



**Szent Istvan University**

**Doctoral School of Management and Business Administration Sciences**

**The Thesis for the Ph.D. Dissertation**

**THE COMPETITIVENESS OF GAMBIA'S AGRICULTURAL  
PRODUCTS IN INTERNATIONAL TRADE: AN INCENTIVE  
FOR ECONOMIC PROGRESS**

**By**

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# 1. INTRODUCTION

## 1.1. Introduction

Agriculture is the most important sector in The Gambian economy given its contribution to employment, foreign exchange, food, and its linkages with other sectors of the economy. Indeed, the sector's performance directly mirrors that of the overall economy. The Gambia like in many other African countries, farming systems exhibit a high degree of heterogeneity, livelihood strategies, population pressures, access to markets, institutions, and agro-ecological conditions. Despite The Gambia's ratifications and commitments to numerous agricultural supportive instruments, the country and its regions continue to be challenged and failed to reach the international hunger targets. This, according to FAO are largely attributable to several natural and human-induced disasters resulting in protracted crises with increased vulnerability and food insecurity of large parts of the rural population. In such contexts, measures to protect vulnerable population groups and improve livelihoods have been difficult to implement (FAO, IFAD and WFP, 2015).

In general, farmers in The Gambia produce for home consumption and sell any surpluses at disappointing prices to either local markets or to the middlemen from the neighboring Senegal. Smallholder farmers are caught in a vicious cycle of risks, limited use of inputs, low productivity and low income. The sector is predominantly subsistence, rain fed with very little irrigation or use of improved seeds and fertilizers. In regions where population growth is rapid and rural population density is high, the size of the average household's farming system has been rapidly declining. Thus exposing The Gambia to be considered as a country where food insecurity has become endemic owing to repeated incidence of crop failure, incidence of animal disease outbreak, rising food prices and the lack of adequate support mechanisms to victims.

The key relevant questions are:

1. What are the sources / determinants of agricultural export competitiveness in The Gambia?
2. What kind of relationship exists between competitiveness and comparative advantage in the case of Gambia's agricultural products?

3. What policies can be implemented to enhance the efficiency in the production and export competitiveness of Gambia's agricultural products?

The thesis is an attempt to answer these timely questions.

## **1.2. Research Objectives and Importance of the Topic**

The general research objectives are two folds: to identify the factors behind The Gambia's slower agricultural export growth and to recommend possible policy measures to effectively address these factors. In particular, the research has set the following specific objectives:

1. To empirically test the agricultural export competitiveness, its stability, and effects on Gambia's economic advancement.
2. To propose solutions to the problems and development strategies as sound and effective policy implications.

As for the significance of the topic, export performance and competitiveness has been found to have a positive impact on economic growth in The Gambia and other countries by creating employment, bringing in foreign exchange, capital, technology and other important resources such as market knowledge. The research is conducted in line with the topic for agricultural policy makers to implement policies that aim at increasing the value, revenue, efficiency, and growth rate of agricultural exports in The Gambia.

## **1.3. Research Hypotheses**

The research has set the following hypotheses:

1. The contribution of agriculture is low and decreasing in Gambia's economy.
2. The Gambia's agricultural products are diverse and differentiated on global markets.
3. The Gambia's agricultural export competitiveness is low and fluctuating on global markets.

4. The Gambia's competitiveness in agricultural export has a positive relationship with economic growth and development.

The structure of the thesis is divided into five main sections. Following the Introduction, chapter 2 presents the Literature Review. Chapter 3 reveals the Research Methodology. Chapter 4 presents the Results and Discussion, while section 5 illustrates the New Scientific Findings. Conclusions and Policy Implications are provided in Chapter 6.

## 2. LITERATURE REVIEW

Competitiveness is the foundation of modern economies. Company leaders and decision makers constantly explore different ways to increase the competitiveness of their firms, industries or nations. Understanding whether an industry like agriculture uses its resources efficiently and whether it can be expected to do so in the future, is a central question for policymakers. Effective decision making involves a full understanding of what factors determine competitiveness at different levels (micro and macro), and how they can improve their performance and efficiency.

### 2.1. Descriptions of Competitiveness

*At the macro-economic level, competitiveness is much more poorly defined. GARELLI (2012) establishes a link between the two levels by suggesting that firms are responsible for creating economic value, while nations create an environment to encourage firms to achieve this value.*

The most widely accepted definition, today is the one given by the World Economic Forum (WEF, 2015: 4.), defining national competitiveness as “set of institutions, policies, and factors that determine the level of productivity of a country”. It is interesting, however, that an earlier WEF report identified competitiveness as ‘the ability of a country to achieve sustained high rates of growth in GDP per capita’ (WEF, 1996). This old definition reflects the early thinking on competitiveness, though GDP per capita is used even today as an index of measuring competitiveness in WEF’s reports.

*Although comparative and competitive advantages are sometimes used interchangeably, they are distinct concepts.* Comparative advantage is based on labor and capital differences and can be considered as a micro-economic concept with a focus on industry-specific trade. However, various other factors (such as, infrastructure, technology, and conducive environment) determine the competitiveness of a nation. In other words, competitive advantage is based on comparative advantage but many other factors are needed for a nation to become competitive (BHAWSAR and CHATTOPADHYAY, 2015).

