

Short communication. A study of the Greek trade deficit in forest products. Current conditions and prospects

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Abstract

The forest products trade deficit in Greece is a characteristic of the national forest sector over time. Greek imports of forest products are more than exports in order to cover domestic consumption. However, since its accession to the EU in 2001 Greece has not exploited all the advantages provided by the euro. The deficit in Greece has continued to increase because of growing imports, while average Europe countries have converted this to a surplus. Greece should aim to reduce this trend by decreasing imports, increasing exports or both. The present paper describes this deficit over time and proposes a forecasting model that could reduce the deficit using three possible scenarios. The model's theoretical and practical contribution is that policymakers can use it as tool to calculate the future forest products deficit.

Key words: deficit; greek timber; forecasts; forest sector; policymakers.

Resumen

Comunicación corta. Un estudio del déficit comercial griego en productos forestales. Condiciones actuales y perspectivas

El déficit del comercio de productos forestales en Grecia es una característica del sector forestal nacional en los últimos años. Grecia importa más productos forestales de lo que exporta para cubrir el consumo interno y esto se podría explicar por las condiciones naturales de los recursos forestales nacionales. Pero por otra parte, a partir del 2001 con la adhesión a la Comunidad Económica Europea, parece que Grecia no ha aprovechado todas las ventajas que ofrece la moneda del euro. El déficit siguió aumentando por causa de las importaciones para cubrir el consumo interno, cuando la media europea lo convertía en superávit. El objetivo principal del país es lograr presentar las tendencias decrecientes del déficit con la disminución de las importaciones y el aumento de las exportaciones o ambas cosas. En el documento se presenta el mencionado déficit a lo largo de los años y un modelo de previsión que podría reducir el déficit en el futuro, a partir de tres posibles escenarios. Los responsables políticos pueden utilizar el modelo de contribución teórica y práctica como herramienta para calcular el déficit de productos forestales futuros.

Palabras clave: déficit; madera griega; previsiones; sector forestal.

Introduction

Despite the worldwide economic recession and the domestic economic problems in Greece, the state should promote national programs and policy measures for the development of the forest sector. Regardless of the failure of Greek forests to produce large quantities of quality timber, the domestic production of some forest products should become more efficient in order to strengthen the country's position in European trade.

Wood products harvested from forests and other wooded land constitute an important component of the

productive function. The volume of wood removed indicates the economic and social utility of forest resources to national economies and local communities (FAO 2006). The exploitation of internal production should thus reduce the forest products trade deficit. This deficit in 2008 reached, \$1.24 billion (Fig. 2), of which the value of Greek imports was \$1.37 billion and of exports in forest products was only \$1.3 million according to FAOSTAT (Fig. 3).

This disproportion can partly be explained by the already mentioned natural weakness of Greek forest resources. Most Mediterranean countries such as Greece, Cyprus and Spain have degraded forestlands because of

decreased growing stock volumes, ranging at 43-45 m³/ha (Efthymiou 2005). Koulelis (2009) placed Greece among low-productivity EU countries like Greece, Belgium-Luxembourg (counted together because of their small production), Portugal, Austria, Denmark, Netherlands, Ireland, United Kingdom, Slovenia, Cyprus, the Republic of Czech Republic, Estonia, Slovakia, Lithuania and Latvia with natural ecosystems that do not support important timber production. Furthermore, Albanis *et al.* (1985) and Fousekis *et al.* (2001) stated that despite the increase in domestic production after the 1950s, Greece remains a major importer of most wood products. In addition, it shows a strong deficit in roundwood, sawnwood, cellulose and cellulose products and a small deficit in fiberboards.

According to Albanis *et al.* (1985), Greece mainly imports printing paper, paperboard and wood pulp. However, Arabantzis and Klonaris (2009) showed that the consumption of all wood and wood products in Greece is based greatly on imports, necessitating every year a great proportion of public expenditure. In addition, Koulelis (2006) and Koulelis and Lefakis (2008) used econometric models (simple regression and multiple regression analysis) in order to investigate the wood market and its products (production, imports, and exports) for 25 EU countries. They found that imports in Greece will continue to increase, especially for products such as paper, by more than 70% over the next 10 years.

The remainder of the present paper is organized as follows. The first section presents a historical analysis of the Greek forest products deficit in terms of the EU deficit. The second section introduces a multiple linear regression model for estimating the influence of trade and policy measures on reducing the national deficit. This method can be highly useful for policymakers, especially when they search for tools to reduce the forest products deficit. The final section concludes.

