NON-TARIFF MEASURES IMPACT ON INDONESIAN FISHERY EXPORT

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ABSTRACT

This study aims to analyze the impact of Non-tariff measures using sanitary and phytosanitary policy (SPS) and technical trade barriers (TBTs) on fishery exports of Indonesia and its trading partner countries such as China, South Korea, Vietnam, Canada, Russia and the European Union in period of 2007 to 2016. SPS and TBT are measured using inventory approach in the form of coverage ratio. In addition, this study uses a gravity model and panel data regression method. The results of this study indicate that the variables GDP of exporting country and GDP of importing country have a positive and significant effect on Indonesian fishery exports. Distance and SPS have a negative and significant effect on Indonesian fishery exports, while TBT has no effect on Indonesian fishery exports.

Keywords: Export, SPS and TBT, Fishery Export, Coverage Ratio

JEL Classification: F10, F130

## Introduction

The high production of world fishery products boosted global fisheries trade to 130 billion USD by 2015 (Food and Agriculture Organization, 2015). The globalization of food trade and technology advancementin the process of production, processing and distribution can cause consumers to demand quality and high quality assurance on products consumed. The matter is addressed as a problemand the main focus for governance in many countries, not least Indonesia. Indonesia still faceshigh barriers non-tariff, particularly in the fishery sector, in international trade.

The high non-tariff barriers in the fisheries sector are preceded by environmental issues such as eco-labelling and protection of certain animal species (Ministry of Trade of Republic of Indonesia, 2014). The trade of Indonesia's fishery sector is not only influenced bysupply and demand factors, but also influenced by international trade policy factors that encompass the safety standards of a product. In its efforts to maintain the quality of fishery product safety, Indonesia is also required to improve and harmonize the system of quality assurance and security of fishery products with export destination countries or countries that have 6 cooperating in the field of fisheries i.e. European Union, Canada, South Korea, China, Russia, and Vietnam. In fact, despite the fact that MRA still has a case of rejection of export of Indonesian fishery products in its trading partner country which can be seen on Graph 1 (BKIPM Ministry of Marine Affairs and Fisheries, 2016).
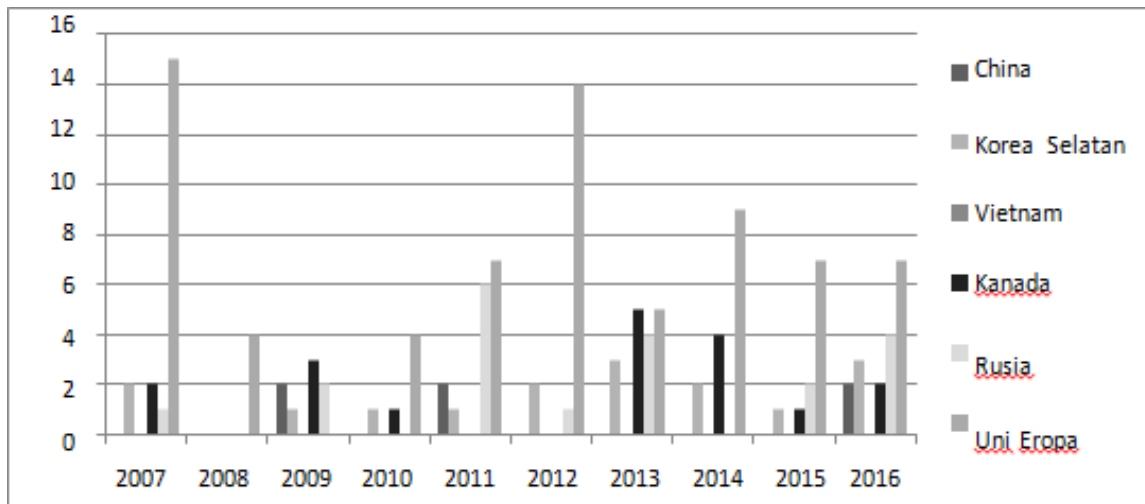
Graph 1: Number of Export Rejection Cases of Indonesian Fisheries to Trade Partner Countries From 2007 until 2016

Source: BKIPM Ministry of Marine Affairs and Fisheries (2016)

The reasons for the refusal case of Indonesian fishery exports as a whole are related to the sanitary and phytosanitary policy (SPS) and technical trade barriers (TBTs) both of which have been negotiated in the Uruguay GATT rounds of Uruguay in 1986. The main objective of the policy is to protect people, animals and plants on a country of disease and ensures national prosperity by improving market failures (Bellanawithana et al., 2009).

