Does The Recent Spike in Food Prices Have Any Economic Benefit?

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Abstract

Over the last decade, there has been an incessant rise in global food prices; this increase in food prices has been associated with the recent discovery of petroleum product substitute “ethanol”. Since bio-ethanol is mainly produced from food crops such as sugar cane and corn, the increase in the demand for these food crops for ethanol production particularly by emerging markets such as china has imposed enormous pressure on demand for food and food prices. This study investigates the impact of increase in food prices on global economic growth; using food producer price and consumer price index as a proxy, this study examines the gain on the producer side and the loss on consumer side from this increase in food prices and how this gain and loss has impact economic growth. Descriptive analysis and bare bone Solow growth model was use in this study on data from 126 different countries, between year 2000 and 2009 for which data is available and during which there has been increase in food prices to achieve its goal. The result from our findings shows that the increase in food prices, has can be observed from the increase in food producer prices, has a positive impact on economic growth, signifying that the increase in food prices has some benefit on current global economic position. Also, our findings shows that consumer price index has a positive but insignificant relationship with economic growth; implying that the current increase in food consumer price index is not detrimental to global economic growth as one would expect instead there has been global benefit from the hike in food price.

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1. Introduction

The world food situation has become of great importance over the last decade; there has been an incessant rise in global food prices this is due to various factors such as increase in global income growth, rapid increase urbanization, high energy prices, and climate change. Also, increase in food prices has been associated with the recent discovery of petroleum product substitute “bio-ethanol”; bio-ethanol is mainly produced from food crops such as sugar cane, corn and other methane related food crops. The increase in the demand for these food crops for ethanol production particularly by emerging markets such as china has imposed enormous pressure on demand for cereals food product coupled with the climate change that has made most agricultural land less fertile and less productive for production of food crops has thus far change the food market. This study investigates the impact of this global food price hike on economic growth over the last decade, using a cross country data from 126 countries. The study made use of the Solow growth model to analyze the impact of this food price on economic growth using producer price and Consumer price index as a proxy; the study also analyses the prediction of Von Braun et al (2008) that net exporting countries will gain from increase in food prices while next importing countries will lose and will struggle to meet domestic demand. This study is organized in the following way; section 1 introduced the subject matter, section 2 use graphical descriptive analysis to examine the trend in global food crop production over the last decade, section 3 describe the data and the empirical design used in the study, section 4 explains the model and hypothesis used in the study, section 5 explains the findings of this work, section 6 provide conclusion and policy recommendation in light of the regression result.

2. Does Food Prices have an impact on Economic growth?

To answer this question, trend analysis of food prices and economic growth was examined; the Figures 1-3 show the trend in food consumer price index, food production price index and gross domestic product (gdp) growth rate over the last ten years (2001-2011). Figure 1 revealed that over the last decade the food producer price index has been increasing despite huge fluctuations in global gdp growth rate. The economic down turn of 2008 did not affect the producer price index immediately just as expected; instead, the farm gate price kept increasing even with the economic meltdown. This shows that the non farming poor households were mostly affected by the economic downturn of 2008; on the other hand poor farming household were much better off because they earn higher income within this period of economic down turn. Figure 2 shows that the consumer price index over the last decade has mimic the pattern of the gdp growth rate. As can be observed from the graph, the increase in gdp growth rate between 2002 and 2003 has translated into increase in food consumer price index within these years and similarly the decline in gdp growth rate between 2004 and 2005 has translated into even deeper decline in food consumer price index within these years. In recent years (2007-2009), gdp growth rate and consumer price index has moved in opposite direction; gdp has declined due to the economic downturn while food consumer price index has increased implying that in the presence of economic down turn, the consumer price index has increased revealing that the economic down turn has had great impact globally particularly on global food security has can be observed via consumer price index.
Figure 1: Relationship between Food Producer Price index and Economic growth (Source: FAO Stat, 2011)

Figure 2: Food Consumer Price index and Economic growth (Source: FAO Stat, 2011)

