Determinant Analysis for Rubber Export in Indonesia

Mirawati Yanita M. Yazid; Zulkifi Alam Syah, Andy Mulyana

Department of Agribusiness, Faculty of Agriculture
Sriwijaya University, Padang Selasa Street No. 524 Palembang 30139, Indonesia

Abstract - Rubber is one of the plantation commodities which have a role quite important in the economic activities in Indonesia. Rubber provides the main livelihood for over one million families and more than twothird of all production comes from smallholders. Rubber is also one of Indonesia's export commodities and foreign exchange earners taking oil and gas. Approximately 86.95 percent of Indonesia's natural rubber production is exported to foreign countries and only a small portion is consumed domestically. This research aims to assess the determinant for rubber export in Indonesia. We use Stata software and estimate the variables by robust regression. Result showed a significant relation between production level, exchange rate and export quantity in the lag time. Indonesia earned substantial foreign exchange from crumb rubber exports. However, major fluctuations in the export earnings have raised concern about the country's future growth potentials and self-sustainability.

Index Terms - Rubber, Determinant, Export, Indonesia

I. INTRODUCTION

Rubber is one of the commodities that serve as the raw materials for strategies in industry. In general, developing countries become producer of natural rubber from plantations belong to smallholders, state and private. While consumers of natural rubber is the advanced industrialized countries. Natural rubber consumption continues to increase along with demand in the industrial sector with rubber raw materials such as rubber balls, yarn, gloves, tires and catheters.

Indonesia is the second largest producer of rubber and represent as one of commodity export which having big enough contribution for state's stock exchange. Rubber is a major export commodity supporting the Indonesian economy. More than 1 million households now depend on rubber as their main source of income. Smallholder rubber constitutes 83 percent of the total Indonesian rubber area (3.5 million ha) and 68 percent of total rubber production. Where smallholder rubber systems often are called jungle rubber (Gouyon et al. 1993; Williams et al. 2001).

The growth of natural rubber production in Indonesia is about 6.3 percent per year. The production estimate is not only because of the growing demand of world market, but also because of growing attention on high yielding clonal rubber and positive externalities brought about by agroforestry system in natural rubber production. For more than a 90 percent share of Indonesian rubber to fulfill the export market, so Indonesia could play a very important role in the international market. Similarly, there are growing concerns among the rubber community to develop domestic markets. In the majority (about 84 percent) of rubber producers in Indonesia is smallholder growers and concentrated mostly (more than 72 percent) in five production centers: North Sumatra, Jambi, Riau, South Sumatra and West Kalimantan. The rubber-based industrial development is obviously related to many segments of economic policy, including the technological advancement, information system and financial institutions and legal issues and enforcement structures in general. Therefore, the development of domestic rubber industry needs more strategic approach and policy to better support a high quality of economic recovery in the country. (Arifin, 2005)

At present, the competition among rubber exporters is becoming more intense. In order to increase rubber production, the Indonesian government is promoting the expansion of rubber growing area and partnering with strategic alliance in the tire industry to spread best practices in the cultivation of rubber among its smallholders. Consequently, Indonesia will become a more competitive player in the near future. Vietnam, India, and China are also producing a larger share of the world's total rubber output as opportunities for exporting grow with increasing trade liberalization. Free trade agreements (FTAs) will further create opportunities for rubber industry to expand into new markets.

Given this backdrop, the whole objective of this paper is to explore rubber behavior from the export side, because for the last one year the price of rubber falling down, hence of entering new player producer from Indochina like Vietnam, Laos and Cambodia.

Our study is also related to recent studies using firm-level data to examine the effect of exchange rate on exports. For example, Dekle, Jeong, and Ryoo (2008) use panel data of Japanese exporters for the period of 1982-1997 and find the exchange-rate elasticity of export to be statistically significant and have a value of 0.77. Drawing on French firm-level data for the period of 1995-2005, Berman, Martin, and Mayer (2012) uncover the heterogeneous reaction of exporters to real exchange rate changes: high-performance exporters increase more their markup but less their export volume in response to a currency appreciation.

In particular, this study therefore aims to examine the factors that can influence the export of crumb rubber with the following specific objectives:

1. Estimate the factors influencing the crumb rubber export trade.
2. Provide some policy recommendations based on the findings of this investigation.

