves fall, the monetary base and the money supply are reduced. Other than this, the currency board does not have discretion to change the money supply or manage interest rates and therefore, cannot pursue domestic monetary policies.

the monetary base and the money supply are reduced. Other than this, the currency board does not have discretion to change the money supply or manage interest rates and therefore, cannot pursue domestic monetary policies.

By using a foreign reserve currency, the currency board can be viewed as a modern form of gold standard that follows strict rules. The currency board earns seignorage through investing the proceeds of note issue in external securities denoted in the anchor currency. Note that one can distinguish between the 'pure' and the 'hybrid' currency boards, where the hybrid currency retains some traditional functions of a central bank.

The basic difference between a central bank and pure currency board can be illustrated by looking at their stylized balance sheets. Currency boards issue cash only in return for the chosen foreign reserve currency. It's balance sheet mainly consists of foreign reserve currency holdings on the asset side and cash in hands of the public, deposits of commercial banks and net worth on the liability side. Currency boards target a slightly larger value of assets compared to face values of their liabilities in order to hedge against the risk of decline in value. This is represented by net worth on the liability side. Commercial banks replenish vault cash by purchasing from the currency board using some of their reserves. Figure 1 shows stylized entries in the currency board balance sheet.

FIGURE: 1 Currency Board Balance Sheet

Assets	Liabilities
- Liquid Foreign Reserves - Currency Assets	- Cash (Notes and Coins) - Deposit of Commercial Banks - Net Worth

On the other hand, the balance sheet of a typical central bank shows that central banks hold liquid foreign reserve currency assets as well as domestic assets. This allows central banks to manage the exchange rate of their respective countries. On the liability side, they issue cash held by the public and in commercial banks vault. In addition, commercial banks always hold their reserves at the central bank. The sum of cash and deposits of the commercial banks is called reserve money (monetary base or high-powered money). Similar to a currency board, a central bank has modest net worth.

The first fundamental difference between a currency board and central bank is that the later holds not only foreign reserve currency or assets, but also domestic assets, of which net claims on government (NCG) is a substantial item (see figure 2). The central bank can also lend to and borrow from commercial banks. This discretion can bring about changes in the monetary base. For instance purchasing domestic assets would increase the monetary base, while the opposite is equally true.

FIGURE: 2 Central Bank Balance Sheet

Assets	Liabilities
- Liquid Foreign Reserve- Currency Assets - Domestic Assets (including NCG)	- Cash - Deposit of commercial banks - Net Worth

As shown in Figures 1 and 2 above, a currency board does not have discretion in its monetary policy as it does not have domestic assets on its balance sheet. It increases the monetary base when the private sector wishes to sell foreign currency at the fixed exchange rate. The monetary base reduces when the private sector wishes to finance a balance of payments deficit by buying foreign currency from the currency board. In contrast, a central bank can make independent decisions as and when to change high-powered money. The second fundamental difference is that for an orthodox currency board, the lender of the last resort function to commercial banks usually performed by central banks is not available.

Thus, as opposed to a central bank, a currency board is characterised by the following main features: (1) 100 percent backing of the money supply by gold and anchor currency reserves; (2) an absolutely fixed exchange rate of the national currency against the anchor currency; and (3) rules for automatic issue of the domestic currency.

3. HISTORICAL DEVELOPMENT OF CURRENCY BOARDS

Currency board arrangements can be traced back to the colonial period when they were used as a means of linking the domestic currency and economies of the colonies to those of the imperial country. According to John Williamson (1995), the pioneer currency board was formed in Mauritius in 1882. Subsequently, many more were established in not less than 70 countries. The peak in currency board arrangements was during the late 1940's to the early 1950's. These currency boards issued local currencies, which as Ghatak Subrata (1995) argues, were fully supported by foreign reserves.

However, despite satisfactory performance, most countries replaced these currency boards with central banks soon after independence. Apart from political independence, the decline in currency board arrangements was attributed to the intellectual environment of the early 1960s. The possibility of pursuing anti - cyclical monetary policy was considered better than following a mechanist rule embodied in the currency board arrangement.

After the 1950s, currency boards survived in very small territories such as Bermuda, Brunei, the Cayman Island, the Falkland Islands, the Faroe Islands and Gibraltar. However, the recent past has witnessed the adoption of currency board arrangements in a number of countries. Some of the countries with a currency board arrangement are shown in the Table below.

Table 1.Selected Countries with Currency Board Arrangement

Country/ Territory	Date of Establishment	Currency Peg
Falkland Islands	1899	Pound sterling
Bermuda	1915	US dollar
Gibraltar	1927	Pound sterling
Faroe Islands	1940	Danish krone
Djibouti	1949	US dollar
Brunei	1967	Singapore dollar
Cayman Islands	1972	US dollar
Hong Kong	1983	US dollar
Argentina	1991	US dollar
Estonia	1992	Deutsche Mark
Lithuania	1994	US Dollar
Bulgaria	1997	Deutsche Mark
Bosnia	1997	Deutsche Mark

Source: http://users.erols.com/kurrency/intro.htm

According to Enock and Gulde (1997), the currency board arrangement have been recommended for some countries such as Indonesia, Russia and some Latin American countries like Brazil, El Salvador, Mexico, Venezuela and other countries.

4. Can a currency board arrangement be an alternative?

A comparative review of the macro-economic performance of countries with currency board arrangements is instructive. Several economists have argued that countries that have adopted the currency board arrangement in the recent past were able to stand firm against the speculative attacks on their domestic currencies. Specifically, the Hong Kong dollar survived the currency crisis of 1997-98 that hit East Asia. Hong Kong withstood the Asian crisis without devaluation. Similarly, countries that adopted the currency board arrangement in the 1990s were able to adjust to low inflation levels more rapidly and lastingly than other countries in similar situations. For instance in Argentina, growth was re-ignited while inflation declined from four digit levels in the two years following the inception of the currency board (John Williamson, 1995].

A number of advantages could be advanced for adopting a currency board arrangement in Zambia. As John Williamson (1995) argues, a currency board arrangement would provide for a guaranteed payments adjustment mechanism and assure currency convertibility. This would in turn result in the maintenance of confidence in the Kwacha. In this regard, it can be argued that Zambia could employ a currency board arrangement to provide a credible framework for macroeconomic stability which would also be attractive to the much needed foreign direct investment (FDI).

In addition, adoption of a currency board arrangement would put pressure on the Government to maintain fiscal discipline. One can argue that monetary restraint would be much easier to establish under the currency board arrangement because government borrowing (the prime source of monetary expansion in Zambia) would not be allowed. A currency board arrangement would forbid the monetization of fiscal deficits, which would force fiscal authorities to observe prudent economic management.The fundamental concern is whether the fiscal authority would agree to be disciplined, which legislating a currency board entails.

Further, as alluded to above, empirical evidence has established that a currency board arrangement would assist the country fight the inflation inertia, which is stack in the 20 percent to 30 percent range. This would result from fixing the exchange rate to the anchor currency. Ghosh, Gulde and Wolf (1998) report that countries with "currency boards tend to have lower average inflation and as good growth performance as other peg regimes."

However, on the downside adoption of a currency board arrangement would mean that the country will not benefit from the current market driven exchange rate whose change assist balance of payments adjustments. In addition, a currency board arrangement would not allow the country to conduct an active monetary policy. However, John Greenwood (1999) argues that this may not be a disadvantage after all because monetary policy has often been abused owing to heavy politicisation.

It should also be noted that a currency board would not act as lender of last resort because that would violate its basic principle of issuing domestic currency only in exchange for foreign reserve currency rather than against domestic assets. Modern consensus is that it is desirable to have the lender of the last resort to provide emergency lending to financial institutions that are solvent but illiquid.

5. CONCLUSION

A currency board arrangement would have an advantage over the current central bank arrangement if Zambia preferred a fixed exchange rate system. However adoption of the currency board requires that the following preconditions hold: (1) the existence of international reserves to back up the issuance of a domestic currency; (2) a strong commitment on the part of government to fiscal discipline; and (3) a sound financial system with appropriate regulation and supervision.

Provided the above pre-conditions hold, Section IV argues that in contrast to central banks, a currency board arrangement would assure convertibility, instill macroeconomic discipline, provide a mechanism that guarantees adjustment in the balance of payments deficits and thus create confidence in the country's monetary system. In this regard, a currency board arrangement could be welfare improving largely due to the inflation stabilisation and credibility properties that it would entail.

Unfortunately for Zambia, the preconditions are largely absent. The level of international reserves is low and budget overruns are a common phenomenon. A currency board arrangement is clearly not a viable option in this environment and the flexibility of the current central bank arrangement would seem appealing. This should be augmented by a strong commitment on the part of government to fiscal discipline.

