Does Food Aid Affect the Agricultural Sector? The Small Economy Case: Jamaica

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Abstract

This paper looked at a small developing country, Jamaica and tried to determine whether food aid has had an effect on its agricultural sector in particular the supply of maize by farmers, the price of maize and the imports of maize. In order to meet this objective, a simultaneous equation system of six equations was estimated. The results found that food aid had a negative and inelastic impact on maize production in Jamaica. Food aid however did not affect the price of maize or the import demand for cereals in Jamaica, contrary to major concerns about food aid to developing countries. The study also produced some interesting results such as tourist arrivals had a positive influence on GDP per capita in Jamaica and the highly elastic response of the domestic supply of maize to temperature. Thus the steady rise in temperature in Jamaica over the period 1970 to 2006 may have had a depressing effect on maize production especially with the more rapid rise in temperature since 1996. In general therefore the inelastic supply effects as well as the lack of impact on maize prices and import demand for cereals some measure of success in limiting the negative effects of food aid on the Jamaican agricultural sector.

Key words: food aid, agricultural impact of food aid in Jamaica, maize supply function

Introduction

The potential for food aid to be a disincentive to the recipient country’s agricultural production has been a serious concern for both recipient countries and donor countries. Two basic arguments have dominated the literature:

- that food aid has great potential for dampening both short- run and long- run price incentives to producers; and
- that food aid in the long run weakens incentives to develop effective agricultural policy of a recipient government (Schultz 1960 and Mann 1967).

These price and policy disincentives, in turn, could lead to economic inefficiency and misallocation of resources. Hence, the objective of this paper is to determine whether it can be demonstrated that food aid has had an effect on the agricultural sector of a small developing country, Jamaican particular the supply of maize by farmers, the price of maize and the imports of maize.

Background

Jamaica like the rest of the islands of the Caribbean is included in the UN classification of Small Island Developing States (SIDS). SIDS were first recognized...
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as a distinct group of developing countries facing specific social, economic and environmental vulnerabilities at the United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit, held the 3-14 June 1992 in Rio de Janeiro, Brazil (UN-OHRLLS 2011).

The Barbados Programme of Action (BPOA) adopted in 1994, further complemented by The Mauritius Strategy of Implementation (MSI) of 2005 and MSI+5 Outcome document, noted that while SIDS are faced with the same economic difficulties and confronted by development imperatives comparable to developing countries generally, SIDS have their own unusual vulnerabilities and characteristics, and thus the challenges they encounter while trying to achieve sustainable development are for the most part severe and complex (SIDSnet 2011).

According to SIDSnet (2011), these vulnerabilities and characteristics include:

- Small size – This refers in the first instance to the land area of the islands but also refers to a number of areas such as excessive dependence on international trade and or tourism hence vulnerability to global developments; high population density; relatively small watersheds; limited supplies of fresh water. The small size of the populations also results in small domestic markets and limited potential for export volumes, which are generally too small to achieve economies of scale.
- Isolation – These islands and island chains are often spread over wide geographic locations which makes access to markets difficult thus resulting in high transportation costs that reduce their international competitiveness.
- Climate change and sea-level rise – the majority of SIDS are situated in coastal zones that are susceptible to the negative effects of climate change and sea level rise.
- Natural and environmental disasters – SIDS are usually located in regions that are prone to natural disasters that result in high economic, social and environmental consequences. The damage caused by these natural disasters are often made worst by excessive land degradation caused by poor land use practices.

Table 1 presents some general indicators for Jamaica and as seen in this table Jamaica has the characteristics of small land area and population, low ranking on the HDI and high levels of poverty and unemployment.

Food Aid

According to Barrette and Maxwell (2005), three (3) core characteristics distinguish food aid from other forms of foreign assistance:

- International sourcing of food – food must originate from outside of the domestic economy (that is, the food must cross a border)
- Concessional resources – food must be donated to the recipient countries at non-commercial rates
- Assistance must be in the form of food or must be for the provision of food.

The USA, though perhaps the world’s leading economy, still has its own food insecure families. Thus, while the number of Americans who did not have enough to eat declined in 2011, this number still stood at a near record number of almost 49 million people. (Fessler 2011) An increase in domestic government food grants perhaps led to the modest decline. Thus, Fessler (2011) stated that new data from the USDA indicated that 17.2 million households in the USA were food insecure in 2011 and more than a third of these households had members who went hungry at some point during the year,
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because they could not afford to buy enough to eat.

