



# COMPETITIVENESS OF EXPORT WOOD PRODUCTS IN BINH DINH PROVINCE IN THE MARKET INTEGRATION

Le Thi The Buu\*, Trinh Van Son

HU – University of Economics, 100 Phung Hung St., Hue, Vietnam

**Abstract:** The objective of this study is to evaluate the competitiveness of export wood products in Binh Dinh province through the DRC/ SER index. Four pieces of indoor furniture and four pieces of outdoor furniture were selected for the study. The DRC/ SER indices of the products are in the range of 0.76–0.84. Meanwhile, indoor furniture is more competitive in the international market.

**Keywords:** competitiveness, DRC, Binh Dinh province, wood products, export

## 1 Introduction

Vietnam's wood processing industry has grown strongly over the last 10 years. Most of the wood processing enterprises are mainly operating in the field of furniture, outdoor furniture and fine art furniture for the domestic market and export. Exporting wood products has become one of the strengths of the forest sector and has contributed significantly to the economic development of Vietnam. From its initial faint position, Vietnam now ranks second in terms of exports of wood and wood products in ASEAN after Malaysia [10]. Currently, Vietnam has more than 4,000 wood processing exporters that have shipped furniture directly and indirectly to foreign countries. So far, Vietnam's wood products have been on the market of 120 countries [16].

Binh Dinh is one of the three leading export wood processing centers in Vietnam, with an average turnover of 300 million USD per year, accounting for over 50 % of the province's export revenue. Binh Dinh province leads the country in outdoor wood products. Furniture from Binh Dinh has been exported to many countries and territories in the world such as England, France, Belgium, Turkey, Spain, USA, Japan, China, Korea, etc. [12]. In 2016, the export value of wood processing and forestry industry in Binh Dinh province reached about 361.2 million USD, accounting for 49.5 % of the province's export turnover [12]. In the past years, the production, processing and import-export activities of wood enterprises the province achieved good development steps. This has brought a large amount of foreign currency revenue and contributed positively to the economic and social development, and employment status for a large number of local laborers. Therefore, the wood processing industry in Binh Dinh province plays a great role in the local socio-economic development. In the context of international integration, improving the competitiveness of export wood products is of great importance for Binh Dinh province.

The purpose of this paper is to properly evaluate the competitiveness of export wood products of Binh Dinh province. The results would be an important basis for enterprises and concerned individuals to make reasonable policies for their production.

## **2 Overview of relevant research**

Up to present, there has been much research into the competitiveness of export products through the use of the domestic resource cost (DRC) index. Domestic resource costs were first studied in Israel to assess the comparative advantage since the 1950s (Barhal, 1956; Barhai, 1956). Bruno (1972) introduced the DRC to determine the comparative advantage in exports for a country's product. Since then, there have been many studies evaluating the competitive advantage of the product using the DRC.

In Vietnam, Nguyen Dinh Long (2001) studied the competitiveness of some agricultural products (rice, coffee, rubber, tea and cashew). In this research, the author used the domestic resource cost index to assess the competitiveness of agricultural exports. Nguyen Van Hoa, Mai Van Xuan (2012) also used the DRC/ SER index to assess the competitiveness of Dak Lak coffee. The results showed that the DRC/ SER index of coffee production in Dak Lak province in 2010/2011 crop was 0.7972. This indicates that Dak Lak province's coffee exports have the advantage. Doan Thi Thu Trang et al (2016) also used the DRC/ SER index to assess the competitiveness of coffee exports in Dak Lak province in 2014/2015.

In general, most of the previous research used the DRC index to study one or some of the exported agricultural products. There have been no studies on wood products for export in Binh Dinh so far. Therefore, a study on the competitiveness of export wood products in Binh Dinh province would be necessary. The authors used the DRC/SER index to evaluate this issue.

