Impacts of Non-tariff Trade Barriers on Tropical Timber Trade in Malaysia

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ABSTRACT

Tropical timber trade has a vital part in the socio-economic improvement of Malaysia. It has been the main exporters of high quality tropical timber products to the world market. International trade in timber products is organized and structured by numerous trade dealings. There is increasing distress around the effect of non-tariff trade dealings on the global timber products sector. The goal of the study is to estimate the impacts of non-tariff trade hurdles to timber trade. The methodology employed in this study includes econometric analysis using spatial equilibrium model. The spatial equilibrium analysis uses a comprehensive econometric model, and the Timber Trade Model (TTM), based on the Price Endogenous Linear Programming System (PELPS) framework. The analysis started by a scenario from the year 2008, and the projections to 2020. The projections show that non-tariff barriers are created to be fewer common than tariffs but have comparable or better combined effects on trade, production, producer revenues, consumer expenditures and value added as tariffs. This study shows the importance of analysing non-tariff barriers to timber trade strategy and the necessity for enduring widespread trade liberalization.

Introduction

Malaysia is a tropical country located north of the Equator within latitudes 1° to 7° north and longitudes 100° to 119° east. There are two parts in Malaysia: one is Peninsular Malaysia and another is Sabah and Sarawak. The area of the total land is approximately 32.83 million hectares and the area of the total forests in Malaysia was assessed to be 18.21 million hectares or 55.5% of the area of the total land at the end of 2008. It has the area of total 14.92 million hectares of inland forest, of which 14.41 million hectares (43.9%) are designated as Permanent Reserve Forest (MTIB 2009).

International trade in timber products is measured and structured by numerous trade dealings. For a variety of purposes, there are non-tariff dealings which are recycled by trade countries. Importing countries kerb or forbid ingresses in order to defend prevailing domestic producers of identical products. Although the limitations of importing countries are most common, exporting countries also enforce procedures which check or legalize trade. Trade and environment have influences on each other. Trade has effects on the environment and similarly, environmental policies and regulations have influence on trade flows (Simula 1999).

Trade Barriers to timber trade are policies or actions or rules and regulations which affect the open market economy in exchange globally (Rytkonen 2003). Generally, three types of trade barriers are seen: tariffs, non-tariff measures (NTMs) and trade impediments, which touch the forestry sector (Bourke & Leitch 2000, Bourke 2003). Non-tariff barriers contain rules, principles, and strategies and applies that either defend nationally manufactured properties from the occupied substance of external antagonism, or affectedly motivate the exports of national goods. Non-tariff dealings recycled are extensive. Non-tariff measures are tougher to assessment their effect than tariff measures. They contain undeviating numerical boundaries such

as import quotas, tariff quotas or unpaid export chains, technical standards and plant health (phytosanitary) ideals, and occasionally weighty import permitting, customs dealings and national rules (Philippidis & Sanjuan 2007).

There are six categories of non-tariff measures: (i) quantitative restrictions, (ii) administrative restrictions, (iii) Phytosanitary and technical regulations and standards, (iv) price control, (v) assistant domestic policies, and (vi) forest management certification and product labeling (Sun et al. 2010). NTBs may harshly encumber trade and corrode the assistances of tariff removal. Forestry products gradually depend on procedural rules, ideals, and linked actions for their getting in the international market. Timber products sector-specific negotiations toward decrease or removal of NTBs epitomize an actual chance that, if effective, could deliver expressive growth toward accomplishing open and open-minded trade in this sector (Islam et al. 2010).

To measure the profits of concentrated non-tariff barriers is challenging (Kee et al. 2008). Former learning on non-tariff barriers in the forestry product sector has been expressive (Cohen et al. 2003). There has been no endeavour to date to assessment the influences of falling NTBs on the global/Malaysian forest products sector and associate them to the influences of falling tariffs.

The principle focus of this paper is to determine the trade policy effects and impacts of non-tariff trade barriers to timber trade on the Malaysia's economic growth, using spatial equilibrium model as a tool.

Materials And Methods

In recent years, spatial equilibrium models have progressed rapidly and have dominated forest sector analysis. Spatial equilibrium models were recycled to learning the possessions of trade policies on timber product trade levels (Boyd et al. 1993). There are different ways of estimating the spatial equilibrium

model. One is "programming approach" and another "reactive programming". Programming approach tries to find the equilibrium by solving an optimization problem. Zhu et al. (1998) used programming approach. Adams and Haynes (1980) used reactive approach which applies an iterative system of computations to reach the equilibrium conditions.