Despite having its own hungry people, the United States of America (USA) has been the major supplier of food aid to developing countries. Figure 1 gives the breakdown of food aid given by developed countries in 2004 and it shows that the USA gave 57% of the food aid, while the EU gave 20% as the other major food aid donor.

The USA has had multiple objectives for food aid given to developing countries. According to the USAID (2000) these include:

- To combat world hunger and malnutrition and their causes;
- To promote broad-based, equitable and sustainable development, including agricultural development;
- To expand international trade;
- To develop and expand export markets for US agricultural commodities; and
- To foster and encourage the development of private enterprise and democratic participation in developing countries.

However, Mousseau (2005) has pointed out various problems associated with food aid. These include:

- It is donor-driven and promotes the domestic interests of donor countries.
- It is used mainly as a foreign policy tool by donor countries and development of the recipient countries is not necessarily its main objective.
- International institutions providing food aid are often driven by food exporting firms.
- Cheap (highly subsidized) American grain and other foods dumped onto the local economy, affect the domestic agricultural sectors of developing countries.
- Small domestic producers in developing countries may be driven into further unprofitability, because their governments, as recipient countries are encouraged to remove protections from their farming sectors, exposing further the international uncompetitiveness of these small producers.

Figure 2 (after Mousseau 2005) presents the international aid flows and the international price of wheat from 1988-2001. Here it is seen that there was an inverse correlation between food aid donations and the price of wheat. That is, when the price of wheat was very high around 1995-1997, food aid flows were much reduced, compared to the flows in the period 1989-1993, when wheat prices were competitively lower.

Figure 3 provides the total food aid to Jamaica for the period 1970-2006. Here it is seen that food aid receipts increased markedly over the period 1986-1993, corresponding to the period of low international prices for wheat, illustrated in Figure 2. It can also be seen that food aid was reduced to negligible levels after 2004 corresponding to the increased utilization of grain in the USA for ethanol production. This increased use of grain was one of the causes of the food crisis of 2007-2008 (Headey and Fan 2010).

**Analytical Framework**

To meet the objective of this paper, a simultaneous equation system was estimated. This model was based on Bezuneh et al. (2003) and had the following structure (variables in natural logarithms with the hypothesized signs of the coefficients in brackets).

(1) Supply Equation:
\[ \log(iQS) = f_{1}(\log(PG, iQS_{t-1}, iFA, iWIR, iWIT, IPS_{t-1}) \]

(2) Demand Equation:
\[ \log(iQD_{t}) = f_{2}(\log(PG_{t}, iYD_{t}, IPS_{t}) \]
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(3) Income Equation:
\[
\log YD_t = f_3(\log QS_t, \log QI_t)
\]

(4) Commercial Import Equation:
\[
\log QM_t = f_4(\log QS_t, \log PW_t, \log FAA_t, \log Pop_t)
\]

(5) Price Setting Equation:
\[
\log PG_t = f_5(\log QS_{t-1}, \log PG_{t-1}, \log PQ_{t-1}, \log FAA_t)
\]

(6) Market Clearing Identity:
\[
\log QTD_t = \log (\log QS_t + \log QM_t)
\]

where:
- \(\log QS_t\) = log of total maize production in Jamaica
- \(\log PG_t\) = log of the price of maize in Jamaica
- \(\log FAA_t\) = log of total food aid imports in Jamaica
- \(\log WIR_t\) = log of the average annual rainfall in Jamaica
- \(\log WIT_t\) = log of the average annual temperature in Jamaica
- \(\log PS_t\) = log of the price of yam in Jamaica
- \(\log QD_t\) = log of per capita demand cereals in Jamaica
- \(\log QM_t\) = log of import of cereals
- \(\log YD_t\) = log of the GDP/capita
- \(\log QI_t\) = log of the arrival of tourists in Jamaica
- \(\log PW_t\) = log of the US price of wheat
- \(\log Pop_t\) = log of the total population of Jamaica
- \(\log PQ_t\) = log of Jamaica consumer price index
- \(\log QTD_t\) = log of demand for cereals in Jamaica
- \(t = \) denotes time in years

Equation (1) was a supply function for maize produced in Jamaica and this was a function of the lagged price of maize in Jamaica \((\log PG_{t-1}+1)\), lagged supply of maize in Jamaica \((\log QS_{t-1}+1)\), food aid to Jamaica \((\log FAA[-1])\), annual rainfall \((\log WIR[+])\), average annual temperature \((\log WIT[±])\) and lagged price of yam in Jamaica as a substitute good \((\log PS_{t-1}[-])\).