## **3 Overview of wood processing industry in Binh Dinh province**

According to a report from the province's Department of Industry and Trade, in the period 2005–2016, the number of wood processing enterprises in Binh Dinh province significantly changed. Specifically, in 2005 there were 79 enterprises and establishments with a capital of less than 10 billion dongs. After 5 years, the number increased to 170 enterprises and establishments with an average annual increase of 21.3 %. 86 units (accounting for just over 50 %) had a capital scale of 10 billion dongs [19]. In 2016, the number dropped to 131 enterprises, a 22.94 % fall compared with 2010. Of those, 71 enterprises with a capital of less than 10 billion dongs, accounting for 54, 2 % of the total export wood processing enterprises in Binh Dinh [19]. The cause of this decline was the impact of the world economic crisis, order decline, frequent inventory, etc. making small enterprises and those with a weak financial capacity not stand on the market and bankrupt.

The wood products export structure of Binh Dinh province is quite diverse. The outdoor furniture group has the largest share, accounting for 56.29 % of the value of wood products export turnover [19]. Following are woodchips with 26.37%; wood chips and indoor furniture with 9,55 %; wood material, wood pellets, other wood products, and wood pulp account for smaller shares at 6,5%, 0,79 % and 0.51 % respectively [19]. In 2016, the export value of wood processing and forestry products in Binh Dinh province reached about 361.2 million USD, accounting for 49.5 % of the export revenue of the province [19].

## **4 Research methodology**

### **4.1 Domestic resource cost index calculation method**

There are many methods and criteria to assess the competitiveness of export indoor furniture products. One of those criteria is a comparative advantage. In order to determine this attribute of wood products exported in Binh Dinh Province, we can use a number of indicators, but the most common one is the domestic resource cost index.

The domestic resource cost index of a product (or product sector) is the cost of production in terms of the value of intermediate inputs at world prices and factors of production at the opportunity cost [14]. The domestic resource cost of a product is used to measure the competitiveness of that product in the absence of price fluctuations due to policy interventions (Tsakoka, 1990). In the period 1965–1970, DRC was applied in several works such as Johnson (1965), Balassa (1965), Basevi (1966), Corden (1966), Lewis & Guisinger (1968), Balassa & Schydrowsky (1968), Halevi (1969), Bhagwati & Desai (1970), Ramaswami & Srinivasan (1970), Jones (1970). These works aim to evaluate the comparative advantage of the nation when entering the international market in the impact of interest rates and exchange rates. The domestic resource cost index is the ratio between the cost of domestic resources with the inputs that cannot be exchanged with international markets (in terms of social prices) to produce products and foreign currency earned or saved when the production of these products replaces imports. The DRC is often used to evaluate the comparative advantage of the commodity sector by considering the efficiency of the domestic resources used to produce the product. The DRC denotes the total cost of domestic resources used relative to a unit of currency derived from the product sold. Therefore, if the DRC is less than 1, the product has a comparative advantage and vice versa. The smaller the DRC is, the higher the comparative advantage. In order to calculate the DRC index for wood products for export in Binh Dinh province, the following items should be identified:

1. Internal factors: direct costs of raw materials, labor costs, general production costs and operating costs,

2. External factors: direct costs of raw materials (imported materials and auxiliary materials), general production costs (depreciation of imported machinery),
3. Product export price.

The calculation formula is

$$DRC = \frac{\text{(The cost of domestic resources) of local currency}}{\text{(Value - Cost of imports) in foreign currency}} = \frac{\sum Qd_i \times Pd_i}{P_y - \sum Qf_i \times Pf_i}$$

where  $Qd_i$  is the volume of domestic inputs used to produce a unit of product;  $Pd_i$  is a social price/real price of domestic inputs;  $Qf_i$  is the volume of imported inputs used to produce a unit of product;  $Pf_i$  is a social price/real price of imported inputs; and  $P_y$  is the product exported.

After being calculated, the DRC is compared with the official exchange rate (OER) and the shadow price of foreign exchange rates [14], [17] (SER);  $SER = OER \times (1 + CE)$ , where CE is the coefficient of inflation adjustment.

### Significance of DRC

A well-established method of presenting the comparative advantage is to measure the domestic resource cost. The DRC compares the opportunity costs or shadow prices of domestic resources used in production with the value added that they generate, that is:

- If  $DRC / OER$  is equal to 1, then the economy is not conducive and foreign currency savings are not equal to domestic production (the products produced beneficial neutrality).
- If  $DRC / OER$  is less than 1, the value of domestic resources is needed for a smaller production value of net foreign savings (the products with a competitive advantage on the international market).
- If  $DRC / OER$  is greater than 1, the value of domestic resources is needed for a greater production value of net foreign savings (the products have no competitive advantages on the international market) [15].

