

## **Competitiveness of Sri Lankan Rubber Products in the Global Market: A Constant Market Share Analysis**

Ishani, P. G. N.<sup>1\*</sup>, Sankalpa, J. K. S.<sup>1</sup>, Wijesuriya, W.<sup>2</sup> and  
Rathnayaka, A. M. R. W. S. D.<sup>2</sup>

<sup>1</sup> *Agriculture Economics Division, Rubber Research Institute of Sri Lanka, Dartonfield, Agalawatta, Sri Lanka 12200*

<sup>2</sup> *Biometry Section, Rubber Research Institute of Sri Lanka, Dartonfield, Agalawatta, Sri Lanka 12200*

*\*Corresponding Author:  
Email: pgn.ishani@gmail.com*

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### **ABSTRACT**

This study examines the competitiveness of Sri Lankan rubber products exports in the international market and determines the contributory factors behind the export growth of these products. Four rubber products that account for more than 95% of the rubber products export earnings during the last five years were selected for the analysis. The Constant Market Share model was used to decompose the export growth of these products into the contributing factors responsible for the export performance. Overall, exports of the above mentioned four rubber products to their major import destinations have grown during the study period of 1999-2019. The results of the decomposition analysis revealed that export growth of the Retreated and Solid Tyres (HS 4012) was mainly due to the general and specific competitiveness of the country. The structural factors and the general competitiveness effect together have been more significant in explaining the growth of exports of New Pneumatic Tyres (HS 4011). The export growth of Gloves of Vulcanized, Unhardened Rubber (HS 4015) was primarily determined by the structural effects. The main contributor to the export growth of Other Articles of Vulcanized Rubber (HS 4016) varied across main import destinations. Whilst the general competitive effect was the main contributor to the export growth of this product into the EU and Australia, it was either specific competitive effect or market effect in the USA, Japan and Canada import destinations. Certain innovations are necessary in the case of some products where general or specific competitive effects were not prominent figures that determined their export performance. Further, the dual strategy of penetrating into new markets while improving our share in existing markets through improving competitiveness is essential to improve our share in the global rubber industry.

**KEYWORDS:** Rubber, Trade, Competitiveness

### **Introduction**

Competitiveness can be defined as the sustained ability to profitably gain and maintain market share in the domestic or export market (Porter, 1990). It has been proven in the economic literature that competitiveness leads to better allocation of scarce resources (Dhehibi and Frija, 2009; Singh and Dey, 2011).

With increasing competition in global markets, firms and nations are more and more interested in realising their competitiveness relative to their competitors.

Natural rubber (NR) has an exclusive position among other agricultural products by influencing industrial development. This is due to a range of unique inherent characteristics, such as elasticity, vibration absorption, abrasion resistance, malleability, heat resistance and dispersion, electrical insulation, gas impermeability and water resistance (Kurian and Mathew, 2011; Cornish, 2014; Yeang, 2020). The applications of rubber are widespread, ranging from household to industrial products. Further rubber is considered as a strategic industrial raw material that concurred special status globally for defence, national security and industrial development (Kurian and Mathew, 2011; UNESCAP, 2011; Cornish, 2014; Yeang, 2020). Almost all NR is from a single species, *Hevea brasiliensis*, the Para rubber tree (Kurian and Mathew 2011; Cornish 2014; Yeang 2020). On a macro level, global NR production and consumption have gradually increased over the past decades. South Asian countries produce more than 95% of the world's NR production to cater to the increasing world rubber demand (International Rubber Study Group, 2020).

The global rubber products market is a very sophisticated place, where demand and competition are high. The rubber products market consists of over 50,000 products that serve different customer needs in diverse sectors including automotive, industrial, agricultural, mining and health (Ministry of Finance of Sri Lanka, 2017). Globally, rubber product exports earn a total revenue exceeding 118 billion US\$ by converting over 28 million tons of NR and synthetic rubber (WITS, 2020). Global rubber industry and production are facilitated by the growth of the automobile, medical, aviation, electronics, and building and construction industries (Yeang, 2020).

As a resource-based technologically sophisticated industry, the rubber industry plays a vital role in the Sri Lankan economy (Ministry of Plantation Industries of Sri Lanka, 2017). In 2019, NR cultivation contributed to 0.2% of the total GDP of the country and the contribution of rubber products export earnings to the total export earnings in Sri Lanka was 7.3 % in 2019 (Central Bank of Sri Lanka, 2019). Sri Lanka's Rubber Industry can be divided into two strongly linked segments as raw rubber production sector and the value-added sector. Over the years, the main focus of the industry has shifted from raw rubber production to the value addition sector (Ministry of Plantation Industries of Sri Lanka, 2017). More than 80% of the raw rubber produced in the country is absorbed by the rubber products manufacturing sector (Central Bank of Sri Lanka, 2019; International Rubber Study Group, 2019).

