COMPETITIVENESS AND PROFITABILITY OF SUDANESE GUM ARABIC IN NORTH KORDOFAN STATE

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Abstract

Sudan is the world's largest producer of gum Arabic. Which is a natural forest product; produced from Acacia senegal and Acacia seyal trees. Sudan is considered as a key supplier of raw gum Arabic in the world as it used to provide more than 80% of high quality gum Arabic in the world market. The product is used primarily in the food industry but has medicinal and technical uses as well. This study investigates the main reasons behind the fluctuation in Sudanese gum Arabic export, as well as specifying the main importers of Sudan's gum Arabic during (2000-2013). In addition the study investigates the competitiveness of the Sudanese gum Arabic in the world market during (2000-2013). Data were collected from different sources that relevant to the field of the study. The analysis was done using descriptive statistic and Policy Analysis Matrix (PAM). The findings of the study have shown that the major reasons behind the decline and fluctuations of the Sudanese gum Arabic the increase in the production cost. Furthermore, exporting gum Arabic is financially and economically profitable. Also Sudan has high competitive ability to export gum Arabic. The study also refers to the negative impact of taxes on gum Arabic. The study recommended that: the government should design a specific policy through reducing the taxes and fees for gum Arabic export in order to increase its comparative advantage.

Key words: Sudan, gum Arabic, PAM

INTRODUCTION

Sudan is a vast country located in north east Africa with an area of 1.9 million square kilometres. It is land stretches between latitudes 23° 8 and 8° 45 north and longitudes 21° 49 and 38°34 east. The great length gives the Sudan a unique range of ecological systems, and extends along the maritime border on the Red Sea coast, and penned two Arab countries are (Egypt and Libya) and 5 African countries, (Fig 1.) show the Sudan location. This vast area of land covers a number of different ecological and climatic zones, from the desert in the north to the tropics in the south with the Nile crossing the country from south to north. Agriculture generally provides the livelihood for the great majority of the population.

Sudan is the world's largest producer of gum Arabic, which is one of the four important agricultural export commodities, along with livestock, cotton and sesame.

Fig. 1. Sudan position on the map

Gum Arabic is "The dried exudation" produced from the trunk and branches of the genus Acacia; namely Acacia senegal and Acacia seyal locally known in Sudan as Hashab and Talha respectively [2] and [9].

The two acacias are found in Sub-Saharan Africa in a belt widely known as the gum belt. The gum belt refers to an area situated at latitude of between 12° and 16° north stretching across Sub–Saharan Africa [5]. In Sudan it stretches from the western border with Chad to the eastern border with Ethiopia (Fig 2.), it covers an area of about 500 thousand square km, and home to roughly one fifth of the population of Sudan.
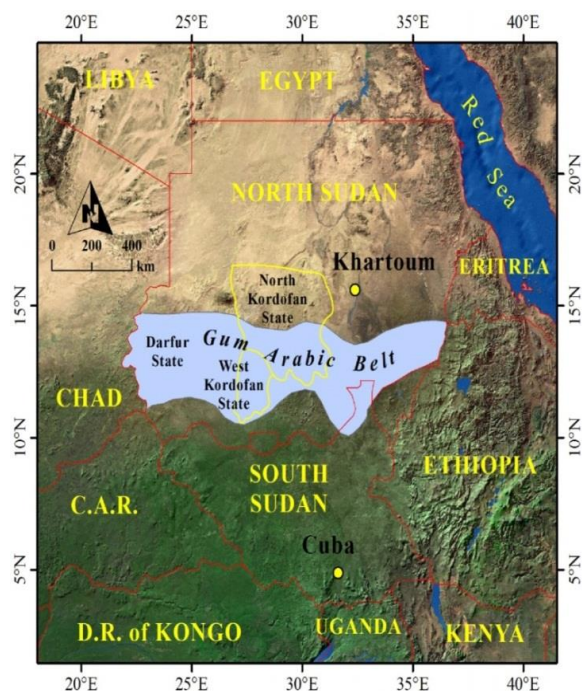

Fig. 2. Gum Arabic belt in Sudan

Sudan gum Arabic total production and distribution have undergone changes between different producing areas, but it concentrated in North Kordofan State, in the central of Sudan and accommodates a big gum Arabic market in the world (Elobeid), which has been selected to the study (Fig 2.).