To determine the DRC, it is necessary to determine the internal costs (opportunity cost) for the wood product for export, the export price in dollars and the external cost in dollars.

These costs are as follows:

### **Direct material costs**

The direct material costs are the sum of the money that an enterprise pays to obtain materials for producing wood products. The cost of direct materials is also defined as the actual cost of the materials used to produce the finished product or to provide a service.

### **Direct labor costs**

Direct labor costs are those directly involved in the production process including the amount payable to employees on the payroll of the business and outsourced services to the employee. For the export wood processing industry in Binh Dinh, labor costs play an important role in the cost structure because most of the production technology in the export wood processing enterprises is relatively backward and semi-automatic.

### **General production costs**

General production costs are expenses incurred in the production teams, including salaries of team managers, salary amounts (Trade Union fees, social insurance, health insurance) at the rate specified, depreciation costs, outsourced service costs and other monetary expenses. In other words, the general costs of production are the indirect production costs such as the costs of maintenance of machinery, buildings, etc.; the costs of administrative management in the workshop, department, production team, etc.; and indirect materials costs and indirect labor costs.

### **Operating costs**

Operating costs are general expenses such as finance expenses, selling expenses and corporate management expenses. For wood processing exporters in Binh Dinh province, operating costs account for a small proportion because the deductions for consumption activity are less often promoted or through other intermediaries. These costs are not very large.

## **4.2 Sample selection methods**

According to the Department of Industry and Trade of Binh Dinh province, the wood processing industry in this province produces about 11 product groups. Each group has a number of individual products; therefore, the calculation of the DRC for each type of product is very difficult. As a result, the selection of some typical and popular products to calculate the DRC is necessary. To make this selection, a survey of 20 middle and senior leaders in export wood processing enterprises was carried out. The results revealed that all the enterprises produce 4 kinds of outdoor furniture, including square garden tables with 4 chairs, round garden tables with 4 chairs, rectangle garden tables with 6 chairs, and sunbathing beds; and 4 types of indoor furniture: 3-door 1.6-metre high wardrobes, 1.6-metre long beds, 2-wing showcases, and 5-drawer cabinets. Therefore, these two product groups were selected to collect the DRC indicator information to assess the competitiveness. 85 over 131 wood processing

export enterprises in Binh Dinh province were chosen for information to calculate DRC index. The overall survey rate is 65 %, so the sample size is highly representative.

### 4.3 Method of data collection

The primary data were collected by directly interviewing with a pre-designed questionnaire. There were two types of questionnaires: one for businesses and the other for manufacturers. The primary data source used to calculate the cost of producing one export wood product was collected through the survey of 85 wood processing enterprises in Binh Dinh province. The enterprises were selected randomly.

## 5 Research results

### 5.1 The domestic resource cost index of wood products for export in Binh Dinh province

#### Outdoor furniture products

The internal production costs, external production costs, and export prices were gathered, and the inflation index of 2016 in Vietnam at 4.74 % [20] was used as a basis for calculating the foreign exchange rates (SER). In addition, the State Bank of Vietnam (SBV) announced that the exchange rate on 3/1/2016 was 21,890 VND, and on 31/12/2016 was 22,159 VND. This research also proposed the average exchange rate (USD/ VND) in 2016 at 22,069.5 VND and regulated to adjust the amplitude to  $\pm 3$  % [2] as the basis for the calculation of official exchange rate. The costs and the DRC/ SER index of the products are shown in Table 1.

