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Trends in Profitability and Measure of Government Protection in Sorghum Production (Zimbabwe)

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ABSTRACT
Despite failures of government policy to stimulate sustained growth in sorghum production in the face of increased climatic shocks on maize, there have been very little efforts to understand sorghum protection by the government. The major objective of this paper is to determine the level of government protection of the sorghum production. The main sources of the data were the Central Statistics office, FAOSTAT and the Ministry of Agriculture. The Nominal Protection Coefficient (NPC) was used to determine the level of protection from 1980 to 2010. Over the past 30years there have been swings from protectionism to liberal approaches in Zimbabwe. Policies and investment strategies should be designed to exploit the competitive advantages of these small grains which is the basis for improving the productivity of the extensive semi-arid regions of the country and of their rural labor force. Gains to the economy will also accrue from improving rural food security, reducing the need for drought relief, lowering the level of subsidies underlying grain markets, and, at least in the short run, stemming migration from rural to urban areas.
Key Words: *Nominal Protection Coefficient, Government Policies, Protectionism*

ABBREVATIONS

NPC	Nominal Protection Coefficient
ERP	Effective Rate of Protection
PSE	Producer Subsidy Equivalent
ERA	Effective Rate of Assistance
NRA	Nominal rate of assistance

INTRODUCTION

The increase in the demand of small grains, particularly sorghum, is attributable to their growing importance in economies of both developed and developing countries. The use of sorghum in bio fuel production (ethanol) has sparked a global increase in the demand of the small grain. The growing importance of small grains is also a result of their adaptability to rainfall variability. With the advent of climate change, there has been increasing risks of crop failures due to frequent droughts and dry spells. As such there has been an enormous pressure among developing nations, particularly Sub-Saharan Africa whose majority of agriculture occurs under rain-fed conditions, to diversify into small grains that are less susceptible to moisture stress. Sorghum is therefore increasingly used as a substitute for maize in most parts of the region in order to reduce the problems of food insecurity. In-order to increase the production of sorghum in the country there is need to determine the role of the government on the sorghum subsector.

Protection Coefficients Concepts

Protection Coefficients describe the nature of government protection in both input and product markets. This could be done by comparing domestic and international prices which indicate the degree of distortions caused by government intervention [1]. The nominal protection coefficient is used to measure the effects of government policies in input and product markets separately. The Nominal Protection Coefficient is the simplest indicator of price distortions and the easiest to measure. It is equal to the ratio of the domestic price of a commodity *i* to its border price using the official exchange rate [1]. NPC is usually used because it measures the effect directly and its product specific. Estimates follow a direct price comparison approach between border and farm prices adjusted for transport costs to or from producers and consumer locations, storage costs, quality differences and other elements in marketing margins.

Empirical Review of Studies on Agricultural Support

In a study by [3] on assessing the comparative advantage of the South African agricultural sector the concept of distortions in the paper is a government policy that creates a gap between the marginal social return to the seller and the marginal social costs to the buyer in a transaction. The benchmark price from which the distortions are evaluated is therefore the price that would pertain in the free market where there is no market failures or externalities. The form of distortions considered are direct agriculture policy measures such as taxes, tariffs, subsidies on agricultural production or consumption, as well as distortions on intermediate inputs used in farm production sectors, exchange rate distortions. The main instrument used by [3] to measure distortions is termed the Nominal Rate of Assistance (NRA) which is defined as the percentage by which government policies have raised gross return to producers above what they would be without the government intervention. Under the conventional free market assumptions and the absence of externalities, processing, exchange rate distortions, marketing margins and trading costs, the domestic farm product price and the consumer price would be equal to E*P, where E is the exchange rate and P is the foreign currency price of this identical product in the international market.

$$NRA = (E * P (1+ t_m) - E*P) \div (E*P) \qquad (1.1)$$

In order to calculate NRA for the agricultural sector [3] used information on international and domestic product prices, international and domestic transport costs, distributions margins and the range of direct policy distortions (taxes, subsidies e.t.c). The major sources of their study included the International Financial Statistics, FAOSTAT data, the Price Monitoring Report, OECD Producer Subsidy Equivalent data and Statistics South Africa. The results of their study reflected that a change in policy from protection in the 1970's and 1980's to a more liberal market in the 1990's.