The history of the rubber manufacturing sector goes back to 1950 with rubber re-treading and expanded rapidly after the introduction of open trade policies and the development of industrial zones in the late 1970s. The finished products sector includes nearly 250 small, medium and large-scale manufacturing units, and such industries are scattered around the country. At present, Sri Lanka exports a wide range of value-added products including tyres, tubes, articles of unhardened rubber, like gloves, apparel clothing accessories, industrial components, biomedical devices and food packaging materials (Export Development Board, 2019).

The turnover from rubber, including NR was recorded as 0.9 US\$ billion in 2019 compared to 0.2 US\$ billion in 1999 (Central Bank of Sri Lanka, 2019; WITS 2020).

Although the value of rubber export earnings is a decent figure compared to Sri Lankan external trade, it accounts for a relatively minor share (less than 1%) in the global rubber industry (WITS, 2020). Hence, certain innovations are necessary for increasing market share and the competitiveness of Sri Lankan rubber trade in the world market to fully utilise the abundant resource base of the country. Focusing on the significance of the international rubber trade in Sri Lanka, it is worth examining the way forward of rubber products trade and competitiveness.

No prominent studies reported in the literature that focus on analyzing the competitiveness of rubber products of Sri Lanka in the world market. Although there are studies that focused on analyzing the export growth performance of the country during the past (Sankalpa *et al.*, 2013), no studies are reported that measured the competitiveness of rubber products categories. Therefore, the non-availability of international trade indicators of rubber exports may generate an incapability of proper decision making. Making the correct and timely decisions when required is also a crucial factor in international trade and delayed response to the market changes may have drastic losses of gain from trade.

With this background, the main objectives of this analysis are to measure the competitiveness of Sri Lankan rubber products exports in the international market and to determine the contributory factors behind the export growth of these products. This objective is accomplished using the Constant Market Share (CMS) model, which decomposes the export growth into different components responsible for export performance. The other objective of this study is to examine the trends and structure of the global and local rubber industries. The results can be used by the decision-makers in the Sri Lankan rubber industry to gain a better understanding of our competitiveness in the key rubber product import destinations and what measures should be taken to maintain and improve Sri Lanka's export performance in the import market of rubber products.

## **Data and Methodology**

### **Data**

This study employed secondary data gathered from the Export and Import data bank of the Ministry of Plantation Industries of Sri Lanka, World Integrated Trade Solutions (WITS) and Trade Map (International Trade Centre's trade statistics for international business development). The data cover a period of 21 years (1999 to 2019). Four finished rubber products with the largest share in the total value of rubber and rubber products export earnings of Sri Lanka at the disaggregated level and the top five importers of these products during the last five years (2015-2019) were selected for the analysis. The selection of major importing countries was made in a two-step process. First, the average import value of countries for the sample period was computed. Then, the first five countries were selected after ranking those countries based on the average import values.

Here, all 27 European Union countries and the United Kingdom (UK) were considered as a single export destination. The four-digit harmonised classification system (HS) was used to classify the four finished rubber products used in this study.

## **Methodology**

The concept of competitiveness should be converted into tangible metrics that let firms or nations to rank or measure their performance against others. These tangible metrics are generally referred to as indicators, and these indicators help policymakers and decision-makers to identify the prevailing conditions and can be used as remedies to overcome their deficiencies. With the growing interest in these indicators, there appears a large number of studies that have focused on determining the indicators or composite measures which can best represent the competitiveness of the firms or nations (Inal, 2003).

From these indicators, Domestic resource cost (DRC) (Bruno, 1972), Revealed comparative advantage (RCA) (Balassa, 1965), and Constant market share (CMS) (Tyszynski, 1951; Krugman and Hatsopoulos, 1987) have been extensively used to measure international trade competitiveness (Dhehibi and Frija, 2009; Singh and Dey, 2011). The DRC method uses social profitability to measure the comparative advantage. The major drawback of this method is the extensive data requirement (Cai, Leung and Hishamunda, 2009). RCA method uses international trade specialisation patterns to draw conclusions on competitiveness. This method does not provide direct policy implications and the factors determining export growth or competitiveness (Balassa, 1965; Singh and Dey, 2011; Rostandine, 2019).

The CMS approach is commonly used in the international trade literature to measure the competitiveness of export products. The CMS approach uses an export country's market share in an import market as a measure of competitiveness. The competitiveness improves in line with the improvement in market share (Bowen and Pelzman, 1984; Fagerberg and Sollie 1987; Ahmad Klasra and Fidan 2005; Singh and Dey 2011). The CMS approach breaks down export growth into several factors and offers valuable information on changing patterns of competitiveness in international trade and the export performance of the countries (Ahmad Klasra and Fidan 2005). This method has been successfully applied in agriculture, aquaculture and the manufacturing sector to measure the international competitiveness (Richardson 1971; Bowen and Pelzman 1984; Fagerberg and Sollie, 1987; Ahmadi-Esfahani, 1993; Feldman, 1994; Lloyd and Toguchi, 1996; Chen, Xu and Duan, 2000; Chen and Duan, 2001; Ahmad Klasra and Fidan, 2005; Singh and Dey, 2011; Rostandine, 2019). When considering the applications of this approach in the rubber sector, Alias and Suleiman (1990) have applied this method to measure the competitiveness of NR exports by the major producing countries. Further Joseph and George (2015) used this method to measure the international competitiveness of selected rubber products exports of India. Considering the drawbacks of other methods and the ability of the CMS method to decompose the export growth into contributing factors that account for the export performance, we have selected the CMS method to conduct this study.

