

THE EFFECT OF IMPORT QUANTITY PROCUREMENT PRICE AND INTAKE FROM PUBLIC DISTRIBUTION ON IMPORT PRICES OF RICE FOR FOOD SECURITY AND POVERTY ALLEVIATION IN GUINEA ECONOMIC DEVELOPMENT

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Abstract

World food crises over the past two centuries have triggered a standard debate each time: how much can the market be relied on to provide food security and how much should the government intervene on behalf of this objective? Rather asked how to deal with hunger and starvation, the question may be how to escape their threat altogether. Then, when evaluating the influence of changes in food prices on poverty, it is essential to consider food producers (who can benefit from higher prices) and consumers (who lose for when the price increases), with an effort on lowly consumers and producers. In the case of rice in Guinea, however, the influence of a price change is not complex, because much of the rice consumed is imported, while locally produced rice is used mainly for self-consumption. An increase in the price of rice will result in greater poverty in the country as a whole (though some local producers benefit from

this increase), while a reduction in price will reduce poverty. As well, since rice is an important part of food consumption, a change in its price is probable to have a large influence on the poverty.

Keywords: Import Quantity, Procurement Price, Public Distribution Import Prices of rice, Food Security, Poverty Alleviation, Economic Development, Guinea

INTRODUCTION

Such as famine and food security are opposite ends of the spectrum. The author (Fogel, 1991), reports that; It is only in modern times that all multinationalists opposed to rewarded defenders of these cartels, were able to escape chronic hunger and its constant threat. The success in stopping the escape in many a country in the developing world, particularly in Africa and South Asia, is still weak. In these countries, the judgment of the factors encouraging hunger and vulnerability to famine, and the tools available to mitigate their impact, remain important intellectual challenges (Sen, 1981; Ravallion, 1987, 1998, Dreze and Sen, 1989). As defined by the FAO, the goal of food security is to assure to all human beings, at all times, physical and economic access to adequate food. At the national level, food security is therefore a situation whereby a country is able to cover the food requirements of its population on a continuous and stable basis.

These requirements can be achieved by the combination of factors that are different between the combination of domestic production through access to food or beyond domestic production, and a combination of both. Rare, if any, countries that are able to meet their food needs through domestic production simply, therefore; the most appropriate model is an open economy that derives from the world market to meet the caloric needs of the population. As a result, a country's level of rice import for food security is dependent upon a complex interaction of domestic and global forces, and any assessment of food security at the national level must take this into account. Food price fluctuations, which will be exacerbated by price change, make Guinean food security even more tenuous. Despite; major developed countries' efforts to improve the capacity to feed every right person. In addition, food security, can only be the ability of all people to have adequate food to lead an active and healthy life, but alas the world food crisis of 2009 continues to plague its damage on many areas; this challenge of lack of tangible results for all depends on many reasons which are among other major issues of poverty, disparities in natural resources, unequal global trade agreements, and a bad government (s),

among others. In 2008, the Global Hunger Index found that West Africa is a region with some of the most severe hunger in the world.

Agricultural mechanization very advanced, to contribute positively increase food production in many parts of the world during the 21st century, due to the presence of improved seeds, chemical fertilizers and pesticides have greatly improved productivity workers and crop yields. This highly advanced industrialization system of production, combined with deeply integrated shipping and transport networks, grain storage and conservation systems have helped keep global food prices stable or declining since 1950, despite a massive increase in the world population. Wherever Technological change has not reached most West African region farmers, In that region, farms are small, primarily cultivated with hand tools, planted with seeds with low yield potential, and use little or no chemical fertilizer. Consequently, most small farms are only able to attain yields which are less than one-seventh (~14%) of those regularly achieved in industrialized systems (Taylor J et al. 2002 & Breman. H2003). In most of the region, purchasing food takes up 50% or more of most households' income Jayne T.S et al. (1995). As global demand for food doubles by 2050, the regions that are already food-insecure today are likely to be put under further pressure as the price of food rises.

Food insecurity is otherwise alluding to the number of people in need and at the same time a victim of this scourge, the total number exceeds a starving by mid-2009 (FAO, 2009) billion. Each food crisis is a renewed activity to governments and donors to consider solutions with respect to the increase in food production and glimpse how best security for poorer populations. In the same vein, market forces (Supply-Demand) also respond, stifling demand (as evidenced by a billion-people suffering from hunger) and leading investments in the high agricultural technologies that play a relentless great for lower prices grasses base over the long term.

