Analysis of Factors Affecting the Volume of Indonesian Coal Exports 1995–2020

Tofan Purri Chaylendra and Maulidyah Indira Hasmarini(✉)

Economic Development, Faculty Economics and Business, Universitas Muhammadiyah Surakarta, Surakarta, Indonesia
mi148@ums.ac.id

Abstract. This study target to examine the factors that affect the volume of Indonesia's coal exports in 1995–2020. This research uses the Error Correction Model (ECM) approach. The finding of this analysis argue wicht in the short term only Indonesian coal production variables are significant and have a positive impact on the volume of Indonesia's coal exports in the short term. Meanwhile, in the long term, the variables of Indonesian coal production, Indonesian coal consumption, and the overall exchange rate are significant to the long-term volume of Indonesia's coal exports.

Keywords: Production · Consumption · Exchange Rate · ECM

1 Introduction

In this era of globalization, the main focus in improving the current economy lies in international trade. International trade arises as a result of high demand and supply that exceeds the country's capacity. This happens because there are goods or services that cannot be produced by the country [1]. Therefore, in order to meet the needs of the domestic community, the state must interact with other countries to meet the needs of its people [15]. Countries in the world are competing to meet the availability of energy in their country to maintain their industrial sector. Some of the efforts made by the state to keep the wheels of industry fulfilled, among others, by the availability of fuel so that industrial machines continue to operate. One of the fuels that drives industrial machines is coal.

Today we are facing challenges regarding the scarcity of resources and environmental impacts, one of which is caused by the industrial sector which uses coal as a fuel for industrial engines. To face this challenge, over the past few years, governments around the world have had a strategic idea, namely green economy. The idea of a green economy emerged as a result of concerns about the environment, social, economy and consumption of natural resources.

A green economy is an economy that improves human well-being and builds social justice that can reduce environmental risks and damage. The green economy is an alternative to the current dominant economic model, which exacerbates imbalances, triggers

H. Maulana et al. (Eds.): ICOEBS 2022, AEBMR 247, pp. 125–136, 2024.
https://doi.org/10.2991/978-94-6463-204-0_11

waste and scarcity of resources, resulting in widespread threats to the environment and human health. According to the United Nations Environment Program (UNEP), if we still use the current economic model, it will trigger an increase in the use of natural resources per capita on a global scale by 70% by 2050.

Indonesia is one of the countries that supports the idea of a green economy. With the implementation of a green economy, it will help preserve nature and prevent the environment from damage and bring benefits to the business sector. To implement a green economy, the government must provide understanding to the public about the green economy so that people can participate in the green economy. In addition, a large enough capital is needed to build infrastructure that supports the green economy. One of the challenges in the transition to a green economy is that Indonesia's economy is still dependent on the export of coal resources.

Indonesia is an archipelagic country with abundant natural resources so that it has quite a lot of reserves of natural resources, both oil and gas as well as non-oil and gas [16]. According to Haryadi (2011) Indonesia is ranked 6th in the world as a country with mineral and coal resources, while in Asia, Indonesia is number 1 as a potential owner of mineral and coal resources [17]. The coal industry is an industry whose activity is to mine coal commercially in 50 countries and is used in more than 70 countries in the globe. Indonesia is one of the world's biggest countries. Coal exporters because of its very important role in the international market, which is a supplier of coal in the international market by 24% [2]. Indonesia itself is also a country with coal production in the world of 7% of the total world production [3]. Coal consumption in Asia alone is 65.6% of the total world coal consumption. So this can provide opportunities for Indonesian coal exporters.

Production has a close relationship with export volume. When production increases, the volume of exports will also increase. Likewise, if production decreases, the volume of exports will also decrease [4]. Seeing the high demand for Indonesian coal, coal production in Indonesia is highly relied upon by the international market.

Consumption is one of the factors in exports. In the past, people's interest in coal processing was minimal because they only got a small profit when compared to oil and gas. However, nowadays people's interest is increasing due to the rising price of oil and gas, so people switch to coal because the price is relatively cheaper [20]. If domestic consumption is minimal, the volume exported will be even more. Likewise, if the level of domestic consumption is high, the volume exported will decrease, this will not experience a drastic decline in Indonesia's coal exports, because the government first meets domestic needs before exports.