**CMS Approach**

Following Chen and Duan (2001), the change in the value of exports is first decomposed into three broader categories as the structural effect, the competitive effect, and the second-order effect (equation 1).

$$\Delta q = \sum_i \sum_j s_{ij}^0 \Delta Q_{ij} + \sum_i \sum_j Q_{ij}^0 \Delta s_{ij} + \sum_i \sum_j \Delta s_{ij} \Delta Q_{ij} \quad [1]$$

*Structural Effect   Competitive Effect   Second order Effect*

These broader categories are further decomposed into subcomponents at the second-stage decomposition. At the second-stage decomposition, the structural effect is further broken down into four components as growth effect, the market effect, the commodity effect and the interaction effect. Then the competitiveness effect is broken down into two components as general competitive effect and the specific competitive effect, and the second-order effect is split into two components as pure second-order effect and the dynamic structural effect as given in equation 2.

$$\Delta q = s^0 \Delta Q + (\sum_i \sum_j s_{ij}^0 \Delta Q_{ij} - \sum_i s_i^0 \Delta Q_i) + (\sum_i \sum_j s_{ij}^0 \Delta Q_{ij} - \sum_j s_j^0 \Delta Q_j) +$$

*Growth Effect   Market Effect   Commodity Effect*

$$[(\sum_i s_i^0 \Delta Q_i - s^0 \Delta Q) - (\sum_i \sum_j s_{ij}^0 \Delta Q_{ij} - \sum_j s_j^0 \Delta Q_j)] + \Delta s Q^0 +$$

*Structural Interaction Effect   Pure Residual*

$$(\sum_i \sum_j s_{ij}^0 Q_{ij}^0 - \Delta s Q^0) + (Q^1/Q^0 - 1) \sum_i \sum_j \Delta s_{ij} Q_{ij}^0$$

*Static Structural Residual   Pure Second-order Effect*

$$\left[ \sum_i \sum_j \Delta s_{ij} \Delta Q_{ij} - (Q^1/Q^0 - 1) \sum_i \sum_j \Delta s_{ij} Q_{ij}^0 \right] \quad [2]$$

*Dynamic Structural Residual*

- q : focus country's export value to destination j for commodity i
- s : focus country's share of the world exports of rubber products
- Q : total world exports of rubber products;
- i stands for commodities (i=1,...n), j stands for destinations (j = 1,... m)
- 0 for the base period,1 for the terminal period

The decomposition above is appropriate when analysing the total exports of a country. Here we analyse the selected four rubber products for only selected countries on a dis-aggregate basis. Therefore, there is no commodity effect and structural interaction effect (the interaction of commodity and market effects). The interpretations of these decomposition items are listed in Table 1.

**Table 1: Interpretations of Decomposition Items**

<b>Decomposition Items</b>	<b>Interpretation</b>
Change in export value	The change in the country's export value
Growth Effect	Part of the export growth of the focus country is due to the general increase in world exports
Market Effect	The effect of the import market or market destination on the focused country's exports. This effect is positive if the focused country has concentrated its exports in markets that are experiencing relatively rapid growth than the world or otherwise
Commodity Effect	This effect indicates the extent to which the exports of the focus country are concentrated in commodities with growth rates higher or lower than the world average
Structural Interaction Effect	The change in exports due to the interaction of the specific commodity and market effects of countries, given that the focused country's competitiveness is unchanged
Pure Residual Effect	The part of the export growth in the focus country is attributed to a general increase in competitiveness.
Static Structural Residual	Part of the export growth in the focus country is attributed to the focus country's export structure change. A positive value indicates that the change in the focus country's export structure has a favourable impact on its export performance; a negative value indicates otherwise.
Pure second-order effect	The change in exports due to the interaction of changes in an exporting country's export structure with the change in the level of world imports, given that the world's export structure is unchanged
Dynamic structural residual	The change in exports is due to the interaction of changes in the focus country's export structure with changes in the world's export structure. A positive value indicates that the focus country has a rapidly growing share in markets (commodities) to which the world's exports are growing relatively rapidly; a negative value indicates otherwise.