**Table 1.** DRC/ SER index for outdoor furniture products

No. order	Item	Unit	Square garden table (4 seats)	Round garden table (4 seats)	Rectangular garden table (6 seats)	Sunbathing bed
<b>I</b>	<b>Internal costs</b>	Dong	<b>480,576.50</b>	<b>498,447.30</b>	<b>870,619.48</b>	<b>546,982.84</b>
<b>1</b>	<b>Direct material costs</b>	Dong	<b>124,186.06</b>	<b>144,980.30</b>	<b>217,949.46</b>	<b>170,593.14</b>
	Cost of main material	Dong	94,678.75	99,631.89	182,412.05	140,418.14
	Cost of sub-material	Dong	29,507.31	45,348.41	35,537.40	30,175.00
<b>2</b>	<b>Direct labor costs</b>	Dong	<b>131,749.71</b>	<b>130,216.37</b>	<b>321,951.07</b>	<b>186,769.18</b>
	Salary	Dong	105,399.77	104,173.10	252,675.68	149,415.34
	Intervals calculated according to salary	Dong	26,349.94	26,043.27	69,275.39	37,353.84
<b>3</b>	<b>General production costs</b>	Dong	<b>133,707.33</b>	<b>126,210.57</b>	<b>166,990.04</b>	<b>117,673.10</b>
<b>4</b>	<b>Operating costs</b>	Dong	<b>90,933.40</b>	<b>97,040.07</b>	<b>163,728.92</b>	<b>71,947.43</b>
	Financial expenses	Dong	54,621.92	58,284.45	87,111.09	96,896.08
	Cost of sales	Dong	19,257.69	20,543.15	32,745.78	36,319.12
	Cost management business	Dong	17,053.79	18,212.46	43,872.05	48,380.40

No. order	Item	Unit	Square garden table (4 seats)	Round garden table (4 seats)	Rectangular garden table (6 seats)	Sunbathing bed
II	External costs	USD	33.00	32.92	64.13	36.72
1	Import of main materials	USD	18.41	16.98	33.28	24.21
2	Import of auxiliary materials	USD	6.67	7.95	13.19	5.36
3	Depreciation	USD	7.92	8.00	17.66	7.15
III	Export price	USD	59.40	59.11	109.13	65.73
IV	DRC	Dong/ USD	18,209.65	19,037.42	19,344.32	18,857.23
V	OER	Dong/ USD	22,069.50	22,069.50	22,069.50	22,069.50
VI	SER	Dong/ USD	23,115.59	23,115.59	23,115.59	23,115.59
VII	DCR/ SER	Time	0.79	0.82	0.84	0.82

Source: Survey data

The DRC/ SER index of the square garden table (4 seats) is 0.79. The DRC/ SER at 0.79 means that if 0.79 USD is spent on the internal costs for production and export, 1 USD of the added value will be earned. For the round garden table with 4 chairs, the DRC/ SER index is 0.82. That means that if we spend 0.82 USD for the internal production resources, we will gain 1 USD of the added value. For the rectangular garden table with 6 chairs, we have a coefficient DRC/ SER at 0.84. That means that if we spend 0.84 USD for the internal costs, then we will increase the amount of foreign currency value by 1 USD. For the sunbathing bed, the DRC/ SER is 0.82. That means that if we spent 0.82 USD on the internal costs, we will bring 1 USD of the added value.

All of these products have the DRC/ SER less than 1. This means that they all have comparative advantages and competitiveness in the international market.

### Indoor furniture products

Similarly, the costs and the DRC/ SER index of the indoor furniture products are shown in Table 2.

Table 2. DRC/ SER index for indoor furniture products

No. order	Item	Unit	3-door wardrobe	1.6-metre bed	2-wing showcase	5-drawer cabinets
I	Internal costs	Dong	2,960,984.73	2,437,462.99	1,766,348.62	1,333,429.91
1	Direct material costs	Dong	1,086,183.20	807,822.10	545,477.13	375,750.78
	Cost of main material	Dong	682,726.79	632,614.37	435,287.62	274,583.59
	Cost of sub-material	Dong	403,456.41	175,207.73	110,189.50	101,167.19
2	Direct labor costs	Dong	959,593.35	751,808.87	644,134.05	564,134.05
	Salary	Dong	757,885.29	594,006.66	506,855.39	443,992.84
	Intervals calculated	Dong	201,708.05	157,802.21	137,278.67	120,141.21

