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Exchange Rate Pass Through to Inflation in Namibia

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Abstract

This paper examines the degree of the exchange rate pass-through to prices at different distribution levels, starting from import prices to consumer prices in Namibia. Using a Structural Vector Auto Regressive (SVAR) framework, Namibian data from 2000 to 2014 was used for the study. The exchange rate pass-through elasticity suggest that the pass-through is low and incomplete on both imported and consumer inflation. These results can be ascribed to the pricing to the market strategy of importers. The results suggest that for forecasting consumer inflation in Namibia, a significant weight should be placed on, imported inflation, South African food inflation, oil prices and the exchange rate.

Key Words: *Namibia, SVAR, Pass-through Elasticity, Causality dynamics, Impulse Response Function.*
JEL Classification : *C 19, G13, G 14*

1. Introduction

In open economies such as Namibia, exchange rate fluctuations affect the behavior of inflation. This makes the exchange rate pass-through (ERPT) (defined as the impact of a 1 percent change in the exchange rate on domestic inflation) an important consideration for formulating monetary policy. Currency depreciation can have both direct and indirect effects on the economy. The direct effects work through the following: Firstly, prices of finished imported goods become expensive due to the reduced purchasing power of the currency. Secondly, the prices of imported raw materials used in the production process may also become expensive. Consequently, the production costs increase and the domestic producers may pass the higher costs to the final consumers.

Moreover, ERPT can have indirect effect on consumer goods such as the change in the composition of demand, which effects the aggregate demand. For example, a depreciation of the domestic currency increases the demand for Namibian tradable goods both at home and abroad. This is due to the fact that the high prices of imported goods create an increase in the demand for locally produced goods and this consequently puts excessive pressure on domestic inflation. The exchange rate pass-through, nevertheless, depends on a number of factors, such as the relative weight of imported goods and services in the production process, the extent to which imports are priced to the market in the importing country's currency, demand conditions, the cost of adjusting prices and perceptions of the duration of the depreciation.

Several studies have examined the relationship between the exchange rate and inflation; however only a few have focused on the Sub-Saharan Africa (SSA). Moreover, the findings of these studies tend to be mixed. For instance, Choudhri and Hakura (2001) found low pass-through for countries such as (Ghana, South Africa, Zimbabwe) and zero ERPT for Tunisia and Ethiopia. Similarly, Anguyo (2008) using Vector Error Correction Model (VECM) found low ERPT to inflation in Uganda. Frimpong and Adam (2010) using a Vector Auto-Regression (VAR) model also finds low ERPT to inflation for Ghana.

On the contrary, the study by Choudhri and Hakura (2001) report modest ERPT for countries such as Kenya, Cameroon and Zambia. On the other hand, Sanusi (2010) employing a SVAR model obtained large but incomplete pass-through elasticity of 0.79 for Ghana. These conflicting results from empirical studies regarding the size of the exchange rate pass-through to inflation in developing countries necessitate further studies in countries such as Namibia; in consideration of the change in the macroeconomic fundamentals following the financial crises in 2008.

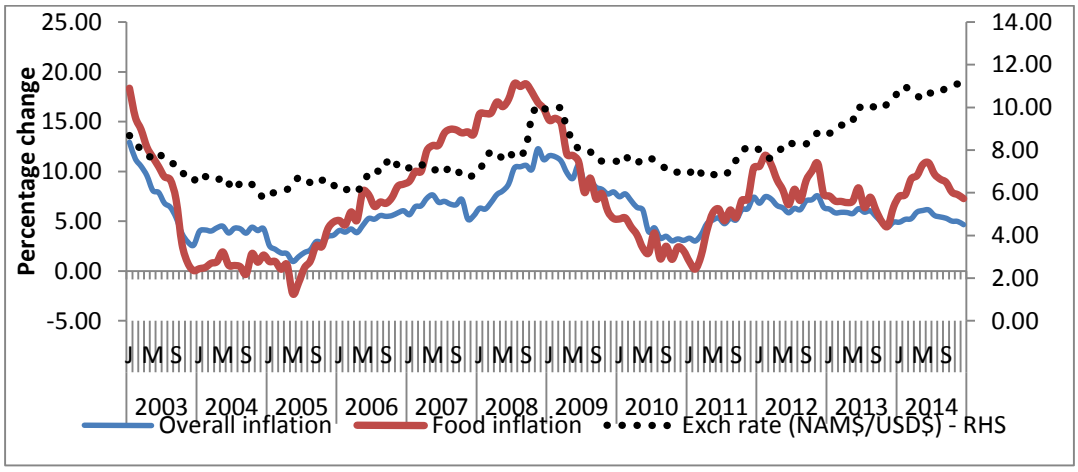
The objective of the study is to investigate the degree of the exchange rate pass-through on prices at different distribution levels i.e. from import prices, up to consumer prices in

