Forest Stewardship Standards: Voluntary Governance As A Trade Facilitation Strategy?

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Introduction

Pressure from international institutions, local communities, and consumer groups have forced governments to impose restrictions on timber production based on ecological and social criteria. In addition, businesses and end consumer concerns about poor public governance and a desire for further industry accountability have demanded market based certification systems to help signal a firm's commitment to ecological and/or socially responsible behavior.

Introduced in 1993, forest certifications (FC) were initially a market instrument designed to combat deforestation and to promote the sustainable management of tropical forests. Since then, the range of forest certification goals has expanded from forest management to include chain of custody (COC) of forest products for both tropical and temperate forest settings. Certified companies have adapted to social and biological constraints imposed by the scheme guideline (Gullison, 2003) .

Literature examining forest certifications has considered many aspects of the impact of these standards. Most commonly this literature has focused on: (i) as a market governance mechanism (e.g. Marx and Cuypers, 2010; McGinley and Cubbage, 2011); (ii) price premiums from certification adoption and the costs of certification (e.g. Kollert and Lagan, 2007; Nebel et al., 2005; Stevens et al., 1998); or (iii) the role of these standards in forest conservation (e.g. Ebeling and Yasué, 2009; Rametsteiner and Simula, 2003). Among the positive impacts of FC, sustainable management practices (Auld et al., 2008; Elbakidze et al., 2011; Gullison, 2003), and improvement on the quality of timber production (Acharya et al., 2015) have been claimed by FC supporters. The economic benefits of becoming certified to a forest industry standard, however, is not as clear as the ecological. Financial returns depends on in improvement in the certified firm's profitability through either improving revenue or decreasing cost, or an improvement in the firm's competitive position. The possible benefits of having a certified product might not overcome the investment required to become certified. Kollert and Lagan, (2007), estimate that production cost of companies certified to a forest industry standard increases 2% to 56% as companies implement FC standards. In addition, the expected financial return, if any, might not occur in short-run. Bouslah et al. (2010), find that that FC had negative impact on shareholder returns during the first three years after certification adoption.

Buyer willingness to pay a price premium for certified products varies by region and product; tropical forest products tend to have higher price premium than products from non-tropical forests (Aguilar and Vlosky, 2007). Espach (2006), estimated that certified tropical wood exported from Brazil received a 20- 50% price premium over comparable, non-certified, products. Nebel et al., 2005, compared export timber prices between certified and non-certified timber of seven tropical species from Bolivia. The authors showed statistically significant difference between certified and non-certified prices from 5 to 51% dependent on species type. In a survey of the certified firms in the Finish wood industry, Owari et al., 2006 found that the primary reasons that firms became certified to an FC was to keep existing customers. Improving profitability was the lowest ranked motivation. A similar surveys was conducted among Malaysian furniture manufacturers by Ratnasingam et al. (2008). According to these authors, even firms that are highly dependent on exports do not consider the possibility of a price premium as their main motivation to get certified. In this study, 93% of surveyed firms were not certified and do not intend to become certified due to the lack of demand, lack of a price premium for certified products, and insufficient knowledge about certification.

Companies located in developing countries are, likely, to be the most challenged to meet the FC management and social requirements. The uncertainty regarding to what extent, if any, certification will generate a price premium, and the relatively high cost of initial certification implementation and maintenance is a barrier to certification adoption for many firms. While FC standard setting bodies have taken steps to facilitate adoption of these standards by smaller or less competitive firms, it is not clear that these steps have been sufficient to facilitate comparable standard adoption levels in developing countries. For these reasons it is unclear what, if any, trade facilitation impacts are offered by forest industry standards. To date, no comprehensive, ex post empirical analyses examining the impacts of adoption of voluntary forest certifications on the international trade of wood and wood products have been completed.