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CHAPTER SIX

Dollarisation In Zambia: Causes And Implications

Ivan Zyuulu[1]

1. INTRODUCTION

The Zambian economy has experienced dollarisation since the mid-1990s consequent to liberalisation of the economy, in general, and the financial sector in particular. This was after a new Government was voted to power under the multi-party political dispensation in 1991. Subsequently, since 1994, financial assets denominated in foreign currency have increasingly constituted a substantial part of broad money, posing questions on the effectiveness of monetary policy in controlling money supply growth. This paper attempts to assess the extent, causes and implications of dollarisation on monetary and exchange rate policies.

The paper begins by providing the background to dollarisation in Zambia in section 2 followed by a review of the literature in section 3. Section 4 evaluates the extent and trend of dollarisation in Zambia while section 5 presents the empirical methodology. Empirical results and policy implications are presented in section 6 and 7, respectively. The conclusion of the paper is given in section 8.

2.BACKGROUND

Following Zambia's economic reforms of the early 1990s the foreign exchange market was liberalised. The main objective was to achieve stability through a market-determined exchange rate and prevent over-valuation of the Kwacha, which made Zambia's exports expensive (less competitive) and imports cheaper, and thereby worsening the balance of payments position. It was also aimed at achieving allocative efficiency in the foreign exchange market, by moving away from administrative allocation, which was considered to be inefficient and susceptible to malpractices such as rent seeking behaviour. Liberalisation of the foreign exchange market in Zambia was an interesting development especially at a time it was argued that it was not a viable option for developing countries even when the policy of floating industrial country currencies went almost unquestioned (Williamson, 1987). According to Amin (1996), adoption of floating exchange rate policy has complicated policy in African countries as much as it has presented an opportunity for them to carry out a more active exchange rate policy.

In 1993, the liberalisation of the foreign exchange market started in earnest with introduction of weekly auctions of foreign exchange, based on the Dutch auction system

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and later moved to daily auctions in 1995. In January 1994, the Foreign Exchange Control Act was revoked, removing foreign exchange restrictions on both the current and the capital accounts with the exception of limits on certain capital transactions, and the *bureau de change* system of exchange rate determination was introduced. Further, during the same year, Bank of Zambia allowed commercial banks to hold foreign currency deposits. This introduction of foreign currency deposits that was aimed at deepening the financial system, marked the beginning of some formal and measurable form of dollarisation in Zambia.

Dollarisation is not a new phenomenon although it has hitherto not been a major policy issue in most countries. However, in the recent past, it has become a topical policy issue in Latin America and other transitional economies such as Turkey, Vietnam and the Philippines. Since the ascendance of dollarisation to a topical position is fairly recent, experience with it is limited, and empirical data is scanty (Calvo, 2000). Consequently, the literature on the subject is somewhat limited.

The concept of dollarisation may be defined in various ways. It is imperative to distinguish them clearly from the outset. The term can be used to refer to the establishment of a foreign currency as a legal tender *in lieu* of the domestic national currency such as the case in Panama where the US dollar was adopted as the means of exchange (Berg and Borensztein, 2000b). This entails a complete removal of the national currency in favour of using another country's national currency as legal tender, in an attempt to solve monetary and exchange rate policy problems.

Dollarisation has also come to mean currency substitution, which is a situation in which foreign assets are used as money (i.e. a means of payment and unit of account). Asset substitution, which is a case where foreign currency assets are demanded as financial assets but without a specific monetary function, is another form of dollarisation. For the purposes of this study, dollarisation would be taken to mean asset substitution defined as the holding by residents of foreign currency deposits at domestic banks (Berg and Borensztein, 2000a).

The introduction of foreign currency denominated deposits in commercial banks in 1994 was, by and large, meant to stem capital flight and encourage corporate organisations, Zambians, and non-Zambian residents to bring their foreign financial assets into the country. It was also aimed at achieving stability in the foreign exchange market. Prior to this change, it was felt that Zambians and residents held substantial amounts of foreign exchange in bank accounts abroad and the new policy was intended to encourage relocation of these funds to banks domiciled in Zambia. To a large extent this objective has been achieved as evidenced by the increase in foreign currency deposits from US $8.1 million in March 1994 to US $291.8 million as at end November 2000. In terms of the ratio of foreign currency deposits to broad money, it rose to 48.7 % at end December 2000 from 2.2 % at end-December 1994.

While the purpose for allowing foreign currency deposits has generally been achieved in Zambia, a new problem has arisen, as the deposits have become a source of money supply growth by introducing a valuation effect, especially when the exchange rate is depreciating.[2] Asset substitution has thus negatively affected the potency of monetary policy in controlling money supply. Against this background, the need for a thorough understanding of dollarisation in Zambia is imperative. The key questions this study attempted to answer are: What are the key determinants of dollarisation in Zambia? What are its implications on the exchange rate policy and monetary policy in general?

[2]This problem was observed by Balino, et al. (1999) as well.

3. Literature Review

Over the last decade, some literature has developed on the phenomenon of dollarisation and a consensus has largely been achieved in terms of understanding its causes. Dollarisation is chiefly a response to fundamental macroeconomic instability including severe inflationary pressures (hyperinflation), economic stagnation, volatility in the exchange rate, and in some cases, political instability (Ize and Levy-Yeyati, 1998; Mongardini and Mueller, 1999; Balino, et al., 1999; and Berg and Borensztein, 2000a). These problems make the public seek protection or hedge themselves against the cost of holding financial assets denominated in the domestic currency which are susceptible to loss of value through inflation and depreciation. In this regard, as Berg and Borensztein (2000a) point out, there is a tendency to use a stronger currency to the extent possible as a means of protection.

Generally, dollarisation (particularly in its extreme form) is a promising way of avoiding currency and balance of payments crises (Berg and Borensztein, 2000b) as it eliminates the possibility of sharp depreciation and sudden capital outflows prompted by expectations of depreciation. It is also argued that the phenomenon creates a higher level of confidence by international investors leading to lower spreads on international borrowing, which in turn lowers fiscal costs and promotes investment and growth. Further, it enhances the promotion of closer economic and financial integration with the economy providing the foreign currency (such as the US for the dollar) and the global economy.

Other arguments have been advanced in favour of dollarisation (Berg and Borensztein, 200b). First, there would be a reduction in the country risk premia, which is attributed to the elimination of the risk of currency crisis resulting in lowering of interest rates. This would significantly lower the fiscal cost of servicing the public debt and increase the prospects for increased investment and economic growth.

Second, a country may impose capital controls in the interest of defending the national currency causing other debtors to default on their foreign currency denominated debt. Under dollarisation, such actions are not necessary thereby minimising currency risk and country risk.

Third, since the prospect of currency crisis is eliminated (although the risk of external shocks remains), a firm basis for a sound financial sector that is an essential basis for strong and steady economic growth is established. In fact, dollarisation in this case is perceived as an irreversible institutional move towards the achievement of low inflation, fiscal sustainability, and transparency.

In the case of dollarisation centered on foreign currency deposits, Balino, et al (1999) are of the view that it brings forth the enhancement of the opportunity for re-intermediation in economies that have undergone periods of high inflation and unstable macroeconomic conditions during which economic agents may have become reluctant to hold deposits in the banking system. Further, they contend that allowing of foreign currency deposits promotes financial deepening in that domestic banks have an opportunity to expand their operations rapidly by competing for foreign currency deposits held by residents in cross-border accounts. The foreign currency accounts also facilitate the integration of the domestic market into the rest of the world and lower the cost of international transactions as well as providing a chance for depositors to shift part of their local currency deposits into foreign currency deposits. Furthermore, asset substitution can increase credibility by raising the cost of monetary indiscipline. The government is therefore committed to stronger financial policies.

From the above benefits, the impression created is that dollarisation has no problems. To the contrary, it comes with a number of disadvantages. The country that adopts a foreign currency as its legal tender suffers from loss of seignorage (both the purchase stock and flow of new currency printed every year) that accrues to the monetary authority from its right to

issue legal tender (Berg and Borensztein, 2000b). The dollarised economy can no longer use monetary policy to react to external shocks, as may be the situation in a non-dollarised country. Monetary policy becomes undermined by currency substitution and the country relies on the stability of the foreign currency provider(s). Full dollarisation also impairs the lender of last resort function and hence the central bank's ability to respond to financial system emergencies. This may result in greater fragility in the financial system.

