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# Identifying Aggregate Supply and Demand Shocks in Small Open Economies: Empirical Evidence from African Countries

**A. H. Ahmad**
**Department of Economics**
**University of Bath**
**Claverton Down**
**Bath, BA2 7AY**
**United Kingdom**
**A.H.Ahmad@bath.ac.uk**


**Eric J. Pentecost**
**School of Business and Economics**
**Loughborough University**
**Loughborough**
**Leicestershire, LE11 3TU**
**United Kingdom**
**E.J.Pentecost@lboro.ac.uk**

**Abstract**

This paper uses a tri-variate structural VAR with a long-run identification scheme, akin to the Blanchard and Quah method, to identify external and domestic supply and demand shocks in 22 African countries between 1980 and 2005. Domestic supply shocks are found to be the most important factor contributing over 70% to output fluctuations in these countries, with external shocks playing a relatively minor role. A partial correlation analysis between the identified shocks and a measure of the fiscal policies of the countries revealed that the fiscal policies pursued by most of the countries during the period are counter-cyclical.

**JEL Classification:** E62, F41, F43

**Key Words:** African countries; Structural VAR

## 1. Introduction

This paper contributes to the on-going debate over the disappointing economic performance of many African countries over recent decades with respect to economic growth (see, for example, Easterly and Levine, 1997), by focusing on the identification of the sources of the economic shocks faced by these economies between 1980 and 2005, in order to examine the country-specific constraints on economic growth and potential policy options.

Despite the optimism about Africa's economic potential in the 1960s and early 1970s (Enke, 1963; Kamark, 1976) for most African countries, the 1980s are considered as 'a lost decade' with slow, and even negative, growth commonplace (Fisher, 1991). For example, in 1957 Ghana, then the wealthiest nation in sub-Saharan Africa, had a per capita income almost equal to that of South Korea (US$ 490 against US$ 491 in 1980 dollars), but by the early 1980s, Ghana's annual income per head had fallen by nearly 20 per cent to US$400, while South Korea's per capita GDP was, by then, over US$ 2,000. The UNDP's 1990 Human Development Report suggests that South Korea had an annual purchasing power per head ten times greater than Ghana (US$ 4,832 against US$ 481) based on 1987 statistics (The Economist, 26 May, 1990, p.81). Furthermore this was not just a country-specific problem, but an African problem. Collier and Gunning (1999), for example, note that African economic performance had been markedly worse than that of other regions, during the 1980s as per capita GDP declined by 1.3 percent per annum, five percent below the average for all low income developing countries. During 1990-94 the decline accelerated to 1.8 percent per annum which, widened up the gap between the average of all low income countries to 6.2 percent. Since the mid-1990s economic performance in Africa seems to have been improving, with GDP growth in sub-Saharan Africa rising to about six percent per annum, while inflation has been in single digits, a much improved performance perhaps partly attributable to structural adjustment programmes sponsored by the IMF and the World Bank.

To identify the potential economic shocks faced by the African countries since 1980 we undertake a tri-variate VAR analysis, following Dungey and Pagan (2000). For small open economies, like those in Africa, where external shocks are likely to be at least as important as domestic shocks in influencing the evolution of output growth and inflation, the tri-variate VAR is preferred to Blanchard and Quah's (1989) more usual bi-variate VAR. In this framework in addition to domestic output growth and inflation, world output growth is also included in the model. This variable is assumed to be an important exogenous determinant of individual country exports, and therefore fluctuations in world output growth are likely to have significant effects on domestic output growth and inflation. A second contribution to the existing literature is to identify the contribution of national fiscal policies by a partial correlation analysis between the estimated shocks and a measure of fiscal policies of the countries studied.

The rest of the paper is organised as follows. The next section discusses the identification of aggregate supply and demand shocks within a structural VAR. Section 3 analyses the data from our sample of 22 African countries and the results from the trivariate-VAR analysis. Section 4 concludes.

## 2. Aggregate Supply and Demand Shocks within an SVAR

The SVAR methodology imposes structural restrictions, based on economic theory (Hoffmaister et al 1998), on a Vector Autoregressive (VAR) model. In particular, in a bi-variate VAR context, Blanchard and Quah (1989) interpret the permanent shocks as aggregate supply shocks and transitory shocks as aggregate demand shocks. In an open economy context, a third-order VAR is necessary to capture potential shocks from the rest of the world on domestic output growth and inflation (Dungey and Pagan, 2000).

Therefore let $y_t^*, y_t$ and $\pi_t$ represent the log of real foreign output, the log of real domestic output and the domestic inflation rate, respectively. Then a tri-variate autoregressive (VAR) model can be set up to represent the small open economies of Africa as follows:

$$\Delta y_t^* = \sum_{j=1}^{k} a_{11j} \Delta y_{t-j}^* + e_{1t} \tag{1}$$

$$\Delta y_t = \sum_{j=0}^{k} a_{21j} \Delta y_{t-j}^* + \sum_{j=1}^{k} a_{22j} \Delta y_{t-j} + \sum_{j=1}^{k} a_{22j} \Delta \pi_{t-1} + e_{2t} \tag{2}$$

$$\Delta \pi_t = \sum_{j=0}^{k} a_{21j} \Delta y_{t-j}^* + \sum_{j=1}^{k} a_{22j} \Delta y_{t-j} + \sum_{j=1}^{k} a_{23j} \Delta \pi_{j-i} + e_{3t} \tag{3}$$

where the constant terms are suppressed for notational convenience and the variables are differenced sufficiently to achieve stationarity. If the domestic economy is assumed to be small, then it is reasonable to assume that this economy has no effect on the world output, and therefore the foreign output equation includes neither current or lagged values of the other variables. The small country assumption also means that domestic output and inflation are allowed to depend on the current and past values of foreign output. The residuals $e_{1t}$, $e_{2t}$ and $e_{3t}$ are assumed to be related to each other through different types of shocks, which are foreign shocks, $v_t$, domestic demand shocks, $\eta_t$ and domestic supply shocks, $\varepsilon_t$. Since these shocks are not observable, they need to be identified from the VAR residuals. Let the relationship between the residuals and the innovations be given by

$$\begin{bmatrix} e_{1t} \\ e_{2t} \\ e_{3t} \end{bmatrix} = \begin{bmatrix} g_{11} & g_{12} & g_{13} \\ g_{21} & g_{22} & g_{23} \\ g_{31} & g_{32} & g_{33} \end{bmatrix} \begin{bmatrix} v_t \\ \varepsilon_t \\ \eta_t \end{bmatrix} \tag{4}$$

In the above system, there are fifteen unknowns to identify. These are nine elements, $g_{ij}$, of matrix G linking the VAR residuals and the structural innovations, three variances $\sigma^2_v$, $\sigma^2_\varepsilon$, $\sigma^2_\eta$ and three covariances $\sigma^2_{v\varepsilon}$, $\sigma^2_{\varepsilon\eta}$, $\sigma^2_{\eta v}$ in the variance-covariance matrix, $\Sigma$, of the structural innovations. From equation (4) the variance-covariance matrix of the VAR residuals $\Sigma_e$ is denoted by

$$\Sigma_e = G \Sigma_s G' \tag{5}$$

The elements of $\Sigma_e$ provides six of the fifteen restrictions required for exact identification of the system. In addition, following the Blanchard-Quah methodology, it is assumed that all variances are unity, i.e. $\sigma^2_v = \sigma^2_\varepsilon = \sigma^2_\eta = 1$ and all co-variances are zero, $\sigma^2_{v\varepsilon} = \sigma^2_{\varepsilon\eta} = \sigma^2_{\eta v} = 0$. The penultimate two restrictions are that the domestic supply shocks $\varepsilon_t$ and domestic demand shocks $\eta_t$ have no impact on the large country, so that both $g_{12}$ and $g_{13}$ are zero. Finally, domestic demand shocks have no long-run effects on domestic output, so that:

$$g_{23}\left[1 - \sum_{i=1}^{k} a_{33j}\right] + g_{33}\left[1 - \sum_{i=1}^{k} a_{23j}\right] = 0 \tag{6}$$

These restrictions are adequate to identify the structural system. Impulse response functions and variance decomposition analysis of the output effects of the structural shocks are considered with the view to investigate the plausibility of the identification presented here.

Given that the domestic country is assumed to be small, world output growth is taken to be exogenous and therefore, domestic shocks do not affect world output. A positive shock to foreign growth, however, perhaps from a global technological improvement, would raise domestic output growth through two possible channels. There would be a direct effect of higher demand for home exports as world income rose and an indirect effect, through a more favourable terms of trade for the home country as import prices fall relative to export prices. A positive domestic supply shock directly and permanently increases output. As long-run neutrality of aggregate demand is assumed demand shocks have no effect on the long-run path of domestic supply.

### 3. African growth: response to external and internal shocks

*3.1 The Data Set*

To estimate the SVAR model quarterly data is obtained from the IMF's International Financial Statistics database, covering the period from 1980Q1 to 2005Q4 and comprises of foreign (or world) real GDP plus domestic real GDP and the consumer prices indices (CPI) for each of the 22 African countries in the sample. Foreign real GDP is represented by US output, which is highly and significantly correlated with world output (correlation coefficient of 0.73). The time series were first logged and then subjected to a battery of unit root tests that included the ADF, PP and KPSS tests to identify their level of integration. Table 1 shows that the tests rejected the stationarity of the series in levels, but failed to reject stationarity in first differences. In addition, Table 1 also reports Johansen cointegration tests between the logarithms of domestic prices, domestic GDP, and foreign GDP for each country, and  shows that there is no cointegration and therefore the use of the SVAR methodology is appropriate for each of the sample countries.

*3.2  SVAR Results*

The impulse response functions show the direction, magnitude and time path of domestic output growth and inflation from shocks emanating from world output, domestic demand and domestic supply. Figure 1 shows these GDP growth and inflation profiles for each of the 22 countries, where the dotted lines denote the five per cent confidence bands.

Output growth of these countries does not seem to be very sensitive to the positive external shock from world GDP growth. This maybe a reflection of the general movement towards more flexible exchange rates (see Ahmad, et al 2011 and Alba, et al 2011) by many of these economies, so providing them with greater insulation from real foreign shocks. In fact only three countries' output responded to the world GDP shock: Botswana, Central Africa, and to a lesser extent, Egypt. This effect is probably due to the structure of these countries exports. For example, Botswana's and Central African Republic's main exports are diamonds, the demand for which is likely to be sensitive to income growth in the industrial countries and Egypt is increasingly becoming an important gold exporting country. Jin, et al (1994) reported similar findings for Korea in the 1990s. For some countries, such as Ethiopia and Nigeria the positive world output shock lead to an initial fall in

domestic growth which persisted until the tenth quarter and sixth quarter after the shock, respectively. Similar results are reported by Ahmed and Park (1994) for a set of developed countries. With the exception of Gabon, world output shocks had no effect on domestic inflation. In Gabon inflation rises at a diminishing rate for ten quarters, to be 10% higher than before the shock.

A positive domestic supply shock results, as expected, in a persistent rise in the growth of real output from the period contemporaneous to the shock up to the tenth quarter in all the countries. The magnitude, however, varies from country to country. Zambia, for example, recorded a 3% positive response during the period immediately after the shock, whereas Gabon, Ghana, Libya, Malawi, Mauritania and Tanzania's output responded by a 2% rise in the period contemporaneous to the shock. The rest of the countries recorded a rise of about 1% in output due to the domestic supply shock, except for Egypt, Mauritius and Tunisia, where the immediate response to the shock was less than 0.5%. The degree of persistence also varies among the countries. In Algeria, Botswana, Gabon, Ghana, Libya, Malawi and Tanzania, the response of the output was to rise by between 3% and 4% by the second or sixth quarter, where it mostly remained until the tenth quarter. The effect of the domestic supply shock on inflation rates was small, although this result may also reflect the role of price distortions in some of these economies. Countries that operate some form of price control, such as Benin, Cameroon, Central Africa, Gabon and Senegal, recorded a rise in inflation in response to a positive shock to domestic supply. Other countries, such as Algeria, Egypt, Ghana and Tunisia, where there are few price controls, did record a decline inflation of between 1% and 1.5% as a result of a positive domestic supply shock, albeit in some cases insignificant.

A positive domestic demand shock has no permanent effect on real GDP in most of the sample countries, the exceptions being Benin and Senegal, where output growth, although very small is sustained for over ten quarters. The demand shock, however, has a much greater effect on inflation, inducing an immediate, positive and significant rise in inflation in all the countries, except Gabon. For most countries the rise in inflation is between 1% and 2%, although in three countries – Ghana, Malawi and Zambia it is very much higher. In Ghana inflation rises immediately by 2% and is 10% higher ten quarters later and on a rising trend. In Malawi inflation jumps immediately by 2.5% ad is 7.5% higher after ten quarters and still rising. In Zambia inflation jumps immediately by 15% and remains about 15% higher after ten quarters.

Impulse response analysis is useful in considering the signs and magnitude of responses to specific shocks, however, the relative importance of shocks for given variable fluctuations is better assessed through the variance decompositions. Table 2 presents the variance decomposition of real output and inflation to world GDP and domestic supply and demand shocks. Foreign shocks have not significantly impacted on the domestic output of these countries, except in Egypt, Gabon and Ghana where the foreign shock accounted for more than 10% of domestic output variations. Gabon recorded the highest of 14% after three years. The domestic supply shock is by far the most important source of domestic real output variation in all the 22 countries, however, its relative significance seems to decline over time in some countries. For example, in Nigeria and Senegal, the supply shocks initially accounted for about 99% of output fluctuations, but its contribution in both countries declined to about 68% after six years. The influence of demand shocks on domestic output varies across the countries, but its relative importance is generally low, accounting for less than 20%

of output variations in all the countries, except in Senegal where the influence of the demand shock on output is about 30%.

The most important source of inflation is the demand shock, which accounts for between 50% and 90% of inflation variation in all countries, with the exception of Gabon. The country where the demand shock has the largest influence on inflation is Zambia, where demand shocks accounts for between 100% and 96% of the variation in inflation. In general the external world output shock has had rather less impact on inflation variation in most of the countries, with the exceptions of Gabon and South Africa, accounting for between 3% and 7% of their inflation variation. For Gabon, external shocks initially account for 98% of the inflation variation, before falling to about 80% after three years. South African inflation variation is also highly dependent on foreign output shocks, which account for 21% of inflation variation after two years. This level of external dependence is probably explained by the fact that South Africa's largest trading partner, accounting for about a third of her exports and imports, is the USA. The contribution to inflation of domestic supply shocks varies from one country to another. In Algeria, Central Africa, Benin, Ethiopia, Malawi and Senegal, between 20% and over 40% of variations in inflation are attributable to the domestic supply shocks. Domestic supply shocks are, however, responsible for less than 10% of inflation in Botswana, Egypt, Kenya, Libya, Mauritania, Mauritius, Nigeria, Tanzania, Tunisia, Uganda and Zambia.

*3.3 Fiscal policy*

Given the impact of the three shocks on inflation and domestic output growth, it is also interesting to consider the possible impact fiscal policy has had on eliminating or magnifying the impact of such shocks. In order to undertake this kind of analysis, a measure of the fiscal is needed. In this regard we follow Kaminsky et al (2004) and Ilzetzki and Vegh (2008), where fiscal policy is measured from the perspective of the potential instruments of fiscal policy, rather than from the outcomes (which could lie outside the policy makers' control). Since data on tax rates are not available, or indeed a reliable measure of the tax burden in developing countries, government consumption is used as the measure of the fiscal policy stance. The variable is sourced from the Worldbank Development Indicators database.

