Determinants of the recent soaring food inflation in Ethiopia

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Accepted 15 May, 2012

Recently, Ethiopia’s food price inflation has increased dramatically. Given the double digit growth rate and a lagging demand reported by the government, the current food price hike in the country remained a puzzle to many. Using monthly data from 1997 to 2010, this study identified the long-run and short-run external and domestic factors causing Ethiopia’s food inflation using Johansen’s cointegration test and Vector Error Correction Model (VECM), respectively. The study results did not support government’s claim that Ethiopia’s inflation is a non-monetary phenomenon. On the contrary, monetary developments remain important and significant factor in explaining the high food inflation in Ethiopia. Moreover, there are other important factors that explain Ethiopia’s soaring food inflation, including the general price level, world grain price index, lagged world DAP price index, domestic benzene price index, non-food price index, shocks in the goods and money markets, the continuous depreciation of Birr against dollar and the degree of inflation inertia. Therefore, stabilization policies to dampen inflation expectations and a prudent fiscal policy as a means of avoiding sources of macroeconomic imbalance are quite apparent to reduce the rapidly rising food prices in the country.

Keywords: Food inflation, VECM, money supply, and Ethiopia

INTRODUCTION

The rising food price in recent years is a global phenomenon. The surge was led by some major food crops (corn, wheat, and edible oil), but has spread to other foods including, most recently, rice (IMF, 2008b). The likely reasons forwarded for the price surge includes a mix of permanent and temporary factors such as strong food demand from emerging economies, rising biofuel production, the slow supply adjustment to higher prices, wrong policy responses in some countries, drought conditions, higher input costs, and restrictive trade policies in major net exporters of key food staples such as rice.

In Ethiopia, since 2005 the rise in food prices has been tremendous. It has been 15.1% in 2006, 28% in 2007, 57.4% in 2008 and stands at 36.4% in 2009. The non-food price index has also been rising since 2000, but is relatively stable compared to the food price index (FPI).

The consumer price index (CPI) and FPI are highly correlated with about 57 percent of consumption expenditure spent on food. The dramatic increase in food prices was not only an issue of policy makers, donor agencies and economists, but to the society at large. Donor agencies and economists on the one hand and government on the other have different views about the current food inflation in the country. The former states increased government expenditure financed by increased money supply (demand side factors) as the main cause of inflation; that is, the hoarding of goods by traders (piling up stocks) and the unbalanced growth of different sectors (e.g. high public expenditure).

It has been argued that moderate inflation is positively correlated with economic growth. Fischer (1995) suggests an inflation targeting in the range of 2–3% per year as optimal for economic growth. It encourages investment and production by raising the rate of profit. It also allows growth in wages, since nominal wages may lag behind prices, creating an enabling environment for
slower adjustment to wage expectations. However, when inflation crosses the reasonable limits it conveys negative effects. It reduces the value of money, which is the medium of exchange. This results in uncertainty of the value of gains and losses of borrowers and lenders, and buyers and sellers. The increasing uncertainty discourages saving and investment. Savings are also discouraged as inflation reduces the real rate of return on financial assets. This again leads to lower investment and hence lower economic growth.

Many studies documented the significant impeding impact that food inflation has on the livelihoods of low- and middle-income communities. The complexities of the distribution effects reach out farther than changes in food prices. The traditional economic theory asserts that inflation will have redistributive effect by imposing ‘inflation tax’ and can hurt particularly the lower income groups and those people whose income is relatively less flexible. Zhu (2008) noted that the rising food and energy prices significantly impact people of all countries; however, the social unrest occurring in some developing countries shows that the survival of the local poor is threatened. In 2007-2008, the food prices increase in Ethiopia accounted for almost 62% of the total inflation. Food price inflation affects poor people’s purchasing power. It has an income effect on household budgets and also increases the risk. Inflation stands as a “Poor Man’s Tax”. Poor people are disproportionately affected because they spent larger proportion of their income on food. Rising food prices thus decrease the real income of the most vulnerable people, with serious nutritional and health consequences. In a similar vein, Dessus et al. (2008) argue that countries with high initial poverty rates and poverty gaps, and high-income inequality, are particularly vulnerable to food price increases. Of course, policy measures targeting the poor by compensating them the amounts of income required to maintain their initial utility levels (before the change in prices) are required. Yet, some argues that such measures could also trigger inflation further.