In the available literature, evidence of dollarisation in the last decade or so is well documented. For instance, Balino, et al, (1999) using the reported ratios of foreign currency to broad money for countries with International Monetary Fund arrangements, categorised countries as either highly or moderately dollarised economies. Countries such as Argentina (43.9 %), Bolivia (82.3 %), Croatia (57.4 %), Peru (64.0 %), and Uruguay (76.1 %) were considered as highly dollarised economies in 1995.[3] During the same year countries that were moderately dollarised included Armenia (20.4 %), Egypt (25.1 %), Estonia (11.4 %), Malawi (8.0 %), Poland (20.4 %), Uganda (13.5 %), Vietnam (19.7 %) and Zambia (16.2 %). Mongardini and Mueller (1999) in their application of ratchet effects in currency substitution to the Kyrgyz Republic point out that currency substitution ratios rose from virtually nil at independence (early 1990s) to below 25 % in Estonia, Moldova, Uzbekistan and Turkmenistan in 1995. During the same year, the ratio was 50 % or above in Armenia, Azerbaijan and Georgia.

Recent studies have shown that even after macroeconomic stability has been achieved, that is, there is moderate inflation, resumption of growth, stability in the exchange rate, and a relatively calm political situation, dollarisation may persist (Mongardini and Mueller, 1999). Ordinarily, macroeconomic stability provides the *conditio qua non* for dollarisation to abate. Experience from Latin America shows that the reduction in the ratio foreign currency deposits to broad money takes place only after long time lags. There is a tendency for agents to be "locked in" the pattern of having foreign currency deposits despite a decline in inflation and an appreciation of the exchange rate.

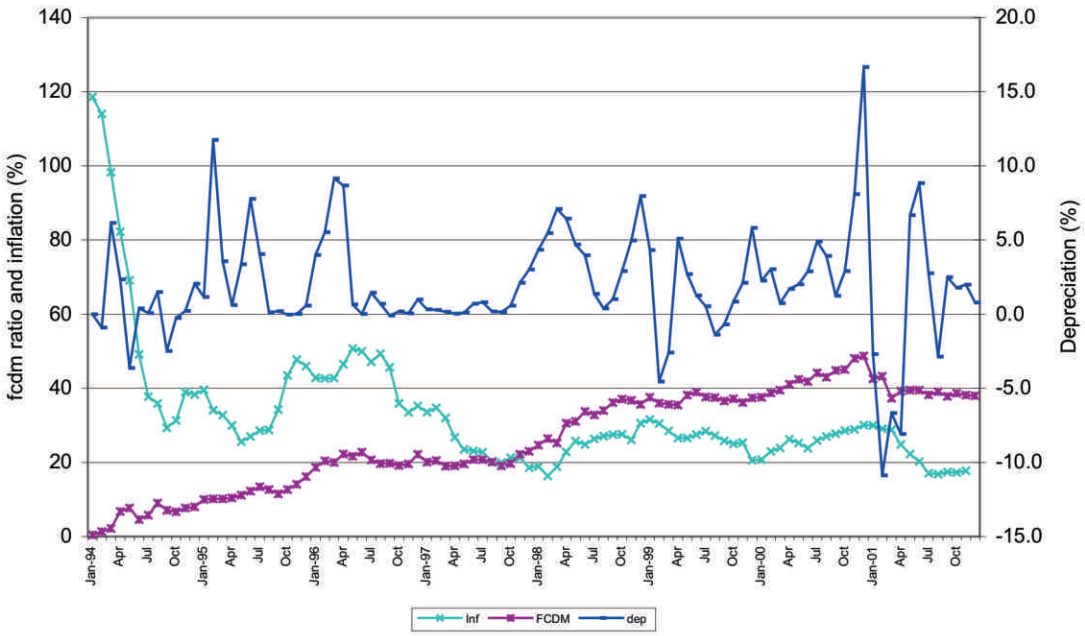
Ize and Levy-Yeyati (1998) indicate that policy implications of dollarisation are clear. First, they conclude that countries that seek to limit asset substitution should target inflation rather than the exchange rate. Further, tax-based policies have substantial costs in terms of capital flight and financial dis-intermediation while tight monetary policy that attempts to reduce dollarisation by tilting the domestic interest rate differential in favour of local currency deposits is bound to increase the dollarisation of loans which pose more severe prudential implications. However, Mongardini and Mueller (1999) articulate that by further stabilising the economy and reducing inflation to single digits, monetary policy can bring greater stability to the exchange rate and thus reduce the incentives behind the process of dollarisation.

4. Extent And Trend Of Dollarisation In Zambia

The evidence of dollarisation in Zambia indicates that there has been an upward trend between 1994 when foreign currency deposits were introduced and 2000. The movement in the ratio of foreign currency deposits to broad money (FCDM) is depicted in Chart 1. The chart also shows the developments in inflation and the depreciation of the Kwacha against the US dollar over the study period.

[3]Balino at al defined highly dollarised economies as those with foreign currency deposits to broad money ratios greater than 30 %, while those with ratios less than 30 % were categorized as moderately dollarised economies.

CHART 1. Indicators of Dollarisation in Zambia 1994-2001



Note: FCDM = Foreign currency deposits to broad money ratio.
Inf = Inflation.
Dep = Depreciation.

The FCDM ratio rose from 0.45 percent in March 1994 to 39.5 percent by the end of 2002. This measures the extent and development of dollarisation in Zambia. Using Balino et al (1999) definition of a highly dollarised economy, this is evidence that the Zambian economy has been highly dollarised since April 1998, when the FCDM was more than 30 percent. In terms of the actual foreign currency deposits, the development has not been different. There was a steady increase in deposits valued in US dollars from about US $8.1 million in March 1994 to US $268.6 million by December 2001 (see Chart 2). Inflation generally had a downward trend with the overall annual rate declining from 118.6 percent at end-January 1994 to 18.7 percent at end-December 2001.

CHART 2. Foreign Currency Deposits and Inflation 1994-2001

Key: fcd = foreign currency deposits in US dollars.
Inf = Inflation.

5. EMPIRICAL METHODOLOGY

The empirical model employed to identify the determinants of dollarisation, like most econometric studies, rely on a simple structural model that is based on a standard demand function and incorporates inflationary or exchange rate expectations and/or interest rate differentials as the main explanatory variables (Mongardini and Mueller, 1999). The econometric analysis in this paper assumes the same model using Zambian data.
The dollarisation model adopted can be presented in equation form as follows:

$$FCDM_t = \alpha + \beta_1 FCDM_{t-1-L} + \beta_2 Dep_{t-L} + \beta_3 inf_{t-1} + \beta_4 Intdiff_{t-L} + u_t \quad \textbf{(1)}$$

where *FCDM* is the ratio of foreign currency deposits to broad money, *Dep* is the depreciation of the Kwacha against the US dollar, *Inf* is the inflation rate while *Intdiff* represents the interest differential between the local 28-day Treasury bill yield rate and the US Fed Funds rate. It was expected that depreciation and inflation would be positively related with the ratio of foreign currency deposits to broad money. However, it was expected that the interest rate differential and broad money would be negatively correlated.

Since *FCDM* is a ratio falling within zero and one there was need to transform the series to avoid the fitted value of the ratio from falling outside the 0-1 range when there are outlying values of the independent variables.

6. Empirical Results

Econometric Analysis

The focus of this section was to estimate dollarisation equation (1) for Zambia, based on Mongardini and Mueller (1999) without the ratchet variable but with inflation as follows:

$$FCDM_t = \alpha + \beta_1 FCDM_{t-1-L} + \beta_2 Dep_{t-L} + \beta_3 inf_{t-1} + \beta_4 Intdiff_{t-L} + u_t \qquad \textbf{(2)}$$

where $\beta_1 > 0, \ \beta_2 > 0, \ \beta_3 > 0, \ \beta_4 < 0$

After this, it was imperative to test whether dollarisation represented by FCDM can be explained by the depreciation of the Kwacha against other currencies, inflation and interest rate differential. In other words, the hypotheses that the coefficients of the independent variables are non-zero were tested.

(a) Time Series Properties of the variables in the Equation

The first step was to examine the time series properties of the four variables in equation 1. Firstly, the Augmented Dickey-Fuller (ADF) test, with a trend and without a trend, as implied by equation (2), was applied to the four data series in levels and first differences. An arbitrary maximum lag of 12 was selected from which, working downwards; all insignificant terms were eliminated until the best specification was reached.

$$\Delta y_t = \alpha + \delta t - \Omega y_{t-1} + \sum \gamma_i \Delta y_{t-i} + \varepsilon_t, \quad t = 1,....., n \qquad (3)$$

where the null hypothesis is $H_0 : \rho = 1$ against $H_1 : \rho < 1$ and

y = variable to be tested

α = a constant

t = trend

ε = disturbance term

ρ, δ, Ω and γ are parameters

The results of the ADF unit root tests are tabulated in Table 1 in the appendix. The null hypothesis of a unit root cannot be rejected for the dependent variable FCDM at all levels of significance, both with and without a trend while it is rejected for the first difference. It is thus established that the dependent variable has a unit root, i.e. it is I(1). However, the independent variables namely, *Dep*, *Inf* and *Intdiff* were found to have no unit roots, i.e. they are I(0).