A partial correlation analysis between the estimated shocks and government consumption are reported in Table 3, which shows that for the majority of countries fiscal policy is counter-cyclical (see also Diallo, 2009), as indicated by negative and significant correlation coefficients between the demand shock and the government consumption. Of the 22 countries, 19 show negative correlation coefficients (four of which are not statistically significant at the 10% level), while three, Central Africa, Gabon and Morocco are positive (between 0.22 and 0.46) and significant. The most counter-cyclical fiscal policy countries seem to be Malawi and Mauritius, with correlation coefficients of -0.95 and -0.76 respectively. The relationship between domestic supply shocks and fiscal policy is usually positive (20 out of 22 countries) and statistically significant. The two exceptions are Central Africa and Morocco, with partial correlation coefficients of -0.26 and -0.44 respectively, both of which are significant at the 5% per cent level. This suggests that in most countries government consumption rises with positive output shocks, suggesting that much of the additional supply is bought up by the public sector, rather than by the private sector.

## 4. Conclusion

This paper has investigated the effects of external, demand and supply shocks on output growth and inflation in 22 African countries. On the whole, domestic supply shocks are by far the most important of the shocks in accounting for between 70% and 95% of movements in domestic output. This finding may suggest that economic policies that aim at alleviating country-specific supply-side constraints would most likely help in raising the economies' rate of economic growth.

Foreign supply shocks have produced positive and significant output responses in Botswana, Egypt, Gabon, and Tunisia, perhaps reflecting the importance of solid minerals in these countries' exports. Domestic demand shocks did not produce any significant response in real output, except in Senegal and Benin, although inflation did respond positively to the demand shocks in almost all the countries.

Finally, a partial correlation analysis between domestic supply and demand shocks and government consumption, used as a measure of the countries' fiscal stance, indicated that fiscal policy undertaken by these countries during the sample period was primarily counter-cyclical, and that extra output produced as a result of a positive supply shock was largely absorbed by the public sector.

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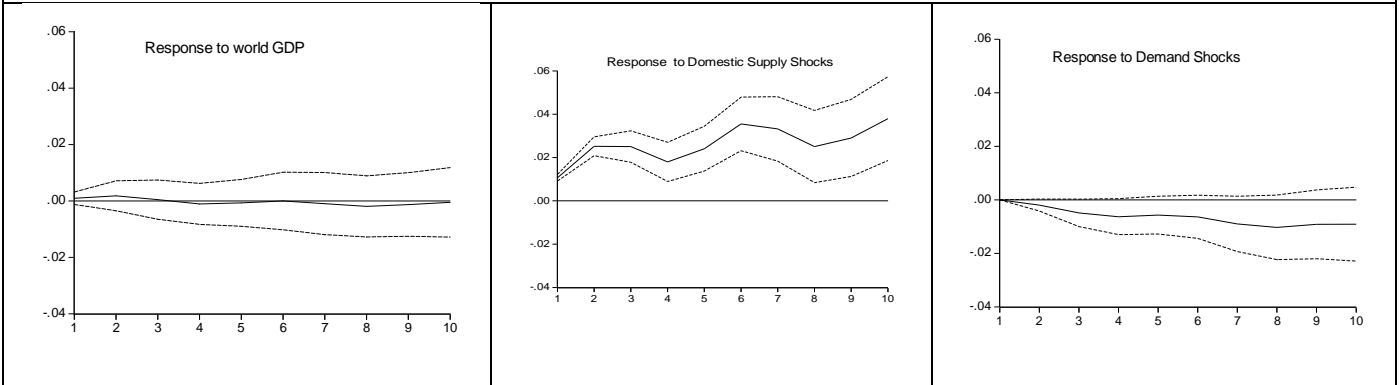
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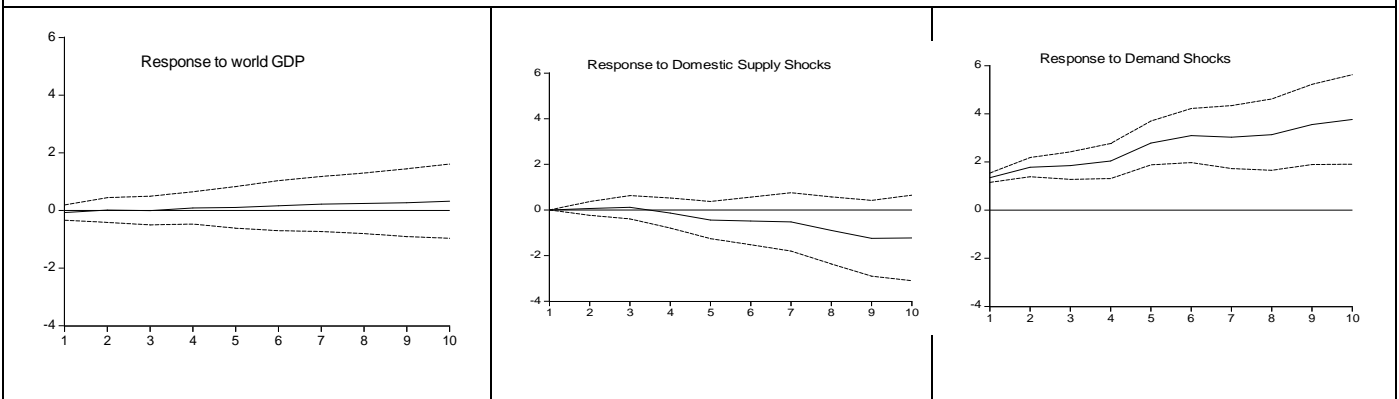
# Figure 1. Impulse Responses

## (1) Algeria

### Real GDP Responses



Response to world GDP

Response to Domestic Supply Shocks

Response to Demand Shocks

### Inflation Responses



Response to world GDP

Response to Domestic Supply Shocks

Response to Demand Shocks

## (2) Benin
### Real GDP Responses



Response to world GDP

Response to Domestic Supply Shocks

Response of to Demand Shocks

### Inflation Responses



Response to world GDP

Response to Domestic Supply Shocks

Response to Demand Shocks

10
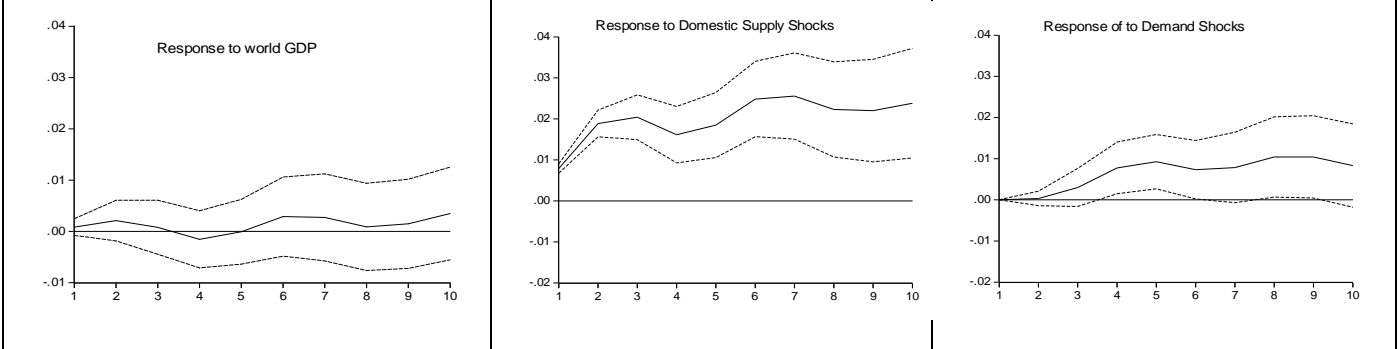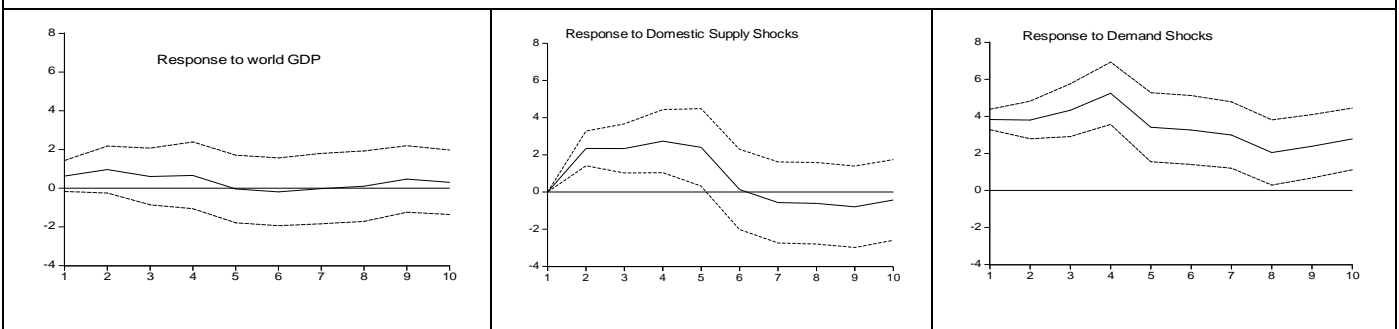
## (3) Botswana
### Real GDP Responses



Response to world GDP

Response to Domestic Supply Shocks

Responseto Demand Shocks

### Inflation Responses



Response to world GDP

Response to Domestic Supply Shocks
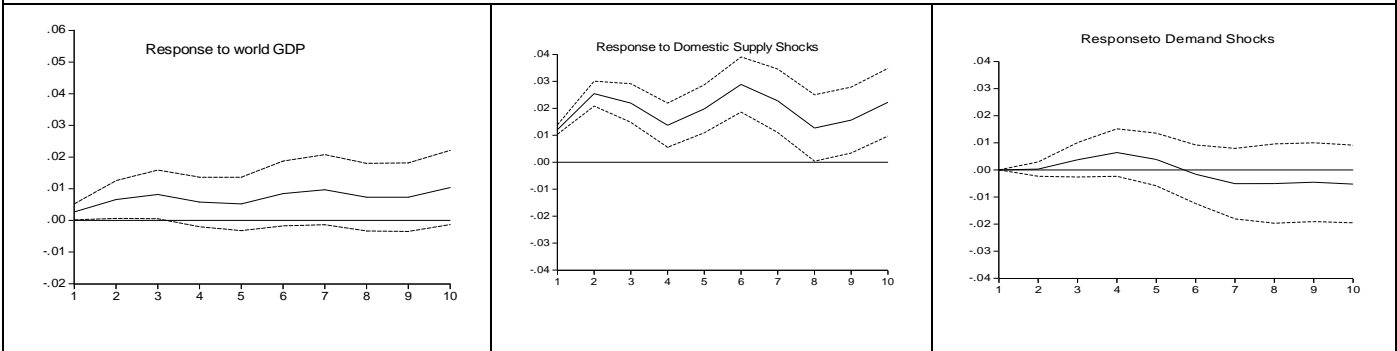
Response to Demand Shocks
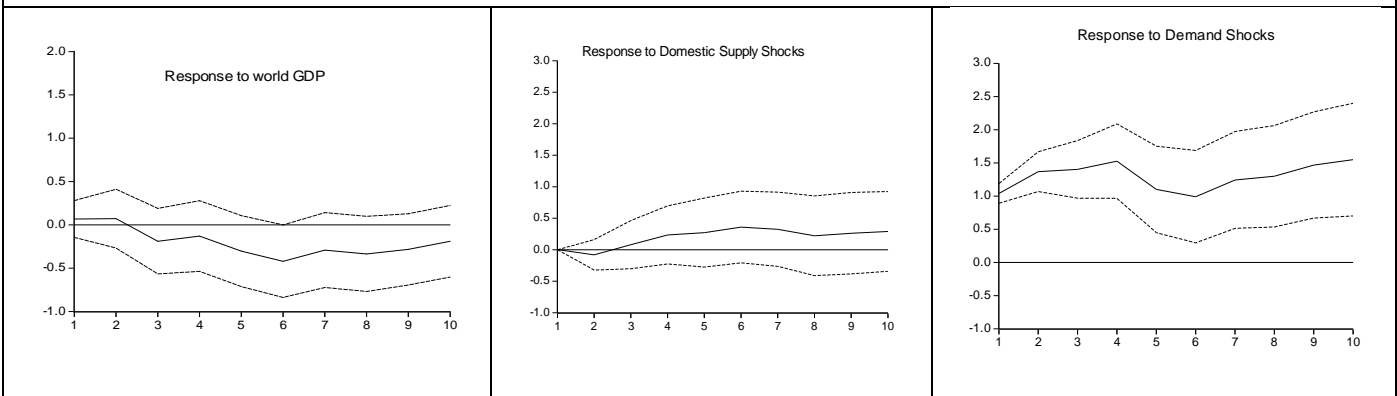
## (4) Cameroon
### Real GDP Responses



Response to world GDP

Response toDomestic Supply Shocks

Response to Demand Shocks

### Inflation Responses



Response to world GDP

Response Domestic Supply Shocks
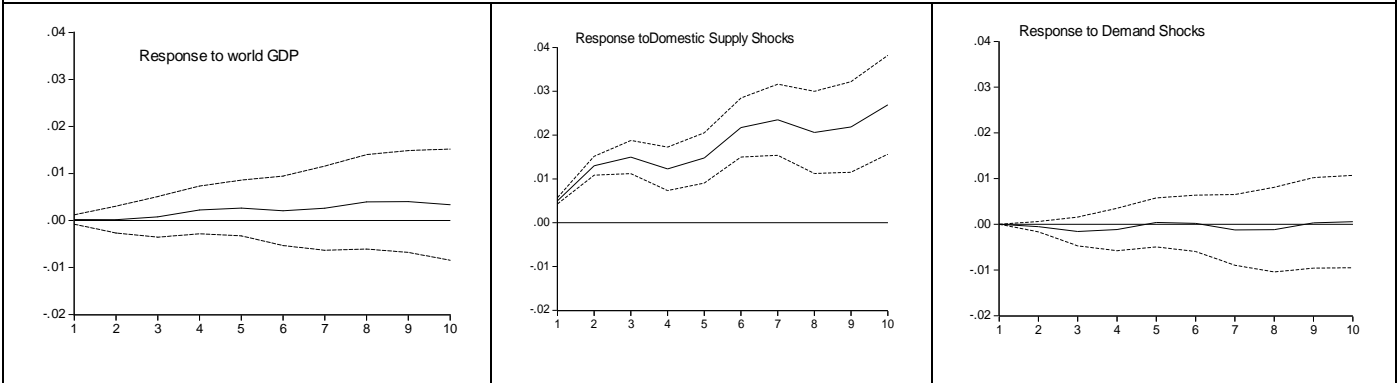
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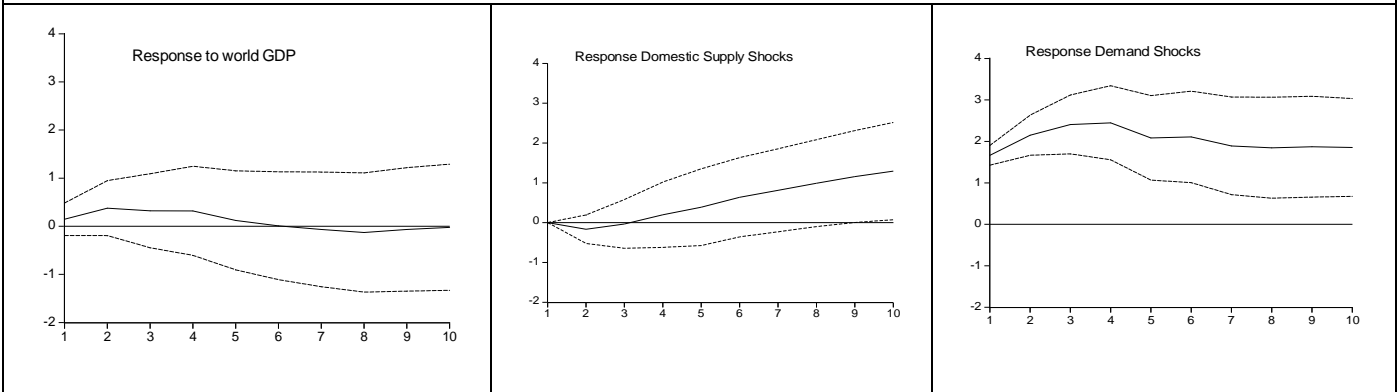
## (5) Central Africa
### Real GDP Responses



