Trade incentives for importers to adopt policies to address illegally logged timber: The case of non-tropical hardwood plywood

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ABSTRACT

In recent years the United States, European Union and most recently Australia have taken steps to address illegal logging indirectly through trade policy. These policies generally involve restricting the importation of forest products deemed to be produced from illegally sourced timber. Previous research finds no overall trade benefits for these countries to impose such restrictions and conclude rationale to do so is likely based on solely domestic production benefits or perceived social, political or environmental benefits. This study investigates how the implementation of trade policies impacts the trade costs for importing countries that have yet to adopt policies and how their incentives are affected by actions of others. Specifically, we explore the dynamics using a spatial equilibrium price model to simulate actual and hypothetical trade policy actions targeting a well-defined market, the non-tropical hardwood plywood market. This is accomplished through increasing the transaction costs on the non-tropical hardwood plywood exports from high risk producing countries to various combinations of importing countries. We show that non-participating importing countries benefit from the status quo policy regime and have no apparent incentive to join. We show that the incentive to join will increase if a coordinated global policy decreases transaction costs, though it may inadvertently diminish the incumbent countries' continued support for the policy. Thus trade-related economic incentives alone may be insufficient to encourage an effective multilateral regime to address illegal logging and confirm that a complex set of political, environmental and social interests are essential to motivate the development of a full multilateral stable cooperative solution.

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Introduction

In recent years, several countries have taken action to reduce the trade in forest products derived from illegally logged sources. The United States amended the *Lacey Act* in 2008, a U.S. law that addresses illegal trafficking of wildlife, fish and plants, to cover a greater variety of plants and products derived from those plants.[1] The amendment makes it unlawful to import into the United States any plant (or plant product) that was illegally harvested. The European Union's *E.U. Timber Regulation* (EUTR) came into effect on March 3, 2013, in support of the broader Forest Law Enforcement Governance and Trade (FLEGT) Action Plan instituted in 2003. The EUTR prohibits the placing on the EU market of illegally sourced timber and timber products.[2] Australia enacted the *Illegal Logging Prohibition Act* in 2012 and its regulations (*Illegal Logging Prohibition Amendment Regulation 2013*) came into effect on November 30, 2014. Under the Act, it is a criminal offence to import illegally logged timber and timber products into Australia or to process domestically grown raw logs that have been illegally logged.[3] The purpose of this study is to analyze the dynamic and incremental economic implications from restricting trade of wood products sourced from potentially illegally logged timber sequentially and how the uncoordinated sequence of an import policy may affect the incentives of individual importer countries to adopt the policy. We focus on non-tropical hardwood plywood (NTHP), a product with a well-defined market.

Plywood is an engineered wood product composed of multiple layers of wood veneer[4](s) glued or bonded together including the front veneer, the core and the back veneer. The core can be composed of various materials, such as veneers (of any type of wood), particleboard, and medium-density fiberboard. Hardwood plywood products are known as "non-structural plywood" and mostly used in interior non-structural uses such as furniture, kitchen cabinetry, architectural woodwork, etc. They are also used in building construction as an underlayment for flooring products where strength is not vital.

This study assesses the impact of measures to prevent the importation of non-tropical hardwood plywood derived from potentially illegally logged timber using a Spatial Price Equilibrium model (SPE). The results confirm the economic incentives created by import bans may be insufficient alone to encourage an effective multilateral regime to address illegal logging.

The rest of the paper is organized as follows. Previous studies of the impact of policy measures to prevent import of illegal wood products are provided. Then, an overview of the global non-tropical hardwood plywood market is outlined. This is followed by a description of the model methods, data, and results. We end with a discussion of the insights generated from this research, policy implications, and extensions.

Previous studies

Studies analyzing the impacts of timber legality regulations can be divided into two groups. One group uses simulation models to analyze the potential impacts before regulations actually come into effect. This approach was used to study the potential impacts on the E.U., Australia and New Zealand. The second group evaluates the effectiveness and impacts of regulations after implementation using empirical methods; research to date has focused on the impacts of 2008 *Lacey Act* amendment as there is sufficient data for statistical analysis.

The two most common simulation frameworks used in this area of research are Computable General Equilibrium (CGE) models and Spatial Price Equilibrium (SPE) models. CGE models assume that a reduction in illegal logging will have extensive repercussions for forest industries, downstream sectors and the broader economy, both in the home country and globally. It incorporates interactions between various parts of the broader economy. SPE models focus on a particular sector in more detail. For the forest sector, this entails details on markets for industrial roundwood and other wood products that use industrial roundwood as an input such as sawnwood, panels, pulp, paper, etc.