Different reports show that the Ethiopian economy has been growing with double digits for at least half a decade with a lagging demand. The puzzle is as to why prices are persistently rising given that supply is in excess of demand. This is the reason why many agree on the need for a detailed study on how prices of agricultural commodity are determined and identifying the factors affecting price formation.

The Phillips curve and the quantity theory are the two traditional approaches used to modelling inflation (Loening et al., 2009). The Phillips curve relates inflation with unemployment on the ground, and suggests that an increase in aggregate demand increases employment and wage rates. The rise in wage rates translates into higher prices of goods and services. However, in an economy like Ethiopia’s, dominated by the subsistent agricultural sector, the main source of labour is the household itself. Apart from the agricultural sector, except a few large scale enterprises and government and non-governmental institutions, most other sectors also use family labour. The labour market is very weak and almost missing in Ethiopia. Thus the model is not applicable to such economies.

The quantity theory attributes the money market disequilibrium (i.e., the supply and demand of money) as the main cause of inflation. Many have used this model in explaining inflation in developing countries (e.g., Loening et al., 2009 for Ethiopia; Mukhtar and Zakaria, 2010 for Pakistan; Moriyama, 2008 for Sudan; Blavy, 2004 for Guinea; Kilindo, 1997 for Tanzania). In many of these studies, in addition to money market other markets such as exchange rate market and goods market were also considered as long-run determinants of inflation. This study adopted the latter methodology for analysing the determinants food inflation in Ethiopia.

METHODOLOGY

Data Types and Sources

In this study, monthly data for the period 1997-2010 on national retail prices data of agricultural products, prices of basic inputs, money supply, government expenditure data, etc. obtained from National Bank of Ethiopia, Central Statistics Agency, World Bank Database and IMF database were used.

Data Analysis

In this study, the long term determinants of inflation were identified using Johansen’s cointegration test and the short and long term determinants of inflation were identified using Vector Error Correction Model (VECM).

First we derive the VECM for the determinants of agricultural products prices in the Ethiopian context as follows.

Agricultural product prices

Agricultural products can be divided into tradable and non-tradable products. The general price of agricultural products as in a “food basket” is then the weighted sum of tradable and non-tradable products:

\[ P^w = \rho P^w_t + (1 - \rho)P^n_t \]  \hspace{1cm} (1)

The price of tradable agricultural outputs \( P^t \) is determined in the world market and depends on the world price, \( P^w_t \) and exchange rate, \( e_t \).
\[ P^*_e = \theta_2 e_e + \theta_2 P^*_w \]  

(2)

We assume that the price of non-tradable agricultural outputs \( P^*_e \) is determined by the demand for and supply of non-tradable agricultural products in the domestic market. In a country where about 57 percent of the total household expenditure is on food, the demand for agricultural products is expected to be highly influenced by the general demand situation in the economy.

The domestic market of agricultural products is influenced by the demand for and supply of these products. Since the agricultural sector is dominated by subsistent agriculture, only a small proportion of the total output is sold. Hence, domestic supply of agricultural products is the sum of marketed surplus, imports and food aid.

Supply side

Price of agricultural products is determined by the demand for and supply of agricultural products. The supply of agricultural products is the sum of three variables, namely: domestic output of agricultural products, imports and agricultural aid.

Three sectors will be considered in the analysis: the domestic market for non-traded agricultural products, the external market for traded-agricultural products and the money market.

Hence, supply function is given by:

\[ S_e = MS_e + M_e + A_e \]  

(3)

Where \( S_e \) is the total supply of agricultural products at time \( t \); \( MS_e \) is the total marketed surplus of agricultural products at \( t \); \( M_e \) is the imports of agricultural products at \( t \) and \( A_e \) is the volume of inflow of foreign aid of agricultural products at \( t \).