Response to world GDP

Response to Domestic Supply Shocks

Response to Demand Shocks

### Inflation Responses



Response to world GDP

Response to Domestic Supply Shocks
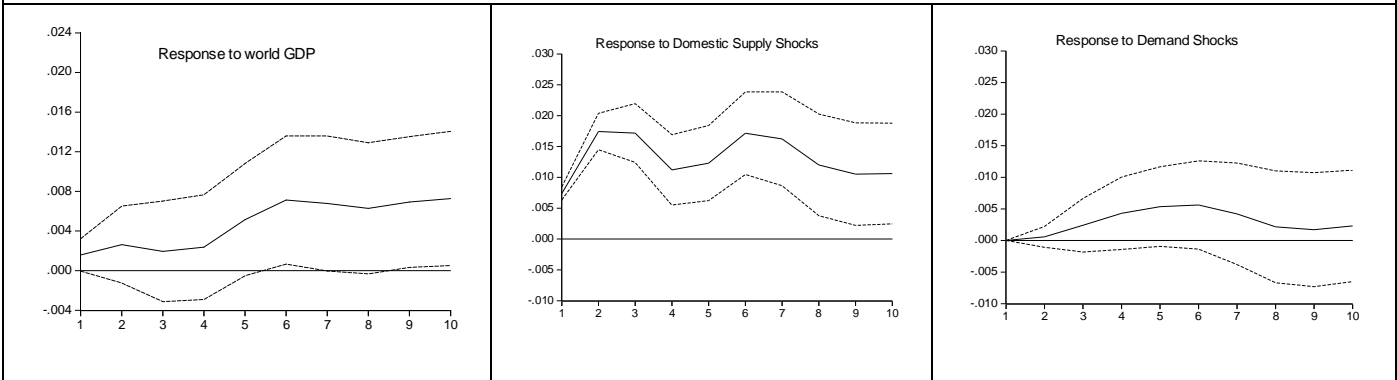
Response to Demand Shocks
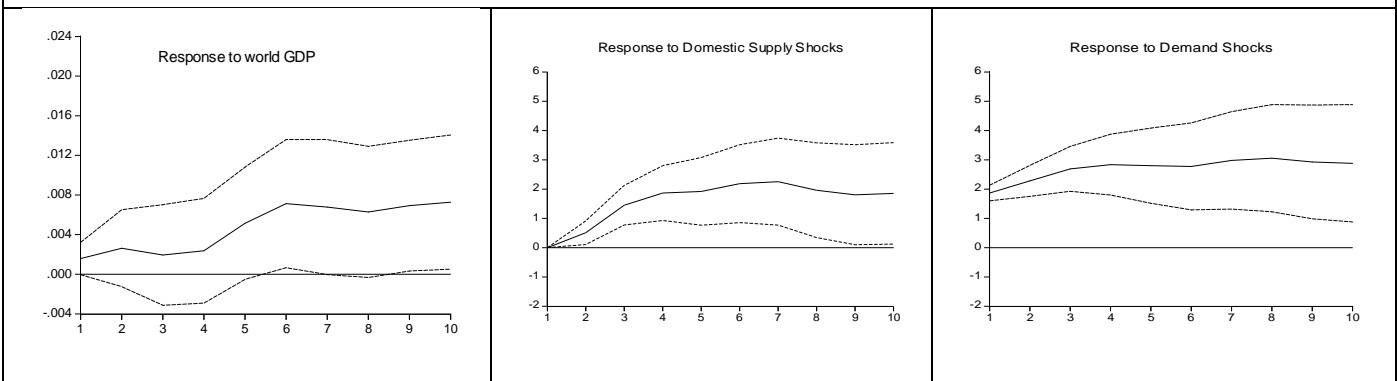
## (6) Egypt
### Real GDP Responses



Response to world GDP

Response to Domestic Supply Shocks

Response to Demand Shocks

### Inflation Responses



Response to world GDP

Response to Domestic Supply Shocks

Response to Demand Shocks

12
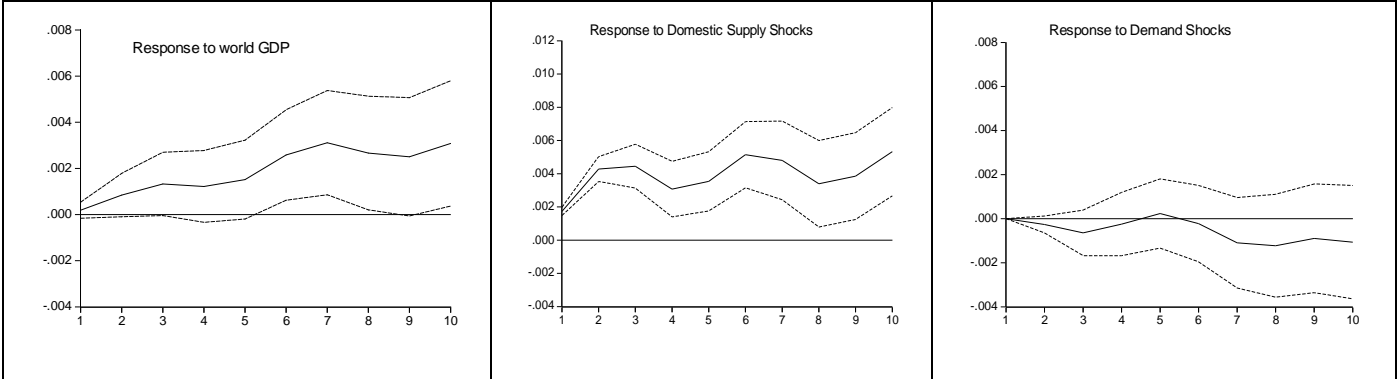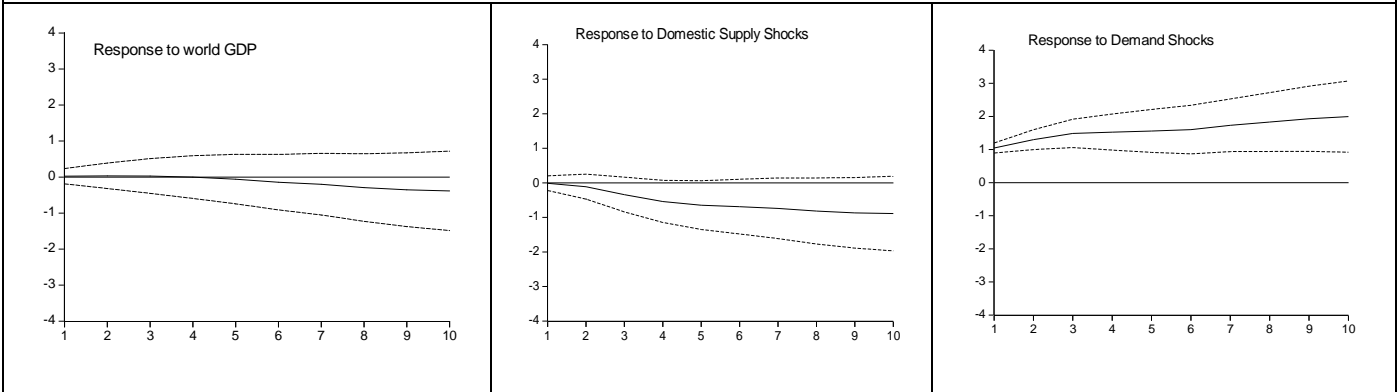
# (7) Ethiopia
## Real GDP Responses
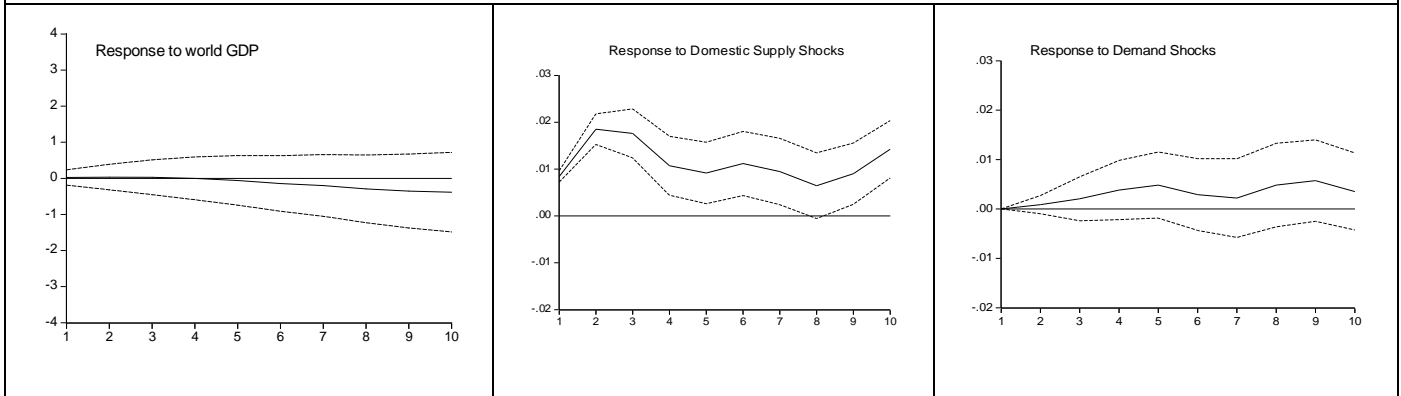


## Inflation Responses
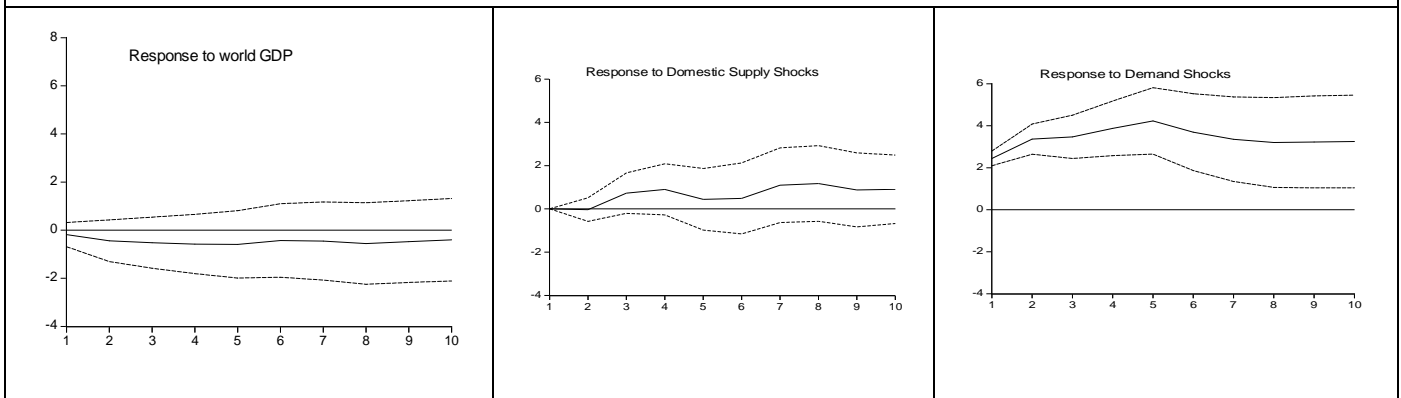


# (8) Gabon
## Real GDP Responses
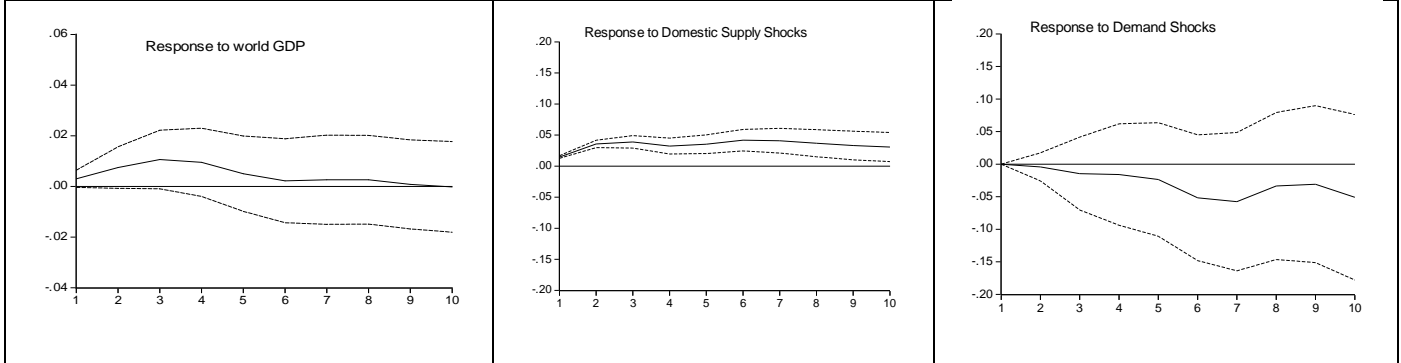


## Inflation Responses

## (9) Ghana
## Real GDP Responses



Response to world GDP

Response to Domestic Supply Shocks

Response to Demand Shocks

## Inflation Responses



Response to world GDP

Response to Domestic Supply Shocks
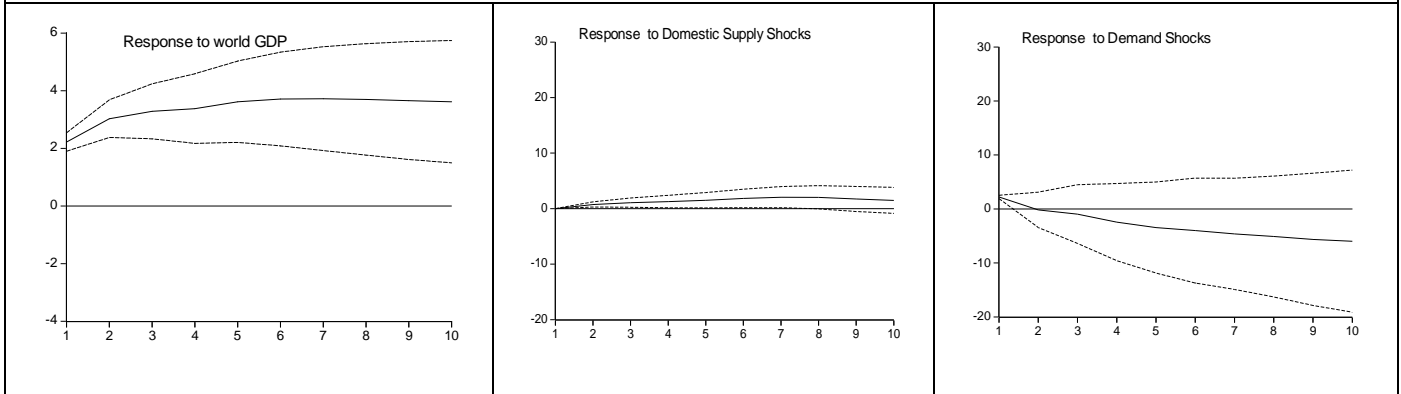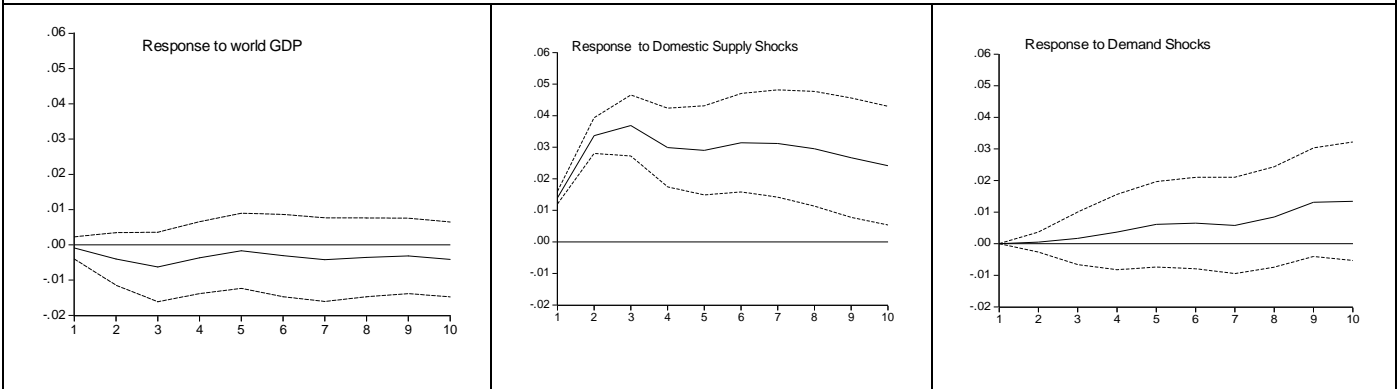
Response to Demand Shocks

