

**DETERMINANTS OF MALAYSIA'S
RESOURCE-BASED RUBBER MEDICAL DEVICES
EXPORT**

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**DETERMINANTS OF MALAYSIA'S
RESOURCE-BASED RUBBER MEDICAL DEVICES
EXPORT**

by

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LIST OF ABBREVIATIONS

ADB	Asian Development Bank
AFTA	ASEAN Free Trade Area
AJCEP	ASEAN-Japan Comprehensive Economic Partnership
AKFTA	ASEAN-Korea Free Trade Agreement
AMMI	Association of Malaysian Medical Industries
AANZFTA	ASEAN-Australia-New Zealand Free Trade Area
ASEAN	Association of Southeast Asian Nations
CAGR	Compounded Annual Growth Rate
CEPII	<i>Centre d'Etudes Prospectives et d'Informations Internationales</i>
EPA	Export promotion activities
ETP	Economic Transformation Programme
EU	European Union
FAO	The Food and Agriculture Organization of the United Nations
FDA	Food and Drug Administration
FMM	Federation of Malaysian Manufacturers
FTA	Free Trade Agreement
HIV	Human Immunodeficiency Virus
H-O	Heckscher-Ohlin
IEMP	Index of Export Market Penetration
JETRO	Japan External Trade Organization

KOTRA	Korea Trade-Investment Promotion Agency
LNG	Liquified Natural Gas
MARGMA	Malaysian Rubber Glove Manufacturers' Association
MATRADE	Malaysia External Trade Development Corporation
MITI	Ministry of International Trade and Industry
MPIC	Ministry of Plantation Industries and Commodities
MRB	Malaysian Rubber Board
MREPC	Malaysian Rubber Exports Promotion Council
MRPMA	Malaysian Rubber Products Manufacturers' Association
NKEA	National Key Economic Area
NR	Natural rubber
OBM	Original Brand Manufacturer
OEM	Original Equipment Manufacturer
OLS	Ordinary least squares
PPML	Poisson-pseudo Maximum Likelihood
PQML	Poisson Quasi Maximum Likelihood
RCA	Revealed Comparative Advantage
RMD	Rubber medical devices
SMG	Standard Malaysian Glove
SR	Synthetic rubber
TPPA	Trans-Pacific Partnership Agreement
UN Comtrade	United Nations Commodity Trade Statistics Database
UNAIDS	The Joint United Nations Programme on HIV/AIDS (UNAIDS)

UNFPA	United Nations Population Fund
WITS	World Integrated Trade Solution

PENENTU EKSPORT PERALATAN PERUBATAN GETAH

BERASASKAN SUMBER MALAYSIA

ABSTRAK

Malaysia merupakan pengeksport utama dunia bagi peralatan perubatan berasaskan sumber getah (RMD) dan menunjukkan kejayaan dalam eksport RMD ditambah nilai berbanding pergantungan kepada getah asli semata-mata. Walau bagaimanapun, Malaysia berdepan cabaran penurunan syer pasaran akibat persaingan daripada negara lain, serta kelembapan syer pasaran global. Kajian ini menyelidik penentu eksport RMD dari Malaysia sepanjang tempoh 1989-2013. Teknik empirik yang digunakan adalah kaedah regresi terkumpul kuasa dua terkecil (pooled OLS), penganggaran model kesan tetap (FE) dan penganggaran model kesan rawak (RE) serta Poisson pseudo-maximum likelihood (PPML). Dapatan kajian menunjukkan pemboleh ubah utama, Keluaran Dalam Negara Kasar (KDNK) pengeksport dan pengimport dan pendapatan khusus industri pembuatan (penganggaran berasingan) adalah signifikan dalam model graviti. Jarak antara negara (proksi bagi kos pengangkutan) adalah tidak signifikan dan ini dijelaskan oleh Indeks Prestasi Logistik (LPI) di mana negara dengan infrastruktur logistik yang kurang maju mungkin tidak mempunyai kos logistik lebih rendah. Pengimport yang mempunyai perbelanjaan kesihatan per kapita yang tinggi menunjukkan keputusan signifikan dalam meningkatkan import RMD manakala negara dengan jumlah orang dengan HIV/AIDS (menunjukkan kesedaran terhadap pencegahan dan kawalan penyakit) tidak signifikan dalam mengurangkan import RMD Malaysia. Semua rakan dagang FTA dua-hala Malaysia menunjukkan hubungan signifikan import

RMD lebih rendah berbanding rakan dagang bukan-FTA dua-hala terutamanya negara-negara besar yang mengimport lebih banyak RMD dari Malaysia secara relatif. Bagi FTA serantau, hanya ASEAN sebagai FTA serantau pertama (bermula 1992) dan ASEAN-China (bermula 2010) adalah signifikan. ASEAN menunjukkan keputusan signifikan dalam meningkatkan eksport RMD manakala dalam FTA ASEAN-China yang dimaterai lebih lambat, Malaysia tidak menerima eksport RMD yang lebih banyak berbanding rakan dagang bukan-FTA yang lain, secara relatif. Kajian ini juga menunjukkan bukti empirik bahawa ses (cukai eksport) mempunyai hubungan negatif yang signifikan dengan eksport RMD, sekaligus menunjukkan potensi kehilangan eksport disebabkan ses. Pada masa yang sama, ses ini digunakan untuk membiayai aktiviti promosi eksport (EPA) yang menunjukkan kesan positif (pejabat luar negara adalah signifikan, manakala misi perdagangan dan penglibatan dalam pameran perdagangan tidak signifikan) terhadap eksport RMD. Model graviti eksport pembuatan berasaskan sumber boleh diperluaskan bagi analisis penentu perdagangan produk berasaskan sumber lain. Malaysia harus mengusahakan jalinan FTA dengan negara-negara besar, berpendapatan tinggi yang lain, atau melalui FTA ASEAN+X serantau, selain meningkatkan usaha eksport ke rakan FTA sedia ada. Para pengksport juga harus memanfaatkan EPA untuk terus meningkatkan eksport RMD dan pada masa yang sama kutipan ses boleh digunakan bagi insentif yang dapat membantu melonjakkan industri.

