The Competitiveness of Coal Export Indonesia to India

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Abstract. This research aims to analyze the specific factors, particularly from the demand side, that influence the export competitiveness of Indonesian coal to India. The study employs a quantitative approach and utilizes secondary data. Data collection for this research is conducted through a literature review method, drawing from sources such as BPS, Bank for International Settlements, UN Comtrade, BP Statistical Review of World Energy, and JDIH ESDM. The analytical methods used include the Revealed Comparative Advantage (RCA) method and multiple linear regression analysis. The research findings indicate that international coal prices, coal consumption in India, and the Real Effective Exchange Rate of the Indian Rupee (REER INR) have a significant negative influence on the export competitiveness of Indonesian coal in the Indian market. On the other hand, non-coal imports of India have a significant positive impact on the export competitiveness of Indonesian coal. However, the growth of India's Gross Domestic Product (GDP) does not have a significant influence on the export competitiveness of Indonesian coal.

keywords: Coal Export Competitiveness, RCA, International Coal Prices, Real Effective Exchange Rate, Import, Economic Growth.

1. Introduction

The global uncertainty that has hit the world in recent years has threatened the wider economic sector and caused anxiety in various countries, including Indonesia. This uncertainty refers to complex problems, ranging from internal issues within a country to geopolitical tensions involving several countries. The impact of this uncertainty causes a decrease in global demand which ultimately results in a decrease in the prices of various commodities on the international market. Countries that are highly dependent on exports, such as Indonesia, are threatened with a decline in income from the export sector due to these external factors. This is supported by the trend of exports to main export destination countries which are decreasing from year to year.

Initially, Indonesia was very dependent on oil and gas exports (oil, gas, and derivative products) where the peak of dependence occurred in the 1980s and early 1990s. In that period, oil and gas exports accounted for most Indonesia's export earnings and played an important role in the country's foreign exchange earnings. However, over time, the oil and gas sector has lost its position as one of Indonesia's leading commodities. Therefore, the Indonesian government is taking action to
restructure the economy so that it does not depend on the oil and gas sector and shifts to the non-oil and gas sector.

In facing global economic changes and reducing dependence on the oil and gas sector, Indonesia has committed to increasing productivity and efficiency in the non-oil and gas sector, especially coal. Through more inclusive and sustainable economic restructuring, Indonesia can increase its competitiveness in the global market and achieve better and more sustainable economic growth.

According to the World Coal Association (WCA), coal is an important energy source for the world which is used by power plants to produce almost 40% of electricity throughout the world and it is predicted that its contribution will continue to increase to 22% in 2040, so coal will remain a contributor. biggest for energy in the future. WCA also emphasized that in fact 70% of world steel production depends on coal, so it is also called the backbone of the steel and cement industries.

![World Coal Consumption, 2011-2021](figure1.png)

*Source: BP Statistical Review of World Energy, processed*

**Figure 1. World Coal Consumption, 2011-2021**

The graph above shows that the development of world coal use continues to increase over time and is relatively stable above 150 exajoules in the last 10 years. As can be seen in 2000, total coal use throughout the world was 98.74 exajoules, then in 2011 it rose drastically to 158.46 exajoules, but in 2020 it fell to 151.07 due to the pandemic. In the following year it rose again to 160.10 exajoules. This is a good sign for Indonesia because this fact proves that coal still has quite high demand in the world, considering that Indonesia is one of the countries that has the largest coal reserves in the world, where in January 2022 the Ministry of Energy and Mineral Resources recorded Indonesia's coal reserves at 31.7 billion tons, which if predicted with an average coal production of 600 million tons per year, the life of Indonesia's
coal reserves is still 65 years away if it is assumed that no new reserves are discovered. As one of the top 5 largest coal producing countries in the world, Indonesia's coal consumption on average is only around 20% to 30% of its total coal production and the rest is diverted for export. Therefore, it can be said that coal is Indonesia's leading export commodity that needs more in-depth attention regarding its competitiveness.

