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# The Determinant of Beef Import Growth in OIC Countries

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## Abstract

*This study aimed to test the extent of factors affecting beef import activities as one of the import commodities in countries of the Organization of Islamic Cooperation (OIC). The method used in this study was the regression of panel data collected from time-series data with the range of 2010 to 2017. Its subjects were 7 OIC member countries that had the largest population and complete data availability. The Factors used in testing beef import activities covered beef production, beef consumption, exchange rate, inflation, and Gross Domestic Product (GDP). The results of this study showed that overall independent variables were able to significantly affect the volume of beef imports by 90%. However partially, the study found that only aspects of beef production, exchange rates, and inflation had significant effects on the volume of beef imports, while the variable of consumption of beef and GDP did not.*

**Keywords:** ***Import, Beef, OIC Countries***

## Abstrak

Penelitian ini bertujuan menguji sejauh mana faktor-faktor yang mempengaruhi kegiatan impor daging sapi sebagai salah satu komoditas impor di negara anggota Organisasi Kerja Sama Islam (OKI). Metode yang digunakan dalam penelitian ini menggunakan regresi data panel yang dihimpun dari data runtut waktu dengan rentang tahun 2010 hingga 2017, serta objek data menggunakan 7 negara anggota OKI yang memiliki jumlah populasi penduduk terbesar serta ketersediaan data yang lengkap. Faktor–faktor yang digunakan dalam menguji kegiatan impor daging sapi yakni meliputi produksi daging sapi, konsumsi daging sapi, nilai tukar, inflasi, dan Produk Domestik Bruto (PDB). Hasil penelitian ini menunjukkan bahwa secara keseluruhan, variabel independen mampu mempengaruhi secara signifikan terhadap volume impor daging sapi sebesar 90%. Namun secara parsial, penelitian ini menemukan bahwa hanya aspek produksi daging sapi, nilai tukar, dan inflasi yang berpengaruh signifikan terhadap volume impor daging sapi. Sedangkan variabel konsumsi daging sapi dan PDB tidak berpengaruh signifikan terhadap volume impor daging sapi pada negara anggota OKI.

**Kata Kunci: Impor, Daging Sapi, Negara OKI**

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## INTRODUCTION

The economic progress of a country is inseparable from the economic sector that sustains it. It will decide whether the country is developed or developing. The contribution of each sector supporting the condition of economic development in each country is called as economic growth. The former can happen once there is increasing capacity of various economic goods available in a country over a long period of time (Todaro & Smith, 2012).

The rapid impact of globalization requires each country to compete in conducting international economic activities. One of them is the existence of international trade covering all commodities, including the export of imports of halal products. Islamic countries that are members of the Organization of Islamic Cooperation (OIC) participate in trading products and services between countries. Sutawi (2019) states that the emergence of competitive free market competition makes countries with low competitiveness as the main targets to win competing products and services.

International trade indicates that a country implements an open economic system. Heckscher and Ohlin believe that international trade occurs because each country has a different magnitude or ratio of production factors. A country will import commodities whose production factors are relatively rare and expensive, while the country will export if the commodity comes up with relatively efficient production factor (Bakry, 2015).

Islamic countries incorporated in the OIC participate in trading products and services between countries. However, the presence of the free market itself makes the trade competition more tight and competitive. A research conducted by Smith et al (2018) shows that the quality of meat produced by the livestock industry and the rate of growth of livestock not only meet the domestic needs of its citizens, but also meet the needs of international market competition.