One of the most essential aspects in export is the exchange rate. The exchange rate, according to Mankiw (2003), is the price determined in international commerce transactions. Currency value is classified as nominal trade rate or actual exchange rate [5]. When the rupiah exchange rate weakens, exports will increase because commodity prices will get cheaper in the international market which triggers more importers from outside Indonesia to buy these commodities.

Estabilished the preceding argument, researchers want to see if there is a link between exchange rates for Indonesian coal production, Indonesian coal consumption, and Indonesian coal exports. This research was studied under the title "ANALYSIS OF

FACTORS AFFECTING THE VOLUME OF INDONESIAN COAL EXPORTS IN 1995–2020".

2 Literature Review

2.1 Definition of Indonesian Coal Export Volume

Volume is the total production of export commodities in that country. Indonesia has the advantage of specialization in coal, so Indonesia can produce more than average. To get foreign exchange, Indonesian coal will be exported to countries that lack in meeting their coal needs [18]. In general, Indonesian exports are very good because they can bring in foreign exchange for Indonesia, this is due to the fact that the majority of the increase in export value lies in oil, wood, and mining products [19].

2.2 Definition of Coal Production to Indonesia's Coal Export Volume

According to Heizer and Render (2014), production is an activity to create products and services. In the process of creating products and services requires techniques to process resources in order to provide optimal results. If the resources used in the process of creating goods and services have good quality, the results will be optimal [6]. The increase in production activities aims to meet domestic needs and the rest can be exported, with increased production pushing the quantity of export commodities even higher. Considering that coal is a great opportunity to contribute to the government is working to boost the national economy, and Indonesia is one of the world's major exporters must support coal production by providing supporting facilities for the mining sector in order to create efficiency, so the amount of production has a positive influence on exports [7]. According to previous research, in the long term the amount of production has a substantial impact on exports. Similarly, the volume of output has a substantial impact on exports in the short term [8].

2.3 Definition of Coal Consumption of Indonesia's Coal Export Volume

According to Salvatore in Ariani (2014) suggests that consumption is an activity to spend the value attached to an item or service that is used in daily activities that aim to fulfill satisfaction [11]. People consume coal for daily activities, if people consume coal beyond the limit it will have an impact on the level of coal shipments from Indonesia. This is because the government will meet the needs of the domestic community first before carrying out export activities.

2.4 Definition of Currency Exchange Rate Against Indonesian Coal Export Volume

According to Latumaerissa (2015), the exchange rate has an understanding as the cost of a foreign currency or the cost of a foreign currency in terms of domestic currency [9]. Exchange rates look at foreign exchange rates from another foreign exchange point of

view, due to changing economic conditions, exchange rates can also change substantially. A decrease in the value of foreign currency is usually called depreciation, while when the value of foreign currency is rising, it is called appreciation. The equilibrium exchange rate will change according to the level of demand and supply [10].

3 Data and Methods

Secondary data in the form of a time series was employed in this investigation from 1995–2020. Namely the Volume of Indonesian Coal Exports, Indonesian Coal Production, Indonesian Coal Consumption, and Currency Exchange Rates. Data obtained from the World Bank, BPS, UNCOMTRADE, BP.

This study uses an error correction model approach to avoid inaccurate regression results. A spurious regression result is a regression result whose results look good but are good because the variables have a trend, not because of a strong relationship. To complete research with time series data using the ECM approach, is to use several test sequences such as the following:

- **Stationerity Test**
  Includes (1). Unit root test: Augmented Dickey-Fuller (ADF) type on the degree level used in this test. The data is said to be stationary if the probability value is less than alpha (α). (2) Integration degree test: A test that will change the data from non-stationary to stationary using the Augmented Dickey-Fuller (ADF) test type at the first degree level. If the probability value is smaller than alpha, the data is considered to be stationary (α).
- **Cointegration Test**
  Cointegration test tests the residual variable (et) if it is stationary or not, the data can be said to have cointegration if the data being tested is stationary at the same degree level, the residual value is stated to be stationary if the probability is less than alpha (α).
- **Estimate ECM**

