21 Global Trade Liberalization and Forest Product Trade Patterns

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Introduction

One of the recent economic trends is regional economic integration and global trade liberalization. Among recent multilateral trade agreements are the World Trade Organization (WTO) and the North American Free Trade Agreement (NAFTA). The main objective of NAFTA, in effect since January 1994, is to curtail most barriers to trade and investment between Canada, Mexico and the USA in four phases. As the Uruguay Round (UR) negotiations of the General Agreement on Tariffs and Trade (GATT) came to a close in December 1993, the WTO emerged. The WTO negotiations began in late 1999 and have become the centre of focus for multilateral trade policy activities for member countries. The WTO agreement furnishes a common organizational and institutional framework for the conduct of trade relations among its members and serves as a forum for negotiations on further trade liberalization and additional legal disciplines.

A reduction or removal of existing trade distortions is likely to affect global trade flows. The effects of trade liberalization on trade flows can generally be classified into trade creation and trade diversion. For example, a reduction in the import tariff of a wood product will reduce the import price, leading to more import demand. This is the trade creation effect of the tariff reduction. If tariff reduction rates are not identical for all import sources, relative import prices from different sources will change. As a result, import shifts from one source to another may occur, leading to trade diversion or substitution.

Several studies on the impact of regional and global trade liberalizations on forest product trade have been conducted. Wisdom (1995), based on a review of the trade data from 1989 to 1995, found that the NAFTA would have little impact on forest product trade between Canada, Mexico and the USA. He indicated that the Mexican economic crisis of 1994 and 1995 and the associated drastic peso devaluation had probably a much greater effect on forest product trade between the USA and Mexico than the NAFTA by altering the relative pricing structure for forest products. Prestemon (1996) assessed the NAFTA impacts on the US and Canadian forest product exports to Mexico using an econometric approach with the inputs on macroeconomic effects from general equilibrium studies. He identified that the NAFTA would have a significant impact on US and Canadian exports of selected wood products to Mexico. Barbier (1999) analysed the effects of the UR on global forest product trade. He found that forest product trade gains from tariff reductions under the UR were positive and significant, but that the magnitude of the impacts on global forest product trade would be relatively small, 1.6–2% gains for the countries studied.

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All these studies applied the partial equilibrium approach and focused on a few wood products. There is a need to assess sector-wide effects as well as effects on specific products. Moreover, the partial equilibrium approach fails to capture the intersectoral effect of the tariff changes. Given the relatively low distortions in forest product trade and extensive interactions of forest product sectors with other economic sectors, the intersectoral effect could be significant. A computable general equilibrium (CGE) model permits interactions throughout the economy to be taken into account in a consistent manner. A CGE model could be used to analyse the effects of policy actions and other exogenous events in the context of a consistent, interrelated global system (Borges, 1986; Ethier, 1988). Since the pioneering work by Harberger (1962) and Johansen (1973), CGE has had increasing application in impact assessments of trade and environmental policies. Its applications in forestry, though limited, are also visible (Boyd, 1987, 1998). This study develops a CGE model to evaluate the impacts of the NAFTA and GATT/WTO on the global forest product trade patterns. The outcomes of this study will include both intrasectoral and intersectoral impacts of these trade polices on the global trade of forest products.

Methods

The CGE model used in this study is based on the Global Trade Analysis Project (GTAP) model constructed to analyse the economic effects of global trade (Hertel, 1997). The standard GTAP model is a comparative static multi-market, multi-region model. Its basic assumptions include constant returns to scale in all production sectors and perfect competition in all markets. For each region in the model, expenditures by the regional household are determined by an aggregate utility function that allocates expenditure across private, government and savings expenditures. On the other hand, the regional household sells endowment commodities to firms. Profit-maximizing firms use these endowment commodities along with intermediate goods to produce final goods and services. Firms sell final goods and services to private households and governments to generate income. In addition, there are two global sectors in the model: global transportation and banking. The global transportation sector redeems its service with the difference between the f.o.b. (free on board) and c.i.f. (cost, insurance and freight) values for a particular commodity shipped along a specific route. The global bank intermediates between global savings and investment by creating and distributing the investment good to all firms.