Currently, Indonesia has also begun the process of transitioning energy to renewable energy so that domestic demand for coal will gradually decrease and the coal industry in Indonesia can focus on the international market because it will no longer be so burdened by the Domestic Market Obligation (DMO) policy as in previous problems.

2. Method

This research design refers to a conceptual framework based on theoretical and empirical reviews using the multiple regression estimation method, in which the analysis model to be used is as follows:

\[ y = f(x_1, x_2, x_3, x_4, x_5) \]

\[ y = x_1^{a_1} x_2^{a_2} x_3^{a_3} e^{a_0 + a_4 x_4 + a_5 x_5 + \mu} \]

\[ y = \alpha_0 + \alpha_1 \ln x_1 + \alpha_2 \ln x_2 + \alpha_3 \ln x_3 + \alpha_4 x_4 + \alpha_5 x_5 + \mu \]

where:

- \( y = \text{Competitiveness of Indonesian coal exports to India} \)
- \( x_1 = \text{International coal prices} \)
- \( x_2 = \text{India's coal consumption} \)
- \( x_3 = \text{India's non-coal imports} \)
- \( x_4 = \text{India's Real Effective Exchange Rate} \)
- \( x_5 = \text{India's real GDP growth} \)
- \( \mu = \text{error term} \)

In this study, the competitiveness of Indonesian coal exports (HS. 2701) in India is measured using the Reveal Comparative Advantage (RCA) index, which is a method for measuring the comparative advantage and market share of a commodity in a particular region relative to the international export structure.

Furthermore, Real Effective Exchange Rates (REER) are the weighted average of the Indian Rupee (INR) against the weighted average of a basket of other currencies (64 currencies) adjusted for inflation or the consumer price index. In this study, the REER used is the Real Broad Effective Exchange Rate for Indian Rupees.
obtained from the website of The Federal Reserve Bank sourced from the Bank for International Settlements.

3. Results

The estimation results obtained in analysing the competitiveness of Indonesian coal exports to India by looking at the effect of international coal prices, India’s coal consumption, India’s non-coal imports, India’s real effective exchange rate and India’s real GDP growth on it using multiple regression analysis can be seen in the following table.

Table 1. Estimation results of the effect of international coal prices ($X_1$), India’s coal consumption ($X_2$), India’s non-coal imports ($X_3$), India’s real effective exchange rate ($X_4$), and India’s real GDP growth ($X_5$) on the competitiveness of Indonesian coal exports to India ($Y$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression Coefficient</th>
<th>$t$-Statistic</th>
<th>$Prob$</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>-302.5403***</td>
<td>-4.845226</td>
<td>0.0019</td>
</tr>
<tr>
<td>$X_1$</td>
<td>-8.742777***</td>
<td>-4.876305</td>
<td>0.0018</td>
</tr>
<tr>
<td>$X_2$</td>
<td>-4.683815***</td>
<td>-5.802179</td>
<td>0.0007</td>
</tr>
<tr>
<td>$X_3$</td>
<td>14.01468***</td>
<td>5.500359</td>
<td>0.0009</td>
</tr>
<tr>
<td>$X_4$</td>
<td>-0.175951***</td>
<td>-3.725566</td>
<td>0.0074</td>
</tr>
<tr>
<td>$X_5$</td>
<td>0.063766$^\text{ns}$</td>
<td>1.55059</td>
<td>0.2497</td>
</tr>
</tbody>
</table>

$^\text{***}$) Significant at $\alpha = 1$
$^\text{ns}$) not significant

$R^2 = 0.94127$

F Statistics $= 22.43778$

The R Square value of 0.94127 means that 94.127 percent of the variation in changes in the competitiveness of Indonesian coal exports to India can be explained by variations in changes in international coal prices, India’s coal consumption, India’s non-coal imports, India’s real effective exchange rate and India’s real GDP growth. The remaining 5.873 percent is determined by variables or other factors outside the model.