## (10) Kenya
## Real GDP Responses



Response to world GDP

Response to Domestic Supply Shocks

Response to Demand Shocks

## Inflation Responses



Response to world GDP

Response to Domestic Supply Shocks

Response to Demand Shocks

14

## (11) Libya
### Real GDP Responses

Response to world GDP

Response to Domestic Supply Shocks

Response to Demand Shocks

### Inflation Responses

Response to world GDP

Response to Domestic Supply Shocks
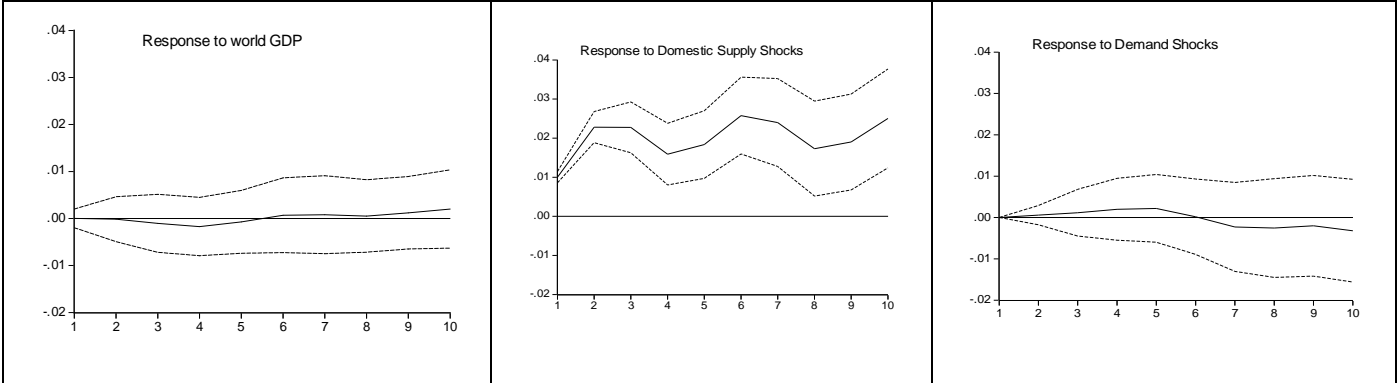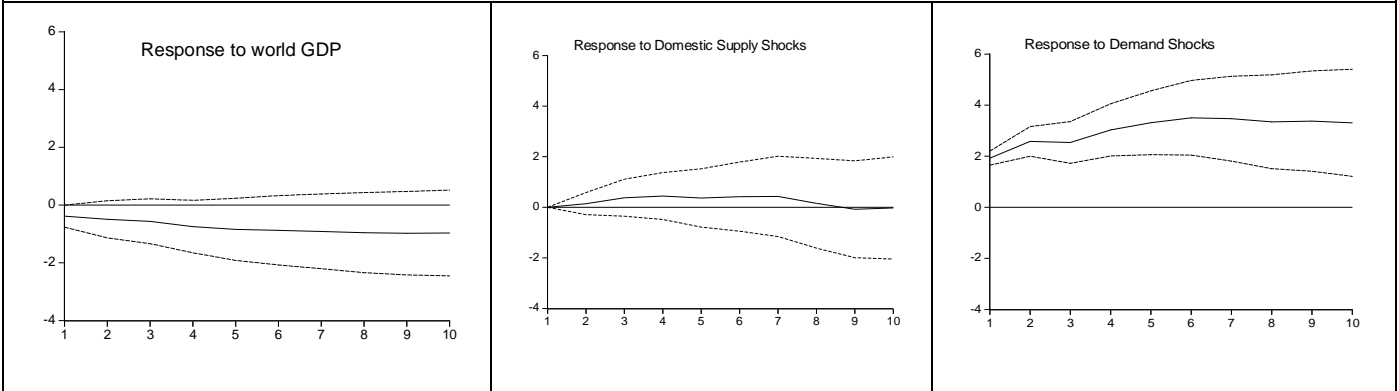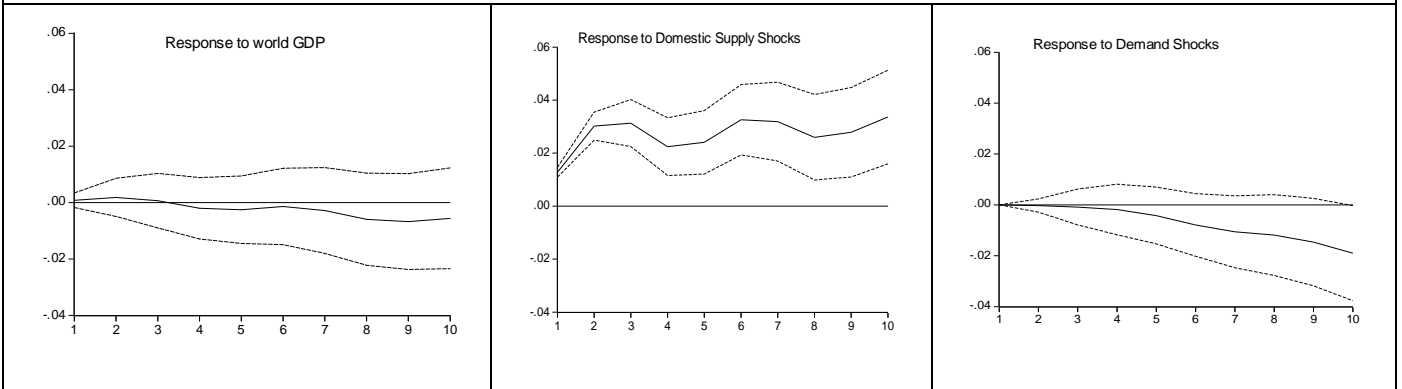
Response to Demand Shocks
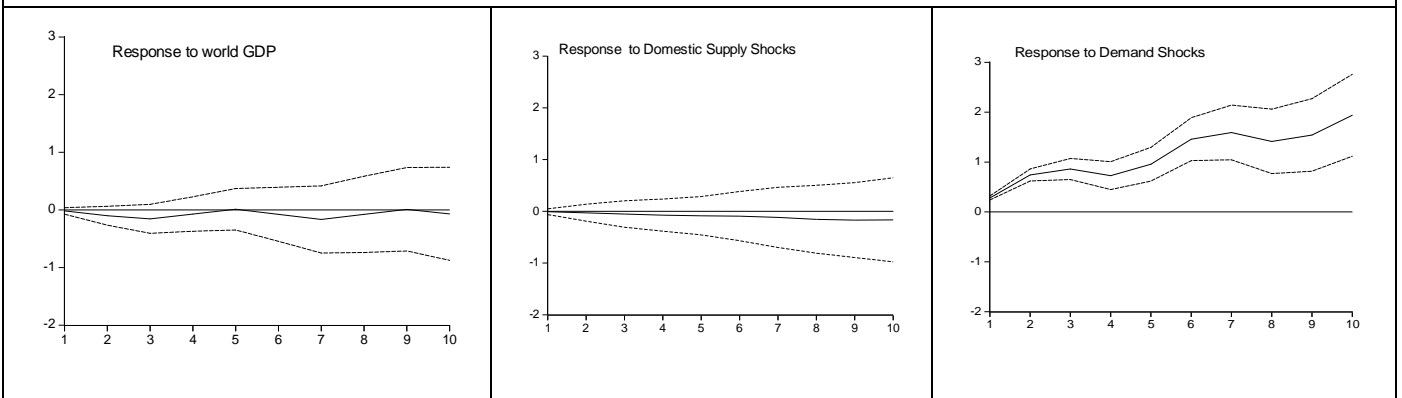
## (12) Malawi
### Real GDP Responses

Response to world GDP

Response to Domestic Supply Shocks

Response to Demand Shocks

### Inflation Responses

Response to world GDP

Response to Domestic Supply Shocks

Response to Demand Shocks

15
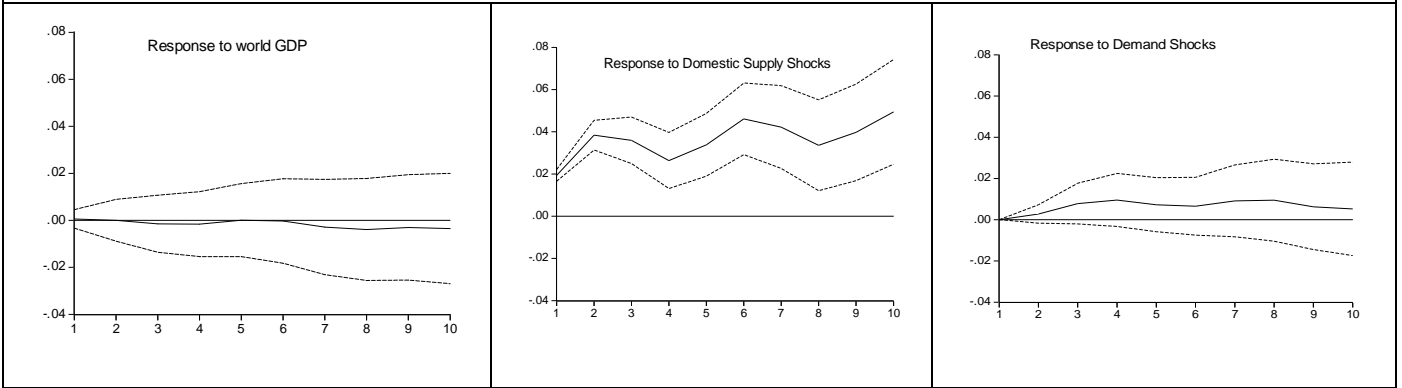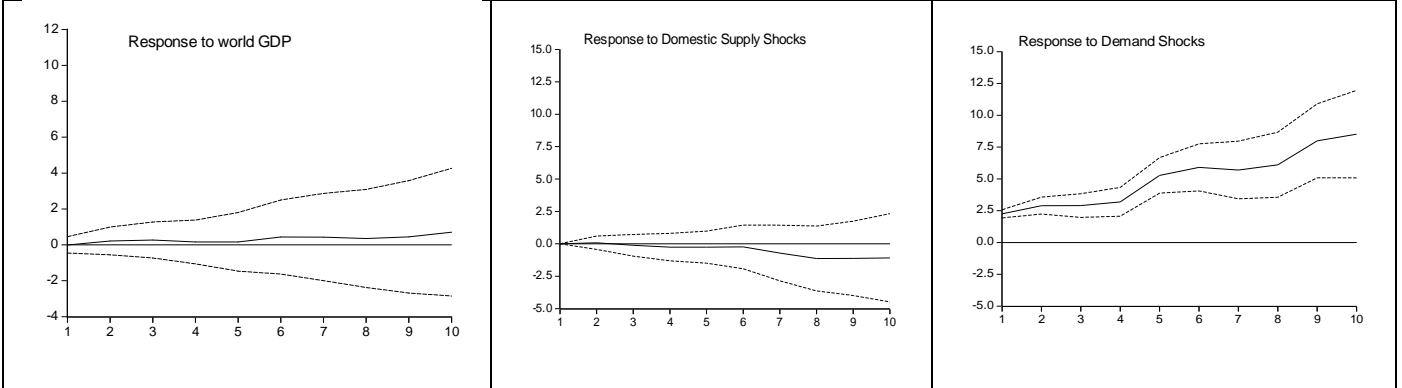
# (13)Mauritania
## Real GDP Responses


Response to world GDP


Response to Domestic Supply Shocks


Response to Demand Shocks

## Inflation Responses


Response to world GDP


Response to Domestic Supply Shocks
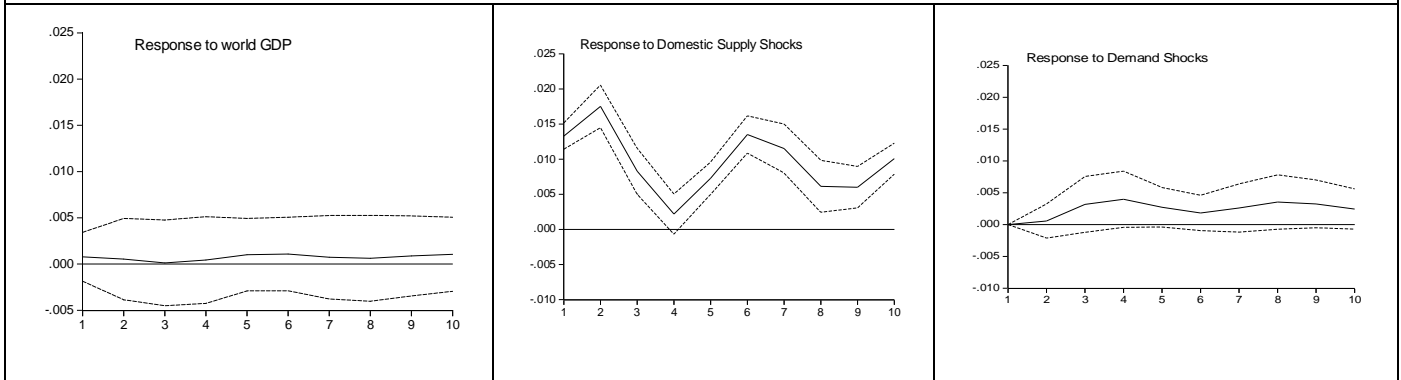

Response to Demand Shocks
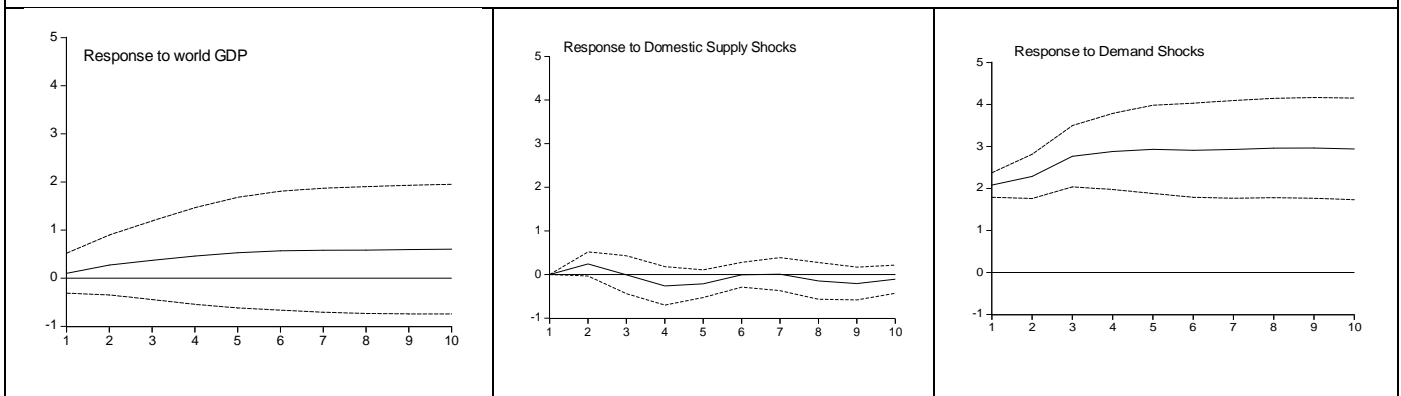
# (14) Mauritius
## Real GDP Responses