A further study by the World Bank monitored agricultural support policies in transition economies [7]. This study covers six transition economies during the period 1994-97. Using a direct price comparison approach, the study presents various estimates of agricultural support policies, including trade and price policy interventions and government non-price related subsidies on production incentives and on net farm income. The study examined to what extent the economic environment prevailing in 1994-97 provided an appropriate and sound basis for adjustment towards a more internationally competitive agricultural sector. Based on a common methodology for all countries, the study reports estimates of NPRs, ERPs, and ERAs for the major agricultural import- competing and export activities. The report presents a synthesis of the various indicators for all the countries included, which is followed by individual country agricultural policy notes describing the salient features of agricultural policies at the time. This study does not adjust for a possible misalignment of the exchange rate, though it does present a "decomposition analysis" to examine the relative effect of fluctuations in the real exchange rate, border prices and domestic trade policy on the evolution of domestic real farm prices.

METHODOLOGY

The Nominal Protection Coefficient (NPC) is the simplest indicator of price distortion and the easiest to measure. It is equal to the ratio of the domestic price (P_i^d) of a commodity *i* to its order price (P_i^b) using the official exchange rate: $NPC = P_i^d / P_i^b$ (1.2) Thus, if $NPC_i > 1$, producers are protected and consumers taxed

If $NPC_i < 1$, producers are taxed and consumers subsidised, and

If $NPC_i = 1$, the structure of protection is neutral [1]

If the official exchange rate is not at equilibrium, the border price against which the domestic price is compared should be adjusted to remove this additional distortion. Calculating the border price at the equilibrium exchange rate the NPC become the real protection coefficient and the real rate of protection, which take into account both direct price distortions through product specific price policies and indirect distortions through the exchange rate [1].

RESULTS AND DISCUSSION

Trends in Selected Measures of Market Distortions

Interventions in Sorghum Prices

Agricultural prices are left to the market mechanisms in very few, if any countries. Developed, undeveloped, capitalist, socialist or communist, all intervene to a greater or lesser extent in price which would be established by unfettered supply and demand. This consistently high level of government intervention in agricultural markets is motivated by concern with a number of the following factors:

i. Market imperfections
ii. High variability in the supply of agricultural commodities, mainly due to the effects of unpredictable biological factors.
iii. Inelastic demand for agricultural products which causes prices to fluctuate move sharply to variations in supply.

Of these factors it is, perhaps the biological nature of agricultural and its effect on supply and demand that primarily encourages the government intervention in agricultural prices. Most government in agricultural markets is to stabilise prices. Government most frequently intervene in agricultural markets and are involved in setting prices in order to exert control over this strategic sector.

Trends in Nominal Protection Coefficient

Agricultural pricing policies have been a major instrument of government intervention, with the goal either increasing the contribution of agriculture to economic development or of enhancing the welfare of farm households. Pricing policy has been used to satisfy the rent seeking demands of special interests groups. Price distortions against agriculture have been blamed for the stagnation of agriculture in most Sub Saharan African countries.

The nominal protection coefficient (NPC) is a ratio that contrasts the observed (private) commodity price with a comparable world (social) price which gives the opportunity cost to the country of producing the good and thus helps determine whether the country is an efficient producer of the commodity. This ratio indicates the impact of policy (and of any market failures not corrected by efficient policy) that causes a divergence between the two prices.

