THE EFFECT OF THE SOUTH AFRICAN MONETARY CHANGES ON THE NAMIBIAN ECONOMY: CASE STUDY ON BEEF INDUSTRY

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Abstract

The aim of this study is to measure the long and short term dynamics of trade with South Africa, impact of Common Monetary Area (CMA) on the Namibian beef price. More specifically, it examines the relationship between monetary change by South African Central Bank Governor (i.e. taking exchange rate and interest rate as explanatory variables) and the beef industry a case study to the Namibian economy. The Vector Error Correction Model (VECM) was applied by using beef price a dependent variable, with a mentioned set of explanatory variables. As the study hypothesized the study has found a significant linkage between monetary shock occurred in South Africa simultaneously affect the beef industry (or the Namibian agriculture sector in general), and also bears the burden of adjustment in the economy, that could increases farmers financial vulnerability. The dynamic relationships of trading between Namibia and South Africa, more specifically the volatile nature of rand and interest rate have influenced consumers to absorb short-run price change. This change could be substantially affecting the poor households. The result has found that Namibian consumers have to absorb the short run price overshooting, which in turn impacts on the ability to manage their cash flow. For example, the result finding shows one percent change in South Africa money supply or appreciation (depreciation) of rand leads to double change in beef price in Namibia. Due to the linkages between monetary policy variables and relative agricultural prices, it is recommended that agricultural policy makers and monetary authorities in CMA need to work closely in designing and implementing monetary policy. This is important because monetary policies meant to stabilize the economy may have less desirable impacts on farmers and consumers, especially in the short run.

Keywords: *Beef Industry, Monetary policy, Namibia, agricultural policy, Common Monetary Area.*

JEL Classification: E, F_{13}, Q_{13}, Q_{18}.

1. Introduction

After independence in 1990s, Namibia decided to remain in the Common Monetary Area (CMA) with Lesotho, Swaziland and South Africa, whereby South Africa continued to set monetary and exchange rate policies. The Namibian dollar, which was first issued in 1993, has been pegged to the South African currency on the basis of one-to-one parity. The South African rand is also legal tender in Namibia. Such an arrangement requires that a major proportion of the Bank of Namibia's monetary liabilities be backed by the reserve currency (the rand) or other foreign assets (Kalenga, P., 2001).

As Kalenga (2001) presented, the concerns of the new Namibian government about redressing the lop-sided dependence of the economy on South Africa, while not undermining the stability and confidence in the economic and domestic financial system, led to Namibia's officially joining the CMA. Namibia's membership of the CMA was formalized by accession to both the multilateral agreement between Namibia, Lesotho, Swaziland and South Africa in 1990 and a separate bilateral agreement with South Africa in 1992. This agreement has two dominant features that is:

- A commitment by the Bank of Namibia to exchanging the domestic currency for a specified amount of the reserve currency, the rand, without restriction subject to a normal handling charge at a fixed exchange rate;
- Explicit requirement that at least a proportion of its monetary liabilities be backed by the reserve currency or other foreign assets.

The Bank of Namibia's monetary policy is undertaken with a view to keeping prices (consumer and interest rates) in line with South African rates. This strategy is driven by the desire to achieve and maintain stable and low levels of prices (inflation). Added to this fact over 80 per cent of Namibia's imports are sourced from South Africa. As long as South Africa remains a low-inflation country, the pegged exchange rate should continue to be an appropriate intermediate target for ensuring price stability. It constrains monetary expansion, restrains excessive government spending, and sends out credible signals to economic agents about prospects of inflation (Bank of Namibia, 2001).

However, with in the above context, Kalenga (2001) has raised basic and critical questions, which still remained unanswered: How does this arrangement ensure monetary stability? Does the stability of the exchange rate (stability of the external value of the currency) necessarily coincide with the stability of the internal value of the currency (price stability)? With the current reality of the South African agricultural sector showing a continuous decline trend to contribute to its economy, the continuous raise in interest rate by the South African reserve bank governor, and the impact of bilateral agreement of South

Africa with EU; gives a signal for Namibia to be caution and revise on the trade relationship with SA and the CMA issue.