No. order	Item	Unit	3-door wardrobe	1.6-metre bed	2-wing showcase	5-drawer cabinets
	according to salary					
3	<b>General production costs</b>	Dong	<b>499,988.98</b>	<b>439,777.18</b>	<b>320,345.51</b>	<b>223,880.42</b>
4	<b>Operating costs</b>	Dong	<b>415,219.20</b>	<b>438,054.84</b>	<b>256,391.93</b>	<b>169,664.65</b>
	Financial expenses	Dong	221,162.42	233,488.60	136,749.57	90,441.02
	Cost of sales	Dong	83,043.84	87,610.97	51,278.39	33,932.93
	Cost management business	Dong	111,012.94	116,955.27	68,363.97	45,290.70
II	<b>External costs</b>	USD	<b>199.35</b>	<b>160.77</b>	<b>137.97</b>	<b>89.36</b>
1	<i>Import of main materials</i>	USD	119.58	97.30	79.18	52.10
2	<i>Import of auxiliary materials</i>	USD	39.38	34.05	33.47	22.24
3	<i>Depreciation</i>	USD	40.39	29.41	25.31	15.03
III	<b>Export price</b>	USD	<b>361.87</b>	<b>299.11</b>	<b>237.83</b>	<b>162.61</b>
IV	<b>DRC</b>	Dong/ USD	<b>18,219.84</b>	<b>17,618.91</b>	<b>17,687.52</b>	<b>18,203.56</b>
V	<b>OER</b>	Dong/ USD	<b>22,069.50</b>	<b>22,069.50</b>	<b>22,069.50</b>	<b>22,069.50</b>
VI	<b>SER</b>	Dong/ USD	<b>23,115.59</b>	<b>23,115.59</b>	<b>23,115.59</b>	<b>23,115.59</b>
VII	<b>DCR/ SER</b>	Time	<b>0.79</b>	<b>0.76</b>	<b>0.77</b>	<b>0.79</b>

Source: Survey data

The DRC/ SER indices of all the indoor furniture are 0.79, 0.76, 0.77, and 0.79 for the 3-door 1.6-metre wardrobes, 1.6-metre beds, 2-wing showcases, and 5-drawer cabinets, respectively.

Similarly to the outdoor furniture, these products also have the DRC/ SER less than 1, and they all have comparative advantages and competitiveness in the international market as well.

## 6 Conclusion

The results show that the DRC/ SER indices of the products representing the export wood processing industry in Binh Dinh province are less than 1. This means that export wood products in Binh Dinh province have comparative advantages and certain competitiveness in foreign markets. Meanwhile, indoor furniture has greater competitiveness than that of outdoor counterparts. Therefore, in the coming time, it is advisable to increase investment in developing indoor furniture and reduce the proportion of outdoor furniture.

This result is an important basis for local authorities, credit organizations, wood processing associations as well as individual export wood processing enterprises in Binh Dinh province to have suitable policies to increase the competitiveness of furniture export in the future.