## 2.2. Measurement of Competitiveness

WEF assumes that economic development of developing countries are factor driven where well-functioning institutions, infrastructure, macroeconomic environment, and health and primary education (pillars 1-4) are key for future growth. In the next stage when incomes and prices rise, quality and efficiency become engines of growth, so factors such as higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness, and market size matter (pillars 5-10). In the final phase, differentiation and innovation helps in keeping standards of living high, so factors such as, business sophistication and innovation (pillars 11-12) proven to be central to economic development.

## 2.3. The Most Competitive Nations in The World

According to IMD's World Competitiveness Yearbook, USA, Hong Kong, and Singapore were the most competitive countries globally. Other countries in the top 10 were all from Western Europe, except Canada. The IMD suggests that USA's rank one, is a result of its strong business efficiency, financial sector, its highly innovative environment, and the effectiveness of its infrastructure. In this report, Asian and Eastern-European countries show mixed results, while some decline can be observed for Latin America.

**Table 2.1.** Top 10 Country Ranks by IMD in 2015

Country	Rank of 2015 (out of 61)	Score (1-100)	Rank of 2014
USA	1	100.000	1
Hong Kong (SAR)	2	96.037	4
Singapore	3	94.950	3
Switzerland	4	91.916	2
Canada	5	90.410	7
Luxembourg	6	89.411	11
Norway	7	87.915	10
Denmark	8	87.077	9
Sweden	9	85.921	5
Germany	10	85.637	6
The Gambia	123	3.48 (score 1-7)	125

Source: JAMBOR & BABU (2016)



### 3. MATERIALS AND METHODS

One of the main interests in this research is to estimate the empirical models for causality tests and explain their applications to different sets of data. Probably the most well-known index for analyzing trade-based competitiveness of nations is the *Revealed Comparative Advantage* (RCA), calculating the proportion of a country's share of exports for a single commodity to the exports of all commodities and the similar share for a group of selected countries, expressed by BALASSA (1965) as follows:

$$RCA_{ij} = \left( \frac{X_{ij}}{X_{it}} \right) / \left( \frac{X_{nj}}{X_{nt}} \right) \quad (1)$$

where,  $X$  means export,  $i$  indicates a given country,  $j$  is a given product,  $t$  is a group of products and  $n$  is the group of selected countries. Hence, a revealed comparative advantage (or disadvantage) index of exports can be calculated by comparing a given country's export share by its total exports, with the export share by total exports of a reference group of countries. If  $RCA > 1$ , a given country has a comparative advantage compared to the reference countries, or in contrast, a revealed comparative disadvantage if  $RCA < 1$ .

The Balassa (RCA)-index is criticized because it neglects the different effects of agricultural policies and exhibits asymmetric values. Trade structure is distorted by different state interventions and trade limitations. While the asymmetric value of the RCA index ranges from one to infinity if a country enjoys comparative advantage, but for countries with a comparative disadvantage, it varies between zero and one, hence overestimating the sector's relative weight.

Besides calculating revealed comparative advantages, the literature suggests that its stability and duration should be measured by estimating a survival function  $S(t)$ . This can be done by using the non-parametric Kaplan–Meier product limit estimator, pertaining to the product level distribution analysis of the RSCA index. Following BOJNEC and FERTO (2014), a sample contains  $n$  independent observations denoted  $(t_i; c_i)$ , where  $i = 1, 2, \dots, n$ , and  $t_i$  is the survival time, while  $c_i$  is the censoring indicator variable  $C$  (taking on a value of 1 if failure occurred, and 0 otherwise) of observation  $i$ . It is assumed that there

are  $m < n$  recorded times of failure. We denote the rank-ordered survival times as  $t(1) < t(2) < \dots < t(m)$ . For the purpose of our analysis let  $n_j$  indicate the number of subjects at risk of failing at  $t(j)$  and let  $d_j$  denote the number of observed failures. The Kaplan–Meier estimator of the survival function is then (with the convention that  $\hat{S}(t) = 1$  if  $t < t(1)$ ) as follows:

$$\hat{S}(t) = \prod_{t^{(i)} < t} \frac{n_j - d_j}{n_j} \quad (2)$$

In order to calculate indices above, the chapter uses the World Bank WITS software based on COMTRADE, an international trade database developed by the United Nations at the HS six-digit level as a source of raw data. Agri-food trade is defined as trade in product groups HS 1 to 24, resulting in 739 products using the six-digit breakdown. The chapter works with trade data for the period of 1995 to 2014.

The first part of the research analysis employs Gambia’s agricultural products trade data of World Bank (2017) World Integrated Trade Solution (WITS) database at HS-6 level between 1995 and 2014 with the following product codes included: 120220, 150810, 080130, 120210, 030613, 230500, 080450, 030333, 030379, and 071339. It focuses on the export side of the revealed comparative advantage index (B or RCA index) to exclude imports analysis, which is more likely to be influenced by agricultural policy interventions. Secondly, due to econometric and policy reasons, having in mind the high concentration from the top 10 exported products, the author still wants to know in which products The Gambia has a comparative advantage in, possibly in the future from a policy perspective.

## **4. RESULTS AND DISCUSSION**

### **4.1. Descriptive Analysis**

As mentioned in the previous chapter, this section describes The Gambia's most exported agricultural products in global markets. It aims to examine the top 10 exported agricultural products and analyses the top 10 major importers of these products from The Gambia and from whom does she imports them. Gambia's agricultural products trade data of World Bank (2017) World Integrated Trade Solution (WITS) database at HS-6 level between 1995 and 2014 was employed with the following product codes included: 120220, 150810, 080130, 120210, 030613, 230500, 080450, 030333, 030379, 071339, 100640, 170199, 151519, 110100, 240220, 200290, 100610, 100620, 100190, and 090210.