Using a gravity model approach this research examines to what extent and, through which mechanisms, forest certification affects the international trade of forest products. The specific objective of this study is thus to assess the trade facilitation impacts of forest certification on bilateral trade of forest products. The remainder of this paper is organized as follows. Section two presents a review of the relevant literature, and Section 3 describes the data and model used in this analysis. Section 4 presents our results, and Section 5 concludes.

Literature Review

2.1. Bilateral Trade of Timber Products

In 2014, $356 billion of timber products were traded worldwide; historically, paper and paperboard, wood manufactures and, pulp and waste have shared more than 75% of the international trade market (Figure 01 - A). From 2000 to 2014, on average trade of timber products increased by 70%, in which trade of fuel and wood charcoal has raised 250% during the same period (Figure 1.B).

[Insert Figure 1 here.]

The market of timber products is concentrated in a few regions, with ten countries sharing more than 50% of imports and exports. Germany, USA and China are the largest traders and, together, they share 29.5% of imports and 31.1 % of exports in the market, respectively (table 01).

[Insert Table 1 here.]

Bilateral trade between Canada and USA has historically had the largest flow of goods. In 2014, around $26 billion of timber products were traded (7% of total value traded in 2014), however since 2004, trade between these countries has declined 37% (Figure 02 - A). This drop is explained partially by the growth in trade between USA and China. From 2004 to 2014, USA-China trade increased from $ 7.4 billion to $14.30 billion USD. In fact, China has increased significantly its share of the trade market more than any other core country in the last decade. Trade between China and its main partners (USA, Canada, Russia, Indonesia and Brazil) is now 1.5 fold greater than in 2004 (Figure 02 – B).

[Insert Figure 2 here.]

The dominance of few countries is also observed after disaggregating trade flows by country and product type. USA and Canada, for instance, have the highest value traded in 3 of the 8 forest products analyzed. The flow of products between these countries represents a notable share of the market of each examined good. For example, 23.54% of Pitprops,poles (NES), 11.96% of Sawnwood, and 3% of paper and paperboard.

[Insert Table 2 here.]

The increasing demand for derivatives of timber and non-timber products has positively affected the flow of timber products among countries (Bonnefoi and Buongiorno, 1990; Lundmark, 2010a; Michinaka et al., 2011). On the other hand, consumers have demanded from governments, private sector and international institutions, mechanisms of regulation to address non-sustainable forest management practices and illegal logging (Cabarle and Heiner, 1994). Forest products commercialization has been constrained by several types of regulations in order to address consumers’ and governments’ standards. Over the last decades, FC has become a widely adopted voluntary standard.

2.2. Certification of Forest Products

At present, there are two main forest certification systems: Forest Stewardship Council (FSC) and Program for the Endorsement of Forest Certification (PEFC). FSC was initiated in 1993 by environmentalist groups after RIO 92 to reduce deforestation in tropical forests. Companies certified by FSC must follow ten principles and 56 performance-based criteria (FSC, 1996). Principles of FSC covers tenure and land use rights, indigenous peoples’ rights, conservation, management, and financial return. FSC offers three types of certifications: (i) forest management, (ii) chain of custody (COC) and (iii) controlled wood (material that could be mixed with certified wood during manufacturing). Currently, FSC has been adopted by firms 125 countries. As of 2014, a total of 183 million hectares of forest is certified to FSC, and 28,000 companies are certified under COC.

PEFC has a different structure; it is an umbrella organization composed of local and government schemes. Founded in 1999 by forest producers in Europe, PECF is present in 69 countries and offers two types of certifications: forest management and chain of custody. Requirements of each of the composite certification schemes vary according to local regulations; however, each standard within the PEFC umbrella must ascribe to six main criteria for forest management which include socio-economic functions, forest management, and management of the contributions of the forest to the global carbon cycle. In 2014, 263 million hectares of forest area, and 10,000 companies held a COC certification through PECF.