For the purposes of this study, the countries in the database were grouped into the following ten regions: Australia and New Zealand, Japan, the Rest of Asia, Canada, USA, Mexico, Central and South America, the European Union (EU), Former Soviet Union, and the Rest of the World (ROW). In each country/region, there are ten sectors: agriculture, forestry, mining, food and tobacco, manufacturing, lumber, pulp and paper, services, construction, and dwellings (Gan and Ganguli, 2001). The GTAP database version 3 was used in this study with the base year of 1993, the year prior to the NAFTA implementation.[1]

The CGE model is capable of analysing various separate or joint effects of NAFTA and GATT/WTO. The model is appropriate for capturing the substitutions in production and consumption between goods and services, and the resulting changes in trade flows and values. All experiments were conducted in a multi-country, general equilibrium closure. Output, prices, incomes, imports and exports are endogenous for all regions. The experiments involved the partial and complete removal of *ad valorem* import and export taxes in NAFTA and GATT/WTO members. While the analysis was conducted, the WTO negotiations were ongoing. The associated trade reforms, when known, could be incorporated into the analysis, for an assessment of additional WTO liberalization by the member countries in the future.

In addition to tariff reductions or elimination, the NAFTA and GATT/WTO also deal with non-tariff trade barriers (NTB). One question that immediately arises is what to assume about the reduction or elimination of non-tariff barriers. Consistent with the spirit of the agreements, the most desirable way to handle the NTBs would be to represent them in terms of their tariff equivalents and then to assume that these would be reduced to zero. Unfortunately, there are not sufficient data to measure NTBs as tariff equivalents. There is also an issue of whether or not many of the existing NTBs will in fact be eliminated over whatever period specified in the negotiations. That is, it

is conceivable that countries may find ways to continue to impose their NTB restrictions in their present form or in some future alternative form yet to be determined. In such an event, the tariff equivalents of such NTBs should be only partially reduced and the quantitative restrictions should remain in place, so that the effects of the reduction or elimination of tariffs in these sectors would be diminished.

Another issue is the assumptions on labour and capital mobility. In this model, labour and capital are assumed to be perfectly mobile between sectors in each region, but perfectly immobile between regions. This may capture some of the short- and medium-term effects of trade liberalization as compared to the long term when all factors of production are mobile.

Current tariffs vary tremendously across commodities and countries/regions. Each trade agreement also has complex tariff reduction schemes for different countries and products. To consider all cases of the tariff reductions under the NAFTA and GATT/WTO is impossible. In light of the foregoing considerations, five scenarios were formulated to simulate the impacts of NAFTA and GATT/WTO (Table 21.1). These scenarios represent different levels and scopes of trade liberalization, ranging from NAFTA to the UR and to perfect free trade.

Results

NAFTA impacts on global forest product trade are presented first, followed by the GATT/WTO. Current forest product trade is dominated by developed countries and regionalized in a few major markets including the Pacific Rim, North America and the EU. This analysis will focus on how NAFTA and GATT/WTO would affect current trade patterns of forestry, lumber, and pulp and paper products. All the changes in imports and exports presented here, if not specified, are relative to the benchmark levels of year 1993.

Impacts on the forestry sector

The impacts of NAFTA and GATT/WTO on the trade of products in the forestry sector are shown in Table 21.2. The primary product of the forestry sector is logs. The current major log exporting countries/regions are the USA, the Rest of Asia, the former Soviet Union, the EU and ROW. On the other hand, Japan, the Rest of Asia and the EU dominate global log imports. NAFTA would have little impact on current global log imports and exports except for the log trade between the USA, Mexico and Japan. When NAFTA is fully implemented, Mexico would increase its log imports by US$11 million from its 1993 level. Almost all of the Mexican increased log imports would come from the USA. Under NAFTA, the total US log exports would not increase much, the increased US log exports to Mexico would be met primarily by reducing exports to Japan. Given the magnitude of US log exports to Japan, the impact on Japan could be ignored. Moreover, Japan would partially compensate for its import loss from the USA through increasing its imports from the Rest of Asia.