(b) Estimation of the Equation

Since the independent variables were found to be I(0), whilst the dependent variable is I(1), the method of co-integration could not be employed as it requires that all series are I(1). Thus, the paper proceeded to difference the dependent variable in order to transform it into a stationary series after which the Ordinary Least Squares (OLS) method was employed to estimate equation (1).

An initial regression of FCDM on its own lagged values, the lags of depreciation, inflation and interest differential with a constant as implied by equation (1) above produced results consistent with the theoretical model (see Eviews Output in Table 2). The coefficients were correctly signed implying that higher depreciation and a rise in inflation will result in the foreign currency deposits to broad money ratio rising. On the contrary, in line with the theory, a higher interest rate differential will encourage a switch of funds from foreign currency denominated assets in preference for Kwacha denominated assets.

In addition, the coefficients of the one-period lags of the dependent and depreciation variables were significant at the 5 % significance level while the coefficient for the inflation variable with a two-period lag was found to be significant at 10 % level. However, the coefficient of the lagged interest rate differential was statistically insignificant even at 10 % significance level. The equation was specified as:

$$FCDM_t = 0.1749 + 0.9103FCDM_{t-1} + 0.0158Dep_{t-1} + 0.0041Inf_{t-1} \quad 0.001Intdiff_{t-1} + u_t$$

In an attempt to improve the specification of the equation, the interest rate differential was dropped from the equation to reduce equation (1) to the following:

$$FCDM_t = \alpha + \beta_1 FCDM_{t-1} + \beta_2 Dep_{t-1} + \beta_4 inf_{t-1} + u_t \qquad \textbf{(4)}$$

The results of regressing FCDM on its own lag, the one-period lags of depreciation and inflation are tabulated in Table 2. The results show that the coefficients of the independent variables were correctly signed and significant at the 5% significance level. Further, the Durbin-Watson statistic at 1.9% and the adjusted R-squared at 95 % are well within the acceptable range, indicating non-existence of serial correlation as well as goodness of fit. These results are an acceptance that the one-period lags of the dependent variable, the currency depreciation and inflation can explain the changes in foreign currency deposit holdings which was accepted at 5 % level of significance.

These econometric results indicate that persistent currency depreciation and inflation have been significant determinants of dollarisation in Zambia during the last seven years. In addition, there is a ratchet effect[4] whereby, once depositors have converted to foreign currency deposits, they will not convert back to local currency denominated assets even when fundamental determinants of dollarisation have changed. Clearly, macroeconomic instability represented by depreciation and inflation is the fundamental factor behind the process of dollarisation as a result of loss of confidence in local currency denominated assets.

(c) Further Tests

The econometric graveyard is full of magnificent correlations, which are spurious or meaningless. Interesting examples include a positive correlation between teachers' salaries and the consumption of alcohol and a superb positive correlation between

[4]This is mainly due to large fixed costs involved in changing to foreign currency assets and their wide-spread use and acceptance induce households and enterprises to continue using substitute assets even in the event of a decline in inflation or an appreciation in the exchange rate.

the death rate in the UK and the proportion of marriages solemnized in the Church of England (Eviews Version 4.0 Manual, 2000). To check the consistence and robustness of the OLS results, the Granger Causality and Probit tests were conducted.

The Granger Causality Test answers the question of how much of the current values of the dependent variable can be explained by past values of the independent variable. It also seeks to test whether adding more lagged variables of the dependent variable can improve the explanation of the movements in the dependent variable. It is worth mentioning that the statement "x Granger causes y" does not imply that y is the effect or the result of x. The Granger causality test merely measures precedence and information content but does not by itself indicate causality in the more common use of the term.

The results of the Granger Causality test are consistent with those of the OLS procedure Both hypotheses that *Dep* and *Inf* do not Granger cause *FCDM* were rejected whilst the alternative hypotheses were accepted (see Table 3). This implies one-way Granger causality running from *Dep* and *Inf* to *FCDM* and not the other ay. However, the hypotheses that *Intdiff* does not Granger cause FCDM and the opposite were both accepted indicating poor information content. This ends further support to the results of the LS procedure whose coefficient on the interest rate differential variable was insignificant.

As stated above, the Granger causality test is about precedence and information content. To examine the strength of the relationship between the dependent and independent variables, it is appropriate to conduct a logit or probit test (see Table 4). The probit test is also a test of the explanatory power of the independent variables on the dependent variable. Economic agents are sometimes faced with a choice between two alternatives (for example in this case whether to invest their money in foreign currency denominated assets or domestic currency denominated assets) and their choice depends on a set of k explanatory variables. To model this kind of decision making process, logit or probit models, which are also referred to as stimulus and response models become handy. The logit/probit tests employ maximum likelihood to show the extent to which a dependent variable responds to a stimulus from an independent variable.

Since a one-way causal relationship between the dependent and independent variables was established, the probit test was employed to test the explanatory power of the independent variables in this relationship. Table 4 below, in which the interest differential variable has been left out, depicts the results of the probit test. Firstly, the estimated coefficients had the expected signs, which are positive. However, the results of the probit test are insignificant at all conventional significance levels, i.e., the joint null hypothesis that the coefficients of the independent variables are Zero is rejected in favour of the alternative hypothesis that the coefficients are not equal to zero. These results confirm those of the OLS procedure. Secondly, to calculate the marginal effects of unit changes in the rate of depreciation and inflation, the probit test provides a factor, which is multiplied by the coefficients of the respective variables. These were calculated to be 0.0184064 and 0.0024546, respectively. This implies that a 1% change in the exchange rate will result into a 0.018% change in foreign currency deposits to broad money supply ratio. Similarly, a 1% change in the rate of inflation will result into a 0.002% change in the ratio.

7. Policy Implications

An interesting finding from the study was that the interest rate differential was not correlated to the ratio of foreign currency deposits to broad money in the case of Zambia. A few reasons are discernible to explain this unexpected result. First, uncertainty about the continued availability of foreign exchange encourages depositors to maintain their foreign currency deposits regardless of what adjustments are made to the interest rate. This is particularly the case when economic agents forecast persistent depreciation and high rates of inflation. High returns are received from speculating on the dollar than investing in Kwacha denominated assets..

Second, asymmetric information in the market about the level of foreign exchange available which breeds more uncertainty, which results in some pressure on the Kwacha to depreciate. Finally, but not the least, there is uncertainty about donor inflows in general and balance of payments support in particular. All these uncertainties outweigh the benefits that may arise from changes in the interest rates, resulting in a situation where they are not a key factor considered in the process of dollarisation in Zambia.

The study has shown that the major causes of dollarisation in Zambia are instability in the exchange rate and inflation. The two variables are an embodiment of macroeconomic instability in any economy. In this regard, the level of dollarisation can be moderated by the use of monetary policy to achieve sustained stability in the exchange rate as well as attainment of a single-digit inflation rate.

However, other studies (Mongardini and Mueller, 1999) have established that short-term macroeconomic stability may not significantly reduce dollarisation due to the ratchet effect. Therefore, sustainable macroeconomic policy stability resulting in stable currency and low inflation is the panacea to lowering dollarisation in a liberalised financial system.

Since foreign currency deposits are used as a hedging vehicle for economic agents that have lost confidence in local currency assets, as they earn more through gains from depreciation, they use their local currency earnings to demand for foreign exchange to pay for their imports and other costs. They may even borrow working capital to meet their operational expenses. This puts pressure on the local currency to depreciate as demand superficially outstrips supply of foreign exchange on the market. Further, the high levels of foreign currency deposits as a proportion of broad money makes the economy susceptible to increased capital mobility as the public can potentially shift between dollar-denominated deposits held by domestic banks and abroad, and between dollar- and domestic currency-denominated deposits held with domestic banks (Balino, T.J.T., et al., 1999).

To reduce this speculative behaviour, substantial progress in stabilising the exchange rate and lowering inflation have to be made to win back confidence in the local currency assets as investment vehicles. Introduction of foreign currency denominated assets may also be supportive in this case. The other alternative to minimise the resulting volatility in the exchange rate is use of direct restrictive measures on foreign currency deposits.

Potential fragility of the banking system, a major cost of dollarisation, is yet another problem from dollarisation (Balino, T.J.T, et al., 1999). This may be related to the repayment difficulties of some borrowers for the dollar-denominated loans. This calls for adoption of special prudential measures to help commercial banks in times of exchange rate volatility and swings in capital flows.

There is need to broaden and deepen the financial market by introducing new instruments which are dollar-based to contribute in mopping-up liquidity in the banking system. These could include dollar term deposits that would help withdraw some liquidity at least for a given period.