Figure 3 reveals the volume of different types of food production over the last ten years. The graph shows that the total cereal production has had its fair share of fluctuation within the last decade; between 2010 and now global cereal production has increased tremendously this increase can be attributed to increase in demand of cereal for bioethanol production by emerging economies like China. Findings of past work revealed that cereal production might likely reduce in the future due to climate change; current pattern of drought and floods are likely going to reduce cereal production. In Most developing economy particularly in Sub Sahara Africa, cereal production is expected to decline with a mean loss of 15% by 2080 (Fischer et al, 2005). These three graphs above shows that food production have in some way been related with economic growth and the consumer price index has in fact mimic the gdp growth pattern until the last economic down turn.
3. Data and Empirical Design

The data used in this study was obtained from different sources; the producer price index and consumer price index were obtained from Food Agricultural organization (FAO, 2012). Real gross domestic product data were obtained from Penn World table 7.1, population growth rate and share of investment was obtained from World Bank data base. The study analyzed 126 countries for which data was available from 2000-2009. Since we are interested in the overall impact of food prices on economic growth, we average out all variables to net out cyclical fluctuations and average out each country’s time series into a single data point in order to eliminate variations within each of the country over the study period. Very many authors have used this method of single point averaging, among many of them include Barro(1991), Barro and Sala-i-Martin(1991,1992),Kormendi and Mequire(1985). Although this study is similar to afore mentioned studies in choice of model which is the Solow growth model but this study differs in the inclusion of food price index as an important determinant of economic growth. There has been debate as regards the impact of high food prices in the literature; Studies of Von Bran et al (2008) argued that countries that are net exporter of food will end to gain from this increase in food prices through improved terms of trade while major net importer will however struggle to meet domestic demand. Also, studies by Ivanic and Martin (2008) have argued that although the impact of this food prices will differ from country to country and from food commodity to food commodity but the adverse effect will be more felt by low income households, hence leading to substitution of high nutrient food with low food nutrient and further pushing low income household in to poverty threshold. This study investigates the impact of global food increase on the global economic growth using consumer price index as a proxy for the price of food from the consumer side and the producer price index as a proxy for food price that farmers receive at the farm gate.

4. Hypothesis and Variables

The model used in the study is thus:

\[ \ln y_{it} - \ln y_{i0} = a_0 - a_1 \ln y_{i0} + a_2 \ln s_i + a_3 \ln (n_i + g + \delta) + \sum_j a_j \ln X_{ij} + \varepsilon_i \]
Where \( y_t \) is real GDP per capita in year 2009 and \( y_{t0} \) is the real GDP per capita in year 2000. The negative coefficient on initial per capita income, \( \ln y_{t0} \), implies growth slows with economic development, making for convergence conditional on the remaining explanatory variables. The rate of capital accumulation, \( s_i \), is expected to contribute positively to per capita income growth while rates of population growth, \( n_i \), and depreciation, \( \delta \), will contribute negatively to per capita income growth. \( X_{ij} \) represent other variables which are consumer price index and Producer price index in this study, which are expected to have a negative and positive impact on economic growth respectively.

In this segment of the study we highlight the hypothesis that motivates this study comparing the motivation with past studies.

A Initial Real gdp is expected to have a negative impact on economic growth; this is in line with the theory of diminishing return on investment and according to Solow’s prediction that countries with high level starting point tend to grow slower compared with countries with low level starting point. Also, return to investment is expected to be higher in less developed countries compared with developed countries with low return to investment hence the convergence is dependent on other factors aside from initial conditions. Findings of Sala-I Martin et al (2004); Burger and Plessis, 2002 reveals that convergence effect has the highest effect on economic growth of all determinants of economic growth, hence the reason for our inclusion of this variable in the model.

B Population Growth rate is expected to have a negative impact on economic growth. For this study we followed Stephen Bond et al, 2001 of adjusting for depreciation (d) and technical change (g) by adding 0.05 to the logarithm of average population growth rate by assuming common depreciation and technical change rate for all countries within the study. Population growth rate is expected to have a negative impact on economic growth; this is in line with the Solow model’s prediction.

C Investment share is expected to have a positive impact on economic growth rate. A current high level of investment increases future income, this is in line with Solow’s prediction.

D For the purpose of this study we have included two additional variables to capture food prices. Food consumer price index and producer price index are used as a proxy for both the demand and supply price of food commodity. We expect that producer price will have a positive impact on economic growth particularly for net exporting countries just as predicted by Von Bran et al (2008) while consumer price index is expected to have a negative impact on economic growth particularly net importing countries.