II. LITERATURE REVIEW

International trade is the exchange of goods and services across national boundaries. It is the most traditional form of
international business activity and has played a major role in shaping world history. It is also the first type of foreign business operation undertaken by most companies because importing or exporting requires the least commitment of and risk to the company’s resources. For example, a company could produce for export by using its excess production capacity. This is an inexpensive way of testing a product’s acceptance in the market before investing in local production facilities. A company could also use intermediaries, who will take on import export functions for a fee, thus eliminating the need to commit additional resources to hire personnel or maintain a department to carry out foreign sales or purchases (Daniels and Radebaugh, 2004).

Why do some countries export or import more than others? Several studies have been conducted to establish major factors that influence exports. The trade and exchange rate regime (import tariffs, quotas, and exchange rates), presence of an entrepreneurial class, efficiency enhancing government policy, and secure access to transport (and transport costs) and marketing services are considered to be important influential factors of export behavior (Kaynak and Kothavi, 1984; Fugazza, 2004). A study on the nature, composition, and determinants of Singapore’s technology exports suggests that the country’s open trade and investment regime and development-oriented economic policy have been the key factors in enhancing the country’s exports. Singapore’s economy has shown continued and remarkable growth in exports for over thirty years with only two brief and mild recessions in the mid-1970s and mid-1980s. Its total trade as a proportion of GDP remains one of the highest in the world, over 300 percent of GDP in 2003 (Fong and Hill, 1991; WTO, 2004b). A recent study on the determinants of export performance underlines the importance of foreign direct investment (FDI) and the general quality of the institutional framework. Foreign direct investment contributes to capital formation and helps promote the development and export of knowledge-based industries (Fugazza, 2004).

Related research for this study like Tang and Zhang (2012) find significant effect of exchange rate on the exit and entry of Chinese exporters as well as product churning. Li, Ma, Xu, and Xiong (2012) use detailed Chinese firm-level data to examine the effect of exchange rate on firms exporting behaviors, such as export volume, export price, the probability of exporting, and product scope. The main difference between our study and this literature lies in the identification strategy: while besides other variable we also explore the currency exchange monthly from the world, ii) $/ton, and iii) PCr = Crumb rubber export price in SICOM market (USD/ton).

Robust regression method was used to determine variables affecting export of crumb rubber by using STATA 12.0 software. The function is stated as: $XCr = f (PCr, PrCr, EXRt, XCrMt, XCrTt, XCrTt-i)$. Where as:

i. $XCr = $Crumb rubber export quantity (000 tonnes) monthly between 2005 and 2012

ii. $PrCr = $Crumb rubber export price in SICOM market (USD/ton),

v). \( XCrM_t = \text{Crumb rubber export quantity in Malaysia (000 tonnes) monthly between 2005 and 2012,}
\)

vi). \( XCrT_t = \text{Crumb rubber export quantity in Thailand (000 tonnes) monthly between 2005 and 2012, and}
\)

vii). \( XCr_{t-1} = \text{Crumb rubber export quantity in lag time (000 tonnes) monthly between 2005 and 2012.}
\)

If we expressed the equation of Crumb rubber export is to be expected influenced by quantity of crumb rubber output, price of crumb rubber in the SICOM marketprice, exchange rate, export ofcrumb rubber in MalaysiaandThailand and export ofcrumb rubber in the previous period as shown below.

\[
XCr_t = a_0 + a_1PCr_t + a_2PrCrt + a_3EXR_t + a_4 XCrM + a_5XCrT + a_6 XCr_{t-1} + e_t
\]

\( 0 < a_0 < 1; a_1, a_2, a_3, a_4, a_5 > 0 \)

IV. RESULTS AND DISCUSSION

The result of the robust regression method is presented in Table 1. We prefer natural logs (that is, logarithms base \( e \)) because, coefficients on the natural-log scale are directly interpretable as approximate proportional differences. The coefficient of determination \( R^2 \) was 0.5009; implying that the independent variables explain 50.09% of the total variation in the rubber export. The value was significant at 1% for rubber production \( (b= 0.3523097) \) and , exchange rate \( (b=-0.7399705) \), was significant at 5%. The F value (12.59); \( P<0.05 \) is significant at 1%, implying that the model was significant.