8. CONCLUSION

The study has established that the Zambian economy is highly dollarised with foreign currency deposits to broad money ratio hovering around 50 percent by the end of 2000. The causes of dollarisation in Zambia are found in macroeconomic instability, which is exhibited by exchange rate volatility and high levels of inflation. This finding is confirmed by studies of other developing nations and countries in transition. Dollarisation poses several challenges for monetary policy as it makes macroeconomic stability an imperative to restore economic agents' confidence in local currency assets and the financial system in general.

Appendix

TABLE 1. Augmented Dickey-Fuller Test results

Variable	ADF	Test Statistic	Critical Value
FCDM	-0.368784	1 % Critical Value	-3.5111
		5 % Critical Value	-2.8967
		10 % Critical Value	-2.5853
Dep	-3.640931	1 % Critical Value	-3.5111
		5 % Critical Value	-2.8967
		10 % Critical Value	-2.5853
Inf	-6.418097	1 % Critical Value	-3.5111
		5 % Critical Value	-2.8967
		10 % Critical Value	-2.5853
Intdiff	-5.357355	1 % Critical Value	-3.5111
		5 % Critical Value	-2.8967
		10 % Critical Value	-2.5853

TABLE 2. Regression results using the OLS method
Sample period Jan 1994 to December 2000

Regression 1
Dependent Variable: LFCDM
Method: Least Squares
Date: 04/11/01 Time: 14:30
Sample(adjusted): 1994:02 2000:12
Included observations: 83 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.174898	0.134499	1.300369	0.1973
LFCDM(-1)	0.910272	0.031326	29.05786	0.0000
DEP(-1)	0.015816	0.004335	3.648120	0.0005
INF(-1)	0.004114	0.002404	1.711793	0.0909
INTDIFF(-1)	-0.000972	0.001418	-0.685440	0.4951

R-squared	0.960525	Mean dependent var	3.017087
Adjusted R-squared	0.958501	S.D. dependent var	0.704475
S.E. of regression	0.143512	Akaike info criterion	-0.986452
Sum squared resid	1.606455	Schwarz criterion	-0.840739
Log likelihood	45.93775	F-statistic	474.4823
Durbin-Watson stat	1.851822	Prob(F-statistic)	0.000000

Regression 2
Dependent Variable: LFCDM
Method: Least Squares
Date: 04/11/01 Time: 15:07
Sample(adjusted): 1994:02 2000:12
Included observations: 83 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.181124	0.133741	1.354290	0.1795
LFCDM(-1)	0.911944	0.031126	29.29842	0.0000
DEP(-1)	0.016482	0.004211	3.914018	0.0002
INF(-1)	0.002769	0.001382	2.003008	0.0486

R-squared	0.960287	Mean dependent var	3.017087
Adjusted R-squared	0.958779	S.D. dependent var	0.704475
S.E. of regression	0.143029	Akaike info criterion	-1.004543
Sum squared resid	1.616131	Schwarz criterion	-0.887972
Log likelihood	45.68853	F-statistic	636.7598
Durbin-Watson stat	1.847610	Prob(F-statistic)	0.000000

TABLE 3. Granger Causality Test Results

Pairwise Granger Causality Tests
Date: 04/23/01 Time: 16:42
Sample: 1 84
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Probability
DEP does not Granger Cause LFCDM	83	17.0061	9.1E-05
LFCDM does not Granger Cause DEP		5.20748	0.02515
INF(-1) does not Granger Cause LFCDM	83	5.37649	0.02296
LFCDM does not Granger Cause INF(-1)		0.24166	0.62436
INTDIFF(-2) does not Granger Cause LFCDM	83	0.99793	0.32082
LFCDM does not Granger Cause INTDIFF(-2)		0.06339	0.80186
INF(-1) does not Granger Cause DEP	83	3.98236	0.04938
DEP does not Granger Cause INF(-1)		14.8222	0.00024
INTDIFF(-2) does not Granger Cause DEP	83	8.84034	0.00389
DEP does not Granger Cause INTDIFF(-2)		19.9598	2.6E-05
INTDIFF(-2) does not Granger Cause INF(-1)	83	5.58147	0.02058
INF(-1) does not Granger Cause INTDIFF(-2)		10.8602	0.00147

TABLE 4. Probit Maximum Likelihood Estimation

Probit Maximum Likelihood Estimation
The estimation method converged after 4 iterations

****

Dependent variable is FCDM
81 observations used for estimation from 1994M4 to 2000M12

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
FCDM(-1)	.0010390	.0079141	.13128[.896]
DEP(-1)	.049260	.050619	.97315[.333]
INF(-2)	.0065691	.0052661	1.2474[.216]

****

Factor for the calculation of marginal effects	= .37366
Maximized value of the log-likelihood function	= -52.2391
Akaike Information Criterion	= -55.2391
Schwarz Bayesian Criterion	= -58.8308
Hannan-Quinn Criterion	= -56.6801
Mean of CFCDM2	= .65432
Mean of fitted CFCDM2	= 1.0000
Goodness of fit	= .65432
Pesaran-Timmermann test statistic	= *NONE*
Pseudo-R-Squared	= .069567

****

Predicted values of FCDM are all 1's.

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CHAPTER SEVEN

Exchange Rate Pass-Through to Domestic Prices: The Case of Zambia

Hobby M. Simuchile

1. INTRODUCTION

This paper investigates the influence of exchange rate depreciation on domestic prices, commonly known as exchange rate pass-through. A recursive Vector Autoregression (VAR) Model is estimated from which impulse responses and variance decompositions are derived using the Cholesky Decomposition to identify structural shocks. Knowledge of this influence will assist greatly in the conduct of monetary policy and combating inflation.

The rest of the paper is organized as follows: Section 2 gives a brief background to the Zambian economy whilst section 3 presents the theoretical framework of exchange rate pass-through. Section 4 presents some empirical literature and findings from other countries. Section 5 presents a recursive vector auto regression (VAR) model with supply shocks, demand shocks, exchange rate, and consumer prices based on McCarthy's 2000 model as well as the results. The conclusion is given in Section 6.

2. BACKGROUND

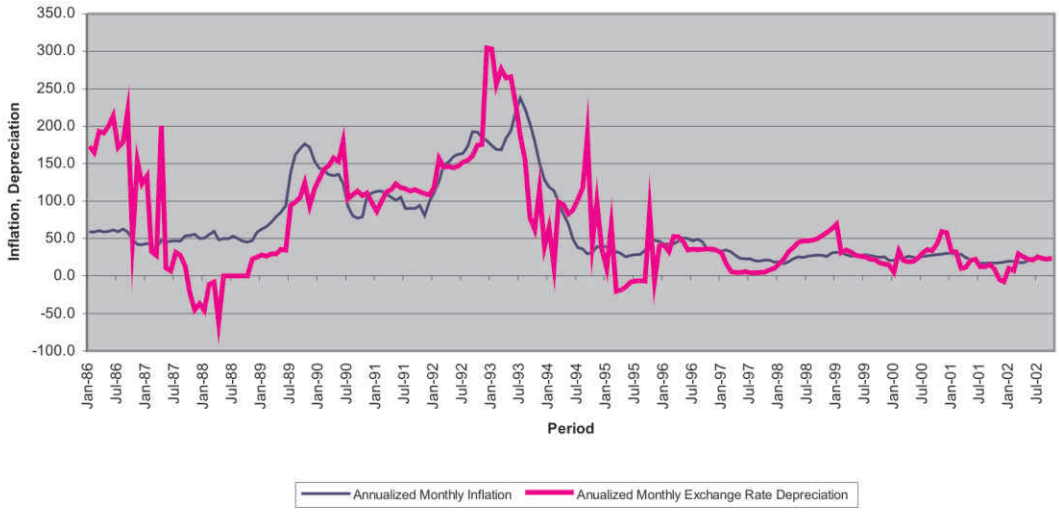
Prior to October 1992, many aspects of the Zambian economy were nationalised and centrally controlled. Fiscal and monetary indiscipline were rife and had led to hyperinflation ranging in the three-digit region by 1991 (176.4 percent in October 1989 and 113.3% by February 1991). In addition, the authorities had pursued several exchange rate regimes, which included fixed (1964 - 1971, 1982, and 1987 - 1989), managed float (1976 1983, 2001 to date), crawling peg (1985 - 1987), free-float (1992 - 2001). These were accompanied by stringent capital and current account controls. Further more, interest rates were administratively set and price controls prevailed.

The inflation resulting from fiscal and monetary indiscipline had led to an overvalued currency and hence the economy becoming uncompetitive. This gave rise to serious balance of payments problems, which were characterised by a thriving foreign exchange parallel market, narrow export base dominated by an uncompetitive and declining copper mining industry and a huge import bill. The economy was also burdened by a huge external debt and arrears, which had accumulated as a result of failure to service debt. Moreover, price controls and the absence of competition, under the protective umbrella of import substitution industrialisation, restricted both agriculture and industrial growth leading to increasing inefficiency and escalating cost structures. This adversely affected the productive sectors' performance and profitability leading to the economy registering negative growth in the decade leading to 1992.