Namibia using SVAR model. With this background, the study further focuses on the existence and degree of causality between the exchange rate, oil prices, international food prices, imported and consumer prices. The results of the study will enhance the understanding about the transmission of exchange rate shock to inflation in Namibia and also aid the inflation forecasting process. Moreover, to our knowledge, no study has analyzed the pass-through of the exchange rate, oil and international food price to inflation in Namibia. The IMF (2006) reports that if the ERPT is high, it implies that the response of the trade balance to nominal exchange rate changes will also be large.

1.1 Relationship between the Nominal Exchange Rate, Food and Overall Inflation in Namibia

We begin with a visual inspection of the relationship between the exchange rate and inflation in Namibia. In small open economies such as Namibia, inflation comes from both domestic factors and external factors such as the increase in world commodity prices or exchange rate fluctuations. Figure 1.1 depicts the relationship between the nominal exchange rate (NAM$/USD$) where an increase means depreciation on the primary axis, and food and overall inflation on the secondary axis. Although inflation in Namibia was generally low since 2008, averaging a single digit of 6.6 percent, the nominal effective exchange rate of the local currency against Namibia's major international currency depreciated by approximately 20.0 percent over the last seven years. This suggests that the ERPT is low but there are other factors determining inflation apart from the exchange rate in Namibia. On the other hand, food inflation is positively correlated with inflation. Hence, the correlation between international food prices and the overall inflation in Namibia also needs to be established.

Fig. 1.1 Nominal exchange rate and Inflation in Namibia 2003 to 2014



Source: Bank of Namibia

The study is structured in five sections which commenced with section 1 explaining the background and aims for the study. Section 2 covers the literature review, and section 3

explains the methodology. The results and discussion are exhibited in section 4 and the study conclude with recommendations in section 5.

2. Literature Review

Most empirical studies on exchange rate pass-through have focused on developed countries and have found a low and decreasing pass-through since the 1990s. In this regard, McCarthy (1999), examined the pass-through of external factors, the exchange rate and import prices to domestic inflation for several industrialised economies (such as the United States, Japan, Germany, France, the United, Kingdom, Belgium, the Netherlands, Sweden, and Switzerland), using a VAR model. He observed that the impulse responses and variance decompositions estimated over the post-Bretton Woods period indicated that the effect of external factors on domestic inflation is quite modest in most of the countries examined, including the United States.

Taylor (2000) shows that the exchange pass-through in the USA declined since the late 1990s mainly due to the low inflation environment achieved during that period. Similarly, Choudhri et al. (2002) found that domestic prices in non-U.S. G-7 countries increased by only 0.2 percent after ten quarters following a one percent change in the exchange rate. Campa and Goldberg (2002) using micro-level prices of imported goods for a few selected industries in 25 OECD countries asserted that higher inflation is weakly associated with a large pass-through and that the types of products and their share in the country's import bundle are the most important determinants of the pass-through.

Savoie-Chabot et al. (2015) concluded that movements in the Canadian dollar can have a sizable direct impact on inflation, but the estimates also indicate that only a small portion of exchange rate movements tend to be reflected in consumer prices. A possible reason for this result is that import costs are only a small portion of the various costs incurred through the supply chain in bringing goods to consumers. They used a variety of models, including the ToTEM (Terms-of-Trade Economic Model) and LENS (Large Empirical and Semi-structural model), which account for the linkages between inflation, monetary policy and the exchange rate.