Response to world GDP


Response to Domestic Supply Shocks


Response to Demand Shocks

## Inflation Responses


Response to world GDP


Response to Domestic Supply Shocks
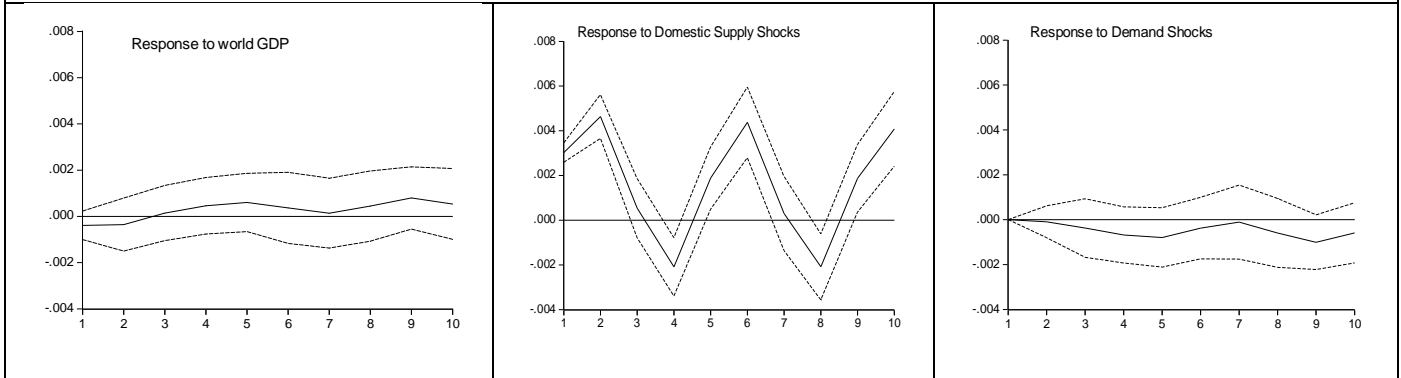

Response to Demand Shocks
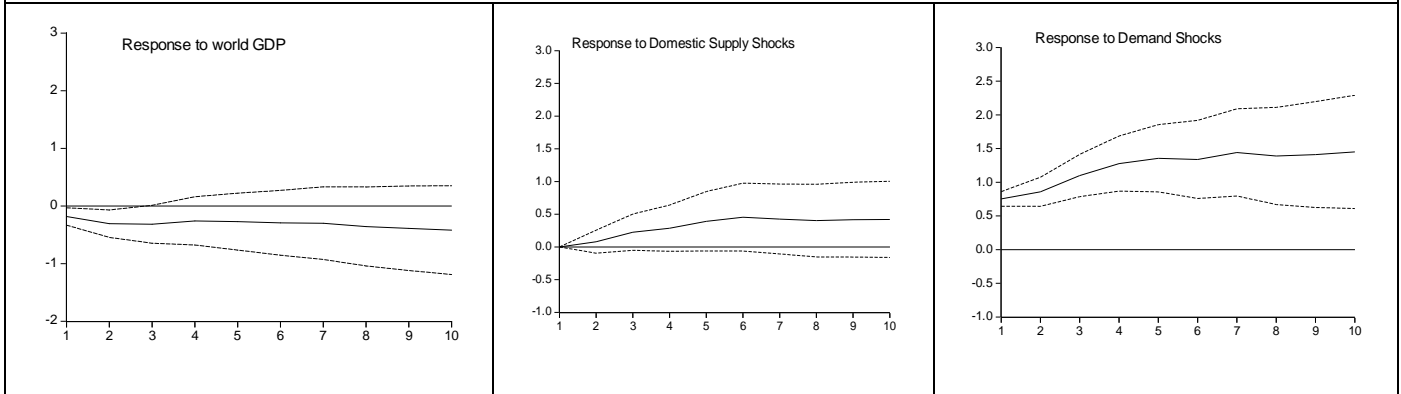
## (15) Morocco
## Real GDP Responses
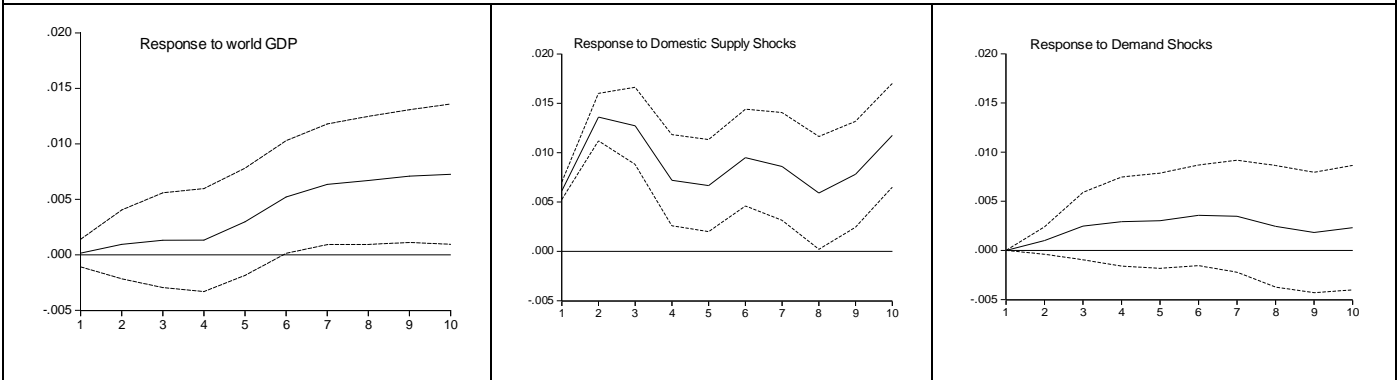

Response to world GDP


Response to Domestic Supply Shocks


Response to Demand Shocks

## Inflation Responses


Response to world GDP


Response to Domestic Supply Shocks


Response to Demand Shocks

## (16) Nigeria
## Real GDP Responses


Response to world GDP


Response to Domestic Supply Shocks


Response to Demand Shocks

## Inflation Responses


Response to world GDP


Response to Domestic Supply Shocks


Response to Demand Shocks

17
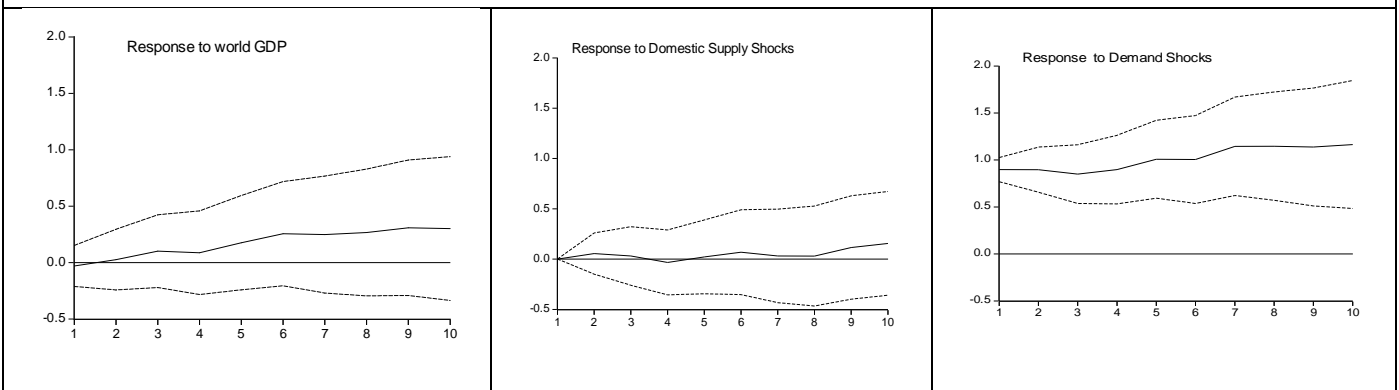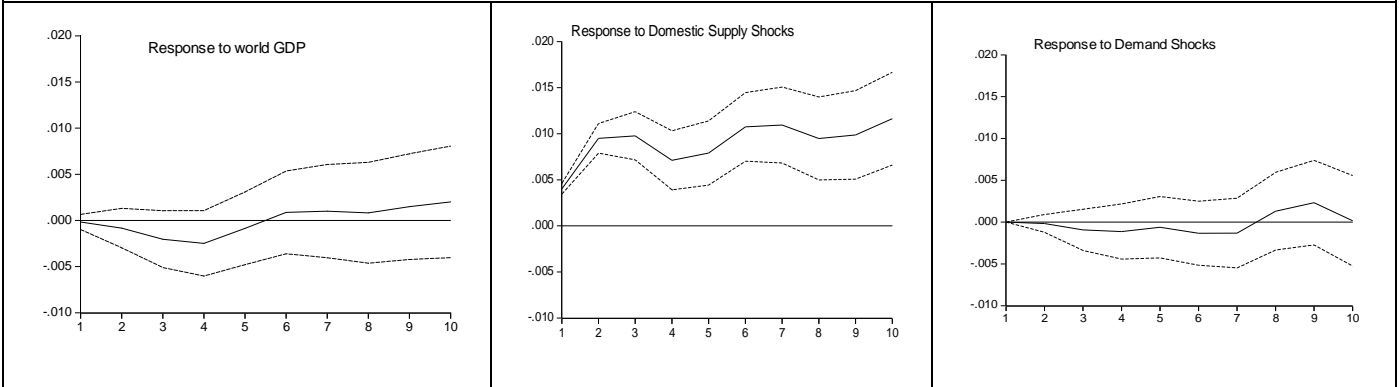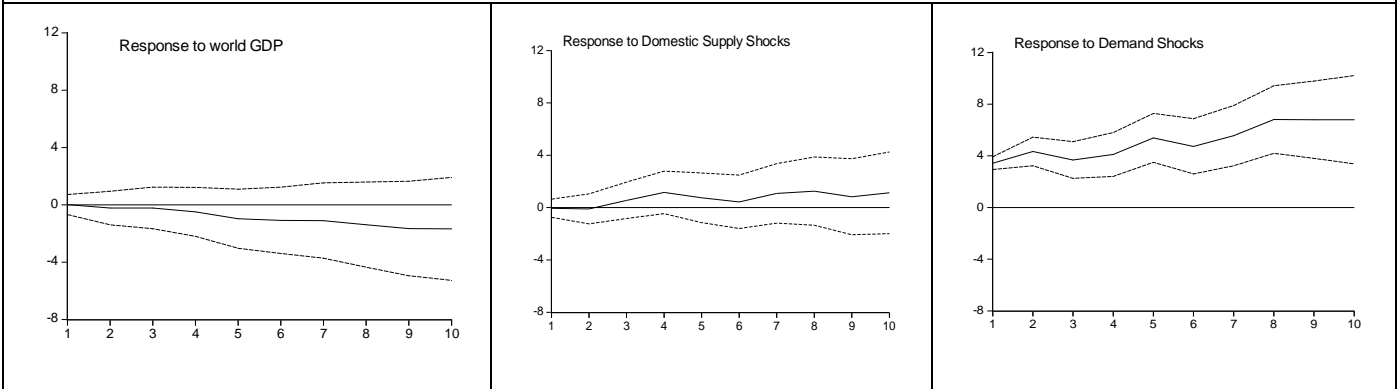
# (17) Senegal
## Real GDP Responses



Response to world GDP

Response to Domestic Supply Shocks

Response to Demand Shocks

## Inflation Responses



Response to world GDP

Response to Domestic Supply Shocks
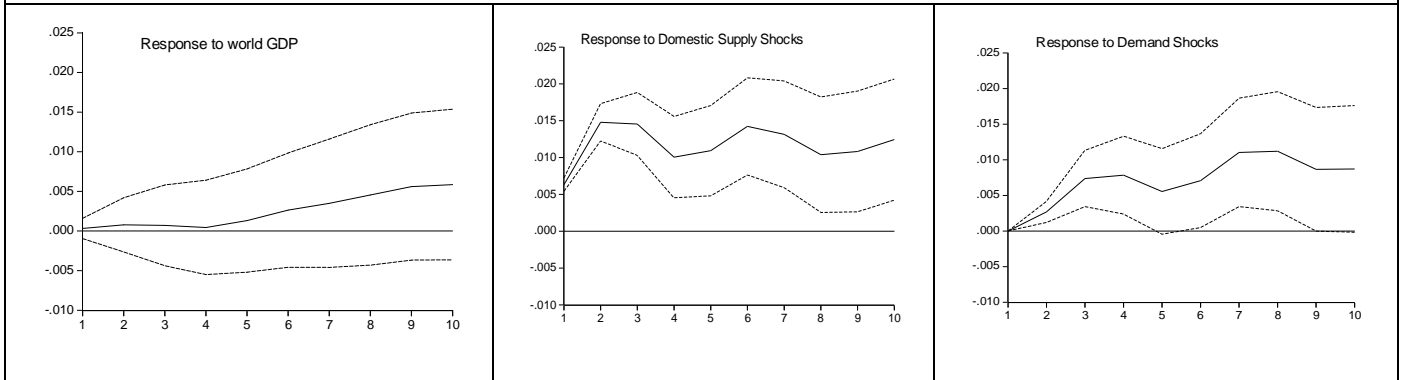
Response to Demand Shocks
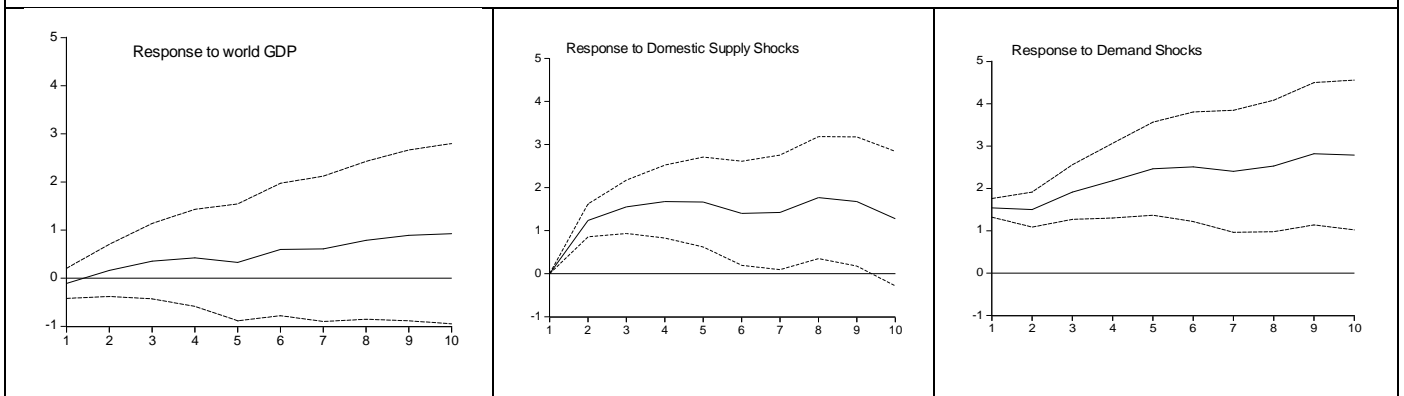
# (18) South Africa
## Real GDP Responses