The timber trade model has a vigorous financial stability typical to forecast production, consumption, trade, and values of major timber products in world markets.

Several studies have applied the panel data approach to measure elasticity of timber products demand and supply (Chas-Ante & Buongiorno 2000). The impacts of trade barriers on production, consumption, trade and prices of tropical timber products were studied with a spatial partial equilibrium model, with supply and demand equations of tropical timber products estimated econometrically from the panel data.

This study adopts the approach of the most recent version of the GFPM (Zhu et al. 2007). PELPS began to be developed in the early 1980's. It has both static and dynamic phases.

2.1 Static Phase

The timber trade model simulates vigorous market stability for the world timber sector. Each year, production, consumption, trade and values are calculated that strong markets for all harvests in all areas (spatial equilibrium).

Objective function:

$$Max_{(D_m S_m Y_m T_m)} Z =$$ (i)

$$\sum_i \sum_k \int_0^{D_{ik}} P_{ik}(D_{ik})\, dD_{ik} - \sum_i \sum_k \int_0^{S_{ik}} P_{ik}(S_{ik})\, dS_{ik} -$$

$$\sum_i \sum_k Y_{ik} m_{ik} - \sum_i \sum_j \sum_k T_{ijk} c_{ijk}$$

Where:

i,j = country, and k = product;

P = price in US dollars;

D = quantity demanded for product;

S = quantity supplied of product;

Y = quantity manufactured;

m = cost of manufacture;

T = quantity transported;

c = cost of transportation plus import non-tariff;

2.2 Dynamic Phase

Annually variations in the market balance conditions are carried out by:

i) Changes of the demand curves for final products, owing to fluctuations in GDP growth;

ii) Shifts of the supply curves of timber products;

iii) Variations of trade constants m, reflecting assumptions about technical change;

iv) Changes of manufacturing capacity, determined as follows:

vi) Change in trade inertia constraints

2.3 Model Data and Parameters

For the purpose of this study, the implementation of the timber trade model deals with 165 countries and each country produces, consumes, exports, imports at least one of 8 timber products.

The model requires data on major timber products production, consumption, trade and prices. Historical data on production, consumption, exports, imports, and prices of major timber products are taken from the FAO Yearbook of forest products series (1990-2008), accessed through the online FAOSTAT statistics database (FAO 2009a, FAO 2009b). Historical data on real GDP came from the World Bank Development Indicators (World Bank 2009). The endogenous variables, exogenous variables and parameters are shown in the following table 1.

Table 1: Endogenous variables, exogenous variables and parameters

Endogenous variables	Exogenous variables	Parameters
Demand for final products	GDP growth rates	Demand elasticity
Supply of timber products	Supply shifts rates	Supply elasticity
Manufacturing costs	Capacity expansion rates	Manufacturing capacity
Transportation costs	Tariff/non-tariff rates	Trade inertia

3. Results and Discussion

A variety of theoretical and empirical studies have absorbed on the elements of a nation's trade barriers, both tariffs and non-tariff barriers.

There are common economic and political factors that can explain the implementation of protection across countries and industries. The three categories factors leading to trade protection are i) political motivation, ii) economic conditions, and iii) trade retaliation.

The model claims the trade barriers are the result of rent-seeking actions are self-interested industry groups and politicians. Gawande et al. (2006) have stressed that the trade policy in political-economy models is endogenously determined by interactions between self-interested regulators and organized special interest groups.

Table 1: Projected impacts of non-tariff trade barriers on industrial roundwood (2008-2020)

Region /Country	Impact on average annual (% Year⁻¹)					
	2008 (000' m³)			Non-tariff		
	Production	Import	Export	Production	Import	Export
Africa	72097	754	3449	0.3	13.3	16.1
North America	469127	6039	13039	-1.8	19.4	16.7
South America	185755	61	4275	1.5	7.2	15.0
Asia	244515	55225	7963	-6.7	16.8	8.6
Europe	507442	57383	76723	3.3	0.0	7.3
Oceania	52378	17	11291	3.5	0.0	12.3
Malaysia	22744	217	4811	3.4	12.6	0.3
World	1542379	119868	117088	0.5	10.1	10.3

Table 2: Projected impacts of non-tariff trade barriers on sawnwood (2008-2020)

Region /Country	Impact on average annual (% Year⁻¹)					
	2008 (000' m³)			Non-tariff		
	Production	Import	Export	Production	Import	Export
Africa	8795	4657	1281	-4.8	7.3	2.2
North America	114417	23899	27921	0.5	2.8	4.3
South America	39391	386	6262	0.3	0.0	2.3
Asia	88196	25319	5174	1.1	2.5	10.3
Europe	136532	46939	72866	-0.8	1.3	-0.1
Oceania	9602	711	2250	-0.4	1.3	-0.3
Malaysia	4486	203	2514	5.6	27.6	13.2
World	402204	106160	116014	0.1	2.3	2.1