Policymakers that want to install policy measures in order to reduce the forest products deficit could use this model to understand the meaning of these measures, simplifying the selection of appropriate ones. Moreover, the model gives researchers and policymakers the capability to understand the relation between the production and imports of forest products. This methodological approach makes a theoretical and a practical contribution in this context. Future scenarios could also be carried out easily by using the FAOSTAT database.

Materials and methods

Multiple regression analysis is a flexible method of data analysis that can be used when the dependent variable is studied in isolation or in relation to independent variables (Cohen and Cohen 1983). In addition, it can be used as a dynamic and precise data analysis tool. Regression provides all the essential mechanisms for statistical affairs, estimates and dynamic analyses (Cohen and Cohen 1983). Multiple linear regression also contributes heavily to the manufacture of predictable models (Draper and Smith 1981).

After the construction of the equation the correctness of the process was tested. Table 1 shows the basic statistical tests of regression including the adjusted R² value, standard error of estimate (SEE) value and P value. One simple and important diagnostic of multicollinearity is the variance inflation factor (VIF) (Matis 2004). When the value of VIF is bigger than 10, there are redundant variables in the regression model and the parameter estimates may be unreliable.

The data set used in this study includes EU and Greek imports and exports (in millions of dollars) and roundwood production and imports quantities (cubic meters). These data were derived from the FAOSTAT database. Data on the GDP of Greece were derived from the World Bank database.

Results

Europe is an important exporter of timber and timber-based products, representing roughly half the world's exports (FAO 1999). Because forestry is a relatively minor economic activity in most European countries, the impact of policies in other sectors (agriculture, energy, industry, the environment and trade) on the forest sector, or the contribution that the forest sector could make to others, is not always taken into consideration (FAO 2009).

Figure 1 presents the European forest products deficit from 1960 to 2009. Since the 1990s, the deficit has decreased gradually. That means that EU countries have based a share of their economic growth on an export strategy for forest products. After 2002, the deficit decreased rapidly and became a surplus (-400 million \$).

Figure 2 displays the corresponding deficit for Greece over the same data range, showing that its deficit has continuously increased. In particular, after 2001 when the rest of the EU was decreasing,

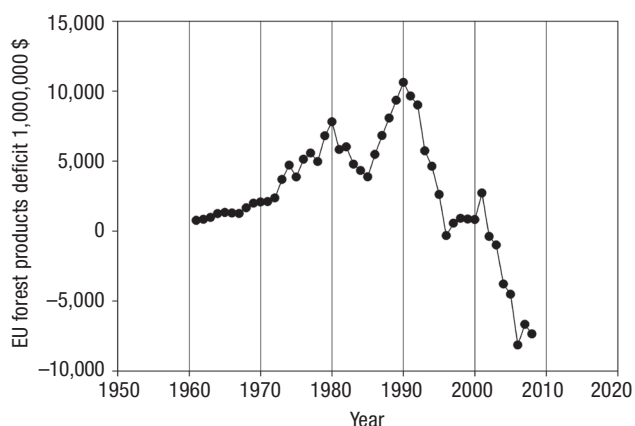


Figure 1. EU trade deficit in forest products.

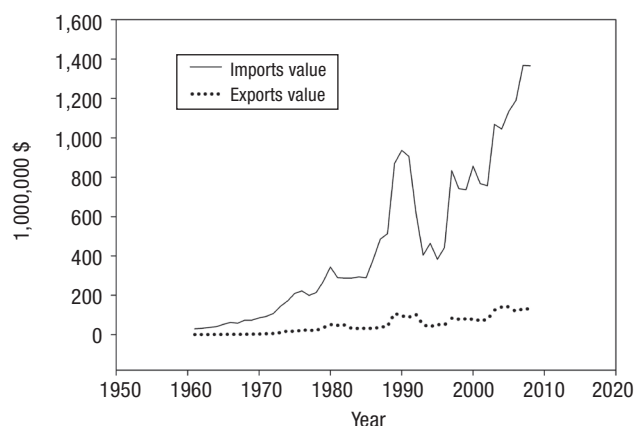


Figure 3. Forest products imports and exports value of Greece.

in Greece the deficit increased rapidly reaching in 2008 \$1.2 billion compared with \$293 million in the 1980s and \$778 million in the 1990s.