The UR would increase log exports from the Rest of Asia, the USA and ROW, but decrease log exports from the former Soviet Union. Compared with 1993 levels, log exports from the Rest of Asia,

Table 21.1. Tariff reduction scenarios implicated by NAFTA and GATT/WTO.

Scenario	Description
I	A 100% cross the-board cut of the existing tariffs in all sectors for NAFTA countries
II	A cross the-board cut of 36% of the existing tariffs in all sectors for developed countries and 24% for developing countries
III	A cross the-board cut of 100% of the existing tariffs among NAFTA members, 36% of the existing tariffs for developed countries, and 24% for developing countries outside NAFTA. A combination of scenarios I and II
IV	A 50% cross the-board cut of all existing tariffs for all sectors and all countries/regions
V	A complete elimination of all existing tariffs for all sectors and all countries/regions

the USA and ROW would increase by US$126 million (5.5%), US$89 million (3.9%) and US$167 million (8.0%), respectively. The Rest of Asia increased exports would mainly go to Japan. Japan and the Rest of Asia would also account for most of the increased US exports. The ROW would expand its log exports to many regions/countries including Japan, the Rest of Asia, the EU and ROW. Under the UR, the former Soviet Union would see an US$80 million reduction in log exports, resulting from reduced imports by Japan and the EU. This indicates that under the UR the former Soviet Union would face stiffer competition from the Rest of Asia, the USA and ROW in the global log markets.

The combination of NAFTA and UR would have similar effects on global log trade patterns except for promoting US log exports to Mexico by US$6 million. The additional tariff reductions beyond NAFTA and UR would significantly boost log exports from the Rest of Asia, the USA and ROW, but reduce log exports from the EU and the former Soviet Union. With the complete elimination of all tariffs, the Rest of Asia log exports would reach US$3046 million, a 31.5% increase from the 1993 level. Japan would be the major market for the Rest of Asia increased exports. Currently, there are relatively high log import tariff rates in Asia. The removal of these tariffs would stimulate log trade among the Rest of Asia countries. Under the complete free trade scenario, US log exports would go up by US$396 million (17.1%) from the 1993 level. Japan and other Asian markets would account for most of the US exports' increase. The ROW would experience a 36.9% (US$768 million) increase in its log exports from the 1993 level under complete free trade. The main destinations of the ROW's increased exports would be Japan, other Asian countries and the EU. With the increasing trade liberalization, the former Soviet Union and EU would continuously lose their market shares in the global log markets. In the complete free trade situation, the former Soviet Union and EU would end up with an exports loss

Table 21.2. Imports and exports in the forestry sector due to NAFTA and GATT/WTO tariff reductions (US$ million).

Region/country		Base year (1993)	Scenario I	Scenario II	Scenario III	Scenario IV	Scenario V
Australia and New Zealand	Import	5.4	5.4	5.5	5.5	5.5	6.1
	Export	260.8	261.4	266.4	266.8	274.7	246.5
Japan	Import	4,783.2	4,773.4	5,067.8	5,061.6	5,161.8	5,514.0
	Export	11.9	11.9	10.4	10.4	10.0	8.7
Rest of Asia	Import	2,699.4	2,694.4	2,808.3	2,804.9	3,234.2	3,876.2
	Export	2,316.9	2,323.4	2,443.3	2,447.8	2,673.2	3,046.1
Canada	Import	258.5	257.4	254.6	253.9	253.1	248.0
	Export	228.5	230.4	240.2	241.5	252.2	279.1
USA	Import	144.0	143.7	145.1	144.8	145.7	148.6
	Export	2,314.5	2,301.1	2,403.6	2,394.7	2,512.4	2,710.7
Mexico	Import	28.5	39.5	30.8	38.1	31.5	35.0
	Export	24.3	21.7	23.9	22.1	23.8	23.2
Central and South America	Import	41.8	41.5	43.5	43.3	49.9	60.5
	Export	256.9	258.2	267.5	268.6	277.4	298.0
European Union (EU)	Import	2,650.3	2,647.0	2,627.0	2,624.7	2,593.7	2,533.5
	Export	655.3	655.3	636.2	636.1	591.9	533.5
Former Soviet Union	Import	5.2	5.2	5.7	5.7	6.4	7.7
	Export	730.2	730.4	650.4	650.4	562.7	437.2
Rest of World (ROW)	Import	695.2	695.1	734.7	734.6	797	939.8
	Export	2,085.6	2,082.5	2,253.0	2,250.7	2,438.8	2,854.1
Total	Import	11,311.5	11,302.2	11,723.0	11,717.1	12,278.8	13,369.4
	Export	8,884.9	8,876.3	9,194.9	9,189.1	9,617.1	10,437.1

