JPAS Vol. 1, No. 4, pp 1-8, 2017
© 2016 FIA UB. All right reserved

Journal of Public Administration Studies
URL: http://www.jpas.ub.ac.id/index.php/jpas

The Evaluation of Indonesian National Standardization (SNI) Policy towards Import in Steel Industry

Diana Muji Hartati[a], Mardiyono[b], Alfi Haris Wanto[b], Motoko Kawano[c] *

[a] *Ministry of Industry, Indonesia*
[b] *Brawijaya University, Malang, East Java, Indonesia*
[c] *National Graduate Institute for Policy Studies, Tokyo, Japan*

ARTICLE INFORMATION

Article history:
Data submission : 10 October 2017
1st revision: 10 November 2017
Accepted: 16 December 2017
Available online: 30 December 2017

Keywords: Non-tariff barrier, SNI policy, steel product

ABSTRACT

The Indonesian government enacted a mandatory national standardization (*Standar Nasional Indonesia*, SNI) policy for deformed steel bars in 2008. This policy provides the assurance of supplying safe and reliable products for consumers especially in the construction sector. At the same time, the SNI policy can create non-tariff barrier to trade as it raises the cost of compliance. While tariffs are being increasingly eliminated, the government may choose to use standardization as a tool to protect national industries. This paper analyzes the effect of SNI policy as technical barriers on import values using an auxiliary gravity model. This paper applies panel data on steel imports to Indonesia from the eight major exporting countries between 2000 and 2014. The results of the gravity model reveal a negative impact of the SNI policy on the steel import value in Indonesia across all eight main exporters. The findings support the commonly held view that national standards are an impediment to trade.

2016 FIA UB. All rights reserved.

1. Introduction

The most likely result of multilateral agreements under World Trade Organization (WTO) is the loosening of tariff barriers to market access. In fact, several negotiations require the progressively cut tariff rates up to 0%. To subdue the impact of tarriff elimination, governents imposed The Technical Barriers to Trade (TBT) on market. TBT is also designed to substitute tarriff barrier for various reasons, such as protectionism and increasing consumer preferences. As a consequence, governments have relied on non tariff barriers as protective measure and it became popular instruments of trade policy (Maskus, Otsuki, and Wilson, 2005; Jorgensen and Schroder, 2006). Due to wide implementation of TBT policy, researchers begin to pay attention to the role of this policy on trade. According to Bao and Qiu (2012), TBT can promote or hinder trade. On one hand, TBT promotes trade by providing consumers of importing countries with confidence on the quality of the imported products. On the other hand, governments of importing countries can use TBT to restrict imports even if the imported products are safe and meet the standard imposed. A research conducted by Swann (1996) showed that standards can also serve as an important quality signal in trade and thus increase country's share in market share domestically and internationally. Nonetheless, stringent standards can raise barriers to entry.

One of TBT policy implemented in Indonesia is Indonesia National Standardization, or known as *Standar Nasional Indonesia* (SNI). This policy regulates the uniformly minimum standard of quality of products which distributed in the domestic market. Improving the quality and competitiveness of the products produced in the country becomes necessary if government want to trigger competition with the rapid flow of imported products **(**Jaffe & Henson, 2004**)**. As the backbone of modern industry, Indonesia puts higher effort to promote domestic industry by developing SNI policy in such area. In 2014, national steel production capacity reached 18.9 million tons, while domestic consumption reached 12 million tons (Ministry of Industry of Republic of Indonesia [MOI], 2015). Based on the supply side and demand analysis, national demand for steel should have been met. However, actual domestic production was about 9.3 million tons. These numbers show that steel industry is underutilized. Hence, Indonesia still imported 4-5 million tons steel annually

* Corresponding author. Tel.: +62-81331708940; e-mail: dianamujihartati@gmail.com

to meet national demand. It appears that government had to set technical policy regarding to increase the fair competition between domestic and imported products.

To date, the impact of product standards on international and national market have been examined largely. Only few of those examine in the field of steel industry. Moreover, there is no such study conducted in steel industry especially in Indonesia. In order to fill this gap, this paper will examine the impact of SNI policy introduced in 2008 on import value to Indonesia.