Therefore the objective of this study is not aiming at evaluating the general impact of CMA to the Namibian economy; rather to test the extent of linkages between money supply (interest rate), exchange rate, and agricultural prices; by taking the Namibian beef industry as a case study. More importantly, it evaluates the impact of macro-economic variables (meanly the monetary police change by South Africa and variability of rand) to prices and beef exports. For instance, studies by Asfaha and Jooste (2007) show that high agricultural price volatility caused partially by the macroeconomic policy changes increases the uncertainty faced by farmers and affects the investment decisions, which has an implications for farm debt, farm incomes and productivity. Furthermore, one has to consider changes in monetary policy within the broader economic context in that changes in monetary policy to induce favourable change in the industrial sector, for example, might have less than favourable outcomes in the agricultural sector and vice-versa (Kargbo, J. M., 2005).

Profile of the country

Namibia achieved its independence 21 March 1990 after 70 years of South African rule that replaced the German protectorate established in 1884. The South West Africa People's Organisation (SWAPO) spearheaded the liberation struggle from the 1960s onwards and formed the first government in independent Namibia, following the December 1989 elections. In the 1994 presidential and parliamentary elections SWAPO gained an over two-thirds majority and this majority was further increased in the December 1999 elections.

Namibia is located in the south-west of Africa bordering South Africa, Botswana, Zambia and Angola. It covers 824,000 square kilometres, but accommodates a small population of just 2 million people. Namibia is the driest country in sub- Saharan Africa, with an annual average rainfall of about 100 millimetres in the south, 400 millimetres in the central regions and around 600 millimetres mm in the northeast. The only perennial rivers form the borders with Angola and Zambia in the north and north-east, Botswana in the north-east and South Africa in the south. All rivers within the country are ephemeral and carry water during heavy rainfalls only. The Namib Desert – one of the oldest deserts on earth – stretches about 80 kilometres inland from the coast, while Namibia's eastern parts are characterized by the Kalahari Desert (NEPRU, 1999). Namibia is classified as a 'lower middle income' country, with a gross domestic product (GDP) per capita of around US$ 3,000. However, income and wealth are very unevenly distributed in Namibia, illustrated by the Ginicoefficient of 0.6, based on the National Household Income and Expenditure Survey in 2003/04. Namibia shares many developmental challenges with countries in the region: poverty; natural disasters such as floods and drought; the HIV/AIDS epidemic; concerns for quality education; and exposure

to globalization, as well as rising food and fuel prices. Its unemployment rate is 22 percent and poverty rate is 28 percent.

Since independence, the Namibian government has implemented and maintained a liberal economic policy regime, emphasising incentives for investments and a stable macroeconomic environment; it has also taken a rather cautious approach to the issue of redistribution of land, assets and capital. Namibia has maintained political stability and succeeded in reducing its levels of inflation, with the result that the country has become integrated in the world economy and foreign investments and tourism have expanded.

2. The Namibian beef industry back ground

Meatco is Namibia's biggest exporter of prime beef, taking up 80 percent of the local export market. The Company slaughters approximately 120.000 cattle every year and produces more than 27.000 tons of beef annually. It also produces approximately 250.000 wet blue hides and 14 million canned food products every year. All Meatco's abattoirs are HACCP and ISO 9001 accredited and have South African export status. The abattoirs south of the Veterinary Cordon Fence in Windhoek and Okahandja also have European Union export status.

Meatco has been the cornerstone of the Namibian Meat Industry for more than 20 years. It has been developing world class slaughtering facilities that consistently deliver high quality products to international as well as local customers in Namibia. The products are sourced from farms all across Namibia, where semi-desert conditions and extensive cattle farming ensure a deliciously distinctive taste. Meatco has grown into an industry leader and has gained the respect of the international community for consistently producing nutritous, quality beef of the highest standards. Meatco is HACCP and ISO approved and is capable of delivering meat anywhere in the world. More than half of Namibians make a living off cattle farming either directly or indirectly. It is a way of life that has allowed Meatco to bring the wholesome taste of Namibia to the international community's as well (Meatco, 2009).