Considering the export competitiveness in agricultural products, it could be observed that shelled groundnuts, crude groundnut oil, and cashew nuts are the three major exported products, amounting for 50% of all the exported products from 1995-2014 (Table 4.2). Moreover, the top 10 products revealed a concentration of 76% from 1995–2014 (Table 4.1). Furthermore, between the periods 1995-1999, 2000–2004, 2005–2009, and 2010–2014, shelled groundnuts, crude groundnut oil, cashew nuts, groundnuts in shell, frozen shrimps and prawns, oil cake [and other residues of groundnuts], guavas, mangoes, and mangosteen, frozen sole, frozen fish, and dried beans, constituted 74%, 86%, 72%, and 74% of global exports of agricultural products, respectively.

**Table 4.1.** Top 10 agricultural exported products, 1995-2014, by Gambia (in 1000 US\$)

Product	1995-1999	2000-2004	2005-2009	2010-2014	1995-2014
Shelled groundnuts	3619	859	2535	2528	2385
Crude groundnut oil	0	3587	1936	2634	2039
Fresh / dried cashew nuts	166	19	1085	3670	1235
Groundnuts in shell	905	1548	20	341	703
Frozen shrimps & prawns	1699	404	180	31	578
Oil cake / *GN solid residues	0	850	594	256	425
Guavas & mangoes	368	212	739	30	337
Frozen sole	274	412	280	109	269
Frozen fish	86	60	494	342	246
Shelled dried beans	797	129	0	0	231
<b>Concentration</b>	<b>74%</b>	<b>86%</b>	<b>72%</b>	<b>74%</b>	<b>76%</b>

Note: Products are listed in decreasing order based on their 1995-2014 averages. \*GN: groundnut

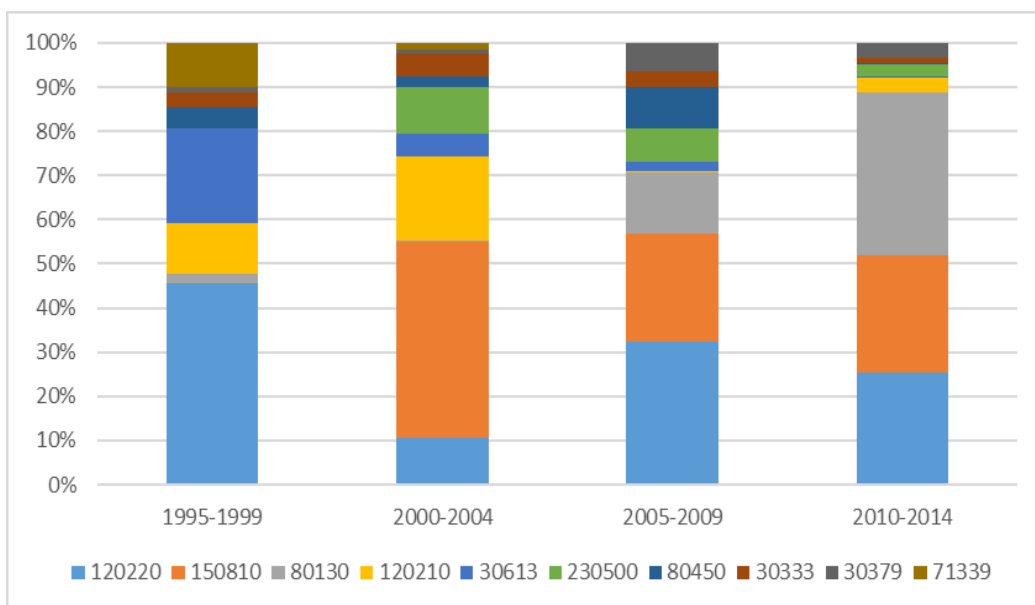
Source: Own calculations based on WITS (2017) data

**Table 4.2.** Top 10 agricultural exported products, 1995-2014, by Gambia, percentage

Product	1995-1999	2000-2004	2005-2009	2010-2014	1995-2014
Shelled groundnuts	34%	9%	23%	19%	21%
Crude groundnut oil	0%	38%	18%	20%	18%
Fresh / dried cashew nuts	2%	0%	10%	27%	11%
Groundnuts in shell	8%	16%	0%	3%	6%
Frozen shrimps & prawns	16%	4%	2%	0%	5%
Oil cake / *GN solid residues	0%	9%	5%	2%	4%
Guavas & mangoes' products	3%	2%	7%	0%	3%
Frozen sole	3%	4%	3%	1%	2%
Frozen fish	1%	1%	5%	3%	2%
Shelled dried beans	7%	1%	0%	0%	2%
<b>Concentration</b>	<b>74%</b>	<b>86%</b>	<b>72%</b>	<b>74%</b>	<b>76%</b>

Source: Own calculations based on WITS (2017) data

Note: \*GN: groundnut



**Figure 4.1.** Top 10 agricultural exported products, 1995-2014, by Gambia, percentage

Source: Own composition based on WITS (2017) data

Note: 120220 - Shelled groundnuts, not roasted or otherwise; 150810 - Crude groundnut oil; 080130 - Cashew nuts, fresh or dried; 120210 - Groundnuts in shell, not roasted or otherwise; 030613 - Frozen shrimps and prawns; 230500 - Oil cake and other solid residues of groundnuts; 080450 - Guavas, mangoes, and mangosteens, fresh or dried; 030333 - Frozen sole; 030379 - Frozen fish; 071339 - Dried beans, shelled.

