



Research report on the evaluation on Malaysian wood products to Europe- A comparative advantage perspective, in regards of recent evalutions in European forest sector

Noor Aini Z, Roda Jean-Marc, Ahmad Fauzi P.

► To cite this version:

Noor Aini Z, Roda Jean-Marc, Ahmad Fauzi P.. Research report on the evaluation on Malaysian wood products to Europe- A comparative advantage perspective, in regards of recent evalutions in European forest sector. 2008. hal-00343566v2

HAL Id: hal-00343566

<https://hal.science/hal-00343566v2>

Preprint submitted on 4 Dec 2008

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Research report on the evaluation on Malaysian wood products to Europe – A comparative advantage perspective, in regards of recent evaluations in European forest sector

Authors: Noor Aini Z., Roda J.M., Ahmad Fauzi, P.
(Forest Research Institute Malaysia, Kepong 52109 Malaysia)

Abstract

As the growing trade in timber and wood products increasing, it has gained more attention from the main supplier in increasing the export competitiveness of timber and related products. Therefore, countries with large forest resources have an advantage in maximizing the resources in fulfilling the world demand. Given performance of Malaysia on timber exports, this study is to provide the opportunities and benefits as well as challenges facing by Malaysian exporters to penetrate the global market. This paper analyses the pattern of Malaysian export on wood and forest products (excluding furniture) to European Union by estimating the revealed comparative advantage indices. This study uses revealed comparative advantage (RCA) framework developed by Balassa (1956) to examine the export competitiveness of Malaysian wood and forest products by using data from United Nations Commodity Trade Statistics from 1999-2006. The results explain the performance of Malaysian wood exports in competing with other exporters to Europe. Based on the findings, some policy in expanding the exports and increase the comparative advantage of Malaysian wood and forest products also drawn.

Table of Contents

| | Page |
|---|------|
| Introduction | 3 |
| Objectives of work | 4 |
| Revealed comparative advantage | 4 |
| The Balassa index of revealed comparative advantage | 5 |
| Result and discussion | 6 |
| Summary and Conclusion | 13 |
| Annexes | 15 |

Introduction

Generally, international trade has been perceived as a vital mechanism for growing domestic economy through the expansion of exports and imports. It also helps country to grow and become more competitive in the world market. As the growing trade in timber and wood products increasing, it has gained more attention from the main supplier in increasing the export competitiveness of the timber and related products. Therefore, countries with large forest resources have an advantage in maximizing the resources in fulfilling the world demand. Europe, America and Asia are the main importing and exporting regions in forest products (Hillring, 2006; FAO, 2007¹). According to FAO (2007), Europe is considered as the largest trading region in the world in terms of global import and export values.

Table 1: EU15 imports and export of wood and forest products from world in 1999-2006

| Year | Import values from world (US dollar) | Export values to world (US dollar) |
|------|---|---------------------------------------|
| 1999 | 25,586,089,399 | 18,238,585,659 |
| 2000 | 25,142,184,511 | 19,211,909,153 |
| 2001 | 23,693,164,389 | 18,745,232,307 |
| 2002 | 24,922,859,969 | 20,727,194,206 |
| 2003 | 29,843,832,780 | 24,467,981,278 |
| 2004 | 34,767,589,339 | 28,579,493,883 |
| 2005 | 36,339,209,671 | 30,192,247,512 |
| 2006 | 40,815,364,440 | 34,273,821,817 |

Source: United Nations COMTRADE (2008)

For Malaysia, exports of the natural resources and related products as well as manufactured goods have much contribution to the development of Malaysian economy. Besides that, with the fact that 60% of Malaysia is covered with natural forest, it is difficult to ignore that forest product industry can play a key role and has economic potential in further developing the economy. Furthermore, forest product industry has been recognized can generates more foreign exchange than any other natural resources in Malaysian economy. Therefore taking Europe as the potential markets for Malaysia to

¹ Food and Agricultural Organization of United Nations (2007), State of the World's Forests 2007, Electronic Publishing Policy and Support Branch, Communication Division, FAO, Rome.

expand the exports of forest and wood products in the global market, this research is purposely to make a new movement in penetrating the global market focus mainly on European countries.

Objectives of work

This work analyzes the revealed comparative advantage of wood and forest products from Malaysia to Europe. This research has the following objectives:

1. To identify the revealed comparative advantage of wood and forest products from Malaysia in exporting the products to Europe.
2. To harness the export competitiveness of Malaysian products to Europe.

This research differs from past study in several ways. Firstly, it attempts to identify the revealed comparative advantage of Malaysian wood industry to world and focus on Europe. This research particularly focuses on the trade between Malaysia and Europe in wood and forest products (excluding furniture). This study may contribute to harness the export competitiveness of Malaysian forest industry at a global market. Indeed, this is to provide the opportunities and benefit as well as challenges facing by Malaysian exporters to penetrate the global market.

Revealed Comparative Advantage

Generally, the concept of comparative advantage is defined as a country/ region has low relative cost a good compared to other countries (Deardorff, 1998)². The concept of revealed comparative advantage is using in analyzing the relative strengths of nations in different sectors of economic activity (Uusivouri and Tervo, 2002)³. According to Dowling and Cheang (2000)⁴, revealed comparative advantage can be used to explore the association between industrial and economic development as well as trade. In addition it can be used to identify the production structures and patterns of trade at different stages

² Deardorff, A. V. (1998), Benefits and Costs of Following Comparative Advantage, Research Seminar in International Economics, Discussion Paper No.423, University of Michigan, US.

³ Uusivouri, J. & Tervo, M. (2002), Comparative advantage and forest endowment in forest products trade: Evidence from panel data of OECD countries, Journal of Forest Economics Vol.8, pp. 53-75.

⁴ Dowling, M & Cheang, C.T (2000), Shifting Comparative Advantage in Asia: New Test of the “Flying Geese” Model, Journal of Asian Economics, Vol.11, pp. 443-463.

of economic development. Furthermore, revealed comparative advantage indices can be used to analyzed changes in comparative advantage, structure adjustment in individual industries, countries and/or regions as well as trade patterns (Yue and Hua, 2002).

Literature found that a country with larger forest endowments exhibit comparative advantage in their exports as compared to countries with lesser forest endowments (Uusivuori and Tervo, 2002; Prestemon and Buongiorno, 1997). According to Uusivuori and Tervo (2002), they also believe that country with relatively richer forest assets will also have larger net exports of forest products.

The Balassa index of revealed comparative advantage

In determining the comparative advantage of a country in a specific commodity, Heckscher-Ohlin (H-O) theory attributes from its relative factor scarcity such as factor endowments ratios (Utkulu and Seymen, 2004). However, it was found some difficulties in measuring comparative advantage of a country by H-O theory due to the unobservable relative price under autarky. Instead, Balassa suggested measuring comparative advantage of a country using observed trade patterns. Thus, to understand comparative advantage from observed data is named “revealed” comparative advantage.

This research is using the approach of Balassa (1965) on revealed comparative advantage methodology. This revealed comparative advantage methodology also has been used in many studies before (refer Yue and Hua, 2002⁵; Utkulu and Seymen, 2004⁶). Revealed comparative advantage pioneered by Balassa assumed the true pattern of comparative advantage can be observed from post-trade data (Bender and Li, 2002⁷; Utkulu and Seymen, 2004). Therefore, Balassa index trying to identify a “revealed” comparative advantage rather than determining the underlying sources of comparative advantage.

⁵ Yue, C. & Hua, P. (2002), Does Comparative Advantage Explains Export Patterns in China, *China Economic Review*, Vol. 13, pp. 276-296.

⁶ Utkulu, U. & Seymen, D. (2004), Revealed Comparative Advantage and Competitiveness: Evidence for Turkey vis-à-vis the EU15, Presented at the European Trade Study Group 6th Annual Conference, ETSG, Nottingham, UK.

⁷ Bender, S. & Li, K.W (2002), The Changing Trade and Revealed Comparative Advantages of Asian and Latin American Manufacture Exports, Center Discussion Paper No. 843, Economic Growth Center, Yale University, United States.