Since 1900, the inflation adjusted price of rice has declined 1.37% per year, corn by 1.25% per year, and wheat by 1.05% per year. Wherever, higher food prices in West Africa will affect not only urban populations, but also farmers, the majority of whom are net grain purchasers.

The problem of food security remains a major concern for developing countries especially sub-Saharan countries such as Guinea, and soaring food prices are likely to have a negative impact on the poor (on the impact of the recent food price crisis, see eg Ivanic and Martin, 2007, International Monetary Fund, 2008, Wodon and Zaman, 2008 and the World Bank, 2008a and 2008b).

As noted in the Comprehensive Assessment of the Agriculture Sector prepared by Guinea's Ministry of Agriculture (2007), improving rural incomes, food production, food security,

safety nets and nutrition remains a key priority for the country. In part because rice production has fallen substantially during the period of neighbor States (Sierra Leone, Liberia and Ivory Cost) conflict, a large majority of the population today is a net buyer of food, with much of food consumption coming from rice imports. There have been numerous accounts in the press over the years related to the price of rice in the country, including on issues regarding the awarding of import licenses for rice. The issues related to rice are not new in Guinea.

This paper explores the relationship of rice imports (price of rice) for assessing food security at the national level in an effort to better understand how food imports reacts to and is affected by the integration of domestic and global markets. To achieve this objective, a conceptual model is first presented to provide a stylized framework for the supply, demand, excess demand, procurement price, government stocks and intake from public distribution system and market-based factors that affect the domestic food economy. From this point, an empirical model will be presented in order to provide a more quantitative means of assessing food security, and in particular to pinpoint specific variables that explain price of rice at the national level. Both of these models will then be used to analyze the domestic food economy and the price of rice situation in Guinea.

Since the 80s, the vacillation of prices on food specifically rice led to a strong blow on some states. But all signs point to the future rice imports are likely to continue to increase even more, with possible variations in commodity prices; rice consumers as also a major impact on the poor.

West Africa and Food Prices

Rosegrant M.W et al (2001) argue that, West Africa is a semi-arid region with a rapidly growing population and a very low gross domestic product. In contrast to South and East Asia, which have seen a reduction in the number of food-insecure people in recent years, the number of poor and food-insecure people in Africa is still rising and is likely to continue to rise because of the lack of economic and agricultural growth that can feed the increasing population. A significant portion of the world's extreme poor, who live on less than \$0.50/day, reside in the region. Many farming families have diversified their income sources, working in rural markets, livestock production, crafts, and wage labor markets Abdulai, A. et al (2001). Although this has increased cash income and to some extent has also improved the standard of living, it has also driven most farmers in the region to be net purchasers of food from the market Brycceson et al (2002). In fact, despite its agricultural orientation, the entire West African region is a net food buyer, importing even local food staples such as millet and corn FAO (2008). West African farming households experience significant internal variability in food production and prices.