Notes: The tariff reduction scenarios are shown in Table 21.1. Imports and exports are valued at c.i.f and f.o.b., respectively. The values for the base year are derived from the GTAP database version 3.

of 40.1% (US$293 million) and 18.6% (US$122 million), respectively. The former Soviet Union's drop in log exports would primarily be because Japan and the EU would increase their imports from the Rest of Asia and the USA.

Overall, NAFTA would have almost no impact on current global log trade patterns. However, the UR and WTO would have significant impacts on global log trade flows. The increasing global trade liberalization would stimulate log imports by Japan, other Asian countries and the ROW. The increased global demand would be met by increased exports from the Rest of Asia, the USA and ROW. The increase in Japanese imports, and in both imports and exports in the Rest of Asia and ROW implies that the global trade liberalization would promote log trade among Asian countries (including Japan) and ROW. Moreover, the former Soviet Union and EU would lose their competitiveness in the global log markets to the USA, the Rest of Asia and ROW with the increased reductions or removal of trade tariffs.

Impacts on the lumber and wood products sector

Of the three forest product sectors, the lumber and wood products sector would be affected most by the NAFTA and GATT/WTO (Table 21.3). The EU, the Rest of Asia, Canada, the USA and ROW are currently major lumber and wood products exporters. And the EU, the USA, ROW, Japan and other Asian countries also dominate the global lumber and wood products imports. Although the Rest of Asia, the EU, the USA and ROW are both major importers and exporters, the Rest of Asia is a net exporter while the others are net importers. NAFTA and GATT/WTO would not dramatically change the dominant roles of these countries/regions in the global lumber and wood products markets. Their impacts on the global lumber and wood product trade flows vary, and in some cases would be significant. First, NAFTA would have no noticeable impact on the global lumber and wood product trade flows outside North America. However, NAFTA would

Table 21.3. Import and export values of lumber and wood products due to NAFTA and GATT/WTO tariff reductions (US$ million).