*Source: Bowen and Pelzman, 1984; Ahmadi-Esfahani, 1993; Chen et al., 2000; Chen and Duan, 2001; Ahmad Klasra and Fidan, 2005; Singh and Dey, 2011.*

Here, decomposition was done on a yearly basis. Hence, the end of the period in each decomposition becomes the beginning of the next period. Then the results were averaged to obtain values for the entire study period. Hence the year selected as the beginning of the entire period does not dominate the results. As we calculate the competitiveness in absolute measures, it cannot be used to compare competitiveness in each import destination as the import size varies. Therefore, to derive relative measures, the decomposed values were divided by export growth for each import destination in the study period (Chen and Duan, 2001; Singh and Dey, 2011).

## Results and Discussion

### Global Trade of Rubber Product

World rubber market is mainly concentrated in China, Europe, India, the USA, and Japan. They were the top five natural rubber consuming countries in 2019. China was the world's largest natural rubber consumer, consuming 5497 thousand tonnes in 2019, making up 40% of the world's total rubber consumption (International Rubber Study Group, 2020). Thailand has been the world's largest producer and exporter of NR since 1991 (Romyen *et al.*, 2018). The value of world rubber and rubber products export was about US\$ 42 billion in the year 1999, and it has remarkably increased up to about US\$ 112 billion in the year 2019 (WITS, 2020). The total value of global exports of rubber and rubber products grew at a rate of 4% during the 21 years from 1999 to 2019.

Global trade statistics showed that during 2015-2019, a significant fraction (about 58%) of the rubber products trade earnings were derived from Pneumatic, Retreated and Solid Tyre trade. The other products that have a considerable contribution to the total rubber earnings are Other Articles of Vulcanised Rubber, Tubes, Pipes and Hoses of Vulcanised Rubber and Gloves of Vulcanised or Unhardened Rubber.

### *Export & Imports of New Pneumatic Tyres in the Global Market*

Details of the top 10 exporters and importers of New Pneumatic Tyres in the global market during 2015-2019 are presented in Table 2.

**Table 2: Global Export & Import Markets of New Pneumatic Tyres (HS 4011)**

Top ten exporters of the Global New Pneumatic Tyres (HS 4011) market during 2015-2019				Top ten importers of the Global New Pneumatic Tyres (HS 4011) market 2015-2019			
	Size of the Market (US\$ Billion)	Share %	Rate of Growth (%)		Size of the Market (US\$ Billion)	Share %	Rate of Growth (%)
China	14.17	19	1.9	USA	14.67	19	1.4
Germany	5.71	8	1.2	Germany	6.73	9	1.2
Thailand	4.37	6	13.4	France	3.51	5	1.6
Japan	5.06	7	-0.8	Mexico	3.13	4	-0.5
USA	4.86	6	-0.3	Canada	3.06	4	-0.3
S Korea	3.40	4	-0.4	Netherlands	2.74	4	4.2
France	2.68	4	-1.3	UK	2.67	3	2.5
Netherlands	2.47	3	2.3	Italy	2.24	3	2.9
Spain	2.26	3	3.8	Australia	1.98	3	4.2
Poland	2.13	3	2.0%	Russian Federation	1.63	2	12.2

While China is the leading exporter of New Pneumatic Tyres, capturing 19% of the global market, the USA is the leading importer during the period considered. Among the top exporters, the highest growth rate of 13.4% was recorded in Thailand.

Other exporters showed a positive growth rate during the period, except for Japan, the USA, South Korea and France. Russia showed the highest growth rate of 12.2% on imports. Except for Mexico and Canada, the rest showed positive growth in New Pneumatic Tyre imports.

When it comes to the Sri Lankan condition, the rate of growth of this product during this period was negative (-2.7), and the share in the world market is less than 1% (0.24%).

### ***Export & Imports of Retreated & Solid Tyres in the Global Market***

The details of exporters and importers of Retreated and solid Tyres in the global market during 2015-2019 against the countries are presented in Table 3. Sri Lanka holds the number one position in Retreated and solid Tyre exports in the global market, followed by Germany and China. During this period, Spain recorded the highest growth rate of 8.7%. Except for China and the USA, other countries showed a positive growth rate during this period.

The USA is the number one importer of Retreated and Solid Tyres followed by Germany and France. During this period, except UK other countries showed positive growth in imports. The highest growth rate of 7.39% was recorded in China.

**Table 3: Global Export & Import Markets of Retreated & Solid Tyres (HS 4012)**

Top ten exporters of the Retreated & Solid Tyres (HS 4012) market during 2015-2019				Top ten importers of the Retreated & Solid Tyres (HS 4012) market during 2015-2019			
	Size of the Market (US\$ Million)	Share %	Rate of Growth (%)		Average Size of the Market (US\$ Million)	Share %	Rate of Growth (%)
Sri Lanka	339.63	13	5.2	USA	1943.10	15	0.55
Germany	270.70	11	3.0	Germany	1067.32	8	4.11
China	163.18	6	-1.2	France	818.85	6	6.07
Netherlands	164.23	6	1.6	Netherlands	641.01	5	0.86
France	153.28	6	3.0	China	422.71	3	7.39
Belgium	151.00	6	3.5	Canada	462.64	4	0.04
USA	143.90	6	-2.6	Belgium	394.47	3	2.34
Japan	96.75	4	4.8	Italy	358.68	3	2.55
Thailand	88.13	3	3.5	Thailand	318.86	3	5.37
Spain	75.44	3	8.7	UK	393.20	3	-2.99