DETERMINANTS OF MALAYSIA'S RESOURCE-BASED RUBBER MEDICAL DEVICES EXPORT

ABSTRACT

Malaysia is a world leading resource-based rubber medical devices (RMD) exporter and has remarkable success in the value-added RMD export rather than depending on exporting the raw rubber. However, Malaysia faces the challenges of decreasing market share due to increasing competition from other countries, and stagnating RMD market share. This study examines the determinants of Malaysia's RMD export for 1989-2013. Empirical techniques used are Pooled Ordinary Least Squares (OLS), panel estimation of fixed (FE) and random effect (RE) and Poisson pseudo-maximum likelihood. Findings show that the key determinants in terms of exporter's and importers' income and manufacturing industry incomes (separate estimations) are significant in the gravity model. Distance (a proxy for transportation cost) was insignificant but Logistic Performance Index provides the explanation that a country with less developed logistics infrastructure may make transporting costlier to a nearby country. Importers with higher healthcare expenditure per capita showed significance in increasing Malaysia's RMD import while countries with number of people living with HIV/AIDS (indicating disease awareness, infection prevention and control) are not significant in reducing import of Malaysia's RMD. All Malaysia's bilateral FTA partners show significant negative relationship in terms of lower imports relative to other non-bilateral FTA partners especially compared against the export to high income, large countries, relatively. In terms of regional FTAs, only Association of Southeast Nations (ASEAN) as

Malaysia's first regional FTA (since 1992) and ASEAN-China FTA (since 2010) are significant in the regression. ASEAN FTA shows that it increased RMD export while ASEAN-China which took effect much later did not absorb export as much as other non-regional FTA partners. This study provides empirical evidence that cess has a negative relationship with Malaysia's RMD export, indicating a potential export loss with the cess imposition. Concurrently, cess is used to fund export promotion activities (EPAs of oversea office in particular is significant; trade mission and participation in trade fairs were not significant) which contributes positively to RMD export. The resource-based manufacturing export gravity model may be replicated for other resource-based products trade analysis. Malaysia should also pursue FTA with large high-income countries, or through ASEAN+X regional FTAs while concurrently maximise the existing FTAs benefits. Exporters should also continue to tap on the EPAs to increase exports while cess proceeds should continue to be used for incentives to enhance the industry.

CHAPTER 1: INTRODUCTION

1.1 Introduction

Rubber medical devices (RMD) is a main product group of rubber and rubber products from Malaysia. Rubber and rubber products continue to be the main contributor to Malaysia's export revenue, listed among the top ten major export products since 2012 by Malaysia External Trade Development Corporation (MATRADE). In assessing the resource-based manufacturing exports in Malaysia and Thailand, Reinhardt (2000) highlighted that while it is clear that Malaysia experiences major exports in the rubber products industry, the latex-dipped industry such as rubber gloves experienced the greatest success.

In addition, Goldthorpe (2015) also commented that the study of rubber products manufacturing industry in Malaysia contributes to the study of resource-based industrialization. Sharing the same opinion from the business perspective, IOI Corporation Berhad (2015) and Kuala Lumpur Kepong Berhad (2015) stated that resource-based manufacturing business is the downstream activities in the value chain (of the commodity) in the business. To escape the commodity dependency, one of the ways highlighted was to address the downstream constraints of these value-added resource products, which are mainly exported (Farfan 2005).

The biggest driver of Malaysia's manufacturing industry is the resource-based industries between the years of 2002-2012 (Bank Negara Malaysia, 2013). Sander et al.

(2013) noted that vertical diversification was successful in rubber and rubber products sector in Malaysia where rubber gloves itself accounted for about half (own calculation shows 41% in 2013) of the total export value of raw rubber and processed products. This is in contrast to oil and gas processed products which makes up only around 35% of total petroleum (raw and processed) exports; and palm oil sector where only 19% of total palm oil and palm oil processed products are made up of processed value-added products (calculation by CEIC Data and World Bank as reported in Sander et al., 2013). International Labour Organisation (ILO) (2016) noted that given Malaysia's rubber gloves leading position in the global market, the study on rubber gloves deserves 'special attention'.

The Minister of Plantation Industries and Commodities (The Business Year, 2017) and industry members such as Latexx Partners (Yap, 2012) and Top Glove (Pemandu, undated) also dispelled the perception that RMD industry in Malaysia is a sunset industry and instead they emphasized that the industry is growing. This is in contrast to Goldthorpe (2015) review of studies that found the lack of interest among economists in the study of analysis rubber product manufacturing. The reasons are perception of policymakers that the rubber plantation industry and rubber product manufacturing has limited growth, and the view in the 1970s and 1980s that rubber trees are a sunset crop.

RMD market consists of three main components: rubber gloves, sheath contraceptives and rubber catheters¹. The Association of Malaysian Medical Industries

¹ Rubber catheters are not included in this study due to the lack of data on the exports of solely rubber catheters. The currently available Harmonised System (HS) codes on catheters include

(AMMI) identified that gloves, contraceptives and catheters as the “ancillary” to the medical devices industry (World Bank, 2011). These products are produced with rubber, either natural rubber (NR) or synthetic, as the main raw material.²

The RMD market has grown significantly over the years with the expansion of the global healthcare sector and with the increase in the awareness and education of infection control and prevention of diseases. Furthermore, Barlow (1999) attributed the growth of Malaysia’s RMD in 1980s as due to the fear of Human Immunodeficiency Virus (HIV). Previous studies (for example, Barlow, 1999; Ong, 2001, 2002; Yip, 2004) have shown that the awareness of infection control by using glove (especially for health workers, caregivers and public) and contraceptives has contributed to the growth in demand and export of RMD. In fact, MREPC (2012) remarked that there was a surge in glove demand during global infectious disease outbreak.

Malaysian Rubber Glove Manufacturers’ Association (MARGMA) aims for Malaysia to reach a global glove market share of 65% by 2020. Based on published statistics of Malaysia’s exports from United Nations Commodity Trade Statistics (UN Comtrade), from 1989, Malaysia is the world’s largest exporter of RMD. International trade plays an important role to the RMD and rubber products industry because Malaysia exports a significant amount of RMD.

other types of catheters, including those made from plastic. Details on HS code and description are in Table 3.2.

² Top Glove Corporation Berhad (2016) provided the cost breakdown for natural rubber and nitrile gloves. The cost of latex constitutes 41% and 47% in the production of natural rubber and nitrile (synthetic rubber) gloves respectively.

In the study of international economics, gravity model is one of the most frequently applied models since the model was first introduced by Tinbergen (1962) and its foundation explained by Pöyhönen (1963) and Linneman (1966). The gravity model has become the workhorse for empirical studies on patterns of bilateral trade (Eichengreen and Irwin, 1998) and is considered as a “fact of life” in the study of international trade (Deardoff, 1998). Most studies (except for those in the commodity specific gravity model, or studies discussed later in Section 2.10) have applied the gravity model of trade to aggregated data in the study of international trade flows. Karemera (1989) argued that none of the prior studies dealt with disaggregation of single commodity levels. Among the surveyed literatures, Koo and Karemera (1991), and Koo et al. (1994) are among the first study to apply the gravity model of trade in the study of supply and demand determinants of trade flow for disaggregated data specific to a commodity. Koo and Karemera (1991) applied it to trade flow of wheat while Koo et al. (1994) on trade flows of meat.

