



## Do Indonesian dairy farmers need special regulation?

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### Abstract

Facts and discourses that happen in the dairy farms development in Indonesia exhibit government regulations as a determining factor. In the local and global economic context, government policies are getting important to support upstream side dairy farmers production. The study analyzed the impact of various government regulation on Indonesia's total imports of milk. The study also analyzed the effects of two crisis periods, namely the Asian economic crisis in mid-1997 and the 2008 global crisis. It triggers import turmoil and government regulation changes. Then, the study considered Indonesia's policy related to WTO to see the broader impact on milk imports. Using regression analysis on series data during 1977-2016, our research found significant robust that the two crisis period suppressed milk import. Milk imports had a vulnerability to external shocks risk through exchange rate fluctuations. The Indonesian global trade policy through the WTO mechanism, however, had an insignificant impact on milk imports. The Government regulation related to WTO tends to weaken the position of dairy farmers on the milk market competition. Meanwhile, various government regulation increased milk import. Therefore, the Indonesian government should make special regulations that support dairy farmers to increase milk production.

**Keyword:** Crisis; dairy farmers; dairy product; fresh milk; government regulation; milk import

## INTRODUCTION

The Asia-Pacific region has seen the world's highest growth in demand for milk and dairy products over the last 30 years (Moran and Morey, 2015; Kapaj, 2017). In fact, small holder dairy farmers produce over 80% of the world's annual 240 billion litres of milk (Moran and Morey, 2015).

Indonesia also experienced high growth in milk consumption. However, Indonesia's milk production not yet meet the needs of domestic milk raw materials until now.

Indonesia, after China and Algeria, is still the third-largest country to import milk powder in the world. Overall, there was a cow milk deficit of approximately 208 thousand tons in 2017. Local cow's milk was only able to meet 26.2% of cow's milk needs. The rest, 73.8% of local cow's milk fulfilled by imports until 2017.

This situation creates a dilemma. The milk processing industry seeks to fulfil the needs of milk, which is dominated by milk powder and obtained through imports on one side. On the other hand, domestic dairy farmers' production indirectly neglected due to less demand for their products.

Several policies are designed by the government to fulfil the need for Indonesian milk, without omitting domestic dairy farmers since a long time ago. The government released regulations relating to the supply and absorption of milk in Indonesia thirty-seven years before. At that time, domestic milk production was only able to supply around 14% of domestic milk needs. (Kompas, August 4, 1982).

The government issues regulations known as "BUSEP" or Evidence of Absorption. This provision stated in the Decree of the Minister of Trade and Cooperatives, which took effect on August 14, 1982. The milk processing industry gets permission to import milk if it can show evidence that they buy milk from domestic farmers. The ratio is one to seven.

The BUSEP regulation then abolished in 1998 in line with enactment of the IMF rules. The Presidential Decree No. 4/1998 on the coordination and development of national milk which is part of the Letter of Intense set by the IMF, resulting in changes to the government regulations that restrict imports of milk. The BUSEP regulation then became no longer valid. (Ilham nad Swastika, 2001; Amaliah, 2008; Pratiwi, and Hakim, 2013; Guntoro, *et al.*, 2016).

Various studies have sought to analyze the impact of removing BUSEP policy regulations (Amaliah, 2008; Kustiari, 2008; Pratiwi and Hakim, 2013; Siregar, 2013). However, the study about BUSEP abolition was implemented at period that was relatively concurrent with the 1997 economic crisis.

Beyond BUSEP's policy and analysis, there are actually a number of other regulations aimed at increasing milk production. In 2009, a year after global crisis period, the government issued Minister of Finance Regulation No. 131/PMK.05/2009 concerning Cattle Breeding Business Loans.

Cattle Breeding Business Credit (KUPS) is a credit given by the implementing bank to Cattle Breeding Business Actors who receive interest subsidies from the Government. The Cattle Breeding Business Actors are breeding companies, cooperatives, groups/joint groups of breeders who conduct Cattle Breeding Business. KUPS for Business Actors in the form of Cooperatives and Farmer Groups/Groups is given until 2014, with interest subsidies ending no later than 2020.