Based on Balassa (1965), revealed comparative advantage measures the intensity of a country's export of a good relative to the intensity of world exports of that good (Coxhead, 2007)⁸.

$$RCA_{jkt} = \frac{X^i_{kt}/X^i_{Kt}}{(X^W_{kt}/X^W_{Kt})}$$

Referring to the formula, X is the export of a country for a particular good/commodity, j , k and t denote as a country, good/commodity and time period respectively. K denotes the total of all exports from country j or the world (W) respectively. If the index exhibit value greater than one, the sector or products has a comparative advantage in the production of the goods and if index less than one, it indicates a comparative disadvantage in the production of the products.

To calculate the index of revealed comparative advantage of Malaysian exports in wood and forest products, we are using the data in United Nation Commodity Trade Statistics Database (UN Comtrade) from 1999-2006. The 8 years time span has been analyzing in determining the comparative advantage of export for wood and forest products from Malaysia to Europe. The analysis takes place for about 21 types of wood and articles of wood in HS 4-digit classification for exports. According to Dowling and Cheang (2000), to measure the accurateness of the export share of revealed comparative advantage index by Balassa, it is suitable only for two-trade. Based on the principle, a country should export the products that use its relative abundant factor intensively and import the goods that use its relative scarce resources (Yue and Hua, 2002).

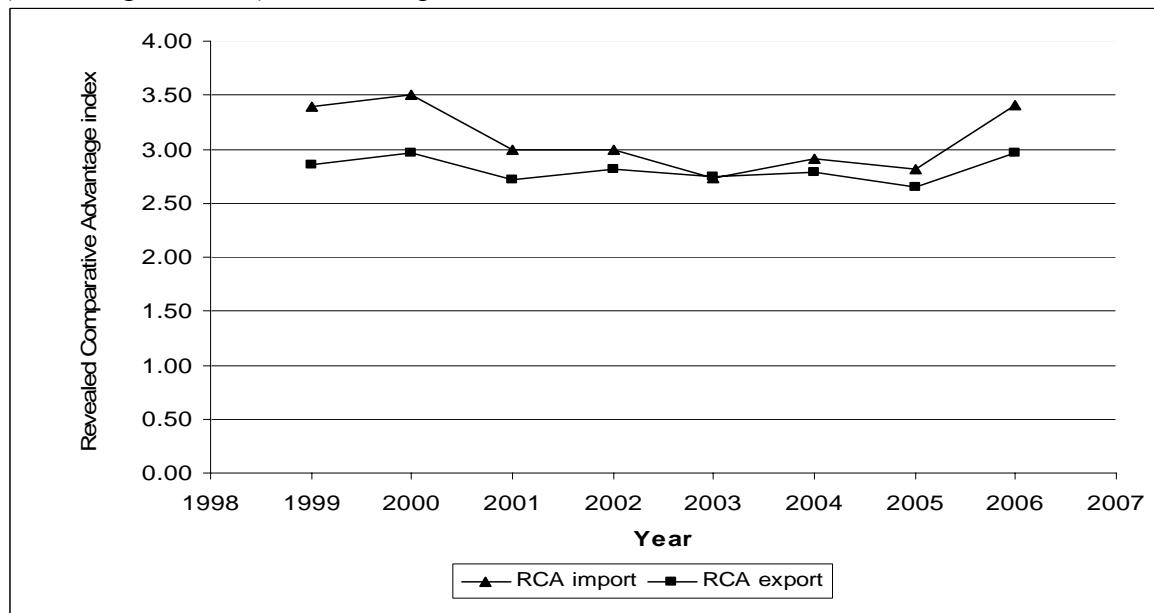
Result and Discussion

Analysis take place for the wood and forest based products from Malaysia to Europe (excluding furniture). Generally, it was found that Malaysia has 3 times advantage (in average) in exporting the wood and forest products to Europe compared to other global

⁸ Coxhead, I. (2007), A New Resource Curse? Impacts of China's Boom on Comparative Advantage and Resource Dependence in Southeast Asia, World Development Journal, Vol.35, No.7, pp. 1099-1119.

exporters. It shows increasing trend from 2005 and expected to increase in coming years due to the increasing of global demand on wood and forest products.

Figure 1: Revealed Comparative Advantage of Malaysian wood and forest products (excluding furniture) to the European market

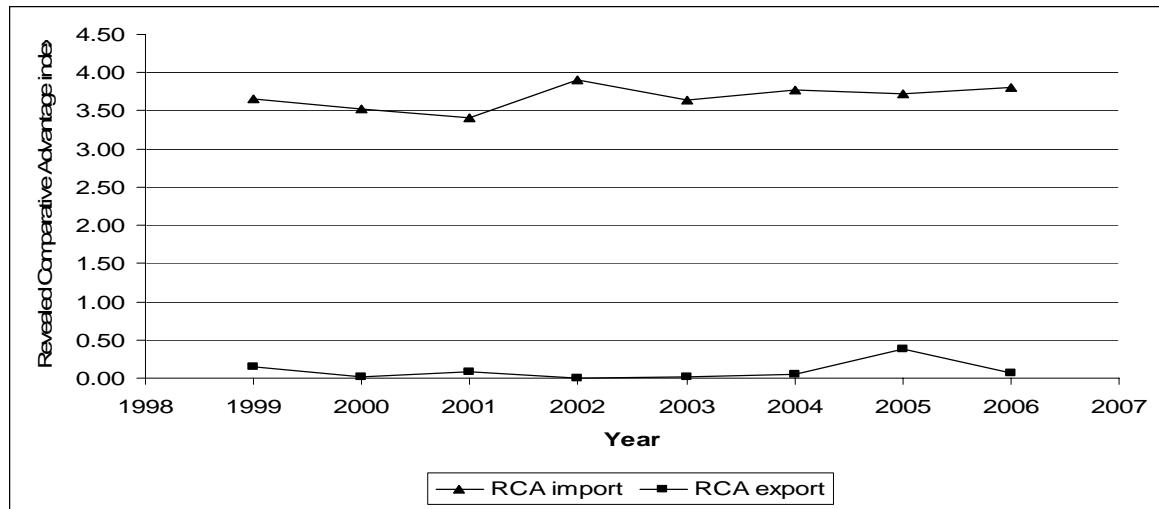


Source: United Nations COMTRADE (2008)

Figure 2 shows the revealed comparative advantage of wood charcoal including shell or nut charcoal (HS4402). The analysis showed that there is a big difference of data between import and export of the products. However, the comparative advantage of Malaysia in this product is high due to the importing index showed in the revealed comparative advantage analysis.

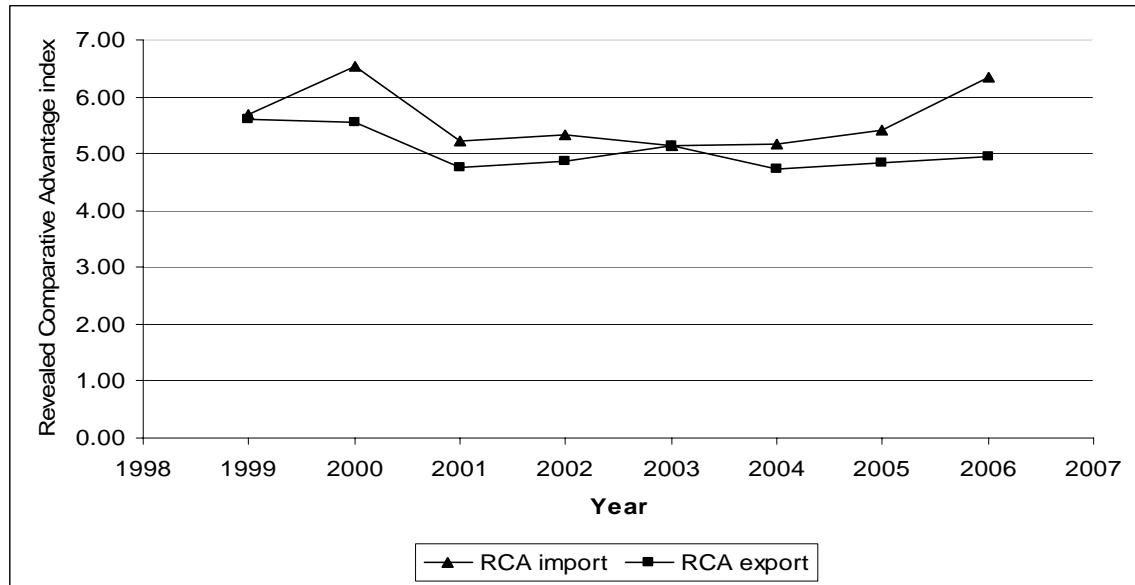
Furthermore, figure 3 indicates that Malaysia has high revealed comparative advantage on wood sawn, chipped lengthwise, sliced or peeled (HS4407). It can be seen Malaysia has high potential in exporting and marketing the product to EU and in average it about 5 times more advantage than other exporters.