However, from Koo (1994) study until recently, the studies on microeconomic perspective of the application of the gravity model is still scarce. Other major studies on specific product or commodities using the application of gravity model are Karemera et al. (1994), Kang (2003), Polyakov and Teeter (2007), and Prehn and Brummer (2011). Kang (2003) emphasized on the adoption of a microeconomic perspective of international trade, and recent empirical literature also suggests the application towards single commodity market. More critically, Prehn and Brummer (2011) argued that gravity model analysis should be conducted at product level and later aggregate the estimation results. This is because policy evaluation is usually done better at a disaggregate level and there

is likely a significant downward aggregation bias when estimation is done at aggregate level.

In the context of international trade, Malaysia currently has several bilateral (between two countries) and regional (between multiple countries) free trade agreements (FTAs) with partner countries (excluding the widely anticipated but already halted Trans-Pacific Partnership Agreement, TPPA). Trade agreements play an important role in the facilitation of trade and the removal of trade barriers in terms of tariff and non-tariff barriers. However, some recent studies on FTAs do not provide clear indication on the positive effects of FTA.

The bilateral FTAs that Malaysia is currently involved in are with Australia, Chile, India, Japan, New Zealand and Pakistan. The scope of many gravity model studies is focused on examining the effects within a regional FTAs or trading bloc compared to effects of bilateral relationships (Narayan and Nguyen, 2015). Malaysia has also signed regional FTAs which are ASEAN Free Trade Area (AFTA); ASEAN, Australia and New Zealand Free Trade Area (AANZFTA); ASEAN-India; ASEAN-China; ASEAN Japan Comprehension Economic Partnership (AJCEP) and ASEAN-Korea (AKFTA). With the removal of trade barriers through FTAs, it is expected that FTAs would be beneficial in terms of increasing trade between partner countries. Further, Kangas et al. (2002) highlighted that separated product categories would provide a more profound insight, even when the study itself was already focused on trade of specific group of products.

Fliess and Mard (2012) defined export tax as “a tax collected on goods or commodities at the time they leave a customs territory. This tax can be set either on a per unit basis or an ad valorem (value) basis. Other terminologies equivalent to export tax are export tariff, export duty, export levy and export charge. In some countries, the term “cess” is used³. Sundaram and Wee (2013) argued that different rates were applied on different commodities and products in Malaysia but no clear policy stance emerged from the different rates (applied).

In terms of cess imposed on RMD, the Malaysian Rubber Board (Cess) Order 1999 and Malaysian Rubber Board (Cess) Order 2009 specifies that cess shall be imposed on the specified rubber products (according to their HS codes, inclusive of rubber gloves and sheath contraceptives). This cess on selected rubber products are charged based on fixed percentage on export value, which is ad valorem basis.⁴ The cess on rubber products including rubber gloves and sheath contraceptives was introduced in 1998 with the aim to promote the export of rubber products through export promotion activities (EPAs) funded by cess.

³ There is difficulty to generalize the group of countries that uses the term ‘cess’. While most countries that use the term cess are Commonwealth countries such as Ireland, India, Malaysia and Sri Lanka, there are also non-Commonwealth countries that use the term cess such as Thailand.

⁴ On the other hand, there are also export tax on a fixed rate based on weight irrespective of the prevailing price such as natural rubber which is charged RM0.04 per kg (not covered in this study).

1.2 Overview of Malaysia's Export

As a relatively small country, Malaysia adopts an open economy approach and is export-oriented, especially after the period of 1970s (Bank Negara Malaysia, 2013). Figure 1.1 shows Malaysia's total export for the period of 1989-2017. As of 2016, Malaysia has had an uninterrupted 19-year positive trade balance (Ministry of International Trade and Industry, 2017). Between 1998 and 2013, there were only two periods when Malaysia has negative balance of trade which was 1991 and in the period of 1994-1997.

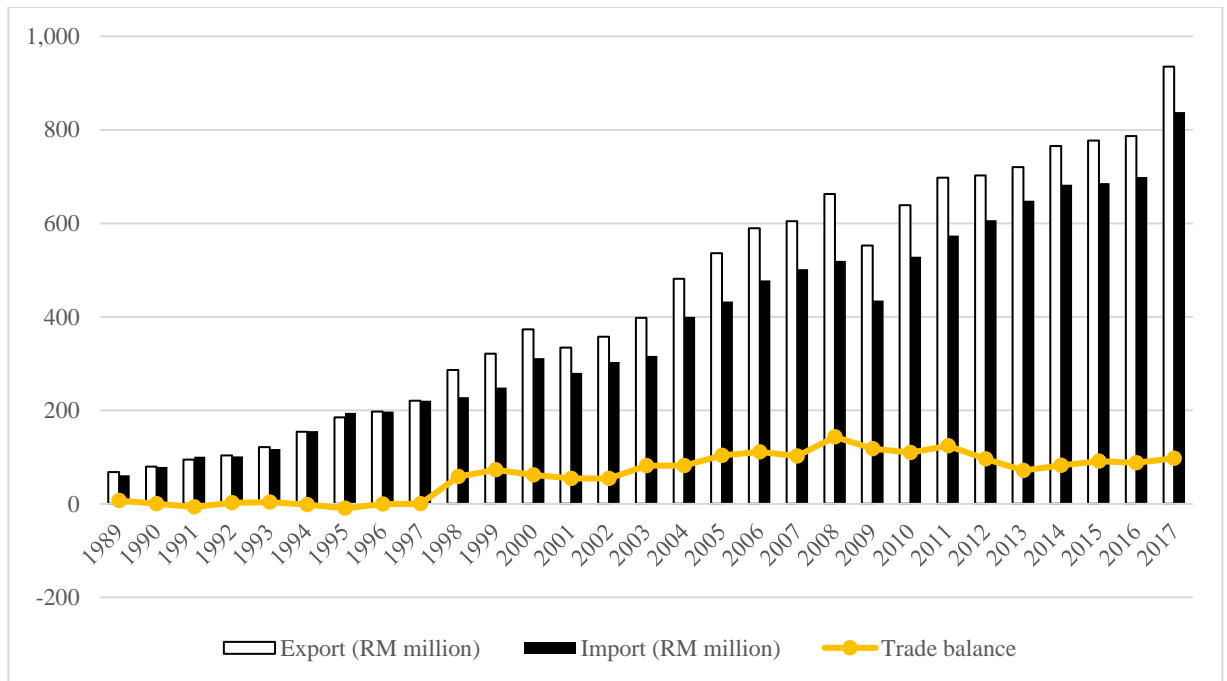


Figure 1.1: Malaysia's total export, import and Balance of Trade, 1989-2017
Source: Own compilation based on Merchandise External Trade Statistics (METS), Department of Statistics

It is observed that Malaysia export has been increasing steadily, and within the span of 25 years, the export value has increased more than ten-fold. In the period of 1989-

2013, the Cumulative Average Growth Rate (CAGR) recorded for the total value of Malaysia's export is 10.3%. On a year-on-year basis, there are some slight decrease in a few periods such as in 2001 and 2009, but the overall long-term trend shows a healthy and positive growth.