Response to world GDP

Response to Domestic Supply Shocks

Response to Demand Shocks

## Inflation Responses



Response to world GDP

Response to Domestic Supply Shocks
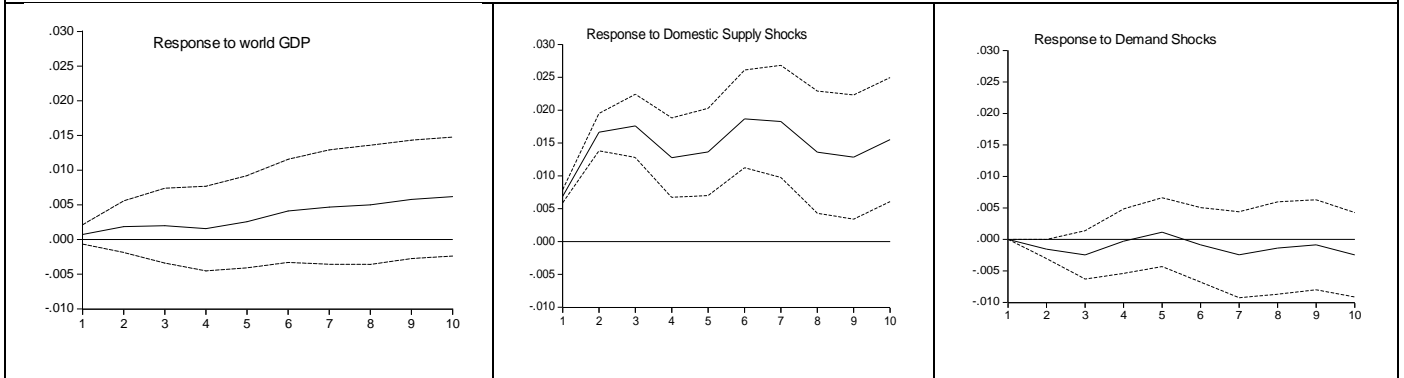
Response to Demand Shocks
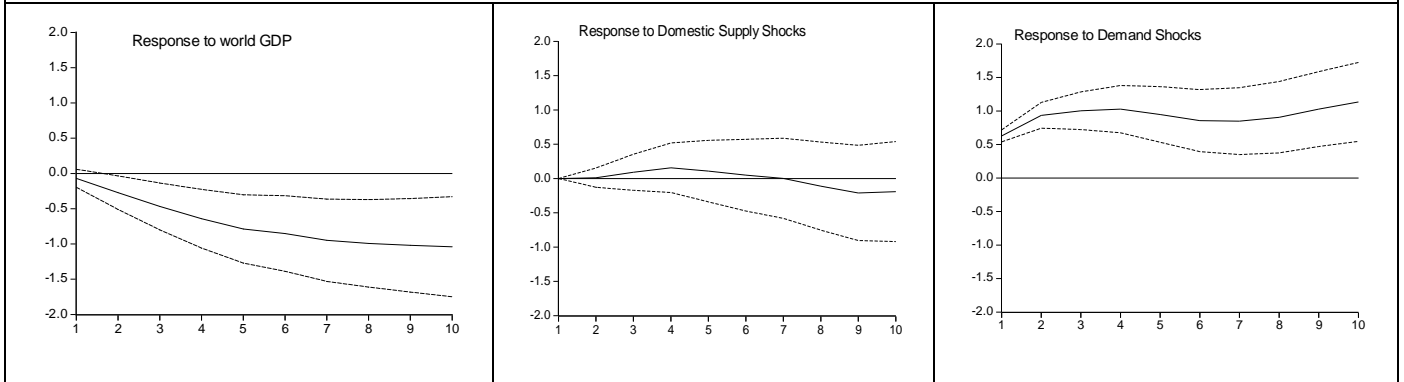
## (19) Tanzania
## Real GDP Responses

**Response to world GDP**

**Response to Domestic Supply Shocks**

**Response to Demand Shocks**

## Inflation Responses

**Response to world GDP**

**Response to Domestic Supply Shocks**
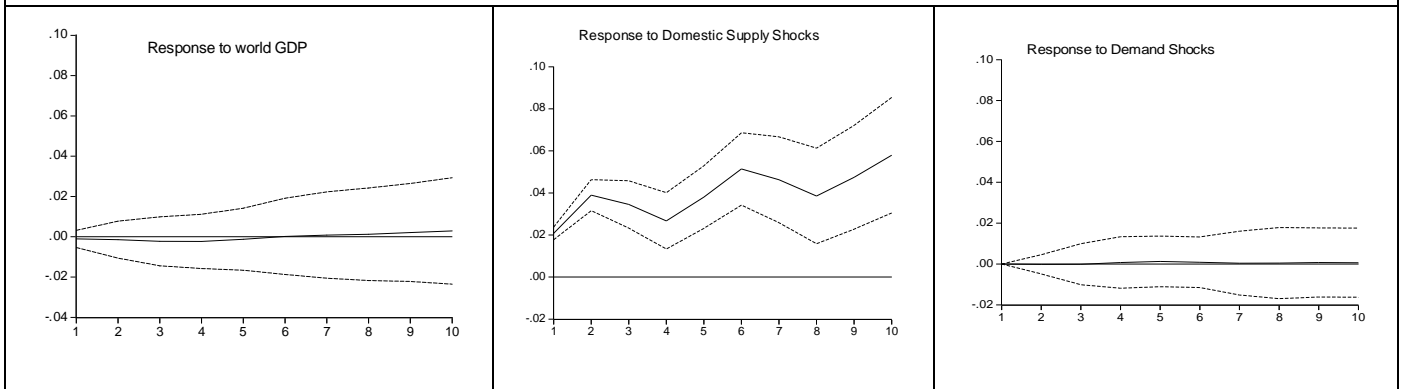
**Response to Demand Shocks**
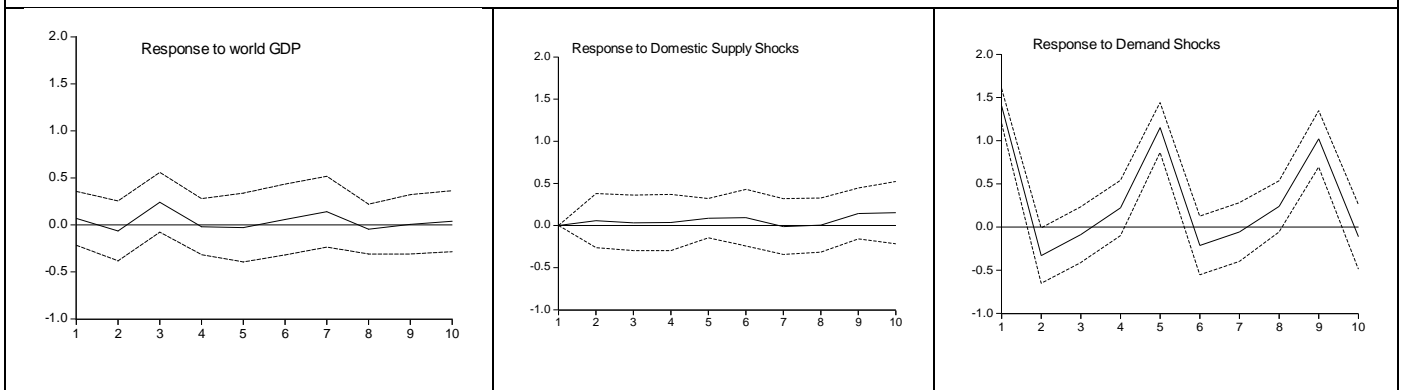
## (20) Tunisia
## Real GDP Responses

**Response to US GDP Shocks**

**Response to Domestic Supply Shocks**

**Response to Demand Shocks**

## Inflation Responses

**Response to world GDP**

**Response to Domestic Supply Shocks**

**Response to Demand Shocks**

19
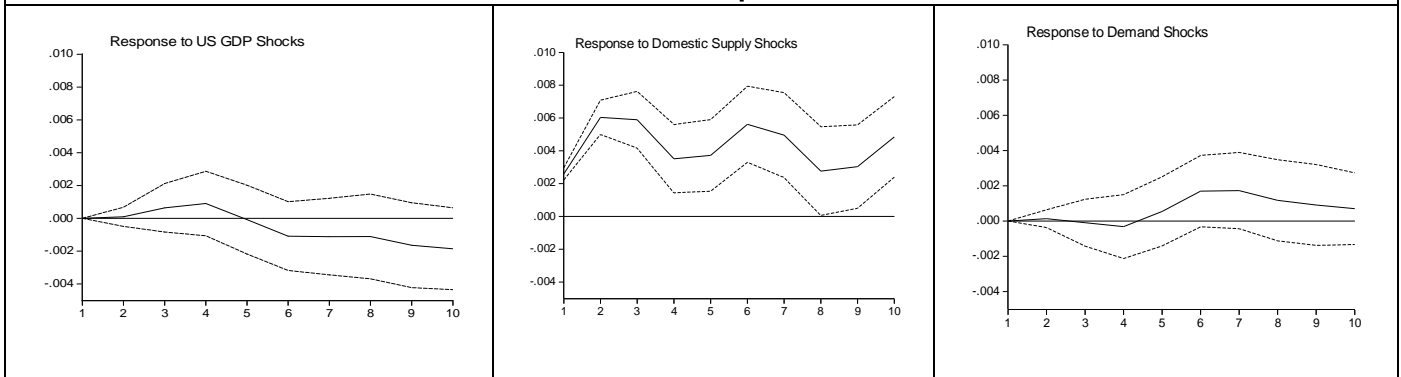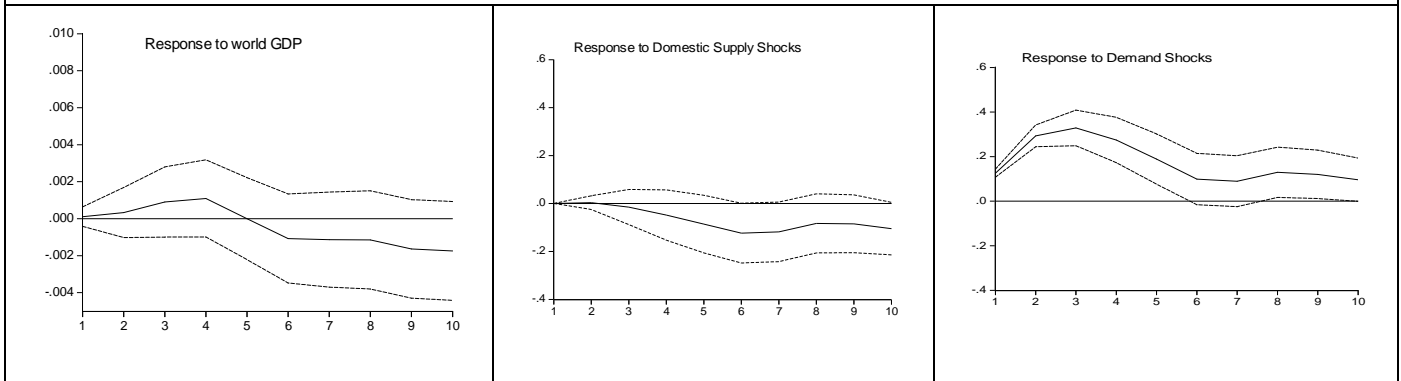
## (21) Uganda
### Real GDP Responses

Response to world GDP

Response to Domestic Supply Shocks

Response to Demand Shocks

### Inflation Responses

Response to world GDP

Response to Domestic Supply Shocks
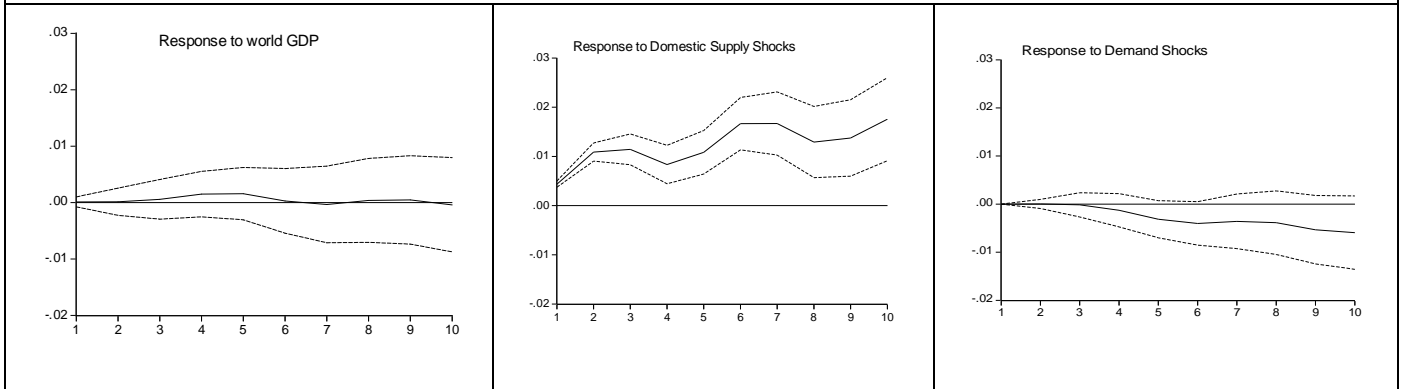
Response to Demand Shocks
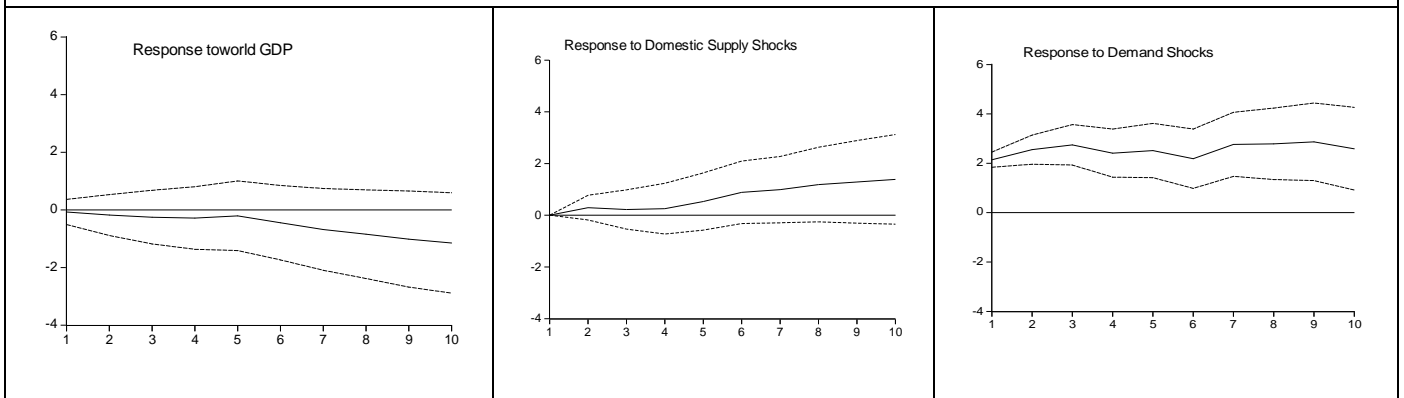
## (22) Zambia
### Real GDP Responses
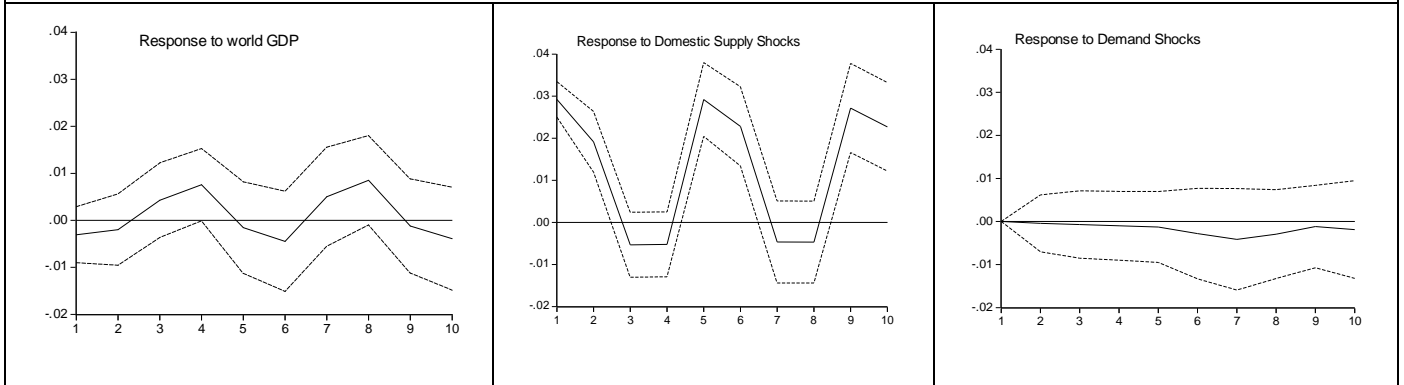
Response to world GDP