Figure 2: Revealed Comparative Advantage of Malaysian wood charcoal including shell or nut charcoal (HS4402) from 1999-2006



Source: United Nations COMTRADE (2008)

Figure 3: Revealed Comparative Advantage of Malaysian wood sawn, chipped lengthwise, sliced or peeled (HS4407) from 1999-2006

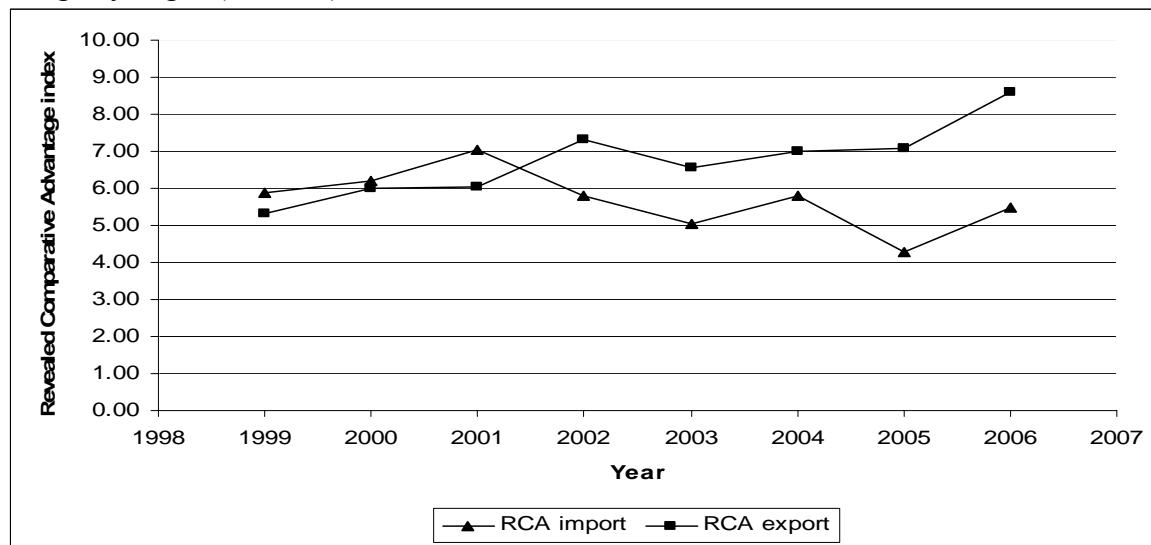


Source: United Nations COMTRADE (2008)

Based on figure 4, the revealed comparative advantage of Malaysian on wood continuously shaped along any edges (HS4409) considered having the highest comparative advantage compared to any other wood products exporting to EU. The

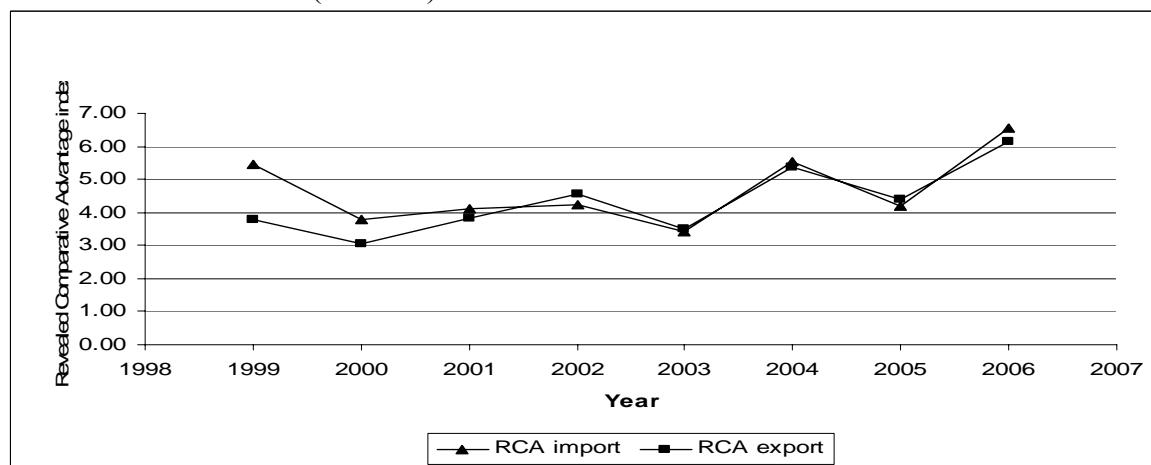
revealed comparative advantage index showed an average about 7 times having advantage in promoting and marketing the product to Europe. On the same situation, Malaysian plywood, veneered panels and similar laminated wood (HS4412) also having a good indicator in revealed comparative advantage in exporting the products to EU. The trends indicated an increasing trend throughout the years.

Figure 4: Revealed Comparative Advantage of Malaysian wood continuously shaped along any edges (HS4409) from 1999-2006



Source: United Nations COMTRADE (2008)

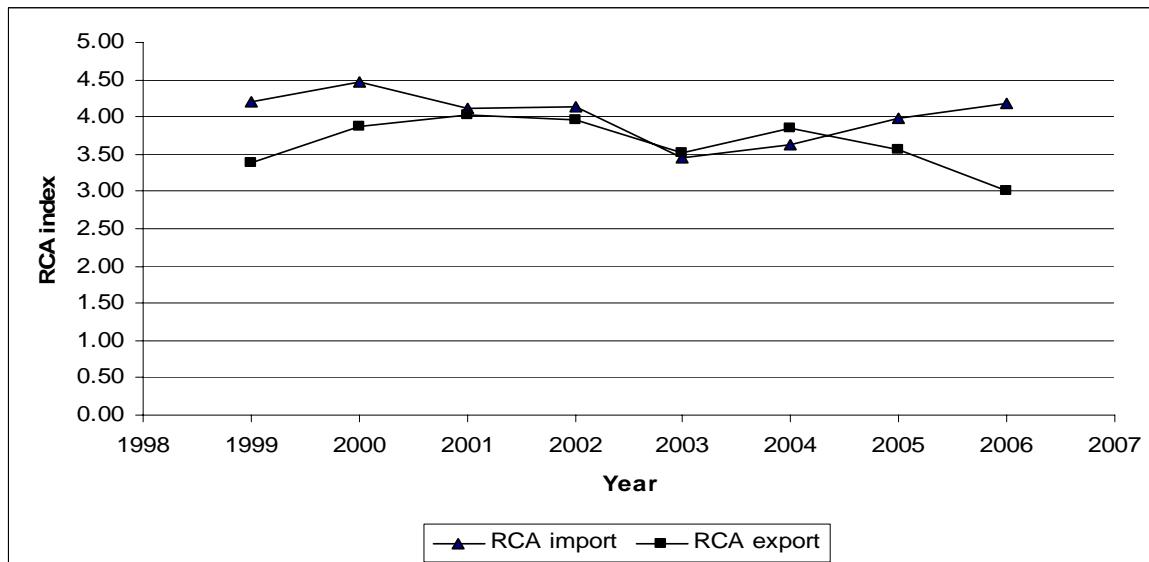
Figure 5: Revealed Comparative Advantage of Malaysian plywood, veneered panels and similar laminated wood (HS4412) from 1999-2006



Source: United Nations COMTRADE (2008)

In addition, the builder joinery and carpentry of wood (HS4418) have comparative advantage in exporting the products to EU due to the high index of revealed comparative advantage. Malaysian exporters have the average about 4 times advantage to exports the products to EU compared to other world exporters.