Beginning 2012, the Malaysian External Trade Development Corporation (MATRADE) also released the top ten export product groups. Table 1.1 shows the export value by the top ten major export products. Electrical and electronic products remained as Malaysia's largest export product group. Meanwhile, the oil and gas sector products such as refined petroleum, liquefied natural gas (LNG) and crude petroleum are also significant in the external trade of Malaysia.

Rubber and rubber products also in the top 10 major product groups for Malaysia. It is important to note that the rubber products export value in 2014 is almost equivalent to the export value of rubber and rubber products group in 2012 and 2013. This value shows the growth of the rubber products group and the relative importance of the product in Malaysia's exports. The value of rubber products export in the period of 2015-2017 outpaced the total rubber products export in the period of 2012-2013.

Table 1.1 Malaysia's top 10 major export groups, 2012-2017

Major Products Groups	Export (RM billion)					
	2012	2013	2014	2015	2016	2017
Electrical and electronic	231.16	236.98	256.14	277.92	287.81	343.00
Refined petroleum (termed as petroleum products beginning 2014)	51.49	68.37	70.36	54.55	54.66	71.99
Chemical and chemical products	46.30	47.47	51.45	55.14	59.08	68.58
Palm oil	56.00	45.92	42.81	40.14	41.44	46.12
Liquefied natural gas (LNG)	56.13	59.57	63.75	47.07	32.71	40.46
Machinery, appliances and parts	25.31	27.07	30.00	36.14	37.50	40.21
Manufactures of metal	20.24	28.16	26.44	34.89	33.35	38.00
Optical and scientific equipment	22.93	20.84	23.66	26.11	28.75	32.42
Crude petroleum	31.95	31.64	33.72	26.08	22.32	27.97
Rubber and rubber products (Rubber products only beginning 2014)	20.14	18.94	18.00	20.18	20.25	26.31
- Rubber medical devices (Rubber gloves and sheath contraceptives)	10.90	10.89	11.03	13.53	13.67	16.29

Source: Own compilation based on MATRADE and Malaysia External Trade Statistics, Department of Statistics

In MIDA's 2011 Guidebook on Medical Device Industry in Malaysia, it was noted that the industry was dominated by the rubber-based products comprising mainly medical gloves, catheters and sheath contraceptives. Furthermore, MIDA (2011) listed the 15 major domestic companies in the medical device industry in Malaysia, and the top three companies in the list are glove companies namely Top Glove Corporation Berhad, Hartalega Berhad and Supermax Corporation Berhad, which further exemplifies the significance of the RMD in the Malaysian medical device industry. Perhaps the best industry example in Malaysia from small and from ground up developed into multi-billion industry is the rubber products industry (Sander et al., 2013).

1.3 Malaysia's Trade of RMD

Based on published data by United Nations Commodity Trade Statistics (UN Comtrade) database, the export of Malaysian RMD was valued at USD3.5 billion in 2013, increased by Compounded Annual Growth Rate (CAGR) of 10.6% from USD0.3 billion in 1989, as shown in Table 1.2. Based on available published statistics (from UN Comtrade), Malaysia is a relatively small importer of RMD and has been a net exporter of RMD since 1989. The net export figures also show a steady increase from USD318.5 million in 1989 to USD3.3 billion in 2013, which is 10 times increase in 25 years. RMD export contributed around 0.86%-1.82% to annual national export in the period of 1989-2013. It should be noted that this export contribution is from only 3 products of 6-digit HS codes (HS401511, HS401519, HS401410), which shows significant contribution of RMD.

Malaysia is also the largest exporter of natural rubber and nitrile (most widely used synthetic rubber) gloves, Foley catheters and sheath contraceptives (Malaysian Rubber Export Promotion Council, 2015). Based on the National Key Economics Areas (NKEA) for palm oil and rubber, Malaysia's market share of latex gloves globally is projected to increase from 62% in 2011 to 65% in 2020 (PEMANDU, 2011).

Table 1.2 Malaysia's total export, import and net export of RMD, 1989-2013

Year	Export (USD million)	Import (USD million)	Net Export (USD million)	Contribution to Malaysia's Export (%)
1989	319.7	1.16	318.54	1.28
1990	391.8	1.62	390.18	1.33
1991	566.0	2.98	563.02	1.65
1992	660.5	3.50	657.00	1.62
1993	723.3	5.29	718.01	1.53
1994	923.6	2.94	920.66	1.57
1995	1,037.8	3.40	1034.4	1.41
1996	1,026.6	3.81	1022.79	1.31
1997	1,076.8	4.95	1071.85	1.37
1998	978.9	4.85	974.05	1.34
1999	892.0	10.56	881.44	1.06
2000	845.8	11.21	834.59	0.86
2001	851.1	40.61	810.49	0.97
2002	923.8	12.30	911.50	0.99
2003	1,105.1	9.02	1096.08	1.05
2004	1,219.8	22.04	1197.76	0.96
2005	1,507.8	26.93	1480.87	1.06
2006	1,755.0	34.13	1720.87	1.09
2007	2,175.5	31.36	2144.14	1.24
2008	2,095.7	59.27	2036.43	1.05
2009	2,859.8	67.88	2791.92	1.82
2010	3,323.3	92.35	3230.95	1.67
2011	3,527.7	110.27	3417.43	1.55
2012	3,452.8	141.59	3311.21	1.52
2013	3,370.2	99.77	3270.43	1.48

Source: Own compilation based own UN Comtrade

RMD contribute significantly to the export earnings of Malaysia's rubber products. In 2014, export of rubber gloves and sheath contraceptives contributed 72.4% of the total export of rubber products from Malaysia. Both gloves and sheath contraceptives profit margins come from sales based on large quantity as the unit cost is small. The data from UN Comtrade shows that for the period of 1989-1999, the average

unit price of surgical gloves (HS401511) is USD0.04-0.17 while the average unit cost of non-surgical gloves (HS401519) is USD0.03-0.14, respectively. Meanwhile, for sheath contraceptives, the average price for the period of 1989-1996 and 1999 is around USD0.02-0.20.⁵ Puspadevi (2017) reported that the price of surgical gloves is three times higher than examination gloves.