The appropriate sign on crumb rubber production is positive; it implies that an increase in production will stimulate an increase in export. The crumb rubber price has a positive sign. This is in agreement with Okoruwa et al. (2003), who reported that an increase in producer’s price of rubber will lead to an increase in export of rubber. The implication is that an increase in the crumb rubber price to match world price will encourage maintenance of rubber farms and increased output. Likewise for the production level of crumb rubber has a positive sign. While the magnitude of 1% output of crumb rubber will increase the export quantity as much as 0.3523%.

Table 1. Determinant of Crumb Rubber Export

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>T</th>
<th>Sig (p&lt;( \alpha ))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>9.302866</td>
<td>2.98</td>
<td>0.0004</td>
</tr>
<tr>
<td>lnPCR</td>
<td>0.3523097</td>
<td>3.04</td>
<td>0.003*</td>
</tr>
<tr>
<td>lnPrCR</td>
<td>0.0042997</td>
<td>0.10</td>
<td>0.923</td>
</tr>
<tr>
<td>lnEXC</td>
<td>-0.7399705</td>
<td>-2.43</td>
<td>0.017**</td>
</tr>
<tr>
<td>lnXCRM</td>
<td>0.0294005</td>
<td>1.01</td>
<td>0.316</td>
</tr>
<tr>
<td>Ln XCRT</td>
<td>-0.0624168</td>
<td>-0.66</td>
<td>0.510</td>
</tr>
<tr>
<td>lnXCr_{t-1}</td>
<td>0.1898669</td>
<td>1.70</td>
<td>0.092***</td>
</tr>
</tbody>
</table>

Source. Computed from data using STATA 12.0

F = 12.59 ; \( R^2 = 0.5009 ; * = \text{significant at 1% ; ** significant at 5% ; *** Significant at 10%} \)

We find a negative and statistically signficant effect of a currency appreciation on quantity of exports. In terms of economic magnitude, a 1 % currency appreciation is found to cause total exports to fall by 0.73999%.asignificant number that may justify the concerns by government officials and exporters. This finding is in agreement with Mesike (2005) who also reported a negative relationship between rubber export and exchange rate.

Wang and Barrett (2007) found monthly exchange rate volatility affects agricultural trade flows, but not trade in other sectors in Taiwan. Kayode (2003) revealed that the low elasticity suggests potentially limited volume of agricultural export earning in response to the devaluation of the local currency. This finding also support by Sang, Sriboonchitta, Huang, and Wiboonpongse (2013) observed that the exchange rate return of the Thai Baht can affect the rubber price return, indicated the trade volume was an important factor in international product pricing.

As we know exchange rate is subject to various endogenous and exogenous factors which are outside the control of the exporter; which has to bear the risk. However, fluctuation in exchange rates is not of significance to the export flows of the selected agricultural products. The focus of trade diversification should not solely be on traditional large export markets, as this is not necessary were the growth can be achieved.

V. CONCLUSION

As the intermediary products in international trade, crumb rubber exports showed a significant relation between production level, exchange rate and export quantity in the lag time. Indonesia earned substantial foreign exchange from crumb rubber exports. However, major fluctuations in the export earnings have raised concern about the country’s future growth potentials and self-sustainability.

VI. IMPLICATION POLICY

Indonesian crumb rubber exports, which were earlier dominated by resource products must be shifting in. No longer enjoys the luxury of exporting such products rather are exporting standardized manufactured products that compete with other countries in the Asia especially compare with Thailand. Given such structural change in the export trade and international trade environment, Indoneisa needs to devise a longterm strategy to raise the quality of its exportables through adaptation of better technology and encouragement of foreign investment in moderately high-tech industries. The focus should be to move towards human-capital based products and remain less dependent on resource-based and or standardized manufactured products which face tremendous competition from relatively low cost countries such as Cambodia, India and Vietnam.

REFERENCES


AUTHORS

First Author – MirawatiYanita, Lecturer at Jambi University, Jambi, Indonesia; Ph.D Candidate at Sriwijaya University, mherlam@gwdg.de

Second Author – M. Yazid, Lecturer at Sriwijaya University, Palembang, Indonesia, yazid_ppmal@yahoo.com

Third Author – ZulkifliAlamsyah, Lecturer at Jambi University, Jambi, Indonesia, zalamsyah@unja.ac.id

Fourth Author – Andy Mulyana, Lecturer at Sriwijaya University, Palembang, Indonesia, andy_sep@yahoo.com