2. Theory

2.1. Standard and Technical Barrier to Trade Policy

As global trade liberalization becomes inevitable, industries and governments rely heavily on non-tariff barriers to protect domestic markets from foreign competition (Jorgensen & Schroder, 2006). The non-tariff barrier measures can be technical barriers, import licenses, quotas or other forms of protection. Technical barriers or standards may be used by the government to protect domestic firm from foreign competitors in the domestic market. With the increase tariff elimination becoming a part of liberalization, these technical regulations serve as protective measure to restrict trade and limit market entry.

Most of the products in all sectors of the economy are required to meet technical regulations. The regulations can range from food labeling, toys safety or cars specification. The government authorities set legitimate policies to enact these regulations (Essaji, 2008).

Technical regulation differs across sectors and hence, differences in industry specialization cause the impact and importance of technical barriers to vary across countries (Brenton, Sheehy, & Vencauteren, 2001). Standards as technical barriers to trade have become popular in recent years as most countries are aware of their importance. The proliferation of the removal of the traditional tariff barriers due to free trade agreements is the main reason behind the increase prevalence of the standards. Standards as technical barriers to trade that include technical regulations, conformity assessment procedures, and compliance restrictions. These regulations can facilitate trade through the promotion of interoperability and the ensuring of product safety.

2.2. Standard and Trade

In recent trade activities in the market, standardized products have become the main attraction for consumers. Consumers are now aware about the implication of higher level standard of products. Therefore, standards offer several benefits such as the guarantee of security and catalyst for economic growth(Swann, 2010). The International Organization for Standardization (ISO) defines the role of a standard as ‘providing for common and repeated uses, rules guidelines, or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context’(Chen, Otsuki, & Wilson, 2006). It is now widely recognized that standards can have a significant impact on trade, although the level and reliability of existing empirical evidence remains questionable on considering, at least in part, the complex ways in which standards influence the level of direction of trade flows.

For the government, avoiding unnecessary obstacles to trade implies that negotiations involved in the preparation of a technical regulation for the achievement of a certain policy objective, whether it is the protection of human health, safety, the environment, do not exceed trade-restrictions beyond those necessary for the fulfillment of the legitimate objective. For business actors, standard have a role that is quite important to achieve economies of scale, lower production costs and renew access to a larger market again. Standards also contribute to the enhancement of the competitiveness and innovation in the markets, they improve consumer trust in the market and promote the development of new products (Love & Lattimore, 2009). Standard have a positive influence in the promoting competition, innovation and the improvement of product quality without affecting an increase even a fall prices.

The actual role and impact of standards are still under debate since it has a very diverse influenced varies in terms of by product code and viewpoint in many countries. According to Jorgensen & Schroder (2006), standards can be market limitation tool with the procedure of issuance of licensing or the certification process, and the rise in administration and transaction costs. On the other hand, the standard policy is regarded as a policy for protection of the domestic industry and for affecting an increase in the domestic production capacity (competitiveness). Therefore, the impact of this standard policy can be seen from various points of view, it can have a negative impact, especially on export-oriented businesses, as well as a positive impact on domestic businesses that use standards as a protectionist policy.

A research conducted by the World Bank concluded that standards had differing effects on every level, at the level of companies, at the national and at the international levels (Maskus, Otsuki, & Wilson, 2005). The study involved 689 companies in 17 developing countries with the bulk (93%) of the respondents being export oriented enterprise. Developing countries are commonly seen as "standards takers" rather than as "standards makers". Thus, costs of standard compliance will be borne by the companies in developing countries, especially export- oriented that will get the greater share. As mentioned in the beginning, the impact of standard policy is extremely diverse (debatable). But overall, due to a continual lack of data for the interpretation of the standards condition, causing the analysis of research in this field is limited.

3. Research Method

The primary research method for this paper is quantitative. The model used in this paper will follow Anders and Caswell’s(2009) methodwho employed the gravity model of trade in cost compliance with product

standards. Gravity models are widely used to estimate trade volume that is determined by the economic size of the trading countries and the multilateral resistance (Bao & Qiu, 2012). Multilateral resistance is the barriers to trade that each country faces with all its trading partners. The benefits of using gravity models in analyzing product standards on international market have also been established through researched conducted by Peridy, Guillotreau, and Bernard (2000), and Maskus, Wilson, and Otsuki (2005).