A rapidly increased deficit in forest products means that the country uninterruptedly imported forest products from all over the world while attaching no relevant significance to domestic exports. Figure 3 presents the levels of Greek imports and exports between 1960 and 2009. This Figure shows that the levels of Greek imports in forest products are high, whereas the levels of exports are limited and scarce. It is interesting to note that in 2008 imports were almost \$1.4 billion but exports were only \$130 million (Fig. 3). After 2001, Greece used the trade power of the euro to import relatively cheaper international forest products to cover domestic needs. Although these exports did not change significantly in 2001 they grew from \$75 million in 2002 to \$124 million in 2003 and to \$141 million in 2005 before declining to \$130 million in 2008 (Fig. 3).

Although the deficit that imports created continued to increase, the main question remains: did Greece utilize the advantages of the euro? The answer is not completely. The economic growth of the forest sector, especially for wood industries, comes both ways. This political choice amplifies the trade but gives no opportunities to the domestic industry (small or large) for development and sustainability.

In addition, small-scale forest owners did not achieve the expected results from their activities. The average sized privately owned forest in Greece is 1.3 ha and Greek forest owners are not generally economically dependent on their forests (Wiersum *et al.* 2005). However, a rapid growth in Greek GDP was observed, especially after 2004 (Fig. 4). This economic development should have promoted investment into large companies and enterprises. However, nothing happened except investment into small-scale timber companies that primarily served local demands. In addition, the country did not adapt to

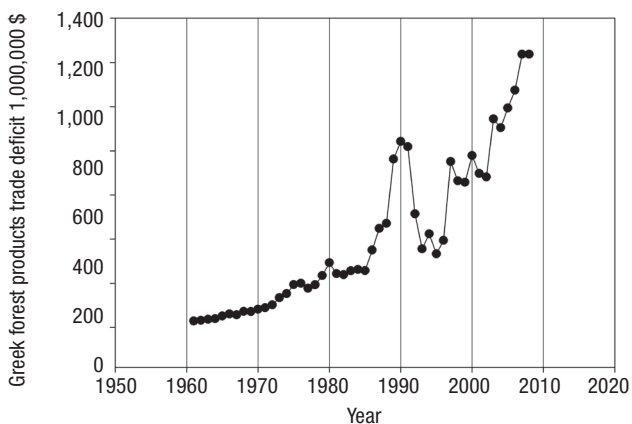


Figure 2. Trade deficit in forest products of Greece.

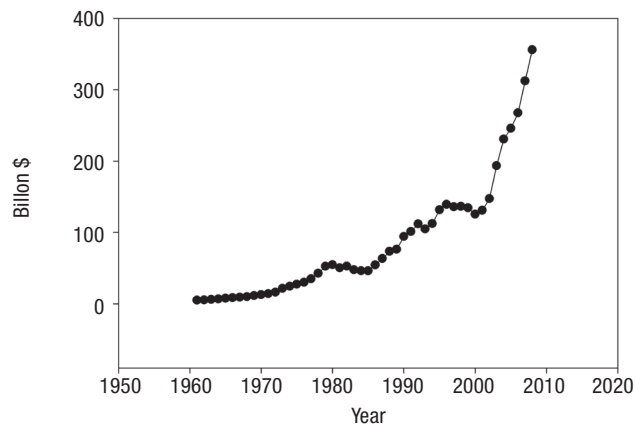


Figure 4. The enlargement of Greek GDP over the years.

European specifications regarding modernization and machinery standards, certificates of timber origin, the implementation of quality control systems, the correct desiccation and oiling of wood and the full training of labor. Consequently, many timber products made in Greece are not useable in major construction projects.

The second part of this analysis is a multiple linear regression analysis that estimates the relationship between the forest products deficit using explanatory variables such as the roundwood production of Greece and roundwood imports. Although we could have used other independent variables such as the production of sawnwood or other forest products, we selected roundwood as a primary forest product. After performing the multiple linear regression analysis and the respective predictive ability tests, we constructed the model shown below.

$$\text{DEFICIT} = 1,138.596 - (0.000389 * \text{RP}) + [1] \\ + (0.000798 * \text{RI})$$

Adj $R^2 = 0,686$ with regression tests results that presented in the table 1.

According to the table above, the previously mentioned independent variables were found to be significant for the deficit. The adjusted R^2 value is 0.686, with a SEE for the constant variable of 190,153 and a p-value of under 0.001. Finally, the VIF is 1.276, which is under 10, implying that there is no multicollinearity between the variables.

The main aim of the Greek forest sector is to reduce the forest products deficit. Based on the proposed model, we have analyzed and quantified the influence of future changes to domestic roundwood production and roundwood imports on this deficit. We thus present three hypothetical scenarios.

