HAS IMPORTED RICE CROWDED-OUT DOMESTIC RICE PRODUCTION IN GHANA? WHAT HAS BEEN THE ROLE OF POLICY?

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Abstract

Commercial rice imports have accounted for approximately 61%, food aid in rice accounted for about 2%, and domestic rice accounted for some 37% per annum of rice consumption in Ghana over the four years between 2000 and 2003. Compared to the 1990s, these figures show a gradual decline in the share of local rice production in the total quantities of rice consumed in the country. On the other hand, the proportion of food aid in rice consumed has remained relatively constant over the period, while the proportion of commercial imports has increased steadily. Using the Engel-Granger residual-based co-integration test, a market integration analysis was explored for imported rice and domestic rice which compared a central market for imported rice and five key rice producing centres in Ghana. In addition, the various policies that affected rice during the period were analysed. The results of the co-integration analysis suggest that there is no spatial market integration between the central market price of imported rice and prices in the local markets. This implies that the prices of imported rice in these local markets do not share common properties or behaviour with prevailing price trends in the central market, suggesting that markets for imported rice in Ghana are segmented, and domestic policies have generally not favoured local rice production

Keywords: Ghana, market integration Policy, Rice, Production

Introduction and Problem Statement

Over 80% of the rural populace in Ghana have their main livelihood activities centered on agriculture because it provides food and income for mainly rural communities. In 2004, Ghana produced about 25 million tons of foodstuffs. With a contribution of about 145,000 tons, domestic rice production amounted to some 0.6% of this total (SRID, 2005) Rice is arguably the most important cash crop in the communities in which it is produced, besides being an important food staple for both rural and urban communities across the country. The per capita consumption of rice in Ghana has consistently increased since the 1980s, from 12.4 kg/person/year in 1984 to an estimated 20 kg per person per year in 2005 (SRID, MOFA, 2005). Over the last ten years, it has increased by more than 35% mainly due to the rapid urbanisation and changes in food consumption patterns (GRIB, 2005), making it an important cereal staple for many households in Ghana. These increases are significant, considering that Ghana's population has increased from 12.3 million in 1984 to about 21 million in 2004, an increase of more than 70%. However, the surge in the imports of commodities, such as imported rice, poultry meat, and tomato paste, from developed and developing country markets (world markets) into the Ghanaian market (domestic market) is competing with domestically produced goods such as local rice. Meanwhile, rice production in Ghana has increased marginally or stagnated over the past ten years at about 150,000 tons of milled rice while rice imports have soared, requiring more scarce foreign exchange and prompting the Government to declare a policy to reduce rice imports by 30% between 2002 and 2005 (even though this target could not be achieved). For example, Sub-Saharan African (SSA) countries, including Ghana, are spending more than US$1.2 billion annually on rice imports, depriving the region of scarce foreign earnings that could have been used to import strategic developmental goods. Figure 1 demonstrates the case of surges in the volumes of rice imported. This phenomenon started in about 1998 and there has been a study rise or surge since then. Between 2002 and 2003, the volume of rice imports grew by 154% whilst for this same period, the volume in domestic rice production decline from 280,000 mt to 239,000 mt, representing a 15% decline in growth rate. As rice imports have surged for the period under consideration What reasons can be adduced for these import surges? Possible causes of rising import surges may be the result of 1), a decline in the import price (CIF price) and/or 2), shifts in the supply function, and/or 3), shifts in the demand function (Westlake, 2005). This

has prompted a national debate in the last few years about the rationale for spending scarce foreign exchange on rice imports while the local rice industry has been left to deteriorate. Does the policy environment have a role to play in these developments in the local rice industry? Ghana, being a member of the international community has subscribed to the rules and regulations that govern trade among the world community (both global and regional) including the World Trade Organization (WTO), African Union (AU), Economic Community of West African States (ECOWAS), etc. Therefore, Ghana is committed to fully participate in multilateral trade negotiations to secure Ghana's national interests, and to ensure that trading rules provide the best opportunities for Ghana's overall development. The trade policy objectives, as stipulated in Ghana's current trade policy thrust contained in the Ghana Trade Policy document of December 2004 indicates the pursuance of negotiations to:

- obtain reductions in tariffs and the elimination of non-tariff barriers on goods produced in Ghana;
- obtain reductions in subsidies on products which compete with Ghanaian exports; and
- help develop the agricultural and industrial sectors of the economy to compete effectively in global markets

Although Ghana is committed to creating a fair and transparent import-export regime through the appropriate use of tariffs and other taxes, non-tariff measures, and other trade incentives, it appears such policy stance of the government is impacting negatively on domestic rice production. Economic and political implications emerge from rice import surges in terms of their impacts on food security, rural livelihood, employment and the general stability of the economy. Has imported rice really crowded-out domestic rice production as a result of rice import surges? What is the proportion of imported rice in total domestic rice consumption in Ghana? What is the relationship between the markets for imported rice and domestically produced rice? And are these two markets integrated spatially? This study investigates the questions raised.

Domestic Rice Policy

The Tema and Takoradi sea ports are the main points of entry for imported rice. And as expected, consumption of rice is much higher in the urban than the rural areas. Local production of rice also occurs virtually in all parts of the country, even though concentration tends to be at some major production centres, including Nobewam (forest zone), Saaka and Golinga (northern savannah zone), and Okyereko and Ashaiman (coastal savannah zone). The current tariff of 20% on food imports is what is applied to all three commodities; and in addition a Value Added Tax (VAT) of 12.5% (effective December 1998), a National Health Insurance Scheme (NHIS) levy of 2.5% (effective 2004), an Export Development and Improvement Fund (EDIF) levy of 0.5% (effective February 2003), and a Destination Inspection Scheme (DIS) levy of 1.0% (effective February 2003) are charged. From the available data, imported rice seems to have overtaken locally produced rice in terms of market share (see figure 2). For example, the share of imported rice in total rice consumed in Ghana shows a steady rise from 1998, whilst the share of local rice also shows a steady decline over the same period. In 1998 the market share of local rice was 88%, but this has sharply declined to only 24% in 2003; implying that the market share of imported rice has steadily risen from 12% in 1998 to almost 76% in 2003 of the total rice marketed and consumed in Ghana.

Methodology

Spatial integration of the rice market in Ghana is the focus of this paper. Four main economic approaches have been identified in the literature that deals with the measurement of spatial price integration (Baulch, 1997): the Law of One Price (LOP), the Ravallion model, Cointegration, and Granger-causality. This study uses the technique of cointegration (regression analysis) based on monthly time series price data for the period January 1996 to December 2003 (108 observations) in 10 regional markets to measure the extent to which the rice prices in spatial markets are integrated or co-move. The regional markets are Cape Coast (Central region), Sekondi/Takoradi (Western region), Koforidua (Eastern region), Kumasi (Ashanti region), Sunyani (Brong Ahafo region), Ho (Volta region), Tamale (Northern region), Bolgatanga (Upper East region), and Wa (Upper West region). Accra market (Greater Accra region) is considered the central market. Co-integration analysis requires that the stationarity of the variables be examined for random walks or unit roots. The stationarity or unit root test takes the form:

$$\Delta P_t = \alpha_0 + \alpha_1 P_{t-1} + \sum_{i=1}^{k} \beta_t \Delta P_{t-i} + \varepsilon_t \qquad (1)$$

where P_t denotes the log of rice price and $\Delta P_t = P_t - P_{t-1}$. Harris (1995) suggested a testing procedure to determine the number of lags of each variable to use for the Augmented Dickey-Fuller (ADF) test (i.e., whether an additional lag increases the value of adjusted r-squared or in a linear model, it's equivalent to using the Akaike information criterion). The maximum lag-length q^{max} for the ADF test was chosen based on the following formula proposed by Schwert (1989):

$$q^{max} = \text{int}\left\{12(T/100)^{1/4}\right\} \qquad (2)$$

where T denotes the sample size. Non-stationary time series variables may possess some long run equilibrium relationships. This relationship can be modelled within the Engel-Granger cointegration framework. The first stage runs an OLS regression (i.e., cointegration regression) of the $I(1)$ price variables:

$$P_{l,t} = \gamma_1 P_{c,t} + \varepsilon_t \qquad (3)$$

where $P_{l,t}$ denotes the price variable in regional market l at time t and $P_{c,t}$ denotes the price variable in the central market (Accra) and ε_t denotes the residuals from the regression. The second stage retrieves the residuals ε_t from the first stage and tests for non-stationarity of the residuals. Thus, an ADF test, as specified in equation (4) with the residual as the dependent variable is run. Only one lag of the dependent variable was used as an explanatory variable in the model. As the cointegration regression included a constant term, this is excluded from the second stage (see for instance, Harris, 1995).