Price of local food products are examined by a difference of factors, including social unrest, the macroeconomic policies of the Government, food and assistance often came from multiple sources, the regional price variations in agricultural production, and demand and other market factors. However, when weather reduces agricultural production over large areas, the resulting widespread reductions in supply cause significant increases in local food prices Brown M.E et al (2006). In addition to annual variation, prices of food staples also exhibit a distinct seasonal pattern. The two main reasons for this are a lack of storage capacity and the limited access of rural producers to export hannels. An inability to store forces farmers to sell most of their surplus in the months after harvest (September-December), and to purchase imported grain during the “hungry season” (June-August) when their own stocks are depleted. Access to international markets is a partial substitute for stockpiling, as food can be imported and exported in the same way that stocks can be drawndown or built-up. But because of costly export procedures and low total volumes potentially available for export, the sale of food on the world market is not an option for farmers. (Storage and integration with other markets is the reason prices for basic storable foods such as rice, wheat, cassava, beans, etc., show relatively little intra-annual variation in developed countries.) The simultaneous influx of grain on local markets reduces the prices that farmers receive at harvest, whereas the scarcity of food during summer translates to high prices. Thus, preharvest grain prices are significantly greater than post-harvest prices. Because Terpend, N. (2006) explain that, most poor and food insecure farmers in the region do not invest in the agricultural technology needed to boost overall yields, production remains only at subsistence levels. Many small farmers produce little more than they consume throughout the year, and many are net buyers of the crops that they produce. Farmers in Burkina Faso, for example, sell only 10-20%of the cereals produced, mainly after harvest, consuming the rest within the household or exchanging them with other needy households for goods and services, then purchasing food on the market if they run out of stocks. For the purpose of welfare analysis related to food prices, it is important to distinguish sellers and buyers. In all markets, sellers benefit from a price increase (all else equal), whereas buyers lose, and vice versa. In the context of subsistence level farming households in West Africa without access to storage, the differentiation into net sellers and net buyers is a little more complicated. On one hand are consumers who buy all of their food on the market and producers who produce much more than they consume and are able to sell grain year-round (provided they have storage facilities). The former are clearly net buyers, whereas the latter are net sellers. However, most rural households produce some grain, sell part of it, but then buy the same type of grain on the market later in the year.

Rice production and consumption in Guinea: A brief review

Guinea's agriculture can have three different production systems. First, there are large plantations which focus on export crops (fruits, groundnut oil palm oil, coffee and cocoa).

Agricultural production in Guinea follows plantations that are most private property, but also a number of smaller plantations owned operated by the Guinean Palm Products Corporation and peanut oil and Lebanese Coffee Corporation. A second component of Guinea's agriculture sector consists of privately owned commercial farms of medium size which also focus on industrial crops for export and to a lesser extent on livestock for the local market. Finally, the bulk of the population engaged in agriculture belongs to small household farms which rely on traditional production techniques that generated low yields due among others to a lack of inputs, and thereby focus on subsistence production.

In terms of consumption, rice is the main staple food, followed by cassava and other food crops. But the inability of the country to produce enough rice and other cereals to feed the population has led to massive imports and has been one of the many factors that have led to high levels of food insecurity. The FAO typically describes food insecurity as a situation under which some people lack access to enough food of good quality to meet their nutrition needs in order to be able to lead an active and healthy life.

Relationship between local and global Markets

Rapidly expanding urban markets in Guinea rely on global commodities for affordable food. Efficient global commodity markets have made rice imported from China, Malaysia, and Indonesia extremely competitive with cassava, corn, millet, and sorghum grown locally, but this is only the case for urban markets. Because there is a high cost to move grain from the interior of the country to the urban cities and ports on the coast, local rice prices in rural areas tend to be sensitive to climate variability.

When rural markets have a deficit and prices are high, grain is imported from the capital city and thus local prices are affected by global fluctuations. In this sense rural markets are integrated symmetrically into world markets: grain flows in from abroad when prices are high, but not the other way around. This makes the world price (plus transportation costs) a determinant for peak prices during the hungry season, but not for prices after harvest (unless harvest is unusually low). As evidence for such an asymmetric integration note the fact that Guinea only import but do not export grain, and the pronounced intra-annual variation of local prices. Integration into world markets benefits net buyers as it lowers peak prices, while decreasing the profits of net sellers. Because there are many more net buyers than net sellers, integration into world markets has generally improved food security in West Africa (case study

Guinea). Yet at the same time, the dependence of local prices on world prices makes local rice prices vulnerable to shocks from the world markets. For example, the increase in global economic and financial crisis in 2008 had a strong influence on the price of rice grain in the rural, informal commodity markets in Guinea, despite their relative isolation. Wherever Wodon, Q. et al (2008) argue that, the period of high global price had the immediate consequence of sharply increasing the number of hungry people while boosting the income of only a few relatively well-off farmers.

The government has been an active partner in the management of the country's food economy. Government intervention in the foodgrain market can be viewed broadly from four angles. First, there is a system of public procurement of foodgrain and support prices. Secondly, the state manages food stocks for distribution and buffer stock operations. Thirdly, there is a state guided system of delivery of cheap food through network of fair price shops (FPS) known as public distribution system. Fourthly, government intervenes in trade both internal and external viz., legal controls on hoarding and other aspects of internal trade and restrictions on external trade. Let us examine the objectives and nature of government intervention in Guinea's foodgrain sector.