The form of the ECM E-G equation for short-term estimates is as follows:

$$\Delta VEB_t = \beta_0 + \beta_1 \Delta LogPBI_t + \beta_2 \Delta LogKBI_t + \beta_3 \Delta KURS_t - \lambda ECT_{t-1}$$

Description:

ΔVEBt : Changes in Indonesian Coal Export Volume.
ΔLogPBIt : Changes in Indonesia's Coal Production.
ΔLogKBIt : Changes in Indonesia's Coal Consumption.
ΔKURSt : Changes in Currency Exchange Rates.
λECTt-1 : Previous year's residue.

The form of the ECM E-G equation for long-term estimation is as follows:

$$VEB_t = \beta_0 + \beta_1 LogPBI_t + \beta_2 LogKBI_t + \beta_3 KURS_t + e_t$$

Description:

VEB : Indonesian Coal Export Volume
PBI : Indonesian Coal Production
KBI : Indonesia's Coal Consumption
KURS : Currency Exchange Rates
e : Error Term
β0 : Constant
β1…β3 : Independent Variable Regression Coefficient
t : year to t

- **Classic Assumption Test**

In this section, the researcher will test the classical assumptions on the regression results. The classic that will be tested assumption is the multicollinearity test using the VIF value as a reference. Then there is the jarque-fall normality test, this test is carried out to see whether there are residuals that are normally distributed or not.

Then the Breusch-Godfrey autocorrelation to determine whether the model has autocorrelation. That is by percieving the chi-square probability value. If the chi-square probability value is greater than alpha (α) then it is possible to assert that is 'nt autocorrelation in the model.

Furthermore, the heteroscedasticity test is used to assess if the model has heteroscedasticity. This may be noticed from the chi-square probability value; if the chi-square probability value is larger than alpha (α), then the model has no heteroscedasticity.

- **Statistic Test**

A simultaneous significance test (F test), a partial significance test (T test), and a coefficient of determination test (R2)comprised the statistical test.

4 Result and Discussion

- Stationarity Test Results

Table 1. Unit Root Test Results (Degree Level)

Series: KURS, LOGKBI, LOGPBI, VEB				
Intermediate ADF test results UNTITLED				
Series	Prob.	Lag	Max Lag	Obs
KURS	0.4523	2	5	23
LOGKBI	0.1869	0	5	25
LOGPBI	0.1942	0	5	25
VEB	0.6369	1	5	24

Source: Eviews10 (processed)

Table 2. Results of the Degree of Integration Test (First Degree)

Series: KURS, LOGKBI, LOGPBI, VEB				
Intermediate ADF test results D(UNTITLED)				
Series	Prob.	Lag	Max Lag	Obs
D(KURS)	0.0161	1	4	23
D(LOGKBI)	0.0002	0	4	24
D(LOGPBI)	0.0056	0	4	24
D(VEB)	0.0812	0	4	24

Source: Eviews10 (processed)

Table 1 demonstrates that at the level with the greatest alpha (α) of 10%, all variables are not stationary. To stabilize all variables, a degree of integration test on the first degree will be performed.

The results of the integration degree test on the first degree are shown in Table 2. Using the maximum alpha (α) of 10%, the results reveal that all variables are stable at the first degree.

- **Cointegration Test Results**

After doing the stationarity test and it is stated that all the variables are stationary at the first degree, then the cointegration test is then carried out. To perform the cointegration test, it is necessary to have residual data obtained from the simple regression results of Ordinary Least Squares (OLS). After acquiring the residual data, the Augmented Dickey-Fuller (ADF) test type is used to perform a unit root test utilizing degrees at the level level. The null hypothesis (H_0) says that the residual is not steady, as opposed to the alternative hypothesis (H_a) says that the residual is stationary. It is known in Table 4 that the residual probability value is less than alpha (α) 10% so that Ha is not rejected, and it can be concluded that the residual is stationary at the levels so that there is cointegration

Table 3. OLS Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-88581378	45243902	-1.957863	0.0630
LOGPBI	2.50E + 08	25616431	9.775021	0.0000
LOGKBI	-81829861	30052596	-2.722888	0.0124
KURS	-9420.247	2502.809	-3.763870	0.0011
R-squared	0.980249			
Prob(F-statistic)	0.000000			
Durbin-Watson stat	1.123973			

Source: Eviews10 (processed).