While the differences between these certifications has been narrowing over the time (Auld et al., 2008; NEPCon, 2012; O’Reilly, 2006), important differences remain. The foundation of these standards lay in different interests; FSC was founded by environmental groups to protect the interests of consumers while PEFC was founded by producers to preserve their own interest. Previous studies indicate that FSC tends to be more prescriptive (Mcdermott et al., 2008) and rigorous (NEPCon, 2012) than the standards endorsed by PEFC. According to Stringer (2006), the strengths of FSC is the inclusion of economic, social and environmental interests, while PEFC increases the level of transparency within countries and it regulates national standards.

Both certification schemes have experienced substantial incremental growth in recent years. In 2014, there were 446 million hectares of forest certified by either FSC or PEFC. This area reflects approximately 38% of the world's productive forest[1]. Since its inception in 1993, the forested area certified to FSC increased at an annual average of 63%, while the number of firms certified to COC increased by 82%. PEFC, on the other hand, has expanded their area from 2004 to 2014 at an average of 30% annually, while COC expanded 20% per year (Figure 03).

[Insert Figure 3 here.]

Most of the certified forest areas are located in the North America (50%) and Europe (38%) (Table 02). The concentration of firms certified to a COC standard is highest in Europe (61%), followed by Asia (21%), and North America (10%). Africa has the lowest share of the world's certified forests (1.2%) and COC companies (less than 1%).

[Insert Table 3 here.]

2.3. Empirical Examinations of the International Trade of Forest products

The use of economic models on international trade of forest products was initiated in the 1980s. Early studies described wood consumption, trade in a post-war scenario, and the world's forest policy programs (Glesinger, 1945). Holland (1973) was a pioneer in describing the different markets worldwide, as well as analyzing a potential increase of the trade between the US and Canada. Sedjo and Lyon (1983) offered the first application of empirical models used to examine the international trade with their study of national comparative advantage of wood product production. These authors compared hypothetical scenarios in which a region dominated by forest plantations (South America, Australia, and Asia) has comparative advantage to old growth forests (USA, Canada, and Europe). In a global approach, Bonnefoi and Buongiorno (1990), used the HO model to analyze forest endowments of 63 countries between 1960 and 1980. Consistent with HO model predictions, these authors confirmed that countries with a relatively large endowment of forest resources are more likely to be exporters. Later, the same model has also been applied to the study trade of forest products and fuel in Europe (Lundmark, 2010b) and the influence of endowment on long-run forest product trade (Uusivuori and Tervo, 2002).

Another approach practiced in studies about international trade of forest products is the use of Structural Equilibrium Models (SEM). The most common model used is the Global Forest

[1] The total area of forests designated for productive function was 1,196,169 thousand hectares measured by FAO, 2010.

Products Model (GFPM) (Buongiorno et al., 2003; FAO, 1999). GFPM has been used to project the trade of timber products and to study the impact of external shocks in the international timber market due to tax changes and timber production quotas (Buongiorno et al., 2012, 2011; Gan, 2004; Sun et al., 2010).

Kangas and Niskanen (2003), and Akyüz et al. (2010), examined the trade in forest products between current and possible future European Union (EU) members. Both studies found a negative impact on trade from non-members due to trade barriers to accessing the EU market. Once a country became an EU member; trade in forest products was predicted to increase. The authors used only Ordinary Least Square (OLS) to estimate the model parameters, however, which might generate bias due to heterogeneous trading relationships (Gómez-Herrera, 2012). Zhang and Li, 2009, investigated the role of forest endowment and logging restrictions on China's trade of wood products. . Using the H-O model, these authors also found that countries with a large amount of commercial forest tend to be net exporters of forest products. In addition, logging restrictions had positive effect on China's imports. The Gravity model also was used to investigate international trade among members of EU (Buongiorno, 2015). The benefits to international trade varied from 1.7% (wood and articles of wood) to 13.8% (paper and paperboard, articles of pulp) dependent on the product being considered. Finally, Guan and Gong (2015), showed the negative effect on exports of timber products from China due to international efforts to reduce illegal logging.

