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ECONOMIC COMPETITIVENESS OF SHEEP EXPORTS OF SUDAN IN SAUDI ARABIA

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المستخلص

يتمتع السودان بثروة حيوانية مكونة من الابقار، الضأن، الماعز، والابل. توجد اساسا بالقطاع المطري التقليدي الذي يعتمد على المراعي الطبيعية فى كردفان، دارفور، النيل الابيض، النيل الازرق و الجزيرة والاقاليم الاخرى. القطاع التقليدي هو المصدر الاساسي لامداد الماشية (الحيوانات الحية او اللحوم الحمراء) للاسواق المحلية والاجنبية ويشكل صادر الضان مصدرا رئسا للعملة الاجنبة في السودان. تهدف هذه الدراسة لتقدير تنافسية صادرات الضأن الى العربية السعودية مستخدمة احجام الضأن (صغير، متوسط وكبير) للاتيان بسياسة مفيدة لتحسين صادرات الضأن من السودان. استخدمت الدراسة طريقة مصفوقة تحليل السياسة لتقدير مدى تشوه الاسعار بالسوق ودرجة سؤ توزيع الموارد. جمعت البيانات الاولية والثانوية من المصادر ذات الصلة شاملة وزارة الثروة الحيوانية والمراعي والاسماك، وزارة التجارة الخارجية، ممثلى التجار ومصدري الماشية الحية بولاية الخرطوم. اوضحت نتائج الدراسة القدرة التنافسية والارباح الايجابية المالية والاقتصادية لاحجام الضأن الثلاث. التكلفة الاجمالية لصادر رأس واحد من الضأن تزيد كلما زاد حجم الضأن. وبالمثل، تزيد الارباح الخاصة والاقتصادية حسب زيادة حجم صادر الضأن. اوصت الدراسة مراجعة السياسات المالية للضرائب والرسوم وتقليل الفجوة بين سعر الصرف الاسمى والحقيقي لازالة الضرائب الضمنية المفروضة على صادرات الضأن من السودان الى المملكة العربية السعودية.

Abstract

Sudan has a wealth of livestock composed of cattle, sheep goats and camels. Livestock production in Sudan occurs mainly under the traditional rain fed sector, which depends on the natural pastures of Kordofan, Darfur, White Nile, Blue Nile and Gezira and other regions as well. This traditional sector is the main source of supply of livestock (live animal or red meat) for the domestic and foreign markets. Sheep exports constitute the main livestock earning foreign currency in Sudan. The purposes of this study is to estimate the competitiveness of sheep exports to Saudi Arabia using three sizes of sheep (small, medium and large) to come up with useful policy for improving sheep exports of Sudan. The study used the policy analysis matrix (PAM) method to estimate the extent of market prices distortion and the degree of misallocation of resources. Primary data and secondary data were collected from relevant sources including the Ministry of Animal Resources, Pastures and Fisheries, Ministry of Foreign Trade, traders and exporters' representatives of sheep in Khartoum State. The results of the study indicated the

competitiveness and the positive financial and economic profits of the three sizes of exported sheep. The total cost of exporting one head of sheep increases as the size of the sheep increases. Similarly, the private and economic profits increase as the size of the exported sheep increase. The study recommended revision of the taxing and fees levy policies and to reduce the gap between the nominal and the real (economic) exchange rate to remove implicit taxes imputed in the exports of sheep from Sudan to Kingdom of Saudi Arabia.

Key words: livestock, PAM, sheep

Introduction

Increasing export earnings from livestock has been a primary concern of the policies of Sudan during 1990s. The country is endowed with more than 104 million heads of cattle, sheep, goats and camels (Ministry of Animal Resources and Fisheries, 2011). The contribution of the livestock sector in the Gross Domestic Product (GDP) of Sudan decreased from 22% to 17% between 1999 and 2009.The export earnings of the sector increased, with fluctuations, from about US$ 142 million in 1999 to about US$ 146 million in 2009 and US$ 270 million in 2011 (Ministry of Animal Resources and Fisheries, 2013). However, the progressive performance of livestock exports was faced with several short falls including the import ban in 2001 and the partial ban in 2007 by Saudi Arabia. During 2000-2011, sheep exports of Sudan, the main livestock earning foreign currency, faced cycles of expansion and detraction (figure 1).

