

The Correlation of Export, Import, Foreign Investment, and Unemployment in Indonesia 1985-2020

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Abstract

Export, import, foreign investment, and unemployment are associated with the economy of a country. This research aims to analyze the correlation between export, import, foreign investment, and unemployment in Indonesia, from 1985 to 2020. This research employs secondary data, which are time series data. Vector Autoregression (VAR) is used as an analysis model. The result of the Granger Causality analysis indicates the existence of a one-way correlation between exports and imports. In contrast, the IRF (Impulse Response Function) analysis demonstrates that the shock, which existed in each variable causes other variables to be stable at the period of 6-9. Variance Decomposition analysis verifies that each variable is still influenced by itself, except for the imports variable, which is influenced more by the export variable. Therefore, an increase in exports and foreign investment should be able to increase employment opportunities in Indonesia, which will lead to a decrease in the unemployment rate. On the other hand, imports must be controlled so as not to interfere with domestic production, which can reduce productivity and result in workers losing their jobs. The government must make strategies and policies related to exports, imports, and investment that can increase job opportunities in Indonesia, both in the industrial sector and other sectors.

Keywords: Export, Import, Foreign Investment, Unemployment, VAR

JEL Code: E24, E27, F17, F47

A. INTRODUCTION

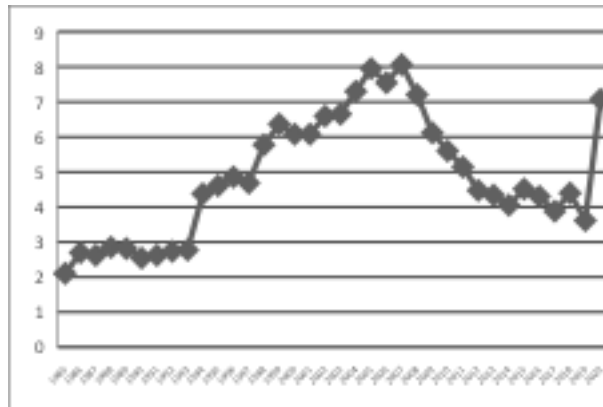
A country's economic development is profoundly important to establish a community's welfare for the country's development. According to Sukirno (1994), economic development is defined as a process that leads to the increase of a long-term people's per capita income. Yet, economic development not only considers per capita income but also several other indicators. Unemployment is one of the noticeable indicators that appear as a macro problem for developing countries, including Indonesia. Lower unemployment showcases high job opportunities. According to Djojohadikusumo (1994), the unemployment problem, both open and disguised unemployment, becomes the main problem for economic development in developing countries. If the problems are unsettled, they potentially could cause social

vulnerability that might lead to poverty (Statistics Indonesia, 2019).

According to Pitartono (2012), unemployment happens due to the high transformation of the workforce, which is not aligned with the existence of sufficient work opportunities and labor absorption, in which a small percentage is caused by low job opportunities to absorb new, ready-to-work labor. The new large numbers of a workforce that cannot be accommodated with enough job opportunities increase the necessity for work. The condition is getting worse due to the economic crisis. Besides the increase in figures for the workforce that is unbalanced with the number of job opportunities, work termination also exists, which makes people lose their jobs. That condition promotes a higher level of unemployment in Indonesia.

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As a country that is recorded as the fourth most populous nation in the world with abundant natural resources, Indonesia still cannot escape the unemployment issues. From year to year, the government always works optimally in formulating the development program to tackle the unemployment issues.



Source: Statistics Indonesia & World Bank, processed

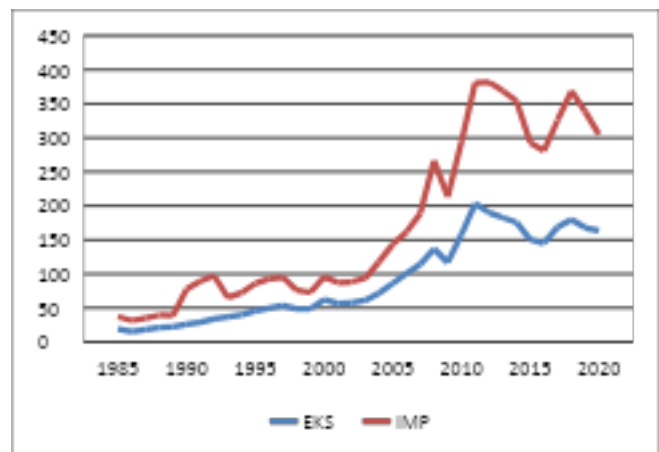
Figure 1. Open Unemployment Rate in Indonesia 1985-2020 (%)

Unemployment in Indonesia fluctuated, starting from 1985 with 2,1% to 2020 with 7,07%. During the period, the unemployment rate experienced a raise in 1997-1998 due to the economic crisis that occurred in Indonesia and kept on rising until 2007 before decreasing in 2008. Besides, in 2020, the level of unemployment hit a quite high figure due to the pandemic. The fluctuation shows the inconsistent efforts from the government to deal with unemployment-related problems in Indonesia.

As previously known, in the globalization era, almost all countries practice an open economic system. Every country is ready to be exposed to a variety of international economic activities. One of them is international trade, which could connect the domestic economy with international economic activities. International trade happens due to the inability of a country to fulfill its internal necessities; therefore, the activities called exports and imports take place. High export promotes labors absorption that could reduce unemployment in a country.

According to Roesida (2019), open trade will have a positive impact on a country through an increase in the export rate, which will motivate the producer to produce the goods/services to be exported. Then, the need for workers also increases, which could decrease the unemployment rate. Later, based on the study conducted by Fuji & Cervantes (2013), it is suggested that the effect of export can indirectly influence indirect jobs, direct jobs, growth, and productivity.

High exports will lead to an improvement in the labor-intensive company. The rise in export quantities will encourage people with more creativity to improve their productivity, which will increase the number of workers. High quantities of imports reduce the domestic production numbers, which leads to an increase in unemployment numbers. Low prices on imported goods motivate people to consume the imported goods rather than the local products. Then, the import rate will rise, and the demand for local products will decline. It triggers decreased production and forces the producers to cut the number of workers, directly causing unemployment.