Data and Methods

3.1. Data

The bilateral trade flow data was collected from the United Nations (UN) Comtrade (SITC Rev.2). Data at the 2,3, and digit levels of aggregation were used to permit the evaluation of specific forest products which are of particular interest. These products, and their total traded value are presented in Table 4.

[Insert Table 4 here.]

Information concerning country population, gross domestic product (GDP), and forest area data are drawn from World Bank Development Indicators. Common gravity model covariates such as distance between countries, currency, language, and World Trade Organization (WTO) membership, were collected from the *Centre d´Etudes Prospectives et d´ Informations Internationales* (CEII). Historic information regarding the area and number of companies certified to COC standards was provided by FSC and PEFC and updated using information from the websites of these organizations. The final dataset includes trade between 252 reporting and partner countries, between 1985 to 2013.

3.2 Model Specification

This analysis uses the gravity model to analyze the impact of Forest Certification on the international trade of forest products. The gravity model has its basis in Newton's Law of Universal Gravitation, which states that the attraction between two bodies is directly proportional to the product of their masses, and inversely proportional to the square of the distance between them. In a trade context, mass is reflected by a country's economic size; country specific characteristics known to facilitate or impede trade are included as additional covariates.

The theoretical foundation of gravity equation has been derived from monopolist competitive and H-O model along the last decades (Anderson and van Wincoop, 2003; Anderson, 1979, 2011; Bergstrand, 1985; Deardorff, 1998). Assuming market-clearance condition, different production between countries, identical and homothetic demand, the gravity model is defined as (Anderson and van Wincoop, 2003):

$$X_{ij} = \frac{y_i y_j}{y_w}\left(\frac{T_{ij}}{P_i P_j}\right)^{1-\sigma} \quad (1)$$

where X_{ij} is the trade flow between country *i* and *j,* y are the incomes (GDP) of countries *i,j* and global (w), T_{ij} is the bilateral trade barriers , P are price indices or "multilateral resistance".

Equation 1 cannot be solved directly because multilateral resistance are not observable or hard to collect. Consequently, simple Ordinary Least Square estimators are biased. An alternative approach to account for unobserved country-specific heterogeneity, is to incorporate country-specific fixed effects as proposed by (Harrigan,1996; Hummels,1999; Anderson and van Wincoop,2003). Therefore, this paper adapted equation 1 to a fixed effect model and added new variables as described below:

$$\begin{aligned} Log\left(Y_{ijt}\right) = \delta_{\mathrm{i}} + \delta_j + \beta_0 + \beta_1 Log(GDPcap_{it}) + \beta_2 Log\left(GDPcap_{jt}\right) + \beta_3 Log\left(dist_{ij}\right) + \beta_4 WTO_{ijt} \\ + \beta_5 WTO1_{ijt} \quad \beta_6 currency_{ijt} + \beta_7 RTA_{ijt} + \beta_8 language_{ijt} + \beta_8 border_t \\ + \beta_9 colony_{ijt} + \beta_{10} RFSC_{it} + \beta_{11} RFSC_{jt} + \beta_{12} RPEFC_{it} + \beta_{11} RPEFC_{jt} + \varepsilon_{ijt} \end{aligned} \quad (2)$$

where Y_{ijt} is the imported value of forest product between importing country *i* and exporting country *j* during period *t*. $GDPcap$ is per capita GDP of country i or j during year t, $dist_{ij}$ is the distance between country *i* and *j*. WTO_{ijt} and $WTO1_{ijt}$ are dummy variables which when both and one trading partner respectively are members of the World Trade Organization in year t. $Currency_{ijt}$, $language_{ijt}$, $colony_{ijt}$ and RTA_{ijt} are dummies variables that, respectively, reflect country trading pairs with a common currency, use a common language, have a historic colonial relationship, or are both members of the same Regional Trade Agreement. $RFSC_{it}$, $RFSC_{jt}$, $RPEFC_{jt}$ and $RPEFC_{it}$ are the ratio of certified area to total forest area by FSC and PEFC in country *i* and *j* during period *t* respectively. Country-specific characteristics which are not explicitly included in this model are captured by country fixed-effects ($\delta_{\mathrm{i}}, \delta_j$).