Table 1.3 shows the export, in value terms, of the products by the top ten exporters in selected years. Despite being a top exporter of rubber gloves and sheath contraceptives Malaysia has seen its market share dropped from 59.6% in 1989 to 48.2% in 2013. At the same time, it is observed that Thailand, China, Indonesia and Sri Lanka have their market shares increase and are currently also major producers of rubber gloves and sheath contraceptives. China which has no exports of these products in 1989 is now the third largest exporter for 2013.

⁵ After year 1999, the quantity for gloves is declared in terms of kg, which makes it not feasible to calculate unit cost in terms of per pair or per piece. The largest condom manufacturer in the world, Karex Berhad, highlighted that the company, as an original equipment manufacturer (OEM), sells a piece of condom at an average price of USD0.03.

Table 1.3: Export of RMD by top 10 exporters in 1989, 1999, 2009 and 2013

	1989		1999		2009		2013	
	USD mil	%	USD mil	%	USD mil	%	USD mil	%
Malaysia	281.4	59.6	978.9	44.3	2,095.7	46.0	3,452.8	48.2
Thailand	76.3	16.2	303.9	13.8	725.4	15.9	1,207.4	16.9
China	-	-	62.4	2.8	361.9	8.0	607.5	8.5
Germany	38.1	8.1	42.2	1.9	164.1	3.6	256.4	3.6
Belgium	-	-	58.0	2.6	128.0	2.8	242.5	3.4
Indonesia	3.0	0.6	68.2	3.1	199.0	4.4	227.0	3.2
Sri Lanka	-	-	52.0	2.4	113.6	2.5	194.7	2.7
USA	-	-	125.0	5.7	97.7	2.1	123.7	1.7
India	3.1	0.7	28.8	1.3	118.8	2.6	88.2	1.2
Netherlands	-	-	38.4	1.7	53.6	1.2	86.3	1.2
ROW	70.6	14.8	451.7	20.4	494.2	10.9	673.1	9.4
World	472.5		2,209.5		4,552.0		7,159.6	

Note: in USD million, ROW refers to the Rest of the World

Source: Own calculation based on UN Comtrade data

Figure 1.2 shows the market share of Malaysia's RMD export against world export for the 25-year period of 1989-2013. Hence, although the RMD export is increasing in absolute value terms, Malaysia's relative market share are decreasing over a long-term period which is a cause for concern.

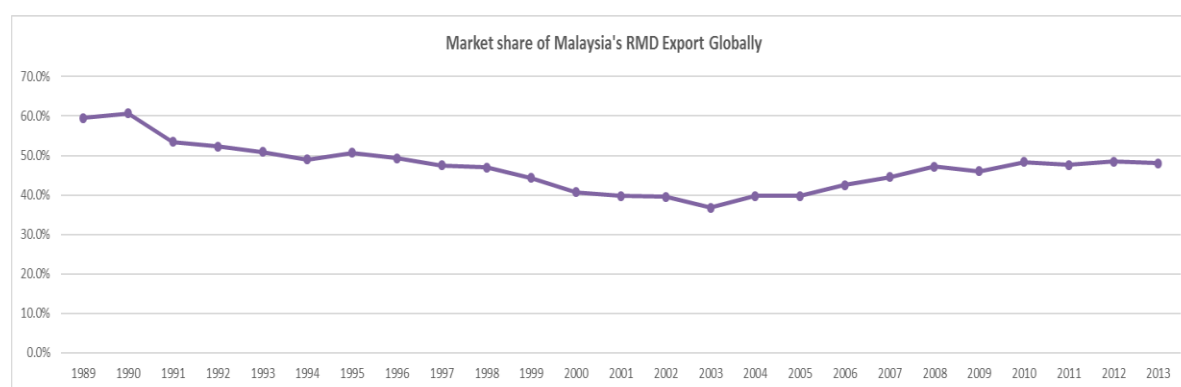


Figure 1.2: Market share of Malaysia's RMD export globally (%)

Source: Own computation based on data from UN Comtrade

The large export of Germany, Belgium, USA and Netherlands is unlikely to be attributed to the fact that these countries are major producer of RMD, but is more likely due to the high values of re-export of RMD. Gehlhar (2010) noted that these countries have high re-exports where more than 10% of their exports are re-exports. Data by UN Comtrade only shows the re-export of RMD by USA, which is worth USD64.5 million in 2013 (equivalent to 1.9% of Malaysia's RMD export to USA).

However, re-export data by other countries is not available. Mellens (2007) also showed that Germany has a relatively high re-export value of EUR91 billion against EUR467 billion which explains that re-export value is about 19.5% against domestically produced goods exported. This is also the same case for Belgium which recorded a re-export value of EUR50 billion against total domestically produced export of EUR103 billion (Re-export value is about 48.5% against domestically produced goods exported). The re-export growth for Belgium and Germany in the period of 1996-2000 is about 11% and 17% respectively, outpacing countries (or territories) such as Singapore (8%), Hong Kong (6%), and Sweden (9%).

Table 1.4 shows the top twenty export destinations of rubber medical devices from Malaysia in 2013, and countries with bilateral or regional free trade agreement with Malaysia, as listed by the Ministry of International Trade and Industry (MITI). The countries' FTA effective date is also stated as this will be an important information in the preparing the data in Chapter 3. These 29 countries import of Malaysia's rubber gloves and sheath contraceptives represents about 85.0% of the total export of such products from Malaysia.

Table 1.4: List of top twenty export destinations of RMD export in 2013 and/or countries with FTAs with Malaysia