Since the 2000s, studies on the exchange rate pass-through were extended to developing economies in the Sub Saharan Africa, their results however tend to be mixed, despite many of them suggest a low exchange rate pass-through to inflation. Pioneering work in this regard include Choudhri and Hakura (2001) who studied a sample of 71 countries, including emerging markets and developing economies, and confirm a strong correlation between the exchange rate pass-through and a high inflationary environment. For instance, they found zero elasticity of exchange rate pass–through to inflation in Bahrain, Singapore, Canada and Finland. For Sub Saharan Africa countries, they found the exchange rate pass–through of 0.09

for Kenya, 0.14 for Ghana, 0.02 for South Africa, 0.06 for Zimbabwe, 0.16 for Burkina Faso and zero for Tunisia and Ethiopia.

Frankel et al. (2005) carried out a cross-country analysis and found that developing countries have experienced a rapid downward trending pass-through since the 1990s, more so than did high income countries. Their study identified the determinants of pass-through to include income, trade openness, inflation environment, and exchange rate variability. Mwase (2006), found low exchange rate pass-through for Tanzania using quarterly data for the period 1990-2006. He splits his study into three, firstly is a full sample; and second for two sub-periods, i.e. periods prior to and after 1995. He finds a pass-through elasticity of 0.028 in the full-sample, and 0.087 in the period before 1995. After 1995, however, the pass through declines to 0.023, despite the depreciation of the currency. He partly attributed his findings to macroeconomic and structural reforms that were implemented by the country.

Similarly, Nkunde (2006) found an incomplete exchange rate pass-through to inflation in Tanzania, where a 10 percent depreciation brought a 0.05 percent increase in inflation after two quarters following a shock. The study applied the SVAR framework using data for the period between 1990 and 2005. Anguyo (2008), found low exchange rate pass-through to inflation in Uganda. Using monthly data for the period 1996M7 to 2007M5, the scholar found that a 1 percent exchange rate depreciation resulted in a 0.056 percent increase in inflation, in the second month. Frimpong and Adam (2010) also found low, diminishing and incomplete exchange rate pass-through to inflation in Ghana using the data for the period 1990-2009. In particular, the researchers observed 1 percent depreciation was linked to a 0.025 percent increase in inflation in the quarter subsequent to the shock. The impact on inflation increased to 0.09 percent after eight quarters before it decreased to 0.07 percent but after twelve quarters.

On the contrary Kiptui et al. (2005), found large elasticity of exchange rate pass–through to inflation in Kenya accounting for 46 percent of the variance in inflation during the period between 1972 and 2002. The scholars used a Vector Error Correction methodology in their study. Similarly, Sanusi (2010) using a SVAR model on quarterly data for the period between 1983Q3 and 2006Q3 in Ghana, found large but incomplete pass-through elasticity of 0.79. In addition, Razafimahefa (2012) found that countries within the Common Market for Eastern and Southern Africa (COMESA) with the highest inflation, the exchange rate pass-through was 25 to 50 percent higher than in the West African Monetary Zone (WAMZ), Common Monetary Area (CMA), the West African Economic and Monetary Union (WAEMU), and the Central African Economic and Monetary Community (CEMAC), where inflation was low.

These results regarding large pass-through were collaborated by Bwire et al. (2013) who found a modest and incomplete exchange rate pass-through elasticity of 0.48 percent in Uganda. The study used a triangulation of well specified Vector Error Correction (VEC) and Structural Vector Auto-regression (SVAR) models and covered quarterly data over the period between 1999Q3 and 2012Q2. Similarly, Jombo et al. (2014) found modest exchange rate pass-through in Malawi. Using the Phillips curve and Vector Auto Regression, the study estimated the pass-through elasticities at 0.15 and 0.20 respectively.

The evidence from empirical literature reviewed suggests that the exchange rate pass through is low and declining in developing countries. On the contrary, the evidence from developing countries in SSA is mixed with some studies suggesting that the ERPT is low, while other studies show that EPRT is high. Therefore, it is misleading to generalise the opposing results to any particular country within the SSA. Therefore, it imperative to conduct empirical studies and the researchers believe that these results will contribute to prevailing literature on ERPT in SSA.