Region/country		Base year (1993)	Scenario I	Scenario II	Scenario III	Scenario IV	Scenario V
Australia and New Zealand	Import	997.3	995.5	1,073.7	1,072.4	1,134.1	1,435.8
	Export	818.9	820.0	825.6	826.3	847.7	793.0
Japan	Import	8,092.4	8,077.7	8,818.2	8,809.2	9,143.2	10,218.9
	Export	705.7	706.2	725.5	725.6	777.2	936.0
Rest of Asia	Import	5,924.7	5,918.9	6,095.1	6,091.0	7,080.5	8,528.3
	Export	14,090.0	14,110.9	14,531.4	14,545.2	15,328.6	16,801.9
Canada	Import	2,742.2	2,826.6	2,742.7	2,795.1	2,736.7	2,753.8
	Export	8,462.7	8,505.9	8,642.3	8,670.5	8,825.5	9,215.0
USA	Import	14,321.2	14,484.7	14,466.1	14,570.8	14,470.6	14,738.5
	Export	7,252.8	7,649.8	7,536.3	7,797.7	7,750.1	8,241.0
Mexico	Import	1,072.8	1,465.2	1,161.7	1,422.6	1,195.5	1,341.3
	Export	780.0	833.9	815.0	847.7	838.6	902.7
Central and South America	Import	1,082.1	1,075.3	1,155.6	1,150.4	1,380.2	1,819.8
	Export	1,580.0	1,580.2	1,621.6	1,622.5	1,791.1	2,075.0
European Union (EU)	Import	22,400.8	22,379.0	22,458.1	22,442.7	22,431.0	22,456.6
	Export	16,434.8	16,426.7	16,677.3	16,670.0	16,779.5	17,438.1
Former Soviet Union	Import	654.1	653.9	725.4	725.3	826.5	1,030.2
	Export	836.4	835.7	720.5	720.0	614.6	456.6
Rest of World (ROW)	Import	9,343.8	9,345.0	9,771.6	9,772.0	10,432.5	11,801.5
	Export	6,609.6	6,600.8	7,022.6	7,016.2	7,585.9	8,773.8
Total	Import	66,631.4	67,221.8	68,468.2	68,851.5	70,830.8	76,124.7
	Export	57,570.9	58,070.1	59,118.1	59,441.7	61,138.8	65,633.1

Notes: The tariff reduction scenarios are shown in Table 21.1. Imports and exports are valued at c.i.f and f.o.b., respectively. The values for the base year are derived from the GTAP database version 3.

boost lumber exports of all three NAFTA countries, promoting exchanges of lumber and wood products between the USA, Canada and Mexico. When NAFTA is fully implemented, the US exports of lumber and wood products would reach US$7649.8 million, a 5.5% (US$397 million) rise from the 1993 level. Mexico would account for 93% of the US increased lumber and wood products exports. Mexico would see a US$53.9 million increase in lumber and wood products exports, which would mainly go to the USA. Canada would also experience a minor lumber and wood products export increase, a US$43 million rise from the 1993 level, as a result of the increased US imports from Canada.

Second, the UR would promote the imports and exports of lumber and wood products for almost all regions except the former Soviet Union exports. Under the UR, EU lumber and wood products exports would increase by US$242.5 million from the 1993 level. The increased exports would be distributed among all regions outside the EU. Meanwhile, the EU would reduce its own market share in the EU lumber and wood products market. The EU total imports would basically be unchanged under the UR, but the EU would reduce its imports from the former Soviet Union, and increase its imports from ROW, the Rest of Asia, the USA, Canada, and Central and South America. Canada would also enjoy a 2.1% (US$180 million) export gain compared with the 1993 level. Japan would absorb most of the increased exports from Canada. The US exports would increase by US$283.5 million, but would be lower than that resulting from the full implementation of NAFTA alone. The increased US exports would largely be designated to Japan and other Asian countries. The UR would boost ROW exports by US$413 million (6.3%). Most of the ROW new exports would be shipped to the EU. The drop in the former Soviet Union exports would be mainly due to the EU's shifting its supply of imports to other regions, particularly ROW.

Third, adding NAFTA to the UR would not alter the global lumber and wood products trade patterns under the UR except for the trade flows within North America. Compared with the scenario under the UR alone, the combination of the UR and NAFTA would significantly increase US exports and Mexican imports, but have relatively small effects on Canadian imports and exports of lumber and wood products. The increased US exports would be largely due to the increased Mexican imports.