**Table 1.** The Cattle Population in OIC Countries (head, in thousand)

| Country | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|
| Indonesia | 12,686 | 14,726 | 15,419 | 16,004 | 16,599 |
| Iran | 7,936 | 4,231 | 4,572 | 5,237 | 4,879 |
| Iraq | 2,780 | 2,900 | 1,823 | 1,860 | 1,899 |
| Malaysia | 751 | 743 | 742 | 737 | 744 |
| Pakistan | 38,299 | 39,743 | 41,241 | 42,800 | 44,400 |
| Saudi Arabia | 456 | 354 | 357 | 361 | 364 |
| Turkey | 13,914 | 14,415 | 14,223 | 13,994 | 14,080 |
| Uzbekistan | 10,141 | 10,607 | 10.995 | 12.181 | 12,471 |

Sources : The Food and Agriculture Organization (Processed Data)

Based on Table 1, the number of cattle population in OIC countries tended to have differences based on the needs of the population, geographical and cultural conditions of each country. If the livestock sector has supportive environmental conditions, there will be good farm market potential (Pham, 2015). The diversity of OIC member countries both developed and developing countries is one of the reasons for not only including geographical region only.

Beef import activities by OIC member continue to increase every year. Based on the graph of the total import value of some OIC countries over a period of 5 years, beef import activity is still one of the food commodities that is always carried out. The increase in the value of imports is inseparable from the supply of domestic beef that is considered not able to meet the needs of the community so that it continues to import beef from abroad every year. Import activities through international trade play a role in a country's economy, but if the import is done massively and excessively it can cause a recession of the domestic economy.

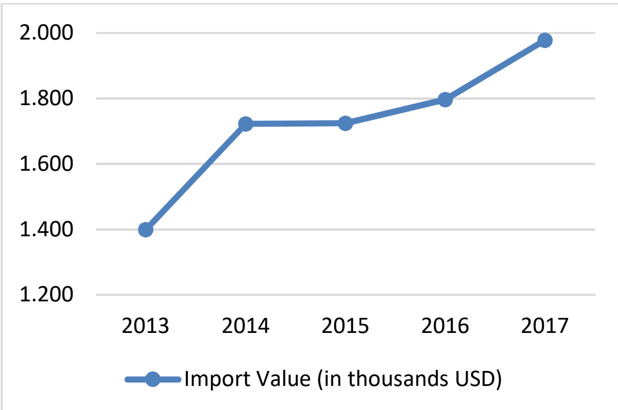


**Figure 1.** Number of import values from multiple OIC countries
Sources by the FAO (Processed Data)

The provision of food needs must be able to be met through production in the country adjusting to population growth in the country (Purwaningsih, 2008). That is why import is done as a way to fulfill beef demand in each country. The import activities are carried out by a country in order to meet the needs of meat supply based on quality and quantity and maintain price stability in the community. Chisilia & Widanta (2019) research found that one of the main causes of excessive imports is the ratio of consumption to domestic production, while at the same time the domestic production is unable to meet consumption or market demand.

In the African regions self-sufficiency, livestock usually becomes a net exporter to foreign countries. However, at the same time, intra-African trade has not been utilized to the maximum so they still import animal products (Rich, 2009). Africa's ability to capitalize these new opportunities will depend heavily on its ability to compete competitively with other competitors. The biggest challenge for countries in the African regions in facing the global market is limited competitiveness with a wide range of competitors in the field.

The trend of increasing meat imports, especially in southeast Asia increased sevenfold in 2016. Several countries in the region such as Malaysia, Indonesia, Vietnam in large quantities import livestock from Australia for their respective domestic needs (House, 2018). In some Asian countries, the increasing demand for beef has played an important role in regional trade.

Beef export and import activities have become one of the international trade commodities owned by each country. The availability of beef production in a country, as well as beef consumption factors according to Yulianto (2019), Didik (2017), and Widanta (2019) can significantly affect the volume of beef imports in a country. The increasing amount of consumption that causes the demand for beef needs must be accompanied by the availability of sufficient beef production. The inability of a country to provide sufficient beef stocks will result in an increase in beef imports.

The review of production and consumption aspects regarding beef import activities or policies is considered quite important to see the potential of each country (Chisilia & Widanta, 2019; Maruli et al., 2017; Yudhanto et al., 2019). Other aspects that play an important role in the growth of meat imports are the increase in inflation, exchange rate, and GDP. If these aspects increase every year it can affect the import of beef (Ihza, 2018; Prasetyawati & Basuki, 2019; Rudatin, 2016).