The gravity model is by analogy the same as Newton's law of gravitation (Krugman, Obstfeld, & Melitz, 2012). According to the generalized gravity model of trade, the volume of exports between pairs of countries, X_{ij} , is a function of their incomes (GDPs), their populations, their geographical distance, and a set of dummies,

$$X_{ij} = \beta_0 Y_i^{\beta_1} Y_j^{\beta_2} N_i^{\beta_3} N_j^{\beta_4} D_{ij}^{\beta_5} A_{ij}^{\beta_6} u_{ij}$$

where $Y_i(Y_j$) indicates the GDPs of the exporter (importer), $N_i(N_j)$ are exporter (importer) populations, D_{ij} measures the distance between the two countries capitals (or economic centers) and A_{ij} represents any other factors aid or prevent trade between pairs of countries. u_{ij} is the error term.

This study uses panel data with gravity model for bilateral trade to estimate the impact of the SNI policy on the import value of Indonesia's steel product. This study will use Indonesia's trade with eight top exporting countries: Japan; China; Republic Of Korea; Malaysia; Singapore; Taiwan; Thailand and Australiabetween 2000 and 2014.As mentioned before, this study models on Anders and Caswell's study, the extendedgravity model of trade in cost compliance with product standards. The following is the extended gravity model used in this research:

$$\ln import_{ijt} = \beta_0 + \beta_1 DSNI_t + \beta_2 lnGDPind_{it} + \beta_3 lnGDP_{jt} + \beta_4 lnDist_{ijt} + \beta_5 lnExcRate_{jt} + \beta_6 lnPrice_t + \varepsilon_{ijt}$$

Table 3.1. Definition of Variables

Variable	Description
$Import_{ijt}$	Value of annual imported steel products into Indonesia by country (US$)
SNI_t	Dummy variable for the intoduction and enforcement of mandatory SNI policy for steel industry in Indonesia (2008-2014=1; 2000-2007=0)
GDP_{it}	Real GDP of Indonesia (US$)
GDP_{jt}	Real GDP of exporter countries (US$)
$Distance_{ij}$	Geographical distance between Indonesia and exporter countries (miles)
$Exchange_{jt}$	Real exchange rate between domestic currency and US$
$Price_t$	World price of steel product at year t

Source: Author

Table 3.1 presents definitions of the dependent and independent variables. Imports denote the value of imported product from country j to Indonesia in a particular year t for the years 2000 – 2014. The error is assumed to be normally distributed with a mean of zero. GDP, as a proxy of country economy size, is the real GDP of each country with 2000 US dollars. Distance is the geographical distance between exporter's and importer's capital. Exchange is the market exchange rate between the U.S. dollar and the domestic currency of each exporting country. Price is the world market price of steel products.

GDP variables are expected to have a positive impact on the import value. When a country exports goods, it sells them to a foreign market, that is, to consumers, businesses, or governments in another country. Those exports bring money into the country that increases the exporting nation's GDP. Real GDP reflects the demand in importer country. Thus, it is expected to have positive impact on import value

The impact of geographical distance is negative on the export, since it reflects transport costs as well as trade restriction expressed by tariff and relative exchange rate. Import tariff is assumed to have a negative as well as it restricts the volume of exports to countries imposing tariff. On the other hand, the exchange rate of exporter countries is expected to have a positive impact. The depreciation of the domestic currency forces foreign firms to export. The same rationale can be applied to the price variable. The increase of world price will also increase export flows.

This paper utilizes panel data regression to estimate the import flows of steel product. The data collected is a time series data from 2000 – 2014and represents a cross section of eight countries (China, Japan, South Korea, Taiwan, Malaysia, Thailand, Vietnam and Australia),which are selected from Indonesia's major trading partner countries in each continent. The trade analysis employs HS 6-digit codes. These codes constitute deformed bar steel that is commonly used in construction following the classification of SNI 07-2052-2002; SNI 07-0065-2002; and SNI 07-0954-2005.

4. Results

4.1 Descriptive analysis

The remarkable degree of industrialization in Asia has made this region both the world's highest steel producer and importer. China, Japan and South Korea are among the largest producer of steel products (Propescu, Nica, Nicolaescu, & Lazaroiu, 2016). The other countries Japan (India, Thailand, Vietnam, Philippines, Indonesia, and Malaysia) are the largest net importers of steel in the world. Those six countries represent almost 64 million ton of net imports into the region (Brun, 2016). However, new domestic steelmaking capacity is rapidly increasing in Asian regions and can replace Chinese export of steel grade steel in these markets.

