

ANALYSIS OF IMPACT A CHANGE IN THE PRICE OF RICE ON POVERTY LINE IN URBAN AND RURAL AREAS OF GUINEA

Diallo Mamadou Saliou Kokouma 

College of Economic and Management, Anhui Agricultural University, Hefei, China

salitadiallo@yahoo.ca

Luan Jingdong

College of Economic and Management, Anhui Agricultural University, Hefei, China

Diallo Hawaou

College of Hydrology and Water Resources, Hohai University, Nanjing, China

Abstract

The increase in the international price of rice had significant negative effects on the poor in countries such as Guinea, which is a major importer of rice and rice represents a large share of food consumption. However, it is important to note that, in appreciation of the effect of increase in food prices on poverty, it is the producers who are gaining and poor consumers' suffering. In the case of rice in Guinea, however, the impact of a price change is not ambiguous because a large part of the rice consumed is imported, while local production is mainly used for home consumption. This soaring price certainly will not only result in poverty in the country as a whole, but also a renewed benefit for some local producers, so that a price reduction will alleviate poverty. This paper explains the importance of change in price of rice on the poverty line and shows the importance of explicitly considering marketing margins in analysis of the impact of price changes on the welfare of different segments of the population. Admittedly, a lack of conventional assumptions in appropriate marketing analysis that considers improvements equally respects hiking food costs. Furthermore; the bias is not necessarily consistent across income quintiles, so the lack of specificity examines differences in marketing would lead to the conclusion that the poor are affected more than the rich by raising prices while the opposite is correct. We provide rules of thumb that may help to ascertain, in many circumstances, the

percentage change in consumer prices that is appropriate for a given percentage change in farm prices and in consumer prices that lead to improved consumer expenditures as a function of production value, and import value.

Keywords: Price changes, Poverty line, Consumer expenditure, Marketing margin, Guinea

INTRODUCTION

The price of rice prices internationally has experienced a dramatic increase from the month of December 2006, causing serious supply problems for the markets of developing countries such as Guinea and promotes the lack of access for rice populations at the base; most of who are already experiencing food insecurity.

As shown (World Bank 2008a), the world prices for staple foods have increased since 2006, with particularity dramatic increases in cereal prices during 2007-08. World rice prices nearly tripled in the four months from January to April 2008, rising to more than \$900 per ton. Wheat prices more than doubled between March 2007 and March 2008, rising from \$ 200 to \$400 per ton. Maize prices increased from \$150 per ton to nearly \$ 300 per ton between July 2007 and June 2008. Prices of oilseeds also increased rapidly over this period. The spiraling prices, has had a significant impact on consumers in developing countries, with an estimated 100 million people pushed into poverty (Ivanic and Martin 2008), to an even greater impact on the 1.4 billion people already living on less than \$ 1 a day before the food price shock (Top et al. 2008).

The increase in food prices globally is attributable to several factors, most obviously the diversion of grains and oilseeds for biofuel production, plummeting U.S. dollar, increasing the cost of production for energy and fertilizer, higher prices and adverse policy responses to the initial shock, have pushed prices even higher (Mitchell 2008). Although the reduction in prices were at the vertices in the first half of 2008, however, they significantly rose above their levels in early 2006, and are expected to rise more than 50% (in terms of U.S. dollars) 2003 levels (World Bank 2008a).

In this situation, middle-and middle-income incentive to understand how food can increase its effects on citizens, especially the poor? Such as Guinea, which is no exception, and this rise in food prices could lead to a lowering sectoral, and see a mutation-significant progress instituted by Guinea for the reduction of poverty in the last 15-20 years. In addition, the impacts in Guinea are likely to be distributed very unevenly. Overall, the repercussions spread to more areas where prices are rising and people are sourcing more food for consumption in urban

markets. With rural households that are essential artisans of their food needs are protected against food price shocks. Also households whose food prices have not changed hands. In addition, households in rural areas that generate surplus which may optionally be profitable for the elevation of crop prices is generally offset by higher production costs. In rural areas, 63% of households are net sellers of at least one staple food, but 87% are also net buyers of at least one staple food such as rice in Guinea's households. Most often, the barges generals of basic foodstuffs avoid liquidating the same commodity in the moment of harvest to not buy at a high price on the market later this year. Net purchases are financed by household income from other sources, including sale of other agricultural products (including cash crops such as banana, cocoa, coffee and peanut...), non-farm enterprises, wage income, and remittances. The most rural farm households are net food buyers.