Table 4. Unit root test results on residuals (e)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.037379	0.0450
Test critical values:	1% level	-3.724070	
	5% level	-2.986225	
	10% level	-2.632604	
*MacKinnon (1996) one-sided p-values.			

Source: Eviews10 (processed).

between variables in the long term and can form a short-term Engle-Granger ECM model.

- **Engle-Granger ECM Estimation Results**

ECM Engle-Granger has two requirements that must be satisfied in order to be declared valid. The first condition is lambda (λ) is less than 0 but more than -1. The second condition is that lambda (λ) is significant (Prob $<$ α). Table 5 demonstrates that the value of lambda (λ) is obtained from the variable res(-1). The first condition has been fulfilled because lambda (λ) is -0.507, and the second condition has been fulfilled, namely significant lambda with a probability of 0.005 less than alpha (α) 10%. So with this the Engle-Granger ECM is declared valid, and the long-term effect is taken from the simple regression results of Ordinary Least Squares (OLS) in Table 3.

- **Classic Assumption Test Results**

Table 6 is the result of the multicollinearity test by looking at the value in the Centered VIF section. The null hypothesis (H_0) there isn't multicollinearity problem in the model. The alternative hypothesis (H_a) there is a multicollinearity difficulty in the

Table 5. Engle-Granger. ECM Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4097671.	5179775.	-0.791090	0.4382
D(LOGPBI)	1.78E + 08	40042583	4.433033	0.0003
D(LOGKBI)	-674776.8	26605459	-0.025362	0.9800
D(KURS)	-4084.213	2742.002	-1.489500	0.1520
RES(-1)	-0.507824	0.162349	-3.127979	0.0053
R-squared	0.659581			
Prob(F-statistic)	0.000159			
Durbin-Watson stat	1.448240			

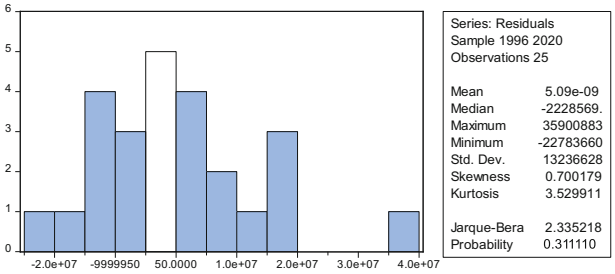
Source: Eviews10 (processed).

Table 6. Multicollinearity Test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	2.68E + 13	3.190258	NA
D(LOGPBI)	1.60E + 15	3.399190	1.344815
D(LOGKBI)	7.08E + 14	2.349954	1.371234
D(KURS)	7518577.	1.291615	1.072491
RES(-1)	0.026357	1.041013	1.040740

Source: Eviews10 (processed).

Table 7. Jarque-bera test.



Source: Eviews10 (processed)

Table 8. Breusch-Godfrey. Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.036561	Prob. F(2,18)	0.3749
Obs*R-squared	2.581963	Prob. Chi-Square(2)	0.2750

Source: Eviews10 (processed).

Table 9. Heteroscedasticity Test

Heteroskedasticity Test: White			
F-statistic	0.469234	Prob. F(14,10)	0.9049
Obs*R-squared	9.911831	Prob. Chi-Square(14)	0.7686
Scaled explained SS	8.024335	Prob. Chi-Square(14)	0.8881

Source: Eview s10 (processed)

Table 10. Partial Validity Test of the Effect of Independent Variables (T Test)

Variabel	Koef	Prob
D(LOGPBI)	17751	0.0003
D(LOGKBI)	-67477	0.9800
D(KURS)	-4084.2	0.1520
LOGPBI	250401	0.0000
LOGKBI	-818298	0.0124
KURS	-9420.2	0.0011

Source: Eviews10 (processed).

model. Because all variables in Table 6 have a centered VIF value less than 10, the null hypothesis (H_0) is not rejected. As a result, there is no multicollinearity problem in the model.

