ANALYSIS OF THE EFFECT OF INFLATION AND EXCHANGE RATE ON EXPORTS IN 5-YEAR ASEAN COUNTRIES (YEARS 2010–2020)

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Abstract

International trade is a form of economic cooperation between two or more countries that provides direct benefits. International trade has an important role because a country cannot meet all domestic needs and with international trade, every country in the world can exchange resources owned by each country, with the aim that there is no excess or lack of resources in each country in the world. This research was conducted in 5 countries in ASEAN, namely Indonesia, Singapore, Thailand, Malaysia, and the Philippines with a period being tested for 11 years starting from 2010 to 2020 with 2 independent variables being tested, namely inflation and the exchange rate in 5 ASEAN countries and the dependent variable tested is Exports in the 5 ASEAN countries. Analysis of the data used in this study is panel data regression. The results of this analysis show that inflation and exchange rate have a negative and significant effect on exports in the five ASEAN countries, which means that if inflation or the exchange rate in a country increase, exports will decrease and vice versa. So, the macroeconomic factors that exist in a country must still be considered and also considered in international trade activities.

Keywords: Inflation, Exchange Rate, Export, ASEAN

INTRODUCTION

Each country has its advantages and disadvantages, some countries are blessed with abundant natural resources, on the other hand, some countries are poor in natural resources but are endowed with superior human resources so they can create efficient technology, resulting in an exchange of resources between countries. International trade can lead to the establishment of an economy between one country and another which can affect the economic conditions of the two countries. International trade occurs due to two main factors, namely factors that affect supply and demand (Nopirin, 2009:3).

Countries with open economic systems cannot avoid the flow of international trade. International trade is a form of economic cooperation between two or more countries that provides direct benefits. This form of collaboration between countries can be in the form of export or import activities. Countries that carry out economic cooperation will directly increase the use of goods and services. Increasing the use of goods and services will form a relationship of interdependence between countries. (Rahardja and
Manurung, 2008:80). This illustrates the basic argument for the formation of free trade between countries.

Developing countries that are relatively richer in labor than capital will specialize in labor-intensive products and become net exporters of these products in international trade transactions. On the other hand, developed countries, which are richer in the capital, will become net exporters of capital-intensive products (Wiwin, 2017). Amornkitvikaia, et al., (2012) argues that strong export performance plays an important role in encouraging a country's economic growth. The increase in foreign markets also results in more demand for these exports, the number of products produced will increase (Farabi, 2014). Export itself is the activity of selling goods and services from within the country to abroad.

International trade plays an important role in meeting the needs of countries in the world. With the occurrence of international trade, foreign exchange is needed. According to Tambunan (2001:1), international trade is defined as trade between or across countries, which includes exports and imports.

International trade is important for the economy of every country to prosper its people. International trade has an important role because a country cannot meet all domestic needs. With international trade, every country in the world can exchange resources owned by each country, with the aim that there is no excess or lack of resources in each country in the world.

Christianto (2014) reveals that the factor that affects the trade balance so that it cannot run smoothly is the exchange rate. In its development, the current money market that money does not only function as a medium of exchange, but also a commodity that is traded and speculated. Almost all countries have their currencies, so the exchange rate problem arises. The existence of currency differences in various countries makes international trade unable to run smoothly.

In addition to the exchange rate, exports are also affected by the inflation rate. Inflation is the process of increasing the general prices of goods continuously over a certain period, the inflation rate weakens the trade balance. This is because inflation will lead to a weakening of competitiveness and ultimately lead to a decline in exports.

Based on this, the authors are interested in analyzing the effect of inflation and exchange rates on exports in ASEAN-5 countries consisting of Indonesia, Malaysia, Singapore, the Philippines, and Thailand during 2010-2020. The expected benefit of this research is that research results can contribute to scientific development in the economic field and can be taken into consideration by the government in making policies related to international trade, especially exports.
LITERATURE REVIEW

Export
According to Todaro (2000), exports are international trade activities that provide an impetus to grow domestic demand which causes the growth of large manufacturing industries, followed by a stable political structure and flexible social institutions. Exports make a positive contribution to the country's economy, the greater the export, the higher the economic activity to be achieved. Meanwhile, imports have the opposite effect, greater imports result in lower national income (Sukirno, 1999: 390).

In the Hecksher-Ohlin theory (in Appleyard, Field and Cobb, 2008) it is explained that a country will export its products that are produced using cheap and abundant factors of production intensively. Hecksher-Ohlin has the opinion that a country that conducts international trade or trade between countries is due to the comparative advantage possessed by that country, this advantage can be reflected in the form of technology and advantages in its production factors.