As known that with the recent changes in the global economy 2006-2008, especially the skyrocketing of food prices of petrol coupled with the international financial crisis, constitute a major preoccupation for the government of Guinea which has had to cope with a reduction in the availability of rice on world markets, an increase in world rice prices (which stood at US\$ 600 per metric ton in March 2008) and the continuous rise in the price of a barrel of crude oil which rose from US\$ 36 to US\$ 140 between 2006 and 2008. This trend could intensify if the US dollar continues to weaken in relation to currencies in the major exporting countries. It is within this context that Guinea has implemented several initiatives to improve production and productivity of rice, the staple food for the local population, with the aim of limiting dependence on imports. Accordingly, rice production rose significantly from 772,765 tons in 1991 to 1.534,088 tons in 2008 (FAO 2010). This was possible due to the increase in the surface area shown, capacity building, etc... And incentive prices for production and for marketing.

It is noteworthy that the contribution of the rice sector to gross domestic product (GDP) is continually improving, reaching 5.2% in 2000 and expected to reach 6.2% by 2018. This represents GNF 320.3 billion in value terms in 2000 and GNF 487.7 billion in 2008. The CIF (cost, insurance and freight) value of imported rice was 5.4% of all imports in 2000 and 11.3% in 2008.

This paper explains the importance of change in price on the poverty line and shows the importance of explicitly considering marketing margins in analyses of the impact of price changes on the welfare of different segments of the population. Admittedly, a lack of conventional assumptions in appropriate marketing analysis that considers improvements equally respects hiking food costs. Furthermore; the bias is not necessarily consistent across income quintiles, so the lack of specificity examines differences in marketing that would lead to

the conclusion that the poor are affected more than the rich by raising prices, while the opposite is correct.

We provide rules of thumb that may help to ascertain, in many circumstances, the percentage change in consumer prices that is appropriate for a given percentage change in farm prices that lead to improve consumer expenditures is a function of production value and import value.

IMPACT ON FARMING

The increase in food prices could increase the savings of farmers if the world price is reflected in the local markets. However, the transmission may be reduced by policies on the domestic prices and transportation costs or marketing margin. The increase in transport costs pushed up prices of import parity; also it has much lower prices of export parity. In general, the experience always proves that farmers may lack the credit and inputs needed in the short term. However, they can benefit in the medium and long term, as in the Guinean green revolution and in many African countries in the recent past.

The vulnerability of the inhabitants of a large metropolis and those campaigns that essentially depend on their income the market to buy food, which represent the bulk of their expense. However, most policy development, programs is focused on the improvement of living conditions of the people at the grassroots. In addition to a structured social protection, statements under auspices policies, governments, NGOs have been made for increasing the investment in smallholder agriculture; give more attention to macroeconomic measures, commercial trade, and extension or reconstruction of national and regional food stocks. With sustenance by major maker's strategy in these three sectors, it contributes to greater food security in urban and rural areas, according to analysts and scientific reports, with more effort in this area has a potential impact on preventing hunger around the world, particularly in Guinea. However, as a result of the effect of this hard ordeal, some mothers abandon their own consumption, for the benefit of children at home. And the most important is to see if some households borrow money or food for the family need. In this case, how can the family pay their rent or the costs of raising children?

IMPACT ON THE POOR

Rising food prices affect the poor more severely than producers and consumers, due to its impact on their economies since; the big concern becomes the effect of food consumption. While the neediest in general live in rural areas, not all farmers, and even some farmers buy

staples. The poor generally spend large portions of their budgets on food. So the higher prices make them more likely to reduce their food consumption.

However, this does not mean a decrease in caloric intake, households can augment their expense, but spend less on foods rich in protein and vitamins, such as meat, fish, dairy products, fruits and vegetables, reducing the quality of their cut down. IMF (International Monetary Fund 2008) explains the short-term impacts are alarming: incomes fall by more than 25% and food consumption by almost 20%. Medium-term prospects remain bleak, with incomes and food consumption down by 11% and 8% respectively.