The subsidised credit offered by the government, according to (Farid and Sukes, 2011) research, is often difficult to access by farmers due to requirements problems. Additional costs for managing subsidised credit are borne by farmers as well so that the real capital costs proposed by farmers become higher.

The government, through the minister of finance, also issued another regulation on the same year. The government issued Regulation of the Ministry of Finance (PMK) No. 101/PMK.011/2009 dated May 28, 2009 concerning Stipulation of Import Duty (BM) Tariffs for the Import of Certain Dairy Products sets the import tariff for dairy products to be five percent.

Initially, the import tariff for dairy products was zero referring to PMK No. 19/2009 dated February 13, 2009. The intended milk products are butter milk, condensed milk and milk heads, yoghurt, kefir, milk and yeast/sour milk heads.

Without BUSEP's policy, however, raw milk import is a threat for farmers considering the quality of imported raw milk over the domestic fresh milk (Guntoro, *et al.*, 2016).

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About a year ago, the milk policy in Indonesia has become a hot issue after the change of regulations from the Ministry of Agriculture (Kementan). The Kementan issued Regulation No. 33/2018 as amendments to Regulation of the Minister of Agriculture No. 26/2017 concerning Provision and Distribution of Milk.

The revised regulation of the Ministry of Agriculture gave rise to two discourse related to the production and import of cow's milk. First, the revision is allegedly related to the pressure of the interests of the WTO and major milk producing countries.

Changes to regulations, according to the government, are a consequence of Indonesia as a member of the WTO. The government is thus obliged to synergize with the existing regulations, especially related to exports and imports. (Kontan, August 20, 2018).

Second, the revision is considered to increase imports and disadvantage for the dairy farmers. The reason is, the government is eliminating the obligation of the milk processing industry to partner with farmers. Most likely, the milk processing industry prefers to import milk rather than buying fresh milk from farmers.

Meanwhile, many developing countries including Indonesia facing problem related to the ability and quality of dairy farmers. Several weaknesses discourage the competitiveness of many Asian countries in producing qualified milk (Beghin, 2006).

Facts and discourses that happen in the dairy farms development in Indonesia exhibit government regulations as a determining factor. In the local and global economic context, government policies are very important to support dairy farmers production on the upstream side.

The BUSEP policy is only one of various regulations issued by the government to increase milk production in this study. Therefore, we see BUSEP as part of a wider set of government regulation that promotes production.

The study applies various government regulation that supports production as a dummy variable along our research's period. We focused on three regulation, i.e policy of reducing the ratio of milk imports (BUSEP), cattle breeding business credit (KUPS), and import tariff policy for dairy products.

The study analyze the impact of government and foreign trade policies on Indonesia's total imports of milk specifically. The study also analyze the effects of two crisis periods, namely the Asian economic crisis in Mid-1997 and the 2008 global crisis, which triggered import turmoil and policy changes, toward milk import in Indonesia.

The revised Ministry of Agriculture regulation controversy also strengthened research motivation to know significance rule that has been imposed by the government on supporting Indonesian milk production. To our best knowledge, there are few research looks at the effect of various regulation on milk production and the impact on milk import in Indonesia.

Then, the study also consider Indonesia's participation in WTO as a dummy variable. The WTO plays an important role, reduces import tariffs that become trade barriers. That is, we also consider the wider impact of Indonesia's participation in WTO to see the impact on milk imports. Insignificant dummy variable means WTO does not affect supporting dairy farming in Indonesia.

### **Review of literature**

In developing countries, policies are generally designed to reduce milk imports and promote domestic production because of the importance of improving the livelihoods of farmers' households (Kapaj and Deci, 2017).

The same thing also happened in Indonesia. The BUSEP regulation aims to provide market certainty to domestic fresh milk producers. Some studies examine the impact of government regulations focusing on BUSEP regulations.

Before crisis mid-1997, government implemented policy mix, i.e BUSEP, import tariffs, import licensing scheme and restrictions on investment in milk processing. It has resulted in a significant increase in numbers of dairy cattle and dairy farmers, fresh milk and end-product output, and lowering import (Erwidodo and Trewin, 1996).