***Export & Imports of Gloves of Vulcanised or Unhardened Rubber in the global market***

The top ten exporters and importers of Gloves of Vulcanised or Unhardened Rubber in the global market are presented in Table 4. In the glove market, Malaysia holds the position of number one exporter and the USA is the number one importer. From the exporters, Vietnam showed the highest growth rate of 20.6%. In this market, except for the USA, all other exporters from the top ten exporters showed a positive growth rate during the last five years. Sri Lanka ranked as the seventh-largest glove exporter with 8.5% positive growth rate.

From the importers, all ten countries showed a positive growth rate while China showed the highest growth rate of 18%.

**Table 4: Global Export & Import Markets of Gloves of Vulcanised or Unhardened Rubber (HS 4015)**

Top ten exporters of the Gloves of Vulcanised or Unhardened Rubber (HS 4015) market during 2015-2019				Top ten importers of the Gloves of Vulcanised or Unhardened Rubber (HS 4015) market during 2015-2019			
	Size of the Market (US\$ Million)	Share %	Rate of Growth (%)		Size of the Market (US\$ Million)	Share %	Rate of Growth (%)
Malaysia	3783	51	6.0	USA	2470	31	6
Thailand	1073	14	5.8	Germany	594	8	4
China	621	8	7.6	Japan	427	5	7
Belgium	262	4	12.2	UK	314	4	3
Germany	263	4	3.9	China	199	3	18
Indonesia	257	3	2.2	Netherlands	204	3	14
Sri Lanka	192	3	8.5	Italy	221	3	3
Netherlands	149	2	13.4	France	209	3	4
VietNam	127	2	20.6	Canada	193	2	5
USA	155	2	-0.1	Brazil	193	2	2

***Export & Imports of Other Articles of Vulcanized Rubber in the global market***

The top ten exporters and importers of Other Articles of Vulcanized Rubber in the global market during 2015-2019 listed with the details are presented in Table 5. In this market, Germany is the largest exporter and the USA is the largest importer. From the exporters, the highest growth rate of 9.5% was shown by Mexico. All the top ten exporters showed positive growth of Other Articles of Vulcanized Rubber exports during this period. While all the importers showed positive growth in Other Articles of Vulcanized Rubber imports, Poland showed the highest growth rate of 5%.

When it comes to Sri Lankan condition, Sri Lankan exports were growing at a rate of 4.7% during this period. And the Sri Lankan share in the world exports is around 0.42%.

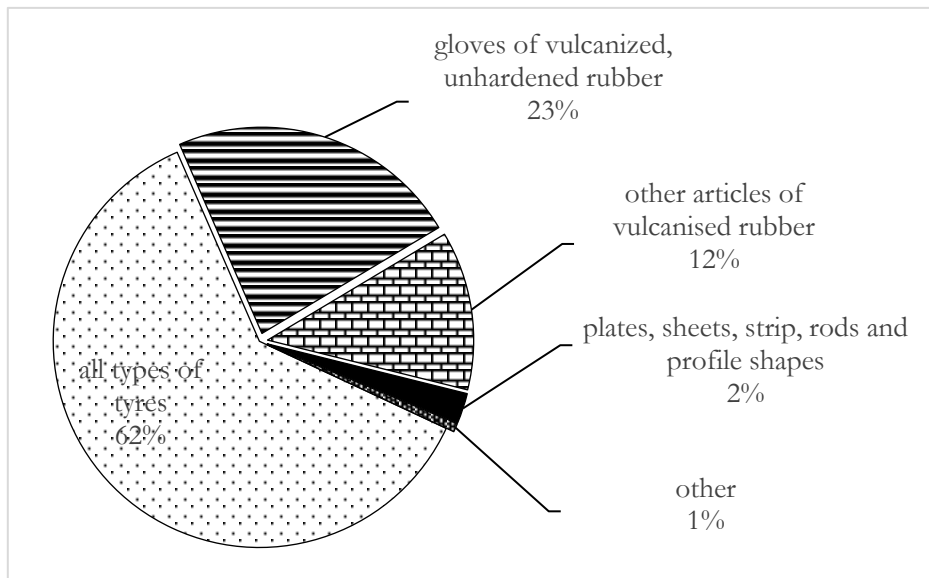
**Table 5: Global Export & Import Markets of Other Articles of Vulcanized Rubber (HS 4016)**