In low-income neighborhoods, people frequently live in crowded conditions, with poor-quality housing, poor or non-existent garbage collection, unsafe drinking water and non-functional or nonexistent sewage systems. In the urban areas of low-and middle-income countries, between 25 and 50 per cent of the population lack access to clean drinking water and safe sanitation (UNESCO, 2006). Urban poor people often do not have physical access to health care, and even when they do, they may not be able to afford it (USAID, 2004).

Food security, regardless of their location depends first on having food available in the markets. The ability of families to be in possession depends on their income, as well as rising food costs. As they can also buy food through their own production or purchase by neighbors or government or NGO programs Figure 1 also shows that *individual* food security depends on the distribution of food within the household. Sufficient food may exist on a per capita basis at the household level, but some individuals, such as boys or those who work outside the home, may get preference in allocations.

POVERTY LINES

The poverty lines are based on the cost of basic needs method. First, the food poverty lines were estimated to assess the cost of the food basket providing 2,397 kcal per day per adult equivalent. The poverty lines were estimated separately for urban and rural areas. These caloric equivalents indicate the caloric value of 100 grams or 100 milliliters of a product which are in part comestible. We defined a basket of food goods consumed on a regular basis (including food auto-consumption) for the entire country (see table 1) by the population with consumption between the second and ninth deciles.

The eventual expenditures extend the 28 most consumed food in Guinea. These products represent 87% of total household expenditure on food in the country. After having defined the range of food products, we determine the quantities of each product consumed per day in standard units (mainly kg or liters) per adult equivalent. The consumption of each product is then converted into calories based Guinea conversion tables.

Table 1. Basic needs food consumption in Guinea basket scale 2007

N	Basic food consumption	Initial consumption		Adjusted consumption		Conversion Coefficient
		Quantit y (g)	Kilocalories	Quantit y (g)	Kilocalories	
1	Rice	191	694	224	813	363
2	Local rice	136	492	159	570	363
3	Maize/corn	6	21	7	25	359
4	Cassava flour (fufu, Gari)	16	53	18	62	342
5	Garri	5	17	6	19	342
6	Bread	5	13	6	15	249
7	Chicken	8	10	9	12	139
8	Game and insects (porcupine)	1	4	2	4	267
9	Fresh or frozen fish	36	23	43	27	64
10	Smoked fish (dried or salted)	3	13	4	15	374
11	Fresh milk	1	1	2	1	79
12	Eggs	1	1	1	2	140
13	Palm oil	27	217	32	254	798
14	Banana, plantain	23	31	27	36	135
15	Coconuts	7	26	8	30	388
16	Palm nut	44	177	52	208	400
17	Cassava leaves	21	19	25	23	91
18	Bitter balls	14	5	17	5	32
19	Okra	3	1	3	1	36
20	Green pepper	7	3	8	3	36
21	Hot or sweet pepper (fresh or dry)	1	0	1	0	53
22	Onions	5	2	6	2	41
23	Dried beans	4	14	5	16	336
24	Cassava roots	99	148	116	173	149
25	Sugar	4	17	5	20	400
26	Bouillon cubes	3	9	3	10	331
27	Salt	11	56	13	43	337
28	Soft/carbonated drinks	2	1	3	1	42
Total		684	2,047	805	2,397	6,686

Source: Ministère du plan de la Guinée 2007

The amounts actually consumed for all products are adjusted in order to yield exactly a total of 2,397 calls per equivalent adult per day. We then estimate the total cost of purchasing the resulting food basket. A daily food poverty line is then estimated in urban and rural areas as follows with a normative caloric threshold of 2,400 kcal.

$$Z_F^{U,R} = 2397 * \frac{\sum_{i=1}^n (Q_i * P_i^{U,R})}{\sum_{i=1}^n (Q_i * C_i)} \quad (1)$$

Where, Q_i is the average daily quantity of product I consumed in the country, C_i the caloric value (for 100g or 100ml) corresponding to the product I consumed, and $P_i^{u, are}$ being the average price of the product I in urban and rural areas.