According to the first scenario, it is assumed that Greek roundwood production will increase by 5% by 2015 (from 1,742,916 m³ of roundwood in 2008 to 1,830,062 m³). If we keep the other parameters stable, the deficit will decrease by 6% from \$1,237 billion to \$1,161 billion.

Table 1. Regression model parameters and tests

Adj Rsqr = 0.686	Std. Error of Estimate	P	VIF
Constant	190.153	< 0.001	
Roundwood production (RP)	0.0000655	< 0.001	1.276
Roundwood Imports (RI)	0.000174	< 0.001	1.276

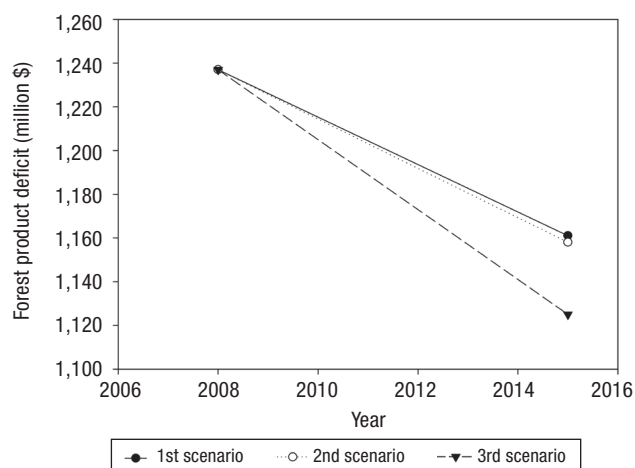


Figure 5. Three possible scenarios to reduce the forest products deficit in Greece.

According to the second scenario, a possible reduction in roundwood imports by 5% (from 908,777 m³ in 2008 to 863,331 m³) would reduce the forest products deficit by 6.3% (from \$1,237 billion in 2008 to \$1,158 billion).

Finally, in the third scenario, we assume that the domestic production of roundwood and the reduction of imports of roundwood would both increase by 5%. This scenario would reduce the deficit by 9% to \$1,125 billion in 2015 (Fig. 5).

The combination of the increase in the domestic production of roundwood and decrease in imports by 5% provides the best result. Both of these objectives could be realized in the next period. It is important to underline that imports could be decreased not only as a result of planned economic and policy measures but also through the difficult economic situation and general recession. This decrease is not desirable because it is almost impossible to relate to improved production. Imports must be decreased through the ongoing increase of covering domestic needs in forest products from national production.

Conclusions

Because Greece has no capability to cover its domestic needs in wood and forest products from its own production, its dependence on importing wood and wood products is very high (Arabatzis and Klonaris 2009). In addition, these needs have increased over time. The deficit in forest products has been created from this level of enlarged imports and not only from reduced exports.

Therefore, Greece must aim to reduce imports or establish an imports policy that offers corresponding advantages to the exports policy, combined of course with general healthy economic conditions and economic development. Although economic growth organizations such as the OECD forecast the opposite, the Greek economy is in a protracted recession in the wake of the global crisis and its necessary fiscal austerity measures. The rate of the decline in real GDP is projected to diminish until 2012 by 2.5% reflecting improvements in external demand (OECD 2010).

However, domestic production must improve. Much of the existing industrial wood processing capacity is not currently fully utilized. The increased domestic production of all categories of products and good marketing would reduce imports gradually. This quality improvement combined with an increase in the productivity of Greek forests could make domestic roundwood products more competitive.

This study argues that the proposed method is highly useful for policymakers that want to develop the national forest sector because it helps them constrain the deficit and increase production (through better exploitation). In these years of crisis, when the achievement of financial objectives is important, this simple method could help straighten national economies.

Other positive results from the adoption of policy measures include a reduction in unemployment in forest products industries at a national and at a European level. In particular, the ratio between the policies that must be installed (in order to increase production and to reduce imports) and the desirable result (improve the deficit) is quite efficient. The possible combination of the above measures by 5% (only for roundwood) affects the deficit by 9%.

It is important to mention that the particular results of the present study only concern Greece's roundwood production. More study should be carried out on the other categories of forest products such as fuelwood, which has an important production level in Greece. In addition, other measures may contribute to the general effort as we head out of economic recession. These measures include the increase in exports especially in neighbor countries (with low transportation costs), improvement in management, improvement in harvesting and production methods, incentives for private investment into the timber sector, economic support for the State Forest Service and less bureaucracy in the public sector generally.

Acknowledgements

I would like to thank the Editor of Forest Systems Journal and the anonymous reviewers whose insightful comments helped to substantially improve this manuscript.

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