Table 7 is the result of the jarque-bera normality test. The null hypothesis (H_0) says normally distributed by residuals, the alternative hypothesis (H_a) says aren't normally distributed by residuals. The probability value in this test is 0.3111 which is greater than alpha (α) 10% so that the null hypothesis (H_0) is not rejectedThe residuals are then assumed to be regularly distributed.

Table 8 is the result of the Breusch-Godfrey autocorrelation test. The null hypothesis (H_0) says that there isn't autocorrelation in the model, the alternative hypothesis (H_a) says that there is autocorrelation in the model. The chi-square probability value in this test is 0.2750 which is greater than alpha (α) 10% in order to avoid rejecting the null hypothesis (H_0). As a result, it is possible to conclude that the model has no autocorrelation.

Table 9 is a heteroscedasticity test. The null hypothesis (H_0) says that there isn't heteroscedasticity problem in the model, the alternative hypothesis (H_a) says that there is a heteroscedasticity problem in the model. The chi-square probability value in this test is 0.7686 which is greater than alpha (α) 10% so that the null hypothesis (H_0) is accepted. As a result, the model does not have a heteroscedasticity problem.

- **Statistical Test Results**

The null hypothesis (H_0) in the model existence test (F test) states that all independent variables have no influence on the short-term dependent variable at the same time. The alternative hypothesis (H_a) states that all independent factors impact the short-term dependent variable at the same time. The Prob (F-statistic) value in Table 5 is utilized in the F test, which is 0.0001, which is less than alpha (α) 10%, so that the alternative hypothesis (H_a) is not rejected. As a result, the independent factors influence the short-term dependent variable concurrently.

Furthermore, in the statistical test there is a partial effect validity test (t test) by partially testing all variables as follows:

In Table 10. It is a combination of short-term and long-term variables, to find out what variables have an effect, the likelihood value demonstrates this and then compared with the largest alpha (α) value of 10%.

In Table 10. The variable in the short term may be shown to be that is significant to the volume of Indonesia's coal exports is only the variable of Indonesian coal production. While the variables in the long term are overall significant to the volume of Indonesia's coal exports.

To test the coefficient of determination (R2), use the R-squared value in Table 5. The R-squared result is 0.659, indicating that the independent variables of Indonesian coal production, consumption, and currency rates impact the dependent variable of Indonesian coal export volume by 65.9%, with the remaining 34.1% influenced by factors outside the model.

4.1 Discussion

According to the t-test, partially variable production is significant and has a positive impact on the volume of short-term coal exports from Indonesia; variable coal production in Indonesia has a coefficient value of 17751 with a linear-log dependence, which means that each 1% increase in coal production in Indonesia increased the volume of short-term coal exports 17751 tons. This is in line with research [12] which states that the results of short-term estimates of coffee production variables have a good and considerable impact on Indonesian coffee exports to the United States.

In the long term, Indonesia's coal production variable is also significant and has a positive impact with a coefficient value of 250401 with a lin-log relationship pattern, which measure that every 1% escalation in Indonesian coal production will boost Indonesia's coal export volume by 250401 tons.

Indonesia's coal consumption variable has a negative and insignificant The Indonesian coal consumption variable has a negative and considerable influence on the volume of Indonesian coal exports in the short term with a coefficient value of -81829 with a lin-log relationship pattern which means that every 1% increase in Indonesian coal consumption it will reduce Indonesia's coal export volume by 81829 tons. This research same as [13] which states that per capita consumption has a negative and significant effect on Indonesia's net exports of fuel oil in 1991–2012.

The variable of currency exchange rates in the short term has a negative and insignificant effect, this is in line with research [14] which states indicates the exchange rate had a negative and small impact on the amount of Indonesian coffee exports from 2001 to 2011. However, in the long run, the currency exchange rate has a negative and substantial influence, with a coefficient value of -9420 and a linear connection pattern, implying that every dollar rise reduces the volume of Indonesian coal exports by 9420 tons.