CONSUMPTION PATTERNS

A nutritional transition has accompanied urbanization and economic development (Popken, 1994). The changes in food and price changes greatly affect the health of urban poor long-term habits. Higher incomes have permitted the purchase of processed foods with higher added values, including dairy and meat. The concentration of population has allowed for efficiencies in marketing and an ability to cover fixed costs when providing a variety of goods. And employment outside the home, which increases the opportunity cost of time, has increased demand for foods that are ready to eat or easily prepared. For example, with urban residence, consumers shift from sorghum, millet, maize and root crops to rice and wheat (often processed into bread). Rice and wheat, along with maize, tend to be internationally traded food items (as opposed to roots and tubers such as cassava mixed with plantains or sweet potatoes that have relatively little trade as shown in the production). The table1 shows us guinea food and agricultural commodity production during 2008 and explain that rice represent the main staple food.

Table 2. Guinea food and agricultural commodity production during 2008

Rang	Commodity	Production (Int \$1000)	Flag	Production (MT)	Flag
1	Rice, paddy	318313	* ¹	1534088	[] ²
2	Groundnuts, with shell	147346	*	315107	
3	Indigenous Cattle Meat	104909	*	50723	Fc ³
4	Plantains	96709	*	436000	F ⁴
5	Cassava	80863	*	1122171	
6	Citrus fruit, NEs	78305	*	218000	F
7	Maize, green	56085	*	285000	F
8	Vegetables, fresh news	42784	*	228000	F

9	Mangoes,mangosteens, guavas	40419	*	166000	F
10	Maize	32475	*	952170	
11	Cow milk, whole, fresh	28189	*	106000	F
12	Bananas	23086	*	162000	F
13	Pineapples	21079	*	109000	F
14	Cotton lint	20782	*	14000	*
15	Sweet potatoes	20560	*	204598	
16	Hen eggs, in shell	18850	*	22155	Fc
17	Pulses, NEs	15730	*	62500	F
18	Palm oil	15138	*	50000	*
19	Coffee, green	14716	*	18000	*
20	Indigenous Goat Meat	12884	*	8462	Fc

¹*:Unofficial figure

² []: Official data

³ F: FAO estimate

⁴ Fc: Calculated data

Source: FAO statistic database 2010 <http://faostat.fao.org/site/339/default.aspx>

ANALYSIS OF THE RICE PRICE INCREASES

Household Income and Expenditure Survey (HIES) are used for assessing the impacts of price changes on the poor (see the studies listed in the references, among others). For example, the most often used for the determination of the production and consumption status of the various segments of the population base, is disaggregated by income quintile, location, gender, ethnicity or other characteristics.

In the logic of using these data on the net consumption / production status that allows to assess the impact of the effects of welfare due to an exogenous shock data, it is normal even obligatory to decide on price changes which are about farmers and consumers, as can be seen in the basic formula for determining changes in well-being (Minot Goletti 2000):

$$\frac{\Delta y}{x_0} = \frac{(P_F^1 - P_F^0)}{P_F^0} PR - \frac{(P_C^1 - P_C^0)}{P_C^0} CR \quad (2)$$

Where, x_0 is initial income, w is the net welfare effect of the price change, PF and PC represent farm and consumer prices respectively (with superscripts 0 and 1 indicating initial and final price) and PR and CR represent production and consumption ratios for the specific commodity in question, as defined as the value of production or consumption divided by total income.

This formula only considers the immediate impact of the price change, such as consumers shifting from rice to corn, or from higher quality rice to lower quality rice, when rice

prices increase. Such responses will reduce the welfare impact of any price change, and the new welfare impact can be estimated by using demand and supply elasticity. See Minot and Goletti (2000) for more details.

The reason for this range is applied to predict a change in the same proportion for both actors: farmers and consumers. If the transfer price is set as a long-lasting price trends in nominal terms, it is a natural assumption. For example, changes in prices, marketing margins and consumer costs are mainly due to the policy of printing money and inflation of its value, which seriously affect the same proportion of increase. However, if improving the cost allocated is considered as a short-term change in real prices (ie rice prices up more than other prices), and by the same percentage change between farmers and consumer; this amounts to implicit assumptions which may bias the results of the impact analysis. This point is very important, for the simple reason that the cost of staples were bound to the upheaval in the short term from actual costs, not to alterations in long-term nominal price.