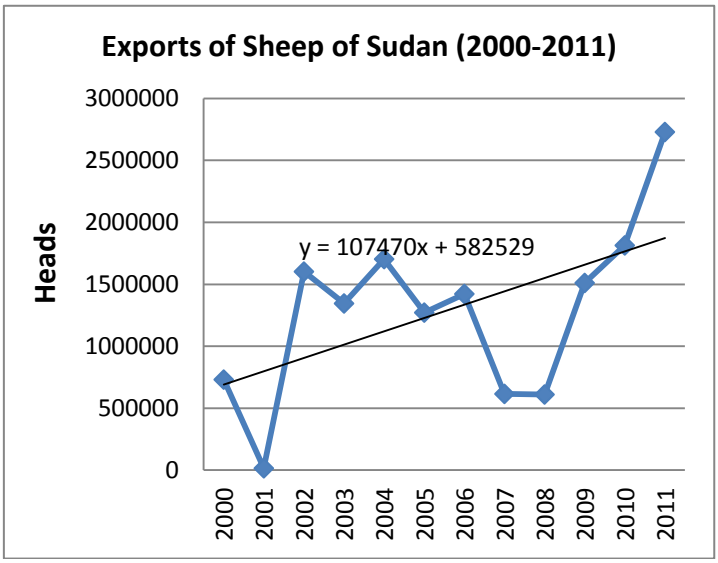

Figure 1: Exports of sheep of Sudan during 2000-2011

The infection of livestock with contagious diseases is considered one of the most important barriers to trade. The various diseases of animals affected export of livestock and red meat in different ways, some of which resulted in decreasing the foreign exchange earnings of the country. Some of the diseases are transmitted from animals to human, while other diseases cease their infection effect when slaughtered

and do not harm people. The list of the important animal diseases that harmed the export of meat from Sudan and the date of their occurrence are: The Rift Valley Fever (1973), Foot and Mouth Diseases (1990), Pestedes Petits Ruminants (1990), Rinderpest (1991), Caprine and Ovine Brucellosis (1998), Anthrax (1999), Sheep small Pox and Goat small Pox (2000) (Office International des Epizooties (OIE), Annual Animal Diseases Status, 2000). Suspected Rift Valley Fever (2001) and of the hemorrhage fever in 2007 resulted in complete and partial bans of exports of sheep from Sudan to Saudi Arabia in 2001 and 2007 respectively (Ministry of Animal Resources and Fisheries, 2013).

In 2001 almost none was exported to Saudi Arabia due to ban decision of the importing country against the suspected River Valley Fever. In 2002 the price of sheep was US$ 59 per head and rose up to US$330 per head in 2013 (table 1) (Ministry of Foreign Trade, Sudan, 2013). The deferred payment arrangement increased the sheep export prices forcing Saudi Arabia to stop importing the Hadi sheep during the Hajj season from Sudan 5 years ago and shifted to Somalia and Australia for importing the Hadi sheep.

Table 1: Prices of livestock and red meat exports of Sudan during 1990-2013 in US$ per unit

Items	1999/2003	2004/2012	2013
Sheep per head	190	270	330
Cattle per head	250	450	1000
Calf per head	300	550	1100
Goats per head	40	55	90
Mutton per ton	3650	5500	5500
Beef per ton	1750	3500	4000

Source: Ministry of Foreign Trade, Sudan, 2013

The Saudi Arabia is increasing its reliance on imports of sheep to fill the increasing demand for mutton triggered by the increasing number of its citizens and of the coming Hajj pilgrims. The present population of Saudi Arabia is estimated at 20 million persons and is growing ant at an annual rate of 3.8% (Robinson, Lee and Fletcher, 2013). The consumption of sheep-meat ranked second in Saudi Arabia, after poultry, due to the Islamic related tradition and cultural heritage. Table (2) shows the annual per-capita consumption and the market share of sheep meat compared to other sources of meat diet in Saudi Arabia.