3. Methodology

3.1 Research Questions

As indicated in the introduction, the researchers have three major research questions. The first is to investigate the degree of the exchange rate pass-through on prices at different distribution levels i.e. from import prices up to consumer prices in Namibia. The second is to examine the existence and degree of causality between the exchange rate, imported and consumer. Lastly, the study assesses the pass-through and the existence of causality between the oil prices and the international oil prices on imported and consumer prices in Namibia.

3.2 Modeling Exchange Rate Pass-through

This paper derives the model from McCarthy (2006) which is a model of pricing along distribution chain - import and consumer - to track pass-through from exchange rate fluctuations at each stage of the distribution chain. The model also considers supply, demand and exchange rate shocks. Furthermore, the model accounts for the reaction of the Central Bank to carry out monetary policy. The supply shocks (ε_t^s) and (ε_t^{ifp}) are identified from the dynamics of oil price inflation denominated in US dollars(π_t^{oil}) and international food inflation (π_t^{ifp}). The proxy for demand shocks (ε_t^d) is the dynamics of output gap $\left(y_t\right)$ in the country after accounting for the contemporaneous effect of the supply shock. Finally the exchange rate shocks (ε_t^e) are identified from the dynamics of exchange rate changes (Δe_t) after taking into account the contemporaneous effect of demand and supply shocks.

Inflation at each stage – import, and consumer – at time period *t*, is assumed to contain several components where the first component is the expected inflation at that stage based on available information at the end of the time period *t-1*. The next two components are the effect of period *t* domestic supply and demand shocks on inflation at that stage. The fourth component shows the effects of exchange rate shocks on inflation at that stage. Then the effects of the shocks of the previous stages of the chain will be included and finally there is the stage's shock. The shocks at each stage can be considered as the changes in the pricing power and mark-ups by firms at each stage of the shocks. Finally, the Central Bank's reaction function is estimated where the short term interest rates (r_t) is related to the previously mentioned variables in the model. The model used for the analysis is specified as follows:

$$\pi_t^{oil} = E_{t-1}(\pi_t^{oil}) + \varepsilon_t^s \quad (3.1)$$

$$y_t = E_{t-1}(y_t) + a_t\varepsilon_t^s + \varepsilon_t^d \quad (3.2)$$

$$\Delta e_t = E_{t-1}(\Delta e_t) + b_1\varepsilon_t^s + b_2\varepsilon_t^d + \varepsilon_t^e \quad (3.3)$$

$$\pi_t^m = E_{t-1}(\pi_t^m) + \alpha_1\varepsilon_t^s + \alpha_2\varepsilon_t^d + \alpha_3\varepsilon_t^e + \varepsilon_t^m \quad (3.4)$$

$$\pi_t^{ifp} = E_{t-1}(\pi_t^{ifp}) + \beta_1\varepsilon_t^s + \beta_2\varepsilon_t^d + \beta_3\varepsilon_t^e + \beta_4\varepsilon_t^m + \varepsilon_t^{ifp} \quad (3.5)$$

$$\pi_t^c = E_{t-1}(\pi_t^c) + \gamma_1\varepsilon_t^s + \gamma_2\varepsilon_t^d + \gamma_3\varepsilon_t^e + \gamma_4\varepsilon_t^m + \gamma_5\varepsilon_t^{ifp} + \varepsilon_t^c \quad (3.6)$$

$$r_t = E_{t-1}(r_t) + c_1\varepsilon_t^s + c_2\varepsilon_t^d + c_3\varepsilon_t^e + c_4\varepsilon_t^m + c_5\varepsilon_t^{ifp} + c_6\varepsilon_t^c + \varepsilon_t^{r_t} \quad (3.7)$$

where π_t^m, π_t^{ifp} and π_t^c are import price, international food price inflation, and consumer price inflation respectively and ε_t^m, ε_t^{ifp}, ε_t^c are import price, international price shock and consumer price shock respectively, while $\varepsilon_t^{r_t}$ is the monetary policy shock.

3.3 Data

This study used quarterly data on variables such as oil prices, the output gap, the nominal effective exchange rate (NEER), the import price inflation and the consumer price inflation. The output gap was calculated as the deviation of the log of real gross domestic product from a quadratic trend, while inflation was calculated from the quarterly average of consumer price index. The bank rate was used to reflect the central bank's behavior. These data were sourced from the Namibia Statistic Agency (NSA) and Bank of Namibia (BON) and the IMF. South African Consumer Price Index (CPI) and oil price was used for both cases to serve as control variables. For international food prices the study used the United Nations Food and Agriculture Organization's (FAOs) World Food Price Index[1]. The data examined was for the period between 2000 and 2014.