Sudan is considered as a major supplier of raw gum Arabic in the world as it used to provide more than 80% of high quality gum Arabic in the world market [3], [4] and [5], it is exports fluctuated due to unstable production and unstable policies of gum Arabic (Fig 4.).

As a result of the poor performance of the exports of this strategic commodity in the world market and the need for improving it in the future, the government of Sudan undertook positive steps towards deregulation of the gum Arabic company concession rights

in 2009 to provide incentives to producers to reactivate their production in favour of increased exports.
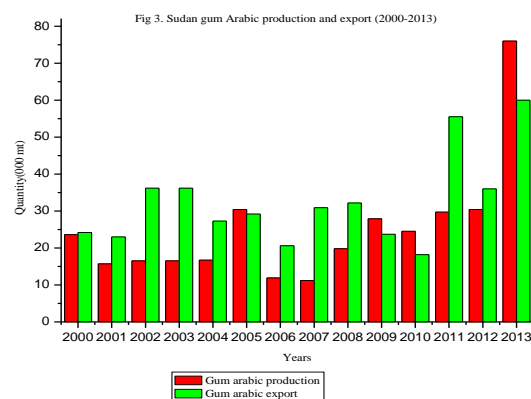

Fig. 3. Sudan gum Arabic production and export (2000-2013)
Source:[1]

The government established the Gum Arabic Council for free gum Arabic trade in domestic and export markets. The recent switch in gum Arabic sector policy came as normal continuation of the 1992 liberalization policy of the economy of Sudan and the attempts of Sudan to access to the membership of the World Trade Organization (WTO). That policy is expected to rearrange Sudan gum Arabic production and trade based on its comparative advantage. The actual challenge that the Sudan will face is how to reduce the costs of gum Arabic production and increase its competitiveness in the world market.

MATERIALS AND METHODS

This study aimed to measure the competitiveness, profitability and incentives of gum Arabic production in North Kordofan state, Sudan. It depended mainly on primary data, which was collected through questionnaire directly towards producers for the seasons 2010/11 – 2013/14 in North Kordofan State, while secondary data was obtained from official sources, covered the period (2000-2013). The data was analysed using policy analysis matrix (PAM), which designed to measure the divergence between actual market prices and efficiency prices. Efficiency prices are prices that have to exist if all markets perfectly competitive and the

economy in a state of general equilibrium.

The PAM is a tool for quantitative policy analysis developed by Monke and Pearson [6]. It is a product of tow accounting identities; the first identity defines profitability as the difference between revenue and costs (rows), whereas the second measures the effects of divergences due to distorting policies and market failures - difference between observed parameters and parameters that would exist if the divergences were removed - (columns). In this way, the matrix allows us to compute the effects of a particular policy or the adoption of a new technology on income, costs and profits. The PAM depends on a simple accounting identity stated as follows:

Profits = Revenues – Costs

Profits are defined as the difference between total sales revenues and costs of production. Costs are defined in two columns as tradable inputs and domestic factors (essentially land, labour and capital). Tradable inputs are those available at the international market level, while those available domestically [6]. In the PAM, profitability is measured horizontally, across the columns of the matrix, as demonstrated in (Table 1), it shown in the right hand columns and found by the subtraction of costs, given in the two middle columns, from revenues, indicated in the left hand column.