Since The Gambia is a small open economy, her trade openness in the global market is therefore minimal. The United Kingdom, France, India, and Senegal, were the major importing countries of the top 10 exported agricultural products, amounting to 80% of the total agricultural exports between 1995-2014 (Table 4.4). Effective policies must be implemented by The Gambian authorities to expand and diversify the scope of the global markets. Failure to do so will eventually affect the export industry. Also, any political or bilateral impasse that may occur between The Gambia and these four major importing countries can result in serious economic consequences.

**Table 4.3.** Top 10 importing countries, 1995-2014 (in 1000 US\$)

Country	1995-1999	2000-2004	2005-2009	2010-2014	1995-2014
United Kingdom	1797	2899	2650	3116	2615
France	3140	1904	1966	1622	2158
India	93	17	901	3386	1099
Senegal	872	1211	1559	426	1017
Italy	21	736	2	10	192
Germany	185	428	99	0	178
Mauritania	6	314	369	4	173
Guinea	179	1	460	4	161
Vietnam	0	0	0	572	143
United States	39	92	42	396	142
<b>Concentration</b>	<b>81%</b>	<b>93%</b>	<b>95%</b>	<b>94%</b>	<b>91%</b>

Note: Countries are listed in decreasing order based on their 1995-2014 averages.

Source: Own calculations based on WITS (2017) data

**Table 4.4.** Top 10 importing countries, 1995-2014, percentage

Country	1995-1999	2000-2004	2005-2009	2010-2014	1995-2014
United Kingdom	23%	36%	31%	31%	30%
France	40%	23%	23%	16%	25%
India	1%	0%	11%	34%	13%
Senegal	11%	15%	18%	4%	12%
Italy	0%	9%	0%	0%	2%
Germany	2%	5%	1%	0%	2%
Mauritania	0%	4%	4%	0%	2%
Guinea	2%	0%	5%	0%	2%
Vietnam	0%	0%	0%	6%	2%
United States	0%	1%	0%	4%	2%
<b>Concentration</b>	<b>81%</b>	<b>93%</b>	<b>95%</b>	<b>94%</b>	<b>91%</b>

Source: Own calculations based on WITS (2017) data

## **4.2. Calculations for Analysing Agricultural Products Competitiveness**

The theory of comparative advantage is an economic theory about the work gains from trade for individuals, firms, or nations that arise from differences in their factor endowments or technological progress (MANESCHI, 1998). In an economic model, agents have a comparative advantage over others in producing a particular good if they can produce that good at a lower relative opportunity cost or autarky price, i.e. at a lower relative marginal cost prior to trade. Meanwhile, one does not compare the monetary costs of production or even the resource costs (labour needed per unit of output) of production. Instead, one must compare the opportunity costs of producing goods across countries. The closely related law or principle of comparative advantage holds that under free trade, an agent will produce more of and consume less of a good for which they have a comparative advantage.

As mentioned elsewhere, David Ricardo developed the classical theory of comparative advantage in 1817 to explain why countries engage in international trade even when one country's workers are more efficient at producing every single good than workers in other countries. He demonstrated that if two countries capable of producing two commodities engage in the free market, then each country will increase its overall consumption by exporting the good for which it has a comparative advantage while importing the other good, provided that there exist differences in labour productivity between both countries. Widely regarded as one of the most powerful yet counter-intuitive insights in economics, Ricardo's theory implies that comparative advantage rather than absolute advantage is responsible for much of international trade.

### ***4.2.1. Product Classifications***

The agricultural product groups from HS1 – HS24 used in this study are further sub-categorised as: **1** – live animals, **2** – meat and edible meat offal, **3** – fish and crustaceans, molluscs, and other aquatic invertebrates, **4** – dairy produce (bird's eggs, natural honey, edible products of animal origin, not elsewhere specified or included), **5** – animal originated products, **6** – live trees and other plants; bulbs, roots, and the like; cut flowers, and ornamental foliage, **7** – edible

vegetables and certain roots and tubers, **8** – edible fruits and nuts; peel of citrus fruit or melon, **9** – coffee, tea, mate, and spices, **10** – cereals, **11** – products of the milling industry; malt, starches, inulin, wheat gluten, **12** – oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit, industrial or medicinal plants; straw and fodder, **13** – lac; gums, resins, and other vegetable saps and extracts, **14** – vegetable plaiting materials; vegetable products, not elsewhere specified or included, **15** – animal or vegetable fats and oil and their cleavage products; prepared animal fats, animal or vegetable waxes, **16** – meat, fish, or crustaceans, molluscs or other aquatic invertebrate; preparations thereof, **17** – sugars and sugar confectionery, **18** – cocoa and cocoa preparations, **19** – preparations of cereals, flour, starch or milk; pastrycooks' products, **20** – preparations of vegetables, fruit, nuts, or other parts of plants, **21** – miscellaneous edible preparations, **22** – beverages, spirits, and vinegar, **23** – food industries, residues and wastes thereof; prepared animal fodder, **24** – tobacco and manufactured tobacco substitutes.

Table 4.5 illustrates the revealed comparative advantages and disadvantages in the exports of Gambia's total agricultural products. Product groups greater than 1 shows a comparative advantage and those with figures less than 1 indicate a comparative disadvantage. The country has experienced a comparative advantage in the exports of fish products and other aquatic invertebrates; edible vegetables and certain roots and tubers (but a comparative disadvantage between 2010 – 2014); edible fruits and nuts; vegetable products; animal or vegetable fats and oil; prepared meat, fish, or crustaceans, molluscs or other aquatic invertebrate; prepared food industries, residues and wastes (but a comparative disadvantage between 1995 – 1999).