However, marketed surplus is a function of the prices of key production inputs (fertilizer and labour), price of fuel (as it affects transportation and other marketing costs), prices of non-food products and own price of agricultural products. Price of non-food is expected to affect marketed surplus because the decision on whether to sell the output or to consume it at home could depend on whether they can cover non-food expenditures or not which is directly related with the prices of non-food products. The marketed surplus can then be formulated as

\[ MS_e = f(P^{Fr}_e, P^L_e, P^{Fu}_e, P^N_e, P^*_{w}) \]

The linear form of the MS function can be written as

\[ MS_e = \beta_1 P^{Fr}_e + \beta_2 P^L_e + \beta_3 P^{Fu}_e + \beta_4 P^N_e + \beta_5 P^*_w \]  

(4)

\( P^{Fr}_e \) is price of fertilizer; \( P^L_e \) is wage rate of unskilled labor; \( P^{Fu}_e \) is price of fuel; \( P^N_e \) is price of non-traded agricultural products and \( P^*_w \) is price of non-agricultural products.

The other component of domestic supply is the total imports of agricultural products. Though the magnitude of imports could be small, it could sometime be higher when there is an output gap in the domestic market. In addition, the government also attempts to absorb domestic supply shocks with imports. Imports of agricultural products are assumed to be affected by the relative prices between world and domestic prices of agricultural products, exchange rates and transportation costs.

Taking prices of fuel as a proxy for transportation costs, imports is thus a function of

\[ M_e = f(P^w, P^{Fr}_e, e_e, P^*_w) \]

The demand for imports is then

\[ M_e = \alpha_1 P^{Fr}_e + \alpha_2 P^N_e + \alpha_3 P^{Fu}_e + \alpha_4 P^*_e \]  

(5)

Where \( P^{Fr}_e \) is world price of imports; \( P^*_e \) is the domestic price of imports (traded); \( e_e \) is the exchange rate.

The total supply of agricultural products is the sum of marketed surplus in eq. (4), imports eq. (5) and the autonomous foreign aid, \( A_e \). The total supply can thus be written as

\[ S_e = \beta_1 P^{Fr}_e + \beta_2 P^L_e + \beta_3 P^{Fu}_e + \beta_4 P^N_e + \beta_5 P^*_w + \alpha_1 P^{Fr}_e + \alpha_2 P^N_e + \alpha_3 P^{Fu}_e + \alpha_4 P^*_e \]  

(6)

Part of this total supply in the market is exported and the total supply of non-traded agricultural products, \( S_{nt} \), to the domestic market is then the difference between total supply and exports. That is,

\[ S_{nt} = S_e - X_e = S_{nt} \]

Similar to eq. (5), the export of traded agricultural products can be written as

\[ X_e = \alpha_1 P^{Fr}_e + \alpha_2 P^N_e + \alpha_3 P^{Fu}_e + \alpha_4 P^*_e \]  

(7)

Deducting eq. (7) from eq. (6) gives

\[ S_{nt} = S - X_e = (\alpha_1 P^{Fr}_e + \alpha_2 P^N_e + \alpha_3 P^{Fu}_e + \alpha_4 P^*_e) - (\alpha_1 P^{Fr}_e + \alpha_2 P^N_e + \alpha_3 P^{Fu}_e + \alpha_4 P^*_e) \]

(8)

The last two terms can be modified to give the external market equilibrium.

\[ P(\alpha_1 P^{Fr}_e + \alpha_2 P^N_e + \alpha_3 P^{Fu}_e + \alpha_4 P^*_e) - (1 - \rho)(\alpha_1 P^{Fr}_e + \alpha_2 P^N_e + \alpha_3 P^{Fu}_e + \alpha_4 P^*_e) \]

(9)

Rearranging eq. (9)

\[ (\alpha_2 - (1 - \rho)) P^N_e + (\alpha_3 - (1 - \rho)) P^{Fu}_e + (\alpha_4 - (1 - \rho)) P^*_e \]

Assuming strong PPP and letting

\[ \rho \alpha_e - (1 - \rho) e_e = S_e \] gives

\[ \rho \alpha_e - (1 - \rho) e_e = S_e \]
Demand side

The demand for agricultural products is a function of real income, price of non-food items, prices of agricultural products and excess money supply.

\[
D_x = (Y_x, P_{NF}^x, P^{NF}, EM)
\]

The money market equilibrium is attained when real money supply equals real money demand \( (M^d = M^z) \). The effects of excess money supply on non-traded agricultural products can be expressed as

\[
P^{nf} = \eta[(M^z - P) - M^d]
\]

where \( \eta \) is a scalar value showing that proportion of the money market disequilibrium which explains the changes in prices of agricultural product. The value of \( \eta \) was predetermined based on the contribution of agricultural output to the total GDP of the country.

