The effects of globalization on the imports of wood products in Iran

Sheyda Khosravi[a], Rahim Maleknia[a,*], Kamran Adeli[a], Reza Mohseni[b], Donald G. Hodges[c]

[a] Department of Forestry, Faculty of Agriculture, Lorestan University, Khorramabad, Islamic Republic of Iran
[b] Department of Economics, Faculty of Economics and Political Science, Shahid Beheshti University, Tehran, Islamic Republic of Iran
[c] Department of Forestry, Wildlife and Fisheries, Natural Resources Policy Center, University of Tennessee, Knoxville, USA

ARTICLE INFO

ABSTRACT

Globalization has not affected Iran substantially, even though it possesses the largest economy outside the World Trade Organization (WTO). In the present study, the level of international trade (LIT) and intra-industry trade (IIT) were considered as two globalization indices. Adding the two indices to the import demand functions of three categories of wood products (wood raw materials, semi-finished wood products, and finished wood products), the effect of the globalization of various wood products sectors on imports of related wood products was evaluated. The findings reveal significant relationships between the import of wood as raw material and the globalization indices of semi-finished wood products and finished wood products. The import of finished wood products was positively correlated with the IIT of semi-finished wood products. However, globalization indices had no impact on semi-finished wood products imports. Other results indicate that the three categories of wood products were significantly different in terms of the mean of globalization indices ($p < 0.05$). Compared to the other categories, finished wood products had the highest LIT and lowest IIT, suggesting a large amount of import-based trade of the given products relative to domestic production in Iran. Overall, semi-finished wood products and finished wood products were placed in a higher stage within the LIT–IIT framework, implying that these sectors in Iran are more globalized.

Introduction

"Globalization" has become one of the more controversial global issues in the past few years. As an extensive and inevitable process, globalization is comprised of a variety of political, social, economic, cultural, ecological, and technological dimensions. From an economic perspective, globalization benefits from a wide network and quicker responses, allowing it to provide more positive, tangible impacts for human societies. Moreover, economic parameters are measurable and reliable. Therefore, economic globalization often is considered as the most obvious and important dimension of globalization. Economic globalization also can decrease the ability of governments to control financial transfers and foreign relations, reduce the role of geographical boundaries, enhance trade flows, and allow for the free movement of capital among different countries. Negotiations related to the "Uruguay Round", "General Agreement on Tariffs and Trade", and the establishment of the World Trade Organization (WTO) in 1995 are thereby among the most important manifestations of globalization in the economic domain.

Following the creation of the WTO, globalization has significantly affected land use, specifically forest ecosystems, and forest products

trade among member and non-member countries (Bael and Sedjo, 2006; Hecht and Saatchi, 2007; Lambin and Meyfroidt, 2011). Globalization has also caused a shift in comparative advantage from countries endowed with forest resources (particularly temperate forests), to ones in which factors of production (e.g., capital, labor, and land) are cheaper and conditions for afforestation are more favorable (such as tropical forests) (Bael and Sedjo, 2006). In other words, patterns of production and trading routes of wood have switched from temperate, developed countries (with strict rules for conserving forests) to tropical, developing countries. Therefore, globalization not only has led to a transition of forests in different regions of the world (Bowyer, 2004; Hecht and Saatchi, 2007; Li et al., 2015), but it also has affected trade flows and the balance of trade for a number of countries.

Korhonen et al. (2017) provide a thorough review of research on international trade of one segment of the finished wood products sector (paper and paperboard), focusing largely on the effects of recycled paper, price, and income on demand. Zhang and Buongiorno (2007) conducted a study on 11 forest industries in 43 countries between 1961 and 2002, concluding that intra-industry trade (IIT) was substantial for most wood products, implying that many countries were simultaneously importing and exporting the same forest products. Bael and

Sedjo (2006) reviewed the effects of globalization on the global forest products industry from 1980 to 2005. The results of their evaluation revealed that globalization could lead to evolutions in forest products industry within different countries. Other findings indicated that since wood fuel is mostly used in a traditional way, it is least affected by the process of globalization, compared to other wood products. In contrast, changes in the industry of semi-finished wood products, such as pulp for paper and sawnwood, have been more fast-paced than other sectors. Certainly, such changes have differed by country and region. For example, China's accession to the WTO led to a remarkable increase in imports of forest products to this country, which reduced domestic market prices of lumber and wood products as well as pulp, paper, and allied product (Gan, 2004). Within the European Union (EU), the wood furniture industry has been similarly affected by globalization, as the number of developing countries exporting such products to the EU has considerably increased (Kaplinsky and Readman, 2005). Globalization has also had profound effects on the forest sector in the United States; imports of timber products have increased significantly, while exports declined as a result of the recession (Ince et al., 2007). Overall, increasing globalization is changing the current patterns of dominant trade routes for forest products (Liebhold and Wingfield, 2014).