The significance of marketing margins

For sake of illustration, assume that initial domestic, farm and consumer prices are $P^0_F=10$ and $P^0_C=20$ (in units of local currency per unit weight). Assume now that the cost, insurance and freight (CIF) border price increases by an amount that raises domestic consumer prices by 20%, so that $P^1_C=24$ (note that this is not the same as stating that the cost, insurance and freight (CIF) border price increased by 20%). If we assume that P^0_F also increases by 20%, then $P^1_F=12$. This implies that the real marketing margin has also increased by 20%, from 10 to 12. Other than for a system of market competitive (under perfect competition, marketing margins are equal to marketing costs when returns to management are included in costs) prices should not increase by 20% for a simple reason of a change in the price of rice on the international market. (it is true that higher farm prices increase working capital costs for traders, but working capital costs are only one portion of marketing costs. Thus, increased real farm prices do raise real marketing margins, but not by an identical percentage). Consequently, the change in prices between farmers and consumers implicitly admit that marketing margins also increase by the same percentage proportion.

If instead we assume that real marketing costs and margins remain unchanged in the face of the world rice price shock (we will call this case 1), then $P^1_C=24$ would imply that P^1_F . In this case, a 20% increase in consumer prices is consistent with a 40% increase in farm prices. This does not mean that farmers benefit more than consumers are hurt: in absolute terms, the prices increases by 4 units for both. The greater percentage increase at the farm level is simply a reflection of the fact that the base on which the percentage change is calculated for farmers is

lower. Rice processing at the farm and retail marketing costs by positive are due to the fact that real resources are necessary to the transformation.

However, it is possible that absolute marketing margins in real terms are not constantly in the face of an external rice price shock. For example, traders may employ rules of thumb in setting prices that lead to equal percentage changes in both farm and consumer prices. In this case (we will call this case 2), $P_{F=12}^{12}$ instead of $P_{F=14}^{11}$ (where the superscript 12 indicates time period 1, Case 2, while the superscript 11 indicates time period 1 and Case 1). This be a sign of a rule used by operators which leads to an increase in real trade margins without increasing the actual cost of marketing. Such a case is in fact eligible, but if this case should be used to analyze the impact on households, the additional income earned by traders should be added to the income of some households in the economy. (This assumes that trading is done by domestic residents, which is likely to be the case in most developing countries). This is because an equally-proportionate increase in farm and retail prices benefits traders as traders, but the standard impact analysis looks at welfare only from the point of view of individual agents (including traders) as producers and consumers.

In other hand, the increase in trading income due to the assumptions made on equal percentage increases in farm and retail prices; has not adopted the attention that producers and consumers. The distribution of that income among quintiles is not an easy task often remains a scientific rule but may be somewhat arbitrary because of lack of data.

While traders in general are usually healthier than farmers, it is less clear how wealthy, they are relative to other segments in so society. Surely, some large traders are very wealthy, but there are also small traders who are not particularly wealthy.

In order to avoid this issue of how to properly allocate trading profits across Quintiles, we use case 1 in our case study of Guinea below and contrast it to case 2 where no additional income is allocated to traders. A scenario of (case 2) without allocation of additional income for traders is consistent with how changing rice prices are analyzed in the literature (Barrett and Doris, 1996; Budd, 1993; Deaton, 1989; Ivanic and Martin, 2006; Minot and Goletti, 2000). To a large extent, the change in relative prices between farmers and consumers could be caught in an impact assessment. Normally, dependent assumptions empirical data relative to the prices of the different levels of the marketing chain which vary in different geographical areas, but these data are scarce. Even when such data are available, there is still the problem of controlling the influence of other exogenous factors (such as changes in oil prices, interest rates) that took place at the same time as the price of rice increased.

Furthermore, if one wants to examine the impact of a shock to world rice prices only (e.g. excluding the impact of rising fuel prices that might rise, real marketing margins), then marketing

margins should be assumed constant. If one argues that all shocks to world food prices will be accompanied by changes in real domestic marketing margins without any change in domestic real marketing costs (i.e. constant absolute marketing margins is a bad assumption), then the additional real returns to traders must be incorporated into the impact analysis. Our assumption of a constant marketing margin is identical to that employed by Minot and Goletti (1998), who examined the impacts of rice price changes in Vietnam.