The pure monetary theory, based on the influential work of Friedman (1969), claims that the expansion of money supply in excess of the real productive potential of the economy leads to inflation. This suggests that policies intended to contain inflation at an acceptable level should keep the growth of money with the growth of real income.

The general demand for real money balance is expressed as:

\[
M^d - P = \tau_1Y_x + \tau_2R - \tau_3\pi^{x+1}
\]

(13)

Since the financial market is poorly organized and the interest rate is almost fixed in the country, it cannot be considered as a true measure of the cost of holding money. Ignoring interest rate, and given exogenously determined money supply, the price effects of the excess money supply to agricultural products can be expressed as:

\[
P^{nf} = \eta[(M^z - P) - \lambda_1Y_x + \tau_3\pi^{x+1}]
\]

(14)

The demand for non-traded agricultural products in the domestic market can thus be written as:

\[
D_x = \phi_1Y_x + \phi_2P_{NF}^x + \phi_3\eta[(M^z - P) - \lambda_1Y_x + \tau_3\pi^{x+1}] - \phi_5P^{nf}
\]

Rearranging, we have

\[
D_x = (\phi_1 - \phi_5\lambda_1)Y_x + \phi_2P_{NF}^x + \phi_3\eta[(M^z - P)] - \phi_5P^{nf}
\]

(15)

The long-term relationship between demand for and supply of non-traded agricultural products is established by the domestic good’s market equilibrium of eq. 11 and 15, respectively

\[
D_x = S_x
\]

(16)

Rearranging and solving for \( P^d_x \) gives

\[
P^d_x = \frac{\lambda_1[(\psi_1 - \psi_2\lambda_1)Y_x + \psi_2P_{NF}^x + \psi_3\eta(M^z - P)] - \psi_5P^{nf}}{1 + \psi_2}
\]

(17)

VAR model

The VAR model can be expressed as

\[
P^{nf} = \psi_0 + \psi_1P_{NF}^x + \psi_2\eta(M^z - P) + \psi_3\pi^{x+1} + \psi_4P^{nf}
\]

(18)

Since it is difficult to separate prices of traded and non-traded agricultural goods, the two prices are assumed to be equal in the domestic market

\[
P^d_x = P^{nf}
\]

The VAR model in eq. (17) will then be written as:

\[
P^{nf} = \psi_0 + \psi_1P_{NF}^x + \psi_2\eta(M^z - P) + \psi_3\pi^{x+1} + \psi_4P^{nf}
\]

(19)

Since the variables in the agricultural price model are assumed to be I (1), the appropriate modelling strategy is VECM. The VECM is estimated once the number of cointegrating relationships in the VAR model is determined.

The VECM

Three cointegrating relationships are assumed to explain the domestic prices of agricultural products in Ethiopia. The domestic market is expected to adjust to previous shocks in the domestic market, and this in turn adjusts to its previous shocks and other shocks in the money and foreign market.

The three cointegrating relationships are:

\[
P^d_1 - \delta_1P_{NF}^x - \delta_2P^x - \delta_3P^{nf} = ECM_1
\]

(20)

\[
(M^z - P) - \lambda_1Y_x = ECM_2
\]

(21)

\[
\frac{\psi_2}{\psi_5}P^x - \psi_4P^{nf} = ECM_3
\]

(22)

and the resulting VECM can then be specified as:

\[
P^d_x = \phi_1Y_x + \phi_2P_{NF}^x + \phi_3\eta[(M^z - P)] - \phi_5P^{nf}
\]

(23)
The above VECM model was then estimated using a high frequency monthly data to analyze the determinants of agricultural prices in Ethiopia.