Meatco's biggest clients currently are South Africa, the United Kingdom and Norway, although Meatco has penetrated to various other European and non-European markets including Germany, Switzerland, Italy, Czechoslovakia, China and Dubai. The Meat Corporation of Namibia was consolidated in the early 1980's from various competing abattoirs and has grown into a strong and well established company since. Meatco employees 1 200 highly skilled employees that add significant value to its product and help to reach the company's vision to have the most sought after Meat brands in selected markets in the long term interest of its stakeholders (Meatco, 2009).

Cattle farming in Namibia are the main agricultural production sector in the country of which the value of production is annually estimated at N$900 million, and of which approximately N$400 million is being contributed by weaner exports. The average number of cattle estimated 2.3 million in 2006 (Meat Board of Namibia, 2007).

Figure 1 indicates that total marketing has declined since 1968. Although slaughtering has increased over the period it has declined during the past 5 years. The average annual marketing over the period 1968 to 2001 was 363 598 head of cattle while the average annual marketing of the last 5 years (2002 to 2006) was 330 246 head of cattle, which represents a decline of 9%. This can be attributed to factors such as bush encroachment, the establishment of wildlife conservancies and wildlife farming (Meat Board of Namibia, 2007).

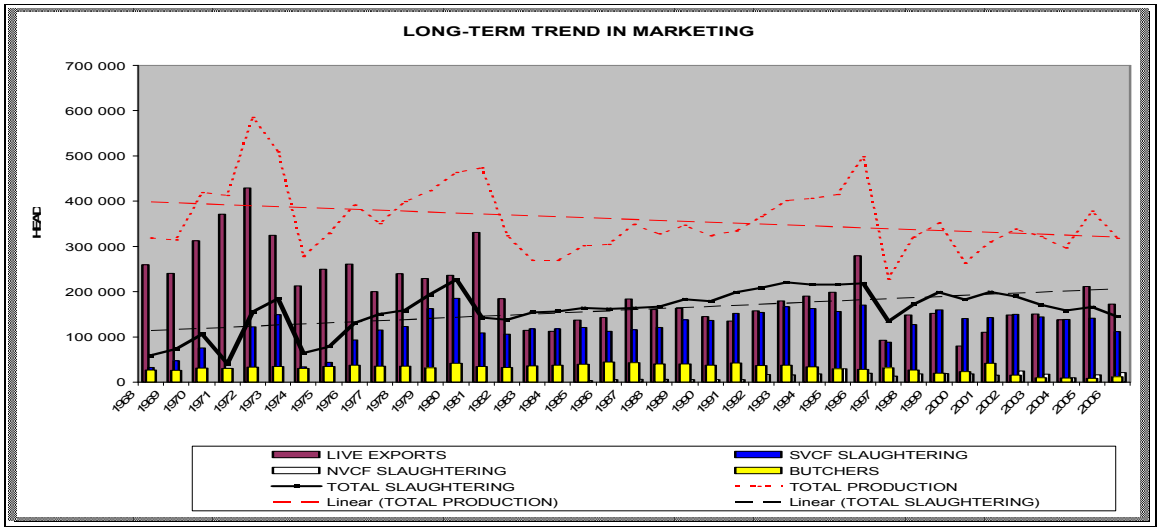

Fig. 1. Long term marketing trend

It is important to take note that approximately 156 000 cattle are exported live to South Africa (6 year average) of which more than 96% are weaners, calves and stores destined for feedlotting. Comparing the first seven months of 2007 with the same period in 2006 there is an increase of 7.84% in the export of weaners from 96 781 in 2006 to 104 369 in 2007. This figure is however 12.42 % lower than the export figure of 117 332 for the same period on 2005 (Meat Board of Namibia, 2007).

Figure 2 show that the comparison of weaner prices between South Africa and Namibia from January 2001 to July 2007, as shown on the Figure 2 the Namibian weaner price is below South African prices since 2001. From January 2006 to March 2006 the Namibian

weaners price shows that a record of higher price than that of South African. This might be an indication that the Namibian weaner price is competitive to the South African.