However, this policy mix imposes costs. Still According to (Erwidodo and Trewin, 1996), rapid expansion of domestic fresh milk production without technological and productivity improvements will result in high-cost raw materials and a non-competitive milk manufacturing sector. Domestic prices are negotiated mainly on a cost-of-production basis, bearing in mind the constraints of import

competition. Cost-of-production pricing fails to provide incentives to lower costs, to increase productivity and to innovate.

The impact of the increase in imports after BUSEP was abolished in 1998, according to the conclusion (Amaliah, 2008; Pratiwi and Hakim, 2013), was relatively small in a short run. This means, according to (Pratiwi and Hakim, 2013), that the imported raw materials volume for milk will not increase when the government abolished the import ratio policy. The major cause is importing ratio policy abolition that relatively happened at the same time as the 1998 economic crisis in Indonesia.

Therefore, the government's policy to eliminate milk imports has no positive effect on national milk imports in the short run referring to the study (Amaliah, 2008; Pratiwi and Hakim, 2013).

The sensitivity analysis conducted by (Siregar, 2003) showed that the import tariffs abolition on milk caused the competitiveness of local cattle milk commodities to decline. However, farmers still have financial and economic competitiveness even though the milk import tariff conditions are at zero percent.

Government regulation changes after mid-97 crisis. On the one side, Indonesian Government should follow the IMF, and, WTO regulation. However, study conducted by (Rose, 2004) found that there are no differences between WTO members and non-members on tariff rates.

His study using regression panel data from 1950-1998 in 168 countries and 68 measures of trade policy and liberalisation. It is to ask if membership in the World Trade Organization (WTO) and the General Agreement on Tariffs and Trade (GATT) is associated with more liberal trade policy.

Rose concluded in his study that there is no convincing evidence that membership in the multilateral trade system is associated with a more liberal trade policy. It might be that WTO did not liberalize trade, but it only liberalizes countries policy.

On the other hand, dairy farmers in Indonesia also faced many production problem after BUSEP abolished in 1998. Indonesia is the one of developing and transitioning countries that have small farms with 15 cows or fewer. Feed is the highest single cost component of the dairy farm (Kapaj and Deci, 2017).

Study conducted by (Ilham and Swastika, 2001) showed that after the crisis, the domestic dairy farm industry is economically more efficient, but not with dairy farmers. Meanwhile, net impact of government policy did not provide an incentive to farmers.

## **METHOD**

### **Research Object**

This study used yearly data collected from 1977-2016 with the scope of research throughout Indonesia. The data used are secondary data published by Food Agricultural Organization (FAO), Statistic of Indonesia, Central Bureau of Statistics and Directorate General of Animal Husbandry, Ministry of Agriculture. This study is quantitative with the purpose to determine the impact of government regulation on Indonesia's total imports of milk. This study also used Indonesian dairy farmers as the unit of analysis.

### **Research limitation**

We used yearly data from 1977-2016 as a sample.

We used 2016 as a recent sample due to data availability

We focused on three regulation, i.e policy of reducing the ratio of milk imports (BUSEP), cattle breeding business credit (KUPS), and import tariff policy for dairy products.

### **Hypothesis**

The impact of government regulation to Indonesia's total imports of milk

In developing countries, policies are generally designed to reduce milk imports and promote domestic production because of importance of improving the livelihoods of farmer's households (Kapaj and Deci, 2017). Research by (Amaliah, 2008) said that the policy of reducing the ratio of milk imports (BUSEP) has a positive impact on the volume of milk imports in Indonesia.

Consumers can freely import without having to buy domestic milk production. Meanwhile, research by (Pratiwi and Hakim, 2013) discussed the policy of reducing the ratio of milk imports not be significant to milk imports in the short term or long term.

The impact of foreign trade policy (wto) to indonesia's total imports of milk

The joining of a country to international trade organizations like WTO should be able to impact on the trade of the country. However, the WTO has not been able to provide many benefits for member countries. There is no significant difference in import tariff levels between WTO and non-WTO member countries (Rose, 2004). Meanwhile, the competitiveness of local dairy products in the TPK Cibedung has fallen due to the elimination of imported milk tariffs.