Fourth, further tariff reductions beyond NAFTA and UR would considerably promote the global trade of lumber and wood products. With the complete elimination of all tariffs, the Rest of Asia, Canada, the USA, Central and South America, EU and ROW would become big winners in lumber and wood products exports, while the former Soviet Union would suffer a large percentage export decline. Meanwhile, lumber and wood products imports by Australia and New Zealand, Japan, other Asian countries, the USA, Mexico, Central and South America, the former Soviet Union and ROW would increase significantly. Under the ideal free trade situation (Scenario V, see Table 21.1), the Rest of Asia lumber and wood products exports would increase by US$2712 million (19.3%) from the benchmark level. The Rest of Asia export increase would be attributed largely to the increased imports by Japan, other Asian countries and ROW. This further stimulates regionalization of lumber and wood products trade in Asia (including Japan) and trade between developing countries. Canada would also record a noticeable export increase, a US$752 million (8.9%) climb from the 1993 level. Japan would be the number one designation for the new Canadian exports, followed by the USA. The US gain in lumber and wood products exports would amount to US$988 million (13.6%). Under complete free trade, the US would increase its exports to all regions/countries except Canada. The EU would consolidate its exports with a US$1003 million (6.1%) gain through expanding its exports to all regions. Central and South America would experience a US$495 million (31.3%) rise in lumber and wood products exports. The effects of complete free trade on ROW would also be sizable. Under this scenario, ROW exports would jump by US$2164 million (32.7%). Although ROW would expand its lumber and wood products exports to all regions, the EU would account for most of its increased exports. Again, the decline in the former Soviet Union exports would be largely due to the reduced imports by the EU. With increased global trade liberalization, the former Soviet Union would lose its competitiveness in the global wood products markets. The relatively low existing import tariffs for wood products originating from the former Soviet Union and its ageing wood processing facilities may be the main reasons

for it to lose market share. On the other hand, wood products imports by the former Soviet Union would go up by US$376 million, or 57.5%. The increased imports would largely come from the EU. Japanese imports would rise by US$2126.5 million (26.3%). The majority of the Japanese increased imports would originate from other Asian countries, Canada and the USA. The wood products imports by the Rest of Asia would increase dramatically, a US$2603 million (43.9%) rise from the 1993 level. The sources for the increased imports would be the Rest of Asia itself, the EU and the USA. The ROW imports would also jump by US$2458 million (26.3%). The increased imports by ROW would be supplied by all major wood products exporters including the Rest of Asia, the USA, EU and ROW.

Impacts on the pulp and paper sector

Pulp and paper products are the most traded forest products in the world. Table 21.4 presents the amount of pulp and paper imports and exports by various regions/countries. The USA and EU are currently the largest pulp and paper products importers and exporters. Canada is also a major exporter while the Rest of Asia and ROW are importers of pulp and paper products. NAFTA would basically have no impact on current pulp and paper trade patterns within North America and worldwide. This is because of the existing relatively low tariffs for pulp and paper products in NAFTA countries and the price inelasticity of Mexican import demand for pulp and paper products.

The UR would have small positive, but insignificant, impacts on current global pulp and paper trade flows. The UR would enhance pulp and paper exports from Canada, the USA and EU. Under the UR, Canadian exports would go up by US$145 million (1.1%), US exports would rise by US$122 million (0.8%) and EU exports would increase by US$269 million (0.9%) relative to the 1993 levels. On the import side, Australia and New Zealand, Japan, other Asian countries and ROW

Table 21.4. Import and export values of pulp and paper products due to NAFTA and GATT/WTO tariff reductions (US$ million).