Figure 4.1 shows the fluctuation of imported steel product (for construction) between 2000 and 2014. In average, the value increased between 2000 and 2008, and dropped dramatically in 2009. The SNI policy was

implemented in November 2008. As a consequence, in 2008, the value of imported productswas still high. In general, Japan primarily contributes to the value of imported poducts, although it was outnumbered by China in 2005 and continued to do so till 2008. It is reported that China changed from being a net importer before December 2004 to being the world's largest net exporter since the first half of 2005. China reached a notable self-sufficiency in steel production after 2005.



Figure 4.1. Indonesia import value for steel products, 2000-2014
Source: Constructed by the author from UN Comtrade database (various years)

Steelmakers countries believe that China's government subsidization of its steel (in the form of an undervalued currency, export rebates and/or quotas, subsidized financing, relatively weak environmental, labor, and safety regulations, etc.) resulted in China's high export values. Figure 4.2 shows the intense competition between Japan and China before 2008.In 2000 Chinese steel constituted only 15% of the world's steel and the amount soared to almost half of the world's steel production. Although statistics indicate that the Chinese steel industry is not export-oriented, its consistently high output keeps the world's steelmakers concerned that excess Chinese steel might overwhelm the global market once domestic demand is adequately met. The rapid growth of Chinese's steel demand increased global capacity utilization rates between 2000 and 2008. The global financial crisis dramatically reduced capacity utilization in steel), from which full recovery has not yet taken place in the current period.

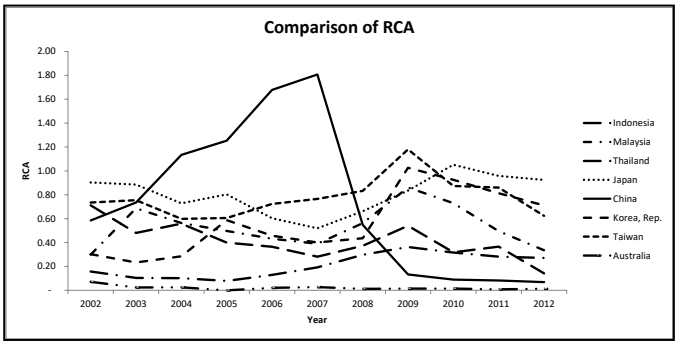

Figure 4.2. The comparison of competitiveness among 8 top major steel exporter countries to Indonesia, 2002-2012
Source: Construcred by the author from Global Trade Atlas database (various years)

Japan and South Korea took the advantage of their lower production volume out of China due to slowed growth. In order to set themselves apart, they set their product line-up to offer more advanced, customized solutions that cannot be provided by high volume producing competitors. Starting from 2009, China's competitiveness dramatically fell and it was replaced by South Korea and Taiwan.

The construction, building and infrastructure sector, accounts for 50% of the global steel use. This sector has been a major driver for steel demand in the developing countries that are driven by urbanization. One of the primary reasons for the fluctuation in steel prices is the synchronized rebound in the major industrial blocks and the consequence of volatile demand (Adams, 2006). The world steel capacity between 2000 and 2008 was quadrupled due to China's massive development. At the same time, China engaged in rapid industrialization and outsourcing that caused the Chinese demand to increase by more than 20% per year. This overcapacity affects industry profits because plant-level efficiencies are not maximized, leading to higher production costs. As a consequence, steel prices tend to be higher during periods of higher capacity utilization. The same understanding can also be applied to the global financial crisis of 2008. In this period, the export market's demand fell. Global nominal capacity utilization ratio fell from 95% to 70.5%. This, of course, led to lower steel price as shown in Figure 4.3.



Figure 4.3. World steel price, 2000-2015
Source: Constructed by the author from London Metal Exchange database (various years)

In theory, overcapacity ought to be a short-term phenomenon. When demand and prices fall, profit-maximizing firms reduce production and idle capacity. If the situation persists, firms seek to permanently reduce capacity because the costs of maintaining capacity, notably maintaining furnaces and rolling facilities, decreases profits. Firms that are not maximizing profits will exit the market, while more efficient producers will capture the market share, effectively eliminating excess capacity in the industry.