Ranking*	Export Destination	Free Trade Agreements	Year FTA takes effect
1	United States of America	None	-
2	Germany	None	-
3	Japan	Bilateral: Malaysia- Japan Regional: ASEAN-Japan Comprehensive Economic Partnership (AJCEP)	2006 2009
4	Brazil	None	-
5	United Kingdom	None	-
6	Italy	None	-
7	China	Regional - ASEAN – China	2010
8	Belgium	None	-
9	France	None	-
10	Canada	None	-
11	Netherlands	None	-
12	Spain	None	-
13	Turkey	None	-
14	Australia	<ul style="list-style-type: none"> • Regional: ASEAN, Australia and New Zealand Free Trade Area (AANZFTA) • Bilateral: Malaysia-Australia 	2010 2013
15	Russia	None	-
16	Viet Nam	Regional: ASEAN Free Trade Area (AFTA)	1995
17	South Korea	Regional: ASEAN-Korea	2007
18	Poland	None	-
19	Argentina	None	-
20	India	<ul style="list-style-type: none"> • Regional: ASEAN–India • Bilateral: Malaysia-India 	2010 2011
22	Thailand	Regional: ASEAN Free Trade Area (AFTA)	1992
30	Chile	Bilateral: Malaysia- Chile	2012
31	Singapore	Regional: ASEAN Free Trade Area (AFTA)	1992
34	Philippines	Regional: ASEAN Free Trade Area (AFTA)	1992
35	Indonesia	Regional: ASEAN Free Trade Area (AFTA)	1992
39	New Zealand	<ul style="list-style-type: none"> • Regional: ASEAN, Australia and New Zealand Free Trade Area (AANZFTA) • Bilateral: Malaysia-New Zealand 	2010 2010
49	Pakistan	Bilateral: Malaysia-Pakistan	2008
61	Myanmar	Regional: ASEAN Free Trade Area (AFTA)	1997
109	Cambodia	Regional: ASEAN Free Trade Area (AFTA)	1999
134	Brunei Darussalam	Regional: ASEAN Free Trade Area (AFTA)	1992

*Note: *Ranking is based on the export value in 2013.*

For ASEAN, original signatories in 1992 were Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand while Vietnam joined in 1995, Laos and Myanmar in 1997, and Cambodia in 1999.

Source: Own compilation based on data from UN Comtrade, MITI

1.4 Issues with regards to RMD Export

This section explains some of the issues which is closely related to Malaysia's RMD export. These issues are important to Malaysia's RMD export ranging from the NR production which represents the raw resource availability, followed by the awareness and education of HIV/AIDS which represents the increase in the awareness and education of infection control and prevention of disease. RMD serves as a good barrier for protection against potential infections and diseases. Section 1.4.3 also provides some background on the research and development efforts that take place in Malaysia's RMD industry. Moreover, the issues that is closely related to the RMD export are the regional and bilateral free trade agreements of Malaysia and its partner countries. Another issue is the cess (export tax) imposition on RMD export and the EPAs (three major EPAs are the establishment of oversea offices, trade missions and participation in foreign trade fairs) implemented funded by cess.

1.4.1 Natural Rubber Production as Resource for Manufactured RMD

The NR is important in the production of RMD as it is the main raw material to produce RMD. After synthetic rubber (SR) was created, the use of SR to substitute NR was also prevalent in recent years⁶. However, Mann (2015) described the relevance of NR where it is described that for items that totally cannot fail from contraceptives to surgeon's gloves (and even to airplane tyres), NR remains the top selection. The rubber production

⁶ Hartalega, the largest producer of nitrile gloves, started the production of nitrile gloves in 2005 (Tan, 2005).

statistics shows that the world major producers have changed over time, as shown in Table 1.5.

Malaysia was the largest producer of NR in 1989, but the position gradually fell to third place in 2002 and sixth in 2013. Thailand, meanwhile, has increased its position from second largest producer in 1989 to the largest producer in 2002 and maintained the ranking in 2013. Viet Nam, which was not a major producer in 1989, is the third largest producer of NR globally in 2013, overtaking the major producers such as India, China and Malaysia. Although the top 10 producers ranking fluctuates over time, it is noticeable that almost the same countries appear in 1989, 2002 and 2013, except for Nigeria, Liberia, the Philippines, Brazil and Guatemala which did not appear across all the three years as shown in Table 1.5.

Table 1.5: Top 10 producers of natural rubber, 1989, 2002 and 2013

Rank	1989	Production (tonne)	2002	Production (tonne)	2013	Production (tonne)
1	Malaysia	1,415,300	Thailand	2,633,124	Thailand	4,305,069
2	Thailand	1,311,000	Indonesia	1,630,360	Indonesia	3,107,544
3	Indonesia	1,209,037	Malaysia	890,000	Viet Nam	946,865
4	India	259,200	India	649,435	India	900,000
5	China	242,766	China	527,413	China	864,806
6	Nigeria	132,000	Viet Nam	298,200	Malaysia	826,421
7	Sri Lanka	110,968	Côte d'Ivoire	135,540	Philippines	444,818
8	Liberia	106,000	Nigeria	112,000	Guatemala	356,392
9	Côte d'Ivoire	66,960	Liberia	109,000	Côte d'Ivoire	289,563
10	Philippines	56,700	Brazil	95,900	Brazil	185,725

Source: Own calculation based on data from Food and Agriculture Organization of the United Nations (FAO) Production Database

Note: It is important to note that the quantity stated here refers to the weight in tonne and does not indicate earnings in currency.

Furthermore, the price of NR as a commodity fluctuates from time to time (Burger and Smit, 1989; Khin and Thambiah, 2014). While there may be some correlation with the top 10 RMD exporters in Table 1.3, it is not always clear whether being an NR producer and having the natural resource availability contributes to the country being able to produce value-added RMD. Furthermore, there is little indication on whether a country will then decrease RMD import from Malaysia just by producing more of NR. Figure 1.3 shows the export, import and net export of latex in Malaysia. Malaysia is a net importer of latex, consistently having a net import of latex between 144,070 tonnes and 314,325 tonnes for the period of 2000-2013.

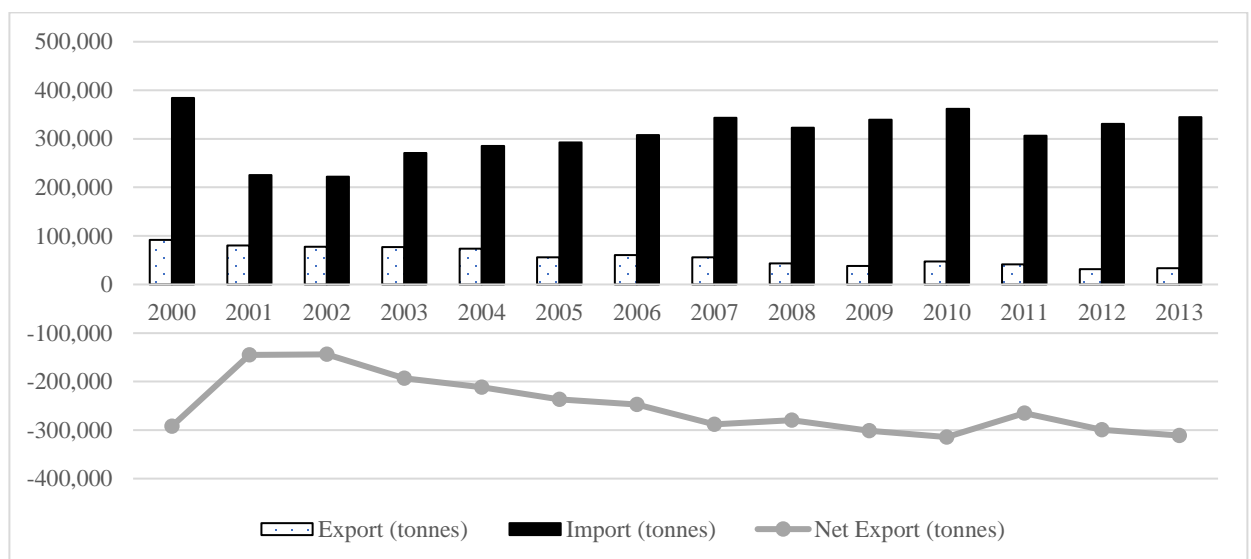


Figure 1.3: Malaysia's import and export of latex, 2000-2013

Source: Own compilation based on *Natural Rubber Statistics (2014)*, Malaysian Rubber Board (MRB) and Department of Statistics