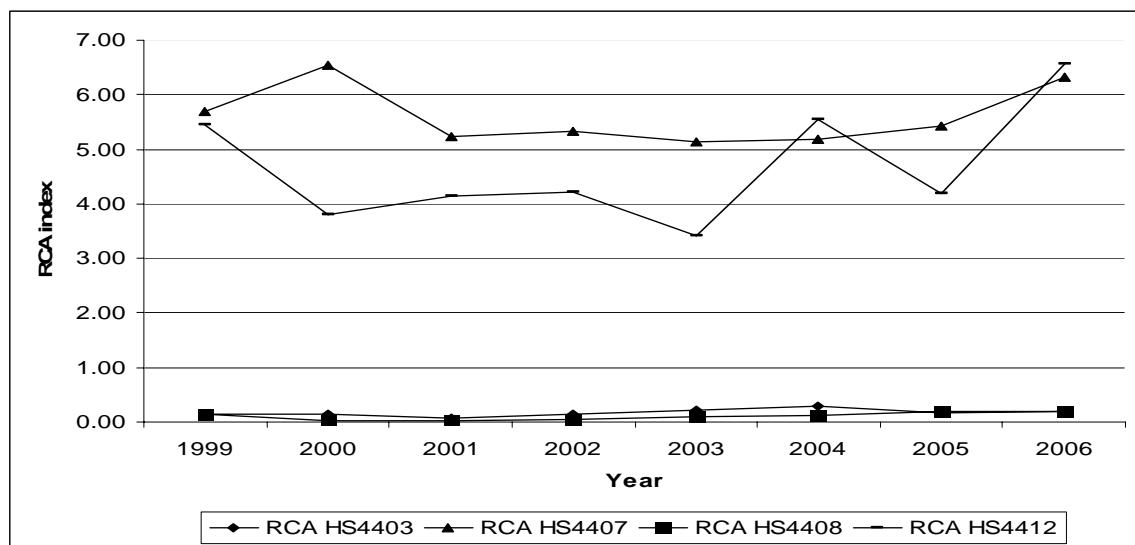
Figure 6: Revealed Comparative Advantage of Malaysian builder joinery and carpentry of wood (HS4418) from 1999-2006



Source: United Nations COMTRADE (2008)

However, we questioned whether the recent trends in Europe for certification of wood and forest products or new regulations as FLEGT has an impact on relative comparative advantage of Malaysian woods. Between, we also analyze the codes that has been interested by FLEGT in the forest sector such are wood in the rough or roughly squared (HS4403), wood used for tramway sleepers (HS4406), wood sawn, chipped lengthwise, sliced or peeled (HS4407), veneers and sheets for plywood etc <6mm thick (HS4408) as well as plywood, veneered panels and similar laminated wood (HS4412). Based on figure 7, we found that Malaysia has high revealed comparative advantage in two codes that are interested by FLEGT which are wood sawn, chipped lengthwise, sliced or peeled (HS4407) and plywood, veneered panels and similar laminated wood (HS4412) in exporting to Europe.

Figure 7: Revealed Comparative Advantage of Malaysian wood interested by FLEGT from 1999-2006



Source: United Nations COMTRADE (2008)

Interestingly, even though we know that Europe is the main global market for certified products, but in terms of export share of forest products from Malaysia to Europe relative to world exports shows continuously decreasing trend since nineties. Furthermore for the Europe market per se, the declining trends can be seen clearly (refer figure 9). From point of view of Malaysian exporters, the European forest product sectors have evolved in the recent years in a “green market”. Therefore, they believed that the competitiveness of the tropical forest products in this market are supposed now to be their ability to display proves of legality and eco certification characteristics. With the continuous decreases of Malaysian wood and forest products market share in Europe compared to other countries, it is clear that the market attraction of Europe fails to create real market incentives despite the efforts of Malaysia through its MTCC⁹ or through its involvement in FLEGT¹⁰ process.

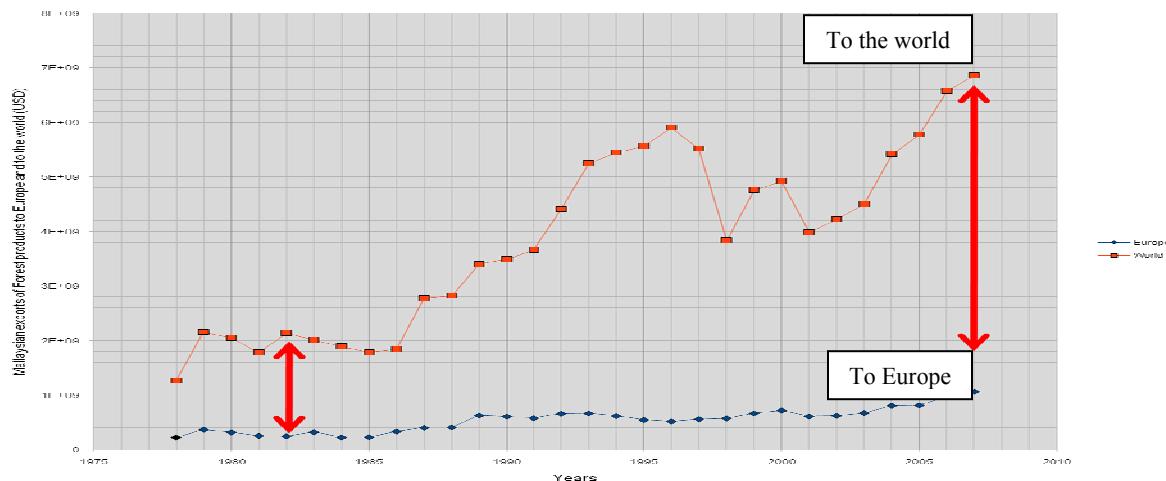
While the volume of sales to Europe for Malaysia are not decreasing, but the relative sales shrink from around 10-18% to less than 6%. This showed that selling to Europe is not compulsory but the other growing markets create new competitiveness opportunities

⁹ Malaysian Timber Council Certificates

¹⁰ Forest Law Enforcement, Governance and Trade

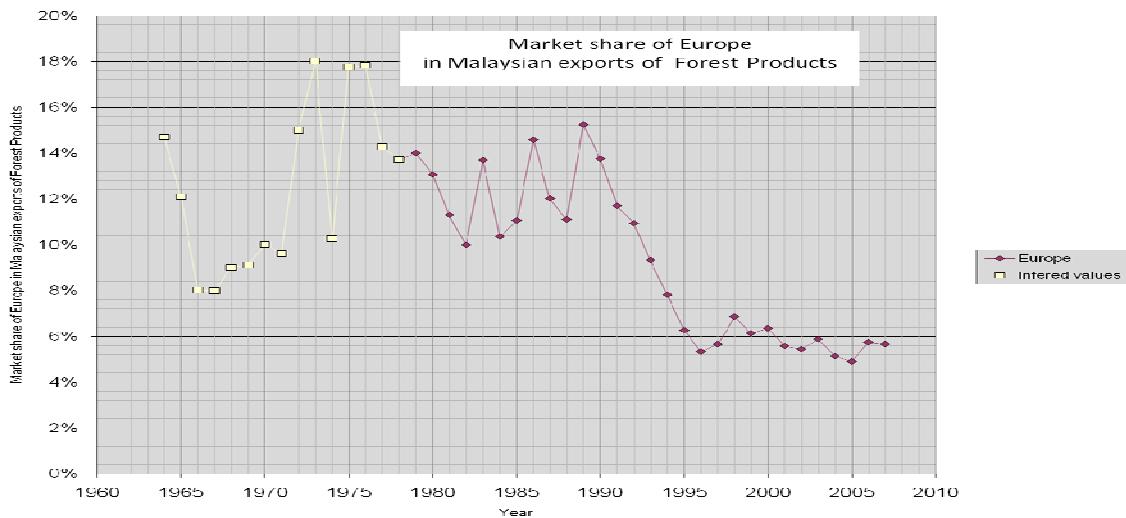
for Malaysia, letting only a few market niches still being “Euro-centered”. In the case of Malaysia, forest certification is not a “transnational private regulation tool” promoting sales to Europe as it should be. It has rather, more an impact on the realistic “image” of the country itself, than on the forest products themselves. Conversely it is too soon to see any effects created by the ongoing FLEGT process. In a nutshell, we can conclude that the “green” criteria evolving in European forest sector recently have only a marginal effect on Malaysian exporters compared to the differences of the various market segments (products) between themselves.