It was against this background that the authorities, in 1991, embarked on a series of radical policy reforms to liberalise the economy and rid it of the distortions and inefficiencies that had arisen. Amongst these reforms were the privatisation of state owned enterprises, liberalization of the financial and foreign exchange market r and decontrol of prices. Floating of the exchange rate was considered vital for redressing the balance of payments problems through adjustment of relative prices .

Prior to floating, annualised monthly inflation rate averaged 81 percent during the five years leading up to 1992. Immediately after floating, the inflation rate rose to as high as 237.8 percent in July 1993 (see figure 1 below). This was seen as an adjustment of the price level to its equilibrium, given that prices had been repressed through price controls. Between January 1994 and December 1997, the average rate of inflation declined to 41.2 percent, ending at 18.6 percent in December 1997.

FIGURE 1: Plot of Monthly Inflation and Monthly Exchange Rate Depreciation.



Although the rate of inflation has been brought down from triple to double digits, it still remains moderately high at an average of 24.2 percent between 1998 and 2002.

In 1998, the Zambian authorities undertook a five-year macroeconomic program under which, amongst other things, they sought to bring down the rate of inflation from 18.6 percent at the end of 1997 to single digits by the end of 2002. However, this has been difficult to achieve due to many factors such as demand, supply and external shocks, including large fluctuations in the external value of the Kwacha. Instead of coming down, the rate of inflation averaged 24.2 percent between 1998 and 2002. This paper investigates the link between exchange rate fluctuations and inflation, which is commonly known as exchange rate pass-through.

3. THEORETICAL FRAMEWORK

Exchange rate pass-through is generally defined as the degree to which changes in the exchange rate are transmitted into domestic currency import prices (Dwyer et al 1993, Menon 1996, Goldberg and Knetter 1997, and Sahminan 2002). In countries where there is

over reliance on importation of capital and intermediate inputs into industry, exchange rate depreciation is also transmitted to producer prices and ultimately to consumer prices. Exchange rate pass-through can therefore, be defined in a broader sense, to mean the degree to which exchange rate changes are transmitted to domestic prices. The pass-through to domestic prices can be complete or partial. Complete pass-through occurs when changes in the exchange rate are completely transmitted to domestic prices, i.e. a percentage change in the exchange rate causes a proportionate change in the domestic price level. Partial exchange rate pass-through occurs when a percentage change in the exchange rate causes a less than proportionate change in domestic prices.

The degree and speed of pass-through depends on the relative share of imports in the consumer price index (CPI) basket and on other factors such as demand conditions, the cost of adjusting prices and expectations as to whether the depreciation is temporary or permanent (Philips 1988, Piggot and Reinhart 1985).

Changes in the exchange rate inevitably affect domestic prices either directly or indirectly through changes in the composition of demand or in the levels of aggregate demand and wages (Khan 1987, Menon 1995).

The direct channel of pass-through affects a country's external sector through the price of imports. This can be illustrated using the concept of Purchasing Power Parity, which states that countries have identical price levels when the prices are measured in a common numeraire:

$$P_t^I = E_t P_t^* \qquad (1)$$

where P_t^I is the domestic price level of imports, E_t is the nominal exchange rate and p* is the foreign price level. Taking logs of equation (1) yields,

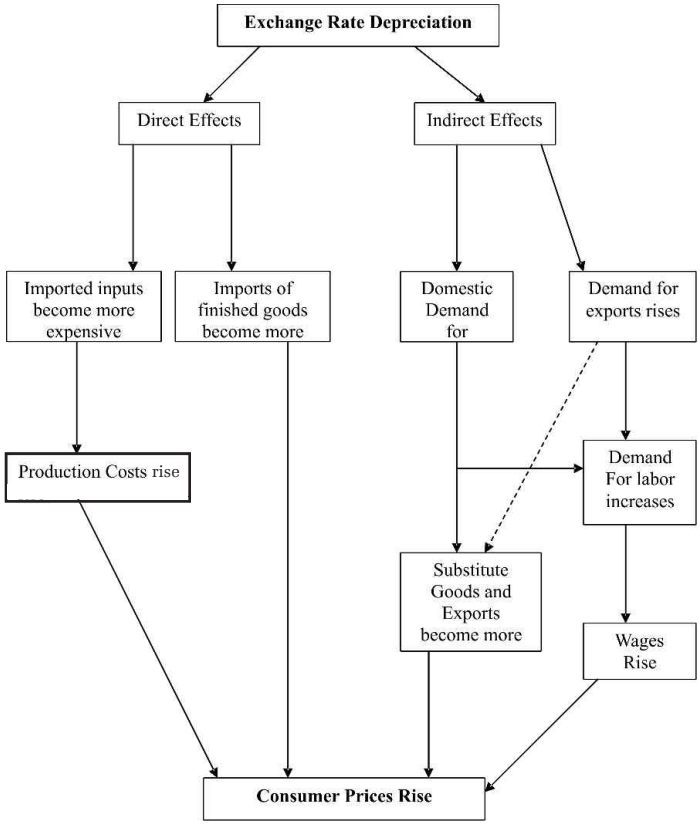
$$p_t^I = e_t + p_t^* \qquad (2)$$

which states that the domestic price level of imports is a positive function of the nominal exchange rate and foreign price level. As such, changes in the exchange rate or foreign price level are translated into domestic import-prices. In other words, exchange rate changes affect the price of imported intermediate goods, thereby increasing production costs, which are passed on to consumer prices. Exchange rate changes also affect the price of imported finished products and hence consumer prices. This is the direct channel of exchange rate pass-through. For an economy that is highly dependent on imports for input into industry as well as finished products, the pass-through can be high since exchange rate changes affect not only the production chain, but also the wholesale and retail prices.

A depreciation of the exchange rate affects domestic prices indirectly by making domestic products relatively cheaper for foreign buyers, which raises aggregate demand[1] and leads to an increase in the domestic price level. Since nominal wage contracts are fixed in the short run, real wages decrease and output increases. Over time, real wages increase to their original level pushing up production costs and the overall price level whilst output falls. In the end, therefore, exchange rate depreciation causes a permanent increase in the domestic price level with only a temporary increase in output (Hufner and Schroder 2002, Khan 1987 and Lafleche 1996 - 1997). Figure 2 below illustrates the direct and indirect channels of exchange rate pass-through.

[1]Argument assumes high price elasticity of demand

FIGURE 2



According to Dwyer et al (1993), the above representation of exchange rate pass-through assumes perfect competition. By relaxing the assumption of perfect competition, allowance can be made for variations in the profit margins of price setting agents. The price of a traded good can therefore be defined as the sum of the cost of producing the good and a margin or price mark-up . This can be presented in logs as:

$$p^* = c^* + m^* \qquad (3)$$

which can be expressed in domestic currency as:

$$p_t^i = (c^* + m^*) + e \qquad (4)$$

From equation (4), it can be shown that the change in the domestic price of traded goods will be related not only to the exchange rate, but also to the pricing policies of importers or suppliers of imported goods.

Hooper and Mann (1989) argue that presentation of the pass-through relationship should allow for the variation of margins of both domestic and foreign price setting agents. This allows for equation (4) to be presented as follows:

$$c + m = (c^* + m^*) + e \quad (5)$$

The left hand side of equation (5) represents the price setting of local importers and distributors while the right hand side represents the price setting of foreign agents. From the equation, it is apparent that exchange rate pass-through occurs in two stages. First, foreign price setting agents will choose either to maintain or change their margins in response to a depreciation. Second, local importers or distributors will in turn choose to maintain or change their margins when setting the price that they charge local customers. Thus, in an environment of imperfect competition, the final impact of an exchange rate change on consumer prices is determined by the extent of combined pass-through.

It must also be noted that the degree of exchange rate pass-through depends on the relative elasticities of demand for and the supply of traded goods, macroeconomic conditions and the microeconomic environment (Dwyer et al 1993, Philips 1988).

4. Empirical Evidence

Most of the studies on exchange rate pass-through have concentrated on industrialised and emerging economies, with only a few such as Anaya (2000), Goldfajn and Werlang (2000), Alba & Papell (1998) and Garcia & Restrepo (2001) extending the study to developing countries.

A review of the literature indicates that most of the studies on exchange rate pass-through have followed in the footsteps of the pioneering study by Dornbusch (1987), which applied industrial organisation models to explain the relationship between the exchange rate changes and domestic price changes in terms of market concentration, import penetration, and the substitutability of imported and domestic goods. Building upon Dornbusch's work, Feinberg (1989) carried out studies on the United States and Germany and found evidence of exchange rate pass-through to domestic prices being greater in industries that were less concentrated and faced greater import penetration. Goldberg and Knetter (1997) have concluded that the pass-through to imports is smaller in segmented industries.