In a situation of food shortages foodgrain prices rise. Since the purchasing power differs across natural regions, there is every possibility of the grain moving from surplus to deficit producing regions. High prices may prevail throughout the country, if private trade movements are not regulated. This would result in distress to the vulnerable sections of population. Public distribution of food grains to these vulnerable sections would assume prominence because during the periods of scarcity, one is not sure that market mechanism and private trade would function effectively in distributing the available supplies equally across the regions without excessive rise in prices. Thus, it is recognised that "poverty considerations" compelled Guinea to sustain publicly sponsored foodgrain procurement, storage and distribution.

Trends in Rice Prices

Foodgrain prices in general and rice prices in particular have been increasing at a rate higher than production. They exhibited a staircase type of movement remaining steady when production is rising and increasing when production shortfalls occur. This is mainly because "during years of good harvest the surpluses have gone into stock building and not been used for bringing down prices in accordance with normal market functioning" (Krishnaji, 1988). This is evident from the coefficient of variation of per capita production and availability of rice and cereals. This demonstrates that the stocks have not been used in stabilising the fluctuations in domestic production. It is generally believed that whenever there is procurement, the open

market price goes up to enable the farmer to receive the weighted price for his total sales which is not less than what he would have received in the absence of procurement.

Not only the open market prices, but also the procurement and issue prices exhibited similar patterns. Movements in procurement prices exhibited a downward rigidity in the sense that they have been either kept stable or revised upwards irrespective of production levels. Since the procurement price has been an assured support price, market price movements closely followed those of the former.

METHODOLOGY

Specification and Estimation of the Model

The price equation for agricultural commodities is determined as a reduced form of complete commodity model where demand is specified as a declining function of price and supply is an increasing function and a reduced form price equation is derived using the market clearing mechanism. In the framework of excess demand, prices are functions of excess demand via, demand-supply gap and equilibrium prices are attained when demand is equal to supply. In our model of domestic price formulation, in addition to demand and supply equations, price equation is explicitly specified in a dual market framework due to the interaction of the operations of the government and the functioning of the open market.

The model used to analyses the domestic rice price movements takes into account (1) demand equation for rice (2) the actual quantity of rice supplied to the open market (3) Price equation for rice (4) Procurement equation for rice (5) intake from public distribution system for rice (6) Change in private stocks for rice (7) Change in government stocks for rice.

Demand Equation:

On the demand side, economic theory suggests that demand for any commodity is a function of income, price of the commodity, and prices of the other related commodities. We specified an aggregate demand function, in which demand for rice is made to depend on real disposable income, relative rice price, and relative price of cassava. The demand function for rice, therefore, can be written as:

$$D_t = a_1 + a_2 Y_t + a_3 P_{rt} \dots \dots \dots (1); a_2 > 0 ; a_3 < 0$$

Where, D_t = Per capita quantity of rice demanded in the open market

Y_t = Per capita disposable income in current prices

P_{rt} = wholesale rice price index

t =time

a_1 , a_2 and a_3 are parameters.

Supply Equation:

Production is assumed to be exogenous. Quantity of rice actually supplied to the open market in period 't' is the actual quantity of rice available in the open market in period 't'. Actual quantity of rice available to the open market is:

$$S_t = Q_t - Q_{pt} - I_t + \Delta IP \dots(2) \text{ and } \Delta IP = IP_t - IP_{t-1}$$

S_t = Actual quantity of rice supplied to the open market in per capita

Q_t = Per capita net rice production

Q_{pt} = per capita quantum of rice procurement

I_t = per capita net rice imports

IP_t = Closing stocks with the private traders in per capita

IP_{t-1} = Opening stocks with the private traders in per capita

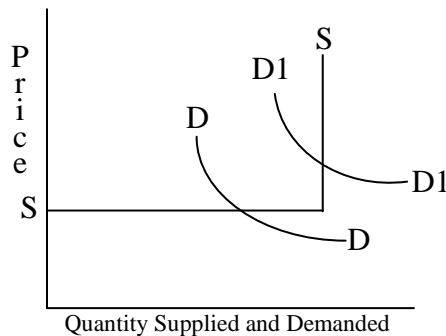
t = time

Net production ' Q_t ' is obtained after deducting and wastage a proportion of net production is taken away by the government for public distribution through compulsory procurement. Some percentage of it would meet the domestic demand and some percentage as speculative stocks of the traders. The actual quantity available to the open market in period t is thus equal to the left-out part of the current production plus stocks with the private traders.