Region/country		Base year (1993)	Scenario I	Scenario II	Scenario III	Scenario IV	Scenario V
Australia and New Zealand	Import	2,323.6	2,321.5	2,418.9	2,417.4	2,478.2	2,853.4
	Export	930.1	931.3	919.3	920.2	923.3	869.8
Japan	Import	3,568.6	3,561.4	3,782.5	3,777.9	3,870.7	4,167.4
	Export	2,828.4	2,834.3	2,819.8	2,823.2	2,915.5	3,099.3
Rest of Asia	Import	12,099.5	12,090.9	12,370.7	12,365.1	13,381.9	14,926.1
	Export	4,881.0	4,889.4	4,865.9	4,871.4	5,427.8	6,170.8
Canada	Import	4,544.9	4,538.6	4,501.4	4,497.5	4,475.2	4,445.5
	Export	12,866.7	12,890.9	13,011.3	13,026.8	13,104.5	13,371.1
USA	Import	14,548.5	14,651.2	14,563.4	14,629.0	14,553.1	14,659.3
	Export	14,877.6	14,857.3	14,999.8	14,983.7	15,144.0	15,389.2
Mexico	Import	2,434.3	2,510.1	2,409.6	2,456.7	2,388.9	2,343.9
	Export	664.5	710.3	685.9	714.5	695.2	729.3
Central and South America	Import	3,589.4	3,580.4	3,630.5	3,623.8	3,859.2	4,171.8
	Export	3,092.8	3,107.7	3,121.9	3,132.6	3,310.6	3,576.7
European Union (EU)	Import	31,302.0	31,286.0	31,218.6	31,207.1	31,231.8	31,166.6
	Export	31,729.5	31,759.2	31,998.4	32,016.8	32,375.1	33,372.1
Former Soviet Union	Import	511.6	511.6	546.5	546.5	595.9	686.3
	Export	386.4	386.4	364.7	364.7	341.3	306.5
Rest of World (ROW)	Import	12,212.4	12,214.3	12,503.6	12,504.5	12,993.6	13,924.2
	Export	5,721.0	5,720.9	5,880.9	5,880.5	6,064.0	6,461.5
Total	Import	87,134.8	87,266.0	87,945.7	88,025.5	89,828.5	93,344.5
	Export	77,978	78,087.7	78,667.9	78,734.4	80,301.3	83,346.3

Notes: The tariff reduction scenarios are shown in Table 21.1. Imports and exports are valued at c.i.f and f.o.b., respectively. The values for the base year are derived from the GTAP database version 3.

would increase their pulp and paper imports slightly.

The further trade liberalization beyond the NAFTA and UR would have some significant impacts on the global pulp and paper trade patterns. The complete elimination of all tariffs would stimulate pulp and paper exports from the Rest of Asia, Canada, the USA, Central and South America, EU and ROW and increase imports by Australia and New Zealand, Japan, the Rest of Asia, Central and South America, the former Soviet Union and ROW. The pulp and paper exports from the Rest of Asia would reach US$6170 million, a 37.2% jump from the 1993 level. More than a half (56%) of the increased exports by the Rest of Asia would be due to expanded trade among the Rest of Asia countries. The Rest of Asia new exports would go to ROW and Australia and New Zealand as well. The Rest of Asia imports would also increase considerably, US$2827 million (23.4%) higher than the benchmark level. Most of the Rest of Asia increased imports would come from the Rest of Asia itself (38%), the EU (32%) and the USA (13%). Canada would see a 3.9% (US$504 million) rise in its exports due to the increased imports by the EU, Japan and other Asian countries. The USA would also enjoy some (3.4% or US$512 million) export increase. Probably the most important impact on the USA is not the change in total export values but in trade flows. Under complete free trade, the US would increase pulp and paper exports to Japan, the Rest of Asia, Australia and New Zealand, and ROW while reducing its exports to Canada and Mexico. Central and South American imports and exports would go up modestly. The USA would be the major source for increased imports by Central and South America, and the main designations for new exports would be ROW and Central and South America itself. Another winner from complete free trade would be the EU, whose exports would climb by US$1643 million (5.2%) with stable imports. As a result, the EU would become a pulp and paper net exporting region. The Rest of Asia, ROW, and Australia and New Zealand would absorb most of the EU new exports. The ROW would remain a pulp and paper net importing region even though its exports and imports would significantly increase under free trade. The USA would supply most of the ROW's expanded imports, while the ROW export increases would be attributed to increased exchanges within ROW and imports by the EU and the Rest of Asia. Under the free trade scenario, both exports and imports of the Rest of Asia, Central and South America, and ROW would increase, but all would remain pulp and paper net importing regions. The increased imports and exports would be mainly due to enhanced exchanges within each individual region and between these regions. Therefore, free trade would stimulate pulp and paper product trade between developing countries.