However, an export comparative disadvantage was recorded for the following agricultural products: live animals; meat and edible meat offal; live trees and other plants; cereals (but an export comparative advantage between 2010 – 2014); and for cocoa and cocoa preparations.

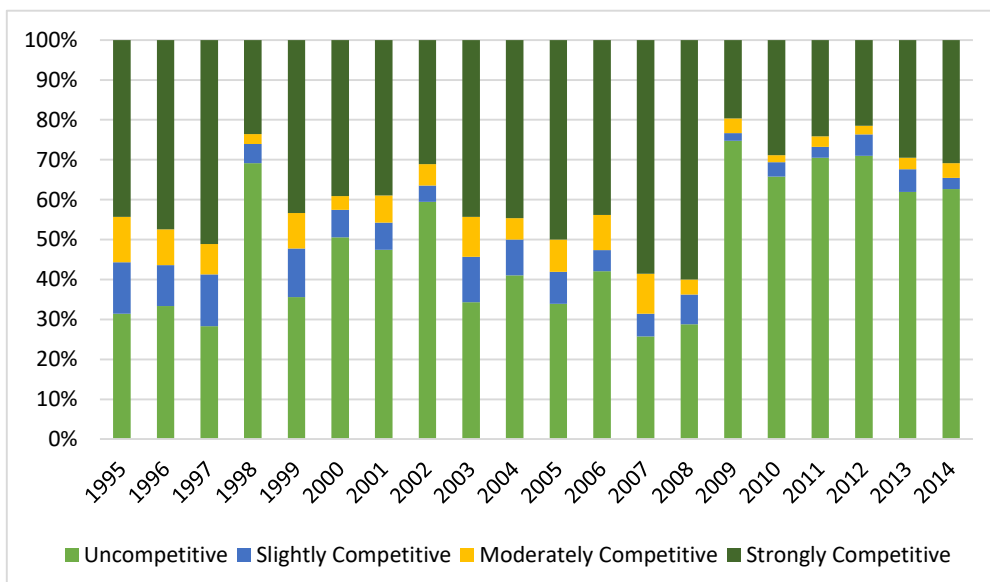


**Table 4.5.** Revealed comparative advantage (RCA) of total agricultural products

Product Codes	1995-1999	2000-2004	2005-2009	2010-2014	1995-2014
1	0.09	0.27	0.00	0.00	0.10
2	0.38	0.00	3.19	0.10	0.92
3	84.97	108.29	133.09	232.04	139.60
4	4.55	1.26	0.09	0.00	1.48
5	6.02	0.48	97.08	3.64	23.11
6	0.39	0.00	0.95	0.01	0.34
7	109.69	145.62	198.37	0.47	113.54
8	59.97	34.62	9302.33	173.89	2392.70
9	15.03	0.36	4.02	0.16	4.89
10	42.64	0.02	0.02	0.22	11.29
11	57.95	2.00	0.19	268.72	82.22
12	932.34	1263.92	1227.89	1434.64	1214.70
13	0.00	0.00	0.00	4.32	1.14
14	839.04	611.69	688.99	1.74	563.45
15	26.39	3967.97	1202.04	665.62	1465.51
16	17.19	10.57	8.68	31.39	16.96
17	12.90	1.17	0.00	0.00	3.52
18	0.00	0.00	0.32	0.00	0.08
19	2.68	0.02	0.24	0.00	0.74
20	3.25	0.41	4.16	0.52	2.08
21	1.71	0.24	1.66	0.07	0.92
22	3.23	0.98	27.50	0.87	8.15
23	0.31	3707.01	7499.58	676.66	2970.89
24	5.20	0.50	0.00	0.00	1.42

Source: Own calculations based on (WITS) 2017

The competitiveness of Gambia’s agricultural products in the global market improved significantly between 1995 and 1997 and between 2007 and 2008, however, temporal fluctuations have been experienced (Figure 4.2). These products were most competitive in 2007 and 2008, despite the 2008 world food and economic crisis, and least competitive in 2009.



**Figure 4.2.** Changes of B-index in time by categories in Gambia’s agricultural products  
Source: Own composition based on (WITS) 2017

**Table 4.6.** Kaplan-Meier survival rates for Balassa indices and tests for equality of survival functions for Gambia’s agricultural products, 1995-2014 (HS1 – HS12)