The use of SPS policy is implemented to regulate the agriculture and animal products. The SPS policy is an essential control to ensure the health, well-being of consumers, and protect the environment. As a result of such use more than 60 percent of food-related products are found to be affected by at least one of the forms of SPS policy (UNCTAD, 2013). Research conducted by Thuong (2018) and Hwang & Lim (2017), suggests that SPS policies canact to preclude or precisely reduce the amount of trade in agricultural and food products.

TBT policy applies to import restrictions based on certain product characteristics (WTO, 2003). Due to the increasing importance of implementation and the complexity ofTBT, researchers are beginning to pay attention to understanding the impact of TBT ontrafficking. Most studies have asked whether TBT can promote or limit trade. The results ofthe study found that TBT in general limited the flow of international trade (Bao & Qiu, 2012).

Based on the above background description, this research will analyze the influence of NTM in the form of SPS and TBT policy on Indonesian fishery exports with trading partner countries such as EU, Canada, South Korea, China, Russia and Vietnam in 2007 to 2016. Trade partner countries are countries that have signed mutual recognition agreement (MRA) in the field of fisheries with Indonesia. SPS and TBT policies are measured using an inventory approach which is coverage ratio. Independent variables used in this study include exporter country GDP and importer country GDP, geographical distance between countries, SPS policy, and TBT policy.

Literature Review

NTM's measures and in particular technical measures have been a hallmark of international trade in goods regulation. Most technical regulations are grouped into two maincategories, namely sanitation or phytosanitary (SPS) and technical barriers to trade (TBT) (Fugazza,

2013).

Some studies have found that NTM has a negative impact on trade (Disdier et al., 2008; Wei et al., 2012; Shepotylo, 2016). Other research shows that SPS policy by China negatively impacts exports from Japan and the United States (Wood et al., 2017). The SPS policy applied by Vietnamese trading partner countries can reduce rice exports from Vietnam (Thuong, 2018). In other studies, it is mentioned that the impact of TBT policies imposed by developed countries is stronger than the developing countries (Bao & Qiu, 2012).

The SPS and TBT policies have important implications for international trade. The policy sets out three basic principles (UNCTAD 2013): (1) Regarding the process of elaboration and implementation of the policy, in addition to transparency requirements, policies must be designed on de jure basis and applied de facto in a way that is not discriminatory. This means that countries implementing SPS and TBT policies must be fair, in the sense that they do not benefit certain producers or products; (2) Proportionality to the objectives to be achieved. In this case related efficiency criteria in choosing and implementing policies; (3) Based on need. The policies that are chosen and applied are indispensable to the country in conducting international trade.

SPS and TBT policies require better production processes, investments in new technologies, efficient trade infrastructure, and the use of more expensive delivery methods that are often applied to developing countries. In addition, SPS and TBT policies are often governed by a series of conformity assessments that cost, complexity, and duration depend on factors of production.

Therefore, the implementation of complex and sometimes inconsistent regulatory and conformity regulations can lead to SPS and TBT policies being a barrier to developing countries because it creates barriers to unfair market access to developed markets (UNCTAD, 2013).

Analysis of SPS and TBT implementation uses inventory approach. This approach is used to carry out an inventory of non-tariff policies, especially SPS and TBT conducted by each country. This approach consists of two types: the frequency index and the coverage ratio in the time period adjusted for the availability of the data. Coverage ratios represent a percentage of the trade of a product that NTM imposed on the importing country and provide a measure of the importance of imported NTM as a whole (UNCTAD, 2013). In addition, coverage ratios have been widely applied to some previous studies (Disdier et al., 2008; Wood et al., 2017).