5. Result and Discussion

Table 1(in the appendix) summarised the regression result of our findings; from the table the first regression shows that initial economic condition is negative and significant as expected implying that convergence is conditioned on other variables aside from the initial real gdp. Investment share is positive and significant just as expected; this shows that increase in investment enhance economic growth just like the Solow model predicted and as found in the work of Sala-i-Martin et al (2004) and Burger and Du Plessis, 2006. Adjusted Population growth rate has a negative significant impact on economic growth rate, in line with Solow model’s prediction that an increase in population growth will mount more pressure on economic growth due to increase in consumption and decrease in savings leading to a decrease in economic growth; also our finding is in line with the result obtained by Stephen Bond et al, 2001. The regression result also indicates that producer price index tends to enhance economic growth while consumer price index has no significant impact on economic growth. We try to test if countries that are net exporters grow differently from other countries that
are net importers just as predicted by Von Bran et al (2008). From our data there are 65 net importing countries and 61 net exporting countries; the regression result shows that net exporting countries did not grow differently in the presence of increase in producer price as predicted by Von Bran et al (2008) suggesting that net exporting countries will have a gain in terms of trade while net importing countries will loss; our finding suggest that this not the case; instead although all countries tend to gain from this increase in producer prices but the gain has not translated into a growth differential between the net importing and net exporting countries. Also, consumer price index has no significant impact on economic growth; infact the result of the regression shows that increase in consumer price index has a positive but insignificant impact on economic growth of the countries that were studied. This result shows that the incessant increase in food price, from macro level studied did not have a significant impact on global economy has economist would have expected. Our study is a macro level study, so we can not totally conclude that the increase in food prices does not have an impact on individual household and to do that we need to make use of an household survey, yet we can say that from a macro level, the increase in food prices has been properly managed such that its impact on economic growth has been less significant.

6. Conclusion and Recommendations

In this study we examined the impact of increase in food prices using food consumer price index and producer price index as proxy; we also investigate if the increase in food prices led to a growth differential between net food importers and net food exporters. The result shows that producer price index unlike consumer price index has a positive significant impact on economic growth of the studied countries but there has been no differential in growth between net exporting countries and net importing countries as predicted by Von Bran et al (2008). Since, the producer price index has positive significant impact on economic growth, hence we suggest that government of each country should implement policies that will enhance producer price index such as good land and water management reform policies that will increase agricultural productivity; also government can encourage farmers to produce more by giving subsidy in form of fertilizer and other agricultural enhancing productivity forms of subsidies.

References

### Appendix A.

Table 1 – Impact of Producer price index on Economic growth 2000-2009

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP PC, 2000</td>
<td>-2.08e-06</td>
<td>-0.0570796</td>
<td>-0.0578355</td>
</tr>
<tr>
<td></td>
<td>(0.013)</td>
<td>(0.0003)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>Investment Share, 00-09</td>
<td>0.1540682</td>
<td>0.1915782</td>
<td>0.189868</td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Population growth rate, 00-09</td>
<td>-0.0211693</td>
<td>-0.0325902</td>
<td>-0.0330111</td>
</tr>
<tr>
<td></td>
<td>(0.044)</td>
<td>(0.007)</td>
<td>(0.005)</td>
</tr>
<tr>
<td>Producer Price index,00-09</td>
<td>0.6283824</td>
<td>0.6035511</td>
<td>0.6087264</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.003)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>Consumer Price Index,00-09</td>
<td>0.0184501</td>
<td>0.007757</td>
<td>0.0030611</td>
</tr>
<tr>
<td></td>
<td>(0.735)</td>
<td>(0.886)</td>
<td>(0.886)</td>
</tr>
<tr>
<td>Dummy</td>
<td></td>
<td>0.003549</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.889)</td>
<td></td>
</tr>
<tr>
<td>Dummy*Producer price index</td>
<td></td>
<td></td>
<td>0.0015331</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.901)</td>
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<tr>
<td>Constant</td>
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<td>-1.148531</td>
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</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td>(0.006)</td>
<td>(0.005)</td>
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<tr>
<td>R²</td>
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<td>0.2032</td>
<td>0.2031</td>
</tr>
<tr>
<td>N</td>
<td>126</td>
<td>126</td>
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</tr>
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</table>

Variables in natural logarithms. Probability levels in parentheses.