RESULTS AND DISCUSSION

The first task in VECM analysis is to make sure that the variables in the VECM are all stationary. Augmented Dicky-Fuller Stationary test was made for all variables and none of the variables included in the model were found stationary at 1% significance level except world fertilizer price and price of unskilled labor service which were found to be stationary at 5% significance level. The general VECM is represented by

$$\Delta P_t = \mu + \sum_{i=1}^{k} \sigma_i \Delta P_{t-i} + \pi P_{t-i} + \epsilon_t$$

where $\Delta P_t$ is the vector of the endogenous variables included in the model; the parameters $\mu$ and $\pi$ are allowed to vary without restrictions; $k$ is the lag length of the model; and $\epsilon_t$ is a vector of i.i.d. errors with a mean of zero and a variance of one. We test for the existence of a co-integrating relationship between the variables by analyzing the rank of the matrix using the methodology developed by Johansen (1988).

Accordingly, three co-integrating equations representing equilibriums of three markets: the goods market, the money market and the foreign market were considered in the model. The three co-integrating relations presented in Eq. 20, 21 and 22 are estimated separately. The results of the three Error Correction Models (ECMs) are presented in Table 2.

All the variables entered in the three equations were found to be strongly significant except the sign in the second model for Interpolated agricultural output which is negative. Before the estimation of the ECM model for determination of agricultural prices, lag-order selection was made based on Akaike Information Criteria and Loglikelihood Ratio tests. The test result reveals that the lag order is 8 months. Accordingly, estimation was made using 8 lags for each of the variables included in the model. Table 3 shows the estimation results.

As the result in Table 3 shows, all variables except agricultural production and external market shocks are significant in explaining agricultural prices in Ethiopia. Money supply, the general price level, world grain price, fertilizer price, domestic benzene price, non-food price, the goods market (ECM1), and money market (ECM2) equilibrium price levels significantly explain agricultural prices in Ethiopia. In addition, shocks in the three markets significantly affect agricultural prices. The sign of all of these variables, except wage rates of unskilled labour, were also as expected.

Two variables, namely agricultural production and external market shocks are insignificant. The reason may be either that the data on agricultural output may be unreliable or the interpolation might be incorrect.

Money supply has always been considered as the major cause of higher inflation. This is the case where ‘too much money is chasing few goods’ – money growing at a rate faster than the growth rate of real GDP. This could be the result of higher fiscal deficit, ‘signiorage’, aggressive credit expansions, switching from food aid to cash transfer, foreign transfers, wage rates, etc. The reason why monetary authorities excessively supply money might be that they have an incentive to surprise the public and apply over-expansionary monetary policy in anticipation of fast growth (the so-called Cukierman and Meltzer (1986) hypothesis) or an ambition to higher growth, lack of independence and institutional capacity of central banks. Finally, it could be due to poor markets which undermine monetary policy transmission.

Large and persistent budget deficits are considered to be the root cause of monetary expansion, persistent inflation and macroeconomic instability (Saleh and Harvie, 2005). Factors such as rapid expansion of domestic credit, the growth of government deficits and treasury bills, the shift from food aid to cash transfers and others contribute for the rapid growth in money supply and put pressure on prices. IMF (2008a) also found excess money supply as the main driver (especially lending to public enterprises) and recommends forceful policy tightening.

Another issue of interest is the degree of inflation inertia, measured by the coefficient on lagged inflation. Rise in actual inflation can lead to an increase in inflationary expectations. It is usually interpreted as measuring the effects of indexation or inflation expectations. In Ethiopia, indexation has not been common and government-administered price setting, which was widespread before, has almost been abolished (IMF, 2008b). Therefore, inertia would capture expectations, which are believed to be particularly important in agricultural markets (Ng and Ruge-Murcia, 2000). The inertia in this case is given by the coefficient of agricultural price which is equal to 0.688 which indicates that a one percent rise in agricultural prices in the preceding year will increase the price of the following year by 0.688 percent (price-price upward spiral movement). This indicates that stabilization policies are important in order to dampen inflation expectations on prices.