4. Results

4.1 Effect of Forest Certifications on the Trade Forest Products

Gravity model results for total trade of forest products, and for trade of products of specific interest are presented in Table 5. In general, these results were consistent with those predicted by economic theory. GDP of the importing and exporting countries increased trade, and distance decreased trade of forest products. Countries which share a common boarder, common language, had colonial ties, and are members of the same regional trade agreement(s), traded more forest products than country pairs without these traits. Membership of both trading partners in the WTO also was related to higher levels of trade; although, unexpectedly, membership of only either importer or exporter in the WTO had a negative impact on forest product trade between the countries.

[Insert Table 5 here.]

Standard gravity model covariates also generally had the expected sign and magnitude for the disaggregated product analyses as well. Except for trade of sawlog, GDP per capita of both importer and exporter countries had positive effect on trade. Only GDP per capita of importer countries had positive impact on trade of sawlog (Coniferous and Non-Coniferous). The large demand for bioenergy by importing (and primarily developed) countries in recent years is likely to be among the reasons for this outcome.

When both trading partners are members of the WTO, membership had positive impact on the trade of every product studied. The impact of only one of the trading partners being a member of the WTO, however, varied dependent upon the product being considered. In the case of paper and paperboard (S2-64), and fuel wood and charcoal (S2-245), one trading partner being a member of the WTO decreased trade; for other products, trade either increased or was not significantly affected by this circumstance. Similarly, membership in a common Regional Trade Agreement also had a variable impact on trade dependent on the product being considered.

The effect forest certification on a country's trade of forest products was found to vary depending on which certification and which products are being considered. In examining aggregate trade, the relative proportion of area certified to FSC in either the importing or exporting nation was found to be positively correlated with increased trade. Adoption of PEFC, however, was not found to significantly impact trade. When disaggregated products are considered, however, results were mixed. Importer use of FSC, positively impacted trade of paper and paperboard, and coniferous sawlogs, and negatively impacted trade of fuel wood and wood charcoal. Exporter adoption of this standard had a negative impact on trade of paper and paperboard, and non-coniferous sawlog. Relative use of PEFC had a much more limited impact on trade. Use of this standard by exporters facilitated trade only of fuel wood and charcoal, but negatively impacted all sawlog trade.

5. Conclusion

This research offers an initial examination of the impact of Forest Certification on the international bilateral trade of forest products. Our initial question was: Does Forest Certification impact the international trade of forest products? Our answer is a qualified yes! The impact of certifications on trade depend on the products being considered, the level of product disaggregation, and the specific certification being considered.

Different certification schemes have distinct effects on international trade. For instance, PEFC has a larger share of the North American market which domestically consumes much of its production. On the other hand, FSC is more widely adopted in South America, a market dependent on exports. It is not surprising then, that PEFC would be correlated with less trade facilitation than FSC. Interestingly, despite environmental regulations and forest management restrictions, the trade facilitation benefits of these voluntary certifications were notably less then when both countries are members of the WTO.

Future research will evaluate the extent to which certification facilitates (or not) trade from countries of different development status' (i.e. developed, developing nations), and will consider a broader range of products.

Table 01. Value and market share of international timber product trade for key importing and exporting countries, 2014.

Exports			Imports		
Country	**$ Billion**	**Share**	**Country**	**$ Billion**	**Share**
USA	37.6	10.3%	China	45.3	12.7%
China	34.9	9.6%	USA	37.1	10.4%
Germany	34.2	9.4%	Germany	28.7	8.0%
Canada	28.8	7.9%	United Kingdom	18.3	5.1%
Sweden	18.2	5.0%	Japan	16.7	4.7%
Finland	15.0	4.1%	France	16.2	4.5%
Russian Federation	11.5	3.2%	Italy	13.3	3.7%
France	11.1	3.0%	Netherlands	10.6	3.0%
Italy	10.7	2.9%	Canada	10.3	2.9%
Austria	10.4	2.8%	Belgium	9.8	2.7%
Others	**152.6**	**41.81%**	**Others**	**150.5**	**42.2%**

Table 2. Main international bilateral trade in 2014 – Value and share of the market per partners.