Table (2): Saudi Arabia meat consumption per capita per year

Source of meat	Consumption (kg/per capita/year)	Market share (%)
Poultry	32.2	67.4
Sheep/lamb	12.7	26.6
Beef and veal	2.9	6.0
total	47.8	100

Source: Robinson, Lee and Fletcher 2013.

The imports of Saudi Arabia of sheep have been expanding over the years. Table (3) gives the imports of sheep by source of exporting county during 2007-2011 in value (US$ 000) while table (4) gives the same information in percentage. From the two tables, Sudan and Syria appear to be the main exporters of sheep to Saudi Arabia, each providing about 25% of the total imports of sheep during the indicated period. In fact, the exports of Sudan depicted an increasing trend from about 11% in 2007 to about 40% in 2011, almost replacing the share of the exports of Syria. Sudan has the advantage of proximity and quality meat sheep compared to the other countries.

Table (3): Value of Saudi Arabia imports of sheep by source of exporting country (in US$000)

Exporting country	2007	2008	2009	2010	2011	Total
Sudan	68267	55414	138104	181891	279554	723230
Syria	214599	192559	88162	164270	82394	741984
Australia	104007	75017	75830	44613	8805	308272
America	33395	0	0	4471	2979	40845
Djibouti	124343	130345	103772	14517	11399	384376
Others	71472	27046	104886	186326	270573	660303
Total	616083	480381	510754	596088	655704	2859010

Source: ITC. (2012). Calculations based on UNCOMTRADE statistics, Switzerland

Table (4): Percentage share of Saudi Arabia sheep imports by source of country (%)

Exporting country	2007	2008	2009	2010	2011	Total
Sudan	11	12	27	31	43	25
Syria	35	40	17	28	13	26
Australia	17	16	15	7	1	11
America	5	0	0	1	0	1
Djibouti	20	27	20	2	2	13
Others	12	6	21	31	41	23
Total	100	100	100	100	100	100

Source: Table 3 above

The prospects for opening more exports opportunities for Sudan is promising as the Saudi Arabia authorities made plans to increase its imports of sheep from 5 million heads in 2010 to 7 million heads in 2013 (Al Shark Al Awsat News paper- No 12646, dated 13 July 2013). The main reason for increasing imports of sheep is due to shortage of supply during the last 5 years. This is expected to lead to comparative increases in sheep prices for imported sheep. The prices of sheep exported to Saudi Arabia increased from US$ 80 per head in 1990 up to US$115 per head in 1995 and then dropped down to US$ 65 per head in 2000 (Central Department of Statistics Foreign Trade Statistics – Saudi Arabia , 2003). By 2013, the Deputy Chairman of the Livestock Committee of the Jeddah Chamber of Commerce and Industry (JCCI) expected the prices of imported sheep from Somalia and Djibouti to range between SR450 and SR500 per head (equivalent to US$120 - US$133 per head) and those for imported sheep from Sudan to range between SR600 and SR900 per head (equivalent to US$160 - US$240 per head) (Saudi Gazette, October 15, 2013, Jeddah). The locally bred Al-Nuaimi sheep are the most expensive, and their prices range between SR1600 and SR2000 per head (equivalent to US$427- US$533 per head). Such price differences and rank of sheep exports of Sudan is expected to open more opportunity for more imports from Sudan.