Price equation:

Our hypothesis here is that government procurement prices set floor to the open market price and any positive deviations from this floor can be attributed to excess demand pressures in the economy.

$$P_{rt} = \beta_1 + \beta_2 X_t + \beta_3 P_{gt} \dots\dots\dots(3)$$



The above hypothesis in terms of the model is:

$$\frac{P_{rt} - P_{gt}}{P_{gt}} = \beta_1 + \beta_2 X_t$$

$$\text{if } \begin{cases} X_t < 0 \\ = 0 \text{ if } X_t > 0 \end{cases}$$

$$X_t = (S_t - D_t) \dots\dots\dots (4)$$

if $S_t - D_t = 0, P_{rt} = P_{gt}$
Hence $\beta_3 = 1$

Where,

P_{rt} = price of rice in the open market

X_t = excess demand

P_{gt} = Procurement price of rice

t = time

β_1, β_2 and β_3 are parameters;

Procurement Equation:

Quantum of procurement depends on the availability, prices and administrative regulations imposed by the government. Availability related to the marketable surplus with the farmers, a close proxy to which can be the level of output. Higher the output higher is likely to be the volume of procurement and vice versa. Since traders have to contribute some proportion of their output both to the central pool as well as to the state, government is the deciding authority to set procurement target which is generally based on the expected output. Government accepts grain from, the traders over and above this target and it depends on the trader's choice whether to sell to the government which intern based on the procurement price relative to the open market price of rice. This ratio is likely to capture the 'substitution effect on volume of procurement.

$$Q_{pt} = \gamma_1 + \gamma_2 Q_t + \gamma_3 P_{gt} + \gamma_4 P_{rt} \dots\dots\dots(5)$$

$$\gamma_2 > 0, \gamma_3 > 0, \gamma_4 < 0$$

Where,

Q_{pt} = Quantum of procurement

t = time

$\gamma_1, \gamma_2, \gamma_3$, and γ_4 are parameters

Stock Equation:

This equation is private demand for speculative stocks. It is presumed that such speculative private demand is dampened by stocks of rice with the government.

$$\Delta IP = \delta_1 + \delta_2 \Delta IG \dots\dots\dots(6)$$

Where, ΔIG is change in stocks with the government $\delta < 0$ because whenever the stocks with the government increase, the stocks with the private traders decrease with the expectation that prices are going to fall in future. This is valid only when there is excess demand or inflationary situation and may not be valid when there is excess supply and farmers are not willing to supply at low prices.

Government Stocks:

The government replenishes or depletes its stocks in order to provide stability to market prices. Change in government stocks is equal to quantum of procurement minus sales from public distribution minus net imports.

$$\Delta IG = Q_{pt} - PDS_t - I_t \dots\dots\dots(7)$$

Intake from Public Distribution System (PDS):

As discussed earlier, in order to protect the poor who, suffer the most due to price rise government distributes foodgrains a fixed quota per consumer at concessional prices through the fair price shops. How much government can sell through fair price shops depends on the difference between the issue price public distribution sales and the open market price. Higher the issue price in relation to open market price higher would be the intake. From PDS is made to depend on disposable income, issue price and open market price.

$$PDS_t = \varepsilon_1 + \varepsilon_2 P_{st} + \varepsilon_3 P_{gt} + \varepsilon_4 Y_t \dots\dots\dots(8)$$

Where, PDS, and Pst, are quantum of intake from public distribution system and issue price of rice respectively.

$$\varepsilon_2 < 0, \quad \varepsilon_3 > 0, \quad \varepsilon_4 > 0$$

Substituting equations (1), (2), (4), (5), (6), (7) and (8) in equation (3) we obtain a reduced form price equation as:

$$P_{rt} = \lambda_1 + \lambda_2 Q_t + \lambda_3 P_{gt} + \lambda_4 P_{st} + \lambda_5 I_t + \lambda_6 Y_t$$

$$\lambda_2 < 0, \quad \lambda_3 > 0, \quad \lambda_4 > 0, \quad \lambda_5 > 0, \quad \lambda_6 > 0$$

As shown below by Faostat database (2008), are data for per capita Guinean net rice imports(I), imports value (Pr), Per capita net rice production (Q) and Per capita disposable income(Y), procurement price of rice(Pg) and Intake from public distribution system (Ps) in current prices on time t.