Figure 1.4 shows the Malaysia's export of NR, rubber medical devices and global rubber price from 1989-2013. RMD export shows steady and stable growth over the years, while NR export shows fluctuations is correlated with the global NR prices. While RMD export has been higher than NR export every year since 1997 (except for 2011 when the

price of NR was very high), scholarly studies attributed to the analysis of RMD trade flows are still comparatively fewer than studies on analysis of NR trade flows.

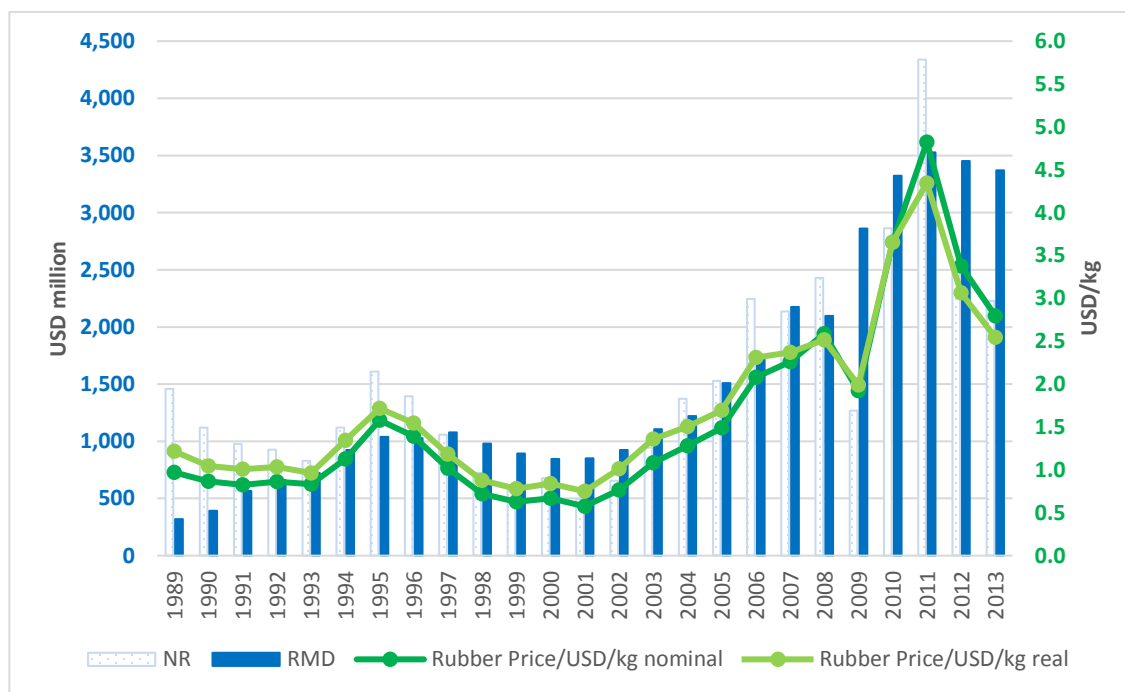


Figure 1.4: Malaysia's export of natural rubber, RMD and global rubber price, 1989-2013
 Note: Right hand side scale for Rubber Price/USD/kg nominal and Rubber Price/USD/kg real

Source: Own calculation based on UN Comtrade, World Bank Commodities Sheet

1.4.2 Awareness and Education of HIV/AIDS Disease and Export of RMD

With the increase in the awareness and education of infection control and prevention, increase in diseases or increases in healthcare demand is linked to increase in demand of RMD. However, the demand and export of rubber gloves and sheath contraceptives have also been reported to be linked to the fear of Human Immunodeficiency Virus (HIV) and its related disease Acquired Immune Deficiency Syndrome (AIDS). This is because both rubber gloves and sheath contraceptives having

the purpose of protection and infection prevention and control is likely to have positive relationship with the rise in HIV/AIDS cases, as has been previously reported by Ahituv (1996), Barlow (1999), Adih and Alexender (1999) and Thornton (2008).

Data released by the UNAIDS shows that the number of people living with HIV has been increasing since 1990s. “Since the beginning of the epidemic, more than 70 million people have been infected..., 35 million people have died ... (and) globally, 36.7 million people were living with HIV at the end of 2015” (World Health Organisation, 2015). The annual data of number of people living with HIV is summarized in Table 1.6 in the frequency of every 5 years from 1990-2015.

Table 1.6: Number of people living with HIV globally for selected years

Year	1990	1995	2000	2005	2010	2015
Number of people living with HIV (million)	9.1	19.5	28.9	31.8	33.3	36.7
CAGR		16.5%	8.2%	1.9%	0.9%	2.0%

Source: Own calculation based on UNAIDS

While the percentage increase has decreased, indicating the marginal increase in number of new HIV cases is lower, probably due to higher awareness and knowledge about HIV prevention, the absolute number of people living with HIV are high, at around 36.7 million people compared to 9.1 million people in 1990. The usage of rubber gloves and contraceptives should be considered based on the absolute number of people living with HIV as the use is continuous and recurring, and should not be considered based on a one-time marginal usage only. Hence, any increase in the absolute number of people living with HIV will increase the demand of gloves and contraceptives.

1.4.3 Malaysia's Free Trade Agreements

This sub-section discusses the FTAs that has taken effect and entered into force for Malaysia until 2013. The Ministry of International Trade and Industry (MITI) and Asian Development Bank provides information on all Malaysia's FTAs currently in effect, and those with ongoing negotiations. Table 1.7 shows the export of RMD in 1989, the year FTA takes effect and in 2013 respectively to the FTA partner countries.