Top ten exporters of the Other Articles of Vulcanized Rubber (HS 4016) market during 2015-2019				Top ten importers of the Other Articles of Vulcanized Rubber (HS 4016) market during 2015-2019			
	Size of the Market (US\$ Million)	Share %	Rate of Growth (%)		Average Size of the Market (US\$ Million)	Share %	Rate of Growth (%)
Germany	3840.83	15	3.9	USA	4166.17	15	2.05
USA	2754.14	11	1.4	Germany	3023.96	11	3.39
China	2365.36	9	2.7	China	2200.62	8	2.19
Poland	1458.53	6	5.1	Mexico	1631.34	6	1.95
Japan	1533.80	6	1.7	Canada	970.24	3	1.84
France	1176.23	5	3.7	France	942.75	3	3.52
Italy	1123.86	4	4.5	Japan	834.55	3	3.40
Mexico	738.25	3	9.5	UK	868.50	3	0.21
Thailand	698.62	3	3.5	Poland	668.69	2	5.07
Spain	616.71	2	4.0	Czech Republic	705.33	2	3.03

**Sri Lankan Rubber Products Trade**

The rubber industry plays a vital role in strengthening the external sector of Sri Lanka. Rubber export trade mainly consists of three streams, including raw rubber (HS 4001), semi-processed rubber (From HS 4003 to HS 4006) and rubber finished products (From HS 4007 to 4017). The export earnings of Sri Lanka from value-added rubber products are steadily growing compared to that of raw rubber. Total revenue generated from rubber products increased from US\$ 159 million in 1999 to US\$ 870 million in 2019.

During 2015-2019, more than 96% of the total export earnings of the country were derived from finished rubber products (WITS, 2020). Pneumatic, Retreated and solid Tyre sectors have contributed to nearly 62% of the total export earnings from rubber products during this period. The growth rate of average annual export earnings from the Pneumatic, Retreated and Solid Tyre sectors during the 1999 to 2019 period in the country is around 12%, which is higher than the world average of 6%. Other rubber products which have a significant contribution to the total rubber product income are Gloves of Vulcanized, Unhardened Rubber and Other Articles of Vulcanised Rubber (Fig. 1).



**Figure 1: Share of different rubber products in Sri Lankan rubber products exports (Average from 2015 –2019)**

The glove sector and the Other Articles of Vulcanized Rubber in the country have grown at a 5% and 12% rate respectively during the last two to three decades.

### **Analysis of Competitiveness**

#### ***New Pneumatic Tyres of Rubber (HS 4011)***

The results of the yearly average CMS decomposition of the change in New Pneumatic Tyre export values to major five importers from 1999-2018 are summed in Table 6.

In general, Sri Lanka's exports of New Pneumatic Tyres have increased in the selected import destinations during this study period. Major import destinations for this product were the USA, EU, India, Tanzania and UAE. According to the results of the first level of decomposition, structural effect (SE) and competitive effect (CE) were the main contributors to the increase in Sri Lankan exports to above mentioned five import markets. Although SE was positive in all countries, the magnitude of contribution varied across the selected countries. CE was positive in all countries except in India. The second-order effect, which means the influence of the interaction between changes in market share and world demand, exerted a negative or minor contribution to the growth in exports to these markets.

At the second level of decomposition, the major sources that improved the Sri Lankan export into the USA and UAE markets were the growth effect, market effect, general competitive effect and pure second-order effect. The growth effect that is the increased demand for New Pneumatic Tyres in the international market and the increase in the market share of these types of products (general competitive effect) have been responsible for the Sri Lankan export growth into the EU market.

Market effect was the main positive source of growth into the Indian market. In this market, the main factor retarding the growth of Sri Lankan exports over this period was a decline in specific competitiveness. While the specific competitive effect was the main factor that enhanced the Sri Lankan exports into Tanzania, the pure second-order effect and dynamic structural effect were the major two factors retarding exports.

Overall, the market effect was positive in all countries except for the EU. The reason was that our exports were mostly concentrated in fast-growing markets as compared to the world's New Pneumatic Tyre market. Although general competitiveness was positive in all import destinations, the specific competitive effect that represents the influence of the change in competitiveness of an exporting country specific to the particular import destination was positive only in the Tanzanian market.

**Table 6: New Pneumatic Tyres (US\$ '000)**

	<b>USA</b>	<b>EU</b>	<b>India</b>	<b>Tanzania</b>	<b>UAE</b>
Export Growth	49,779	40,505	5,538	5,159	1,449
	100%	100%	100%	100%	100%
<b>First Level of Decomposition</b>					
Structural Effect	25,455	13,925	12,679	1,865	1,718
	51%	34%	229%	36%	119%
Competitive Effect	12,421	25,239	-5,674	26,490	41
	25%	62%	-102%	513%	3%
Second Order Effect	11,903	1,341	-1,467	-23,195	-310
	24%	3%	-26%	-450%	-21%
<b>Second Level Decomposition</b>					
Growth effect	13,802	25,409	372	-43	315
	28%	63%	7%	-1%	22%
Market effect	11,653	-11,484	12,307	1,908	1,404
	23%	-28%	222%	37%	97%
General competitive effect	12,775	32,418	291	125	1,104
	26%	80%	5%	2%	76%
Specific competitive effect	-354	-7,179	-5,965	26,365	-1,062
	-1%	-18%	-108%	511%	-73%
Pure second order effect	12,665	2,902	-329	-5,843	1,196
	25%	7%	-6%	-113%	83%
Dynamic structural effect	-762	-1,561	-1,138	-17,352	-1,506
	-2%	-4%	-21%	-336%	-104%