Despite such promising export opportunities, the fluctuating numbers and prices of sheep exports from Sudan to Saudi Arabia, and the consequential recent stopping of importing the Hadi sheep from Sudan raise questions about the viability of the export policy of livestock of Sudan. The adoption of explicit and or implicit domestic and trade taxes caused by applying direct taxes or indirect taxes through the application of nominal exchange rate in contrast to that of the real (economic) rate. The purpose of this study is to estimate private and public profitability of sheep exports of Sudan, their competitiveness and if they were subjected to any market distortion in form of explicit or implicit taxes.

Materials and Methods

The study used secondary data obtained from official sources such as the Bank of Sudan, the Ministry of Animal Resources and Fisheries and the Animal Services Company. It also benefited from selected traders and exporters of sheep to Saudi Arabia.

The study used the policy analysis matrix (PAM) method to analyze the competitiveness of sheep exports of Sudan to Saudi Arabia. The PAM can be used to estimate the extent of market prices deviations from the economic prices levels, which in effect gives indication of the extent of the market distortion and degree of miss allocation of resources.

PAM is an accounting matrix that provides information which helps in making policy decisions (Monke and Pearson, 1989). It analyzes effects, not causes of government policy intervention and indicates efficiency losses caused by price distortion. PAM is based on a simple accounting identity "Profit = Revenue – Costs". The inputs and outputs in the matrix are disaggregated into export items (tradables) and domestic items (non-tradeables).

Two types of prices, the private (financial) and the social (economic) prices are used (Monke and Pearson, (1989) and Pearson, Gotsch and Bahri, (2004)). The private prices are collected from prevailing prices (including nominal exchange rates) in the market while the social (economic) prices are calculated by subtracting transfers and using of real exchange rates and of opportunity costs of inputs to reflect their scarcity values in the trade process. The transfers are the values obtained by finding difference between the private and the social prices which estimates the explicit and/or implicit taxes or subsidies encountered in trade process.

The value of the tradeable inputs and outputs are based on the border FOB prices in case of exports and border CIF prices in case of imports. The domestic factors opportunities are based on their shadow prices (Taskole, 1990). However for simplicity, Shadow wage rate of labour is estimated by using assumed ratios provided by World Bank studies on Sudan. As the non–tradable intermediate inputs include both traded and non–traded elements, they are disaggregated into their two components. Each component is priced separately in a disaggregated matrix (table 5).

Table (5): The general structure of a PAM

Description	Revenue	Total Cost		Profit
		Tradable Input	Domestic Factors	
Private or Financial Prices	A	B	C	D
Social or Economic Prices	E	F	G	H
Transfers	I	J	k	L

PAM gives the following indicators:-

- Private or Financial Profit D = A - B - C
- Social or Economic Profit H = E - F - G
- Output Transfers I = A - E
- Input Transfers J = B - F
- Factor Transfers K = C - G
- Net Transfers L = D - H =I - J - K
- Domestic Resource Cost (DRC) Ratio = G / (E - F) (in local currency) .
- Nominal Protection Coefficient (NPC) = A / E
- Effective protection Coefficient (EPC) = (A - B) / (E - F)

More specifically , the estimate of market distortions can be measured by the NPC and EPC. The DRC measures the competitiveness of the exported commodity. If DRC < 1 then the commodity is economically profitable because its production yields more than enough international value added to compensate for the cost of domestic factors used. If DRC = 1, then the economic profitability is equal to zero. If DRC > 1, then the cost of domestic resources needed to generate one unit of foreign exchange exceeds the value of the ruling foreign exchange in the country. Hence, the country is not internationally competitive in the production and marketing of the commodity.

The NPC is used to assess the discrepancies between domestic and international prices. If NPC > 1, then the market price is higher than the border price implying positive incentives (an implicit subsidy). If NPC = 1, then there is no discrepancy between tradeable and non-traseable prices. If NPC < 1, then the market price is lower than the social price, implying taxation.

The EPC measures the protection of a commodity according to the value added rather than finished products. If EPC > 1, then it indicates commodity protection, which is a positive incentive to producers and traders of the commodity. If EPC < 1, then it indicates taxation in the system.