In terms of regional FTAs, the current FTAs in effect for Malaysia are ASEAN Free Trade Area (AFTA); ASEAN-Korea (AKFTA); ASEAN-Japan; ASEAN, Australia and New Zealand Free Trade Area (AANZFTA); ASEAN-China and ASEAN-India. Among the East Asian countries, ASEAN was among the first agreement on regional economic co-operation (Ismail et al., 2007). ASEAN was formed on 8th August 1967 by the founding member countries of Indonesia, Malaysia, Thailand, the Philippines and Singapore. In 1992, AFTA was formed, and the Common Effective Preferential Tariff (CEPT) was introduced among member countries. The reduction of 0-5% of tariff rates took place until 2013, and this was then followed by the inclusion of other member countries which are Vietnam in 2006, Laos and Myanmar in 2008 and Cambodia in 2010. Malaysia's regional and bilateral FTA partners and the export value is show in Table 1.7.

Table 1.7: Malaysia’s regional and bilateral FTA partners and export in 1989, year FTA took effect, and in 2013

Export Destination	Free Trade Agreements (Year takes effect)	Malaysia’s RMD Export (USD million)		
		1989	Year FTA takes effect	2013
Japan	Bilateral: Malaysia- Japan (2006)	15	77	192
	Regional: ASEAN-Japan Comprehensive Economic Partnership (AJCEP) (2009)	15	104	192
China	Regional - ASEAN – China (2010)	-	44	87
Australia	Regional: AANZFTA (2010)	9	54	66
	Bilateral: Malaysia-Australia (2013)	9	66	66
Viet Nam South Korea	Regional: AFTA (1995)	-	0.2	41
	Regional: AKFTA (2007)	0.5	16	39
India	Regional: ASEAN–India (2010)	0.2	13	28
	Bilateral: Malaysia-India (2011)		22	
Thailand	Regional: ASEAN Free Trade Area (AFTA) (1992)	1	2	27
Chile	Bilateral: Malaysia- Chile (2012)	0.05	22	19
Singapore	Regional: ASEAN Free Trade Area (AFTA) (1992)	1	4	18
	Regional: ASEAN Free Trade Area (AFTA) (1992)	0.3	0.4	15
Indonesia	Regional: ASEAN Free Trade Area (AFTA) (1992)	0.07	0.1	15
New Zealand	Regional: AANZFTA (2010)	1	11	12
	Bilateral: Malaysia-New Zealand (2010)	1	11	12
Pakistan	Bilateral: Malaysia-Pakistan (2008)	0.04	3	8
Cambodia	Regional: AFTA (1999)	-	0.003	0.7
Brunei Darussalam	Regional: AFTA (1992)	0.003	0.08	0.2

Source: Own compilation based on data from UN Comtrade, MITI and ADB

Note: For ASEAN+1, the data is not recorded in this table but is reflected in the dummy variable in data for estimation

Medalla and Mantaring (2009) highlighted that ASEAN has signed additional regional trade agreements, namely with Korea, Japan, Australia, New Zealand, China and India, to forge economic alliance with trade partners outside of ASEAN. Tham and Kam

(2014) termed these as ASEAN+1 agreements⁷. The ASEAN-Japan Comprehensive Economic Partnership (AJCEP) took effect in 2008 on trade in goods. Even at the time intra-ASEAN trade was not so active (in 1990s), trade between Japan and ASEAN was relatively high, reflecting the trade flow of Japanese manufacturing firms to ASEAN member countries (Fukunaga and Isono, 2013). Table 1.8 shows the tariff reduction schedule for the regional FTAs that have taken effect until 2013 for Malaysia. The rate imposed for rubber gloves (HS401511 and HS401519) were at 0% from the beginning of AJCEP in 2009, while the rate for sheath contraceptives was set at a rather high rate of 22.5% in 2009 before being progressively reduced to 0% in 2015 (refer to Table 1.7).

Meanwhile, AKFTA took effect in May 2006 as another ASEAN+X FTA. Park et al. (2012) highlighted AKFTA is an important platform for ASEAN and Korea to face the challenge of increasing competition globally. Under the AKFTA, 5% tariff was imposed on rubber gloves in the first two years (2006-2007) before being reduced to 0% in 2008. A tariff of 5% was imposed on sheath contraceptives for the first four years before decreased to 0% in 2010. The synergy of ASEAN and its trading partners continued when AANZFTA was signed and took effect in 2010. It is also the first regional FTA between Australia and New Zealand with its trading partners (Bano et al., 2013). Under AANZFTA, tariff rate for rubber gloves and sheath contraceptives were set at 0% from the beginning by New Zealand. On the other hand, Australia only set 0% from the beginning for non-surgical gloves (HS401511) and sheath contraceptives (HS401410) but

⁷ ASEAN+X usually refers to the economic alliance between ASEAN and trade partner/partners outside ASEAN.

the tariff rate for surgical gloves (HS401519) was set at 7.5% for the period of 2012-2019.

The rate for surgical gloves then will be made 0% in 2020.

Table 1.8: Tariff reduction schedule for the regional FTAs that have taken effect until 2013

AANZFTA (Australia)													
	2012	2013	2014	2015	2016	2017	2018	2019	2020 onwards				
401511	0 from 1 st year onwards												
401519	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	0				
401410	0 from 1 st year onwards												
AANZFTA (New Zealand)													
	2012	2013	2014	2015	2016	2017	2018	2019	2020 onwards				
401511	0 from 1 st year onwards												
401519	0 from 1 st year onwards												
401410	0 from 1 st year onwards												
ASEAN-China													
	Most Favoured Nation (MFN) for Malaysia					Rate beginning 2009 for Malaysia							
401511	8					0							
401519	8					0							
401410	0					0							
ASEAN-Japan													
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018			
401511	0 from 1 st year onwards												
401519	0 from 1 st year onwards												
401410	22.5	18.8	15	11.3	7.5	3.8	0	0	0	0			
ASEAN-Korea													
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 onwards		
401511	5	5	0	0	0	0	0	0	0	0	0		
401519	5	5	0	0	0	0	0	0	0	0	0		
401410	5	5	5	5	0	0	0	0	0	0	0		
ASEAN-India													
	1 Jan 2010	1 Jan 2011	1 Jan 2012	1 Jan 2013	31 Dec 2013	1 Jan 2014	1 Jan 2015	1 Jan 2016	31 Dec 2016	1 Jan 2017	1 Jan 2018	1 Jan 2019	31 Dec 2019
401511	7.5	5	5	2.5	0	0	0	0	0	0	0	0	0
401519	7.5	5	5	2.5	0	0	0	0	0	0	0	0	0
401410	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: Own compilation based on Ministry of Finance & Revenue, Pakistan (2007), Federal Government Gazette, Attorney General Chambers (2012), Malaysian Rubber Export Promotion Council (undated)