Years	Survivor function	HS1	HS2	HS3	HS4	HS5	HS6	HS7	HS8	HS9	HS10	HS11	HS12
1995	0.9969	0.9821	1	0.9904	1	1	1	0.9972	0.9954	1	0.9948	1	0.9963
1996	0.9931	0.9821	1	0.9739	0.995	1	1	0.9882	0.993	0.9969	0.9948	0.9974	0.9923
1997	0.9891	0.9821	1	0.9669	0.9871	1	0.9891	0.985	0.9903	0.9871	0.989	0.992	0.9923
1998	0.9752	0.9717	1	0.9523	0.9732	1	0.9779	0.9715	0.9816	0.9701	0.959	0.9723	0.979
1999	0.9698	0.9717	1	0.9408	0.9644	0.9833	0.966	0.9626	0.9785	0.9559	0.9529	0.9723	0.979
2000	0.9618	0.9717	1	0.9123	0.9553	0.9833	0.966	0.9551	0.972	0.9411	0.9398	0.9602	0.979
2001	0.9565	0.9717	1	0.8885	0.9489	0.9833	0.966	0.9491	0.9685	0.9296	0.9329	0.9602	0.9738
2002	0.9475	0.9717	1	0.8615	0.9386	0.9833	0.966	0.9427	0.9611	0.9174	0.9112	0.9602	0.9738
2003	0.9423	0.9717	1	0.8498	0.935	0.9833	0.966	0.9382	0.9571	0.9131	0.8957	0.9565	0.9738
2004	0.9369	0.9717	1	0.8274	0.935	0.9833	0.966	0.9307	0.9529	0.9083	0.8957	0.9565	0.9738
2005	0.9316	0.9717	0.9961	0.8142	0.9306	0.961	0.966	0.9252	0.9483	0.9032	0.8957	0.9565	0.9738
2006	0.9248	0.9717	0.9961	0.794	0.9207	0.9375	0.966	0.9129	0.9483	0.8975	0.8957	0.9565	0.9738
2007	0.9191	0.9717	0.9914	0.7876	0.9152	0.9375	0.966	0.9059	0.9426	0.8911	0.8957	0.9565	0.9656
2008	0.911	0.9717	0.9862	0.7766	0.9027	0.9375	0.9177	0.9059	0.9362	0.8838	0.8957	0.9503	0.9656
2009	0.8781	0.9717	0.9862	0.7429	0.8521	0.9375	0.8603	0.863	0.9362	0.8066	0.8612	0.9282	0.9434
2010	0.8439	0.9403	0.9713	0.719	0.7866	0.9063	0.8272	0.8264	0.9278	0.7409	0.8238	0.9108	0.9175
2011	0.8	0.9403	0.9713	0.7131	0.7002	0.8338	0.8272	0.7832	0.9278	0.6429	0.7804	0.8904	0.8879
2012	0.7535	0.9403	0.9713	0.7131	0.6053	0.8338	0.7721	0.7679	0.9024	0.542	0.6968	0.8765	0.8879
2013	0.6886	0.9403	0.9152	0.7131	0.5256	0.8338	0.7721	0.7324	0.884	0.3915	0.5807	0.8561	0.8879
2014	0.5697	0.9403	0.8474	0.6723	0.3597	0.4169	0.6618	0.6592	0.8486	0.2472	0.4645	0.8133	0.8357
Log-rank test	0.0000												
Wilcoxon test	0.0000												

Source: Own calculations based on (WITS) 2017

**Table 4.7.** Kaplan-Meier survival rates for Balassa indices and tests for equality of survival functions for Gambia's agricultural products, 1995-2014 (HS13 - HS24)

Years	Survivor function	HS13	HS14	HS15	HS16	HS17	HS18	HS19	HS20	HS21	HS22	HS23	HS24
1995	0.9969	1	1	0.9956	1	0.9957	1	0.9967	1	1	0.9968	1	0.9773
1996	0.9931	1	1	0.9909	1	0.9957	1	0.9967	1	0.9962	0.9934	1	0.9773
1997	0.9891	1	1	0.9835	1	0.986	1	0.9967	0.9981	0.9921	0.9934	1	0.9606
1998	0.9752	0.9808	1	0.9708	0.9918	0.9709	0.9828	0.9696	0.9841	0.9664	0.9857	1	0.9256
1999	0.9698	0.9808	1	0.9655	0.9831	0.9657	0.9828	0.9577	0.9841	0.9576	0.9857	1	0.9256
2000	0.9618	0.9808	1	0.9573	0.9831	0.9547	0.9828	0.9494	0.9819	0.9484	0.9813	1	0.9256
2001	0.9565	0.9808	1	0.9544	0.9783	0.9432	0.9828	0.9494	0.9795	0.9484	0.9766	1	0.9256
2002	0.9475	0.9808	1	0.9451	0.9783	0.9192	0.9828	0.9447	0.9694	0.9379	0.9565	1	0.9256
2003	0.9423	0.9808	1	0.9353	0.9729	0.9066	0.9828	0.9396	0.9694	0.9323	0.9565	1	0.8914
2004	0.9369	0.9808	1	0.9317	0.9671	0.9066	0.9828	0.9284	0.9694	0.9262	0.945	0.9901	0.8793
2005	0.9316	0.9808	1	0.9279	0.948	0.899	0.9828	0.9284	0.9694	0.9262	0.9324	0.9901	0.8527
2006	0.9248	0.9808	1	0.9238	0.9271	0.899	0.9828	0.9219	0.9694	0.9114	0.9324	0.9785	0.8377
2007	0.9191	0.9808	1	0.9146	0.9271	0.899	0.9649	0.9147	0.9618	0.9033	0.9244	0.9785	0.821
2008	0.911	0.9808	1	0.9095	0.9271	0.8773	0.9448	0.8983	0.9576	0.8848	0.9154	0.9785	0.7819
2009	0.8781	0.9808	1	0.8865	0.8653	0.8279	0.9448	0.8328	0.9228	0.8328	0.8838	0.9638	0.7595
2010	0.8439	0.9808	1	0.8474	0.8068	0.7858	0.9185	0.7808	0.9053	0.7634	0.8599	0.9478	0.7071
2011	0.8	0.9195	1	0.7934	0.7512	0.7203	0.8201	0.7198	0.8329	0.6581	0.8308	0.9296	0.7071
2012	0.7535	0.9195	1	0.7354	0.6813	0.6586	0.6561	0.6148	0.7803	0.5663	0.7516	0.9074	0.7071
2013	0.6886	0.9195	1	0.6685	0.5596	0.4868	0.5047	0.4611	0.7193	0.4854	0.7238	0.875	0.6429
2014	0.5697	0.9195	1	0.619	0.3358	0.337	0.2163	0.2306	0.6321	0.3236	0.5308	0.875	0.5357
Log-rank test	0.0000												
Wilcoxon test	0.0000												