Product	**Trading Partners**	**Million USD**	**Share of the each product market (%)**
Fuel wood and wood charcoal	Germany & Poland	54.48	3.46
Pulpwood	China & Viet Nam	630.28	7.20
Sawlog and Veneerlog	New Zealand & China	1,658.28	7.78
Pitprops, poles, NES	Canada & USA	72.07	23.54
Sawnwood	Canada & USA	4,899.61	11.96
Pulp and waste paper	China & USA	3,947.87	8.07
Wood manufactures	China & USA	1,948.66	3.35
Paper and paperboard	Canada & USA	5,314.84	3.00

Table 3. Area and number of companies with Chain of Custody per scheme and region, 2014

	FSC	PEFC		FSC	PEFC	
Region	**Area(ha)**	**Area(ha)**	**Total(ha)**	**COC**	**COC**	**Total**
Africa	5.67	-	**5.67**	163	1	**164**
Asia	9.5	4.66	**14.16**	7,433	818	**8,251**
Europe	81.84	89.33	**171.18**	14,752	8,949	**23,701**
Central and South America	12.75	4.56	**17.3**	1,431	426	**1,857**
North America	70.76	154.25	**225.02**	4,012	152	**4,164**
Oceania	2.58	10.4	**12.98**	456	245	**701**
Total	**183.1**	**263.21**	**446.31**	**28,247.00**	**10,591.00**	**38,838**

Source: FSC, 2014, and PEFC, 2014.

Table 4. Products studied in this analysis

Code SITC Rev.2	**Product**	**Total Trade (billion USD)**
S2-245	Fuel wood and wood charcoal	1.57
S2-64	Paper and paperboard	176.96
S2-2471	Sawlogs - Coniferous	10.36
S2-2472	Sawlogs - Non-Coniferous	10.94
S2-2482	Sawn wood - Coniferous	27.25
S2-2483	Sawn wood - Non-Coniferous	13.39
	Total	**240.47**