Equation (2) was a demand function for cereals in Jamaica, which was hypothesized to be determined by price of maize in Jamaica \((\log PG[−])\), per capita GDP \((\log YD[+]\) and price of yam as a substitute good \((\log PS[+]\).

Equation (3) was an income equation explaining per capita GDP in Jamaica \((\log YD[−])\) as a function of quantity supplied of maize in Jamaica \((\log QS[+])\), (as a proxy for agricultural output) and the tourist arrivals into Jamaica \((\log QI[−])\) representing a major growth sector of the Jamaican economy.

Equation (4) was introduced to explain the commercial imports of cereals into Jamaica \((\log QM[−])\) which was a function of the domestic supply of maize \((\log QS[−])\), the US price of wheat \((\log PW[−])\), and food aid into Jamaica \((\log FAA[−])\).

Equation (5) is the price setting equation for maize in Jamaica \((\log PG[−])\). This was hypothesized to be determined by the quantity of maize produced in Jamaica \((\log QS_{t-1}[−])\), a lagged dependent variable \((\log PG_{t-1}[-])\), lagged consumer price index \((\log PQ_{t−1}[-])\) and food aid into Jamaica \((\log FAA[−])\).

The final equation (6) was a market clearing or equilibrating equation, which set the total demand for cereals \((\log QTD[−])\) equal to the total quantity of maize
produced in Jamaica ($Q_{S_t}$) plus the imports of cereals into Jamaica ($Q_{M_t}$).

Thus, in the model, food aid was hypothesized to have a negative impact on the quantity supplied of maize in Jamaica via equation (1), a negative impact of commercial imports of cereal via equation (4) and it was also hypothesized to impact negatively on the price set for maize in Jamaica.

**Empirical Procedures**

**The Data**

The data covered the period 1970-2006 excluding the years 2002 and 2003 for which data was missing for some series. $Q_{I_t}$ data was obtained from the Jamaica Tourist Board (JTB), $P_{Q_t}$ was obtained from the World Bank (WB), $W_{IR_t}$ and $W_{IT_t}$ data were obtained from the Center for Climatic Research (CCR), while $P_{op_t}$ and $Y_{D_t}$ were obtained from the United Nations Statistics Division (UNSTAT). For the remaining variables the data was obtained from the Food and Agriculture Organization (FAOSTAT).

**Regression Analysis**

It is well known that regression of a non-stationary time series on another non-stationary time series may produce a spurious results, thus it was imperative to determine if the series were stationary (Gujarati 2003). Thus, the series were tested for stationarity using the augmented Dickey-Fuller test. Given that nine of the fourteen variables were non-stationary, it was necessary to test for cointegration in the estimated relationships. Equations 1 to 6 were estimated using Two-Stage Least Squares, with the instrumental variables being the true exogenous variables as indicated in Tables 3 to 8. To test for cointegration of these equations the Engle-Granger test was performed on the residuals of the estimated equations.

**Results and Discussion**

Presented in Table 1 are the results of the augmented Dickey-Fuller test for the fourteen variables used in this study. The results indicated that the variables $P_{G_t}$, $P_{S_t}$, $Q_{I_t}$ and $P_{Q_t}$ were stationary, while the other variables were non-stationary.

Table 2 presents the results of the Engle-Granger test for cointegration which found that all the equations 1 through 6 were cointegrated indicating a long run relationship exists between the dependent variables and the independent variables, ruling out spurious regressions.

Table 3 presents the results of the estimated supply equation for maize and showed that lagged maize production, food aid and temperature were statistically significant. It was found that a 10% increase in maize production in Jamaica would lead to a 6.3% increase in maize production in the following year. A 10% increase in food aid to Jamaica would lead to a 0.5% decrease in maize production in Jamaica, while a 10% increase in temperature would result in a 44% decrease in maize production. Furthermore, rainfall was not found to be significant in determining maize production.

Presented in Table 4 are the results for the demand equation. For this equation, none of the variables were found to be statistically significant.