Table 3: Projected impacts of non-tariff trade barriers on wood based panels (2008-2020)

Region /Country	Impact on average annual (% Year⁻¹)					
	2008 (000' m³)			Non-tariff		
	Production	Import	Export	Production	Import	Export
Africa	2962	962	574	0.1	0.9	-0.4
North America	47796	12890	8651	-3.4	11.8	6.1
South America	15010	1038	5856	0.2	1.3	0.7
Asia	120935	19796	24838	2.5	0.5	7.4
Europe	77484	36291	36993	-0.3	0.1	-0.5
Oceania	3715	649	1342	-1.7	5.0	-0.9
Malaysia	13054	785	6266	0.9	4.8	2.4
World	268604	73200	78343	0.7	3.8	3.6

Table 4: Projected impacts of non-tariff trade barriers on particle board (2008-2020)

Region /Country	Impact on average annual (% Year⁻¹)					
	2008 (000' m³)			Non-tariff		
	Production	Import	Export	Production	Import	Export
Africa	948	154	28	-21.5	15.8	3.0
North America	26140	4513	4944	0.0	24.8	6.7
South America	4173	338	360	0.4	8.0	8.6
Asia	20803	4486	2325	5.0	0.0	10.1
Europe	50093	16230	18844	6.7	-1.1	12.0
Oceania	1256	103	144	-0.9	1.7	-1.5
Malaysia	209	409	635	16.9	10.8	13.2
World	103607	26002	26700	0.6	11.1	11.0

Table 5: Projected impacts of non-tariff trade barriers on fibre board (2008-2020)

Region/ Country	Impact on average annual (% Year⁻¹)					
	2008 (000' m³)			Non-tariff		
	Production	Import	Export	Production	Import	Export
Africa	200	381	35	0.0	6.8	0.0
North America	8155	2694	1824	0.0	18.6	4.2
South America	4971	467	2246	2.4	4.1	5.3
Asia	38463	6054	6680	4.7	0.0	5.5
Europe	18373	10687	11873	-0.6	2.0	1.7
Oceania	1284	181	951	-0.6	0.0	-0.2
Malaysia	2633	207	593	8.4	8.0	18.7
World	71671	21262	23610	1.1	3.8	3.5

Table 6: Projected impacts of non-tariff trade barriers on chemical wood pulp (2008-2020)

Region/ Country	Impact on average annual (% Year⁻¹)					
	2008 (000' MT)			Non-tariff		
	Production	Import	Export	Production	Import	Export
Africa	1832	444	417	-2.1	2.0	7.5
North America	54854	5585	13840	1.2	7.1	0.4
South America	18247	994	11884	1.1	1.5	1.8
Asia	20558	15229	3059	3.7	-7.6	1.5
Europe	32484	17059	13172	-1.5	1.0	-2.3
Oceania	1423	360	429	-10.8	8.7	-0.7
Malaysia	123	203	1	0.0	12.9	0.0
World	129543	40887	42828	0.9	0.4	0.4

Table 7: Projected impacts of non-tariff trade barriers on printing and writing paper (2008-2020)

Region /Country	Impact on average annual (% Year⁻¹)					
	2008 (000' MT)			Non-tariff		
	Production	Import	Export	Production	Import	Export
Africa	1097	1213	554	-3.9	1.8	-5.4
North America	25102	7986	6471	1.1	-0.3	3.5
South America	3523	2267	2006	0.1	0.0	0.0
Asia	40458	7553	8810	0.7	3.7	0.0
Europe	39640	26542	33154	0.1	0.1	0.3
Oceania	704	1083	129	-0.3	0.0	0.0
Malaysia	172	979	56	4.7	0.0	0.0
World	111943	47962	51172	0.5	0.8	0.7

3.1 *Impacts of non-tariff trade barriers to timber trade*

There would be major changes in the global and Malaysia's timber products sector between 2008 and 2020 with non-tariff trade barriers. The impacts of production and trade on major timber products for the world, its major regions and Malaysia are concise in tables 1 to 9. Impacts on producer revenue, consumer expenditures and value added are summarized in table 9.