Figure 8: Malaysian exports of forest products to Europe and to the World (US dollar)



Source: United Nations COMTRADE (2008)

Figure 9: Market share of Europe in Malaysian export of forest products



Source: United Nations COMTRADE (2008)

Summary and Conclusion

In a nutshell, even though the exports share of Malaysian wood and forest products are decreasing, but the absolute sales to Europe are not decreasing (refer annex 2). However, due to declining trends of exports share in wood and forest products from Malaysia to Europe recently, we can say that Europe is becoming less important for Malaysian exporters in forest products exports. Despite of that, relative competitiveness of forest products from Malaysia has improved for some categories since 2002 after the first batches of Malaysian Timber Certification Scheme has launched.

In conclusion, Malaysia should take full advantage of the natural resource abundance to serve as an engine for economic growth. In addition, export promotion of wood and forest products may play an important role in supporting country for long run growth to maintain the export competitiveness of the industry. The export promotion scheme and incentives should be given to the exporters in promoting and expanding the export to the global market.

Extended Abstract

Historically, forest products trade has been expanding throughout the last few decades. To date, world trade in forest products are dominated by the developed countries both in imports and exports (Hillring, 2006; Buongiorno et al., 2003). Europe, America and Asia are the main importing and exporting regions in forest products (Hillring, 2006; FAO, 2007¹¹). According to FAO (2007), Europe is considered as the largest trading region in the world which in 2004, accounted for 47 and 56 percent of global import and export values respectively. The growing market in Europe are the construction, furniture, packaging and publishing and some other areas that consume forest products for their industry (Rametsteiner and Schwarzbauer, 1999)

As the growing trade in wood and forest products increasing, it has gained more attention from the main supplier in increasing the export competitiveness of the products. Thus, countries with large forest resources have an advantage in maximizing the resources in fulfilling the world demand. For Malaysia, becoming one of the main suppliers in the wood and forest products, the industry should maintain the competitiveness of the industry at the international level. Therefore, this research intends to analyze the comparative advantage of Malaysian wood and forest products in maintaining the export competitiveness of Malaysia to Europe (taking into account that Europe is the largest trading region in the world). Furthermore, the comparative advantage of wood and forest products (exclude furniture) from Malaysia will be analyzed in detail based on the Harmonized System (HS) codes in United Nations Commodity Trade Statistics database from 1999- 2006. The analyses will take place within 21 categories of wood and articles of wood in HS codes starting from HS44-HS4421.

This paper is using the approach of revealed comparative advantage (RCA) by Balassa (1965) in analyzing the strength of Malaysia in exporting the wood and forest products to

¹¹ Food and Agricultural Organization of United Nations (2007), State of the World's Forests 2007, Electronic Publishing Policy and Support Branch, Communication Division, FAO, Rome.

world market. According to Uusivouri and Tervo (2002)¹² the concepts of revealed comparative advantage is used in analyzing the relative strength of a nations in different sectors of economic activity. If the index exhibit value greater than one, the sector or products has a comparative advantage in the production of the goods and if index less than one, it indicates a comparative disadvantage in the production of the products.

The results showed that Malaysia has the comparative advantage based on the performance of exporting wood and forest products to Europe. Overall, it has been figured out that Malaysia has 3 times advantage (in average) in exporting the wood and forest products to Europe compared to other global exporters. The most advantage are gaining through export of wood charcoal (HS4402), wood sawn, chipped lengthwise sliced or peeled (HS4407), wood continuously shaped along any edges (HS4409) plywood, veneered panels and similar laminated wood (HS4412), builders joinery and carpentry of wood (HS4418) and articles of wood (HS4421). Correspondingly, all of the mentioned products are among the highest exports of Malaysia in wood and forest industry.

Keywords: revealed comparative advantage, Malaysia, wood and forest products

¹² Uusivouri, J. & Tervo, M. (2002), Comparative Advantage and Forest Endowment in Forest Products Trade: Evidence from Panel Data of OECD-countries, Journal of Forest Economics, Vol.8, p.53-75

Annex 1

Wood and articles of wood, wood charcoal (HS44)

Ranks

| RCA | N | Mean Rank | Sum of Ranks |
|----------|-----------|-----------|--------------|
| RCAvalue | RCAimport | 8 | 11.12 |
| | RCAexport | 8 | 5.88 |
| | Total | 16 | 89.00 |

Test Statistics^c

| | | | RCAvalue |
|--------------------------------|-------------------------|-------------|-------------------|
| Mann-Whitney U | | | 11.000 |
| Wilcoxon W | | | 47.000 |
| Z | | | -2.207 |
| Asymp. Sig. (2-tailed) | | | .027 |
| Exact Sig. [2*(1-tailed Sig.)] | | | .028 ^a |
| Monte Carlo Sig. (2-tailed) | Sig. | | .000 ^b |
| | 90% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .134 |
| Monte Carlo Sig. (1-tailed) | 90% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .134 |
| | Sig. | | .000 ^b |

a. Not corrected for ties.

b. Based on 16 sampled tables with starting seed 2000000.

c. Grouping Variable: RCA

Note: RCA import and export have significance difference i.e.
RCA export ≠ RCA import

Fuel wood, wood in chips or particles, wood waste (HS4401)

Ranks

| RCA | | N | Mean Rank | Sum of Ranks |
|---------|-------|----|-----------|--------------|
| RCValue | 1 | 8 | 8.50 | 68.00 |
| | 2 | 8 | 8.50 | 68.00 |
| | Total | 16 | | |

Test Statistics^c

| | | | RCValue |
|--------------------------------|-------------------------|-------------|--------------------|
| Mann-Whitney U | | | 32.000 |
| Wilcoxon W | | | 68.000 |
| Z | | | .000 |
| Asymp. Sig. (2-tailed) | | | 1.000 |
| Exact Sig. [2*(1-tailed Sig.)] | | | 1.000 ^a |
| Monte Carlo Sig. (2-tailed) | Sig. | | 1.000 ^b |
| | 95% Confidence Interval | Lower Bound | .688 |
| | | Upper Bound | 1.000 |
| Monte Carlo Sig. (1-tailed) | 95% Confidence Interval | Lower Bound | .040 |
| | | Upper Bound | .710 |
| | Sig. | | .375 ^b |

a. Not corrected for ties.

b. Based on 8 sampled tables with starting seed 1314643744.

c. Grouping Variable: RCA

Note: RCA import and export have no significance difference i.e.