Table 5 presents the results of the income equation, which showed that the variable "tourist arrivals into Jamaica" was statistically significant in explaining GDP per capita. That is, a 10% increase in tourist arrivals would lead to a 7.6% increase in the GDP per capita.

Table 6 presents the results of the
“commercial import of cereal” equation and indicated that the total population variable was significant in determining the imports of cereals into Jamaica. The results suggested that a 10% increase in population would result in a 15% increase in the imports of all cereals.

Presented in Table 7 are the results of the price setting equation, which indicated that the lagged price of maize in Jamaica and the lagged consumer index were statistically significant. A 10% increase in maize production and consumer price index caused a 0.9% and 0.2% increase in the price of maize. Food aid did not significantly impact on the price of maize in Jamaica.

Table 8 presents the market clearing identity.

Conclusions and Discussion

Based on the results obtained a number of conclusions can be made with respect to the food aid and the Jamaican economy. Firstly, food aid had a negative impact on the domestic supply (production) of maize in Jamaica. Increasing food aid by 10% caused the domestic supply of maize to fall by .5% suggesting that the impact of food aid though significant was inelastic. Food aid however did not affect the price of maize nor the import demand for cereals in Jamaica, contrary to major concerns about food aid to developing countries. This result along with the inelastic supply effect suggests some measure of success in limiting the negative effects of food aid on the Jamaican agricultural sector.

Tourist arrivals had a positive influence on GDP per capita in Jamaica which shows the importance of tourism to the Jamaican economy. Furthermore, population had a major influence on grain imports. Another interesting result found is the study is the highly elastic response of the domestic supply of maize to temperature. Thus the steady rise in temperature in Jamaica over the period 1970 to 2006 may have had a depressing effect on maize production especially with the more rapid rise in temperature since 1996 (Figure 4)

The issue is not whether food aid is good or bad, but how it can be used to promote human and physical capital formation in the recipient countries. Such an argument places great responsibility on the governments of recipient countries to determine and design policies so as to realize the potential benefits of food aid, without displacing domestic production. The results of this study suggest that if Jamaica were to resume receiving food aid in substantial quantities that such policies should be put in place to alleviate any negative impacts on its domestic grain producers.

References


Table 1:

<table>
<thead>
<tr>
<th>Indicator</th>
<th>(2011 estimate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>10,991 sq km</td>
</tr>
<tr>
<td>Population</td>
<td>2,889,187</td>
</tr>
<tr>
<td>GDP - per capita (PPP)</td>
<td>$9,100</td>
</tr>
<tr>
<td>Human Development Index (HDI) Rank</td>
<td>#80 (2010 rank)</td>
</tr>
<tr>
<td>Labour force - by occupation</td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>17%</td>
</tr>
<tr>
<td>Industry</td>
<td>19%</td>
</tr>
<tr>
<td>Services</td>
<td>64%</td>
</tr>
<tr>
<td>Literacy Rate</td>
<td>85.9 (2008 est.)</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>12.70%</td>
</tr>
<tr>
<td>Population below poverty line</td>
<td>16.5% (2009 est.)</td>
</tr>
</tbody>
</table>

Source: CIA 2011 and HDI 2011
Est - estimate

Table 2: Results of the Augmented Dickey-Fuller test for Stationarity

<table>
<thead>
<tr>
<th>Variable</th>
<th>tau</th>
<th>Variable</th>
<th>tau</th>
</tr>
</thead>
<tbody>
<tr>
<td>QS</td>
<td>-1.1652</td>
<td>QI</td>
<td>4.8361*</td>
</tr>
<tr>
<td>PG</td>
<td>8.1254*</td>
<td>OM</td>
<td>0.8130</td>
</tr>
<tr>
<td>WIR</td>
<td>-0.5831</td>
<td>PW</td>
<td>-0.2212</td>
</tr>
<tr>
<td>WIT</td>
<td>0.4546</td>
<td>PQ</td>
<td>3.3232*</td>
</tr>
<tr>
<td>QD</td>
<td>0.2407</td>
<td>FA</td>
<td>-0.8066</td>
</tr>
<tr>
<td>PS</td>
<td>4.3935*</td>
<td>QTD</td>
<td>0.8013</td>
</tr>
<tr>
<td>YD</td>
<td>1.8518</td>
<td>POP</td>
<td>3.1250*</td>
</tr>
</tbody>
</table>