The continuous depreciation of Birr against dollar could also contribute to the observed rise in the agricultural prices as shown in the coefficient of ECM3. The study by Bleaney and Fielding (1999) suggest that the widespread adoption of floating exchange rates in the
Table 1. Stationarity test for the explanatory variables

<table>
<thead>
<tr>
<th>Variables (in first difference form)</th>
<th>Test Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECM model for external market</td>
<td>-5.493***</td>
<td>0.0000</td>
</tr>
<tr>
<td>ECM model of the money market</td>
<td>-6.947***</td>
<td>0.0000</td>
</tr>
<tr>
<td>World grain prices</td>
<td>-5.413***</td>
<td>0.0000</td>
</tr>
<tr>
<td>Non-food prices</td>
<td>-3.183***</td>
<td>0.0009</td>
</tr>
<tr>
<td>Wage rate for unskilled labor</td>
<td>-1.847**</td>
<td>0.0334</td>
</tr>
<tr>
<td>Benzin price (proxy for fuel prices)</td>
<td>-3.959***</td>
<td>0.0000</td>
</tr>
<tr>
<td>World fertilizer price (2000 constant price) ††</td>
<td>-3.674**</td>
<td>0.0002</td>
</tr>
<tr>
<td>Agricultural output †</td>
<td>-4.666***</td>
<td>0.0000</td>
</tr>
<tr>
<td>Money used for non-agric. sector</td>
<td>-4.655***</td>
<td>0.0000</td>
</tr>
<tr>
<td>Agricultural prices</td>
<td>-5.785***</td>
<td>0.0000</td>
</tr>
<tr>
<td>Broad money supply</td>
<td>-5.758***</td>
<td>0.0000</td>
</tr>
<tr>
<td>Cereal prices</td>
<td>-6.139***</td>
<td>0.0000</td>
</tr>
<tr>
<td>Parallel exchange rate (Birr against USD)</td>
<td>-4.468***</td>
<td>0.0000</td>
</tr>
<tr>
<td>Consumer price index</td>
<td>-4.737***</td>
<td>0.0000</td>
</tr>
<tr>
<td>Grain producer prices</td>
<td>-5.722***</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Source: Model output
Critical values are -2.353 for 1%, -1.656 for 5%, -1.288 for 10%
*** Significant at 1% and ** at 5%
† the data for agricultural output is interpolated from annual agricultural output data
†† due to lack of fertilizer price data in the domestic market, one year lagged world price of fertilizer was taken as proxy variable.

Table 2. Econometric results of the three cointegrating equations

<table>
<thead>
<tr>
<th>Beta</th>
<th>Coef.</th>
<th>z</th>
<th>P&gt;z</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ECM1 (Goods market equilibrium)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cereal price</td>
<td>1.000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>World fertilizer price</td>
<td>-2.423***</td>
<td>2.830</td>
<td>0.005</td>
</tr>
<tr>
<td>Wage rate of unskilled labor</td>
<td>-0.061***</td>
<td>3.000</td>
<td>0.003</td>
</tr>
<tr>
<td>Benzene price</td>
<td>-0.046***</td>
<td>2.920</td>
<td>0.004</td>
</tr>
<tr>
<td>Non-food price</td>
<td>26.578***</td>
<td>-5.750</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>ECM2 (Money market equilibrium)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real agricultural money</td>
<td>1.000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Agricultural price</td>
<td>0.580***</td>
<td>4.740</td>
<td>0.000</td>
</tr>
<tr>
<td>Agricultural output</td>
<td>-1.332***</td>
<td>-5.520</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>ECM3 (External sector equilibrium)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parallel exchange rate</td>
<td>1.000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>World grain price</td>
<td>1.207***</td>
<td>2.890</td>
<td>0.004</td>
</tr>
<tr>
<td>Agricultural producer price</td>
<td>-1.321***</td>
<td>-4.830</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Source: Model output

developing world has had a significant cost, with inflation tending to be over 10% p.a. faster than in the typical pegged-rate country.