In practice, however, economic downturns cause overcapacity because capacity is price insensitive in the short-term, that is, the physical plant has limited, if any, ability to rapidly reduce its total capacity in response to changes in price. High exit barriers in the steel industry prevent rapid adjustments incapacity. The

costs of reducing capacity include the dismantling and demolition of mills, environmental clean-up and remediation, and legacy pension or other labor-related costs. Expectations about increases in future demand and the cyclical nature of the industry also limit the incentives for steel producers to reduce plant capacity in the face of economic downturns.

Overcapacity affects the profitability of companies in the sector because mills cannot produce at economically sustainable levels that for many steel mills is around 80% capacity utilization. Reduced company profitability affects the incentives of companies to invest in their facilities and workers that ultimately reduces the competitiveness of the sector in the national economy, leading to sectoral unemployment. In addition, overcapacity caused by government subsidies and access to cheap finance incentivizes the production process to cover bond payments and the fixed costs necessary to maintain productive capacity. The result is cheap steel flooding the international trading system, whose price is determined by the amount of government subsidies and the requirement to fulfill bond payments. This counters the comparative or competitive advantage of nations that serves as the basic assumption for the international trading regime.

4.2 Regression results

The gravity model of Indonesia's steel import is estimated considering all explanatory variables. Then the model is estimated by fixed effect regression and the estimated model represents the magnitude of the dependent variable with respect to the independent variable due to its log-linear structure. The basic gravity model includes only GDP and distance with the SNI policy as dummy variable to measure its effectiveness. But, this study used an extended gravity model by including more variables rather than just using GDP and distance. In this trade model, the intercept term β_{0i} is considered to be country specific and the slope coefficients are considered to be the same for all countries for fixed effect estimation technique.

The choice of fixed effect model is determined by Hausman test. The Hausman test helps choose between the fixed effects model and the random effects model. Using STATA, the null hypothesis is that the preferred model is fixed effects; the alternate hypothesis is that the model is random effects. The estimation on Appendix B shows that the p-value is small (less than 0.05). The fixed-effects models largely outperforms random-effects models as indicated by the Hausman tests.

Table 4.1. Gravity Model Fixed Effect Estimates of SNI Policy Effect on Indonesia Steel Import Value, 2000-2014

Variable	Model 1	Model 2	Model 3
SNI Policy	-0189***	-0196***	-0.182***
	(0.063)	(0062)	(0.061)
GDP	0.0372***	0.336**	0.323***
Indonesia	(0.139)	(0.138)	(0.135)
GDP Partner	0.004***	0.003*	0.004**
	(0002)	(0.002)	(0.002)
Distance	-1.893***	-1.928***	-1.989***
	(0.227)	(0.225)	(0.221)
Exchange		0.448*	0.524**
Rate		(0.245)	(0.241)
Price			0.210***
			(0.085)
R2	0.790	0.797	0.808
Rho	0.998	0.998	0.998
N	120	120	120

Note: The standard errors of regression coefficient are reported in parentheses. Single asterisk (*), double asterisks (**) and triple asterisks (***) denote significance at 10%, 5% and 1% respectively.

Source:Author

The estimation result shows each R-squared in models which almost the same for all models. R-squared for Model 1 is 79%; 79.7% for Model 7; and 80.8% for Model 3. These mean that about 80% of the data close to the fitted regression line. The R-squared is a statistical measure of how close the data are to the fitted regression line. The R-squared also provides an estimate of the strength of the relationship between each model and the response variable. However, the formal hypotheses test for such relationship can only be analyzed using t-test for each variable.

The results presented in Table 4.1 support the hypothesis that, with all variables constant, the mandatory SNI policy implementation has an overall negative and significant effect on steel imports into Indonesia. Furthermore, all estimated coefficients on the GDP levels and the distance show highly significant at 1% level with the expected sign. The estimated results of basic gravity model represents Indonesia's steel imported value is positively determined by the home and foreign country's GDP and negatively determined by the trade impediment factor, distance.