Table 1. Policy Analysis Matrix

Item		Total Revenue	Total costs		Profit
			Tradable inputs	Domestic factors	
Private prices		A	B	C	D
Social prices		E	F	G	H
Effects of divergences	of	I	J	K	L

Source: [6]

The rows of the matrix respectively represent:
- Private profitability ($D=A–B–C$)
- Social profitability ($H=E–F–G$)
The columns respectively represent:
- Output transfers ($I = A–E$)
- Input transfers ($J = B – F$)
- Factor transfers ($K = C – G$)
Effects of divergences ($L= D – H = I –J – K$)
Revenues, costs (tradable and non-tradable inputs) and profits are calculated using two sets of prices:

First row is the private prices; these are the prices which private agents actually face in the market.

The second row is the social prices, these prices are designed to measure the opportunity cost to the economy of using a resource or domestic factors. The social efficiency prices for domestic factors of production (land, labour and capital) are estimated also by application of the social opportunity cost principle. Because domestic factors are not tradable internationally and thus do not have world prices, their social opportunity costs are estimated through observations of rural factor markets. [7]

The third row of the matrix represent, effects of divergences, which estimate the difference between the private and social values of revenues, costs and profits, which can be explained by policy interventions.

Private, Economic Profitability, international value added (IVA) and Domestic Resources Cost (DRC) is represented as measures of competitiveness.

Private profitability (D): the term private refers to observed revenues and costs reflecting actual market prices received or paid by producer, merchants or processors in the agricultural system [6]. For the government, private profitability means the boarder value of the product, minus production and marketing costs, all taxes and subsidies are excluded in computing public profitability, as they are merely transfer payments, but in the producer it means farm gate price less the production cost [6]. The private profitability calculations show the competitiveness of the agricultural system, given current technologies, output values, input costs and policy transfers. If private profits are negative (D <0), it indicates that producers are losing and expected to stop production unless something changes to increase profits to at least a normal level (D=0). Otherwise, positive private profits (D>0) are an indication of gaining return and should lead to future expansion in the production system [6].

The Economic or social Profitability (H): these estimation measures comparative

advantage or efficiency in the agricultural commodity system [6]. The economic profitability obtained is the economic value of the product, less production and marketing costs valued at shadow prices. Economic Profitability is computed as: $H = E - F - G$.

For each entry in the matrix measured vertically any divergence between the observed private price and the estimated social price for revenues, costs and profits, must be explained by the effects of policy or by the existence of market failure [6].

Profitability coefficient (PC): the ratio of private and social profits is $PC = (A - B)/(E - F - G)$ or D/H, the PC measured the incentive effects of all policies and thus services as a proxy for the net policy transfer, since $L = (D - H)$. Its usefulness is restricted when private or social profits are negative, since the signs of both entries must be known to allow clear interpretation [6].

The net transfer caused by policy and market failures (L in the matrix) is the sum of the separate effects from the product and factor markets, $L = (I - J - K) = D - H$.

International Value Added (IVA): is a measure of absolute international competitiveness, measured as the value of revenue less costs of tradable inputs in US$. A positive IVA implies a net foreign exchange earnings and the competitiveness of the product.

Domestic Resource Cost (DRC): measure the efficiency of domestic production relative to international markets. It indicates whether the use of domestic factor is socially profitable (DRC < 1) or not (DRC > 1). It is calculated as $G / (E - F)$. If DRC >1, it means that the opportunity cost of using domestic resources exceeds the value added at social prices, and the product will not be internationally competitive. It is better in this case, to reallocate resources to an alternative product. The reverse hold for DRC <1 indicates that the economy saves foreign exchange from local production, because the opportunity cost of using domestic resources is less than the net foreign exchange it gains (in export) or saves (in substituting for imports). DRC< 1 also indicates efficiency and international competitiveness.