To identify the existence of a simultaneous relationship between the independent variable and the dependent variable, a simultaneous test (F test) is carried
out. The F test uses a significance level of 5% or 0.05 and the F test is carried out by comparing the F-statistics with the F-table. The probability value is 0.000355 < 0.05 with an F-statistic value of 22.43778 > F-table of 3.97. Based on the F test carried out, the independent variables in the model include international coal prices, Indian coal consumption, Indian Rupee REER level, Indian non-coal imports and Indian GDP growth simultaneously have a significant effect on the competitiveness of Indonesian coal exports to India.

Based on the statistical test results shown in Table 1, it shows that international coal prices (X1) have a significant negative effect on the competitiveness of Indonesian coal exports with a regression coefficient of -8.742777. This shows that if there is an increase in coal prices on the international market by 1 percent, the competitiveness of Indonesian coal exports to India will decrease by 8.742777 percent. These results are in accordance with demand theory which states that international coal prices have a negative effect on the demand and the competitiveness of Indonesian coal exports to India.

Unfortunately, Indian coal consumption was found to have a significant negative effect on the competitiveness of Indonesian coal exports to India, where every 1 percent increase in Indian consumption would increase the competitiveness of Indonesian coal exports to India by 4.77. This result is not in line with demand theory and has the implication that Indonesian coal exports are not very popular with Indian importers, or in other words, there are coal exports from other countries that are more popular.

Meanwhile, the value of India's imports other than coal has a significant positive effect on the competitiveness of Indonesia's coal exports, with a coefficient of 14.01468, which means that an increase in the value of India's imports other than coal by 1 percent will increase the competitiveness of Indonesia's coal exports by around 14 percent. These results show that India's imports other than coal are complementary to Indonesia's coal exports.

Furthermore, India's REER has a significant negative effect of 0.175951 on the competitiveness of Indonesia's coal exports, which means that every 1 unit increase in the India REER index will reduce the competitiveness of Indonesia's coal exports by 0.17 percent.

The REER (Real Effective Exchange Rate) Indian Rupee (INR) Index is an indicator used to measure the competitiveness of the Indian currency against a group of major currencies traded in international markets. In the REER index calculation carried out, an increasing index number indicates an appreciation of the Indian Rupee exchange rate in real terms against basket currencies, while a decrease in the REER index indicates a depreciation in the value of the Indian Rupee against basket currencies. In this research, the higher the Indian Rupee REER exchange rate, the lower the competitiveness of Indonesian coal exports to India.

Lastly, India's Real GDP growth has no significant effect on the competitiveness of Indonesia's nickel exports. These results are not in accordance with the initial hypothesis of this research which states that India's GDP growth has a positive and significant effect on the competitiveness of Indonesian coal exports.(1)
4. Discussion

The negative influence of international coal prices on the competitiveness of Indonesian coal exports to India can be explained by the law of demand which states that the higher the price of a good, the lower the demand for that good, ceteris paribus.

The higher the international price of coal, the more India's purchasing power to import coal from Indonesia decreases. This encourages India to look for other options to meet its needs, such as diversifying supply sources or using alternative energy sources that are more economical. Apart from that, there are several other countries besides Indonesia that are trading partners and supply coal to India, such as Australia, South Africa, the United States and other coal supply countries. This allows India to be more flexible in choosing higher quality coal when international coal prices increase.(2)