The magnitude of the SNI policy's effects across model specifications are calculated from the estimated model coefficients for this dummy variable. The coefficient of the product of the SNI policy is negative and highly significant as expected. The SNI policy's effect range from -0.182% to -0.195% with respect to the value of the imported steel products. Thus for exporters as a whole, the mandatory SNI policy on steel products imposed a significant barrier to selling into the Indonesia market. The enforcement of the SNI policy has negative impact on the import value. The result is in accordance with the study conducted by Bao and Qiu (2012) that stated TBT are trade restrictive for China since it is a developing country,: a one unit increase in the TBT will decrease the import value by about 0.8%.

GDP measures the economic activity in a country. The estimates of regression for both the home country and the trade partner GDP are expected to be positive and have a tangible effect on the trade flow. Assuming there is an increase in the revenues for the exporter country, the value of steel products traded to the export destination countries will also increase, ceteris paribus. The results indicate that a 1% increase in Indonesia's GDP led to a 0.37% increase in the value of steel

imports to Indonesia. Additionally, the trade partners' GDPs also have a positive relation to the import value in steel products. It is seen that a 1% increase in the partners' GDPs will also increase value of imported steel by 0.004%. The importance of each country's steel sector, in terms of the total value of the steel trade, has a significant and positive effect on its ability to penetrate the Indonesia market.

The geographical distance variable shows the hypothesized negative effect on the steel trade in all model specifications. The elasticity estimates indicate the trade effects that result from increasing transport and transaction costs. Model 1 to 3 show that distance decreases the value of imported steel with a magnitude ranging from -1.89% to almost 2%. Geographical distance influences trade flows between two countries since it represents transport costs. Two countries that have significant geographical distance between them will experience higher transport costs and will consequently trade less intensely.

The estimated coefficient of exchange rate is found significant and positive. A theoretically plausible and significant positive exchange rate elasticity of 0.97 reported by Zarzoso (2003) for seafood exports by MERCOSUR (Argentina, Brazil, Paraguay, Uruguay and Venezuela) countries. In the Table 2, this paper has used the model in a log-linear form. The variables are interpreted in terms of the percentage change. The result states that 1% depreciation of currency increases the trade by 0.45% to 0.52%. One of the biggest factors that influences imports and exports is the value of currencies between trading countries. It is commonly known that export and import activities are carried out in US dollars. Since the exchange rate is calculated using the exporters' currency, it confirms that a weaker domestic currency stimulates export.

Model 3, which includes the effect of the steel price, shows that it has a positive correlation with the import value. The estimate indicates that a 1% increase in price will also raise the import value to 0.21%, and vice versa. As depicted in Figure.1 and Figure 3, Indonesia's import value on steel and steel prices both have almost the same trend line. The steel prices increased substantially between 2000 and 2008. This result in an increase in the import value.

5. Discussion and conclusion

Developing countries may deliberately craft standard measures that impose a cost or other disadvantage on foreign competitors to provide protection to domestic firms. Moreover, standard compliance is often costly for exporter countries. Thus, standard can act as an impediment for trade even when it is imposed due to genuine health and safety of the consumers. Nonetheless, standards also assure the consumers that they use safe, reliable and good quality products. Without standards, non-standardized products may be dangerous as manufacturers will not be obliged to provide qualified products.

The prevention of non-standardized deformed bar steel's circulation in the domestic market motivated the introduction of the mandatory SNI policy as standard measures in steel product for construction in 2008. From the Indonesian government's point of view, this regulatory policy is intended to reduce the potential risk for the construction sector which will affect consumers. However, this type of policy can create trade barriers since it rises the cost of compliance. On the other hand, the standard policy can also act as catalyst for domestic firms. They will react to the new standards by increasing the quality assurance. It is the government's tasks to foster national industries. However, the SNI policy enforcement is expected to create challenges for domestic products.

The mandatory SNI policy on deformed steel bar products is stipulated in September 2008. According to the models with the observational data period from 2000 –2014, this policy can be considered quite successful in limiting the import volume and stimulating the domestic production of deformed bar steel. As an obstacle, it acts like a mandatory shock for foreign manufacturers requiring them to adapt their products to the standards that prevail in Indonesia both from the technical and non-technical aspect. Those obstacles can be the cost of compliance, the difficulty to obtain inquiry information, testing procedures, inspection time and so on. Nevertheless, the results have been changed. Taking into account the trend of imports that started to increase between 2010 and 2011, it can be an indication that the foreign products abroad has begun to adjust to the SNI policy.