Table 5. Core Results, with country fixed effects, 1985-2013

		All Forest Products		S2-64		S2-2471		S2-2472		S2-2482		S2-2483		S2-245	
	Variable	**Coef**	**Std. Error**	**Coef**	**Std. Error**	**Coef**	**Std. Error**	**Coef**	**Std. Error**	**Coef**	**Std. Error**	**Coef**	**Std. Error**	**Coef**	**Std. Error**
1	GDP per capita - Importer	0.058***	0.005	0.393***	0.030	0.086***	0.019	0.078***	0.015	0.09***	0.011	0.093***	0.008	0.109***	0.016
2	GDP per capita - Exporter	0.042***	0.005	0.116***	0.031	-0.005	0.014	0.019	0.012	0.035***	0.009	0.035***	0.007	0.091***	0.015
3	Distance	-1.863***	0.010	-1.78***	0.011	-1.321***	0.044	-1.095***	0.025	-1.296***	0.021	-1.216***	0.015	-0.921***	0.027
4	WTO – both *i*, *j* members	0.513***	0.025	0.194***	0.029	0.161	0.103	0.192***	0.066	0.434***	0.055	0.668***	0.038	0.319***	0.077
5	WTO – *i* or *j* member	-0.496***	0.049	-1.06***	0.054	-0.141	0.185	0.344**	0.144	0.212**	0.108	-0.071	0.084	-0.401**	0.158
6	Common Currency	-0.408***	0.044	0.266***	0.049	0.954***	0.094	0.138*	0.073	0.577***	0.062	-0.072	0.049	0.39***	0.080
7	Regional Trade Agreement	0.421***	0.020	0.593***	0.022	-0.077	0.072	-0.414***	0.049	0.182***	0.036	-0.149***	0.027	-0.226***	0.049
8	Common Border	0.479***	0.019	0.535***	0.023	0.224***	0.076	0.154***	0.045	0.333***	0.040	0.26***	0.028	0.226***	0.052
9	Common Language	0.575***	0.032	0.603***	0.032	2.276***	0.071	1.539***	0.053	1.232***	0.046	0.923***	0.037	1.336***	0.058
10	Former Colony	0.865***	0.032	0.658***	0.034	-0.21**	0.082	0.546***	0.056	0.582***	0.049	0.681***	0.037	0.466***	0.062
11	FSC / Total Forest – Importer	0.116**	0.050	-0.092	0.059	0.275*	0.155	-0.205*	0.108	-0.372***	0.089	0.222***	0.065	-0.374***	0.125
12	FSC / Total Forest – Exporter	0.281***	0.054	-0.534***	0.057	0.231	0.165	-0.402***	0.120	0.009	0.092	0.053	0.071	0.213	0.133
13	PESC / Total Forest – Importer	0.070	0.046	-0.508***	0.047	-0.449***	0.116	-0.276***	0.104	0.18***	0.070	-0.023	0.060	0.339***	0.118
14	PEC / Total Forest – Exporter	0.042	0.043	-0.072	0.056	0.178	0.125	-0.229***	0.088	-0.134*	0.080	0.124**	0.055	-0.084	0.100
	R^2 (Adj.)	0.686		0.610		0.528		0.471		0.556		0.533		0.463	
	d.f.	166555		130278		13890		30183		41988		67273		24238	

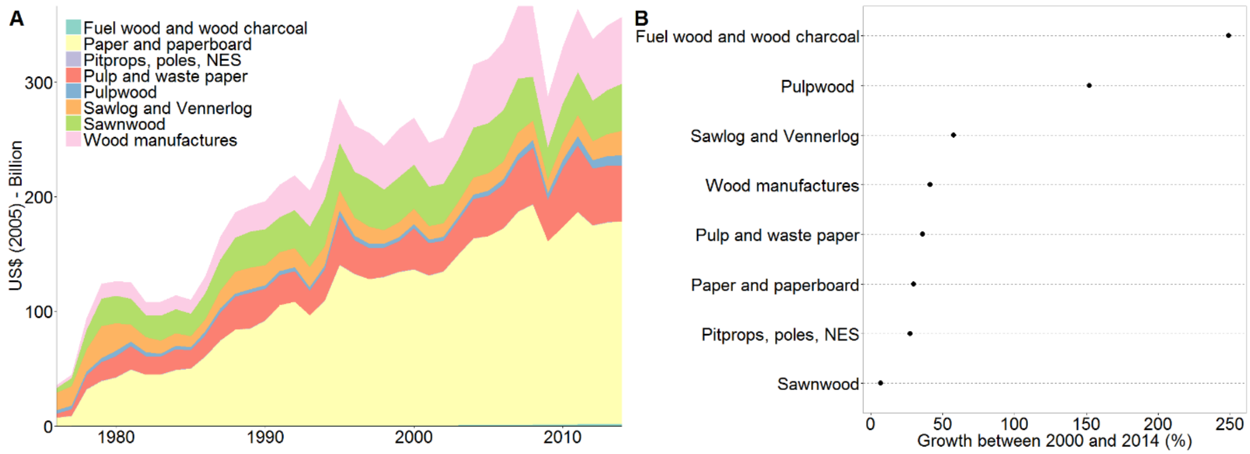

Figure 1. A) Value traded of timber products, billion USD. B) Real increase in the trade of timber products between 2000 and 2014. *Data Source: UN Comtrade.*