Note: Critical value: 0.05 is -1.95
* Stationary Variables

Table 3: Results of the Engle-Granger test for Cointegration

<table>
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<tr>
<th>System Residuals</th>
<th>tau</th>
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<tr>
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<td>-4.5463</td>
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<tr>
<td>Equation 2</td>
<td>-4.0535</td>
</tr>
<tr>
<td>Equation 3</td>
<td>-2.7595</td>
</tr>
<tr>
<td>Equation 4</td>
<td>-4.7729</td>
</tr>
<tr>
<td>Equation 5</td>
<td>-5.4402</td>
</tr>
<tr>
<td>Equation 6</td>
<td>-2.1148</td>
</tr>
</tbody>
</table>

Note: Critical value: 0.05 is -1.95
Table 4: Supply Equation

**Equation 1**
Dependent variable: Maize production in Jamaica ($Q_S$)
Instruments: constant $WIT_l$, $WIR_l$, $PS_l$, $QI_l$, $IFA_l$, $Q_{S_{t-1}}$, $P_{Q_{t-1}}$, $Pop_l$, $P_{G_{t-1}}$, $PW_l$

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-ratio</th>
<th>p-value</th>
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<tr>
<td>constant</td>
<td>17.9971</td>
<td>6.5079</td>
<td>2.7650</td>
<td>0.0057  ***</td>
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<td>Price of maize in Jamaica ($P_{G_{t-1}}$)</td>
<td>-0.2298</td>
<td>0.2565</td>
<td>-0.8960</td>
<td>0.3702</td>
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<td>Maize production in Jamaica ($Q_{S_{t-1}}$)</td>
<td>0.6396</td>
<td>0.1217</td>
<td>5.2570</td>
<td>0.0000 ***</td>
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<tr>
<td>Food Aid ($IFA_l$)</td>
<td>-0.0521</td>
<td>0.0265</td>
<td>-1.9650</td>
<td>0.0495 **</td>
</tr>
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<td>Rainfall ($WIR_l$)</td>
<td>-0.1219</td>
<td>0.2630</td>
<td>-0.4634</td>
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<td>Temperature ($WIT_l$)</td>
<td>-4.4241</td>
<td>2.0319</td>
<td>-2.1770</td>
<td>0.0295 **</td>
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<td>Price of yams in Jamaica ($PS_{t-1}$)</td>
<td>0.2123</td>
<td>0.2766</td>
<td>0.7676</td>
<td>0.4427</td>
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Mean dependent variable | 8.2188 |
S.D. dependent variable | 0.5273 |
Sum squared residual | 1.4421 |
S.E. of regression | 0.2311 |
R-squared | 0.8429 |
Adjusted R-squared | 0.8079 |

Table 5: Demand Equation

**Equation 2**
Dependent variable: (Imports + Local Production)/Population ($Q_D$)
Instruments: constant $WIT_l$, $WIR_l$, $PS_l$, $QI_l$, $IFA_l$, $Q_{S_{t-1}}$, $P_{Q_{t-1}}$, $Pop_l$, $P_{G_{t-1}}$, $PW_l$

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>Std. Error</th>
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<tr>
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<td>-2.4917</td>
<td>1.0916</td>
<td>-2.2820</td>
<td>0.0225 **</td>
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<td>Price of maize in Jamaica ($P_{G_l}$)</td>
<td>-0.1159</td>
<td>0.1159</td>
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<td>GDP/capita ($YD_l$)</td>
<td>0.0704</td>
<td>0.1769</td>
<td>0.3979</td>
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<td>Price of yams in Jamaica ($PS_l$)</td>
<td>0.1338</td>
<td>0.1271</td>
<td>1.0520</td>
<td>0.2927</td>
</tr>
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Mean dependent variable | 1.7970 |
S.D. dependent variable | 0.1569 |
Sum squared residual | 0.7505 |
S.E. of regression | 0.1582 |
R-squared | 0.0767 |
Adjusted R-squared | -0.0156 |
Table 6: Income Equation