The nominal and effective protection coefficients (NPC and EPC) are the most popular measures of agricultural incentives. Nominal Protection Coefficient (NPC) is a ratio of commodity revenue at market prices to its world value. This ratio indicates the impact of policy that causes a divergence between the two prices. In the PAM, is computed for output as $NPCO = A/E$ and for tradable input as $NPCR = B/F$. Since the inputs cost in gum Arabic production is minimal, only NPCO is dealt with here considered as just NPC. If NPC >1, it indicates that the private price of output is greater than its parity price , which means protection measures provide positive incentives to produce the commodity, If NPC < 1, it indicates that the product returns to the producers are less than the social returns that means the product implicitly taxed. When NPC=1, it indicates a neutral situation (returns to producers are the same as returns from selling in a free market system using international prices). A basic defect of NPC is that, no accounts are taken for the subsidies and levies on imported inputs. EPC is an indicator of incentives, it measures the degree policy transfer from product market – output and tradable – input-policies, is the ratio of value added in private prices (A - B) to value added in world prices (E - F), or $EPC = (A - B)/(E - F)$ [6]. EPC is used to correct the main defect of the nominal protection coefficient of neglecting taxes and subsidy elements on inputs. The EPC, however, takes the effect of taxes and subsidies on traded inputs only, while domestic inputs are excluded. If EPC value greater than one, at the existing exchange rate, means that government policies provide positive incentives to producers to produce the commodity, while EPC value less than one indicates that producers are not protected through policy interventions and taxed. EPC=1 implies either no intervention or the net impact of various distortions in both the input and product markets results in a neutral effect on value added.

RESULTS AND DISCUSSIONS

Private and economic profitability, international value added and domestic

resources cost were used as measures of competitiveness.

Table 2 shows both private and social profitability, which were positive at farm level. These results indicated a relatively favorable farm gate pricing policies being encourage domestic production of gum Arabic.

From the results in the table, it is noted that in all seasons except 2011/12 private profitability is more than social profitability, this is an indication that gum Arabic production in North Kordofan State enjoys subsidy in form of a new technology or any facilities that will lead to an increase in production. From the results as the private profitability was less than social profitability in season 2011/12, clear that the gum Arabic has been taxed by the government, in form of direct fees or indirectly like deterioration of exchange rate.

Table 2. Private and social profitability of gum Arabic in North Kordofan state – Sudan

Season	Private profitability	Social profitability	Profitability coefficient
2010/11	251	79	3.177
2011/12	166	221.5	0.749
2012/13	940	433	0.749
2013/14	1047	823	1.272

Source: Own calculation

From (Table 3.), the positives values of International Value Added (IVA) per unit, for the period under consideration, indicated positive foreign exchange earnings and absolute competitiveness.

In relative terms, it is more competitive in seasons 2012/13 and 2013/14 than the other seasons.

This means that the opportunity cost of using domestic resources, measured at world prices or in foreign currency, is less than the value added generated by the product measured at world prices or in foreign currency.

DRC values less than one, which means the opportunity cost of using domestic resources less than value added at social prices, so the product will be internationally competitive, the decreasing trend in DRC values, indicate the increasing in competitiveness.

Table 3. IVA and DRC of gum Arabic in North Kordofan state – Sudan

Season	IVA (US$/feddan)	DRC
2010/11	374	0.79
2011/12	631.5	0.65
2012/13	833	0.47
2013/14	1243	0.34

Source: Own calculation

Nominal Protection Coefficient (NPC) and Effective Protection Coefficient (EPC) are used to measures government intervention. From (Table 4.) NPC and EPC values greater than one except in season 2011/12, indicates positive intervention of the government in the gum Arabic production, and subsidized in form of new technology or any facilities can increase the incentives of producing it. But in season 2011/12, there is a negative intervention of the government in the product in form of different fees.

Table 4. Nominal Protection Coefficient and Effective Protection Coefficient

Season	NPC	EPC
2010/11	1.46	1.46
2011/12	0.92	0.91
2012/13	1.61	1.61
2013/14	1.20	1.20

Source: Own calculation

CONCLUSIONS

In general gum Arabic production system in Sudan is profitable and competitiveness. Domestic Resources Cost for all seasons shows that gum Arabic is internationally competitive and progressing trend in competitiveness can be made by continue of devaluation. Reducing direct and indirect tax can increase the incentives of producing gum Arabic. Subsidize the product in form of technology or any facilities can increase the incentives of production.

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