Their study is one of the few to analyze the welfare impacts of changing prices with explicit attention to the marketing sector (they use a spatial equilibrium model), thus allowing them to model different percentage price changes for farmers and consumers. In line with the reasoning above, the price changes used in their analysis were larger for farmers than for consumers. We do not use a spatial equilibrium model here, but instead generate a simple rule for deciding upon different percentage changes in prices for farmers and consumers that can be used in analyses less sophisticated than Minot and Goletti (1998). Using Guinea Conakry's data, we then also compare the results of (i) assuming constant absolute marketing margins (Case1) with (ii) assuming equi-proportionate price increases without allocating additional income to traders (Case 2).

Deriving a simple relationship between producer and consumer price changes

If the change in the proportion is equivalent to the firm and the consumer price supports a hypothesis about the actual profit margins and appropriate use of percentage changes in the farm and the relationship of the price to the consumer? The general derivation for case 1 is quite simple:

First, consumer prices P_C is equal to farm prices P_F plus a marketing margin M :

$$P_C = P_F + M \quad (3)$$

Note that prices should be expressed in comparable units, e.g. if farm prices are in currency per kg paddy and consumer prices are in currency per kg rice, and then the milling ratio (kg rice per kg paddy) must be used to ensure equivalent units. When taking differences this yields:

$$dP_C = dP_F + M \quad (4)$$

The assumption of constant M gives:

$$dP_C = dP_F \quad (5)$$

We then divide both sides by P_F and multiply the right hand side by

P_C/P_C :

$$\frac{dP_F}{P_F} = \frac{dP_C}{P_F} * \frac{P_C}{P_C} \quad (6)$$

The above can be re-written as:

$$\frac{dP_F}{P_F} = \frac{dP_C}{P_C} * \frac{P_C}{P_F} \quad (7)$$

This indicates that the percentage change in farm price is equivalent to the percentage change in the consumer price multiplied by the ratio of the consumer price of exploitation.

Data sources to obtain the price ratio

There are several sources of data that could be used to obtain the farm to consumer price ratio in (3) for the rice. One possibility is the HIES itself, provided it has data on either prices or quantities (data on expenditures and quantities can be used to calculate an implicit price). Another possibility is secondary data on prices, although one must be careful that such data are nationally representative and pertain to the same quality at the farm and retail levels. Since secondary data on farm prices were not available, and the HIES does not have data for either prices or quantities, macro food balance sheet data (production, imports, Domestic supply, Food, Food supply quantity, Food supply, Protein supply quantity, Fat supply quantity) coupled with expenditure and revenue data from the FAOSTAT was used to obtain an estimate of relative farm and consumer prices, as shown below. In a self-sufficient economy, consumer expenditures CE on the staple food will equal production value PV plus marketing costs.

$$MC: CE = P + MC \quad (8)$$

$$\text{Which is equivalent to: } P_C Q_C = P_F Q_F + MC$$

Where,

QF and QC represent the quantity of production and consumption respectively, which are equal under self-sufficiency.

Divide through by (PF•QF) to obtain:

$$\frac{P_C Q_C}{P_F P_F} = 1 + \frac{MC}{P_F Q_F} \quad (9)$$

Using $Q_C = Q_P$ (the units must be identified, e.g. kg of paddy converted to kg rice or vice-versa):

$$(10)$$

Using $P_F * Q_F = P$ and MC on the right hand side in the case of self-insufficient country such as Guinea Conakry where most of the households, rice or food in general are imported from the neighborhood or Asian countries (China, Thailand, India, Indonesia etc.) and using the data from food balance sheet gives the equations:

$$CE = P + I + D_s + F + F_{SQ} + F_{SKd} + P_{sq} + Fat_s + MC \quad (11)$$

Where:

CE	P	I	D _s	F	F _{SQ}	F _{skd}	P _{sq}	Fat _s	MC
Consumer Expenditures	Production 100tonnes	Import Quantity	Domestic supply	Food 100tonnes	Food supply quantity (kg/capital/day)	Food supply (kcal/capital/day)	Protein supply quantity(g/capital/ day)	Fat supply quantity (g/capital/day)	Marketing Costs

When it is rice or food increase, farmers spend and buy in market at the same price all items of food they need them and using the assumption of constant marketing margin. M on the $P_C = P_F$ then consumer expenditure CE will still constantly.

$$\frac{P_c}{P_f} = 1 - \left(\frac{P - I + D_s + F + F_{SQ} + F_{SKd} + P_{sq} + Fat_s}{P} \right)$$

$$1 = - \left(\frac{P - I + D_s + F + F_{SQ} + F_{SKd} + P_{sq} + Fat_s}{P} \right)$$

$$P + I + D_s + F + F_{SQ} + F_{SKd} + P_{sq} + Fat_s = 0 \text{ and } |P| = I + D_s + F + F_{SQ} + F_{SKd} + P_{sq} + Fat \quad (12)$$

We can use a specific functional form to approximate the underlying functional relationship between economic variables.