Model and Research Methodology

The model of gravity is one model to measure the impact of NTM on trade (Ferrantino, 2006). In the context of trade, this model states the intensity of inter-state trade that is positively related to the exporter and importer's Gross Domestic Product (GDP), and negatively related to the distance between countries (Krugman et al., 2012, pp. 15-17).

Several previous studies have shown results that GDP exporters and GDP importers have a positive relationship to trade (Disdier et al., 2008; Bao & Qiu, 2012; Nugroho, 2014; Shepotylo, 2016; Hwang & Lim, 2017). The distance variables used as transportation cost proxies indicate that there is a negative relationship between distance and trade (Disdier et al., 2008; Bao & Qiu, 2012; Wei et al., 2012; Nugroho, 2014; Shepotylo, 2016; Thuong, 2018; Hwang & Lim 2017; Wood et al., 2017).

$$\ln X_{ijst} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln Dist_{ij} + \beta_4 SPS_{jst} + \beta_5 TBT_{jst} + \varepsilon_{ij} \qquad (1)$$

$\mathbf{X_{ijst}}$ is the export of Indonesian fisheries to trading partner countries in the year t; $\mathbf{GDP_{it}}$ is Gross Domestic Product of exporter countries in the year t; $\mathbf{GDP_{jt}}$ is *Gross Domestic Product* of importer countries in the year t; $\mathbf{D}$ is the geographical distance between the exporter and the importer country in the year t; $\mathbf{P}$ is Sanitary and Phytosanitary (SPS) of importer country to Indonesian fishery in the year t; $\mathbf{B}$ is a Technical Barrier Trade (TBT) of importer country to Indonesian fishery in the year t.

The panel data regression method is used to see the effect of exporter GDP variables (GDP of Indonesia), GDP of importer countries (GDP of European Union, China, South Korea, Vietnam, Canada and Russia), geographical distance, sanitation and phytosanitary (SPS) and technical barriers trade (TBT) in the period 2007-2016.

Result and Discussion

This study uses panel data, a combination of cross section and time series data. Panel data can be estimated with three methods, Pooled Least Square (PLS), Fixed Effect Model (FEM), and Random Effect Model (REM). In determining which model to be used appropriately, it can be done with three tests i.e. F-statistic test, Hausman test and Lagrange Multiplier test.

After regression using Pooled Least Square (PLS), Fixed Effect Model (FEM), and Random Effect Model (REM), the result of FEM regression in STATA 13 variable distance cannot be estimated (omitted). Based on these results, it is not possible to estimate using FEMbecause the variability in the variable distance between countries is very low, causing the parameter cannot be estimated. The Lagrange Multiplier test is used to select the best model between Pooled Least Square or Random Effect Model. In the results obtained from the Lagrange Multiplier test, the chi-square probability value shows less than the degree of significance of ten percent, then the best estimation model for this research is the Random Effect Model. Based on Lagrange Multiplier test, the best model is Random Effect model.

The REM estimation results in Table 1 shows that the exporter GDP variable (GDPi) has a positive and significant relationship. It shows when a one percent increase in GDPi will boost Indonesia's fishery exports by 0.624 percent. The importer GDP variable (GDPj) also has a positive and significant relationship, meaning that when a one percent increase in GDPj will increase Indonesian fishery exports by 1.36 percent. The distance variables (DIST) in REM estimation results show a negative and significant relationship to Indonesian fishery exports. This means that when a one percent increase in distance will decrease Indonesia's fishery exports by 2.91 percent.

Tabel 1: *Random Effect Model* Estimation Resul

	Coefficient
Cons	29.19295***
lnGDPi	0.6243749***
lnGDPj	1.361979***
LnDist	-2.91618***
SPS	-0.1454718*
TBT	0.06227192

Note : *,**,*** siginifican at 10%,5% and 1%.

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The NTM SPS variable has a negative and significant relationship to Indonesian fishery exports. This means that when a one percent increase in SPS will reduce the export offisheries Indonesia by 0.145 percent. Another NTM variable is TBT which has a positive andinsignificant relationship. The probability value is greater than the level of significance (α) often percent stated the TBT variable is not significant in affecting Indonesian fishery exports.