Results

The data obtained from several official sources and sheep exporters indicated the presence of three sizes of sheep exported to Saudi Arabia (small, medium, large). The calculation of the profits and costs were based on the official exchange rate of SDG 5.7: US$1 and an economic exchange rate of SDG 7: US$ 1. Table 6 below gives the summary of tradeable and non-tradeable prices and cost of each size of the purchased sheep in Alkhuway market and along the trip to Port Sudan. About 98% of the total cost was made up of non-tradable factors while only 2% was made up of the tradeable factors. The FOB prices of the exported sheep were considered to be 100% tradeable factors.

Table (6): Summary of tradeable and non-tradeable prices and costs of items related to exported sheep from Alkhuway to Jeddah through Port Sudan, 2013

Item	Tradeable (US$/head)	Tradeable (SDG/head)	Non-tradeable (SDG/head)
Small sheep	187		850
Medium sheep	253		950
Large sheep	320		1100
Shepherd cost			6
Feed cost			6
Quarantine cost			2
Labour cost			1
Transportation cost		20	6.5
Local duties			16.45

Source: based on primary data collected by author

Revenues

The results of PAM analysis indicated the existence of positive financial and economic profits for the three sizes of exported sheep. The total cost of exporting one head of sheep also increased as the size of the sheep increased. Similarly, the private and economic profits increased as the size of the exported sheep increased.

When comparing the private (financial) and the social (economic) profits, it was observed that the economic profits exceeded the financial profits due to explicit and implicit taxes imposed on the exported sheep. The implicit and explicit taxes were estimated at about SDG 299, 405, 512 per head for the small, medium and the large sheep respectively (tables 7 and 8 and 9).

The government benefited from the high prices of sheep in Saudi Arabia market and from the federal, state and local taxes and fees imposed on the exported sheep. However, this situation puts the private sector exporters at a disadvantage in export

market since they cannot compete with other exporting countries. The recent shift in the Saudi government position to import the Hadi sheep from Sudan to Somalia and Australia during the last 5 years may be a case in point.

Moreover, the high prices of sheep of Sudan in Jeddah market are assumed to be influenced by the high taxes and fees levies and the unjustified phenomena of rising prices of sheep in breeding pastures, and in Alkhuway market in Sudan. This would lead to further reduction of the competitiveness of the exports of sheep of Sudan in the Saudi markets at present and in the future.

Table (7): Revenue, cost and profitability of small size sheep (SDG/head)

Description	Revenue	Total cost		Profit
		Tradable Input	Domestic Factors	
Financial Price (private)	1066	20	888	158
Economic Price (social)	1365	20	870	476
Transfers	-299	0	18	-317

Source: Based on primary data collected by author.

Table (8): Revenue, cost and profitability of medium size sheep (SDG/head

Description	Revenue	Total cost		Profit
		Tradable Input	Domestic Factors	
Financial Price (private)	1442	20	988	435
Economic Price (social)	1847	20	970	858
Transfers	-405	0	18	-423

Source: Based on primary data collected by author.

Table (9): Revenue, cost and profitability of large size sheep (SDG/head)

Description	Revenue	Total cost		Profit
		Tradable Input	Domestic Factors	
Financial Price (private)	1824	20	1138	667
Economic Price (social)	2336	20	1120	1197
Transfers	-512	0	18	-530

Source: Based on primary data collected by author.

Table (10) gives the estimated indicators of competitiveness and price incentives distortion of government policy applying explicit and implicit taxes and fees levies on traders and exporters of sheep of Sudan. The DRC results indicated the competitiveness of the 3 sizes of sheep. Again the larger the sheep is the more

competitive one. The NPC and the EPC were all less than one indicating levies of implicit taxes and fees on exported sheep.

Table (10): The estimated incentive indicators of export sheep of Sudan

Sheep size	NPC	EPC	DRC
Small	0.78	0.78	0.65
Medium	0.78	0.78	0.53
Large	0.78	0.78	0.48

Source: Based on primary data collected by author.