[1] This variable was insignificant, thus South African Food Prices was used as a proxy of international food prices.

4. Results and Discussion

4.1 Unit Root Tests, Diagnostic Tests and Granger Causality Tests

The results of the unit root test in levels and first difference are presented in Table 1. Accordingly, all the variables were integrated of order one, except for the output gap which was integrated of order zero and hence found to be stationary. The integration order of the variables was investigated using the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests. The diagnostic test on the structural VAR indicated that the model was stable as the characteristic roots had modulus less than one and all eigen-values laid inside the unit circle which is represented in Fig 1. The granger causality test indicated that a uni-directional causality exists where the nominal effective exchange rate, oil prices and imported inflation granger causes consumer inflation. Also, consumer inflation in Namibia granger causes the repo rate and this relationship was uni-directional. The test result demonstrated that consumer inflation does not granger cause the effective exchange rate, oil prices and imported inflation. Similarly, the output gap and South Africa food inflation do not granger cause consumer inflation and vice versa.

Table 1: Unit root tests: ADF and PP in levels and first difference

		ADF		PP		
Variable	Model Specification	Levels	First Difference	Levels	First Difference	Order of Integration
GDPGAP	Intercept and Trend	-6.462214**		- 5.754212**		0
IMPOINF	Intercept and Trend	-3.079322	-17.20957**	-3.616438	-16.63910 **	1
INTERFOODF	Intercept and Trend	-3.588018	-6.360579 **	-2.408328	-5.937829 **	1
NAMINF	Intercept and Trend	-2.603254	-6.182798 **	-2.236519	-6.293324 **	1
NEER	Intercept and Trend	--1.087567	-5.995774 **	-1.422031	-6.010242 **	1
OILP	Intercept and Trend	-2.025647	-6.130944 **	-2.800624	-5.690627 **	1
RSAFOODI	Intercept and Trend	-0.291335	-4.389455 **	-0.394032	-4.389455 **	1

Source: Author's compilation using E-views. Notes: (a) Gdpgap=Output gap, impoinf=imported inflation, interfoodf=international food inflation, naminf=Namibia consumer inflation, neer=nominal effective exchange rate, oilp=oil prices, safoodi=South African food inflation. (b)**means the rejection of the null hypothesis at five percent.