Especially in developing countries, the public sector, “far from being the ‘balancing factor’..., has often been an accomplice - if not the main culprit - in generating major
Table 3. Error correction model - dependent variable agricultural price

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coef.</th>
<th>Std. Err.</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad money</td>
<td>4.266</td>
<td>0.950</td>
<td>4.49***</td>
</tr>
<tr>
<td>Consumer price index</td>
<td>1.311</td>
<td>0.146</td>
<td>9.00***</td>
</tr>
<tr>
<td>Agricultural production</td>
<td>3.267</td>
<td>2.865</td>
<td>1.14</td>
</tr>
<tr>
<td>World grain price</td>
<td>1.118</td>
<td>0.122</td>
<td>9.20***</td>
</tr>
<tr>
<td>World fertilizer price (12 months lagged)</td>
<td>1.712</td>
<td>0.178</td>
<td>9.64***</td>
</tr>
<tr>
<td>Wage rate of unskilled labor</td>
<td>-0.089</td>
<td>0.031</td>
<td>-2.82***</td>
</tr>
<tr>
<td>Benzene price</td>
<td>0.261</td>
<td>0.029</td>
<td>9.07***</td>
</tr>
<tr>
<td>Non-food price</td>
<td>3.250</td>
<td>0.667</td>
<td>4.87***</td>
</tr>
<tr>
<td>ECM1</td>
<td>-2.827</td>
<td>0.333</td>
<td>-8.50***</td>
</tr>
<tr>
<td>ECM2</td>
<td>3.722</td>
<td>0.298</td>
<td>12.48***</td>
</tr>
<tr>
<td>ECM3</td>
<td>4.485</td>
<td>2.451</td>
<td>1.83</td>
</tr>
<tr>
<td>LD-Agricultural price</td>
<td>0.668</td>
<td>0.300</td>
<td>2.23***</td>
</tr>
<tr>
<td>L3D-Broad money</td>
<td>-1.043</td>
<td>0.491</td>
<td>-2.12**</td>
</tr>
<tr>
<td>L3D-Consumer price index</td>
<td>2.081</td>
<td>1.017</td>
<td>2.05**</td>
</tr>
<tr>
<td>LD-Agricultural production</td>
<td>-0.532</td>
<td>0.320</td>
<td>-1.66*</td>
</tr>
<tr>
<td>LD4-Agricultural production</td>
<td>-0.701</td>
<td>0.423</td>
<td>-1.66*</td>
</tr>
<tr>
<td>L6D-World fertilizer price</td>
<td>-0.808</td>
<td>0.308</td>
<td>-2.62***</td>
</tr>
<tr>
<td>LD-Wage rate of unskilled labor</td>
<td>-0.008</td>
<td>0.004</td>
<td>-2.06**</td>
</tr>
<tr>
<td>L2D-Benzen price</td>
<td>-0.007</td>
<td>0.003</td>
<td>-2.18**</td>
</tr>
<tr>
<td>L6D-Benzen price</td>
<td>-0.006</td>
<td>0.003</td>
<td>-2.09**</td>
</tr>
<tr>
<td>L2D-ECM1</td>
<td>-0.603</td>
<td>0.364</td>
<td>-1.66*</td>
</tr>
<tr>
<td>L3D-ECM1</td>
<td>-0.737</td>
<td>0.305</td>
<td>-2.42**</td>
</tr>
<tr>
<td>L5D-ECM3</td>
<td>-1.216</td>
<td>0.670</td>
<td>-1.81*</td>
</tr>
</tbody>
</table>

Source: Model output

*** Significant at 1%, ** significant at 5% and * significant at 10%

Macroeconomic imbalances” (Tanzi, 1994). Thus, the need for a prudent fiscal policy as a tool for a sustained economic growth and as a means of avoiding sources of macroeconomic imbalance is quite apparent. Fisher and Easterly (1990) contend that rapid inflation is almost always a fiscal phenomenon and they believe that any hope of controlling inflation without reducing government deficits will be in vain. Hence, persistent budget deficits must be kept in mind when the government is called upon to pursue stabilizing policies (Tanzi, 1994).

Inflation growth has recently coincided with high economic growth rates, whereas in the past inflation was traditionally associated with large agricultural supply shocks due to drought (Loening et al., 2009). Though official reports indicate that the country has achieved rapid growth in the past 5 years, the study gives no evidence on the contribution of this growth in reducing agricultural prices. The chief explanations have focused on high domestic demand, expansionary monetary policy, a shift from food aid to cash transfers, and structural factors due to reforms and investments in infrastructure (Ahmed, 2007; Dorosh and Subran, 2007; World Bank, 2007; IMF, 2008a; IMF, 2008b).