This expression shows the relationship between expected food production and the 8 factors with a quadratic relationship that involves the 8 factors as shown:

$$P = \sum_{i=1}^n (I, D_s, F, F_{SQ}, F_{SKd}, P_{sq}, Fat_s) \quad (13)$$

P = that's gives us the Equation

$$Y_P = 0 + {}_1I + {}_2D_s + {}_3F + {}_4F_{SQ} + {}_5F_{skd} + {}_6P_{sq} + {}_7Fat_s +: \acute{I} \quad (14)$$

Using the data from food balance sheet, we can use Eviews in analyzing the result.

Table 3. Econometric output

Variable	Coefficient	Std.Error	t-Statistic	Prob
I	-0.832071	0.061025	-13.63485	0.0000
DS	0.990098	0.007720	128.2430	0.0000
F	-5.593536	2.657826	-2.104553	0.0430
FSQ	53.69759	25.54969	2.101693	0.0433

FSKD	0.100196	0.028201	3.552911	0.0012
PSQ	-0.382703	0.695625	-0.550157	0.5859
FATS	-0.981496	0.234855	-4.179152	0.0002
R-squared	0.999839	Mean dependent var		240.1000
Adjusted R-squared	0.999810	S.D. Dependent var		440.0883
S.E of regression	6.063883	Akaike info criterion		6.600206
Sum squared resid	1213.432	Schwarz criterion		6.895760
Log likelihood	-125.0041	Durbin-Watson stat		1.488784

Table 3...

SUMMARY OF RESULTS AND DISCUSSIONS

The coefficient of determination, R² measures the explanatory power of the multiple regression models. From the results, the coefficient of determination is 99.9%. This result shows that the explanatory variables explained 99.9% of the total variance in production. Thus, the overall fit of the regression model measured by the F-statistic is statistically significant at this level.

The Durbin Watson (DW) statistic of 1.489 indicates that there is no problem of serial correlation in the regression model. Also multi-co linearity which is often present in a cross-sectional data seems to be non-existent in the model.

It is clear from the regression analysis that import is negatively related to production. Consequently, at a favorable level of import, production will be higher. More so, the domestic supply is positively related to production. This implies that at higher domestic supply, production will be higher, but at lower domestic supply production will be low. Food is also negatively related to production. Consequently, the food supply quantity (kg/capita/year) is positively related to production. Food supply (kcal/capita/day) is also positively related to production. Protein supply quantity (g/capita/day) and Fat supply quantity (g/capita/day) is negatively related to production.

CONCLUSION AND RECOMMENDATIONS

There are many good reasons for expecting a country like Guinea to be relatively unaffected by the recent global food price shock. On the one hand, the desire to help households cope with the increase in food prices may lead policy makers to implement projects or provide relief in the hardest hit areas which tend to be urban. On the other hand these hard hit areas may not be among the poorest in the country, and when a country imports essentially all of its consumption of a basic staple, the rural poor suffer as well. In such case, one may wonder if for poverty reduction, interventions should not remain focused to the poorest areas (as measured after the shock), instead of the hardest hit ones by the shock. In the case of Guinea, the dilemma is

perhaps less present than in some other countries in west and Central Africa. Given the substantial production of rice in the country, some of the poorest areas, which are also the rice producing regions, may benefit from the increase in rice prices. Thus these areas may not need larger safety-net types of public interventions to help them cope with the shock, but on the other hand they would benefit (as would the country as a whole) from policies designed to increase rice production.