## References

1. Akhtar, W., Muhammad, S., Waqar, M. and Khalid, M. A. (2004), Economic Incentives and Comparative Advantage in Rice-Wheat System in Punjab, *Socio-Economic Research Studies 2002–03 (Federal) Pakistan Agricultural Research Council*, 21–38.
2. Vu Dinh Anh (2017), Fire proves the exchange rate in 2016, *Journal of Banking*, No. 1–2 / 2017, dated 12.05. 2017, <https://www.sbv.gov.vn/webcenter/portal/vi/menu/rm/apph/tcnh/> (in Vietnamese).
3. Bruno, M. (1972), Domestic Resource Costs and Effective Protection: Clarification and Synthesis, *Journal of Political Economy*, 80, 16–33.  
<https://academiccommons.columbia.edu/download/.../9767.pdf>  
<http://dx.doi.org/10.1086/259858>.
4. Balassa, B. & Schydlowky, D. M. (1968), Effective tariffs, Domestic cost of foreign exchange, and the equilibrium exchange rate, *The Journal of Political Economy*, 76 (3), 24.
5. Bahral, U. (1965), *The Real Rate of the Dollar in the Economy of Israel*, Jerusalem: Ministry Commerce and Indus (in Hebrew).
6. Balassa, B. (1965), Trade Liberalization and Revealed Comparative Advantage, *Manchester School of Economic and Social Studies*, 33, 99–123.
7. Basevi, G. (1966), The U.S. Tariff Structure: Estimamte of Effective Rates of Protection of U.S. Industries and Industrial Labour, *Rev. Econ. And Statis*, 49, 167–60.
8. Corden, W. M. (1966), The Structure of a Tariff System and the Effective Protective Rate, *Journal of Political Economy*, 74 (3), 221–237.
9. Nguyen Hong Gam (2013), Identification of key products and key product development in the Mekong Delta until 2020, PhD thesis of University of Economics Ho Chi Minh City. HCM (in Vietnamese).
10. Bich Hong (2017), Vietnam's wood and furniture export leader in ASEAN, News, <http://baotintuc.vn/kinh-te/kim-ngach-xuat-khau-go-va-do-go-viet-nam-dung-dau-khu-vuc-asean-20170203153049162.htm>, dated 2/3/2017 (in Vietnamese).
12. Viet Hien (2017), Binh Dinh Wood and Forest Products Processing Industries: Efforts to Recover Center, Binh Dinh Newspaper (in Vietnamese).  
<http://www.baobinhdinh.com.vn/viewer.aspx?macm=5&macmp=5&mabb=73450>, dated 28/4/2017.
13. Phan Van Hoa (2009), Thua Thien Hue aquaculture in the context of trade liberalization, PhD thesis, Hue University (in Vietnamese).
14. Nguyen Van Hoa, Mai Van Xuan (2012), Dak Lak coffee market competitiveness in the integration market, Hue University of Science, 72, (3) (in Vietnamese).

15. Khan, N. P. (2001), Comparative Advantage of Wheat Production in Pakistan and its Policy implications, *Pakistan Journal of Agricultural Economics* 4 (2), 17–29 (in Vietnamese).
16. Hong Nhung (2017), Only 7% of wood enterprises can reach US and European customers, Vietnam News Agency, <http://vietnambiz.vn/nganh-go-viet-nam-chi-7-doanh-nghiep-lon-tiep-can-don-hang-lon-cua-my-eu-13119.html>, Dated 20/1/2017 (in Vietnamese).
17. Doan Thi Thu Trang, Hoang Tuan Minh, Jiancheng Chen(2016), Applying the DRC (Domestic Resource Cost) Index to Evaluate the Competitive Advantage of Dak Lak Coffee, *Open Access Library Journal*, June 2016, Vol. 3, DOI:10.4236/oalib.1102727, [http://file.scirp.org/pdf/OALibJ\\_2016080315434295.pdf](http://file.scirp.org/pdf/OALibJ_2016080315434295.pdf) (in Vietnamese).
18. Estudillo, J.P.,Fujumura,M. and Hossain, M. (2002), The Comparative Advantage of Rice Production in the Philippines, 1966–1991, *The Journal of Development Studies*, 35 (5), 386–387.  
<http://www.tandfonline.com/doi/abs/10.1080/00220389908422596?journalCode=fjds20>
19. Department of Industry and Trade of Binh Dinh Province, statistics of import and export of timber and wood products from 2012 to 2016 (in Vietnamese).
20. Financial Times (2016), Inflation for the whole year 2016 increased 4.74%, dated 5/12/2016; <http://thoibaotaichinhvietnam.vn/pages/kinh-doanh/2016-12-28/lam-phat-ca-nam-2016-tang-474-39332.aspx> (in Vietnamese).
21. Tsakok, I. (1990), *Agricultural Price Policy: A Practitioner’s Guide to Partial Equilibrium Analysis*. Cornell University Press: Ithaca NY, 34–42.
22. Jonhson, H. G. (1965), *The Theory of Tariff Struture with Special Reference to World Trade and Development*, Trade and Development (Geneva: Institut Universitaire des Hautes Études Internationales), 9–29.
23. Bahral, U. (1965), *The Real Rate of the Dollar in the Economy of Israel*. Jerusalem: Ministry Commerce and Indus, in Hebrew.
24. Nguyen Dinh Long (2001); Study the main solutions to promote the advantages of raising competitiveness and developing agricultural export markets in the coming time: coffee, rice, rubber, tea, cashew; Scientific report of the Ministry of Agriculture and Rural Development (in Vietnamese).