$$\Delta \hat{\varepsilon}_t = \gamma_0 + \delta \hat{\varepsilon}_{t-1} + \sum_{i=1}^{n-1} \delta_i \Delta \hat{\varepsilon}_{t-1} + \psi_t \quad \psi_t \sim IID(0, \sigma^2) \ (4)$$

The null hypothesis of no co-integration (i.e., $\delta = 0$) is tested against the alternative hypothesis of the existence of cointegration between markets. The non-rejection of the alternative hypothesis of the existence of a long run equilibrium relationship implies that the two markets involved are integrated and have meaningful long run market integration. If the alternative hypothesis of the existence of co-integration is not rejected between two times series data, then according to the Granger representation theorem, one of the prices must Granger cause the other, although price need not be simultaneously determined. Put differently, co-integration between two times series data implies price transmission from one market to the other market. It is also important to mention that the existence of cointegration (long-run equilibrium relationship between the two variables) is not a necessary and sufficient condition for market integration.

Results and Discussions

Rice importation is a highly concentrated business. The three largest rice importers, namely, CCTC, OLAM, and NABB Brothers accounted for well over 60% of imported rice since the mid 1990s, whilst the five major importers accounted for about 77% of the rice imports into Ghana. Meanwhile, the market for local rice remains disorganized and uncoordinated. In order to demonstrate that the imported rice market (using regional markets) is spatially cointegrated with the local rice market (using Accra as the central market for local rice) stationarity test was conducted as shown in Table 1. The results suggest that rice prices are non-stationary (non rejection of the null hypothesis of a unit root) but became stationery after first differencing except four of the markets. Market integration test carried out, as shown in Table 2, also indicates the non rejection of the null hypothesis of no cointegration for all the regional market prices with that of Accra market price. The only exception was the Wa market which cointegrated with the central market in Accra. This result implies that the prices if imported rice in these local regional markets do not share common properties or behaviour with the prevailing price trends in the central market. This finding clearly suggests that the markets for imported rice in Ghana are segmented, indicating that domestic policies have generally not favoured domestic rice production.

Conclusion

The study demonstrates the case of import surge in the volumes of rice imported to Ghana, based on volumes of actual imports. It is observed that as rice imports have increased for the period under consideration that of domestic rice production has stagnated or slightly declined. The main causes may be declining import price (CIF price), shifts in the supply function, and/or shifts in the demand function; and the major injury identified was loss in the market share of local rice, resulting in loss in producer revenue and therefore profits, loss in employment and source of livelihood, and a drain on Ghana's foreign reserves. A significant rise of imports was noted in the study period, from 249,289 mt in 1998 to 415,150 mt in 2003, up 67% (Import statistics for rice were highly unreliable.

Different sources showed very different levels (Ministry of Trade and Industry (MOTI) by importer, by country of origin, Customs and Excise Prevention Service (CEPS), Ministry of Food and Agriculture (MOFA), Ghana Ports and Harbour Authorities (GPHA), as well as FAO and Comtrade). The study team used the GPHA data for some of the analysis on advice of a representative of the rice importation business sector) Local production of milled rice equivalent has stagnated around 150,000 tons during the study period. Ghana imported rice from the US (27% on 1998-2003 average), Thailand (26%), Vietnam (16%), China (11%) and Japan (8 %). Rice importation is a highly concentrated business. The five major importers account for about 77% of the imports. The concentration has increased between 1998 and 2004.

Policy Implications and Recommendations

Based on the results of the study and the conclusions made, some important policy implications and recommendations emerge for the domestic rice industry. These include the fact that (a) the market in Ghana has been flooded with many different types of imported rice with a resultant negative impact on the local rice industry, which calls for appropriate Government action such as the application of higher tariff; (b) that more strategic investments are needed in the rice industry to promote local rice to enable it compete effectively. It is therefore recommended that the country develops a "*brand capital*" in rice which can then be promoted with identifiable names to constitute what is normally referred to as the "local rice". In addition, the private sector should be assisted to set up an efficient countrywide distribution system for local rice so that consumers can get easy access to local rice throughout the country; and that more investments should be made in good and effective advertising for local rice to enable it compete effectively with imported rice. Further, Ghanaian institutions are not well developed with respect to mechanisms required to manage variability of agricultural commodity prices on the international market. Hence, there should be a national focus on agricultural policies that would significantly invest in the agricultural sector to lay a solid foundation for sustained growth. In this regard, development assistance is required to intensify the production of substitute food commodities, such as having more technical and financial assistance to intensify the

production, adoption, and dissemination of selected rice varieties in Ghana.