Sensitivity Analysis

Experience showed continued variation of observed prices of sheep at the domestic and foreign markets alike. These variations in prices may be caused by increases in cost of feed, high levies of fees, and by recurring drought and/or flood cycles and by unforeseen delays of sheep-boarding in Port Sudan on their way into Saudi Arabia. Accordingly two simple sensitivity analyses were made, one by increasing the price of sheep in Alkhuway market by 30% and the by reducing the price by 30% (tables 11 and 12).

The effect of increasing the local prices of sheep supply by 30%in Alkhuway market in Sudan:

Assume an increase in fees, duties and other services in Sudan would result into respective increases on the supply prices of the three sizes of sheep in Alkhuway market by 30%. Then the small sheep price would increase from SDG 850 to SDG 1105 per head, and of the medium sheep from SDG 950 to SDG1235 per head and of the large sheep from SDG 1100 to SDG1430 per head.

The result of the sensitivity analysis indicated the existence of explicit and implicit taxes same as those estimated above (table 11). However, the competitiveness and the private and the social profits of the exported sheep would drop subsequently. Therefore, the exporters would have less incentive to export sheep to Saudi Arabia than before. Further, the private profit of the small sheep would be negative while those of the medium and the large sheep would drop distinctly. The social profits, though positive, would also drop sharply.

Table (11): Sensitivity analysis of increasing domestic price of export sheep in Alkhuway market

Items	Small sheep		Medium sheep		Large sheep	
	Base price	Increased price	Base price	Increased price	Base price	Increased price
NPC	0.78	0.78	0.78	0.78	0.78	0.78
EPC	0.78	0.78	0.78	0.78	0.78	0.78
DRC	0.65	0.83	0.53	0.68	0.48	0.63
Financial Profit	158	-97	435	150	667	337
Economic Profit	476	221	858	573	1197	867

Source: Based on primary data collected by author

The effect of decreasing the local price of three sheep sizes by30%:

Due to improved policies and good supply of feed and less cost services, the sales of animals would be expected to increase with lower prices. In this case, the expected decrease in the local prices of sheep would be expected to result in high Sudan sheep competitiveness in the Saudi Arabia market. Similarly this would lead to a positive impact on the financial and economic profitability of sheep exports. The financial profitability would increase for all sheep sizes. The small sheep profit would increase from SDG 158 to SDG 413 per head, the medium sheep from SDG 435 to SDG 720 per head and the large sheep from SDG 667 to SDG 997 per head (table 12). The economic profitability would increase for small sheep from SDG 476 to SDG 731per head, for medium sheep increase from SDG 858 to SDG 1143 per head and for the big sheep increase from SDG1197 to SDG 1527 per head.

Table (12): Sensitivity analysis of decreasing the local price of the three sizes of sheep by 30%

Items	Small sheep		Medium sheep		Large sheep	
	Base price	Reduced Price	Base price	Reduced price	Base price	Reduced Price
NPC	0.78	0.78	0.78	0.78	0.78	0.78
EPC	0.78	0.78	0.78	0.78	0.78	0.78
DRC	0.65	0.46	0.53	0.37	0.48	0.34
Financial Profit	158	413	435	720	667	997
Economic Profit	476	731	858	1143	1197	1527

Source: Based on primary data collected by author

Conclusion

The export of sheep of Sudan in Saudi Arabia is competitive as it adds positively to the Sudan economy. It provides highly needed foreign currency at low cost based on tapping the available natural pastures in rural areas. Generally, the reform of taxes and improvement of animal resources services and feed would result in lower cost that lead to more competitive prices for exported sheep of Sudan.

Recommendation

It is important to improve the management of sheep raising system in Sudan and to support it with economic reform such as tax and fees reduction on produced and marketed sheep in order to decrease the marketing cost of sheep that can maintain a competitive sheep exports of Sudan.

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