Response to Domestic Supply Shocks

Response to Demand Shocks

### Inflation Responses

Response to world GDP

Response to Domestic Supply Shocks

Response to Demand Shocks

20
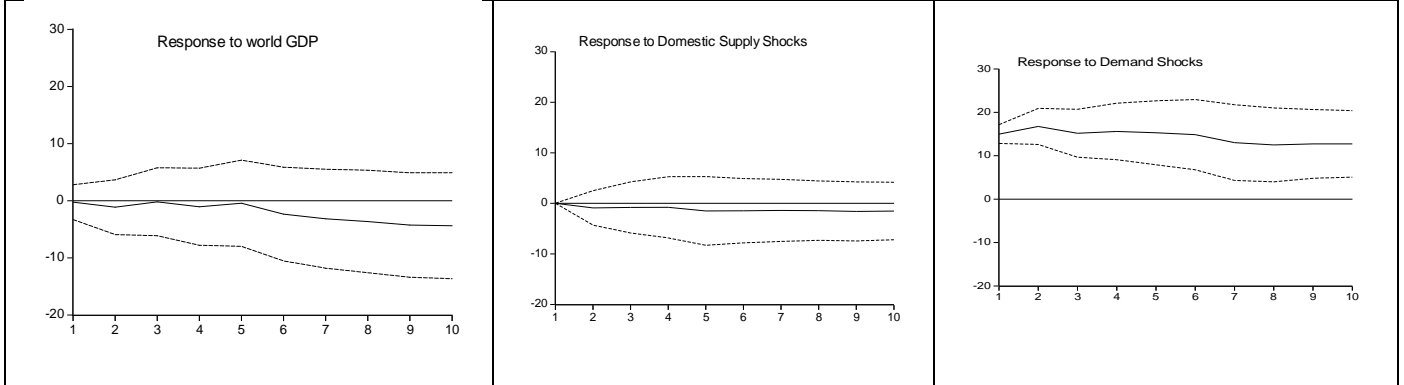
| No. | Country | Variables | ADF | | PP | | KPSS | | Johansen Cointegration Tests± | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Level | 1st Diff | Level | 1st Diff | Level | 1st Diff | Trace | Maximum Eigenvalues |
| 1. | Algeria | LGDP | -1.39 | -2.92** | -2.16 | -8.24** | 1.14# | 0.12 | 20.75 | 11.23 |
| | | LCPI | -1.66 | -2.98** | -0.16 | -7.39** | 1.08# | 0.25 | | |
| 2. | Benin | LGDP | -0.77 | -2.91** | -0.8 | -7.40** | 1.12# | 0.10 | 28.23 | 18.58 |
| | | LCPI | -2.69 | -8.44** | -2.53 | -21.85** | 2.02# | 0.00 | | |
| 3. | Botswana | LGDP | -1.62 | -5.01** | -1.20 | -8.35** | 1.13# | 0.20 | 28.13 | 16.55 |
| | | LCPI | -1.59 | -6.07** | -2.89 | -10.68** | 0.47# | 0.12 | | |
| 4. | Cameroun | LGDP | -1.89 | -2.93** | -1.97 | -7.75** | 1.12# | 0.20 | 22.50 | 12.66 |
| | | LCPI | -0.83 | -6.95** | 0.82 | -6.94** | 1.12# | 0.08 | | |
| 5. | Central Africa | LGDP | -1.78 | -4.68** | -2.34 | -6.55** | 1.22# | 0.26 | 20.99 | 14.19 |
| | | LCPI | -1.06 | -6.83** | 0.83 | -6.82** | 1.12# | 0.06 | | |
| 6. | Egypt | LGDP | -1.03 | -3.05** | -1.29 | -10.26** | 1.14# | 0.16 | 23.40 | 13.04 |
| | | LCPI | -1.31 | -6.68** | -1.35 | -6.79** | 1.14 | 0.32 | | |
| 7. | Ethiopia | LGDP | -0.75 | -3.50** | -0.74 | -7.60** | 1.15# | 0.16 | 25.30 | 17.41 |
| | | LCPI | -0.74 | -4.53** | -0.58 | -7.37** | 1.23# | 0.14 | | |
| 8. | Gabon | LGDP | -0.48 | -4.34** | -0.61 | -6.70** | 1.19# | 0.05 | 27.12 | 17.83 |
| | | LCPI | -1.59 | -6.69** | -1.65 | -6.73** | 1.12# | 0.09 | | |
| 9. | Ghana | LGDP | -0.65 | -4.32** | -0.64 | -5.52** | 0.90# | 0.14 | 28.39 | 20.85 |
| | | LCPI | 3.41 | -3.95** | 7.96 | -5.42** | 1.02# | 0.31 | | |
| 10. | Kenya | LGDP | -1.51 | -4.76** | -1.22 | -8.51** | 1.14# | 0.22 | 26.31 | 16.89 |
| | | LCPI | -1.49 | -7.65** | -1.39 | -7.63** | 1.17# | 0.06 | | |
| 11. | Libya | LGDP | 1.42 | -4.00** | -0.32 | -7.35** | 1.15# | 0.04 | 23.50 | 16.24 |
| | | LCPI | -1.82 | -2.94** | -1.75 | -7.70** | 1.07# | 0.03 | | |
| 12. | Malawi | LGDP | 0.28 | -3.85** | 0.58 | -8.43** | 1.13# | 0.22 | 21.46 | 13.54 |
| | | LCPI | -0.72 | -4.71** | 5.73 | -8.78** | 1.01# | 0.23 | | |
| 13. | Mauritania | LGDP | -0.35 | -4.10** | -0.01 | -8.24** | 1.15# | 0.05 | 19.78 | 14.21 |
| | | LCPI | 2.08 | -8.69** | 1.98 | -8.79** | 1.20# | 0.32 | | |
| 14. | Mauritius | LGDP | -0.30 | -4.32** | -0.86 | -12.26** | 1.14# | 0.11 | 18.26 | 12.93 |
| | | LCPI | 3.78 | -7.70** | 3.18 | -8.02** | 1.13# | 0.21 | | |
| 15. | Morocco | LGDP | -1.26 | -4.77** | -0.89 | -9.67** | 1.11# | 0.04 | 25.17 | 18.18 |
| | | LCPI | -2.46 | -9.60** | -2.63 | -9.64** | 1.13# | 0.09 | | |
| 16 | Nigeria | LGDP | 0.23 | -3.18** | 1.03 | -6.33** | 1.07# | 0.42 | 28.96 | 16.47 |
| | | LCPI | 0.50 | -8.57** | 0.56 | -8.49** | 1.12# | 0.07 | | |
| 17 | Senegal | LGDP | 0.35 | -3.79** | -0.01 | -7.40** | 1.24# | 0.09 | 21.87 | 14.44 |
| | | LCPI | -1.25 | -8.54** | -1.22 | -8.63** | 1.18# | 0.09 | | |
| 18 | South Africa | LGDP | -2.76 | -3.79** | -2.41 | -7.39** | 1.24# | 0.07 | 24.19 | 14.81 |
| | | LCPI | -2.87 | -5.47** | -2.04 | -5.13** | 1.13# | 0.01 | | |
| 19 | Tanzania | LGDP | -1.90 | -4.28** | -1.46 | -8.60** | 1.12# | 0.30 | 22.42 | 14.97 |
| | | LCPI | -2.69 | -5.18** | 0.93 | -10.14** | 1.08# | 0.32 | | |
| 20 | Tunisia | LGDP | 1.10 | -4.08** | 1.06 | -8.58** | 1.14# | 0.22 | 19.67 | 11.72 |
| | | LCPI | -0.65 | -4.83** | -0.56 | -5.12** | 1.19# | 0.12 | | |
| 21 | Uganda | LGDP | -0.86 | -3.08** | -0.39 | -7.86** | 1.10# | 0.09 | 27.63 | 17.98 |
| | | LCPI | 0.79 | -8.28** | 0.57 | -8.35** | 1.11# | 0.27 | | |
| 22 | Zambia | LGDP | -1.66 | -6.08** | -0.56 | -8.75** | 1.12# | 0.20 | 27.92 | 20.58 |
| | | LCPI | 0.49 | -9.08** | -0.39 | -9.09** | 1.15# | 0.23 | | |

** and # signify rejection of the null at 5% level of significance.

±The tests have failed to reject the null of no cointegration at 5% significance level in all the countries.

**(1) Algeria**

**Variance Decomposition of GDP Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.697599 | 99.30240 | 0.000000 |
| 4 | 1.319167 | 95.81604 | 2.864796 |
| 8 | 1.121261 | 94.82389 | 4.054847 |
| 12 | 0.974957 | 93.65991 | 5.365129 |
| 20 | 0.848007 | 91.06307 | 8.088923 |
| 30 | 0.796416 | 89.11219 | 10.09139 |

**Variance Decomposition of Inflation Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 1.314343 | 0.404809 | 98.28085 |
| 4 | 1.912087 | 3.802834 | 94.28508 |
| 8 | 2.096226 | 11.47596 | 86.42781 |
| 12 | 2.159426 | 16.84905 | 80.99153 |
| 20 | 2.077913 | 21.46978 | 76.45231 |
| 30 | 1.999664 | 23.84811 | 74.15223 |

**(2) Benin**

**Variance Decomposition of GDP Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.135179 | 99.86482 | 0.000000 |
| 4 | 1.123328 | 86.74560 | 12.13107 |
| 8 | 3.661426 | 83.33741 | 13.00117 |
| 12 | 3.730439 | 82.21944 | 14.05013 |
| 20 | 3.738947 | 82.15733 | 14.10372 |
| 30 | 3.755063 | 82.03315 | 14.21178 |

**Variance Decomposition of Inflation Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 3.352159 | 0.383648 | 96.26419 |
| 4 | 3.391468 | 26.16956 | 70.43898 |
| 8 | 3.096229 | 35.58237 | 61.32140 |
| 12 | 3.308824 | 35.62448 | 61.06669 |
| 20 | 3.315946 | 35.96312 | 60.72094 |
| 30 | 3.318753 | 35.98966 | 60.69158 |

**(3) Botswana**

**Variance Decomposition of GDP Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 3.139049 | 96.86095 | 0.000000 |
| 4 | 8.959465 | 86.92816 | 4.112373 |
| 8 | 8.157334 | 83.34474 | 8.497930 |
| 12 | 8.022418 | 84.54211 | 7.435471 |
| 20 | 8.071869 | 84.96298 | 6.965149 |
| 30 | 8.018019 | 85.30063 | 6.681352 |

**Variance Decomposition of Inflation Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 1.728150 | 0.223229 | 98.04862 |
| 4 | 4.632431 | 4.455278 | 90.91229 |
| 8 | 6.337457 | 5.090593 | 88.57195 |
| 12 | 6.770689 | 5.064453 | 88.16486 |
| 20 | 6.994070 | 5.145714 | 87.86022 |
| 30 | 7.015931 | 5.157453 | 87.82662 |

**(4) Cameroon**

**Variance Decomposition of GDP Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.152395 | 99.84760 | 0.000000 |
| 4 | 2.450423 | 96.08224 | 1.467342 |
| 8 | 2.936212 | 93.66187 | 3.401922 |
| 12 | 3.099937 | 92.44003 | 4.460034 |
| 20 | 3.262621 | 91.57599 | 5.161386 |
| 30 | 3.310156 | 91.36872 | 5.321122 |

**Variance Decomposition of Inflation Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.760715 | 0.062224 | 99.17706 |
| 4 | 2.392645 | 3.072200 | 94.53516 |
| 8 | 3.831946 | 7.019245 | 89.14881 |
| 12 | 4.277224 | 8.284746 | 87.43803 |
| 20 | 4.312025 | 8.726697 | 86.96128 |
| 30 | 4.309978 | 8.854381 | 86.83564 |

**(5) Central Africa Republic**

**Variance Decomposition of GDP Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 2.154552 | 97.84545 | 0.000000 |
| 4 | 2.464903 | 93.89102 | 3.644080 |
| 8 | 5.944772 | 88.48952 | 5.565709 |
| 12 | 6.074277 | 88.12934 | 5.796381 |
| 20 | 6.305047 | 87.84564 | 5.849310 |
| 30 | 6.323049 | 87.82361 | 5.853340 |

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.738759 | 0.442552 | 98.81869 |
| 4 | 1.750316 | 26.32616 | 71.92352 |
| 8 | 3.067606 | 27.83053 | 69.10186 |
| 12 | 4.721425 | 28.33871 | 66.93987 |
| 20 | 4.866925 | 28.56622 | 66.56686 |
| 30 | 4.883234 | 28.58933 | 66.52743 |

**(6) Egypt**

**Variance Decomposition of GDP Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 1.189876 | 98.81012 | 0.000000 |
| 4 | 5.778992 | 91.18669 | 3.034320 |
| 8 | 11.61283 | 80.78628 | 7.600884 |
| 12 | 11.68917 | 80.89487 | 7.415963 |
| 20 | 11.89244 | 80.65995 | 7.447611 |
| 30 | 11.97479 | 80.59596 | 7.429252 |

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.048876 | 0.013569 | 99.93756 |
| 4 | 0.119168 | 7.888055 | 91.99278 |
| 8 | 1.731025 | 9.046626 | 89.22235 |
| 12 | 2.129253 | 9.465143 | 88.40560 |
| 20 | 2.221445 | 9.820932 | 87.95762 |
| 30 | 2.251901 | 9.920681 | 87.82742 |

Table 2 contd
Variance Decompositions

## (7) Ethiopia

### Variance Decomposition of GDP Due to:

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.479377 | 99.52062 | 0.000000 |
| 4 | 8.352452 | 89.49849 | 2.149060 |
| 8 | 7.513766 | 86.24275 | 6.243487 |
| 12 | 6.514348 | 85.62970 | 7.855956 |
| 20 | 5.911580 | 84.26661 | 9.821813 |
| 30 | 5.600261 | 83.74670 | 10.65304 |

### Variance Decomposition of Inflation Due to:

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.287772 | 0.188646 | 99.52358 |
| 4 | 2.414337 | 7.913673 | 89.67199 |
| 8 | 3.797290 | 13.64155 | 82.56116 |
| 12 | 5.575889 | 15.05473 | 79.36938 |
| 20 | 5.519622 | 17.95117 | 76.52921 |
| 30 | 5.405677 | 19.64493 | 74.94939 |