Figure 1: Inverse Roots of AR Characteristic Polynomial

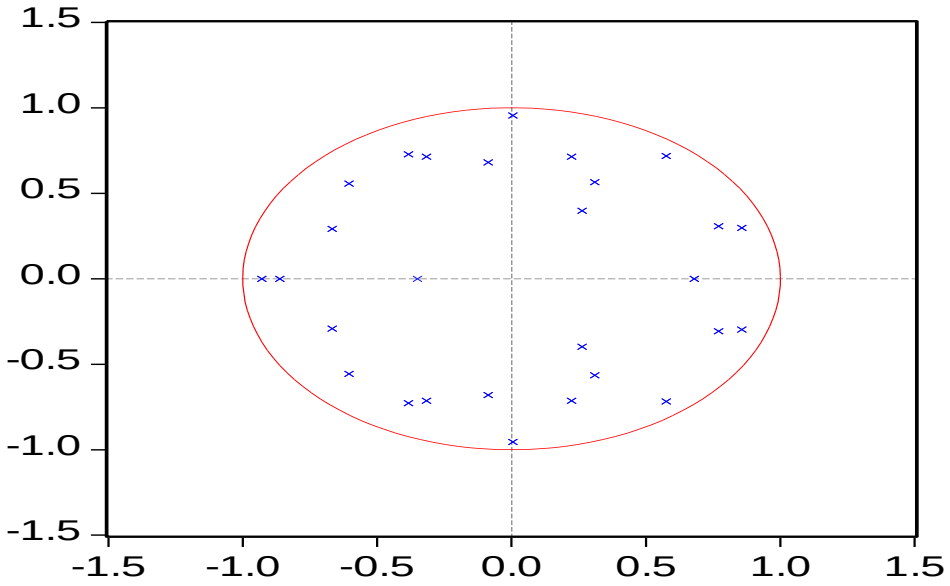


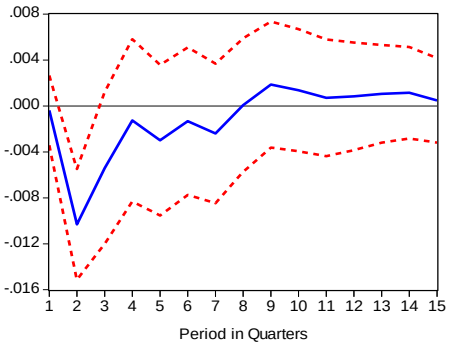
Table 2: Lag Length Criteria for the Pass Through

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1738.367	NA	6.21e+14	62.44167	62.80334	62.58189
1	-1206.356	855.0177	1.30e+08	47.01270	50.99107*	48.55511
2	-1075.046	164.1376	59428855	45.89449	53.48956	48.83908
3	-936.8023	123.4315	41815520	44.52865	55.74042	48.87543
4	-673.4215	141.0968*	1687243.*	38.69363*	53.52209	44.44259*
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

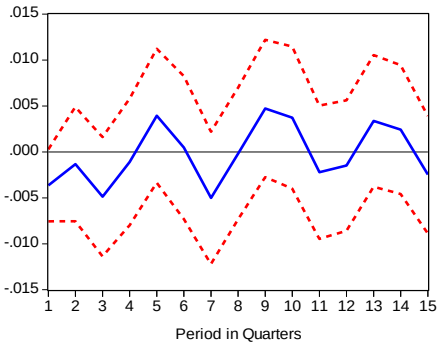
4.2 Impulse Response Functions (IRF).

An IRF traces the effect of a one-time shock of the innovations on the current and future values of the endogenous variables. The results of the impulse response functions are shown below.

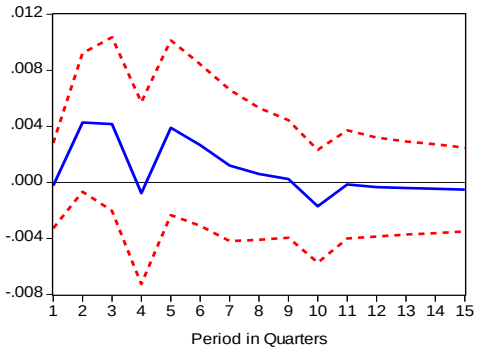
Fiqure 2: Response of Consumer Inflation to Structural One S.D. Shock in the NEER.



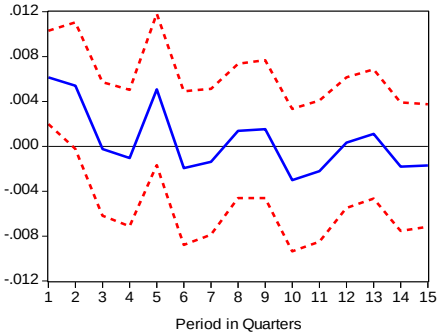
Fiqure 3: Response of Imported Inflation to Structural One S.D. in the NEER



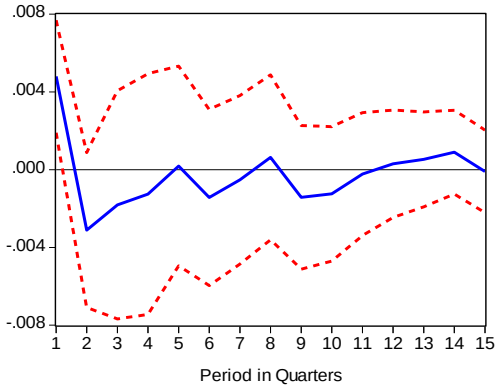
Fiqure 4: Response of Consumer Inflation to Structural One S.D. Oil Prices.