Source: Own calculations based on (WITS) 2017

Survival chances of 100% at the beginning of the period reduced to 57% by the end of the period, illustrating that there exists flexible competition in Gambia's agricultural products trade. Results of survival functions of the analysed agricultural products differed, proposing that the highest survival periods exist for HS-14 product group (vegetable products and plaiting materials), giving the broad majority of Gambia's agricultural products trade (Table 4.7), while the lowest exist for HS-18 product group (cocoa and cocoa preparations), followed by product groups HS-19 (preparations of cereals, flour, starch or milk; pastrycooks' products), as depicted in Table 4.7. The equality of the survival functions across the agricultural products was estimated using two non-parametric tests (Wilcoxon and Log-rank tests). Findings of the tests reveal that the hypothesis of equality across survivor functions can be rejected at the 1% level of significance, meaning that similarities in the duration of comparative advantage across Gambia's agricultural exports are absent.

The following hypotheses developed on the onset of the research were found to be true and acceptable:

1. The contribution of Gambia's agriculture in the economy was discovered to be diminishing, as in compliance with the first hypothesis. Effective and efficient policy measures should be implemented in order to increase higher productivity for domestic consumption and export competitiveness.
2. The diversity and differentiation of Gambia's agricultural products on global markets were positively investigated and found to be true, as illustrated elsewhere in the dissertation. This should be noted and well maintained by the concern authorities.
3. The Gambia's agricultural export competitiveness was found to be fluctuating on global markets, specifically between 2009 and 2014, as depicted in Figure 4.2. Agricultural policies and measures for higher export and stability should implemented.
4. Lastly, there exist a positive correlation between agricultural export competitiveness and economic progress in The Gambia, as illustrated in table 4.5. The high comparative advantages in most of the exported products have also served as one of the determinants for the correlation.

This is in line with export-led growth (ELG) theories, as illustrated in chapter 2 of the dissertation.

## 5. NEW AND NOVEL SCIENTIFIC ACHIEVEMENTS

Based on the calculations of The Balassa Indices and data trend, the following new scientific results were explored.

1. The categories of Uncompetitive, Slightly Competitive, Moderately Competitive, and Strongly Competitive in Gambia's agricultural products in time were newly examined and discovered by the author using Balassa Indices.
2. It was freshly discovered by the author that The United Kingdom, France, India, and Senegal, were the major importing countries of The Gambia's top 10 exported agricultural products, amounting to 80% of the total agricultural exports between 1995-2014. The country's export dependency is strongest in these countries.
3. Survival chances of Gambia's agricultural products in the international market were also evaluated and there exist a flexible competition in the products' trade. According to the author's new findings, the highest survival periods exist for vegetable products and the lowest exist for cocoa products.
4. High comparative advantages in the exports of fish products and other aquatic invertebrates; edible fruits, vegetables, and nuts; animal and vegetable fats and oil; prepared food industries, residues and wastes, were among the new and novel discoveries in this research. However, an export comparative disadvantage was recorded for the following agricultural products: live animals; meat and edible meat offal; live trees and other plants; cereals and for cocoa products.
5. Finally, the author has developed and outlined some key policy implications and development strategies that could lead for the improvement and maximization of the export competitiveness of Gambia's agricultural products in global markets.

## **6. CONCLUSIONS AND POLICY IMPLICATIONS**

### **6.1. Concluding Remarks**

Competitiveness is a central topic in modern economics with various definitions, interpretations and measurement methods. The WEF (2015), conceptualized competitiveness “as the set of institutions, policies, and factors that determine the level of productivity of a country”. According to them, the level of productivity, in turn, sets the level of prosperity that can be reached by an economy. The productivity level also determines the rates of return obtained by investments in an economy, which in turn are the fundamental drivers of its growth rates. In other words, a more competitive economy is one that is likely to grow faster over time.

There are basically two levels at which competitiveness can be interpreted – micro and macro. At the micro-economic level, the understanding of competitiveness is pretty straightforward – it is “the ability of firms to consistently and profitably produce products that meet the requirements of an open market in terms of price [and] quality” (DOMAZET, 2012: 294-295). In comparison, at the macro-economic level, competitiveness is much more purely defined. The most widely accepted definition nowadays is the one given by the World Economic Forum (WEF), defining national competitiveness as “set of institutions, policies and factors that determine the level of productivity of a country” (WFP, 2015: 4).

Consequently, the stability of The Gambia’s agricultural export competitiveness is of great significance to her economic wellbeing. Growth in this sector creates employment, helps to increase aggregate demand which influences higher economic growth, plays an important role in determining current account deficit, and so on. Moreover, the level of exports can be determined by competitiveness, quality and value added products, exchange rates, long run productivity, and economic growth from other countries. Meanwhile, findings in this research reveal that The Gambia’s competitiveness in agricultural export has a positive relationship with economic growth and development. This is due to the high concentration of the top 10 exported products from the total agricultural exports in global markets.



Meanwhile, the export competitiveness of the agricultural products in the international market notably improved between 1995 and 1997 and between 2007 and 2008. However, temporal fluctuations have been realized as depicted in figure 5.3. According to the findings, the products were most competitive in 2007 and 2008, despite the 2008 world food crisis, and least competitive in 2009.