## (8) Gabon

### Variance Decomposition of GDP Due to:

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.129712 | 99.87029 | 0.000000 |
| 4 | 2.598500 | 97.09914 | 0.302362 |
| 8 | 12.61881 | 84.34973 | 3.031462 |
| 12 | 13.86917 | 82.35359 | 3.777237 |
| 20 | 14.44197 | 81.66495 | 3.893079 |
| 30 | 14.47827 | 81.61639 | 3.905349 |

### Variance Decomposition of Inflation Due to:

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 98.20162 | 0.007283 | 1.791096 |
| 4 | 85.02673 | 11.25738 | 3.715884 |
| 8 | 81.99757 | 13.97521 | 4.027224 |
| 12 | 80.14147 | 15.76745 | 4.091085 |
| 20 | 79.40028 | 16.39592 | 4.203797 |
| 30 | 79.37767 | 16.41640 | 4.205926 |

## (9) Ghana

### Variance Decomposition of GDP Due to:

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.948023 | 99.05198 | 0.000000 |
| 4 | 8.157540 | 91.04738 | 0.795084 |
| 8 | 11.59851 | 85.84332 | 2.558164 |
| 12 | 11.16919 | 82.76995 | 6.060863 |
| 20 | 11.02019 | 80.46502 | 8.514792 |
| 30 | 11.04960 | 79.38328 | 9.567118 |

### Variance Decomposition of Inflation Due to:

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.012081 | 0.988645 | 98.99927 |
| 4 | 3.514152 | 7.484227 | 89.00162 |
| 8 | 6.340093 | 11.69651 | 81.96340 |
| 12 | 7.191480 | 12.97630 | 79.83222 |
| 20 | 7.239602 | 13.29020 | 79.47020 |
| 30 | 7.279925 | 13.48217 | 79.23791 |

## (10) Kenya

### Variance Decomposition of GDP Due to:

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.409052 | 99.59095 | 0.000000 |
| 4 | 0.371236 | 99.22212 | 0.406640 |
| 8 | 1.611625 | 95.89511 | 2.493262 |
| 12 | 1.781171 | 95.23749 | 2.981342 |
| 20 | 1.729888 | 95.07788 | 3.192232 |
| 30 | 1.677671 | 95.01054 | 3.311785 |

### Variance Decomposition of Inflation Due to:

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 6.619090 | 0.009465 | 93.37145 |
| 4 | 8.119859 | 1.788591 | 90.09155 |
| 8 | 9.843909 | 3.389220 | 86.76687 |
| 12 | 10.33944 | 5.291002 | 84.36956 |
| 20 | 10.17049 | 7.170474 | 82.65904 |
| 30 | 10.07751 | 8.436345 | 81.48615 |

## (11) Libya

### Variance Decomposition of GDP Due to:

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.379312 | 99.62069 | 0.000000 |
| 4 | 1.834764 | 97.92614 | 0.239100 |
| 8 | 3.290019 | 92.54507 | 4.164909 |
| 12 | 3.399166 | 88.75001 | 7.850828 |
| 20 | 3.664106 | 86.29047 | 10.04543 |
| 30 | 3.764561 | 85.52276 | 10.71268 |

### Variance Decomposition of Inflation Due to:

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.456643 | 0.104375 | 99.43898 |
| 4 | 5.088087 | 0.448835 | 94.46308 |
| 8 | 6.527052 | 0.507621 | 92.96533 |
| 12 | 7.524410 | 0.661936 | 91.81365 |
| 20 | 8.250193 | 1.055560 | 90.69425 |
| 30 | 8.292084 | 1.379007 | 90.32891 |

## (12) Malawi

### Variance Decomposition of GDP Due to:

| Period | US GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.089157 | 99.91084 | 0.000000 |
| 4 | 0.327360 | 95.70023 | 3.972406 |
| 8 | 1.141665 | 94.93488 | 3.923451 |
| 12 | 1.228336 | 94.37930 | 4.392364 |
| 20 | 1.363493 | 92.63320 | 6.003304 |
| 30 | 1.415634 | 89.99254 | 8.591830 |

### Variance Decomposition of Inflation Due to:

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.000832 | 4.182117 | 95.81705 |
| 4 | 1.098662 | 5.236041 | 93.66530 |
| 8 | 1.272701 | 7.951434 | 90.77586 |
| 12 | 1.397055 | 10.39482 | 88.20813 |
| 20 | 1.619632 | 15.51283 | 82.86754 |
| 30 | 1.922339 | 21.01767 | 77.05999 |

23

**Table 2 contd**
**Variance Decompositions**

### (13) Mauritania
**Variance Decomposition of GDP Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.341140 | 99.65886 | 0.000000 |
| 4 | 0.285520 | 97.32375 | 2.390734 |
| 8 | 0.329365 | 96.93890 | 2.731730 |
| 12 | 0.342350 | 96.84188 | 2.815767 |
| 20 | 0.342441 | 96.82494 | 2.832623 |
| 30 | 0.342566 | 96.82009 | 2.837345 |

**Variance Decomposition of Inflation Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.242112 | 0.041890 | 99.71600 |
| 4 | 1.186943 | 3.776650 | 95.03641 |
| 8 | 1.298330 | 5.096483 | 93.60519 |
| 12 | 1.297166 | 5.512266 | 93.19057 |
| 20 | 1.294359 | 5.766615 | 92.93903 |
| 30 | 1.294100 | 5.793982 | 92.91192 |

### (14) Mauritius
**Variance Decomposition of GDP Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 1.650680 | 98.34932 | 0.000000 |
| 4 | 1.439080 | 98.09559 | 0.465330 |
| 8 | 0.917985 | 98.31001 | 0.772006 |
| 12 | 0.913677 | 98.06674 | 1.019579 |
| 20 | 0.893354 | 97.94582 | 1.160822 |
| 30 | 0.871667 | 97.91429 | 1.214042 |

**Variance Decomposition of Inflation Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 5.892880 | 4.058424 | 90.04870 |
| 4 | 7.667576 | 5.215885 | 87.11654 |
| 8 | 7.821074 | 7.016395 | 85.16253 |
| 12 | 8.396674 | 7.193949 | 84.40938 |
| 20 | 8.374595 | 7.292513 | 84.33289 |
| 30 | 8.372648 | 7.363108 | 84.26424 |

### (15) Morocco
**Variance Decomposition of GDP Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.060205 | 99.93979 | 0.000000 |
| 4 | 0.599076 | 96.87550 | 2.525420 |
| 8 | 6.277502 | 90.80418 | 2.918315 |
| 12 | 5.946612 | 91.06283 | 2.990558 |
| 20 | 5.651234 | 91.26708 | 3.081684 |
| 30 | 5.415327 | 91.49998 | 3.084696 |

**Variance Decomposition of Inflation Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.114766 | 2.535742 | 97.34949 |
| 4 | 1.203512 | 3.337419 | 95.45907 |
| 8 | 2.793708 | 3.999742 | 93.20655 |
| 12 | 2.977792 | 5.100876 | 91.92133 |
| 20 | 3.047471 | 6.072823 | 90.87971 |
| 30 | 3.048741 | 6.582463 | 90.36880 |

### (16) Nigeria
**Variance Decomposition of GDP Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.183057 | 99.81694 | 0.000000 |
| 4 | 3.775915 | 95.05124 | 1.172844 |
| 8 | 9.732592 | 79.88312 | 10.38428 |
| 12 | 9.303063 | 70.73596 | 19.96098 |
| 20 | 9.260990 | 69.70403 | 21.03498 |
| 30 | 9.039772 | 67.81870 | 23.14153 |

**Variance Decomposition of Inflation Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.001189 | 0.022156 | 99.97665 |
| 4 | 0.938649 | 5.660758 | 93.40059 |
| 8 | 2.342962 | 7.760214 | 89.89682 |
| 12 | 2.695416 | 9.849148 | 87.45544 |
| 20 | 2.527979 | 9.338862 | 88.13316 |
| 30 | 2.409436 | 9.622358 | 87.96821 |

### (17) Senegal
**Variance Decomposition of GDP Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.259468 | 99.74053 | 0.000000 |
| 4 | 0.223169 | 82.85547 | 16.92137 |
| 8 | 2.193185 | 74.13200 | 23.67482 |
| 12 | 2.564259 | 71.14698 | 26.28876 |
| 20 | 2.486433 | 68.90421 | 28.60936 |
| 30 | 2.428857 | 68.03732 | 29.53382 |

**Variance Decomposition of Inflation Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 0.502992 | 2.842035 | 96.65497 |
| 4 | 2.873270 | 39.65645 | 57.47028 |
| 8 | 4.965927 | 40.35368 | 54.68039 |
| 12 | 4.823426 | 41.75256 | 53.42401 |
| 20 | 4.626647 | 42.02510 | 53.34826 |
| 30 | 4.520969 | 42.07036 | 53.40868 |

### (18) South Africa
**Variance Decomposition of GDP Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 1.120657 | 98.87934 | 0.000000 |
| 4 | 1.139210 | 94.32366 | 4.537125 |
| 8 | 2.474951 | 90.07819 | 7.446864 |
| 12 | 2.622265 | 88.72255 | 8.655189 |
| 20 | 2.536647 | 88.23583 | 9.227519 |
| 30 | 2.528947 | 88.11764 | 9.353412 |

**Variance Decomposition of Inflation Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|---|---|---|---|
| 1 | 1.218182 | 0.009633 | 98.77218 |
| 4 | 18.73362 | 1.758078 | 79.50830 |
| 8 | 21.95426 | 4.570347 | 73.47540 |
| 12 | 20.90553 | 6.176654 | 72.91781 |
| 20 | 21.07563 | 6.653437 | 72.27094 |
| 30 | 21.05664 | 6.749669 | 72.19370 |

**Table 2 contd**
**Variance Decompositions**

**(19) Tanzania**

**Variance Decomposition of GDP Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|--------|------------------|---------------|---------------|
| 1 | 0.267935 | 99.73206 | 0.000000 |
| 4 | 0.235151 | 99.67094 | 0.093909 |
| 8 | 0.464650 | 99.42163 | 0.113725 |
| 12 | 0.469849 | 99.41750 | 0.112648 |
| 20 | 0.404623 | 99.43677 | 0.158602 |
| 30 | 0.363671 | 99.34512 | 0.291212 |

**Variance Decomposition of Inflation Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|--------|------------------|---------------|---------------|
| 1 | 0.243317 | 0.304568 | 99.45211 |
| 4 | 3.461808 | 0.153008 | 96.38518 |
| 8 | 2.831523 | 0.413912 | 96.75456 |
| 12 | 2.507026 | 1.062736 | 96.43024 |
| 20 | 2.212598 | 3.434465 | 94.35294 |
| 30 | 1.985756 | 7.228150 | 90.78609 |

**(20) Tunisia**

**Variance Decomposition of GDP Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|--------|------------------|---------------|---------------|
| 1 | 0.177848 | 99.82215 | 0.000000 |
| 4 | 1.716712 | 97.81600 | 0.467286 |
| 8 | 7.262075 | 86.36504 | 6.372888 |
| 12 | 7.446272 | 86.47764 | 6.076086 |
| 20 | 7.150791 | 87.03960 | 5.809606 |
| 30 | 7.101498 | 87.44934 | 5.449165 |

**Variance Decomposition of Inflation Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|--------|------------------|---------------|---------------|
| 1 | 1.782702 | 0.000271 | 98.21703 |
| 4 | 1.972222 | 2.922940 | 95.10484 |
| 8 | 2.893487 | 7.738044 | 89.36847 |
| 12 | 3.032093 | 10.30799 | 86.65991 |
| 20 | 3.275172 | 10.76633 | 85.95849 |
| 30 | 3.330233 | 11.54321 | 85.12655 |

**(21) Uganda**

**Variance Decomposition of GDP Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|--------|------------------|---------------|---------------|
| 1 | 0.051005 | 99.94899 | 0.000000 |
| 4 | 1.418046 | 96.82325 | 1.758707 |
| 8 | 2.676919 | 93.01603 | 4.307050 |
| 12 | 3.223317 | 91.49613 | 5.280556 |
| 20 | 3.501586 | 90.95756 | 5.540850 |
| 30 | 3.566082 | 90.85069 | 5.583232 |

**Variance Decomposition of Inflation Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|--------|------------------|---------------|---------------|
| 1 | 0.124065 | 0.246888 | 99.62905 |
| 4 | 0.460843 | 2.260634 | 97.27852 |
| 8 | 2.866493 | 6.197755 | 90.93575 |
| 12 | 3.572738 | 6.788654 | 89.63861 |
| 20 | 3.567315 | 6.762468 | 89.67022 |
| 30 | 3.554947 | 6.746145 | 89.69891 |

**(22) Zambia**

**Variance Decomposition of GDP Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|--------|------------------|---------------|---------------|
| 1 | 1.099030 | 98.90097 | 0.000000 |
| 4 | 3.789984 | 96.18779 | 0.022223 |
| 8 | 6.791105 | 93.04929 | 0.159609 |
| 12 | 7.981458 | 91.77073 | 0.247812 |
| 20 | 8.793665 | 90.79196 | 0.414371 |
| 30 | 9.150702 | 90.35322 | 0.496081 |

**Variance Decomposition of Inflation Due to:**

| Period | World GDP Shocks | Supply Shocks | Demand Shocks |
|--------|------------------|---------------|---------------|
| 1 | 0.030485 | 0.008646 | 99.96087 |
| 4 | 1.068879 | 0.375578 | 98.55554 |
| 8 | 3.043479 | 0.575072 | 96.38145 |
| 12 | 3.209379 | 0.592822 | 96.19780 |
| 20 | 3.246050 | 0.614153 | 96.13980 |
| 30 | 3.247690 | 0.632784 | 96.11953 |

| | | Table 3 Partial Correlation Analysis | |
|---|---|---|---|
| No. | Country | Supply | Demand |
| 1. | Algeria | 0.28 (2.97) | -0.28 (-2.90) |
| 2. | Benin | 0.18 (1.87) | -0.11 (-1.12) |
| 3 | Botswana | 0.53 (6.22) | -0.40 (-4.36) |
| 4. | Cameroon | 0.08 (0.81) | -0.08 (-0.81) |
| 5. | Central Africa | -0.26 (-2.65) | 0.22 (2.27) |
| 6. | Egypt | 0.39 (4.25) | -0.36 (-3.83) |
| 7. | Ethiopia | 0.28 (2.92) | -0.35 (-3.78) |
| 8. | Gabon | 0.08 (0.82) | 0.22 (2.25) |
| 9. | Ghana | 0.59 (7.30) | -0.69 (-9.61) |
| 10. | Kenya | 0.04 (0.40) | -0.03 (-0.26) |
| 11. | Libya | 0.48 (5.50) | -0.50 (-5.67) |
| 12. | Malawi | 0.94 (27.96) | -0.95 (-30.05 |
| 13. | Mauritania | 0.17 (1.69) | -0.16 (-1.67) |
| 14. | Mauritius | 0.75 (11.23) | -0.76 (-11.63) |
| 15. | Morocco | -0.44 (-4.94) | 0.46 (5.26) |
| 16. | Nigeria | 0.47 (5.35) | -0.51 (-5.94) |
| 17. | Senegal | 0.01 (0.09) | -0.01 (-0.12) |
| 18. | South Africa | 0.46 (5.43) | -0.50 (-5.73) |
| 19. | Tanzania | 0.23 (2.42) | -0.23 (-2.32) |
| 20. | Tunisia | 0.21 (2.17) | -0.18 (-1.83) |
| 21. | Uganda | 0.53 (6.23) | -0.45 (-5.09) |
| 22. | Zambia | 0.39 (4.30) | -0.52 (-6.11) |
| Figures in the parenthesis are t-ratios | | | |