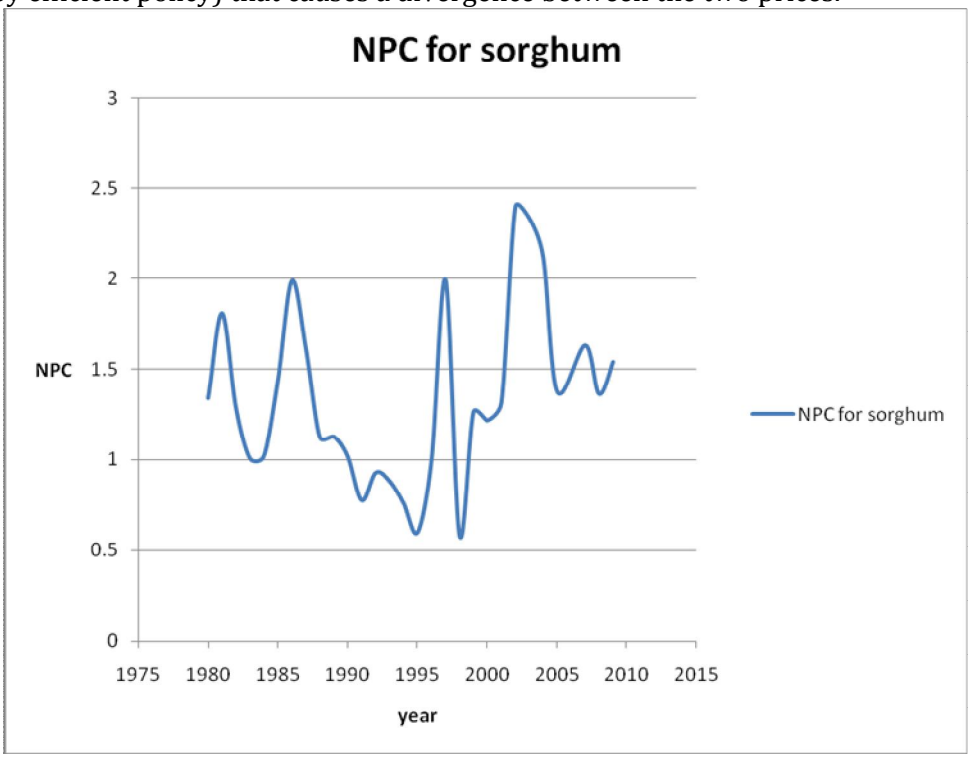

Fig 1: Nominal Protection Coefficient of Zimbabwe

Source: Own Calculation

The NPC for the sorghum in the country was slightly higher after independence; the producers were being protected by the government. The government protected the sorghum farmers for the first 15 years. After the structural adjustment program of 1992 there was a shift in the government policies it started to subsidise the consumers of sorghum in the country. After the year 2000 there was a surge in the value of NPC. This can be attributed to the fact that the government was carrying out the fast track land reform program so there was need to give the new farmers an incentive to produce and this is why there was an increase in producer price of sorghum in the country. The government was trying to protect the newly resettled farmers in the country. In the sorghum enterprise since 1980 the government has only embarked on policies in which the structure of protection was neutral (NPC=1) in 1996. This is the only year in which the government neither protected the sorghum producers nor subsidise the consumers.

Comparison of Maize and Sorghum Level of Protection

Most researchers in other countries argue that the maize subsector is protected more than other grains sorghum being included. When most governments design policies for grains their major target will be maize. Most farmers' attributes the low level of sorghum production to the limited support the sector gets relative to other sectors such as wheat and maize in the country. The following figure compares the production of sorghum and maize in the country.