Source: Statistics Indonesia, processed

Figure 2. The Graph of Indonesian Export & Import 1985-2020 (Million US\$)

Figure 2 reveals that from 1985 to 2020, Indonesian imports were higher than its exports. The export and import activities have fluctuated, with the highest increase recorded in 2011, with

the export valued at 203496.6 million US\$ and the import value was recorded at 177,435.7 million US\$. The export and import activities in a certain country affect the country's economy, particularly unemployment.

Fannoun & Hassouneh (2019) confirmed the existence of a long-term balanced correlation between export, import, and output growth. This research supports the existence of long-term two-way causality between export, import, and output growth. While for short-term causality, the findings support both export-import hypotheses and the existing export-import relationship.

Besides export-import, another variable that also affects unemployment is foreign investment, so-called Foreign Direct Investment (FDI). Based on Law No. 1 of 1967, Foreign Direct Investment (FDI) includes the direct-executed FDI to accomplish the country's internal projects, in which the investor should take the direct risk on the investment. Foreign direct investment is one of the additional capital sources that are essentially required by developing countries, including Indonesia. Many benefits are provided from foreign investment to designated countries, one of which is the escalation of job opportunities. With this investment, many companies may be established, due to the many people who initiate the business. Hence, productivity will escalate and expand job opportunities. It will lead to a decrease in unemployment since more workers are absorbed. The correlation between investment and unemployment has been investigated by several researchers, such as a study conducted by Alalawneh & Nessa (2020). This research revealed, in the short-term, the absence of a causal relationship between FDI and unemployment in any kind of form. It is also verified that the existence of a two-way causal relationship between FDI and exports.

Briefly, the correlation between macroeconomic variables and unemployment may vary. The research performed by Khan et al.

(2020) suggested that macroeconomic factors have an insignificant effect on unemployment in the long term. Based on the above explanation, it can be seen that the unemployment-related problems in Indonesia are still incompletely solved. An open economy, such as export-import and foreign investment, could influence the unemployment issues. Therefore, this research requires investigation regarding export, import, and foreign investment, as well as unemployment in Indonesia. Furthermore, this study aims to see whether there is a relationship between exports, imports, and foreign investment and unemployment in Indonesia, and how the relationship between exports, imports, foreign investment, and unemployment in Indonesia has changed from 1985 to 2020.

B. LITERATURE REVIEW

Manpower

Based on Law No. 13 of 2003 about employment, it is explained that manpower is a person who is capable of performing the designated task in order to produce goods or services to meet people's necessities. Citizens aged 15 years old and above have already been classified as of productive age. The people aged 15 years old who have a job, yet are temporarily inactive or unemployed, are included in the workforce. While a person aged above 15 who is continuing his study, managing domestic activities, or performing other activities aside from personal activities is considered a citizen instead of a workforce (Statistics Indonesia, 2017).

Unemployment

Unemployment, according to Sukirno (1994), is defined as a condition that places a person classified in the workforce, who needs a job yet is still unable to get one. As defined by Statistics Indonesia (BPS), unemployment includes people without jobs or still in the process of getting one, preparing for a business, desperately trying to find a job, or have already been accepted for a job, yet have not started.

As stated by Marius (2004), unemployment can be classified into 3, as follows:

1. Open Unemployment
This type of unemployment is caused by one's inability to get a job, even by involving their best efforts; some are caused by laziness. It can be stated that open unemployment is a condition in which a person is living without a job.
2. Disguised Unemployment
This unemployment happens due to the excessive number of workers available for a single task. It is also due to a person who works in an unmatched field, in terms of ability. It leads to an unoptimized job settlement.
3. Under Unemployment
Underemployment is defined as a person who works unoptimized, temporarily, due to the absence of tasks. A person is considered under-unemployed if he performs less than 7 hours a day of work, or less than 35 hours a week.

Employment Opportunity

Employment opportunity is highly related to the existence of a work field in an economic activity that could absorb the workforce. As suggested by Sudarsono (1988), employment opportunity is defined as the number of employment opportunities where the workforce can be absorbed. While Sukirno (2013) defined employment opportunity as the number of workforces who work for companies, other people, or themselves in full-time employment. High job opportunities in a country affect the condition of the workforce in that country, such as unemployment. The higher the job opportunities, the more the workforce is absorbed, thus the unemployment rate can be suppressed.

Employment opportunity can be explained as the absorption of people who are included in the productivity age, people aged more than 15 years old, who have already been hired for a job, also called employment. This is also defined as a

job opportunity that has been occupied by a worker. Therefore, a person who has succeeded in grabbing a job is termed an employment opportunity (Merizal, 2008).

International Trade

According to Christianto (2013), international trade is defined as trade activity that involves two or more countries. In its existence, it is expected to improve domestic productivity to be later exported overseas. The production improvement could expand the employment opportunity and eventually could reduce the unemployment rate (Iswandari, 2013).

As revealed by Salvatore (2014), there are several theories related to international trade, such as, first, the mercantilist theory, which believes that a country may gain benefits through international trade by sacrificing other countries. It comes up with the recommendation of strict government regulations for all economic activities, the limitation of imports, and incentives for exports. The second is the Absolute Advantage Theory, developed by Adam Smith. If a country has an absolute superiority in producing a certain product/commodity, yet it has an absolute disadvantage compared to others in producing the secondary product/commodity. However, that country could still get the benefits by specializing in producing products with absolute advantages and trading them for products with absolute disadvantages.

Third, the Comparative Advantage Theory reveals a country's inefficiency in manufacturing both types of products/commodities compared to others, yet the basis of beneficial trading still exists for both countries. A less-efficient country should specialize in producing and exporting the product/commodity that has a bigger absolute advantage and importing the product/commodity with a bigger absolute disadvantage. Next is the Heckscher-Ohlin theory verified that if a country has an abundance of a production factor, then it will conduct intense exports referring to the designated factor of production.