Whereas, dairy farmers have good competitiveness both financially and economically (Siregar, 2009). After joining the WTO, a reduction of import tariffs of dairy products in China increased the trade on traditional products such as milk powder. This increase was accompanied by imports of cheese and other dairy products, due to the low production of these goods (Fuller *et al.*, 2005).

The impact of crisis period to Indonesia's total imports of milk

The competitiveness of domestic production increased after the monetary crisis period, due to the higher price of import milk. So, the milk processing industries prefer to buy domestic milk production than import.

The system of dairy cattle breeding has also improved because of the higher price of imported dairy cattle (Swastika, et al., 2003). Research by (Pratiwi and Hakim, 2013) said that the crisis decreased in import activities by the milk processing industries due to a decrease in people's purchasing power.

Accordance with existing theories and previous studies, the hypotheses arranged are as follow:

**Hypotheses 1:** The impact of government regulation that encourages production are expected to be significant in reducing Indonesia's total milk import using annual data from 1977-2016.

**Hypothesis 2:** The impact of Foreign Trade Regulation (WTO) are expected to be significant in reducing Indonesia's total milk import using annual data from 1977-2016.

**Hypothesis 3:** The impact of crisis period's dummy variable are expected to be significant in reducing Indonesia's total milk import using annual data from 1977-2016.

Variables and research models

The dependent variable used in this study is Indonesia's total milk import. While the independent variables used include per capita consumption, the exchange rate, the ratio of milk production to total milk imports, the dummy variable of crisis period, the dummy variable of government regulation that encourages milk production, and the dummy variable of foreign trade regulation through be the member of WTO.

Here are the specifications of each variable used in the study:

Import (IMP)

The import is the total import of milk and milk products in Indonesia. The data measured in a thousand tons, collected from the Food and Agriculture Organization (FAO).

Consumption (CONS)

The consumption is the consumption of milk per capita in kilograms/capita/year. The data collected from FAO and Central Bureau of Statistics Indonesia.

Production Ratio (PRO\_RATIO)

Production ratio is the ratio of the domestic fresh milk production to total milk imports in percent. The data collected from FAO.

Exchange Rate (EXR)

The exchange rate of the rupiah against the United States Dollar in IDR/USD. The data collected from Bank Indonesia and CEIC.

The dummy variable of crisis period (D\_CRI)

This is the dummy variable for the crisis period. Worth 1 for the crisis period (1997-2003 and 2008-2010) and 0 for the non-crisis period. The information was obtained from Bank Indonesia publications.

The dummy variable of government regulation that encourages milk production (D\_REG)

In the research period, several regulations encouraged domestic milk production. When that is the regulation period, we put 1. When that is the non-regulation period, we put 0. Sources of the regulation information are Presidential Instruction (Inpres No.2 / 1985 and Inpres No.4 / 1998) and

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Minister of Finance Regulation (PMK No. 101 / PMK.011 / 2009 and PMK No. 131 / PMK.05 / 2009).

The dummy variable of World Trade Organization (D\_WTO)

We consider Indonesia's participation in WTO. The sign is 1 for the period after Indonesia joined the WTO, and 0 before Indonesia joined the WTO. The information collected from Ministry of Commerce of the Republic of Indonesia.

Then, we arrange the model as follows:

$$IMP_t = \beta_0 + \beta_1 CONS_t + \beta_2 PRO\_RATIO_t + \beta_3 EXR_t + D\_CRI + D\_REG + D\_WTO + \epsilon_t \dots (1)$$

Where:

IMP	= Indonesia's total milk import
CONS	= Consumption of milk per capita
PRO_RATIO	= Production Ratio
EXR	= Exchange Rate
D_CRI	= Dummy variable of crisis period
D_REG	= Dummy variable of government regulation that encourages milk production
D_WTO	= Dummy variable of World Trade Organization (D_WTO)
$\epsilon$	= error term
t	= year

Analysis method

This study uses multiple linear regression analysis to determine the effect of independent variables on the dependent variable. We use Eviews 8th version as an analytical tool.