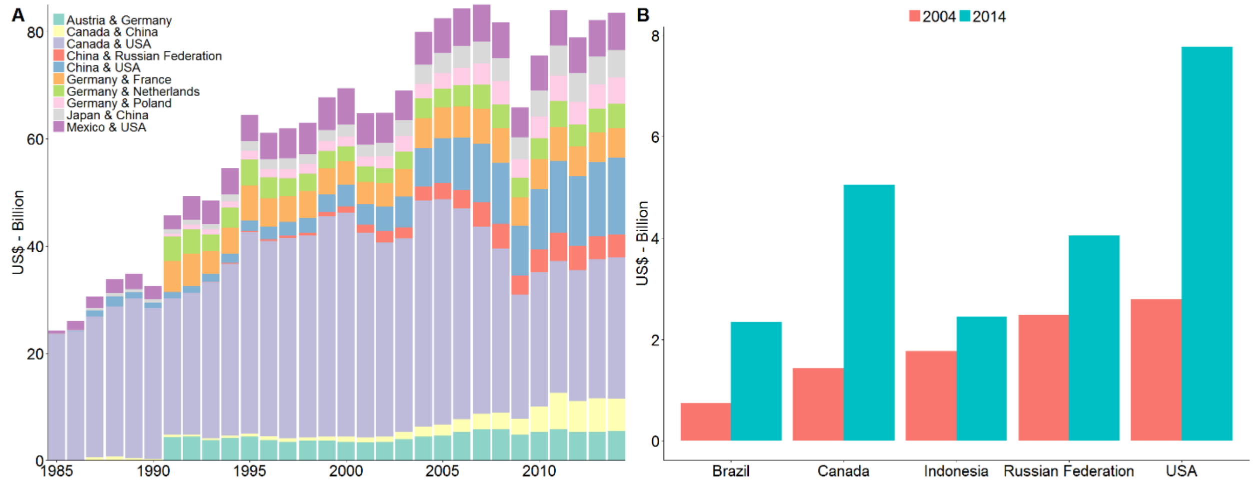

Figure 02. A) Value timber product trade among the top 10 largest trading partners, billion USD (2005). B) Increase of timber product trade between China with its main partners. ***Data Source: UN Comtrade.***

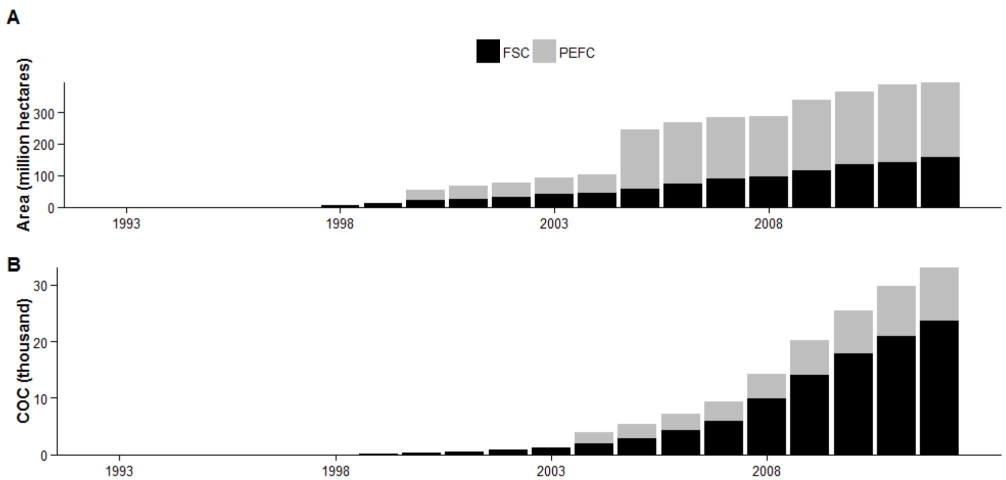

Figure 03. A) Total area certified by FSC and PEFC. B) Number of companies with Chain of Custody (COC) certification by FSC and PEFC.

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