Export

Export is explained as the trade and delivery of products from one country to another. According to Murni (2009), export is defined as the economic activity of trading a domestic commodity overseas. One of the benefits of this activity is to expand employment. As stated by Farina & Husaini (2017), the transactions involved in export activity could boost the foreign exchange, as one of the sources of the country's revenue, as well as be addressed in the expansion of people's job opportunities. The higher the export, the higher the production of goods, which could potentially enhance job opportunities to reduce unemployment.

Net export indicates the difference between a country's total export rate and its total import rate. If net export is valued positively, it means that exports are higher than imports. On the contrary, if the net export is calculated negatively, it indicates that imports are larger than exports (Utami, 2019).

As indicated by a theory previously formulated by Adam Smith, which is the vent-for-surplus of international trade, by implementing international trade, a country could maximize the utilization of capital and human resources that were formerly unoptimized for producing goods to be exported to the international market (Roesida, 2019).

Import

According to Arfiani (2019), import is defined as an activity to bring goods inside a certain customs territory, conducted by the government or a private party. Import is the goods/service purchasing under an agreement of cooperation between two or more countries and brought into a certain country. As confirmed by Sukirno (2013), domestic production will decrease if excessive imports exist. The condition leads to the enhancement of unemployment and the decrease of per capita income, which will directly affect the people's purchasing power. According to Haines (1971) in C&EN Guest Editorials about export, import, and unemployment in America,

low-priced imports influence the lack of job opportunities in the manufacturing field. The unemployment rate increases, while the government needs more income from taxes.

Foreign Investment

As stated by Mubasysyir (2013), investment is explained as the expenses or capital investment for a company to buy equipment and production tools, as well as capital materials to improve the productivity in manufacturing goods and services, in terms of economic activities. Based on Law No. 1 of 1967 about Foreign Direct Investment (FDI) that is conducted directly and employed to execute domestic projects, investors will bear the risks directly towards the capital. According to Dewata & Swara (2013), Foreign Direct Investment is considered stable for long-term activity, which can help the recovery of economic sectors that tend to spend more costs. Besides, it can expand the workers' absorption and nurture the trust of foreign investors to initiate various activities and invest their capital in many economic sectors in Indonesia, to improve the capital inflow.

According to Kurniawan (2014), Harrod Domar's theory could be employed to identify the correlation between investment and unemployment. The theory implies that investment not only could generate demand but also increase production. Furthermore, it is also stated that the increased investment, followed by the decrease in unemployment numbers, means that the investment improvement refers to labor-intensive activities. On the contrary, if the investment refers to a capital-intensive type of activity, the condition will come up differently.

Previous research conducted by Susanti (2019) resulted in only one variable, which is that the investment variable has a negative and significant influence on the rate of open unemployment in Indonesia. While variables of foreign workers, export, and wage show the absence of influence. By using the analysis of Double Linear Regression, it is indicated that the variables of export and investment share a

negative and significant influence on open unemployment in Indonesia. Meanwhile, the variables of wage and foreign workers have an insignificant influence on open unemployment in Indonesia.

The research conducted by Zamzami et al. (2020) demonstrated that the variables of export and unemployment share a negative and positive correlation. The variables of export in China and Hong Kong demonstrate a negative and significant relationship with unemployment in Indonesia. While the countries whose export variable shows a positive and significant correlation towards unemployment in Indonesia are South Korea and other Asian countries. While several countries have no significant influence on unemployment in Indonesia, such as Japan, even though its export rate is high, and Taiwan, which records a higher export rate compared to Hong Kong.

The research conducted by Yolanda (2017) verified that the export variable for non-oil and gas has a significant and positive towards the open unemployment rate. This research indicated that export escalation causes an increase in open unemployment, since the exported goods use more machines or are capital-intensive in their production.

A study performed by Priyono & Wirathi (2016) explained that the variables of export, economic growth, and employment opportunity in Bali province show no significant causal relationship. The result of the VAR test implies that the export variable is influenced by the export $t-1$, while the variable of economic growth is influenced by the economic growth $t-1$. The result of the Variance Decomposition test indicates that the contribution provided by export activity to economic growth is better than the employment opportunity, whereas the economic growth contributed to the employment opportunity.

The research by Sessu (2013) showed that the level of export has a positive influence on the variable of labor absorption. The higher the

export is, the higher the workers' absorption will be. Meanwhile, the import level has a negative influence on labor absorption, in which the higher the import level, the lower the employment opportunity will be.

C. RESEARCH METHODS

Secondary data are the types of data employed in this research, in the form of data series. The period of research ranged from 1985 to 2020. The data are taken from the World Bank, Statistics Indonesia (BPS), Indonesian Investment Coordinating Board/*Badan Koordinasi Penanaman Modal* (BKPM), as well as other related sources such as journals and scientific articles.

Research Variables

Employment Opportunity Rate

The variable of unemployment in this research uses the employment opportunity level as a proxy. The level of employment opportunity is defined as someone who is classified in the productivity age to have an opportunity to be absorbed in the work market or considered capable to work. The equation to calculate the employment opportunity level is as follows:

$$TKK = \frac{\text{Numbers of people who work}}{\text{Numbers of workforce}} \times 100\% \dots (1)$$

The level of employment opportunity (TKK) is utilized to show the percentage rate for the workforce that has been hired. The higher the TKK, the higher the employment opportunity will be.

Export is considered the sales and delivery of products from one country to another. The total export value is the accumulation of the Free on Board (FOB) export value of export materials, which are sent out from the Indonesian customs territory. FOB value means the material's value that is stated in FOB (Free on Board) (Statistics Indonesia, 2015).

Import is explained as the purchasing of goods/services involving the agreement of cooperation between two or more countries,

where the goods/services originate from overseas and are sent inside. The total import value is the accumulation of the Cost Insurance Freight (CIF) of the imported goods that enter the Indonesian customs territory. Cost Insurance Freight includes cost and insurance (Statistics Indonesia, 2015).