Table 1: Imports value of rice and factors from 1991 – 2007

Years	Imports ¹ Value100\$	Net imports Quantity(Tonnes)	Production (Tonnes)	Income (\$)	Procurement ² price of rice	Intake from public ³ distribution system
Variables	Pr	I	Q	Y	Pg	Ps
1991	3838.50	1821.58	772.77	220.20	57.27	464.28
1992	4127.30	2464.93	806.95	188.47	64.61	388.03
1993	4346.50	2136.32	842.64	151.76	72.59	418.63
1994	6703.20	2786.79	879.91	195.57	76.01	511.96
1995	8047.40	2918.62	918.83	245.11	82.06	504.33
1996	5109.50	2143.97	959.46	253.98	83.25	597.60
1997	4646.70	1967.49	1001.90	212.62	82.84	547.78
1998	3864.30	1599.56	1046.22	203.99	91.21	485.11
1999	4077.40	2097.80	1092.49	346.20	96.17	432.46
2000	2870.70	1726.61	1140.81	405.49	100.00	357.78
2001	3304.40	2526.22	1033.52	281.97	100 ^{4*}	320.41
2002	4305.70	3321.24	1088.67	389.37	114.40	316.33
2003	4459.80	3073.77	1146.76	423.18	138.84	323.95
2004	2595.70	980.13	1207.96	147.17	168.29	486.09
2005	4320.70	1594.36	1272.42	138.25	230.57	457.53
2006	5023.70	1955.75	1340.31	134.05	328.61	422.19
2007	9539.00	3303.99	1401.59	156.85	422.24	588.02

¹ The data for Import value, Net imports quantity, Net rice Production, producer price which is Income of the farmers are sourced from FAO Estimated data using trading partners database www.faostat.fao.org.

² The data for Procurement price (consumer prices) and intake from public distribution (Retail price of rice) is source from International Labor Organization Geneva Laborsta Labor statistics database: www.laborsta.ilo.org copyright International Labor organization 1998-2010 selection years: 1991-2007.

³ The Intake from public distribution system value data (Retail price of rice) for 1991 was used for 1992 to 1995 and the 1997 Intake from public distribution system value was used for 1998 and 1999 because there was no available data for 1992 to 1995 and 1998 to 1999. And with the official exchange rate we convert all the values on USD/Tonne. Exchange rate sourced: 1961-2000: IMF, 2005. International financial statistics: database and browser May 2005. Washington DC USA. 2001- 2008: CIA Fact book

^{4*}: Procurement price of rice for 2000 wich is 100\$ was used for 2001 because there was no data for the year 2001.

Table 2: Estimated variables on percent (%)

Variables	Imports	Net imports	Production	Income	Procurement	Intake from public
	Value 100\$	Quantity (Tonnes)	(Tonnes)	(\$)	price of rice	distribution system
ESTIMATED VARIABLE (%)						
Years	P	I	Q	Y	Pg	Ps
1991	38.4	18.2	7.7	2.2	0.57	4.64
1992	41.3	24.6	8.1	1.9	0.65	3.88
1993	43.5	21.4	8.4	1.5	0.73	4.19
1994	67.0	27.9	8.8	2.0	0.76	5.12
1995	80.5	29.2	9.2	2.5	0.82	5.04
1996	51.1	21.4	9.6	2.5	0.83	5.98
1997	46.5	19.7	10.0	2.1	0.83	5.48
1998	38.6	16.0	10.5	2.0	0.91	4.85
1999	40.8	21.0	10.9	3.5	0.96	4.32
2000	28.7	17.3	11.4	4.1	1.00	3.58
2001	33.0	25.3	10.3	2.8	1.00	3.20
2002	43.1	33.2	10.9	3.9	1.14	3.16
2003	44.6	30.7	11.5	4.2	1.39	3.24
2004	26.0	9.8	12.1	1.5	1.68	4.86
2005	43.2	15.9	12.7	1.4	2.31	4.58
2006	50.2	19.6	13.4	1.3	3.29	4.22
2007	95.4	33.0	14.0	1.6	4.22	5.88