We also run a robustness test to get the BLUE (Best Linear Unbiased Estimation) on our model. Classical assumptions testing includes the normality test, autocorrelation test, heteroscedasticity test, and multicollinearity test.

## RESULTS AND DISCUSSION

The regression results using the Eviews analysis tool showed that simultaneously consumption per capita (CONS), the exchange rate (EXR), production ratio (PRO\_RATIO), dummy variable of crisis period (D\_CRI), dummy variable of government regulation that encourages milk production (D\_REG) and the dummy variable of foreign trade regulation through be the member of WTO (D\_WTO) has a significant effect on Indonesia's total milk import in particular.

This showed by the F-stat probability of less than alpha 5%. Simultaneously, the independent variables in the model were able to explain their effect on Indonesia's total milk import in particular in 98.6%.

Partially, the variable consumption per capita, exchange rate, and dummy variable of government regulation that encourages milk production are significantly positive for Indonesia's total milk import in particular. This shown by the positive value of the coefficient on the regression results.

Meanwhile, the production ratio and dummy variable of the crisis period has the negative significant effect on Indonesia's total milk import in particular. This shown by the negative value of the coefficient on the regression results.

The significance of these variables shown by the probability of t-statistic on regression results below 5%. Only the dummy variable of WTO does not have a significant effect on Indonesia's total milk import in particular in this model. It shown by the probability of t-statistic on regression results more than 5%.

Classical assumption test

The result of the classical assumption test shown that the model is BLUE.

Normality Test

The normality test was done to find out whether the error term follows the normal distribution. This test used Jarque-Bera (JB) statistic by comparing the probability value of JB at the output with the level of significance (Gujarati, 2004). We chose a significance level of 5 percent (0.05). The output showed the probability of JB is 0.59 (greater than significance level). So, the error term follows the normal distribution.

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#### Autocorrelation Test

Autocorrelation test is performed to find out whether there is a correlation between the data in a particular year ( $t_1$ ) and the previous year's data ( $t-1$ ) (Gujarati, 2004). Because the data used in this study is time series data, it is necessary to do an autocorrelation test. We used Breusch-Godfrey test by comparing the probability value of Chi-Square at the output with a significance level of 5 percent. The result showed the probability of Chi-Square is 0,052. So, this model escapes the autocorrelation problem.

#### Heteroscedasticity Test

Heteroscedasticity test is used to find out whether there are heteroscedastic variance in the model. We used Breusch-Pagan-Godfrey (BPG) by looking at the chi-square probability of  $Obs^*R$ -squared in the output (Gujarati, 2004). The output showed the chi-square probability is 0.25 (greater than 5 percent), so this model is not exposed to heteroscedasticity.

#### Multicollinearity Test

Multicollinearity test is needed to determine whether there is a correlation between the independent variables in the research model. Correlation can be seen from the number of Variance Inflation Factor (VIF). If the VIF value more than 10, so there is a correlation between independent variables (Gujarati, 2014). The output showed the VIF value from all independent in model less than 10. The output showed the VIF value from all independent in the model less than 10. So, the model in this study does not have multicollinearity.

The per capita consumption (CONS) has a significant effect on Indonesia's total milk imports using the data period of this study. The magnitude of the coefficient shows that every 1 kg increase on milk per capita consumption will increase milk imports by 5.96 tons.

A similar pattern occurs when there is a consumption decrease. when Milk consumption increases, total milk imports will also increase due to Indonesia's inability to meet milk needs. The result in line with Dewayani and Kesumajaya (2015). The study concluded that milk consumption has a significant positive impact on total milk imports.

Research by (Ahmad and Hermiyetti, 2014) says that the increase in Indonesia's milk consumption is a result of an increase in population and per capita income. Besides, a decrease in the real price of milk and changes in tastes or information also affect milk consumption (Campo and Beghin, 2005). An analysis of consumption decomposition by (Dong, 2005) shows the growth of the milk market will be driven mostly by income and population growth and, as a result, will raise world milk prices.

The positive effect of consumption on imports is also in line with the trends of this research data. In the last eight years, the consumption trend increase, followed by an increasing trend in imports according to the data. In 1998 Indonesian milk consumption decreased by 14.71%, allegedly caused by a decrease in people's purchasing power. At the same time, Indonesia's total milk imports also decreased by 15.61% from the previous year.