Findings of survival functions of the selected agricultural products varied, proposing that the highest survival periods exist for HS-14 product group (vegetable products and plaiting materials), giving the broad majority of Gambia's agricultural products trade (see Table 4.7), while the lowest exist for HS-18 product group (cocoa and cocoa preparations), followed by product groups HS-19 (preparations of cereals, flour, starch or milk; pastrycooks' products), as shown in Table 4.7. Survival chances of 100% at the beginning of the period diminished to 57% by the end of the period, highlighting that there exists moderate trade competition in Gambia's agricultural products.

## **6.2. Policy Implications**

Agricultural policy describes a set of laws relating to domestic agriculture and imports of foreign agricultural products. Government authorities usually implement agricultural policies with the objective of accomplishing a specific outcome in the domestic agricultural product markets. Outcomes can involve, for example, a guaranteed supply level, price stability, product quality, product selection, land use or employment. Based on the findings of the study and data trends, some key implications and development strategies that could lead for improvement and maximizing the export competitiveness of Gambia's agricultural products based on the applied approach were developed in a bid to accelerate competitiveness and progress to end low productivity both within The Gambia and in the sub-region. As such, coherent sound and effective policy implementation shall inform partners on emerging research and innovation, developments in global, regional, and national policies and programs for market competitiveness.

First and foremost, the 12 pillars (indicators) of World Economic Forum's Global Competitiveness Report relating to: institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness, market size, business sophistication, and innovation, should be well noted by The Gambia's export industry. The first four pillars are essential for factor driven economies, pillars 5-10 are important for efficiency-driven economies, while the rest are the engines of innovation-driven economies.

Any agricultural policy that seeks to drive down production costs with little concern of what the impact on consumer value could be doing may harm the competitiveness of the value chain. Modernization plans should be implemented within the context of maximizing value - driving down production costs and increasing export quantity should not be the only index or indicator of competitiveness as is typically affiliated with traditional economic approaches (MARSDEN et al., 2001). The availability of market information to farmers, technicians, packers, and exporters could positively contribute towards the competitiveness of the agricultural export sector. Also, as emphasized by ASEM-BANSAH et al., (2012), the creation of information networks can be an important component of value chain competitiveness.

A comprehensive project on Nutrition Sensitive Agriculture (NSA) is recommendable to encourage diversified food and animal production aimed at improving the nutritional quality of the products to be exported in global markets. Agricultural extension actions should include adequate training programs on irrigation methods to improve the products' quality. Better market linkages that will help producers secure better prices for their commodities and to access local and global markets should be instituted. Youth participation in the agricultural value chain including value addition should be motivated. In addition to the above recommendations, farmers' access to production inputs, meteorological data and early warning information should be enhanced.

Moreover, production represents a successful area for policy analysts. Nonetheless, post-harvest operations should be noted, including post-harvest disease control techniques that are paramount for improving quality of sea products, crops, and livestock and negating perishability. Some of the techniques for Gambia's better export competitiveness are illustrated below:

- Adoption of quality control technology;
- Exercising preservation treatments;
- Ratification of controlled environment storage technology;
- Adopting incentives for purchasing quality cold-controlled transportation; and
- Improvement of quality and safety systems.

Lastly, Foreign Direct Investment Flow (FDIF) has been established to have a positive impact on export performance in different countries. The Gambia must try to attract more foreign direct investment not only to improve its export competitiveness, but also to earn foreign exchange, and to bring in capital, technology, and other important resources such as market knowledge.

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## APPENDIX: Author's Publications in Topic

### JOURNAL PUBLICATIONS

- [1]. GIBBA, A. (2017). *Analysis of Export Competitiveness: The Case of Global Nuts*. Albanian J. Agric. Sci., 16(2), 39-49.
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- [5]. GIBBA, A. (2016). *Evaluation of Export Expansion Impact on Economic Growth in Sub-Saharan Africa*. Vadym, 2(29), 57-61.

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[1]. GIBBA, A., & NYASSI, N. (2017). *Evaluation of the Impacts of Social Protection Schemes in Rural Gambia*. Essays in Economics and Business Studies, p. 21-28. In: 4<sup>th</sup> IRI Economics Conference. Bratislava, Slovakia. DOI: 10.18427/iri-2017-0060.

[2]. GIBBA, A., & MOLNAR, M. (2016). *An Empirical Study on Factors of Economic Growth in The Gambia: Lessons from Agriculture and Exports*. Vadym, 2(29), 63-69. Presented In: 2<sup>nd</sup> International Conference on New Approaches in Sciences, Engineering, & Technology, Istanbul, Turkey.

[3]. GIBBA, A., & MOLNAR, J. (2015). *Analysis of Gambia Groundnut Export Competitiveness*, p. 387-393. In: International Scientific Conference on Corporate Social Responsibility and Human Resource Management in V4 Countries. Nitra, Slovakia.

[4]. GIBBA, A., & MOLNAR, J. (2015). *A study on Exports as a Determinant of Economic Growth in The Gambia*. Some Studies of Economics Changes, p. 237-244. In: 2<sup>nd</sup> IRI Economics Conference. Komarno, Slovakia.

### BOOKS PUBLISHED

[1]. GIBBA, A. (2015). *A Study on Exports as a Determinant of Economic Growth in The Gambia: The Case of The Groundnut (Peanut) Sector*. Deutschland: LAMBERT Academic Publishing, no. of pages: 124.