**Retreated & Solid Tyre (HS 4012)**

The average results of the yearly CMS decomposition of the change in Retreated and Solid Tyre export values to major five importers from 1999-2019 are summarised in Table 7.

**Table 7: CMS - Retreated & Solid Tyres (US\$ '000)**

	EU	USA	Canada	Australia	Japan
Export Growth	122,318	103,228	13,191	6,732	1,581
	100%	100%	100%	100%	100%
First Level of Decomposition					
Structural Effect	-93547	-33738	-2410	-945	5164
	-76%	-33%	-18%	-14%	327%
Competitive Effect	3,024,777	176,252	14,695	8,722	-755
	2473%	171%	111%	130%	-48%
Second Order Effect	-2808912	-39286	905	-1045	-2828
	-2296%	-38%	7%	-16%	-179%
Second Level Decomposition					
Growth effect	-106064	-10354	793	-762	607
	-87%	-10%	6%	-11%	38%
Market effect	12517	-23384	-3203	-183	4557
	10%	-23%	-24%	-3%	288%
General competitive effect	91,007	23,447	7,904	2,282	3,513
	74%	23%	60%	34%	222%
Specific competitive effect	2933771	152806	6791	6440	-4267
	2398%	148%	51%	96%	-270%
Pure second order effect	-448194	-11490	2396	339	301
	-366%	-11%	18%	5%	19%
Dynamic structural effect	-2360718	-27796	-1490	-1384	-3130
	-1930%	-27%	-11%	-21%	-198%

Major importers of Retreated and Solid Tyres from Sri Lanka were the EU, USA, Canada, Australia and Japan. Retreated and Solid Tyre exports from Sri Lanka to major importers have increased during the study period. The results of the first level of decomposition indicated that the major contributing factor to the export growth in these all import destinations except Japan was the competitive effect. The structural effect was the main factor in improving Sri Lankan exports into the Japanese market.

Based on the second level decomposition, the specific and general competitive effects were the major two factors that enhanced the Sri Lankan Retreated and Solid Tyre exports into all these import destinations. Apart from the above mentioned two factors, the market effect also contributed significantly to the export growth of this product into the Japanese market. The dynamic structural effect was responsible for retarding the Sri Lankan exports into all import destinations. Again, the pure second-order effect was also retarding this product's exports into the EU and USA.

***Gloves of Vulcanised, Unhardened Rubber (HS 4015)***

The average results of the yearly CMS decomposition of the change in Gloves of Vulcanised, Unhardened Rubber export values to major five importers from 1999-2019 are summed in Table 8.

**Table 8: CMS - Gloves of Vulcanised, Unhardened Rubber (US\$ '000)**

	<b>EU</b>	<b>USA</b>	<b>Brazil</b>	<b>Canada</b>	<b>India</b>
Export Growth	58,266	28,203	12,874	5,245	12,435
	100%	100%	100%	100%	100%
<b>First Level of Decomposition</b>					
Structural Effect	60,096	37,182	2	4,312	22,909
	103%	132%	0.02%	82%	184%
Competitive Effect	1,961	-3,585	7,143	2,402	-7,761
	3%	-13%	55%	46%	-62%
Second Order Effect	-3,790	-5,394	5,729	-1,469	-2,712
	-7%	-19%	44%	-28%	-22%
<b>Second Level Decomposition</b>					
Growth effect	50,957	42,572	3,585	2,697	2,215
	87%	151%	28%	51%	18%
Market effect	9,138	-5,390	-3,582	1,615	20,694
	16%	-19%	-28%	31%	166%
General competitive effect	4,536	6,590	89	238	202
	8%	23%	1%	5%	2%
Specific competitive effect	-2,575	-10,175	7,054	2,165	-7,963
	-4%	-36%	55%	41%	-64%
Pure second order effect	-4,712	-5,070	634	-899	-1036
	-8%	-18%	5%	-17%	-8%
Dynamic structural effect	922	-324	5,094	-570	-1,677
	2%	-1%	40%	-11%	-13%

The major import destinations of Gloves of Vulcanised, Unhardened Rubber from Sri Lanka were the EU, USA, Brazil, Canada and India. The gloves exports from Sri Lanka to all selected import destinations have increased during this study period. At the first level of decomposition, a major contributor to the export growth in all these import markets except Brazil was the structural effect. In Brazil, the major contributor to the export growth of gloves was the competitive effect.