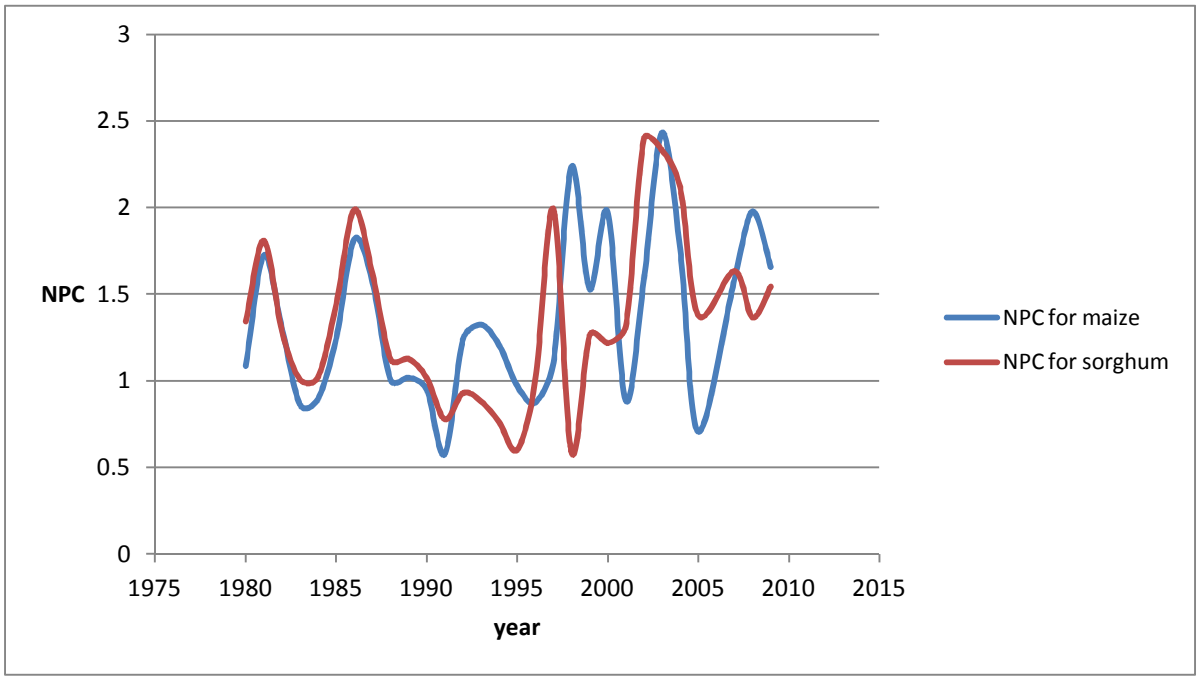

Fig 2: Comparison of Maize and Sorghum Level of Protection
Source: Own Calculation

From 1980 to 1990 the Nominal Protection Coefficient of maize and sorghum was almost the same. After the structural adjustment program of 1992 the rate of protection for maize was slightly higher for maize relative to sorghum except for 1997. The government was now protecting the maize farmers since maize reduces problems of insecurity in the country. After the year 2000 in which the government implemented the land reform program the Nominal Protection Coefficient was also greater for maize as compared to sorghum.

CONCLUSION AND RECOMMENDATIONS

Efforts to promote sorghum production should not be based simply on desire for equity or concern about the welfare of those producing insufficient food. The development of the small grains food system should be viewed as a contribution to national economic growth. Policies and investment strategies should be designed to exploit the competitive advantages of these small grains-a basis for improving the productivity of the extensive semi-arid regions of the country and of their rural labor force. Gains to the economy will also accrue from improving rural food security, reducing the

need for drought relief, lowering the level of subsidies underlying grain markets, and, at least in the short run, stemming migration from rural to urban areas.

In order for the sorghum subsector to be competitive the government must play a major role in ensuring that the producer prices of sorghum are very high since the majority of the sorghum producers are small holder farmers and there is need to support them. The producer price of maize is usually used as the benchmark price for sorghum so there is need for the government to announce the pre-planting price for sorghum in Zimbabwe.

Agricultural price policy alone cannot guarantee sorghum production growth targets, but a policy mix that goes beyond factor and product markets and acknowledges the structural and institutional constraints faced by sorghum farmers is likely to achieve a substantial growth in sorghum output in both the short run and long run.

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