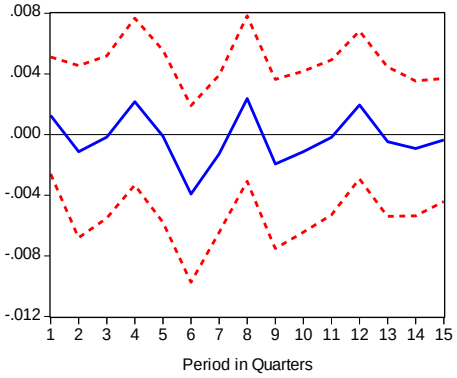
Fiqure 5: Response of Imported Inflation to Structural One S.D. Shock in Oil Prices



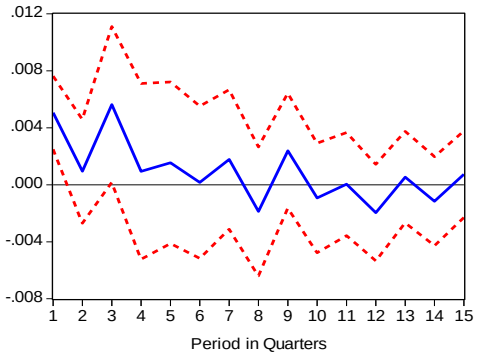
Fiqure 6: Response of Domestic Inflation to Structural One S.D. in South African Food Prices,



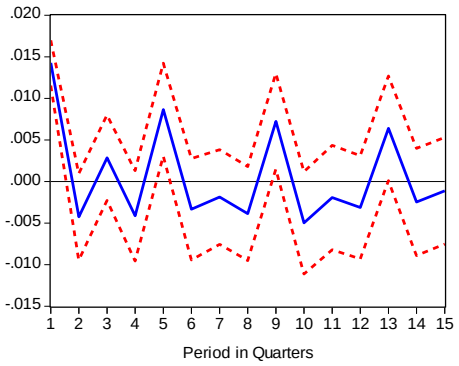
Fiqure 7: Response of Imported Inflation to Structural One S.D. in South African Food Prices



Fiqure 8: Response of Consumer Inflation to Structural One S.D. Shock in Imported Prices.



Fiqure 9: Response of Imported Inflation to Structural One S.D. Own Shock



The exchange rate shock causes a fall in imported and domestic consumer price inflation (Figure 2 and 3). An exchange rate shock at time zero leads to a fall in the nominal effective exchange rate (appreciation of the exchange rate). The impact of the exchange is gradual on both the consumer price inflation and the imported inflation. The full effect of the exchange rate appreciation on the consumer inflation and imported inflation is felt in the second and third quarter, respectively.

As expected an increase in oil prices causes an increase in both the consumer price inflation and imported inflation (Fig 4 and 5). The oil price shock leads to an increase in consumer inflation immediately after the shock, which lasts for 9 quarters. The full impact of the oil shock on consumer inflation is, however, realised in the second and third quarter. The effect of a shock on imported inflation is similar to that on consumer inflation, despite that the impact eases after 3 quarters.

Both the imported inflation and the consumer inflation increase with a shock to the South African food inflation (Fig 6 and 7). The impulse response on both variables is as expected. The impact of the shock is more severe on the consumer inflation than on the imported inflation but the impact dies after the second quarter. Similarly, an increase in imported inflation causes a corresponding increase in the overall inflation, if not countered by a reduction in domestic inflation (Fig 8 and 9). Both the consumer inflation and imported inflation increase immediately in response to a shock in imported prices. The maximum impact of the import price shock on consumer inflation is felt after the third quarter only.

4.3 Pass through Elasticity[2] to Consumer and Import Prices

The exchange rate pass-through is low and incomplete both on imported and consumer inflation. The exchange rate pass-through elasticity on consumer inflation and imported inflation is estimated at 0.01 and 0.04 respectively in the first quarter.

[2] The Pass- through elasticity at time t is calculated from the impulse response function as: Percent change in the price level t quarters after the shock/Initial percent change in the exchange rate at time t=0.

After eight quarters, the exchange rate pass-through to consumer inflation increase to 0.02. On the contrary, the pass-through to imported inflation declines to 0.02 after the corresponding eight quarters. The above is interpreted to mean that a 1 percent appreciation in the exchange rate reduces both the consumer price inflation and imported inflation by 0.02 percent but after eight quarters. This indicates that the exchange rate pass-through is low and incomplete. These results are similar to Chaoudhri and Hakura (2001), who found zero elasticity of pass-through to inflation in Bahrain, Canada, Finland, Singapore, Ethiopia and Tunisia, 0.09 for Kenya, 0.02 for South Africa, 0.06 for Zimbabwe.