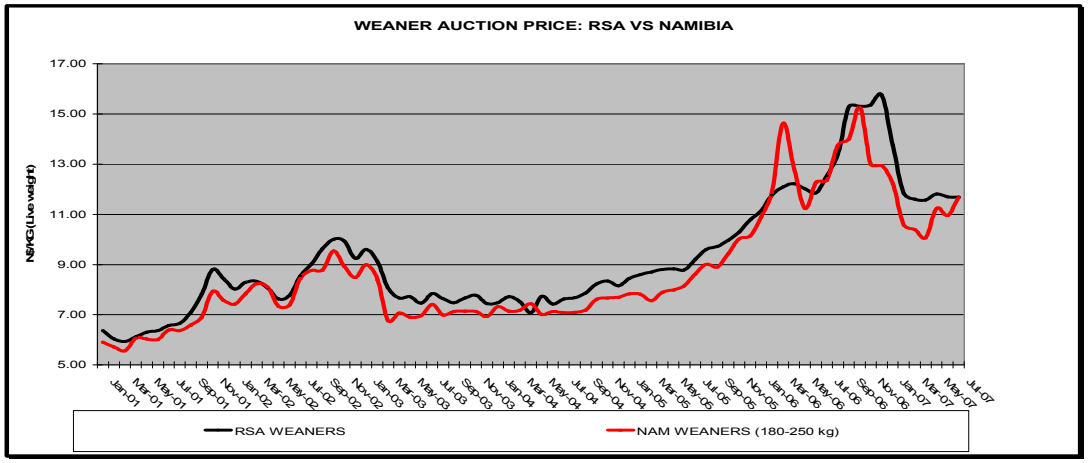

Fig. 2. The weaner auction price of South Africa and Namibia

The Meat Board of Namibia (2007) report from the ratio between weaner prices and slaughter prices (weaner/slaughter ratio) it is projected to be at abattoirs prices to compete with weaners exports. The historic weaner/slaughter ratio was calculated at 64%. This clearly indicate that the producer prices was not competitive (for various reasons) with that of weaner prices which resulted in the outflow of live cattle in 2005 and 2006. This situation has since reversed in the first half of 2007.

3. Methodology and data

The Saghaian, Reed, & Merchant (2002) overshooting model illustrates a long-run relationship between money supply, agricultural and industrial prices and the exchange rate.

In this study, following the general modelling of Asfaha and Jooste (2007) to test the relationship between agriculture and monetary policy. Vector Error Correction Model (VECM) were used, by applying monthly time series of the beef price index (Price), the South African money supply index (M1t), and exchange rate between the Rand and US for the period January 2000 to December 2006 (consisting of 84 observations). All the data were transformed to logarithms. The monthly data sources are from Meat Board of Namibia and the Reserve bank South African.

4. Model estimation

In this section, the necessary statistical test and the long term relationship among the variables were estimated. The section has three subsections: the first two subsections deal with stationary and integration tests respectively, while the next section deals with the model estimation.

4.1. Stationarity test (Unit root tests)

Previous studies indicate that time series data, be they monthly, quarterly or annual are likely to be nonstationary (see for example Bakucs and Ferto, 2005; Cho, Kim and Koo, 2004). In this study, the Augmented Dickey-Fuller (ADF) unit root test, with and without a linear trend, is performed to test for the stationarity of the variables considered. The ADF test with a linear trend checks if the variables are trend stationary.

Table 1

ADF test results – with and without trend

		In levels			Differenced once		
Variables	**Specification**	**Lags**	**Critical value**	**Test statistics**	**Lags**	**Critical value**	**Test statistics**
Price	constant only	1	-2.8981	-0.73807	1	-2.8986	-5.2861
	constant with trend	1	-3.4666	-1.6216	1	-3.4673	-5.2733
M1	constant only	2	-2.8981	1.0003	1	-2.8986	-8.9103
	constant with trend	3	-3.4666	-3.0431	1	-3.4673	-9.0622
EX	constant only	1	-2.8981	-1.3403	1	-2.8986	-5.4132
	constant with trend	1	-3.4666	-1.9016	1	-3.4673	-5.4199

95% critical value for the augmented Dickey-Fuller statistic

Source: Model estimation

In this study, the Augmented Dickey -Fuller (ADF) unit root test, with and without a linear trend is performed. The ADF test with a linear trend checks for the trend stationarity of the variables. The results are presented in Table 1. Since the ADF test is sensitive to the choice of order of the lag, the starting point was the over -specification ADF test where the order of the lag was relatively larger and corresponds to the highest (absolute value) (Akaike Information Criterion).