Foreign investment is defined as the investment or capital originating from overseas. Based on Law No. 1 of 1967, the foreign investment includes the direct investment that is employed to accomplish the domestic project, in which, based on the scheme, the investor will settle the risks, directly, towards the capital.

Data Analysis Method

In this research, the data analysis method is employed, which is the Vector Autoregression (VAR) method. According to Gujarati (2004), several advantages are identified if compared to other methods, such as it is unnecessary to separate dependent variables from independent variables, hence it is considered simpler. Utilizing the Ordinary Least Squares (OLS) method, its estimation is quite simple compared with other, more complicated analysis methods. Therefore, the result of estimation by using the VAR method is considered better (Iskandar, 2019). This research employs the Eviews 10 software as a supporting tool.

1. Data Stationary Test

In the analysis of data time series step one, a stationary data test is conducted. In this research, it is used unit root test with the ADF (Augmented Dickey-Fuller) test is used to identify whether a unit root exists or not.

2. The Selection of Optimal Lag

Lag selection is conducted to determine the optimal lag length that is later used for the next analysis. The parameter criteria of LR, FPE, AIC, SC, and HQ are employed for lag length determination.

3. Cointegration Test

It can be used using the Engle-Granger test and Johansen test to identify the existence of

cointegration. The cointegration test could be applied in the presence of the Engle-Granger test and Johansen test to see whether cointegration existed or not. Cointegration is implemented to see the existence of a long-term equilibrium among variables. In the case of the absence of cointegration. The VAR model can be used for further analysis.

4. VAR Model Estimation

The VAR model is applied to test the dynamic structure of variables in the observed model, as shown by the innovation variable.

From all four variables, which are Export (EKS), Import (IMP), Foreign Investment (PMA), and unemployment (TKK), the VAR equation can be formulated as follows:

$$TKK_t = \beta_{01} + \sum_{i=1}^p \beta_{i1}EKS_{t-i} + \sum_{i=1}^p \alpha_{i1}IMP_{t-i} + \sum_{i=1}^p \pi_{i1}PMA_{t-i} + \sum_{i=1}^p \theta_{i1}TKK_{t-i} + \varepsilon_{1t} \dots\dots\dots(2)$$

$$EKS_t = \beta_{02} + \sum_{i=1}^p \beta_{i2}EKS_{t-i} + \sum_{i=1}^p \alpha_{i2}IMP_{t-i} + \sum_{i=1}^p \pi_{i2}PMA_{t-i} + \sum_{i=1}^p \theta_{i2}TKK_{t-i} + \varepsilon_{2t} \dots\dots\dots(3)$$

$$IMP_t = \beta_{03} + \sum_{i=1}^p \beta_{i3}EKS_{t-i} + \sum_{i=1}^p \alpha_{i3}IMP_{t-i} + \sum_{i=1}^p \pi_{i3}PMA_{t-i} + \sum_{i=1}^p \theta_{i3}TKK_{t-i} + \varepsilon_{3t} \dots\dots\dots(4)$$

$$PMA_t = \beta_{04} + \sum_{i=1}^p \beta_{i4}EKS_{t-i} + \sum_{i=1}^p \alpha_{i4}IMP_{t-i} + \sum_{i=1}^p \pi_{i4}PMA_{t-i} + \sum_{i=1}^p \theta_{i4}TKK_{t-i} + \varepsilon_{4t} \dots\dots\dots(5)$$

In which:

EKS_t : Eksport at the t period

IMP_t : Import the t-period

PMA_t : Foreign Investment at the t period

TKK_t : Level of employment opportunity at the period of t

p : Lag maximum length

i : Lag

$\beta_{01}, \beta_{02}, \beta_{03}, \beta_{04}$: Constant

$\beta_{i1}, \alpha_{i1}, \pi_{i1}, \theta_{i1}, \dots \dots \theta_{i4}$: Energy coefficient

ε : Error

Table 1. Descriptive statistics

Variable	N	Maximum	Minimum	Mean	Std. Deviasi
EKS	36	203496.6	15240	90422.01	61734.27
IMP	36	191691.0	16194	80507.34	61699.20
PMA	36	39944.70	490	16768.13	10979.14
TKK	36	97.86	88.76	94.04	2.51

Source: Eviews 10, processed

D. RESULTS AND DISCUSSION

The results of descriptive statistics are shown in Table 1. From the table, each data point has 36 observations, where the export variable has a maximum value of 203496.6, a minimum value of 15240, an average value of 90422.01, and a standard deviation of 61734.27. The import variable has a maximum value of 191691.0, a minimum value of 16194, an average value of 80507.34, and a standard deviation of 61699.20. The foreign investment variable has a maximum value of 39944.70, a minimum value of 490, an average value of 16768.13, and a standard deviation of 10979.14. Meanwhile, the employment opportunity level variable has a maximum value of 97.86, a minimum value of 88.76, an average value of 94.04, and a standard deviation of 2.51.

To identify the existence of root units on the variables, therefore, a data stationarity test is employed by using the unit root test with the ADF (Augmented Dickey-Fuller) test. Based on the result of the unit root test (see Appendix 1), it can be identified that the t-statistic values for the variables of Export, Import, Foreign Investment, and Employment Opportunity Level are smaller than their critical value, which shows that the data are not stationary. Later on, the unit root test will be performed in the first difference stage.

Furthermore, the unit root test (see Appendix 2) indicates that the t-statistic values for the variables of Export, Import, Foreign Investment, and Level of Employment Opportunity are larger than their critical value, which shows that the data are stationary at the level of first difference.

estimation of VAR, the length of the lag is essential. Hence, for performing the VAR test, the length of optimal lag must be pre-determined. In this research, the determination of lag length, from lag 0 to lag 2, must consider the lowest AIC value.