The pass-through declines as one goes along the distribution channel. The exchange rate pass- through is relatively higher on imported inflation compared to consumer inflation in the first quarter following the shock. The results are similar to those of Parsley (2012), who found the exchange rate pass-through for South Africa to be low on consumer prices (15 to 25 percent following an exchange rate change), while the import price pass-through was 60 percent. Similarly, Rowland (2003) found the exchange rate pass- through in Colombia to be high on import prices (80 percent) and low of consumer prices 15 percent.

The oil price pass-through is higher than the exchange rate pass-through both on imported inflation and consumer inflation. The oil price pass-through elasticity on consumer inflation is negligible and negative during the first quarter, while that on imported inflation was estimated at 0.05. After the second quarter, the oil price pass-through elasticity on consumer and imported inflation increases to 0.18 and 0.22, respectively which suggests that a 1 percent increase in oil prices increased consumer and import prices by 0.18 percent and 0.22 percent, respectively, but after six months.

The pass-through elasticity of South Africa food prices is high on consumer inflation, but low on the imported inflation. The pass through is estimated at 0.22 on imported inflation and 0.96 on consumer inflation in the first quarter. These results contradict with the study of Bukeviciute et al. (2009) who claims that the extent of pass-through gets smaller the further one moves along the price chain.

5. Conclusions and Recommendations

The granger causality test indicates that a uni-directional causality exists, where the nominal effective exchange rate, oil prices and imported inflation granger causes the consumer inflation. Also, consumer inflation in Namibia granger causes the repo rate and this relationship is unidirectional. The test results show that consumer inflation does not granger cause the effective exchange rate, oil prices and imported inflation.

The exchange rate pass-through to inflation is low and incomplete. The exchange rate pass- through on consumer inflation and imported inflation is estimated at 0.01 and 0.04 respectively in the first quarter. After eight quarters the exchange rate pass-through on both the consumer prices and import was estimated at 0.02 respectively. The low ERPT in Namibia can be attributed to the pricing to market strategy of importers.

The oil price pass-through is higher than the exchange rate pass-through both on imported inflation and consumer inflation. The oil price pass-through elasticity on consumer inflation is estimated at 0.18 during the second quarter, while that on imported inflation was estimated at 0.22 during the same period. The pass-through of South Africa food prices is high on consumer inflation, but low on the imported inflation; estimated at 0.22 on imported inflation and 0.96 on consumer inflation in the first quarter.

It can be concluded that external shocks play a significant role in the Namibian economy, given that both import and consumer prices are exposed to external shocks. Imported inflation however could be mitigated by reducing domestic absorption or increasing the repo rate. The impact of monetary policy seems to be working through reducing domestic absorption, imported inflation and finally consumer inflation. To forecast consumer inflation in Namibia, a significant weight should thus be placed on imported inflation, South African food inflation, oil prices and exchange rate. Therefore, these results are important to policy makers for forecasting inflation.

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Appendix: Table 3: Bi-directional Causality to inflation

Variable	F-Statistics	P-Values	Decision
NEER -Consumer Prices	7.11	0.00	Causality Exist
Consumer Prices -NEER	2.44	0.06	Causality Does Not Exist
Oil-Consumer Prices	2.70	0.01	Causality Exist
Consumer Prices-Oil	1.54	0.17	Causality Does Not Exist
Import Prices–Consumer Prices	3.44	0.02	Causality Exist
Consumer Prices – Import Prices	1.13	0.34	Causality Does Not Exist
GDP Gap–Consumer Prices	0.31	0.86	Causality Does Not Exist
Consumer Prices- GDP Gap	0.99	0.42	Causality Does Not Exist
RSA Food Prices–Consumer Prices	2.2	0.08	Causality Does Not Exist
Consumer Prices –RSA Food Prices	0.47	0.75	Causality Does Not Exist
Repo – Consumer Prices	0.39	0.81	Causality Does Not Exist
Consumer Prices –Repo	6.28	0.00	Causality Exist