From Table 1 the absolute values of the ADF test-level shows that it is statistically lower than the 95 percent critical value. This suggests that the null hypothesis of the unit root is not rejected and none of these variables is (trend) stationary in levels at a 5 percent significance level. Each series was differenced and the ADF test performed. The result shows that the unit root null hypothesis is rejected at a 5 percent significance level (see Table 1).

The results show that all the series tested are not stationary in (log) levels, but stationary at a 5 percent significance level after being differenced once, fulfilling a necessary condition for a co-integration test.

4.2. Co-integration test

To test co-integration, Johansen (1988); and Johansen and Juselius (1990) has proposed two statistics which can be used to evaluate the rank of the coefficient matrix, or the number of co-integrating relationships. The one used here is the likelihood ratio test of the null hypothesis, that the number of co-integrating vectors is r versus the alternative r+1 vector. In this case, the null hypothesis is the number of co-integrating vectors which equals 0.

Table 2 shows that Likelihood Ratio (LR) statistics are bigger than their corresponding coefficients of the critical value in all series rank; thus, co-integration exists between the three pair rank. The Johansen tests accept the hypothesis at 5 percent (1 percent) significance level LR (see Table 2). The result shows clearly that there is long-term co-integrating vector among the variables existence.

The results from the Johansen tests (see Table 2) clearly indicate that there is a long-term co-integrating vector among the variables (the test traced co-integrating equation(s) at the 5% significance level, assuming two lags in the test equation(s)). The existence of a long term relationship among the series leads to the estimate the Vector Error Correction Model (VECM) analysis. The next three tables present the long and short-term dynamic estimation of the model using elasticity measurement.

Table 2

The trace and maximum Eigen statistics for testing cointegration rank

Null Hypothesis	Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
r=0	0.256534	54.65328	24.31	29.75	None **
r≤1	0.189567	30.93868	12.53	16.31	At most 1 **
r≤2	0.161840	14.12373	3.84	6.51	At most 2 **

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 3 cointegrating equation(s) at 5% significance level

Table 3 presents the long-run coefficients for the normalized cointegration vectors. The results are consistent with a priori expectations. For the cointegration vectors, the slope coefficients are statistically significant and positive. The interpretation is a 1 percent increase in the money supply in South Africa leads to a 2.7 percent increases in beef price in Namibia, on the other hand an increase (depreciation) in the exchange rate by 2.165 percent.

Table 3

Results for normalized cointegrating vectors

Cointegration Vectors	**Vector 1**	**Vector 2**
lnPrice	1.000000	0.000000
lnM	2.795829	1.000000
	(0.89866)	
lnEx	0.000000	2.164717
		(1.03885)

Standard errors in parentheses

The money neutrality hypothesis expects the long-run rate of increase in prices to be unit proportional to the rate of increase in money supply (i.e. the coefficients for the money supply are expected to be close to one) (Asfaha and Jooste, 2007). The result finding of this

study found that the South African agricultural price the estimated coefficients are statistically less than one, that means the result reject the long-run money neutrality hypothesis, suggesting the monetary changes can have a long-run real effect on agricultural prices. However, the result finding of this study shows that (see Table 3) the estimated coefficient of beef price is more than one, which an increase in money supply in South Africa directly causes inflation in the Namibian economy. That affect directly to the house hold consumers, this could also implies that worsen poverty level in the country.

Estimating the VECM

Johansen proposed to test further for the simultaneously separates short-run dynamics and long-run equilibrium that does not allow the one to contaminate the other (Fedderke, 2001). Results for the short-run dynamics are presented in Table 4. The coefficients of the cointegration equations in the VECM, known as the "speed of adjustments", measure how quickly the system returns to its long run equilibrium after a temporary shock (Asfaha and Jooste, 2007).