This activity will be beneficial for a country because it will increase national income and accelerate the process of development and economic growth. Export is an effort to sell commodities owned to other nations by expecting payment in foreign currency. Malian (2003) explains that the factors that affect exports can be seen from the demand and supply-side. From the demand side, exports are influenced by export prices, real exchange rates, income, and devaluation policies. On the supply side, exports are influenced by export prices, domestic prices, real exchange rates, production capacity that can be produced through investment, imports of raw materials, and deregulation policies.

Inflation
Keynes saw that inflation occurs because of the excessive lust of a group of people who want to take advantage of more available goods and services. Because of the desire to meet needs in excess, demand increases, while the constant supply that will occur is the price will rise. Inflation is a condition where the increase in the price of goods, in general, occurs continuously over a period. The existence of this inflation can reduce people's purchasing power which will lead to reduced people's welfare. Each country always tries with various policies issued so that inflation that occurs in the country is within the normal limits that have been set. Fluctuating inflation causes uncertainty for people's welfare and reduces people's purchasing power for goods and services (Mankiw, 2006: 216).

According to Ball (2005: 281), when the inflation rate is high it will result in the prices of goods and services produced by a country, where the prices of these goods and services will increase, resulting in decreased exports and less competition. Inflation can cause imports to grow more rapidly but on the contrary, export developments will increase slowly (Sukirno, 2002). If a country experiences inflation, the number of goods produced by that country will not be able to compete in the international market. This is due to an increase in the price of domestic goods so that producers are not able to
produce optimally (Wardhana, 2011). At the time of inflation, the competitiveness of export goods decreases. Reduced competitiveness occurs because the price of export goods is getting more expensive. Inflation can be difficult for exporters and countries. The country suffers losses due to reduced export competitiveness, which results in reduced sales. The foreign exchange earned is also getting smaller. When inflation occurs, the price of goods will continuously increase and have an impact on the sluggish purchasing power of the people. The increase in inflation will lead to higher production costs of export goods, thus making exporters less optimal in producing this, resulting in reduced competitiveness for export goods because exports are increasingly expensive and have an impact on declining exports.

**Exchange Rate**

International trade carried out by a country cannot be separated from the exchange rate that has been set. According to Mankiw (2003), the exchange rate is the price set in an international trade transaction. The exchange rate of a country's currency is divided into nominal exchange rates and real exchange rates. The nominal exchange rate is the relative price of the currencies of two countries while the real exchange rate is related to the relative prices of goods between the two countries.

The exchange rate or exchange rate is the price set in an international trade transaction. The exchange rate as a measure of the value of trade between countries triggers the flow of trade. Uncertain (unstable) foreign exchange rates make it difficult for exporters and importers to determine prices and buy and sell goods. These difficulties also have an impact on the price of trade supply and demand. As a result, international traders are reluctant to carry out export and import activities. The exchange rate fluctuates drastically and uncontrollably will cause difficulties for the business world in planning their business, especially for those who import raw materials from abroad or sell their goods to the export market.

In his book, Mankiw (2003) explains the correlation between the exchange rate and the volume of international trade using the Mundell Fleming Model. This model assumes that the price level is fixed and shows the causes of short-run fluctuations in a small open economy with perfect capital mobility. The Mundell Fleming model shows that depreciation or appreciation of the value of a currency will result in changes to both exports and imports. If the exchange rate depreciates, the value of the domestic currency relative to foreign currencies decreases, the volume of exports will increase.

Sukirno (2012) explains that when the exchange rate decreases or there is a devaluation of the currency, exports will increase because in international trade or foreign markets export prices become cheaper.

Purchasing Power Parity (PPP) theory is an exchange rate theory which states that one unit of a certain currency must be able to buy the same amount of goods in a country so that countries with relatively high inflation will have a depreciating currency, while other countries with relatively high inflation will have a depreciating currency with
relatively low inflation will have an appreciating currency (Mankiw, 2013). As a result, the purchasing power of consumers to buy domestic products will be the same as the purchasing power to buy foreign products, this can also affect exports.

**Previous Research**

a. Silviana's research (2016) using the Fix Effect Model OLS analysis method shows that inflation and exchange rates have a negative effect on exports in Indonesia.

b. Khoironi and Ida Ayu's research (2017) using multiple linear regression analysis shows that the exchange rate and production level have a positive and significant effect on exports. Meanwhile, inflation does not significantly affect exports.

c. Research by Ayuningtyas, et al (2014) using the Multiple Linear Regression research method shows that the rupiah exchange rate and export prices simultaneously have a significant effect on exports but partially only export prices have a significant effect.

d. Research by Muhammad Fuad Anshar, et al (2017) with the method of multiple linear regression analysis shows the following results:

1. Simultaneously, the exchange rate and inflation variables have a significant effect on exports in ASEAN-5 countries.

2. Partially, the exchange rate variable has a negative effect on exports in Indonesia, Malaysia, and Singapore. The exchange rate variable has a positive effect on exports in the Philippines and does not significantly affect Thailand.