The exchange rate (EXR) has a significant positive effect on total Indonesian milk imports using the data in this study period. It is indicated by the t-statistic probability below alpha 5%. The higher the rupiah exchange rate against the US dollar, total milk imports will increase. It happens because the rupiah's value is higher so that the milk processing industry can get more imported milk at the same level of expenditure.

The coefficient value of 0.004 means that when the exchange rate is appreciated 1 rupiah per US\$, the total milk imports will increase by 0.004 tons. The milk processing industry prefers imported milk because of the quality is considered better than the domestic (Tifani et al., 2011).

A positive relationship also occurs when the value of the rupiah depreciates. The weakening of the rupiah has an impact on the purchasing power of imported milk. Under these conditions, the milk processing industry as the main actor in milk imports will tend to choose to buy domestic dairy products.

Research by (Pratiwi and Hakim, 2013) concludes the same results. The exchange rate has a positive effect on Indonesia's total milk imports. As the rupiah's real exchange rate depreciates, the milk processing industry as one of the importer will behave rationally by reducing imports. The cause

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is, the exchange rate depreciation makes the real domestic price of milk becomes cheaper comparing with the real price of imported milk.

During the study period, the largest exchange rate change was in 1997, when the exchange rate depreciated by 95.13%. In that year the total milk imports decreased by 18.09% from 28.74 thousand tons to 23.54 thousand tons. In 1998 the Indonesian rupiah depreciated again 72.58% from 4,650 to 8,025. Total milk imports also declined again to 20.08% at the same time. It happened as one of the Asian crisis impacts that also experienced by Indonesia.

The crisis period dummy has a significant negative effect on the total Indonesian milk imports using this research data period. That is evidenced by an alpha probability of less than alpha. The negative value of the dummy coefficient of the crisis period of 8.53 can indicate that in the crisis period the total import of Indonesian milk will decrease by 8.53 thousand tons.

There were two crisis periods during the research period, namely the Asian crisis (1997-2003) and the global crisis (2008-2010). Since July 1997, the crisis hit Indonesia and weakened the national economy. The struck was marked by the weakening of the rupiah. During the crisis, the rupiah against the US\$ depreciated to 95.13%. Indonesia's total milk imports also declined by 18% in 1997 and 14% in 1998.

The year 2004 was at the same time with a new phase in the management of the nation's economy. Since early 2004 Indonesia had been the last country among countries affected by the crisis in Asia, who had completed a macroeconomic stabilization program under IMF supervision. The decision to quit from the program was motivated by improved macroeconomic developments and a strong commitment to continue the economic restructuring program independently. (Bank Indonesia, 2003).

Data during the study period also shows the impact of the 2008 crisis on total milk imports in Indonesia. In that year, Indonesia's total milk imports decreased by 21%. According to (Vanzetti, et. al., 2013), Indonesian milk market faced with constant and inelastic demand. Consequently, a production increase drives down prices by more than the change in output.

The ratio of milk production to total imports has a significant negative effect on Indonesia's total milk imports. The t-stat probability is below 0.049 with a coefficient value of -0.005. It is indicating that when the ratio of milk production to imports increases by 1%, the total milk imports will decrease by 0.005 thousand tons. Similarly, when there is a decrease in the ratio of milk production to total milk imports.

During the study period, the trend of the ratio of milk production to total milk imports declined, while the trend of total milk imports continued to increase. The average growth ratio of milk production to total milk imports during the study period was only 2.87%. It is contrast with average growth in total milk imports which reached 11.13% over the past four decades.

The milk production ratio to total milk imports shows a continuing downward trend. It's reflecting the weakness of Indonesia milk producers. Indonesian milk producers are characterized by smallholder dairy farmers in large quantities. Meanwhile, the milk processing industry is few and tends to lead to an oligopoly (Hutabarat, 1998).

Therefore the domestic economy, according to (Erwidodo and Trewin 1996), will take benefit when government policies can remove barriers that limit trade and investment in dairy products.