Table 3: Estimates of reduced form rice price Equation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-38.69735	28.77008	-1.345055	0.2057
I	1.940688	0.413642	4.691708	0.0007
Q	-0.961244	3.096910	-0.310388	0.7621
Y	-1.645414	3.639654	-0.452080	0.6600
PG	5.349685	6.309375	0.847895	0.4146
PS	11.02891	2.290251	4.815591	0.0005
R-squared	0.903797	Mean dependent var		47.75882
Adjusted R-squared	0.860068	S.D. dependent var		17.88386
S.E. of regression	6.689905	Akaike info criterion		6.909641
Sum squared resid	492.3031	Schwarz criterion		7.203716
Log likelihood	-52.73195	F-statistic		20.66824
Durbin-Watson stat	2.099685	Prob(F-statistic)		0.000030

RESULTS AND CONCLUSION

Estimation is carried out for the period 1991 to 2007 using ordinary least squares estimation; the data are obtained from FAO web site www.faostat.fao.org, International Labour Organization Geneva Laborsta Labor statistics database www.laborsta.ilo.org and International financial statistics.

From the regression analysis results, the coefficient of determination R^2 shows that the explanatory variables per capita Guinean Net rice imports (I), Per capita net rice production (Q), Per capita disposable income(Y), Procurement price of rice (Pg) and Intake from public distribution system (Ps), explained 90.4 % of the total variables in P which is Import Price The implication is that the variables in the equation are useful for explaining the Import price between 1991 to 2007 in Guinea. R^2 value of 0,904 indicates a good fit for the model. The F-statistic value is found to be 20.67. Thus, the F- statistic is significant at the 5% level. The Durbin Watson (D.W) statistic of 2.0997 indicates that there is no problem of serial correlation in the regression model. The Constant C value of -38.697 implies that if all the explanatory variables are held constant the dependent variable P which is the Import price will decrease by

38. 697. The Import Price of rice is positively related to Net rice imports (I). This implies that at higher quantity rice imports (I), import price will increase by 1.940688.

The Net rice production (Q) value – 0.961244, implies that if all the explanatory variables are held constant the dependent variable P which is the Import price will decrease by 0.961244. Per capita disposable income (Y), value -1.645414, implies that if all the explanatory variables are held constant the dependent variable P which is the Import price will decrease by 1.645414. The Import Price of rice is positively related both to the Procurement price (Pg) and Intake from public distribution system (Ps). This implies that at higher Procurement price and intake from public distribution system, Import price will increase respectively by 5.349685 and 11.02891. Results on import price of rice equation demonstrate that except Net rice production (Q) and disposable income (Y), all other coefficients are found to be significant and have the expected signs. Furthermore, import price are found to have significant impact on the quantity of rice import though the elasticity turned up, that might be because Guinea is one of a vulnerable country in West Africa, where the production, harvest and yield are low fertilizer (N, P, K) use is limited. Finally, the above interpretation shows that, in Guinea, rice is the main food of consumption, that mean rice imports became very important and the solution for effective food security and poverty alleviation on the perfect economic development.

RECOMMENDATIONS ON FUTURE RESEARCH

Based on the conclusions above, this study suggests further research structured around the following areas: Further research is needed to help formulate appropriate policies to ensure sustainable urban food security and to build resilience against future shocks. In particular, more knowledge is needed about the nature of employment and labor markets in urban areas of developing countries, so that policies can help foster economic security. Comprehensive and systematic studies are needed on the value of urban agriculture, and so far, knowledge is limited on how to scale up successes in this field. In addition, rural-urban links remain poorly understood; in particular, additional studies are needed on how the food price crisis affected migration patterns between towns and the countryside, and what the impacts of the current recession are on those same patterns. Finally, further studies are needed on when higher urban food prices are likely to spark a violent reaction, and who is likely to participate in protests and violence. Such studies would help policymakers understand how best to design policies and programmers to reduce the likelihood of political instability resulting from volatile prices.

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