1. The selection of optimal lag

It can be verified from the above result of the optimal lag length test illustrated in Table 4 that the value of Akaike Information Criteria (AIC) and other criteria indicates that lag 0 is the most optimal. It shows that the level of employment opportunity, export, import, and foreign investment is instantly influenced, which indicates the absence of past events towards all four variables.

2. Cointegration Test

Based on the above lag length and due to data being stationary on the first difference on Tabel 4, the cointegration test is then executed to identify whether there is a long-term correlation among the variables studied.

Based on the result of the cointegration test in Table 2, it can be noted that the value of trace statistics and maximum eigenvalue is smaller than the critical value, with the significance level of 0,05, which implies the absence of cointegration for the variables of employment opportunity level, export, import, and foreign investment, there is no long-term correlation among those variables.

3. Vector Autoregression (VAR) Model Estimation

After implementing the cointegration test and resulting in the absence of long-term

Table 2. The Result of the Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Unrestricted Cointegration Rank Test (Trace)			Unrestricted Cointegration Rank Test (Maximum Eigenvalue)		
		Trace Statistic	Critical value	Prob.**	Max- eigen Statistic	Critical value	Prob.**
None*	0.597249	57.78684	47.85613	0.0045	30.01139	27.58434	0.0239
At most 1	0.440007	27.77546	29.79707	0.0841	19.13442	21.13162	0.0930
At most 2	0.185722	8.641034	15.49471	0.3996	6.779971	14.26460	0.5155
At most 3	0.054835	1.861062	3.841466	0.1725	1.861062	3.841466	0.1725

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Eviews 10, processed

correlation, next, the estimation will be carried out by employing the VAR model.

Based on the estimation result of the VAR model, on Tabel 3, the following equations are formulated:

1. Equation 1

$$D(TKK) = -0.03928 * D(TKK(-1)) - 0.11651 * D(TKK(-2)) + 9.84606 * D(EKS(-1)) - 1.96193 * D(EKS(-2)) + 7.41233 * D(IMP(-1)) + 2.67995 * D(IMP(-2)) + 1.68806 * D(PMA(-1)) + 2.03249 * D(PMA(-2)) - 0.30432$$

2. Equation 2

$$D(EKS) = 1936.1913 * D(TKK(-1)) - 1814.5502 * D(TKK(-2)) + 0.42583 * D(EKS(-1)) - 0.27434 * D(EKS(-2)) - 0.28208 * D(IMP(-1)) + 0.08813 * D(IMP(-2)) + 0.17860 * D(PMA(-1)) - 0.42868 * D(PMA(-2)) + 4825.1403$$

3. Equation 3

$$D(IMP) = 3896.5723 * D(TKK(-1)) - 738.4806 * D(TKK(-2)) + 0.81035 * D(EKS(-1)) + 0.15834 * D(EKS(-2)) -$$

$$0.50278 * D(IMP(-1)) - 0.16812 * D(IMP(-2)) + 0.56847 * D(PMA(-1)) - 0.17322 * D(PMA(-2)) + 598.2458$$

4. Equation 4

$$D(PMA) = 1987.1775 * D(TKK(-1)) - 1530.3112 * D(TKK(-2)) + 0.14139 * D(EKS(-1)) + 0.20120 * D(EKS(-2)) - 0.18617 * D(IMP(-1)) - 0.12619 * D(IMP(-2)) + 0.15581 * D(PMA(-1)) + 0.01776 * D(PMA(-2)) + 598.2458$$

In the VAR test, the results are based on the significance level of 0,05, by considering the comparison between the t-count and t-table. In this research, on the significance level of 0,05, the value of the t-table is identified as 1,689. The variables of employment opportunity level, Export, import, and foreign investment have an insignificant influence on the employment opportunity level in the previous one or two periods. It can be identified from the value of the t-count that is smaller than the t-table on the significance level of 5%. Besides, the variables of employment opportunity level, export, import, and foreign investment have a significant influence on the export variable in the previous

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Table 3. The Result of Estimation with the Vector Autoregression (VAR) Model

	D(TKK)	D(EKS)	D(IMP)	D(PMA)
D(TKK(-1))	-0.039283 (0.20569) [0.19098]	1936.191 (2977.69) [0.65023]	3896.572 (4291.74) [0.90792]	1987.178 (1201.64) [1.65373]
D(TKK(-2))	-0.116511 (0.21264) [-0.54792]	-1814.550 (3078.34) [-0.58946]	-738.4807 (4436.82) [-0.16644]	-1530.311 (1242.26) [-1.23188]
D(EKS(-1))	9.85E-06 (2.1E-05) [0.46650]	0.425831 (0.30555) [1.39365]	0.810358 (0.44039) [1.84009]	0.141400 (0.12330) [1.14675]
D(EKS(-2))	-1.96E-05 (2.2E-05) [-0.88171]	-0.274349 (0.32213) [-0.85167]	0.158342 (0.46428) [0.34105]	0.201202 (0.12999) [1.54778]
D(IMP(-1))	7.41E-06 (1.6E-05) [0.45621]	-0.282083 (0.23521) [-1.19928]	-0.502785 (0.33901) [-1.48310]	-0.186170 (0.09492) [-1.96137]
D(IMP(-2))	2.68E-05 (1.7E-05) [1.56155]	0.088137 (0.24845) [0.35475]	-0.168124 (0.35809) [-0.46950]	-0.126197 (0.10026) [-1.25868]
D(PMA(-1))	1.69E-05 (3.5E-05) [0.48718]	0.178608 (0.50161) [0.35607]	0.568473 (0.72297) [0.78630]	0.155818 (0.20242) [0.76976]
D(PMA(-2))	2.03E-05 (3.4E-05) [0.59544]	-0.428682 (0.49415) [-0.86751]	-0.173230 (0.71222) [-0.24323]	0.017767 (0.19941) [0.08910]
C	-0.304321 (0.20994) [-1.44958]	4825.140 (3039.20) [1.58763]	2386.499 (4380.40) [0.54481]	598.2458 (1226.46) [0.48778]
R-Squared	0.203154	0.187736	0.186363	0.282819
Adj. R-Squared	-0.062461	-0.083019	-0.084849	0.043759
F-statistic	0.764843	0.693379	0.687148	1.183046
Log Likelihood	-43.65676	-359.8065	-371.8695	-329.8602

Source: Eviews 10, processed

one or two periods. It is revealed by the t-count value, which is smaller than the t-table.