RCA export = RCA import

Wood charcoal (including shell or nut charcoal) (HS4402)

Ranks

| RCA | N | Mean Rank | Sum of Ranks |
|----------|-----------|-----------|--------------|
| RCAvalue | RCAimport | 8 | 12.50 |
| | RCAexport | 8 | 4.50 |
| | Total | 16 | |

Test Statistics^c

| | | | RCAvalue |
|--------------------------------|-------------------------|-------------|-------------------|
| Mann-Whitney U | | | .000 |
| Wilcoxon W | | | 36.000 |
| Z | | | -3.602 |
| Asymp. Sig. (2-tailed) | | | .000 |
| Exact Sig. [2*(1-tailed Sig.)] | | | .000 ^a |
| Monte Carlo Sig. (2-tailed) | Sig. | | .000 ^b |
| | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .171 |
| Monte Carlo Sig. (1-tailed) | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .171 |
| | Sig. | | .000 ^b |

a. Not corrected for ties.

b. Based on 16 sampled tables with starting seed 726961337.

c. Grouping Variable: RCA

Note: RCA import and export have significance difference i.e.
 RCA export ≠ RCA import

Wood in the rough or roughly squared (HS4403)

Ranks

| RCA | N | Mean Rank | Sum of Ranks |
|----------|-----------|-----------|--------------|
| RCAvalue | RCAimport | 8 | 12.50 |
| | RCAexport | 8 | 4.50 |
| | Total | 16 | 100.00 |

Test Statistics^c

| | | | RCAvalue |
|--------------------------------|-------------------------|-------------|-------------------|
| Mann-Whitney U | | | .000 |
| Wilcoxon W | | | 36.000 |
| Z | | | -3.363 |
| Asymp. Sig. (2-tailed) | | | .001 |
| Exact Sig. [2*(1-tailed Sig.)] | | | .000 ^a |
| Monte Carlo Sig. (2-tailed) | Sig. | | .000 ^b |
| | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .171 |
| Monte Carlo Sig. (1-tailed) | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .171 |
| | Sig. | | .000 ^b |

a. Not corrected for ties.

b. Based on 16 sampled tables with starting seed 2048628469.

c. Grouping Variable: RCA

Note: RCA import and export have significance difference i.e.
RCA export ≠ RCA import

Hoop wood, split poles, pile, pickets and stakes (HS4404)

Ranks

| RCA | N | Mean Rank | Sum of Ranks |
|----------|-----------|-----------|--------------|
| RCAvalue | RCAimport | 8 | 12.50 |
| | RCAexport | 8 | 4.50 |
| | Total | 16 | 100.00 |

Test Statistics^c

| | | | RCAvalue |
|--------------------------------|-------------------------|-------------|-------------------|
| Mann-Whitney U | | | .000 |
| Wilcoxon W | | | 36.000 |
| Z | | | -3.363 |
| Asymp. Sig. (2-tailed) | | | .001 |
| Exact Sig. [2*(1-tailed Sig.)] | | | .000 ^a |
| Monte Carlo Sig. (2-tailed) | Sig. | | .000 ^b |
| | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .171 |
| Monte Carlo Sig. (1-tailed) | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .171 |
| | Sig. | | .000 ^b |

a. Not corrected for ties.

b. Based on 16 sampled tables with starting seed 926214481.

c. Grouping Variable: RCA

Note: RCA import and export have significance difference i.e.

RCA export ≠ RCA import

Wood sawn, chipped lengthwise, sliced or peeled (HS4407)

Ranks

| RCA | N | Mean Rank | Sum of Ranks |
|----------|-----------|-----------|--------------|
| RCAvalue | RCAimport | 8 | 11.12 |
| | RCAexport | 8 | 5.88 |
| | Total | 16 | 89.00 |

Test Statistics^c

| | | | RCAvalue |
|--------------------------------|-------------------------|-------------|-------------------|
| Mann-Whitney U | | | 11.000 |
| Wilcoxon W | | | 47.000 |
| Z | | | -2.205 |
| Asymp. Sig. (2-tailed) | | | .027 |
| Exact Sig. [2*(1-tailed Sig.)] | | | .028 ^a |
| Monte Carlo Sig. (2-tailed) | Sig. | | .000 ^b |
| | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .171 |
| Monte Carlo Sig. (1-tailed) | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .171 |
| | Sig. | | .000 ^b |

a. Not corrected for ties.

b. Based on 16 sampled tables with starting seed 926214481.

c. Grouping Variable: RCA

Note: RCA import and export have significance difference i.e.

RCA export ≠ RCA import

Veneers and sheets for plywood etc <6mm thick (HS4408)

Ranks

| RCA | N | Mean Rank | Sum of Ranks |
|----------|-----------|-----------|--------------|
| RCAvalue | RCAimport | 8 | 9.25 |
| | RCAexport | 8 | 7.75 |
| | Total | 16 | |

Test Statistics^c

| | | RCAvule |
|--------------------------------|-------------------------|-------------------|
| Mann-Whitney U | | 26.000 |
| Wilcoxon W | | 62.000 |
| Z | | -.633 |
| Asymp. Sig. (2-tailed) | | .526 |
| Exact Sig. [2*(1-tailed Sig.)] | | .574 ^a |
| Monte Carlo Sig. (2-tailed) | Sig. | .625 ^b |
| | 95% Confidence Interval | Lower Bound |
| | | .388 |
| | | Upper Bound |
| Monte Carlo Sig. (1-tailed) | 95% Confidence Interval | Lower Bound |
| | | .085 |
| | | Upper Bound |
| | | .540 |
| | Sig. | .312 ^b |

a. Not corrected for ties.

b. Based on 16 sampled tables with starting seed 2000000.

c. Grouping Variable: RCA

Note: RCA import and export have no significance difference i.e.

RCAexport=RCAimport

Wood continuously shaped along any edges (HS4409)

Ranks

| RCA | N | Mean Rank | Sum of Ranks |
|----------|-----------|-----------|--------------|
| RCAvalue | RCAimport | 8 | 6.00 |
| | RCAvalue | 8 | 11.00 |
| | Total | 16 | |

Test Statistics^c

| | | | RCAvalue |
|--------------------------------|-------------------------|-------------|-------------------|
| Mann-Whitney U | | | 12.000 |
| Wilcoxon W | | | 48.000 |
| Z | | | -2.100 |
| Asymp. Sig. (2-tailed) | | | .036 |
| Exact Sig. [2*(1-tailed Sig.)] | | | .038 ^a |
| Monte Carlo Sig. (2-tailed) | Sig. | | .000 ^b |
| | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .171 |
| Monte Carlo Sig. (1-tailed) | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .171 |
| | Sig. | | .000 ^b |

a. Not corrected for ties.

b. Based on 16 sampled tables with starting seed 926214481.

c. Grouping Variable: RCA

Note: RCA import and export have significance difference i.e. **RCA export ≠ RCA import**

Particle board, similar board, wood, ligneous material (HS4410)

Ranks

| RCA | N | Mean Rank | Sum of Ranks |
|----------|-----------|-----------|--------------|
| RCAvalue | RCAimport | 8 | 11.75 |
| | RCAexport | 8 | 5.25 |
| | Total | 16 | |

Test Statistics^c

| | | RCAvule |
|--------------------------------|-------------------------|-------------------|
| Mann-Whitney U | | 6.000 |
| Wilcoxon W | | 42.000 |
| Z | | -2.900 |
| Asymp. Sig. (2-tailed) | | .004 |
| Exact Sig. [2*(1-tailed Sig.)] | | .005 ^a |
| Monte Carlo Sig. (2-tailed) | Sig. | .062 ^b |
| | 95% Confidence Interval | Lower Bound |
| | | .000 |
| | | Upper Bound |
| Monte Carlo Sig. (1-tailed) | 95% Confidence Interval | Lower Bound |
| | | .000 |
| | | Upper Bound |
| | Sig. | .181 |
| | | .062 ^b |

a. Not corrected for ties.

b. Based on 16 sampled tables with starting seed 1502173562.

c. Grouping Variable: RCA

Note: RCA import and export have significance difference i.e. **RCA export ≠ RCA import**

Fibreboard of wood or other ligneous materials (HS4411)

Ranks

| | RCA | N | Mean Rank | Sum of Ranks |
|----------|-------|----|-----------|--------------|
| RCAvalue | 1 | 8 | 9.44 | 75.50 |
| | 2 | 8 | 7.56 | 60.50 |
| | Total | 16 | | |

Test Statistics^c

| | | RCAvalue |
|--------------------------------|-------------------------|-------------------|
| Mann-Whitney U | | 24.500 |
| Wilcoxon W | | 60.500 |
| Z | | -.789 |
| Asymp. Sig. (2-tailed) | | .430 |
| Exact Sig. [2*(1-tailed Sig.)] | | .442 ^a |
| Monte Carlo Sig. (2-tailed) | Sig. | .375 ^b |
| | 95% Confidence Interval | Lower Bound |
| | | .138 |
| | | Upper Bound |
| | | .612 |
| Monte Carlo Sig. (1-tailed) | 95% Confidence Interval | Lower Bound |
| | | .000 |
| | | Upper Bound |
| | | .287 |
| | Sig. | .125 ^b |

a. Not corrected for ties.

b. Based on 16 sampled tables with starting seed 957002199.

c. Grouping Variable: RCA

Note: RCA import and export have no significance difference i.e.