The growth potential of the beef trade in the Islamic states has increased in line with the Muslim community's concerns about halal food. The estimated demand for halal food ranges from USD 2.1 trillion per year with a Muslim population of 2 billion worldwide (Nakyinsige et al., 2012). Therefore, there needs to be variables of production and consumption of beef that seek to combine with macro variables such as inflation, exchange rate, and GDP.

Furthermore, the objects of this study were not only from countries in one geographic region, but also international organizations whose member countries have geographical and cultural differences. The current of this study sought to analyze the influence of domestic beef production, per capita beef consumption, inflation, exchange rate, and GDP on the growth of beef imports in OIC member countries. The study also tried to find the right stimulus to reduce beef imports in these countries.

## RESEARCH METHODS

The study in this article used quantitative approach. The data acquisition that the author used in the writing of this article was derived from secondary data source. Secondary data are data that have been processed in such a way and published by official institutions, namely the World Bank, Food and Agriculture Organization, and other literature that support the object of this study.

The period reviewed in this study ranged from 2010 to 2017. It aimed to review the OIC member countries in Asia. Meanwhile, the population of this study was OIC member countries in the Asian continent region with the sample category of the OIC country with the largest population and has a complete availability of data to be followed up in the data processing stage.

In terms of sample, the current study involved of several countries, namely Indonesia, Pakistan, Turkey, Saudi Arabia, Uzbekistan, Malaysia, and Kazakhstan. They were chosen based on the sufficient data to further be followed up at the processing stage of the data. In addition, the total number of samples used in the study was 56 data.

To do the review, the researchers took the merging of time series data (period 2010 to 2017) and cross-section (7 OIC countries). The quantitative data were then analyzed using the panel data regression model by Gujarati (2009). It is the development of a simple regression analysis tool for two or more independent variables or predictor variables to predict dependent variables or responses.

After the determination of the study sample, the next analysis was done to a predetermined variable, namely dependent variables in form of beef imports volume. The independent variables used in this study consisted of beef production, beef consumption, exchange rate, inflation, and GDP. Here, the researchers attempted to find out whether there was a correlation between dependent and independent variables.

Before the final results were found, the analysis was carried out through several tests to determine the best model on the panel data as well as the needs for normality tests, autocorrelation tests, and heteroscedasticity tests so that data analysis results can be interpreted properly. In this study, the data was analyzed using data regression analysis panel technique with the formula of regression equation as follows:

$$Y = \alpha + \beta iPRDK1it + \beta 2KNSM2it + \beta 3NT3it + \beta 4INF4it + \beta 5GDP5it + €it \qquad (1)$$

Information :

| | | |
|---|---|---|
| Y | = | Volume of beef imports |
| α | = | Constant |
| PRDK | = | Beef production |
| KNSM | = | Beef consumption |
| NT | = | Exchange rate |
| INF | = | Inflation |
| GDP | = | Gross Domestic Bruto |
| i | = | Country |
| t | = | Time |

The method of estimating the regression model using panel data can be done through three approaches, including the Common Effect Model (CEM), Fixed Effect Model (FEM), or Random Effect Model (REM). Of the three regression models to estimate panel data, there will appear the best model to be analyzed.

The selection of the best model among three was conducted using several tests. Chow test is used to find out the best model between Common Effect Model and Fixed Effect Model. Furthermore, there is the Hausman test to find out the selection of models between the Fixed Effect Model and the Random Effect Mode, while the last test is the Lagrange multiplier (LM) test aiming to choose between Common Effect Model and Random Effect Model.

## RESULTS AND DISCUSSION

To find out the best model to be analyzed using Common Effect Model (CEM), Fixed Effect Model (FEM), or Random Effect Model (REM), the researchers performed the first test using Chow test, Lag test and Hausman test.