<table>
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<th>Equation 3</th>
<th>Dependent variable: GDP per capita (( \text{YD} ))</th>
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<tr>
<td>Instruments: constant, ( W), ( IR), ( S), ( Q), ( FA), ( QS_{t-1} ), ( PQ_{t-1} ), ( Pop ), ( PG_{t-1} ), ( PW )</td>
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<td>Coefficient</td>
<td>Std. Error</td>
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<td>0.3675</td>
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<tr>
<td>Maize production in Jamaica (( QS ))</td>
<td>0.2331</td>
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<tr>
<td>Tourist arrivals in Jamaica (( QI ))</td>
<td>0.7594</td>
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Mean dependent variable | 7.5706 |
Sum squared residual | 1.8770 |
R-squared | 0.7110 |

Table 7: Commercial Import Equation

<table>
<thead>
<tr>
<th>Equation 4</th>
<th>Dependent variable: Imports of cereals (( QM ))</th>
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<tr>
<td>Instruments: constant, ( W), ( IR), ( S), ( Q), ( FA), ( QS_{t-1} ), ( PQ_{t-1} ), ( Pop ), ( PG_{t-1} ), ( PW )</td>
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<td>Coefficient</td>
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<tr>
<td>Maize production in Jamaica (( QS ))</td>
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<tr>
<td>US price of wheat (( PW ))</td>
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<td>Food Aid (( FA ))</td>
<td>-0.0090</td>
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<tr>
<td>Population (( Pop ))</td>
<td>1.4995</td>
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Mean dependent variable | 12.8367 |
S.D. dependent variable | 0.2129 |
Sum squared residual | 0.7678 |
R-squared | 0.4866 |

Table 8: Price Setting Equation

<table>
<thead>
<tr>
<th>Equation 5</th>
<th>Dependent variable: Price of maize in Jamaica (( P ))</th>
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<tbody>
<tr>
<td>Instruments: constant, ( W), ( IR), ( S), ( Q), ( FA), ( QS_{t-1} ), ( PQ_{t-1} ), ( Pop ), ( PG_{t-1} ), ( PW )</td>
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<td>Price of maize in Jamaica (( PG_{t-1} ))</td>
<td>0.6558</td>
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<tr>
<td>Jamaica consumer price index (( PQ_{t-1} ))</td>
<td>0.4358</td>
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<td>Food Aid (( FA ))</td>
<td>0.0296</td>
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Mean dependent variable | 8.0941 |
S.D. dependent variable | 2.2885 |
Sum squared residual | 0.9966 |
R-squared | 0.4866 |
Table 9: Market Clearing Identity

**Equation 6**
Dependent variable: Imports + Local production of cereals (QTD)
Instruments: constant, WIT\_l, WIR\_l, PS\_l, Q1\_l, FA\_l, QS\_l, PQ\_l, Pop\_l, PG\_l, PW

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-ratio</th>
<th>p-value</th>
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<td>0.0000</td>
<td>0.0000</td>
<td>-2.230</td>
<td>0.0258  **</td>
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<td>Maize production in Jamaica (QS)</td>
<td>1.0000</td>
<td>0.0000</td>
<td>6.30e+13</td>
<td>0.0000 ***</td>
</tr>
<tr>
<td>Imports of cereals (QM)</td>
<td>1.0000</td>
<td>0.0000</td>
<td>1.56e+15</td>
<td>0.0000 ***</td>
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</tbody>
</table>

<p>| | | | | |</p>
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<tbody>
<tr>
<td>Mean dependent variable</td>
<td>388021.</td>
<td>S.D. dependent variable</td>
<td>754680.9100</td>
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<tr>
<td>Sum squared residual</td>
<td>8.52e-19</td>
<td>S.E. of regression</td>
<td>1.66e-10</td>
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<td>R-squared</td>
<td>1.0000</td>
<td>Adjusted R-squared</td>
<td>1.0000</td>
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</tbody>
</table>
Does Food Aid Affect the Agricultural Sector?

Figure 1: Food Aid Breakdown by Country, 2004

- USA, 57%
- European Union, 20%
- Japan, 8%
- Republic of Korea, 3%
- Australia, 2%
- Canada, 3%
- China, 2%
- Others, 5%

Source: Mousseau, 2005

Figure 2: International Food Aid Flows Compared to the International Price of Wheat

Source: Mousseau, 2005
Figure 3: Total Food Aid Jamaica: 1970-2006

Source: FAOSTAT, 2011

Figure 4: Average Annual Temperature in Jamaica, 1970-2006

Source: CCR, 2009