Using cointegration and a vector error correction model (VECM) and Granger Causality, Kim (1998)the estimated exchange rate pass-through for the United States of America(USA) by relating producer price inflation in the USA to the trade weighted effective exchange rate, money supply, aggregate income and interest rates. He found that the exchange rate changes contributed significantly to changes in producer prices. Kenny and McGettigan (1998) also use the cointegration approach to study exchange rate pass-through for Ireland and found that the degree of pass-through in their study was much higher.

Applying the ordinary least squares (OLS) estimation technique, Ranki (2002) examined the exchange rate pass-through for the Euro area and concluded that the exchange rate pass-through from the Euro/US$ exchange rate into consumer prices is complete and occurs within a month. Hufner and Schroder (2002) contradict this finding by pointing out that recent experience within the Euro area were that 25 percent depreciation of the Euro in the first two years of its existence did not translate into similar increases in consumer prices. To support their claim, Hufner and Schroder also examined the pass-through of exchange rate changes to consumer prices for the Euro area by estimating a VECM for Germany, France, Italy, the Netherlands and Spain. Using the weights of the harmonised index of consumer prices (HICP), they computed a weighted average of the country results for the Euro and found that in response to a 10 percent depreciation of the euro nominal effective exchange rate index, the HICP tends to increase by 0.4 percent after 12 months. The total effect amounts to 0.8 percent and the adjustment of consumer prices is completed after three years.

McCarthy (1999 - 2000) investigated the impact of exchange rate and import prices on domestic producer price index (PPI) and CPI in selected industrialised economies. He estimated a VAR model, incorporating a distribution chain of pricing for the period 1976 to 1998. Impulse responses and variance decompositions indicated that external factors have a modest effect on domestic price inflation. The pass-through was found to be somewhat stronger in countries with a larger import share in PPI and CPI. He also found that the import share of a country and the persistence of exchange rate changes are positively correlated with the extent of pass-through to consumer prices while exchange rate volatility was found to be negatively correlated. Exchange rate volatility may be found to be negatively correlated with exchange rate pass-through due to its asymmetric influence on producer and consumer prices. For example, when the exchange rate depreciates, producers, wholesalers and retailers may interpret this as temporally and anticipate an appreciation. Due to menu costs and medium to long-term contracts, prices are not immediately adjusted, i.e. they are sticky.

Bhundia (2002), and Leigh and Rossi (2002) followed McCarthy's footsteps and investigated the degree of exchange rate pass-through to consumer prices for South Africa and Turkey, respectively. Bhundia found that the average pass-through for South Africa was low. Using the same model, Bhundia employed a structural vector autoregression (SVAR) technique and found that the pass-through in South Africa was much higher for nominal shocks compared to real shocks. Leigh and Rossi employed a recursive VAR model to investigate the impact of exchange rate movements on prices in Turkey and found that the impact of the exchange rate on prices is over after about a year but mostly felt in the first four months. They also found that the pass-through to wholesale prices in Turkey is much higher compared to the pass-through to consumer prices.

Goldfajn and Werlang (2000) employ [panel estimation methods] to investigate pass-through effects to consumer prices for a sample of 71 countries classified into developed, emerging and developing countries. They concluded that for the period of 1980 - 1998, pass-through effects on consumer prices increase over time and reach a maximum after 12 months. Factors such as real exchange rate overvaluation and under valuation, the initial inflation rate, GDP deviations from an estimated trend and the degree of openness were found to influence the pass-through coefficient. In general, the pass-through was found to be substantially lower in developed economies than in emerging and developing economies.

5. Model and Methodology

Different techniques of econometric estimation have also been employed, with earlier studies applying Ordinary Least Squares (OLS) techniques. Recent studies have employed Cointegration, Vector Auto Regression (VAR) and Error Correction Models (ECM). The earlier studies have been criticised for applying OLS techniques, which do not take into account the time-series properties of the data (McCarthy 1999 - 2000, Hufner and Schroder 2002). The earlier studies have also been criticised for using single equation estimation, which leads to seriously biased, and inefficient estimates as due account is not taken for strong simultaneity of import prices and domestic competing prices (Kenny and McGettigan 1996).

To investigate the exchange rate pass-through to domestic prices in Zambia, we adapt and estimate McCarthy's 1999 model. The rationale for replicating McCarthy's model is that it enables us to analyse how exchange rate changes are transmitted through the production chain, from imports of inputs and finished products to producer and consumer prices. The model is also suited to a small developing economy with an underdeveloped manufacturing industry and a large import-to-GDP share. Additionally, McCarthy's model captures supply shocks.

In McCarthy's model, inflation at a particular distribution stage in period t is assumed to comprise different components. The first component is the expected inflation at that stage based on the available information at end of period *t*-1. The second and third components are effects of period *t* domestic supply and demand shocks on inflation at that stage. The fourth component is the effect of exchange rate shocks on inflation at a particular stage. Next are the effects of inflation shocks at the previous stages of the distribution chain. Finally, there is the inflation shock at the particular stage.

The inflation shocks at each stage are simply that portion of that stage's inflation which cannot be explained using information from period *t*-1 plus information about domestic supply and demand variables, exchange rates and period t inflation at previous stages of the distribution cycle. These shocks can thus be thought of as changes in the pricing power and mark-ups of firms at these stages. It is also important to note that (i) the model allows import inflation shocks to affect consumer prices directly through their effects on producer prices and (ii) there is no contemporaneous feedback in the model. For example, consumer inflation shocks affect inflation at the import and producer stages only through their effect on expected inflation in future periods.

Under these assumptions, the inflation rates of a country in period *t* at each of the three stages can be written as:

$$\pi_t^m = E_{t-1}(\pi_t^m) + \alpha_1\varepsilon_t^s + \alpha_2\varepsilon_t^d + \alpha_3\varepsilon_t^e + \varepsilon_t^m \quad (6)$$

$$\pi_t^w = E_{t-1}(\pi_t^w) + \beta_1\varepsilon_t^s + \beta_2\varepsilon_t^d + \beta_3\varepsilon_t^e + \beta_4\varepsilon_t^m + \varepsilon_t^w \quad (7)$$

$$\pi_t^c = E_{t-1}(\pi_t^c) + \gamma_1\varepsilon_t^s + \gamma_2\varepsilon_t^d + \gamma_3\varepsilon_t^e + \gamma_4\varepsilon_t^m + \gamma_5\varepsilon_t^w + \varepsilon_t^c \quad (8)$$

where, π_t^m, π_t^w and π_t^c are import prices, PPIand CPI, respectively; ε_t^s, ε_t^d and ε_t^e are the supply, demand and exchange rate shocks respectively; ε_t^m, ε_t^w and ε_t^c are the import price, PPI and CPI inflation shocks; and $E_{t-1}(\bullet)$ is the expectation operator based on the information set at the end of period *t*-1. The shocks are assumed to be serially uncorrelated as well as uncorrelated with one another within a period.

The structure of the model (6)- (8) suggests it is part of a recursive framework. Thus, to complete the empirical model, the following assumptions are made: (i) Supply shocks are identified from the dynamics of oil price inflation denominated in the local currency. (ii) Demand shocks are identified from the dynamics of the output gap in the country after taking into account the contemporaneous effect of the supply shock. (iii) External shocks are identified from the dynamics of exchange rate changes after taking into account the contemporaneous effects of the supply and demand shocks.

$$\pi_t^{oil} = E_{t-1}(\pi_t^{oil}) + \varepsilon_t^s \quad (9)$$

$$\overline{y}_t = E_{t-1}(\overline{y}_t) + a_1\varepsilon_t^s + \varepsilon_t^d \quad (10)$$

$$\Delta e_t = E_{t-1}(\Delta e_t) + b_1\varepsilon_t^s + b_2\varepsilon_t^d + \varepsilon_t^e \quad (11)$$

Finally, it is assumed that the conditional expectations in equation (6) - (11) can be replaced by linear projections of the lags of the six variables in the system.

Under these assumptions, the model is estimated as a recursive VAR using the Cholesky decomposition. The impulse responses of CPI and inflation to orthogonalised shocks of exchange rate changes, foreign inflation, the out-put gap and petroleum price inflation then provide estimates of the effect of these variables on domestic prices. In addition, a variance decomposition of CPI determines the importance of these external variables for domestic inflation.

decomposition of CPI determines the importance of these external variables for domestic inflation.

Data and Estimation Procedure

The sample covers the period January 1994 to June 2001. Due to lack of data on the wholesale price index (WPI) and PPI for the period under review, the model, as outlined in equations (6) to (11), is modified to leave out the WPI and PPI variables. And since output (yt) data is computed only on an annual basis, the revised model uses the Index if Industrial Production as a proxy for output. Therefore, instead of six equations, the modified equation only uses 5 equations.