For import, the export variable in the previous period gives a positive and significant influence on import escalation. It can be verified from the t-count of 1,84009, which is bigger than the t-table. While for the variable of foreign investment, the previous period import leaves a negative and significant influence on foreign investment. It can be noted from the value of the t-count with -1.96137, which is bigger than the t-table, while the variables of employment opportunity level, export, and foreign investment

have an insignificant influence on foreign investment.

Based on the VAR analysis result, the variables of employment opportunity level, export, import, and foreign investment have no significant influence on the level of employment opportunity. This result is aligned with the research conducted by Amri & Nazamuddin (2018), which revealed that the increase in export activity shows no significant influence on employment opportunities in Indonesia.

While research conducted by Priyono & Wirathi (2016) shared the result of VAR analysis on the export variable, which implies that

Table 4. The result of the Granger Causality Test

Null Hypothesis	F statistic	Prob.
D(EKS) does not Granger Cause D(TKK)	0.83255	0.3686
D(TKK) does not Granger Cause D(EKS)	0.10638	0.7465
D(IMP) does not Granger Cause D(TKK)	1.52765	0.2257
D(TKK) does not Granger Cause D(IMP)	0.26292	0.6118
D(PMA) does not Granger Cause D(TKK)	0.21199	0.6484
D(TKK) does not Granger Cause D(PMA)	1.15754	0.2903
D(IMP) does not Granger Cause D(EKS)	3.23074	0.0820
D(EKS) does not Granger Cause D(IMP)	4.66163	0.0387
D(PMA) does not Granger Cause D(EKS)	0.09280	0.7627
D(EKS) does not Granger Cause D(PMA)	9.9E-06	0.9975
D(PMA) does not Granger Cause D(IMP)	0.29524	0.5908
D(IMP) does not Granger Cause D(PMA)	0.97762	0.3304

Source: *Eviews 10, processed*

economic growth and employment opportunity have an insignificant influence on employment opportunities in Bali Province. It is possibly due to the companies that conduct the export, which employ more machines than human resources. Hence, either the increase or the decrease in export activities is insignificant to employment activities.

Furthermore, the variables of employment opportunity, export, import, and foreign investment also indicate insignificant influence on the export variable in the previous one or two periods. The export variable in the previous period indicates a positive and significant influence on import escalation. It is aligned with the research conducted by Arfiani (2019), which explained that the export variable is influenced by the import variable, significantly.

Currently, the export in Indonesia depends on the import of capital goods to fulfill its necessities for production's raw materials. Therefore, export is profoundly influenced by imports, particularly capital goods imports. Moreover, the import of one previous period negatively influences and significantly affects foreign investment. More imports surely threaten the domestic company's productivity, due to the

existence of similar types of goods that offer low prices.

The above condition decreases the intention of foreign investors to invest, due to the possible threat to domestic companies. Low productivity leads to low employment opportunities that directly trigger the growth of unemployment.

Granger Causality Test

This test is employed to identify the correlation among the studied variables. It is objected to seeing the existence of the inter-variable relationship, which is examined through the F test or simply from the probability value. If the probability is less than 0,05, it is ensured that the causal relationship among variables exists.

Based on Table 4, which illustrates the result of the Granger Causality Test, it can be seen that the probability value of export towards the employment opportunity level is counted as 0,3686; on the contrary, the employment opportunity level towards export is counted as 0,7465, which is bigger than 0,05. It implies the absence of a causal correlation between the level of employment opportunity and export. Later, the value of probability on import towards employment opportunity level is counted as

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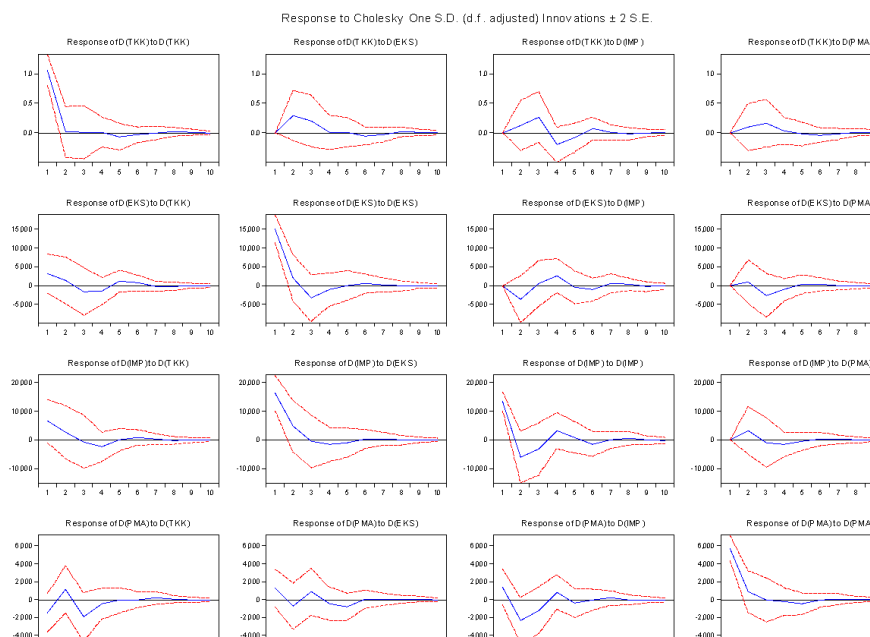


Figure 3. The Analysis Result of the Impulse Response Function

0.2257, while the employment opportunity level towards import is counted as 0,6118, which is bigger than 0,05. It marks the absence of a causal relationship between employment opportunity level and import.