Summary and Conclusions

This study assesses the impacts of NAFTA and GATT/WTO on the global trade flows of forest products using a computable general equilibrium model. The results provide both intrasectoral and intersectoral impacts of the tariff reductions under these trade agreements. The current trade tariffs for forest products vary across products and regions/countries. In general, the tariffs among developed countries or treaty countries are relatively low, and those among developing countries and between developed countries and developing countries are relatively high. Moreover, the trade distortions in forest products are smaller than many other sectors. The relatively low tariffs for forest products might result in small or insignificant intrasectoral impacts of trade liberalization, but intersectoral impacts could be significant. The CGE approach allows us to combine the intra- and inter-sectoral impacts. However, the CGE model is not without limitations. It is a static, not a dynamic, model and assumes perfect competition and the equilibrium of all markets. Due to the limitation of the sectoral aggregations in the database, the model lacks the ability to examine the impacts on a specific wood product. Nevertheless, our results would be a good complement to the existing findings using sectoral models and the partial equilibrium approach. Combined with the findings of previous partial equilibrium studies, our results would provide a more comprehensive picture of the impacts of NAFTA and GATT/WTO on the magnitude and directions of global forest product trade.

NAFTA and GATT/WTO impacts on the global forest product trade patterns vary across product groups and countries/regions. In general, NAFTA and UR would have relatively small or

modest impacts on current forest product trade patterns. Further trade liberalization could result in significant impacts on current trade flows of forest products. As a regional trade agreement, NAFTA impact would be confined within North America, particularly for the lumber and wood products markets in the region. NAFTA would stimulate lumber and wood products trade among NAFTA countries. It would significantly expand US lumber and wood products exports to Mexico. However, the limited log market and existing low tariffs in NAFTA countries would impede NAFTA from producing large effects on current log trade patterns within North America. Similarly, NAFTA impacts on pulp and paper trade flows would also be minimized due to low tariffs and price inelasticity of Mexican import demand for pulp and paper products.

The UR impacts on forest product trade are broader and more significant. The UR would increase log exports from the Rest of Asia and ROW, promote lumber and wood products trade across almost all regions, and slightly enhance pulp and paper exports from Canada, the USA and the EU. Under the UR, Japan and other Asian countries would significantly increase their lumber and wood products imports, supplied mainly by the USA, Canada, the EU and the Rest of Asia. In addition, the EU would shift its wood products imports from the former Soviet Union to ROW.

Additional global trade liberalization beyond the NAFTA and UR would have important and considerable impacts on global forest product trade. For logs, ROW and the USA would expand their exports to Japan and the Rest of Asia. The EU would reduce its exports while further increasing its imports from ROW. In the lumber and wood products markets, the traditional major exporters including Canada, the USA and the EU, would significantly increase their exports, mainly to Japan, other Asian countries and ROW. Probably, the most significant impacts would be the increased trade (both imports and exports) of wood products in emerging markets and developing countries, including the Rest of Asia, Central and South America, and ROW. In terms of pulp and paper products, complete free trade would have a considerable impact on the total amount of trade as well as trade flows. Canada, the USA and the EU would remain as major players in the global pulp and paper markets. The USA would shift its exports from Canada and Mexico to the Rest of Asia and ROW. The EU would become a pulp and paper net exporter largely due to its increased exports to the Rest of Asia and ROW.

The developed countries would continue to dominate global forest product markets, but increasing global trade liberalization would stimulate forest product trade among developing countries, particularly within the Rest of Asia, Central and South America, and ROW. The former Soviet Union's current limited engagement in global forest product trade would not be improved much. Its exports in lumber and wood products, and pulp and paper would decrease, continuing to lose its competitiveness in the global markets to developed countries as well as other emerging forest product exporting regions like the Rest of Asia, and Central and South America.

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Endnote

[1] The version 3 database was used instead of a newer one because it contains pre-NAFTA information, making it appropriate as a benchmark to compare the impact of NAFTA. Year 1993 was also the transition time from the GATT to the WTO. Moreover, version 3 and version 4 contain the same aggregation of the forestry and wood products sectors. Using a newer version (version 4) did not confer any advantage in terms of the sector aggregation for the purpose of this study.

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