3. Partially, the inflation variable has a positive effect on exports in the Philippines and has no significant effect on Indonesia, Malaysia, Singapore, and Thailand.

**Conceptual Framework**

The framework of thought in this study can be described as follows:

**Hypothesis**

Based on the above framework, the following hypothesis can be formulated:

H1: Inflation partially has a negative and significant effect on the value of exports in ASEAN-5 countries in 2010-2019.
H2: Exchange rate partially has a negative and significant effect on exports in ASEAN countries in 2010-2019.

RESEARCH METHODS

The scope of this research is the effect of inflation and exchange rate on exports in ASEAN-5 countries where exports are the dependent variables, while inflation and exchange rates are independent variables. The variable measurement scale used in this study is the ratio scale. This study used secondary data with a quantitative approach method. The type of data used is time-series data from 2010-2020 and a cross-section of 5 countries in ASEAN (Indonesia, Singapore, Malaysia, Thailand, and the Philippines). This data was obtained from the publications of Badan Pusat Statistik (BPS), Bank Indonesia, and World Bank publications in range 2010 – 2020.

Data Analysis Technique

This research is quantitative research with data analysis method used is Panel Data Regression Method. Panel data regression analysis is defined as combining cross-section and time-series data. The model used in this study is as follows:

\[ \text{EXPORTS} = C + a \times \text{EXCHANGE RATE} + b \times \text{INFLATION} + e \]

Where:
- Export = Nominal of goods sold overseas.
- C = Constant.
- Exchange rate = Price set in an international trade transaction
- Inflation = The general rate of increase in prices
- a and b = Coefficient of independent variables (Exchange and Inflation)
- e = Error/Residual

Estimation Selection

According to Sriyana (2014), the use of panel data can provide the availability of the amount of data analyzed and provide a large amount of data so that it can meet the requirements and statistical characteristics with several estimation options, namely:

a. Common Effect Model (CEM)

The common effect model can be said to be the simplest model because it only combines timeseries and cross-section data into the panel data (data pool). The results of these data can then be regressed using the Ordinary Least Square (OLS) method.

b. Fixed Effect Model (FEM)

This model can be assumed that the object of observation and the regression coefficient (slope) remains large from time to time. This fixed effect approach has the possibility of a mismatch of the model to the real situation. So we need a model that can show differences with intercepts that assume differences between objects
and between times (Sriyana 2014).

c. **Random Effect Model (REM)**

This model assumes that differences in intercepts and constants can be caused by residuals or errors as a result of differences between units and periods that occur randomly. This estimation model is called the Error Component Model (ECM).

**Model Selection**

From the three estimation selections, a model selection is carried out which aims to choose the right model. There are several tests carried out, namely:

a. **Chow Test**

Tests to determine the right CEM or FEM model to be used in estimating panel data. The hypotheses in the chow test are:

\[
\text{H}_0: \text{Can be used to choose CEM or pooled least square model}
\]

\[
\text{H}_a: \text{Can be used to select FEM model}
\]

The hypothesis used must have an intercept with the same value. If the cross-section probability value \(F > \text{from table } F (\alpha = 0.05)\) it will cause \(H_0\) to be rejected, meaning that the right model to use is the FEM model and vice versa (Sriyana, 2014).

b. **Hausman Test**

Used as a statistical test in choosing whether the most appropriate FEM or REM model is used. Hausman test testing is carried out with the following hypothesis:

\[
\text{H}_0: \text{Selecting the REM model}
\]

\[
\text{H}_a: \text{Choose the FEM model}
\]

If the Hausman statistic (W-count) probability of a random cross-section is greater than \((\alpha = 0.05)\), the REM model is appropriate, and vice versa (Sriyana, 2014).

**Hypothesis Selection**

The hypothesis testing used in this research is the Determinant Coefficient Test (R²), Joint Regression Coefficient Test (F Test), and Partial Regression Coefficient Test (T-Test).

a. **Coefficient of Determination Test (R²)**

Sriyana (2014) explained that the determinant coefficient was carried out to find out how well it was in the analysis, which was indicated by the R² value in the form of a percentage. The amount of R² comes from the proportion of the dependent variable that is explained using the model and the rest is not explained using the model. The higher the R² value, the stronger the relationship between the independent variable and the dependent variable.

b. **Joint Regression Together (Test F)**

Testing the dependent variable on the independent variable alone can be tested simultaneously with the F test. If \(F \text{ count} > F \text{ table (critical)}\) it will reject \(H_0\) but if \(F \text{ count} < F \text{ table (critical)}\) it will accept \(H_0\) (Sriyana, 2014).
c. Partial Regression Coefficient (T-Test)

The T-test can be used to develop statistical hypotheses, to determine the degree of error (\(\alpha\)), to determine critical t and hypothesis decisions. The value of the t table is obtained with = 0.05% and df. If the value of T count > T table then H\(_0\) is accepted or H\(_1\) is rejected, if t count < t table then H\(_0\) is rejected, and H\(_a\) is accepted.