Furthermore, the value of the probability of foreign investment on the employment opportunity level is identified as 0,6484, while the employment opportunity level for foreign investment is identified as 0,2903, which is bigger than 0,05. It clarifies the absence of a causal relationship between the employment opportunity level and foreign investment. On the contrary, the probability value on import towards export is counted as 0,0820, which is bigger than 0,05, while export towards import is verified as 0,0387, smaller than 0,05. A one-way causality relationship between exports and imports. According to Asbiantari et al. (2016), Indonesia needs to import capital goods to independently produce intermediate or finished products, either to fulfill domestic needs or export them overseas. Therefore, if the export increases, the import will also be raised to meet the needs of capital goods and raw materials for production to be exported.

Next, the probability value of foreign investment towards export is counted as 0,7627, and export towards foreign investment is revealed as 0,9975. It is counted as bigger than 0,05, which indicates the absence of a causality relationship between foreign investment and export. Lastly, the probability value of foreign investment towards import for 0,5908 and import towards foreign investment for 0,3304, which is bigger than 0,05. It specifies the absence of a causality relationship between foreign investment and imports.

Impulse Response Function (IRF)

The analysis of impulse response is addressed to recognize the response of endogenous variables in the VAR system due to certain shocks or the alteration of disruptive variables. In this research, the impulse response is adjusted to 10 periods, equal to 10 years. Based on the result of impulse response analysis described in Figure 3, it can be verified that the response of employment opportunity level at the beginning of the period is increasing and fluctuates after, due to the presence of shocks on export, and finally stabilizes in the year 8. It can also be seen that the

response employment opportunity level is due to the existence of shocks in imports. At the beginning of the period, it experiences an increase up to the 3rd period and fluctuates ever since, then becomes stable at the 7th period. The response of employment opportunity level due to the existence of shocks in foreign investment, which experiences an increase in the early period and decreases at the 3rd period, and eventually stabilizes at the 8th period.

On the variable of export, the response to the shocks exposure of employment opportunity level decreases in the 3rd period and fluctuates in the next periods, then becomes stable in the 7th period. Next, the response of exports to the shocks exposure on imports tends to fluctuate and return to stability in the 9th period. While the response due to shocks in foreign investment is stable in the 7th period. For the variable of interest, the response due to shocks on employment opportunity level and export experienced a decrease in the early period and returned to stable conditions in the 7th period.

It is recognized from the result of the above impulse response that the biggest effect is experienced by the variable of export, in which the existing shocks on the variable of import could cause a long-term instability in the export variable, even longer if compared to other variables. This condition is aligned with research conducted by Arfiani (2019), which indicated that the shocks that happen to the variable of import may cause disorder in the variable of export for quite a long time, compared to the effect that occurs on the import variable itself.

Variance Decomposition (VD)

A variance decomposition test is conducted to see how big and how long the proportion of shocks on other variables is towards the designated variable. This test is addressed to predict the contribution of a variant percentage of each variable, due to the alteration of a certain variable included in the VAR system (Widarjono, 2018).

Based on the result of the Variance Decomposition test (see Appendix 4 - 7), it can be seen that at the beginning of the period, the variable of employment opportunity level is profoundly influenced by the employment opportunity level itself by 100 percent, while other variables provide no significance. In the next period, other variables such as export, import, and foreign investment started to have an influence on the employment opportunity level and kept on increasing up to the 10th period with 8,98 percent, 9,67 percent, and 2,7 percent, respectively. Even though the variable of employment opportunity level itself still shares the biggest influence compared to others.

Based on the result of the Variance Decomposition on employment, it can be verified that at the beginning of the period, the export variable is influenced by export itself by 95,75 percent and the employment opportunity level by 4,25 percent. In the next period, the variable of import and foreign investment started to influence the variable of export up to the 10th period. The variable of employment opportunity level influences the export variable by 6,26 percent, the import variable by 7,52 percent, and the foreign investment variable by 3,14 percent.

Moreover, the result of the Variance Decomposition on the variable of import, it can be seen that import is influenced by itself with 37,04 percent, by employment opportunity level with 8,54, and export with 54,42 percent. In the next period, the variable of foreign investment started to have an influence, but with an insignificant one, if compared to others. Up to the 10th period, the influence of export counted as 48,5 percent is still considered bigger than the influence from the import variable itself for 39,86 percent. The condition demonstrates that the influence of export on imports is considered bigger than the import itself.

The latest decomposition test on all variables shows that all variables in this research are influenced by foreign investment. In the next period, the variables of employment opportunity

level, export, and import increase their influence on foreign investment. Even though most influences originate from the variable of the foreign investment itself. In the 10th period, the variable of employment opportunity level influences the foreign investment variable by 13,47, export variable by 6,83 percent, and import variable by 17,63 percent.

E. CONCLUSION

Based on the previous analysis, a conclusion can be drawn that the export variable is highly correlated with the import variable. In the VAR analysis, the variable of export in the previous period gives a positive and significant influence on import enhancement. While the variable of importance in the previous period shares a negative and significant influence on foreign investment, other variables do not influence one another.

On the Granger causality test, there is a one-way causal correlation on the variable of export towards import, and none for other variables. While the result of impulse response analysis, demonstrates the response from the variable of employment opportunity level due to shocks obtained from other variables that take 7-8 years to stable, the response from the export variable due to shocks from other variables takes 7-9 years to stable, the response from the import variable due to shocks from other variables takes 7 years to stable, and the response from the foreign investment variable due to shocks from other variables takes 6-8 years to stable.

Moreover, on the Variance Decomposition test, at the beginning of the period, the variable of employment opportunity level is highly influenced by itself, and other variables influence it in the next period. As the variable of export at the beginning of the period is influenced by itself and the employment opportunity level, then in the next period influenced by the variable of import and foreign investments. Later, at the beginning of the period, the variable of import is influenced by itself, employment opportunity

level, and export, then in the next period, the variable of foreign investment started to influence the import. Starting at the beginning of the period, all variables in this research influence foreign investment.