Data on the monthly nominal exchange rate and domestic CPI was obtained from the Bank of Zambia's Fortnightly Statistical Bulletin. The data on the index of industrial production (IIP) was obtained from Central Statistical Office (CSO). Since the IIP is an index, deviations from a 100 will represent deviations from the normal or potential trend, which is the output gap. The series on foreign CPI is a weighted CPI of Zambia's main trading partners. The spot price of crude oil was obtained from the IMF's International Financial Statistics publications. Since Zambia's oil imports come from the Middle East, the Dubai spot price was used to represent petroleum prices.

The variables were transformed to be stationary. Unit root tests, using the Augmented Dickey-Fuller approach, are run on the levels and logarithms of the variables to determine their stationarity. The Dickey-Fuller tests suggest that all the variables are I(1) so that the VAR is estimated in first differences. In addition, lag length structure tests are carried out in order to choose the lag length that minimises the Akaike Information Criterion (AIC). The lag of four is chosen after testing and is found to minimise the AIC of the VAR.

The model is estimated over the period January 1994 to July 2001 (91 months). Impulse-responses to the exchange rate are forecasted over a period of 24 months (2 years) horizon to assess the pass-through from exchange rate fluctuations to domestic prices. These are standardised to correspond to a 1 percent increase in the exchange rate or foreign prices so as to allow for comparison of domestic price sensitivity to the exchange rate. Then variance decompositions are used to assess how much of the variance in domestic price indices over the forecast period can be attributed to the exchange rate. Since the focus is on the effects of an exchange rate shock on prices, the impulse responses of other variables are not reported.

The shocks of the exchange rates are estimated given the past values of all other variables plus the current values of oil prices and the output gap, i.e. the crude oil price and output gap enter as exogenous variables in the VAR. The solid line in each graph is the estimated response while the dashed lines denote a two standard error confidence band around the estimate. Under the assumptions of the model, the reduced form of residuals of the VAR are orthogonalised using the Cholesky decomposition to identify the structural shocks, where the variables are in the order given by the system of equations 6-11.

Results

i. Impulse Response

Figure 3 depicts the impulse response of domestic inflation to a one-percentage change in the nominal exchange rate. As expected, the response of inflation to a one-percentage change in the exchange rate is positive, rises gradually and peaks to one percent around the fourth month, then declines gradually and dies out after the fifteen month. The implication of this is that exchange rate pass-through in Zambia is complete, i.e. a one percent depreciation in the exchange rate results into a corresponding increase in domestic prices.

depreciation in the exchange rate results into a corresponding increase in domestic prices.

FIGURE3.

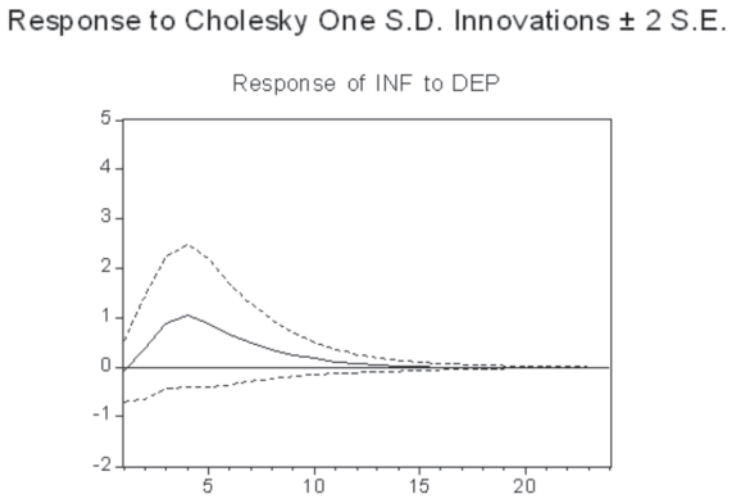
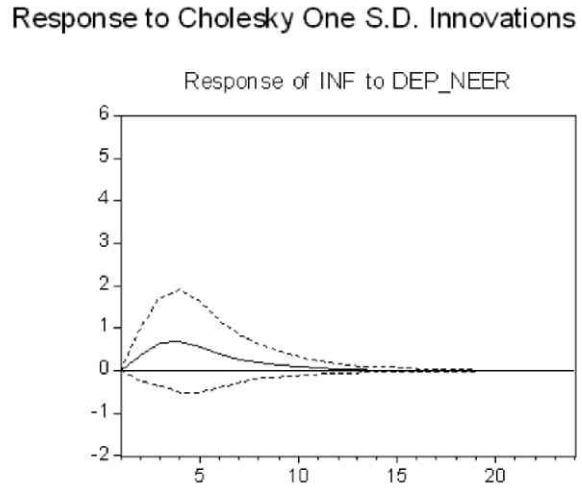


Figure 4 depicts similar results, but uses the depreciation in the nominal effective exchange rate instead of the nominal exchange rate. As in the case of the nominal exchange rate, the pass-through peaks in the fourth month but dies out after the 13th month. In this case however, the rate of pass-through is not complete, about 0.8 of the percentage change in the exchange rate. This is probably due to the fact that the nominal effective exchange rate is trade weighted and less volatile compared with the nominal exchange rate. However, 0.8 percent pass-through due to a one percent change in the nominal effective exchange rate is quite substantial and consistent with expectations.

FIGURE 4.



II. VARIANCE DECOMPOSITION

The impulse-response function provides information on the size of the pass-through of exchange rates to domestic prices. It does not however indicate the importance of these variables in domestic price fluctuations over the sample period. The variance decomposition allows us to examine the importance of exchange rate shocks in explaining domestic price fluctuations over the sample period.

Table 1 depicts the percentage variation of the CPI inflation that can be attributed to foreign inflation, exchange rate depreciation and CPI inflation itself. Foreign inflation explains about 3.1 percent of the inflation variation on average, which is quite minimal and most likely due to the fact that foreign inflation is relatively low and stable compared to Zambian inflation. Exchange rate shocks to domestic prices account for around 40 percent variation in the prices whilst innovations to the CPI inflation itself accounts for 30.6 percent variation in domestic prices on average. The rest is explained by innovations to petroleum prices and other variables.

The implication of this result is that exchange rate depreciation will result into domestic prices going up by about 40 percent. In addition, inflation will feed on itself and rise by a further 30.6 percent on average. This explains why the initial impact of exchange rate depreciation lasts up to 15 months before dying out.

TABLE 1

Variance Decomposition of INF

Period	S.E. F_	INF	DEP	INF
1	0.035027	0.000000	0.000000	100.0000
2	0.046351	11.14025	40.29135	33.81214
3	0.055674	3.400979	47.87849	36.93019
4	0.063370	2.753737	51.03072	38.20753
5	0.068984	2.476302	45.42412	37.30012
6	0.073573	2.367703	40.03874	35.74723
7	0.077522	2.301987	39.78769	33.03241
8	0.080994	2.257735	40.99075	30.94376
9	0.084121	2.230092	41.93644	30.14570
10	0.086999	2.219856	42.73251	30.49049

From the impulse-response and variance decomposition results, it can be said that the pass-through from exchange rate depreciation to domestic prices in Zambia is complete and mostly felt in the first four months. The resultant inflation from exchange rate depreciation also feeds on itself thereby rising even further. An interesting feature is that the pass-through is long and dies out after 15 months. This is as a result of inflation feeding on itself and the slow adjustment of non-tradable prices to the increases in tradable prices resulting from exchange rate depreciation.

This result is plausible for several reasons: Firstly, Zambia is highly dependent on imports of capital, intermediate and finished goods for industry and consumables. As such, any changes in the exchange rate are quickly transmitted into domestic prices via their impact on the price of imports. Secondly, high levels of inflation have resulted into adverse expectations, which in turn contribute to exchange rate depreciation and translate into price hikes by firms. In addition, the oligopolistic structure of the Zambian industry accelerates the pass-through by enabling wholesalers, who are largely importers, to pass exchange rate and other external shocks rapidly onto retailers. Thirdly, there is a high level of dollarisation and currency substitution with many prices indexed (informally) to the Kwacha/US dollar exchange rate.

6. CONCLUSION

Following McCarthy (2000), this paper employs a recursive VAR model to estimate the pass-through effect of exchange rate changes on domestic prices for the period January 1994 to July 2001. The VAR analysis suggests that there is complete pass-through from the exchange rate to domestic prices in Zambia. The pass through is complete within four months of an initial exchange rate shock and dies out after 13 to 15 months. Exchange rate changes also account for about 40 percent of domestic price fluctuations. The VAR also suggests that inflation feeds on itself and accounts for 30.6 percent on average for the variation in domestic prices.

The implications of these findings for monetary policy are that a stable and conducive foreign exchange environment is necessary for controlling inflation.

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