RESULT AND DISCUSSION

From the data analysis performed with panel data regression, the following results were obtained:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>3.58E+11</td>
<td>1.55E+10</td>
<td>23.12621</td>
<td>0.0000</td>
</tr>
<tr>
<td>TP?</td>
<td>-1.77E+10</td>
<td>4.37E+09</td>
<td>-4.043353</td>
<td>0.0002</td>
</tr>
<tr>
<td>UM?</td>
<td>-17719405</td>
<td>4227522</td>
<td>-4.191440</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

From the results of the analysis of this study using Eviews 9 and the panel data regression method, the results of the T-statistical test on the inflation variable showed a coefficient value of -1.77E+10 with a significance value of 0.0002 < 0.05. Based on the results of the research analysis, H\(_1\) is accepted so that it can be concluded that in this study partially inflation has a negative and significant effect on exports.

The Effect of Inflation on Export

The results of the partial hypothesis test show that there is a significant negative effect between inflation on exports. This indicates that rising or falling inflation affects export activities. The results of this study are also in line with the export theory where...
inflation has a significant negative effect on exports. When the inflation rate is high, export activities will decrease, and vice versa when inflation falls, export activities will increase.

At the time of inflation, the competitiveness of export goods decreases. Reduced competitiveness occurs because the price of export goods is getting more expensive. Inflation can be difficult for exporters and countries. The country suffers losses due to reduced export competitiveness, which results in reduced sales. The foreign exchange earned is also getting smaller. When inflation occurs, the price of goods will continuously increase and have an impact on the sluggish purchasing power of the people. The increase in inflation will lead to higher production costs of export goods, thus making exporters less optimal in producing this, resulting in reduced competitiveness for export goods because exports are increasingly expensive and have an impact on declining exports.

The Effect of Exchange Rate on Export
The results of the partial hypothesis test show that there is a significant negative effect between the exchange rate on exports. This indicates that fluctuations in the exchange rate affect export activities. The results of this study are in line with the theory of the Mundell-Fleming Model where the exchange rate has a significant negative effect on exports. When the exchange rate strengthens, export activities will decrease, and vice versa when the exchange rate weakens, export activities will increase. The Mundell Fleming model shows that the depreciation or appreciation of the value of a currency will result in changes to both exports and imports. A strengthening exchange rate will result in a decrease in the number of a country's exports.

Purchasing Power Parity (PPP) theory is an exchange rate theory which states that one unit of a certain currency must be able to buy the same amount of goods in a country so that countries with relatively high inflation will have a depreciating currency, while other countries with relatively high inflation will have a depreciating currency with relatively low inflation will have an appreciating currency (Mankiw, 2013).

As a result, consumers' purchasing power to buy domestic products will be the same as purchasing power to buy foreign products, this can also affect exports.

CONCLUSIONS AND SUGGESTIONS

This study was conducted to examine the inflation and exchange rate variables on exports. In this study, the objects in this study were 5 countries in ASEAN (Indonesia, Singapore, Malaysia, Thailand, and Philippines) with a period of 2010 - 2020 and produced 55 observations. The best model used in estimating the data is the Fixed Effect Model (FEM).

Based on the results of research and discussion, it can be concluded that simultaneously on the F test inflation and the exchange rate have a significant effect on
exports. In the T statistical test, inflation has a significant negative effect on exports, this is following the export theory where inflation has a negative and significant effect on exports. In the T-test, the exchange rate has a negative and significant effect on exports, and this is following the theory of the Mundell Fleming Model where the exchange rate has a significant negative effect on exports.

**Limitations**

From the research process carried out, several limitations were experienced and became several factors to be paid more attention to for future research. Some of the limitations of the study include:

1. The research object used is only 5 countries in ASEAN, of which there are 11 countries in ASEAN.
2. The number of observation data is only 55, which of course is still insufficient to describe the actual situation.
3. The independent variables used are only two variables, namely inflation and the exchange rate (exchange rate).
4. The use of panel data as an analytical tool cannot determine the short-term or long-term effect. The use of panel data can only see the effect between variables.

**Suggestions**

From the results of the analysis and conclusions of this study, several suggestions can be made, namely:

1. It can be considered for further researchers in examining the effect of macroeconomic indicators on a country's exports.
2. The results of this study can be considered for exporters in carrying out their business activities. Macroeconomic factors of a country must still be considered and considered.
3. For further researchers, it can be considered to use the Error Correction Model (ECM) analysis method to see the short-term and long-term effects.

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