Related to the finding that increasing Indian coal consumption has apparently affected the decreasing competitiveness of Indonesian coal exports to India. This can be explained based on the fact that there are several countries with the highest levels of coal production, namely China, India, the United States, Australia, Indonesia and Russia. However, not all of these countries have a high coal production surplus compared to their domestic coal consumption. Reports and data from the United States Energy Information Administration (EIA) and the World Coal Association (WCA) in 2020 show that only a few countries have production much higher than their domestic consumption, including Australia, Russia and Indonesia. According to the IEA in its 2020 Coal Prices and Costs report, there is a price difference between Indonesian coal and Australian coal due to differences in the quality of the coal offered. About 85% of global thermal coal exported by Australia is high in calories (above 5,700 Kcal/kg). Meanwhile, 37% of the coal exported by Indonesia is low calorie (under 4,500 Kcal/kg) and only 8% is high calorie. Low calorie coal is cheaper because it contains less energy. Low calorie coal also generally requires high logistics costs because it contains more ash and water.(3)

The type of coal that dominates Indonesian exports is sub-bituminous with lower quality. This is different from Australia which exports coal of better quality than coal from Indonesia. This causes the influence of Indian coal consumption on the competitiveness of Indonesian coal exports to have a negative effect, which is exports can be influenced by a country's ability to produce export goods, in this case quality, and the price of goods exported. So even though in quantity Indonesia can export more coal to India, in terms of quality, the value of Indonesian coal exports to India is much smaller than its competitor country, namely Australia.

Moreover, regarding that the higher the Indian Rupee REER exchange rate, the lower the competitiveness of Indonesian coal exports to India. This finding is not in line with theory, which says that if the price of a good falls, demand for that goods will increase, assuming that the good is a normal goods. However, there are cases where falling prices will cause demand to also fall, which is the case for Giffen goods or low-quality goods. In this research we can see that an increase in the REER of the rupee which makes the Indonesian currency look cheaper should be able to increase the competitiveness of Indonesian coal exports in India by importing more coal due to excess consumption. However, the results of this study say otherwise. This means that
Indonesian coal in India is not classified as normal goods, especially when compared with goods from other countries. Minimizing the negative effects of liberalization to economic growth and income distribution (welfare) can be done by increasing the competitiveness of Indonesian exports in the international market, among others through the creation of a conducive investment climate by maintaining macroeconomic stability and reducing high economic costs, such as complicated bureaucracy and levies which lead to a greater cost; maintaining the stability of domestic inflation, among others with the monetary policy, such as inflation targeting policy; improving productivity and efficiency of the use of the factors of production that are relatively abundant and cheap in Indonesia, in this case is labour, through education and training of human resources; developing products from each region with high competitiveness through the regional core competence-based products development. (4)

This shows that the increase in the value of the Indian currency tends to encourage India to reduce coal imports from Indonesia and prefer to import coal from other countries. This can happen because the quality of Indonesian coal is lower than the coal of its competing countries so that if India has higher purchasing power, India will prioritize coal with better quality, such as the coal owned by Australia.(5)

5. Conclusion

The conclusion of this paper can be written as follows:
1. Coal prices on the international market have a significant negative effect on the competitiveness of Indonesian coal exports to India. The influence of changes in international prices has quite high elasticity on the competitiveness of Indonesian coal exports.(6)
2. Indian coal consumption also has a significant negative influence on the competitiveness of Indonesian coal exports to India. This shows that Indonesia is not the only country that is a source of Indian coal imports. There are several other countries that also offer coal in India which is of much better quality than coal from Indonesia and handling costs are more efficient compared to importing coal of lower quality.
3. India's non-coal imports have a significant positive effect on the competitiveness of Indonesian coal exports to India. This has the implication that the majority of India's non-coal imported commodities are complementary to India's coal imports from Indonesia.
4. India's Real Effective Exchange Rate has a significant negative effect on the competitiveness of Indonesian coal exports to India. This implies that even though coal prices are relatively cheaper, India tends to prefer coal from other suppliers, in this case Australia, which has relatively more expensive coal prices but has much better quality.
5. India's economic growth does not significantly affect the competitiveness of Indonesian coal exports to India. Even though coal is an important energy resource commodity for India, its elasticity is zero.
References


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