The speed of adjustments for beef price prices (α11), money supply of SA (α22) and rand exchange rate (α33) to the long run equilibrium are -0.600639, -0.146362 and -0.027934, respectively (see Table 4). All coefficients have a negative sign and statistically significant (expected exchange rate found to be insignificant). This implies that beef price adjusting faster than the other variables, keeping other variables constant with the speed of adjustment 60 percent to restore to equilibrium. Money supply and rand exchange their speed adjustment found to be 14 and 3 percent respectively.

The results that $\alpha 11 > \alpha 22 > \alpha 33$ in absolute value provides evidence beef price overshooting in the short run. That is, it suggests that beef prices adjust from its own price taking advantage the domestic market. The relatively high speed of adjustment of agricultural prices, i.e. the overshooting of beef prices, can explain the observed the price variability. The remaining parameters estimates are presented in Table 4 for completeness. The diagnostic tests are similar to those obtained by other studies (for example see Saghaian et al., 2002; Bakucs and Ferto, 2005). The coefficient of determination (R2) ranges between 0.20 and 0.63, thus the model explains a relatively higher percentage of change in the macroeconomic variables than the model estimated by Bakucs and Ferto (2005). Comparing the two explanatory variables of the coefficient determination money supply explain much more higher to prices. This implies that South African central bank governor has to take into account the Namibian economy into consideration, when they are making interest rate change in their economy. Interest change in South Africa causes a bigger inflation to Namibian economy of the largest hit of the poor consumers in the country.

Table 4

Short-run parameter estimates of the VECM

Error Correction:	Δ lnprice	Δ lnM1	ΔlnEx
CointEq1	**-0.600639*** **	0.265554*	0.200768*
ΔlnPrice(-1)	-0.255252*	**-0.146362***	**-0.027934**
ΔlnPrice (-2)	-0.233540*	-0.102791	0.031300
ΔlnEx(-1)	-0.265010**	0.142414**	-0.335405**
ΔlnEx(-2)	-0.022861	-0.044275	-0.344054**
ΔlnM1(-1)	-0.547226**	-0.762860***	0.268766*
ΔlnM1(-2)	-0.103118	-0.385670***	0.211336*
R-squared	0.450522	0.662555	0.262217
Adj. R-squared	0.405360	0.634820	0.201577
F-statistic	9.975573	23.88861	4.324179

Note: *** 1% significance level, **5% significance level, *10% significance level

5. Conclusion

The Bank of Namibia's monetary policy is undertaken with a view to keeping prices (consumer and interest rates) in line with South African rates. This strategy is driven by the desire to achieve and maintain stable and low levels of prices (inflation) (Kalenga, 2001 Bank of Namibia, 2001).

However, the result finding of this study using the Vector Error Correction Model (VECM) estimation of Johansen cointegration analysis reject the long run money neutrality hypothesis, which means that the rate of increase in money supply in South Africa and the variability of rand has direct impact to the price of beef, the results of the dynamic relationships occurred evidence of Namibian economy being overshot. Therefore, when money supply shock occurred in South Africa, Namibian consumers have to absorb the short run price variability and overshooting of prices which in turn impacts of their ability to manage their cash flow; this could be a substantial challenge in poor household of Namibian. Furthermore, the result has found that the 1 percent change in South Africa money supply or appreciation (depreciation) of rand leads to double change in beef price in Namibia. This implies that the CMA and bilateral agreement between Namibia and South Africa is univocal or the trade change is driven by South Africa only.

Therefore, Namibia considering the trend of agriculture contribution of South Africa to its own economy, the trend of continuous increasing of food price globally, and the radical increment of interest rate by South Africa reserve bank has a huge impact on the Namibian economy that affect the poor household consumers, this implies Namibia need to look and revise the bilateral trade agreement with South Africa in the context of the bilateral benefit to both parties.

The result of this study shows there is a bigger linkages between monetary policy variables and beef prices, it is recommended that the Namibian and South African policy makers as well the monetary authorities of countries need work closely in designing and implementing monetary policy. This is important because monetary policies meant to stabilize the economy which may have desirable impacts on farmers and consumers, especially in the short run.

Namibia has also to see other alternative supplying source, rather than dependent for all inputs supplies from South Africa, which to risk relying on one country origin.

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