5 Conclusion

In this study, the variables of Indonesian coal production, Indonesian coal consumption, and the exchange rate on the amount of Indonesian coal exports have a long-term balancing connection from 1995 to 2020. By using the Engle-Granger ECM analysis, it is shown that only Indonesia's coal production variables are significant and affect the volume of Indonesia's coal exports in the short term. However, when viewed from the long term, which is taken from the results of a simple Ordinary Least Square (OLS) regression, then all variables are significant to the volume of Indonesia's coal exports.

Acknowledgments. The conclusion of this piece cann't be isolated from the encouragement and assistance of other parties. So, on this occasion, the author would like to thank Mrs. Ir. Maulidyah Indira Hasmarini, MP as the supervisor who has provided direction, support, and motivation to complete this article. And thanks to Mr. Anas who has provided data processing material in the form of videos that greatly facilitate the author in working on data processing.

Authors Contributions. The findings of this study are wonted to contribute as follows:

For the University, the results of this investigation are expected to be input for the university and can be a contribution to the progress of the university's development.

For students, this research can be used as a reference if they want to be redeveloped and can provide encouragement and motivation for students to create a work that is beneficial to the whole community.

References

1. D. Pratama and S. E. Yulianto, "ANALISIS NILAI TUKAR RUPIAH, PRODUKSI BATUBARA, PERMINTAAN BATUBARA DALAM NEGERI DAN HARGA BATUBARA ACUAN TERHADAP VOLUME EKSPOR BATUBARA INDONESIA (Studi||Pada Ekspor Batubara Indonesia Tahun|2005–2014)," 2016. [Online]. Available: www.minerba.esdm.go.id
2. T. Anindita and A. Apri Syaputra, "Analisis Pengaruh KURS USD, Harga Batubara Acuan, dan Volume Ekspor Pada PT.Bukit Asam (Persero) Tbk," Jurnal Manajemen Industri dan Logistik , vol. 1, 2017, [Online]. Available: http://jurnal.poltekapp.ac.id/
3. L. Tika Carolina and J. Aminata, "ANALISIS DAYA SAING DAN FAKTOR YANG MEMPENGARUHI EKSPOR BATU BARA," DIPONEGORO JOURNAL OF ECONOMICS, vol. 1, 2019, [Online]. Available: https://ejournal2.undip.ac.id/index.php/dje
4. R. Puspita, K. Hidayat, and E. Yulianto, "PENGARUH PRODUKSI KAKAO DOMESTIK, HARGA KAKAO INTERNASIONAL, DAN NILAI TUKAR TERHADAP EKSPOR KAKAO INDONESIA KE AMERIKA SERIKAT (Studi pada Ekspor Kakao Periode Tahun 2010–2013)," 2015.
5. M. F. Anshari, "Analisis Pengaruh Inflasi dan Kurs Terhadap Ekspor di Negara ASEAN 5 Periode Tahun 2012–2016," Jurnal Info Artha, vol. 1, 2017.
6. W. D. Safitri, R. Hartati, S. Tinggi, I. Manajemen, and Y. Yogyakarta, "PENGARUH NILAI TUKAR, PRODUKSI, DAN HARGA TERHADAP VOLUME EKSPOR BATUBARA DI PROVINSI BENGKULU," Efektif Jurnal Ekonomi dan Bisnis, 2020.
7. I. Gusti Bagus Kumbayana and W. Yogi Swara, "Pengaruh Jumlah Produksi, Harga Ekspor, Dan Kurs Dollar Amerika Serikat Terhadap Volume Ekspor Batu Bara Indonesia Tahun," E-Jurnal Ekonomi Pembangunan Universitas Udayana, 2015, [Online]. Available: http://www.hpli.org/tambang.php
8. T. T. Hapsari and A. F. Yuniasih, "The determinant factors of Indonesian competitiveness of cocoa exports to Germany," Jurnal Ekonomi Pembangunan, vol. 18, no. 1, pp. 75–84, Jul. 2020, https://doi.org/10.29259/jep.v18i1.9978.
9. B. C. Pamungkas, "PENGARUH NILAI TUKAR USD DAN BURSA ASEAN TERHADAP INDEKS HARGA SAHAM GABUNGAN (IHSG)," Universitas Brawijaya, Malang, 2018.
10. E. Setyowati, "Faktor-Faktor Yang Mempengaruhi Nilai Tukar Rupiah Terhadap Dolar Amerika Dengan Model Koreksi Kesalahan Engle-Granger (Pendekatan Moneter)," Jurnal Ekonomi Pembangunan, vol. 4, 2017, https://doi.org/10.23917/jep.v4i2.4026.