The implementation of the SNI policy should also consider the availability of the conformity assessment institution. The duty of this institution is to examine the conformity of a product or process or person to a certain standard. This institution may consist of various types of institutions, namely certification bodies and laboratories. Institutions of this kind are usually government institutions, but some of them are privately or state-owned. It is spread in all Indonesian areas, but it is mainly concentrated in Java. This institution must have personnel consisting of competent assessors, experts, sampling officers (PPCs) to carry out product certification. The development of the SNI policy has been very rapid. Based on MOI, there are 744 institutions that were accredited by the National Accreditation Committee in 2011.It implies that conformity assessment institution fully supports the government policy on standards.

The role of SNI policy on the production, based on the limitations of this study models, SNI shall be deemed to have contributed positively to the development of industrial production in the country. This illustrates that SNI policy is the government's efforts to improve the ability of business such as by a process of surveillance (control consistency of product quality), obligations of quality management system for any company who wants to get a product certification) or create a good business climate.

The result of this paper suggests that SNI policy in steel industry has import-reducing effect. The study explores whether technical measures imposed by

Indonesia has a restrictive effect on the import value from the eight main exporters. This paper's result confirms the result from study conducted by Swann (2010) which stated that the effects of national mandatory standards on import tend to be negative. This paper contributes to this result by estimating the import impact of the introduction of SNI policy in deformed bar steel in Indonesia in 2008 for domestic and imported products.

This paper contributes to this result by estimating the import impact of the introduction of the SNI policy on deformed steel bars in Indonesia in 2008 for domestic and imported products.

This paper applies the panel data on steel imports to Indonesia by the eight major exporter countries between 2000 and 2014. The result of the gravity model reveals a significantly negative impact of the SNI policy on Indonesia's steel import value across all the eight main exporters. The regulation supports the commonly held view that national standards are an impediment to trade.

Regarding the gravity model, almost all models exhibit a positive and significant impact of the economy's size towards the trading partners. The size of the economy in the gravity model is measured mainly by the country's GDP and it is expressed more as the economic potential of the market. It has a positive impact on international trade. The geographical distance that reflects the transport cost confirms the gravity model theory. This implies that distance hinders and blocks the implementation of trade exchanges between two countries that are not so close geographically. Trade between two countries tends to be more intense if their states are close to each other and less intense if they are remote.

This paper uses the auxiliary gravity model by adding the exchange rate and price variables. One of the determinants of a nation's economic performance is the value of currency. Currency movement has direct impact on imports and exports. Since the exchange rate variable is deducted from the exporter's currency, the result suggests that the exchange rate significantly affects the export value to Indonesia. It confirms that a weaker domestic currency stimulates exports.

Commodity price fluctuations have led to profound changes that affect trade. With an increase in domestic inflation, the prices of goods that are exported also rise as foreign consumers pay a higher price for imported goods from the country with higher inflation rates. The results of this paper support this theory. The price variable has a positive significant effect on the export value of steel products to Indonesia.

The empirical results reveal that the SNI policy for the steel industry can reduce the import value. The reduction in the import value is associated with heightened trade costs as the SNI policy raises the cost of compliance. However, this policy is expected to lead to the rise of production efficiency as it reduces information asymmetries between buyers and sellers, and promotes product commutability.

From a practical point of view, the results of this paper have policy implications. The governments can devise a SNI policy to promote exports by adopting international standards for the steel industry. Several studies show that in most cases, the adoption of international standards have a positive (or at least neutral) effect on the country's export performance although other studies, like study by Jorgensen and Schroder (2006),also show the opposite result. Nevertheless, since Indonesia owns huge amounts of iron ore and iron sand which are the primary sources for the steel industry, the government should push such adoption to improve trade performance.

Taking this into consideration, the government as the facilitator can create international cooperation for mutual recognition agreements. In the last two decades, the government has also established new policies for the industrial sector with the aim to increase the efficiency and competitiveness of domestic industries(Adam & Negara, 2012). Under these policies, the government sets national standards for commodities to ensure the production of reliable results. Thus, the government has the obligation to harmonize the two policies to support each other. In other words, the policy of engaging in international cooperation should be able to support the government's program for the development of domestic products. An important breakthrough in economic cooperation among countries was initiated by the WTO agreement on TBT. Increased regulatory policy can be seen as the result of higher standards of living worldwide, which have boosted consumers' demand for safe and high-quality products, and of growing problems of water, air, and soil pollution which have encouraged modern societies to explore environment-friendly products.