3.1.1 *Impacts on Production*

Over-all, the elimination of non-tariff trade barriers hints to a surge in the world production of all timber products. The elimination of NTBs in consequence depresses the price of carrying harvests between countries, which in fit encourages greater production and consumption. The projected effects of non-tariff trade barriers on world production were quite small, less than 1.0% per year, except fibre board (1.1%) (Tables 1 to 9). Similarly, the removals of tariffs were quite small, less than 0.9% per year.

In Malaysia, the removal of NTBs increases production of all timber products. The projected effects of NTBs on Malaysia's industrial roundwood, sawnwood, wood based panels, particle board, fibre board, printing and writing paper, would be annual average 3.4%, 5.6%, 0.9%, 16.9%, 8.4%, 4.7% larger respectively.

3.1.2 *Impacts on Imports*

The impacts of NTBs on industrial roundwood imports are identical momentous across all areas, frequently motivating a surge in imports. The largest impact of NTBs percentage change is the increase in imports in Asia. In Malaysia, the removal of NTBs increases imports of all timber products. The projected effects of NTBs on Malaysia's industrial roundwood, sawnwood, wood based panels, particle board, fibre board, chemical wood pulp, printing and writing paper, other paper and paper board would be annual average 12.6%, 27.6%, 3.8%, 10.8%, 3.8%, 0.3%, 0.8%, 3.5% larger respectively.

3.1.3 *Impacts on Exports*

The impacts of NTBs on industrial roundwood exports are identical momentous across all areas, frequently motivating a surge in exports. In Malaysia, the elimination of either type of trade restriction generally serves to surge the trades of Malaysian timber harvests. The increases in exports of Malaysia associated with the removal of NTBs are 13.2% of sawnwood, 2.4% of wood based panels, 13.2% of particle board, 3.5% of fibre board, 0.3% of chemical wood pulp, 0.7% of printing and writing paper, 3.6% of other paper and paper board. The largest impact of NTBs percentage change is the rise in disseminates from North America, South America and Europe.

Table 8: Projected impacts of non-tariff trade barriers on other paper and paper board (2008-2020)

Region/Country	Impact on average annual (% Year^{-1})					
	2008 (000' MT)			Non-tariff		
	Production	Import	Export	Production	Import	Export
Africa	2813	1891	533	-7.1	5.6	-0.2
North America	60678	4654	10861	2.8	0.5	9.9
South America	9729	1909	1404	-0.4	1.9	0.1
Asia	100772	11233	5008	-2.6	11.0	0.6
Europe	60336	25828	28714	1.0	-2.8	0.2
Oceania	1966	648	940	-0.9	0.0	-1.9
Malaysia	683	892	202	0.0	12.5	0.0
World	240111	50133	47961	0.1	3.5	3.6

Table 9: Projected impacts of non-tariff trade barriers on producer revenue, consumer expenditure and value added (2008-2020)

Region/Country	Impact on average annual (% Year^{-1})					
	2008 (Million US$)			Non-tariff		
	Production	Import	Export	Production	Import	Export
Africa	37611	5408	2191	-1.0	0.0	-8.4
North America	246171	44690	43402	-1.3	-15.7	-7.8
South America	53136	3855	10145	1.0	4.0	0.7
Asia	255464	51595	25447	-5.5	0.0	4.0
Europe	189617	80614	84062	2.1	2.3	1.2
Oceania	12377	2435	3252	1.8	3.4	-3.6
Malaysia	7175	2322	3712	0.7	-2.5	0.4
World	833057	193437	182738	-1.0	-13.6	-0.1

4. Conclusion

This study explored the influences of non-tariff trade barriers on the Malaysian timber sector, its main trading partners and on the global timber sector. With or without non-tariff trade barriers, a dynamic linear programming model was applied to forecast the developments of the Malaysian timber sector to 2020 in order to model the TTM. Timber trade model integrated four major components. As a policy analysis tool, it is designed mainly to plan the overall imminent inclinations in amounts and values at diverse stages of change, under diverse situations. It is likely that the Malaysia's exports of industrial roundwood, sawnwood, wood based panel, particle board and fibre board would increase and the exports of chemical wood pulp, printing and writing paper, other paper and paper board would decrease. The projection of Malaysia's major timber products production would increase except chemical wood pulp, and paper and paper board with non-tariff trade barriers.

The elimination of non-tariff barriers hints to a surge in universal/Malaysia's production and trade of all timber products, with the impacts on trade usually larger than those on production. However, in light of the concurrent impacts of existing tariffs imposed by different region/countries on different timber products, the results do not necessarily support the notion that trade discussions would emphasis mainly on NTBs. On the other hand, exertions would remain to emphasis on dipping all inappropriate forms of trade safety, non-tariff. The effects are usually larger at the regional and country levels for both NTBs.

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