Algeria, Bangladesh, Egypt, India, Indonesia, and Pakistan have small farms, with each having about 5–15 cows. (Kapaj and Deci, 2017). Dairy industry-specific regulation could foster international technology transfer to small holder dairy farmers through better genetic stock and feed; promote human capital in dairy production regarding feed and sanitation, and lead to changes in incentive structure for quality improvements (Beghin, 2006).

Besides, there is a wide range of productivity levels across regions in Indonesia. This would involve improving the feed supply and improving collection and transport (Vanzetti, *et al.*, 2013). The Government could focus on making producers more productive.

However, according to (Vanzetti, et. al., 2013), Indonesian milk market faced with constant and inelastic demand. Consequently, a production increase drives down prices by more than the change in output. In other words, an ideal government policy can encourage production while maintaining the price level of cow milk producers.

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The milk consumption in India, according to (Kapaj dan Deci, 2017), has increased from 39 to 66 g/day in a 5-year period. This is due to the Indian government encouraging the process of increasing consumption by reducing the level of imports, supporting milk producers and encouraging investment in this sector.

The dummy on policy driving production has a significant positive effect on total Indonesian milk imports using the data of this study period. The output results show that the presence of a policy driving production (D\_REG) variable in the model will make the biggest change to Indonesian total milk imports. It is proved by a coefficient value of 17.29.

The positive influence between dummy regulation of production on milk imports is contrary to the study hypothesis. One of the causal factors is the effectiveness of government regulations.

The positive impact of dummy production regulations on milk imports implicitly reflects the low effectiveness of government regulations to increase production. This is in line with conclusions (Swastika and Ilham, 2001). The nett impact on government regulation did not provide an incentive for farmers. This was indicated by the magnitude of effective protection coefficient that smaller than 1. It means that regulation did not provide an incentive to farmers due to the low price of fresh milk at industrial level milk processing compared to its border price.

The WTO dummy variable has no significant effect on Indonesian milk imports using the data of this study period. This is thought to be related to Indonesia's low position in dealing with the interests of major milk-producing countries. Referring to the study result by (Davis, *et al.*, 2018) the US will benefit more from increased consumer spending in Indonesia and Singapore than from increased spending in Vietnam and the Philippines. The US is the second-largest milk producer in the world after India (Kapaj and Deci, 2017).

The government also faces an interests dilemma between the needs of smallholder dairy farmers and bow with global agreements through the WTO mechanism. The abolition of import tariffs entirely will harm producers according to the conclusion (Vanzetti, *et al.*, 2013). The results suggest supply side policies predominantly benefit consumers and demand side shocks benefit producers to a greater degree. The removal of tariffs on dairy products would not be beneficial for Indonesian producers. Peraturan pemerintah idealnya lebih berpihak pada small holder dairy farmers.

The WTO dummy which proved to be insignificant in suppressing imports should also be seen as “unfair trade” among of the free market.

Many Asian countries, including Indonesia suffer from one or more factors hindering their competitiveness in dairy (tropical climate, land and feed scarcity, labor cost, transaction/transportation costs) (Beghin, 2006).

Also, every dairy exporter still has the power to protect dairy farms in their countries. Rose (2004) found that there are no differences between WTO members and non-members on tariff rates. There are almost no discernible differences between GATT/WTO members and non-members for tariff rates, measures of non-tariff barrier coverage, price-based measures, measures of openness, and so forth.

## CONCLUSION

The positive impact between dummy production regulations on milk imports implicitly reflects the low effectiveness of government regulations to increase production.

Government policy support for dairy farmers plays an important role in suppressing milk imports. Milk imports had proven vulnerable to the risk of external shocks through fluctuations in the exchange rate of the rupiah against US \$. This was indicated by the significance of the influence of the exchange rate and dummy crisis variables on milk imports in Indonesia throughout the data period of this study.

The WTO dummy which proved to be insignificant in suppressing imports should also be seen as “unfair trade” among of the free market.

Considering the result of the three dummy variable, Indonesia could make special regulations that can support dairy farmers to promote milk production. The special regulation, i.e., related to investment, technological and productivity improvements, knowledge and skills in practices to the small holder dairy farmers.

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