RCA export=RCA import

Plywood, veneered panels and similar laminated wood (HS4412)

Ranks

| RCA | N | Mean Rank | Sum of Ranks |
|----------|-----------|-----------|--------------|
| RCAvalue | RCAimport | 8 | 9.19 |
| | RCAexport | 8 | 7.81 |
| | Total | 16 | |

Test Statistics^c

| | | | RCAvalue |
|--------------------------------|-------------------------|-------------|-------------------|
| Mann-Whitney U | | | 26.500 |
| Wilcoxon W | | | 62.500 |
| Z | | | -.578 |
| Asymp. Sig. (2-tailed) | | | .563 |
| Exact Sig. [2*(1-tailed Sig.)] | | | .574 ^a |
| Monte Carlo Sig. (2-tailed) | Sig. | | .688 ^b |
| | 95% Confidence Interval | Lower Bound | .460 |
| | | Upper Bound | .915 |
| Monte Carlo Sig. (1-tailed) | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .181 |
| | Sig. | | .062 ^b |

a. Not corrected for ties.

b. Based on 16 sampled tables with starting seed 221623949.

c. Grouping Variable: RCA

Note: RCA import and export have no significance difference i.e.

RCA export=RCA import

Densified wood in blocks, plates, strips or profile (HS4413)

Ranks

| RCA | N | Mean Rank | Sum of Ranks |
|----------|-----------|-----------|--------------|
| RCAvalue | RCAimport | 8 | 12.50 |
| | RCAexport | 8 | 4.50 |
| | Total | 16 | |

Test Statistics^c

| | | | RCAvalue |
|--------------------------------|-------------------------|-------------|-------------------|
| Mann-Whitney U | | | .000 |
| Wilcoxon W | | | 36.000 |
| Z | | | -3.388 |
| Asymp. Sig. (2-tailed) | | | .001 |
| Exact Sig. [2*(1-tailed Sig.)] | | | .000 ^a |
| Monte Carlo Sig. (2-tailed) | Sig. | | .000 ^b |
| | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .171 |
| Monte Carlo Sig. (1-tailed) | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .171 |
| | Sig. | | .000 ^b |

a. Not corrected for ties.

b. Based on 16 sampled tables with starting seed 92208573.

c. Grouping Variable: RCA

Note: RCA import and export have significance difference i.e.

RCA export ≠ RCA import

Wooden frames for painting etc. (HS4414)

Ranks

| RCA | N | Mean Rank | Sum of Ranks |
|----------|-----------|-----------|--------------|
| RCAvalue | RCAimport | 8 | 9.75 |
| | RCAexport | 8 | 7.25 |
| | Total | 16 | |

Test Statistics^c

| | | | RCAvalue |
|--------------------------------|-------------------------|-------------|-------------------|
| Mann-Whitney U | | | 22.000 |
| Wilcoxon W | | | 58.000 |
| Z | | | -1.053 |
| Asymp. Sig. (2-tailed) | | | .293 |
| Exact Sig. [2*(1-tailed Sig.)] | | | .328 ^a |
| Monte Carlo Sig. (2-tailed) | Sig. | | .188 ^b |
| | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .379 |
| Monte Carlo Sig. (1-tailed) | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .287 |
| | Sig. | | .125 ^b |

a. Not corrected for ties.

b. Based on 16 sampled tables with starting seed 329836257.

c. Grouping Variable: RCA

Note: RCA import and export have no significance difference i.e.

RCA export = RCA import

Wooden cases, boxes, crates, drums etc. (HS4415)

Ranks

| RCA | N | Mean Rank | Sum of Ranks |
|----------|-----------|-----------|--------------|
| RCAvalue | RCAimport | 8 | 6.38 |
| | RCAexport | 8 | 10.62 |
| | Total | 16 | |

Test Statistics^c

| Test Statistics ^c | | | RCAvalue |
|--------------------------------|-------------------------|-------------|-------------------|
| Mann-Whitney U | | | 15.000 |
| Wilcoxon W | | | 51.000 |
| Z | | | -1.829 |
| Asymp. Sig. (2-tailed) | | | .067 |
| Exact Sig. [2*(1-tailed Sig.)] | | | .083 ^a |
| Monte Carlo Sig. (2-tailed) | Sig. | | .062 ^b |
| | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .181 |
| Monte Carlo Sig. (1-tailed) | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .181 |
| | Sig. | | .062 ^b |

a. Not corrected for ties.

b. Based on 16 sampled tables with starting seed 1993510611.

c. Grouping Variable: RCA

Note: RCA import and export have no significance difference i.e.

RCA export = RCA import

Tableware and kitchenware of wood (HS4419)

Ranks

| RCA | N | Mean Rank | Sum of Ranks |
|----------|-----------|-----------|--------------|
| RCAvalue | RCAimport | 8 | 9.06 |
| | RCAexport | 8 | 7.94 |
| | Total | 16 | |

Test Statistics^c

| | | RCAvule |
|--------------------------------|-------------------------|-------------------|
| Mann-Whitney U | | 27.500 |
| Wilcoxon W | | 63.500 |
| Z | | -.473 |
| Asymp. Sig. (2-tailed) | | .636 |
| Exact Sig. [2*(1-tailed Sig.)] | | .645 ^a |
| Monte Carlo Sig. (2-tailed) | Sig. | .750 ^b |
| | 95% Confidence Interval | Lower Bound |
| | | .538 |
| | | Upper Bound |
| Monte Carlo Sig. (1-tailed) | 95% Confidence Interval | Lower Bound |
| | | .138 |
| | | Upper Bound |
| | | .612 |
| | Sig. | .375 ^b |

a. Not corrected for ties.

b. Based on 16 sampled tables with starting seed 562334227.

c. Grouping Variable: RCA

Note: RCA import and export have no significance difference i.e.

RCA export = RCA import

Ornaments of wood, jewel, cutlery casket and cases (HS4420)

Ranks

| RCA | N | Mean Rank | Sum of Ranks |
|----------|-----------|-----------|--------------|
| RCAvalue | RCAimport | 8 | 9.25 |
| | RCAexport | 8 | 7.75 |
| | Total | 16 | |

Test Statistics^c

| Test Statistics ^c | | | RCAvalue |
|--------------------------------|-------------------------|-------------|-------------------|
| Mann-Whitney U | | | 26.000 |
| Wilcoxon W | | | 62.000 |
| Z | | | -.633 |
| Asymp. Sig. (2-tailed) | | | .526 |
| Exact Sig. [2*(1-tailed Sig.)] | | | .574 ^a |
| Monte Carlo Sig. (2-tailed) | Sig. | | .375 ^b |
| | 95% Confidence Interval | Lower Bound | .138 |
| | | Upper Bound | .612 |
| Monte Carlo Sig. (1-tailed) | 95% Confidence Interval | Lower Bound | .000 |
| | | Upper Bound | .379 |
| | Sig. | | .188 ^b |

a. Not corrected for ties.

b. Based on 16 sampled tables with starting seed 79654295.

c. Grouping Variable: RCA

Note: RCA import and export have no significance difference i.e.

RCA export = RCA import

Articles of wood, nes. (HS4421)

Ranks

| | RCA | N | Mean Rank | Sum of Ranks |
|----------|-------|----|-----------|--------------|
| RCAvalue | 1 | 8 | 11.50 | 92.00 |
| | 2 | 8 | 5.50 | 44.00 |
| | Total | 16 | | |

Test Statistics^c

| | RCAvalue |
|---|-------------------|
| Mann-Whitney U | 8.000 |
| Wilcoxon W | 44.000 |
| Z | -2.521 |
| Asymp. Sig. (2-tailed) | .012 |
| Exact Sig. [2*(1-tailed Sig.)] | .010 ^a |
| Monte Carlo Sig. (2-tailed) Sig. | .000 ^b |
| | .000 |
| | Upper Bound |
| Monte Carlo Sig. (1-tailed) 95% Confidence Interval Lower Bound | .000 |
| | Upper Bound |
| | .171 |
| | .000 |
| | .171 |
| | .000 ^b |
| Sig. | |

a. Not corrected for ties.

b. Based on 16 sampled tables with starting seed 1573343031.

c. Grouping Variable: RCA

Note: RCA import and export have significance difference i.e.