The government also needs to devise strategies for the enforcement of the SNI policy that fits in the long-term framework. Currently, the government has initiated a program under which each state funded infrastructure project has to use standardized domestic product. However, the government has no power to control the use of standardized domestic products by private projects. Therefore, the domestic market needs to be convinced to continue using the standardized domestic product. Thus, the surveillance function of the government need to be served continuously. In turn, the quality of goods on the domestic market is guaranteed, so the level of public confidence in the standards of domestic products also increases.

References

Adam, L., & Negara, S. D. (2012). The Development of Indonesia Steel Industry. *Review of Indonesian Economic and Business Studies Vol 3 No 2*, pp 51-67.

Adams, R. J. (2006). Reasons for Steel Price Increases and Impact on the Agricultural Machinery Industry. *Agricultural Engineering International: the CIGR Journal* , pp 699-705.

Anders, S. M., & Caswell, J. A. (2009). Standards as Barriers versus Standards as Catalysts:

Assessing the Impact of HACCP. *American Journal of Agricultural Economics Vol 91 No 2*, pp 310-321.

Bao, X., & Qiu, L. D. (2012). How Do Technical Barriers to Trade Influence Trade. *Review of Intenational Economics 20(4)*, pp 691-706.

Blonigen, B. A., Liebman, B. H., & Wilson, W. W. (2007). "*Trade Policy and Market Power: The Case of the US Steel Industry" NBER Working Paper Series* . Cambridge: National Bureau of Economic Research.

Brenton, P., Sheehy, J., & Vencauteren, M. (2001). Technical barriers to Trade in the European Union: Importance for Accession Countries. *Journal of Common Market Studies* , Vol 39, No 2, pp 265-84.

Brun, L. (2016). *Overcapacity in Steel: China's Role in Global Problem.* Washington: Social Science Research Institute.

Chen, M. X., Otsuki, T., & Wilson, J. S. (2006). "*Do Standards Matter for Export Success?." Policy Research Working Paper No. 3809.* Washington: World Bank.

Essaji, A. (2008). Technical Regulation and Specialization in International Trade. *Journal of International Economics*, Vol 76, pp 166-76.

Feinberg, R. M. (2010). "*Trends and Impact of India's Antidumping Enforcement" Office of Economics Working Paper No 2010-10A.* Washington: U.S. International Trade Comission.

Giddens, A. (1990). *The Consequence of Modernity.* Cambridge: Polity Press.

Jaffe, S., & Henson, S. (2004). *"Standards and Agro-Food Exports from Developing Countries: Rebalancing the Debate" Policy Research Working Paper No 3348.* Washington DC: World Bank.

Jorgensen, J. G., & Schroder, P. J. (2006). Technical Barriers, Import License and Tariffs as Means of Limiting Market Access. *Journal of Economic Integration*, pp 120-146.

Krugman, P., Obstfeld, M., & Melitz, M. (2012). *International Economics (9th Edition).* Boston: Pearson Education.

London Metal Exchange. (n.d). Steel Proce. Retrieved March 21, 2017 from http://lme.com

Love, P., & Lattimore, R. (2009). "*Protectionism? Tariffs and Other Barriers to Trade" OECD Insight: International Trade.* Paris: OECD Publishing.

Maskus, K., Otsuki, T., & Wilson, J. (2005). "*The Cost of Compliance With Product Standards for Firms in Developing Countries" Policy Research Working Paper 3590.* Washington: World Bank.

MOI. (2015). *Logam Dalam Angka.* Jakarta: Ministry of Industry of Republic of Indonesia.

Moore, M. E. (1996). *The Political Economy of Trade Protection.* Chicago: University of Chicago Press.

Oguledo, V., & Macphee, C. (1994). Gravity Models: A Reformulation and An Application to Discriminatory Trade Arrangements . *Applied Economics*, Vol 26, pp 107-20.

Peridy, N., Guillotreau, P., & Bernard, P. (2000). The Impact of Prices on Seafood Trade: A Panel Data Analysis of The French Seafood Market. *Marine Resource Economics* , Vol 15, pp 45-66.