Appropriate monetary and fiscal policy measures have to be taken to reduce the rapidly rising agricultural prices. Though rises in agricultural prices may have stimulating effect to the agricultural sector and hence a positive income effect on the rural households, it may also have negative effects if the gains from rise in agricultural prices are counterbalanced by the rise in the prices of inputs (such as fertilizer, fuel, and labor) and rise in non-food prices. In addition, the rise in agricultural prices could also have substantial negative welfare effect on net-food buyer rural households such as pastoralists, food-insecure and resource poor households. Wodon and Zaman (2008) show that rising food prices are likely to lead to higher poverty in sub-Saharan Africa as the negative impact on net poor consumers outweighs the benefits to poor producers.

CONCLUSIONS AND POLICY IMPLICATIONS

There are different views about the sources of high food inflation in the country. For example, what the IMF, World Bank and economists view as the causes of food price inflation and what the Ethiopian government suspects, lie at two extremes. The former states increased government expenditure financed by an increased money supply (demand side), while the latter argues for structural factors; that is, even though production has increased, it has not reached the marketplace for ‘various reasons’. In Ethiopia, food price accounts for the lion’s share of the Consumer Price Index. This results in food
price inflation necessitating general inflationary pressures in the economy both directly and indirectly. Furthermore, food prices increased even faster than non-food items that made it the preponderant contributor to high general inflation.

In this study a vector error correction model was used to identify factors affecting the current soaring food inflation in the country. The study result did not support government's claim that Ethiopia's inflation is a non-monetary phenomenon. On the contrary, monetary developments remain important and significant factors in explaining inflation in Ethiopia. Large and persistent budget deficits, rapid expansion of domestic credit, the growth of treasury bills, the shift from food aid to cash transfers and others contribute for the rapid growth in money supply and put pressure on prices. Hence a forceful policy tightening might be required to reduce the current soaring food prices in the country. The money supply is the ‘Black-box’ that has been discovered in this study as a major source of the current soaring food prices in the country. It is an important factor expected by donors and economists, though the government claims the hoarding of goods by traders and the unbalanced growth of different sectors as the main causes.

That means, reducing monetary growth in the country helps to reduce the rate of headline inflation. However, there are also other important factors that explain Ethiopia's food inflation. The most important ones being the general price level, world grain price index, lagged world DAP price index, domestic benzene price index, non-food price index, shocks in the goods market and shocks in the money market. The degree of inflation inertia measured by the coefficient on lagged inflation is also an important factor in explaining food inflation.

It is the poor who are disproportionately affected by food inflation because they spend a larger proportion of their income on food. Rising food prices thus decrease the real income of the most vulnerable people, with serious nutritional and health consequences. The impacts of the recent surge in food prices are echoing across key dimensions of the development agenda, including poverty alleviation, macroeconomic stability, investment incentives and energy security/climate change policies. Because it is capable of weaving together the economic, poverty, social, agricultural and environmental perspectives, appropriate intervention measures should be in place to reverse the situation.

The increase in food prices implies the need to focus on investments in agriculture and social protection. The structural shift in food prices demands government and donors to work together and mobilize the necessary financial support to reverse a perennial problem of under-investment in agriculture and to build better safety nets to help the poor cope with their endemic high levels of risk.

Since inflation affects the poor most, a priority for protecting vulnerable households in the face of continued uncertainties in the food markets needs to be alleviated by improving the quality of and access to safety nets and diversifying livelihood through the introduction of appropriate technology that can boost production and productivity.

Because of its diversified impact, analytical work to better understand the economic, poverty and social implications of rising food prices can contribute to the design of flexible intervention strategies. This implies the need for expanding the diagnostics and identifying critical areas of support, including: agricultural constraints; distributional analysis of food price increases and safety net programs; rural investment climate assessments; and public expenditure reviews.

ACKNOWLEDGEMENT

Dryland Coordination Group (DCG) is highly acknowledged for financing the project from which this manuscript is extracted.

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