**Table 2.** Chow Test Results

| Effects Test | Statistic | d.f | Prob |
|---|---|---|---|
| Cross-section F | 17.765814 | (6,44) | 0.0000 |
| Cross-section Chi-square | 68.902607 | 6 | 0.0000 |

Source : Data Processed, 2020

The Chow test result above indicates that the better model used in this study was the Fixed Effect Model. It was based on the test results which rejected the zero hypothesis, so the data testing can be continued to the Hausman test.

**Table 3.** Haussman Test Results

| Test Summary | Chi-Sq. Statistic | Chi-Sq. d.f. | Prob. |
|---|---|---|---|
| Cross-section random | 16.558328 | 5 | 0.0054 |

Source : Data Processed, 2020

The Haussman test performed the selection between FEM and REM in order to find the best model. It obtained a probability result of 0.0054 or less than 0.05, meaning that the Fixed Effect model was the best. Based on the test results, the best model selection was used as a panel data regression test.

Furthermore, the stage of interpretation of data was conducted based on the selected FEM. The following table shows the results of estimated data with the number of observations as many as 7 countries during the period of 2010-2017. Based on the regression results of the panel data below, there obtained the constant value of 1687888 with a probability value of 0.0011 or less than 0.05, meaning that the constant had a significant effect.

It implied that beef production in a country could negatively affect the growth of beef imports. At the same time, the decrease in beef production had an impact on the increase in beef imports in a country. In addition, the factor of beef consumption turned out to have a positive influence; in other words, the increase in beef import growth coupled with the increase in beef consumption in OIC countries. However, the beef consumption factor was not significant.

**Table 4.** Panel Data Regression Test Results

| Variable | Coefficient | t-Statistic | Prob. |
|---|---|---|---|
| C | 1687888. | 3.488776 | 0.0011 |
| PRDK | -155127.0 | -3.296596 | 0.0019 |
| KNSM | 3046.321 | 1.445993 | 0.1553 |
| NT | 104998.7 | 2.723212 | 0.0092 |
| INF | -3398.392 | -2.341726 | 0.0238 |
| Adj. R-Squared | 0.909105 | | |
| Prob (F-Statistic) | 0.000000 | | |

Source : Data Processed, 2020

The next significant factor influencing the growth of beef import volume was the influence of the exchange rate. The increase in the exchange rate in a country had a positive effect on the growth of beef imports. Furthermore, there noticed inflation factors that negatively affected beef imports. With every increase in inflation in a country, there would be a decrease in beef import trade activities. For more, the last factor of GDP did not significantly affect the volume of beef imports.

It can be inferred that simultaneously all independent variables had an influence on the growth of beef imports by OIC member countries. Overall, the independent variables significantly influenced the growth of beef imports by 7 OIC member countries during the period of 2010-2017.

The review found that the F-Statistic probability value was 0.0000. Furthermore, the results of data analysis showed that adj value obtained. R-Squared of 0.909105, indicating that the independent variables were able to explain dependent variables by 90% while the remaining 10% was described other variables outside the model.

Based on the results of data panel regression, beef imports were influenced by beef production. The relationship between the two variables was inversely or negatively proportional so that if the supply of beef production in OIC countries decreased, it indirectly increased the import activities of beef to meet the beef needs of its citizens.

The data analysis results explained that each increase in beef production by 100,000 tons caused a decrease in beef import volume by 155,127 tons. The correlation between beef production and beef import volume had a significant effect as evidenced by the probability value below 5% which was only 0.0019. The findings of the data suggested that aspects of beef production had an effect on beef imports in OIC countries have been proven.

The volume of import activities may increase or decrease based on a country's ability to produce such goods. If production is unable to meet domestic demand, imports will continue to be carried out, so production volumes will have a negative impact on imports. High production costs leads to a decrease in consumer demand, while producers are indirectly forced to decrease the amount of production quantity resulting an increase in imports ((Pinandra, Anak Agung Bagus Surya Okto., & Rustariyuni. {itra Surya Dewi Rustarini, 2015).