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Table 1: Unit root (stationarity) test for rice prices (H$_0$: 1 unit root)

Price variable	ADF-test		
	In levels	I (1)	I (2)
Accra (central market)	-1.529	-0.006	-2.818
Cape Coast	-1.762	-4.112	
Sekondi/Takoradi	-1.854	-3.139	
Koforidua	-1.915	-2.589	-4.056
Tema	-1.305	-2.979	-4.960
Kumasi	-2.139	-3.730	
Obuasi	-2.818	-3.457	
Mankessim	-1.269	-4.723	
Ho	-2.379	-2.812	-4.619
Tamale	-2.006	-4.076	
Wa	-4.868	-3.917	
Techiman	-2.637	-3.248	
Sunyani	-1.497	-6.297	
Bolgatanga	-1.425	-4.373	
ADF critical values			
1%	-3.517		
5%	-2.894		
10%	-2.582		

Source: Own calculations based on MOFA data, Accra
Notes: All variables are in natural logarithm. Test: H$_0$: X~ I (1) against H$_1$: X~ I (0).
Number of lags used = 12

Table 2: Engel-Granger co-integration tests results (rice markets)

Regional markets (imported rice)	ADF test statistic (lag 12)
Cape Coast	-1.762
Sekondi/Takoradi	-1.854
Tema	-1.305
Kumasi	-2.139
Obuasi	-2.818
Mankessim	-1.269
Tamale	-2.006
Wa	**-4.868**
Techiman	-2.637
Sunyani	-1.497
Bolgatanga	-1.425
Koforidua	-1.915
Ho	-2.379
Critical values (constant, no trend)	
1%	-3.491
5%	-2.888
10%	-2.581

size is 108. Accra is the central market*Value is less than the critical value at 10% significance level, hence non rejection of null hypothesis of no cointegration
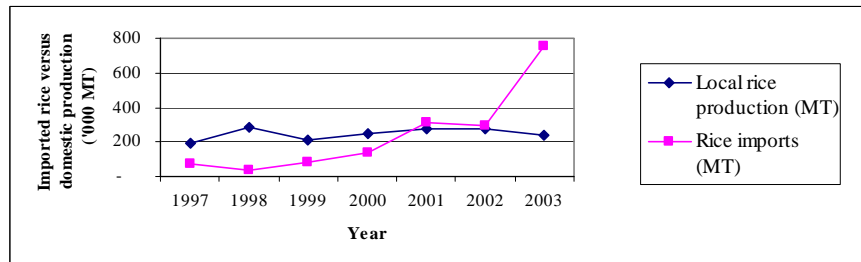
Figure 1: Rice imports and domestic rice production (mt), 1997-2003

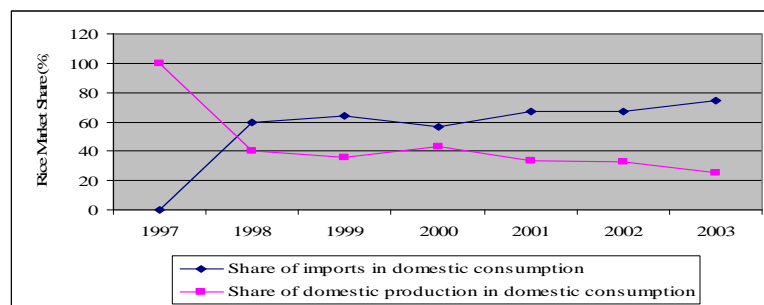Data source: Agriculture in Ghana, 2005. SRID of MoFA, Accra.

Figure 2: Market share of local and imported rice in total rice consumption, 1997-2003
Source: Ministry of Trade and Industry, and President's Special Initiative (MOTI & PSI), Accra