11. F. Aprilia, H. Sasana, and R. Destiningsih, "ANALISIS FAKTOR PENDORONG KONSUMSI BATUBARA DI INDONESIA," DINAMIC : Directory Journal of Economic, vol. 2, no. 1, 2020.
12. L. Christy Elisha, "ANALISIS EKSPOR KOPI INDONESIA KE AMERIKA SERIKAT DENGAN PENDEKATAN ERROR CORRECTION MODEL," Economics Development Analysis Journal, vol. 4, no. 4, 2015, [Online]. Available: http://journal.unnes.ac.id/sju/index.php/edaj
13. D. A. Marciawan, "Faktor-Faktor Yang Memengaruhi Ekspor Neto Bahan Bakar Minyak di Indonesia Periode 1991–2012," E-Jurnal EP Unud, vol. 4, 2015.
14. A. P. Galih, "Analisis pengaruh jumlah produksi, luas lahan, dan kurs dolar Amerika terhadap volume ekspor kopi Indonesia periode tahun 2001–2011," E-Jurnal EP Unud, vol. 3, 2014.
15. S. T. Wahyudi and I. Maipita, "Comparative Analysis on The Market Share of Indonesian Export Commoties: Opportunities and Challenges," Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi dan Pembangunan, vol. 19, no. 2, Jan. 2019, https://doi.org/10.23917/jep.v19i2.5708.
16. S. Aisyah and T. D. Renggani, "DETERMINANTS OF INDONESIA NON-OIL AND GAS EXPORTS TO NON-TRADITIONAL MARKET," Business and Accounting Research (IJEBAR) Peer Reviewed-International Journal, vol. 5, no. 3, 2021, [Online]. Available: https://jurnal.stie-aas.ac.id/index.php/IJEBAR
17. E. Simangunsong, Mardianto, M. L. Rabbani, and P. F. Aufa, "ANALISIS NILAI TUKAR RUPIAH, PRODUKSI BATUBARA, PRODUKSI MINERAL TERHADAP PENERIMAAN NEGARA BUKAN PAJAK SEKTOR MINERAL DAN BATUBARA," Jurnal Syntax Admiration, vol. 2, no. 1, 2021.
18. I. Ayu, D. Fitri, I. Bagus, and P. Purbadharmaja, "PENGARUH KURS DOLLAR AMERIKA, JUMLAH PRODUKSI DAN LUAS LAHAN PADA VOLUME EKSPOR LADA INDONESIA," E-Jurnal EP Unud, vol. 4, no. 5, 2015.
19. M. I. Hasmarini and D. Murtiningsih, "ANALISIS KAUSALITAS EKSPOR NON MIGAS DENGAN PERTUMBUHAN EKONOMI MENGGUNAKAN METODE FINAL PREDICTION ERROR," Jurnal Ekonomi Pembangunan, vol. 4, no. 2, 2017, https://doi.org/10.23917/jep.v4i2.4025.
20. P. Natalia Lestari, "ANALISIS PENGARUH VARIABEL INTERNAL DAN EKSTERNAL TERHADAP VOLUME EKSPOR BATUBARA (STUDI KASUS INDONESIA-JEPANG TAHUN 2008–2015)," Universitas Brawijaya, Malang, 2016. Accessed: Sep. 30, 2022. [Online]. Available: https://jimfeb.ub.ac.id/index.php/jimfeb/article/download/3012/2697