Indufor (2008), for an E.U. commissioned study, uses an SPE model for the whole forest sector, covering production and trade between 60 world regions to assess the impact of four policy options to address illegal logging. They restrict the range of products covered by the scheme to roundwood, sawnwood, plywood and veneer and simulate the impacts of policies by including and varying the legality control costs. Though the study does not evaluate total welfare impacts, it finds a modest positive impact on the E.U. member states in terms of change in value added ranging from 0.2% to 1.3%, thus largely positive impact on producers. They also find the regulation will reduce value added in all high and moderate risk countries from −0.2% to −6.8%. A very minor impact on the forest industry employment in E.U. member states was estimated. Finally, they conclude the environmental benefits from the regulations will depend on the effectiveness of the various options to stem illegal supply of forest products.

Turner et al. (2008) uses two SPE models: the Global Forest Products Model (GFPM) (Buongiorno et al., 2003) and the New Zealand Radiata Pine Market Model (Katz, 1988). The GFPM is used to view illegal logging in its full international context. The model simulates the international wood products sector, and covers 18 forest products in 180 countries. Estimated price impacts from the Global Forest Products Model are used in the New Zealand Radiata Pine Market Model to develop detailed estimates of the impact of illegal logging on the New Zealand radiata pine log and sawn timber sectors. They find that the New Zealand forest industry would gain NZ$264 million per year in additional income from stemming the supply of illegal timber supply. A similar application of the GFPM by Li et al. (2008) find eliminating illegal logging reduces global production and trade, but the welfare impact can be mitigated through a gradual implementation of the policy to allow for a rationale adjustment from illegal timber sources to legal timber sources.

The two Australian studies, CIE (2010) and Mi et al. (2010), used CGE models by changing the compliance costs to simulate the impacts. They find a unilateral policy to reduce illegal logging will impose a net cost on the Australian economy. The domestic producer's benefit is outweighed by the negative effects of higher prices to users of forestry products. The imports of forest products from high risk regions fall but there is negligible effect on logging activities in the high risk regions. The main results do not change significantly even if considering the US and EU are successful in restricting illegal timber imports as illegal timber consumption shifts from restrictive markets to markets with less or no restrictions. They conclude that an effective approach requires full multilateral action including all major suppliers and users of illegally logged timber. Using the Global Trade Analysis Project (GTAP) model, CIE (2010) find welfare losses between US$13 million to US$168 million when Australia acts alone. With global efforts, Australia benefits by US$65 million, while North America benefits by US$1.6 billion but the world suffers a net welfare loss due to reduced production and trade of US$44 billion. Estimated global social and environmental benefits from elimination of illegal logging is estimated to exceed the reduced trade related welfare costs resulting in a global net benefit from such action.

Bosello et al. (2013) use the ICES (Intertemporal Computable Equilibrium System) computable general equilibrium model to examine the reallocation of global demand and timber imports following the introduction of E.U. legislation. Economic impacts and potential greenhouse gas emission reductions from the policy are estimated. They find that the implementation of the E.U. law increases E.U. production but reduces trade, increases both production and trade of legal producing countries, and decreases both production and trade of countries with illegal logging. Emission reductions are found to be much greater if the policy covers both primary and secondary wood and paper products.

Gan et al. (2013) examine the impacts of the *Lacey Act Amendment* (LAA) and the E.U. Voluntary Partnership Agreements (VPAs) using the Global Trade Analysis Project (GTAP) CGE model. They find the LAA and VPAs have moderate impacts to reduce illegal logging (0.1–8.35%). They also find the economic welfare loss of US$1.8 billion and US$1 billion for the U.S. and E.U., respectively but other legal supply countries, such as Canada, benefit from the policy. Unlike the two Australian studies, Gan et al. (2013) find a net welfare increase for the world, as surprisingly both prices and quantity increase under the restrictive trade policy. Like the two Australian studies they conclude a trade policy will be only partially effective due to leakage.

There are mixed empirical results of the effectiveness and impacts of the *Lacey Act* amendment. Using statistical intervention models, Prestemon (2015) found significant increases in prices and decreases in quantities of US tropical lumber imports from Bolivia, Brazil, Indonesia, Malaysia, and Peru, and similarly

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[4] Veneers are thin (1–4 mm) sheets of wood sliced or peeled from a log.