A continuous increase in import activity can worsen domestic beef production. It can be anticipated if a country is able to provide production with the quality and quantity of goods needed. Thus, the volume of imports will be reduced or no imports at all. The findings of this study are also supported by previous researches stating the same things (Chisilia & Widanta, 2019; Yudhanto et al., 2019).

Lack of beef quality production was the reason causing a country imported beef from others. Another problem experienced by producers was regarding high production cost which later made the amount of production not maximum so that meat import was still carried out in order to keep the beef supply sufficient for the community.

Some countries has begun to focus on fixing the problem of imports of beef commodities. One of them is Kazakhstan which actively adopts import subsistence policy in the beef and meat sector. Great expectations can slow the trend of imports of meat in entering the domestic market. Besides, support is also given by the Government of Kazakhstan such as by subsidizing livestock, purchasing feed, and maintaining veterinary services. However, the beef cattle industry has already experienced a crisis due to the lack of maximum support and assistance from the government (Nassyrova et al., 2020).

Indonesia conducts cooperation on imports and exports of beef to maintain the availability of beef when the total domestic beef needs are not met. Based on the data, the problem of beef in Indonesia was also still around the classic problem of bureaucracy. Bureaucratic problems as well as spiritual deterioration of businessmen or bureaucrats with frequent acts of fraud significantly harmed the state. This made beef production in Indonesia was still not maximum because of the many problems that have not been able to be handled by the government.

The quality of domestic beef was still not up to standard in some circles of society. Therefore, some traders still needed more quality imported beef for their customers. Similarly, if the purpose of meat import activities is to get low prices from countries with low production costs, domestic beef producers will get some impact in their production activities (Tutkun, 2017).

Beef consumption had a positive relationship with the volume of beef imports. Further findings obtained from the regression results showed that the variable of beef consumption affected the volume of beef imports but was not significant. The insignificant factors of beef consumption in affecting the volume of meat imports were indicated by the probability value of 0.1553 or greater than 5%.

The beef consumption variable was determined by population and meat consumption per capita. It is because the increased public awareness of the importance of animal protein can increase national beef consumption. Based on the review of the consumption activities of the people in OIC countries, the increase of beef consumption must be in line with the government efforts to carry out beef import activities. Maruli (2017) and Chisilia (2019) state that there is a per capita consumption of beef coupled with an increase in beef imports each year.

Although beef consumption factors had a positive relationship with beef import activities, it had no significant effect based on the findings in this study. This was allegedly due to the influence of different cultures and physiologies of society in each OIC country so that the level of meat consumption of the community was also different. Broadly speaking, only OIC countries in the Middle East region had high levels of beef consumption, while in Asia such as Southeast Asia, the beef consumption was still low.

Other factors causing beef consumption having no significant influence could be caused by people's preference in choosing foodstuffs. Indirect measures on consumer preferences and consumption habits can play a role in increasing and lowering per capita meat consumption globally (Milford et al., 2019).

The positive relationship between consumption and imports has reviewed the extent of the quality of beef available in the community. Upper-middle class has high tastes and standards in consuming some foods, one of which is imported beef. Despite the high standards of consumption, the population of the upper-middle class is not dominant so it could not represent widespread consumption of beef and has not been able to influence significantly.

Based on the results of the data processing, the exchange rate significantly influenced the activities of beef imports and was related positively evidenced by the probability value of 0.0092 and significance at $\alpha = 5\%$. As a result, any increase in the exchange rate would increase beef import activities in OIC countries. It can be interpreted that beef import activities could not be separated from the influence of exchange rates.

The findings in this study are contrary to logic and based on existing theories when the exchange rate depreciates, the price of imported goods becomes expensive and the import activities of goods will decrease. However, previous research by (Salim, 2019) found that the exchange rate has a significant positive influence. The generally increased exchange rate results in an increase in the price of imported beef but the price is not higher than the price of local beef.