At the second level of decomposition, the growth effect in varying degrees was the main contributor to the growth of glove exports from Sri Lanka to all selected import destinations. Although the general competitive effect was positive in all import destinations, the magnitude of this effect was very low. The specific competitive effect was responsible for significant improvement in this export into Brazil and Canadian markets. Except in Brazil, the two secondary effects exerted a negative effect on the Sri Lankan glove exports to other four import destinations.

**Other Articles of Vulcanized Rubber (HS 4016)**

**Table 9 CMS - Other Articles of Vulcanized Rubber (US\$ '000)**

	EU	USA	Japan	Canada	Australia
Export Growth	40860	38551	2525	7089	1303
	100%	100%	100%	100%	100%
First Level of Decomposition					
Structural Effect	15450	10,782	2,489	-506	964
	38%	28%	99%	-7%	74%
Competitive Effect	17,058	29,812	1,232	7,526	647
	42%	77%	49%	106%	50%
Second Order Effect	8,352	-2,042	-1,195	69	-308
	20%	-5%	-47%	1%	-24%
Second Level Decomposition					
Growth effect	14,908	4,290	515.27	-57.601	214
	36%	11%	20%	-1%	16%
Market effect	542	6,492	1,974	-448	750
	1%	17%	78%	-6%	58%
General competitive effect	25,244	7,626	1571.86	1776.65	525
	62%	20%	62%	25%	40%
Specific competitive effect	-8,185	22,186	-340	5,750	121
	-20%	58%	-13%	81%	9%
Pure second order effect	7,056	344	-512	124	-161
	17%	1%	-20%	2%	-12%
Dynamic structural effect	1,296	-2,386	-683	-56	-147
	3%	-6%	-27%	-1%	-11%

The average results of the yearly CMS decomposition of the change in Other Articles of Vulcanized Rubber to major five importers from 1999-2019 are summed in Table 9.

Major importers of Other Articles of Vulcanized Rubber products during the study period were EU, USA, Japan, Canada and Australia. In general, the export of this product has increased in all selected import destinations during the studied period. At the first level of decomposition, the major contributory factor to the export growth into all markets except Japan was the competitive effect. The structural effect was the main contributory factor to export growth into the Japanese market.

At the second level of decomposition, high general competitive effect and also growth effect and the pure second-order effect contributed to Sri Lankan Other Articles of Vulcanised Rubber products export growth into the EU market. Growth effect, market effect, general competitive effect and specific competitive effect exerted a positive impact on these products' export growth into the USA market. The specific and general competitive effects were the two major factors that enhanced the Sri Lankan Other Articles of Vulcanised Rubber products export into Canada. Major sources that improved the Sri Lankan export into the Australian market were the general competitive effect, growth effect and specific competitive effect.

Overall, the general competitive effect was the main factor that contributed to the increase of Sri Lankan exports of this product into all import destinations with varying magnitudes. Further, as the market effect was negative in only one market indicates that our products are mainly concentrated in markets where the demand for this product was growing.

## **Conclusion**

The analysis of the performance of the New Pneumatic Tyres of Rubber (HS 4011) revealed that a major portion of the exports directed to developed countries and emerging markets. Export revenue growth of this product was mainly due to the growth in value of world Pneumatic Tyre exports (Structural effect) and the competitiveness effect. As the specific competitiveness of this product was negative in four major import markets out of five, it is important to develop import market-specific trade strategies aiming at these major markets. Further, as the Sri Lankan share in the world New Pneumatic Tyre exports is less than 1%, and the export growth is negative it is necessary to take actions to improve our growth and share in the world market.

The most promising performance was observed in the case of Retreated and solid tyre (HS 4012) exports. As in the case of new pneumatic tyres, the major import markets of this product were developing countries. The improved performance of this product in these major import markets was due to specific and general competitiveness effects. However, as the market effect is negative in most of these import markets, it is worth looking for other markets where the demand is growing for Retreated and Solid tyres. Perspective planning is required to maintain Sri Lanka's position as the number one exporter in the world and to improve the growth rate of exports further.

The case of other articles of vulcanised rubber was unique as mixed results were observed in the selected import markets.



The export performance of this product was primarily determined by the general competitiveness effect. Apart from that, the specific competitive effect and market effect were responsible for the export growth into some countries. As Sri Lanka share in the world export of this product is lower than one percent, and the growth rate is moderate necessary policy actions should be taken to correct this situation.

The analysis of the performance of surgical, industrial and other types of gloves exports shows a market orientation towards EU, USA, Canada like developed countries and India and Brazil like emerging markets. The export growth of this product is mainly determined by the structural effects. This significant influence of the structural effect on export growth is an indicator of the vulnerability of the long-term export prospects of this product. As the specific competitive effect of this product was positive only in two markets and the influence of general competitive effect is relatively low, it is crucial to develop market-specific strategies focusing on the markets where new pneumatic tyre demand is growing.

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