The GDP of exporters in this study is that Indonesia's GDP statistically has a positiveand significant effect on Indonesian fishery exports. Based on the theory of gravity model, exporter GDP has a proportional relationship to international trade. High exporter GDP showshigh production levels both in the production of goods and services. The high level of production of a country will cause exports to experience enhancement. This estimation is consistent with previous research which states that exporter's GDP has a positive effect on exports (Disdier et al., 2008; Bao & Qiu, 2012; Shepotylo, 2016; Hwang & Lim, 2017).

The GDP of importers in this study statistically has a positive and significant effect on Indonesian fishery exports. According to the theory of the gravity model, high GDP importers indicate the level of consumption in the country is high. High country consumption levels indicate high levels of demand in the country. The importer GDP variables that show a positive relationship in accorandce with previous research which states when the GDP of importers increases, exports also increase (Disdier et al., 2008; Bao & Qiu, 2012; Wei et al., 2012; Nugroho, 2014; Shepotylo, 2016; Hwang & Lim, 2017).

Geographical distance is one of the important conditions in the gravity model. Based on the theory of gravity model, distance has a negative effect on international trade relations. The estimation results obtained in this study shows that Indonesia's geographical distance with its trading partner countries has a negative and significant impact on Indonesian fishery exports. The distance variables indicate that the further the distance between the destination country and the exporting country, the greater the cost of transport for the trade to be carried out by both countries (Disdier et al., 2008; Nugroho, 2014; Shepotylo, 2016; Thuong, 2018; Hwang & Lim 2017; Wood et al., 2017).

SPS policy shows the estimation results is in accorandce with the research hypothesis that has a negative and significant impact on the fishery exports of Indonesia. The enforcement of NTM especially SPS is done as a trade protection of a country. SPS policies often increase the fixed and marginal costs of trade or production costs of a country wishing to export to a country that implements SPS. Research conducted by Wood et al., (2017), states that this SPS policy has a distorting effect because it targets the product regardless of its origin. The effectsof distortion and trade restrictions are one of the most important reasons of why SPS policies are increasingly being concerned in the matter of their impact in international trade. Therefore,SPS policy has an impact on trade restrictions, particularly on agricultural and food products. Developed countries apply SPS policies to products primarily from developing countries. Most developing countries cannot meet strict regulations because of their low awareness, technology,and capital (UNCTAD 2013). The estimation results are in accorandce with previous researchwhich states that the SPS policy can reduce the export of a country (Wei et al., 2012; Thuong, 2018).

In this study, TBT variable estimation results showed positive and insignificant value in influencing Indonesia fishery exports. The results of this estimate do not match the existing theories in previous studies that the implementation of TBT policy of a country will prevent a country that will export to the country (Bao & Qiu, 2012).

Conclusion and Policy Recommendation

This study analyzes the impact of NTM enforcement in the form of SPS and TBT policies of trading partner countries on Indonesian fishery exports in 2007 to 2016. Indonesia's trading partner countries in the field of fisheries are China, South Korea, Vietnam, Canada, Russia and the European Union. Based on the results of the study, GDP exporters (GDP Indonesia) and GDP importers (GDP of China, South Korea, Vietnam, Canada, Russia and the European Union) have a positive and significant relationship to Indonesian fishery exports.

The distance between Indonesia and China, South Korea, Vietnam, Canada, Russia and the European Union has a significant and negative effect on Indonesian fishery exports. SPS policies enacted by China, South Korea, Vietnam, Canada, Russia and the European Union have a significant and negative effect on Indonesia's fishery exports. On the other hand, TBT policies imposed by China, South Korea, Vietnam, Canada, Russia and the EU have no significant effect on Indonesian fishery exports.

Based on the results of the above study which shows that SPS policies applied by trading partner countries have a negative and significant impact on Indonesian fishery exports, therefore the Indonesian government especially BKIPM (Fish Quarantine Agency, Quality Control and Fishery Products Security) is expected to improve the implementation of quality assurance system, health certification, and handling cases of detention and export refusal.

For further research, the research can be developed with specific commodity of other fishery export of Indonesia, for instance commodity of mainstay of fishery and agriculture sector. NTM measurements in this study using the coverage ratio approach, further research can be done with other available approaches such as price comparison, quantity impact, and computable general equilibrium model.

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