RCA export ≠ RCA import

Significance Difference

| | |
|--------|--|
| HS44 | wood and articles of wood, wood charcoal |
| HS4401 | fuel wood, wood in chips or particles, wood waste |
| HS4403 | wood in the rough or roughly squared |
| HS4404 | hoop wood, split poles, pile, pickets and stakes |
| HS4407 | wood sawn, chipped lengthwise, sliced or peeled |
| HS4409 | wood continuously shaped along any edges |
| HS4410 | particle board, similar board, wood, ligneous material |
| HS4413 | densified wood in blocks, plates, strips or profile |
| HS4421 | articles of wood, nes |

No Significance Difference

| | |
|--------|---|
| HS4402 | wood charcoal (including shell or nut charcoal) |
| HS4408 | veneers and sheets for plywood etc <6mm thick |
| HS4411 | fibreboard of wood or other ligneous materials |
| HS4412 | plywood, veneered panels and similar laminated wood |
| HS4414 | wooden frames for painting etc |
| HS4415 | wooden cases, boxes, crates, drums etc |
| HS4419 | tableware and kitchenware of wood |
| HS4420 | ornaments of wood, jewel, cutlery casket and cases |

#Note: Some HS codes are out of analysis due to data limitations.

Annex 2

Table 1: Total imports of EU15 from Malaysia 1999

| Country | Trade value (in US dollar) |
|----------------|----------------------------|
| Austria | \$156,994,868 |
| Belgium | \$623,082,558 |
| Denmark | \$141,491,745 |
| Finland | \$159,722,271 |
| France | \$1,449,380,864 |
| Germany | \$2,706,157,568 |
| Greece | \$74,995,163 |
| Ireland | \$616,775,616 |
| Italy | \$613,249,951 |
| Luxembourg | \$1,875,673 |
| Netherlands | \$2,128,274,708 |
| Portugal | \$68,706,868 |
| Spain | \$500,782,620 |
| Sweden | \$179,371,735 |
| United Kingdom | \$3,286,006,967 |
| Total | \$12,706,869,175 |

Source: UN COMTRADE (2008)

Table 2: Total imports of EU15 from Malaysia 2000

| Country | Trade value (in US dollar) |
|----------------|----------------------------|
| Austria | \$221,045,418 |
| Belgium | \$647,289,113 |
| Denmark | \$145,771,707 |
| Finland | \$271,326,048 |
| France | \$1,786,234,927 |
| Germany | \$3,460,752,000 |
| Greece | \$86,265,920 |
| Ireland | \$603,697,433 |
| Italy | \$655,917,888 |
| Luxembourg | \$11,915,193 |
| Netherlands | \$1,840,323,527 |
| Portugal | \$81,431,544 |
| Spain | \$507,591,360 |
| Sweden | \$362,095,785 |
| United Kingdom | \$3,729,126,509 |
| Total | \$14,410,784,372 |

Source: UN COMTRADE (2008)

Table 3: Total imports of EU15 from Malaysia 2001

| Country | Trade value (in US dollar) |
|----------------|----------------------------|
| Austria | \$519,064,174 |
| Belgium | \$619,791,562 |
| Denmark | \$181,141,168 |
| Finland | \$224,047,950 |
| France | \$1,766,834,522 |
| Germany | \$3,167,067,000 |
| Greece | \$97,537,888 |
| Ireland | \$522,860,373 |
| Italy | \$582,940,906 |
| Luxembourg | \$3,906,622 |
| Netherlands | \$2,198,217,955 |
| Portugal | \$62,418,256 |
| Spain | \$503,635,584 |
| Sweden | \$183,754,961 |
| United Kingdom | \$2,975,597,592 |
| Total | \$13,608,816,513 |

Source: UN COMTRADE (2008)

Table 4: Total imports of EU15 from Malaysia 2002

| Country | Trade value (in US dollar) |
|----------------|----------------------------|
| Austria | \$448,028,610 |
| Belgium | \$554,723,454 |
| Denmark | \$173,214,026 |
| Finland | \$226,508,624 |
| France | \$1,902,095,946 |
| Germany | \$3,237,282,000 |
| Greece | \$80,126,560 |
| Ireland | \$629,789,080 |
| Italy | \$537,386,555 |
| Luxembourg | \$1,527,404 |
| Netherlands | \$1,639,334,019 |
| Portugal | \$58,719,376 |
| Spain | \$548,496,832 |
| Sweden | \$173,871,168 |
| United Kingdom | \$2,742,378,210 |
| Total | \$12,953,481,864 |

Source: UN COMTRADE (2008)

Table 5: Total imports of EU15 from Malaysia 2003

| Country | Trade value (in US dollar) |
|----------------|----------------------------|
| Austria | \$265,527,694 |
| Belgium | \$586,205,518 |
| Denmark | \$199,009,346 |
| Finland | \$244,095,888 |
| France | \$1,840,211,352 |
| Germany | \$3,959,083,000 |
| Greece | \$104,438,849 |
| Ireland | \$530,075,936 |
| Italy | \$642,321,106 |
| Luxembourg | \$4,500,740 |
| Netherlands | \$3,798,470,010 |
| Portugal | \$77,831,654 |
| Spain | \$660,276,683 |
| Sweden | \$205,156,215 |
| United Kingdom | \$3,152,513,678 |
| Total | \$16,269,717,669 |

Source: UN COMTRADE (2008)

Table 6: Total imports of EU15 from Malaysia 2004

| Country | Trade value (in US dollar) |
|----------------|----------------------------|
| Austria | \$255,818,737 |
| Belgium | \$578,303,988 |
| Denmark | \$243,589,443 |
| Finland | \$335,699,185 |
| France | \$1,932,533,173 |
| Germany | \$4,616,722,000 |
| Greece | \$114,010,251 |
| Ireland | \$579,999,022 |
| Italy | \$804,880,701 |
| Luxembourg | \$4,264,269 |
| Netherlands | \$4,284,770,741 |
| Portugal | \$89,794,472 |
| Spain | \$827,678,422 |
| Sweden | \$197,714,802 |
| United Kingdom | \$3,664,826,179 |
| Total | \$18,530,605,385 |

Source: UN COMTRADE (2008)

Table 7: Total imports of EU15 from Malaysia 2005

| Country | Trade value (in US dollar) |
|----------------|----------------------------|
| Austria | \$318,368,591 |
| Belgium | \$629,017,142 |
| Denmark | \$337,979,074 |
| Finland | \$376,519,600 |
| France | \$1,843,832,122 |
| Germany | \$4,654,265,000 |
| Greece | \$85,178,072 |
| Ireland | \$698,665,884 |
| Italy | \$844,995,559 |
| Luxembourg | \$7,315,987 |
| Netherlands | \$4,956,957,509 |
| Portugal | \$77,845,349 |
| Spain | \$843,267,094 |
| Sweden | \$210,945,594 |
| United Kingdom | \$3,310,070,840 |
| Total | \$19,195,223,417 |

Source: UN COMTRADE (2008)

Table 8: Total imports of EU15 from Malaysia 2006

| Country | Trade value |
|----------------|-------------------------|
| Austria | \$457,595,605 |
| Belgium | \$679,943,394 |
| Denmark | \$246,736,301 |
| Finland | \$464,371,861 |
| France | \$2,111,609,134 |
| Germany | \$5,099,172,000 |
| Greece | \$109,817,237 |
| Ireland | \$522,140,411 |
| Italy | \$1,172,097,052 |
| Luxembourg | \$16,153,606 |
| Netherlands | \$5,687,018,558 |
| Portugal | \$123,162,922 |
| Spain | \$1,011,298,099 |
| Sweden | \$377,312,133 |
| United Kingdom | \$3,647,240,666 |
| Total | \$21,725,668,979 |

Source: UN COMTRADE (2008)