The lack of beef supply in some OIC member countries requires beef import activities despite the increase in the exchange rate (Ihza, 2018). The need for imported beef must still be met in order to maintain the balance of beef prices in the domestic market. Worse impacts can occur if the scarcity of a food commodity occurs prolonged which can cause the price of other goods to increase.

The cause of no impact of rising exchange rate on the volume of beef imports was due to cultural factors. The presence of religious holidays every year in OIC countries causes an increase in demand for beef ahead of fasting and Eid al-Fitr. The high demand for beef at a certain time makes the government try to maintain the supply of beef by importing beef although the currency exchange rate is still high.

According to the data analysis results, inflation variable could significantly affect beef import activities. The direction of the relationship between the two was negative or any increase in the inflation rate could contribute to a decrease in beef import activities in a country. The inflation findings that negatively affected meat imports is in line with a previous research conducted by (Sembiring & Sasono, 2019).

It is generally known that if inflation is not well controlled, it will rise every year and cause the policy of importing products and services of a country will decrease or even stop at certain commodities. Based on a research by (Prasetyawati & Basuki, 2019) the increase in inflation each year leads to a decrease in beef imports in the long term.

High inflation can also lead to higher prices of staples and production materials. If inflation in a country is not well controlled it will make losses in various sectors of the economy. However, inflation must remain at a low percentage to stimulate a country's economy and decline beef imports. Intervention by the government and central bank through fiscal and monetary policy can be an effort to control the inflation rate within reasonable limits so that the economy of a country can increase through national income.

The next factor known to have a positive relationship in beef import activities was GDP. The researchers found a positive relationship, but no significant effect. As one of the sources of import activities, if a country's income gets bigger it will directly affect the country's ability to purchase goods and services (Mankiw, 2014). The positive relationship results can be obtained through the GDP of a country.

It can also indicate any international trade activities such as beef imports will increase. However, if the volume of imports is carried out in large quantities and continuously, it will cause a leakage of a country's revenue. Indirectly, the impact on the amount of GDP absorption is not maximum. The demand for imported beef was influenced by the purchasing power of the community where only the upper-middle class can afford and want to buy beef.

This is supported by the same findings from previous researches that GDP has a positive effect on import activities in a country (Agus & Ayuningsasi, 2016; Anggiani & Azizah, 2019; Junaidi et al., 2018). Insignificant aspects of GDP is again in line with a previous research by Ichsan (2016) that beef is not among the largest commodities in import activities in OIC countries.

## CONCLUSION

This study sought to examine the extent of beef import volume growth by OIC countries through the aspects of beef production, beef consumption, exchange rate, inflation rate, and Gross Domestic Product. The results of the reviews showed that overall independent variables significantly influence the growth of beef imports in 7 OIC member countries during the period 2010-2017.

Partially, the variable of beef production is apparently able to affect significantly and has a negative relationship with the volume of beef imports. It can be interpreted that the higher beef production in a country can reduce the volume of beef imports in the country. The volume of beef imports is also influenced by the exchange rate in OIC countries based on the findings of this study.

This means that if the growth of the Dollar exchange rate in each country increases the beef import activities in the OIC country will do so. This is because the findings explain that the exchange rate has a significant positive influence on beef imports.

In addition, it was also found that the variable inflation rate has an inversely proportional relationship with beef import activities. Thus, a country's high inflation rate can trigger a decrease in international trade activities such as imports as a form of anticipation of policies carried out to maintain economic stability in the country.

Based on the findings, some aspects that affect beef imports can disadvantage a country. Factors capable of increasing imports are likely to still be reduced so that state revenues and beef supply availability can be met. Efforts to make this happen can be done through the government as a stakeholder and policymaker.

Full support in the form of positive actions that can encourage domestic farmers in developing their production, and solve bureaucratic problems can be done to counter obstacles in the domestic livestock sector. Therefore, the volume of beef imports is expected to decrease in the future.

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