In the recent crisis, food energy cost were a substantial factor behind the price rises in staple grains. In such crises, the prices of other goods, including transport and different food items, may also rise. Shifting to different foods therefore may not gain the household much, and higher transport costs may make traveling to markets, such as wholesale markets or even supermarkets where per-unit costs may be less, more difficult. The pressure on expenditures may also limit poor families' ability to buy goods in bulk at a discount. Low-income city residents may be left with little choice but to continue to buy in small quantities from the local kiosk or market, at higher per-unit costs. Strong agricultural policies geared to improving producers' access to agricultural inputs (quality seeds, fertilizers and pesticides) through the introduction of low-cost credit. Finance lines favoring fertilizer professionals are necessary to guarantee production, import and distribution as close as possible to the end users.

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, more 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.

REFERENCES

- Abdulai, A.& CroleRees, A. Determinants of income diversification amongst rural households in southern Mali. 2001,
- Barrett, C.B. & Dorosh, P.A. 1996. Farmer's welfare and changing food prices: nonparametric evidence from Madagascar.

- Budd, J.W. 1993. Changing food prices and rural welfare: A nonparametric examination of the Cote D'Ivoire. Economic Development and cultural change.
- Breman, H. 2003. West Africa's Subsistence Farming; Food and Agriculture Organization: Rome, 2003.
- Deaton, A. 1989. Rice prices and income distribution in Thailand: A non-parametric analysis. Economic Journal. 89
- Dessus, S., S. Herrera, and R. de Hoyos. 2008. The impact of Food inflation on urban poverty and its monetary cost: some back-of-the-envelope calculations.
- Dreze, J., Sen, A., 1989. Hunger and Public Action. Clarendon Press, Oxford. Eicher, C.K., Staatz, J.M. (Eds.), International Agricultural Development, 3rd ed. Johns Hopkins University Press, Baltimore, MD.
- FAO statistic database 2010 <http://faostat.fao.org/site/339/default.aspx>.
- FAO. FAO Statistical Database; Food and Agricultural Organization of the United Nations (FAO): Rome, 2008; Vol. 2008.
- International Monetary Fund. 2008. Food and Fuel Prices: Recent Developments, Macroeconomic Impact, and policy Responses, Washington DC.
- Ivanic, M. And W. Martin. 2008. Implications of higher global food prices for poverty in low-income countries.
- Ivanic M, Martin W. 2006. Potential implications of agricultural special products for poverty in low-income countries.
- Ivanic, M., and W. Martin, 2007 "Implications of Higher Global food Prices for Poverty in Low-Income Countries" Policy Research Working paper 4594, World Bank, Washington, DC.
- Ravallion, M., 1987. Markets and Famines. Clarendon Press, Oxford.
- Ravallion, M., 1998. Economics and famines. Journal of Economic Literature.
- Sen, A., 1981. Poverty and Famines. Oxford University Press, Oxford Policy Research Working paper 4594, World Bank, Washington, DC.
- Ministère de l'Agriculture et de l'Élevage de Guinée Avril 2009 : Stratégie National de Développement de la Riziculture.
- Minot, N. & Goletti, F. 2000. Rice market liberalization and poverty in Viet Nam International Food Policy Research Institute Report 114. IFPRI,
- Minot, N. & Goletti, F. 1998. Export liberalization and household welfare: The case of rice in Viet Nam.
- Mitchell, D. 2008. A note on rising food prices. Working paper.
- United Nation Economic, Social, and Cultural Organization (UNESCO) 2006. Water: A Shared responsibility, The United Nations world water development report.
- US Agency for International Development (USAID) 2004. Improving the health of the urban poor: Learning from USAID experience
- Von Braun, J. 2008. High Food prices: The what, who, and how of proposed policy actions.
- World Bank. 2008a. Global Economic Prospects 2009: Commodity Markets at the Crossroads. World Bank,
- Washington, DC. International Monetary Fund (2008) Food and Fuel Prices: Recent Developments, Macroeconomic Impact, and Policy Responses, Washington, DC.
- Wodon, Q., and H. Zaman. 2008. "Poverty Impact of Higher Food Prices in Sub-Saharan Africa and Policy Responses" mimeo, World Bank, Washington, DC.
- World Bank. 2008a. "Addressing the Food Crisis: The Need for Rapid and Coordinated Action" Background paper for the Finance Ministers Meetings of the Group of Eight, Poverty Reduction and Economic Management Network, Washington, DC.

World Bank. 2008b. "Guidance for Responses from the Human Development Sectors to Rising Food and Fuel prices" mimeo, Human Development Network, Washington, DC.