The escalation of export and foreign investment should be able to expand the job opportunities in Indonesia in its objective to reduce unemployment. Thus, the import must be able to be managed, hence the domestic production can be run without any significant disruption. It could avoid the decrease in productivity that may lead to job loss. The government must formulate strategies and policies related to export, import, and investment that enable the improvement of employment opportunities in Indonesia, both in the industrial sector and other sectors. Research is still limited to the analysis of the relationship of four variables with the basis of the VAR model. The development of the VAR model into SVAR is very much needed in further research, considering that the theoretical relationship between these three variables cannot be ignored. Expanding the study across countries is also a good contribution to seeing how consistent the relationship is between the variables of export, import, foreign investment, and unemployment.

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Appendices

Appendix 1: The result of the ADF Test (Augmented Dickey-Fuller) at the level

t-Statistic value and critical value	Variable			
	Export (EKS)	Import (IMP)	Foreign Investment (FDI)	Level of Employment Opportunity (TKK)
t-Statistic	-0.654902	-0.993094	-1.866348	-1.647560
Critical Values 1%	-3.632900	-3.632900	-3.632900	-3.632900
Critical Values 5%	-2.948404	-2.948404	-2.948404	-2.948404
Critical Values 10%	-2.612874	-2.612874	-2.612874	-2.612874
Prob.	0.8451	0.7450	0.3437	0.4483

Source: Eviews 10, processed by authors

Appendix 2: The Result of the Unit Root Test ADF (Augmented Dickey-Fuller) at the First Difference

t-Statistic value and critical value	Variable			
	Export (EKS)	Import (IMP)	Foreign Investment (FDI)	Level of Employment Opportunity (TKK)
t-Statistic	-5.087142	-5.181783	-5.816994	-5.290357
Critical Values 1%	-3.639407	-3.639407	-3.639407	-3.639407
Critical Values 5%	-2.951125	-2.951125	-2.951125	-2.951125
Critical Values 10%	-2.614300	-2.614300	-2.614300	-2.614300
Prob.	0.0002	0.0002	0.0000	0.0001

Source: Eviews 10, processed by authors

Appendix 3: The result of Determination for Optimal Lag Length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1101.661	NA*	1.49e+24*	67.00976*	67.19115*	67.07079*
1	-1095.159	11.03293	2.67e+24	67.58542	68.49239	67.89059
2	-1085.395	14.20224	4.08e+24	67.96336	69.59591	68.51266

Source: Eviews 10, processed by authors

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Appendix 4: The result of the Variance Decomposition Test on TKK

Period	Variance Decomposition of D(TKK):				
	S.E.	D(TKK)	D(EKS)	D(IMP)	D(PMA)
1	1.065262	100.0000	0.000000	0.000000	0.000000
2	1.115797	91.16095	6.836180	1.249930	0.752936
3	1.176460	82.00850	9.059991	6.355424	2.576087
4	1.193986	79.62989	8.800502	8.982850	2.586758
5	1.198908	79.30130	8.738506	9.363832	2.596358
6	1.203387	78.79067	8.875497	9.659863	2.673968
7	1.204052	78.70373	8.943722	9.654855	2.697690
8	1.204397	78.67972	8.950736	9.668757	2.700784
9	1.204500	78.67532	8.954014	9.667117	2.703551
10	1.204530	78.67222	8.953671	9.670674	2.703438

Source: Eviews 10, processed

Appendix 5: The Result of the Variance Decomposition Test on Export

Variance Decomposition of D(EKS):					
Period	S.E.	D(TKK)	D(EKS)	D(IMP)	D(PMA)
1	15421.46	4.250720	95.74928	0.000000	0.000000
2	16043.64	4.610843	90.06649	4.914960	0.407706
3	16661.99	5.157565	87.36286	4.675662	2.803909
4	17003.11	5.672256	84.27185	6.952403	3.103492
5	17055.02	6.132121	83.76084	6.973717	3.133326
6	17116.19	6.256325	83.25286	7.340963	3.149848
7	17129.36	6.258577	83.14467	7.449500	3.147250
8	17133.78	6.264706	83.10583	7.483703	3.145765
9	17136.82	6.262492	83.07659	7.516109	3.144814
10	17137.21	6.262344	83.07285	7.520129	3.144680

Source: Eviews 10, processed

Appendix 6: The Result of the Variance Decomposition Test on Imports

Variance Decomposition of D(IMP):					
Period	S.E.	D(TKK)	D(EKS)	D(IMP)	D(PMA)
1	22226.96	8.537019	54.42379	37.03919	0.000000
2	23865.61	8.628859	51.10494	38.39971	1.866492
3	24116.07	8.530614	50.10802	39.38871	1.972652
4	24559.45	9.204168	48.76313	39.68549	2.347209
5	24598.19	9.175544	48.76618	39.68965	2.368629
6	24660.63	9.259102	48.53745	39.83379	2.369655
7	24665.34	9.264817	48.54223	39.81876	2.374198
8	24673.68	9.263370	48.51004	39.85392	2.372675
9	24673.88	9.263843	48.50930	39.85403	2.372824
10	24675.44	9.263156	48.50391	39.86010	2.372826

Source: Eviews 10, processed

Appendix 7: The Result of the Variance Decomposition Test on Foreign Investment

Variance Decomposition of D(PMA):					
Period	S.E.	D(TKK)	D(EKS)	D(IMP)	D(PMA)
1	6223.281	5.396999	4.233789	5.429014	84.94020
2	6825.137	7.238574	4.631161	15.79540	72.33486
3	7244.419	13.57473	5.542708	16.67683	64.20573
4	7324.245	13.64775	5.826057	17.62532	62.90087
5	7391.067	13.41190	6.819852	17.59826	62.16999
6	7391.588	13.41003	6.827657	17.59583	62.16649
7	7396.884	13.46826	6.818418	17.62813	62.08519
8	7397.276	13.46979	6.821428	17.62762	62.08116
9	7397.901	13.46782	6.832637	17.62464	62.07490
10	7397.928	13.46777	6.832613	17.62512	62.07450

Source: Eviews 10, processed