In contrast to globalized countries, more closed economies such as Iran have been less affected by globalization. Over the past decade, the overall score of Iran for Fraser index of economic freedom has decreased. Therefore, its ranking has declined significantly from 102nd out of 141 countries in 2005 to 150th out of 159 countries in 2015 (Gwartney et al., 2017). One of the five major areas of the index is freedom to trade internationally, in which Iran ranked 156th out of 159 countries. Since 1996, Iran has made efforts to join the WTO; however, it has only played the role of observer since 2005 as the biggest non-member economy in WTO. Iran's accession to the WTO and its entrance into the advanced process of globalization can have substantial effects on trading a range of goods. The given impacts can differ by the three wood categories of raw materials, semi-finished, and finished products. In this article, we first compare two globalization indices between these categories to understand the globalization status for the categories in Iran. Then, adding the two indices to import demand functions for wood and wood products, this study investigates the effect of the globalization of various wood products sectors on imports of related wood products.

Theoretical model specification

Primary import demand (IM) can be considered as a function of real gross domestic product (GDP), import prices (P_i), and domestic price (P_d):

$$IM = f\left(GDP, \frac{P_i}{P_d}\right) \tag{1}$$

Iran is one of the largest oil-producing countries in the world and its economy is heavily dependent on oil. The effects of oil prices or the earnings obtained from oil exports on imports of wood products in Iran were confirmed in research by Mohammadi Limaei et al. (2011), Mollahassani et al. (2013), and Tajdini et al. (2014). Other factors influencing such imports in Iran include the domestic production of wood raw materials, tariffs on wood imports, and exchange rate (Mohammadi Limaei et al., 2011, Mollahassani et al., 2013; Layani and Esmaeili, 2014). Thus, the import demand function for wood and wood products in Iran was developed as:

$$IM_q = f(GDP, Oil_{va}, ER, DWP, PI_r, TRF) \tag{2}$$

where IM_q is the quantity of imports for each category of wood products by volume (cubic meters), Oil_{va} represents the ratio of value-added of oil to GDP (%), ER is the nominal exchange rate (Iranian Rial per US dollar), and DWP indicates the quantity of domestic production of wood raw materials (sum of forest wood production and tree farming

measured in cubic meters). PI_r represents the relative price index resulting from dividing import price index into domestic wholesale price index for each category of wood products. Finally, TRF depicts the trade-weighted average tariff rate for each category, which can be calculated by:

$$TRF = \frac{CI}{IM_v} \tag{3}$$

where CI is the earnings by Customs Administration obtained from total customs duty and commercial benefit for a category of wood products and IM_v indicates the monetary value resulting from the imports of the same category.

Different indicators have been also proposed for measuring globalization effects on trading different products. One important investigation in this respect was conducted by Makhija et al. (1997) in which the level of international trade (LIT) and IIT were used as globalization indices. The LIT index is calculated as:

$$LIT = \frac{IM_v + EX_v}{PR_v + IM_v - EX_v} \tag{4}$$

where EX_v represents the monetary value resulting from exports of one category of wood products and PR_v depicts the monetary value from domestic production of the same category. As a consequence, a smaller LIT suggests that international linkages in the form of imports and exports are not a fundamental aspect in the given industry (Makhija et al., 1997). In contrast, larger LIT values reveal a greater importance of international linkages. However, LIT does not offer a full understanding of international linkages because different combinations of imports and exports that reveal changes in the integration of value-added activities cannot be totally identified by such an index (Makhija et al., 1997). Therefore, measuring globalization of an industry requires LIT and the IIT index, which can be calculated as:

$$IIT = 1 - \left(\frac{|EX_v - IM_v|}{EX_v + IM_v}\right) \tag{5}$$

IIT, the standard Grubel and Lloyd (1975) index, represents the integration of value-added activities within the industry. The amount of this index is also between zero and one. Zero shows lack of intra-industry trade, indicating trade only includes imports or exports. One stands for full intra-industry trade; that is, exports are equal to imports in the given industry (Makhija et al., 1997).

Adding LIT and IIT to Eq. (2), the import demand function can be specified as follows:

$$IM_q = f(GDP, ER, Oil_{va}, DWP, PI_r, TRF, LIT, IIT) \tag{6}$$

The experimental model associated with Eq. (6) after its conversion into log linear form is stated as follows:

$$\begin{aligned}
ln(IM_q) = {} & c + \alpha_1 \ln(GDP) + \alpha_2 \ln(ER) + \alpha_3 \ln(Oil_{va}) \\
& + \alpha_4 \ln(DWP) + \alpha_5 \ln(PI_r) + \alpha_6 \ln(TRF) + \alpha_7 \ln(LIT) \\
& + \alpha_8 \ln(IIT) + \varepsilon_t
\end{aligned} \tag{7}$$

where ln represents the natural logarithm, the letter c denotes a constant and ε_t is an error term.

Methodology

Data source and description

The time series data required for the study were collected from the Central Bank of Iran; Iranian Forests, Range and Watershed Management Organization; Tehran Chamber of Commerce Industries Mines and Agriculture; and Iran Customs Administration. The study period was from 1983 to 2015 (base year 2015). To remove the effects of inflation, all nominal variables were converted into real terms using relevant price indices which are published by the Central Bank of Iran