
IMPACTS OF MANDATORY STANDARDS POLICY AND SIGNING OF INTERNATIONAL MUTUAL RECOGNITION AGREEMENTS ON INDONESIAN IMPORTS

Dampak Kebijakan Standar Wajib dan Penandatanganan Kesepakatan Saling Pengakuan Internasional Terhadap Impor Indonesia

Arief Gunawan^{1,2,3}

¹Master Program on Economics Planning and Development Policy, Universitas Indonesia.
Salemba Raya Street No.4, Senen, Kota Jakarta Pusat 10430

²Master Program on Economics, Planning, and Public Policy, National Graduate Institute for Policy Studies (GRIPS), Tokyo, Japan.

7-22-1 Roppongi, Minato-ku, Tokyo 106-8677

³National Standardization Agency of Indonesia, Jakarta
M.H. Thamrin St. Number 8, Kebon Sirih, Jakarta 10340

Email: arief.g@bsn.go.id

Diterima: 20 September 2020, Direvisi: 18 Maret 2021, Disetujui: 27 Juli 2021

Abstract

The abatement of tariff obstacles led to an increase in the implementation of non-tariff barriers in global trade. Standardization policy plays a dual role in international trade as non-tariff barriers which can drive or inhibit trade. On the other hand, international organizations, such as ILAC and IAF, encourage their members to sign mutual recognition agreements to reduce technical barriers to trade. This study aims to investigate the extent to which mandatory standards policy and signing the international mutual recognition agreements influence Indonesian imports. This is a quantitative study by using secondary data, including: Indonesian import's value, Indonesian tariff, Indonesian GDP, partner countries' GDP, geographic distance, a dummy variable of mandatory SNI, and a dummy variable of MLA/MRA. This study observes the import value of 300 commodities that are required to comply with SNI from 103 trading-partner countries between 2007 and 2019. The gravity model is employed as an analytical tool, which is then regressed by utilizing linear regression with a product's fixed effect. A key finding of this empirical research is that mandatory standards policy has a negative link to Indonesian imports. Another crucial outcome is that though the mutual recognition agreement of the conformity assessment results has a positive correlation to Indonesian imports, it is not statistically significant. It can be recommended that the enforcement of compulsory SNI needs to be upward in the future in order to carry out the mandate of the law for consumers protection from an abundance of low-quality imported goods. Another recommendation is that the government could make optimal use of the MRA to be able to promote exports of Indonesia's main commodities to the global market.

Keywords: mandatory standards, mutual recognition agreement, imports, non-tariff barrier, international trade.

Abstrak

Pengurangan hambatan tarif menyebabkan peningkatan dalam penerapan hambatan non tarif dalam perdagangan internasional. Kebijakan standarisasi memainkan peran ganda dalam perdagangan internasional sebagai hambatan non-tarif di mana dapat mendorong atau menghambat perdagangan. Di sisi lain, organisasi internasional, seperti ILAC dan IAF, mendorong anggotanya untuk menandatangani perjanjian saling pengakuan dalam upaya mengurangi hambatan teknis perdagangan. Studi ini bertujuan untuk mengkaji sejauh mana kebijakan standar wajib dan penandatanganan kesepakatan saling pengakuan internasional mempengaruhi impor Indonesia. Penelitian ini merupakan studi kuantitatif dengan menggunakan data sekunder, berupa: nilai impor Indonesia, bea masuk Indonesia, PDB Indonesia, PDB negara mitra, jarak geografis, dummy variabel SNI wajib, dan dummy variabel MLA/MRA. Penelitian ini mengamati nilai impor 300 komoditas yang diharuskan memenuhi SNI wajib dari 103 negara mitra dagang antara tahun 2007 dan 2019. Model gravitasi digunakan sebagai alat analisis, kemudian diregresikan dengan metode regresi linier dengan efek tetap untuk produk. Temuan utama dari penelitian empiris ini adalah bahwa kebijakan standar wajib memiliki kaitan negatif dengan impor Indonesia. Hasil krusial lainnya adalah meskipun kesepakatan saling pengakuan hasil penilaian kesesuaian memiliki korelasi positif dengan impor Indonesia, namun secara statistik tidak signifikan. Penelitian ini merekomendasikan bahwa pemberlakuan SNI wajib ke depan perlu lebih ditingkatkan guna menjalankan amanat undang-undang dalam rangka perlindungan konsumen dari banyaknya barang impor berkualitas rendah. Rekomendasi lainnya adalah pemerintah dapat memanfaatkan MRA secara optimal untuk dapat mendorong ekspor komoditas utama Indonesia ke pasar global.

Kata kunci: standar wajib, kesepakatan saling pengakuan, impor, hambatan non tarif, perdagangan internasional.

1. INTRODUCTION

Tariff barriers in global trade have significantly reduced since the sixth-round negotiation (Kennedy round) of the General Agreement on Tariffs and Trade (GATT) in 1967 (Deardorff & Stern, 1983). As tariff barriers decrease significantly, there has been a rising interest in applying non-tariff barriers in global trade (Deardorff & Stern, 1997). Standardization policy is an instrument most commonly used as a non-tariff barrier in international trade (Gandal & Shy, 2001). Standards can encourage trade because they can reduce consumer uncertainty (Hudson & Jones, 2003). However, standards can also deter trade since they do require high efforts for compliance (Maskus *et al.*, 2005). Thus, standardization policy creates dualism as a non-tariff barrier in multilateral trade, which can both promote or restrict trade.

The Law of the Republic of Indonesia Number 20 of 2014 states that the application of the Indonesian National Standard (hereinafter referred to as "SNI") is voluntary; however, technical institutions can adopt SNI as a technical regulation to be mandatorily enforced if it is related to environmental preservation, security, safety, and health. The number of SNIs stipulated in February 2020 is 13,073 SNIs (BSN, 2020a), of which 136 SNIs are compulsory standards for products (BSN, 2020b). Additionally, the 136 obligatory SNIs have a contribution of about 27% of all non-tariff barriers imposed in Indonesia (UNCTAD, 2020).

The implementation of standards and technical regulations cannot be carried out without the sustenance of conformity assessment. The law states that conformity assessment is performed by conformity assessment bodies (hereinafter referred to as "CABs") which is accredited by the *Komite Akreditasi Nasional* (KAN) [National Accreditation Committee]. Those CABs consist of laboratories and certification bodies.

Furthermore, for conformity assessment results to get favorable global reception, conformity assessment bodies must obtain accreditation from their national accreditation body. Besides, the national accreditation body should have signed the International Laboratory Accreditation Cooperation-Mutual Recognition Arrangement (ILAC-MRA) for laboratories and the International Accreditation Forum-Multilateral Recognition Arrangement (IAF-MLA) for certification bodies. ILAC and IAF utilize these MRA and MLA to facilitate global trade by promoting international recognition of

the conformity assessment results (Muse, 2008). KAN has gained many international acclaims by signing ILAC-MRA and IAF-MLA (BSN, 2020c).

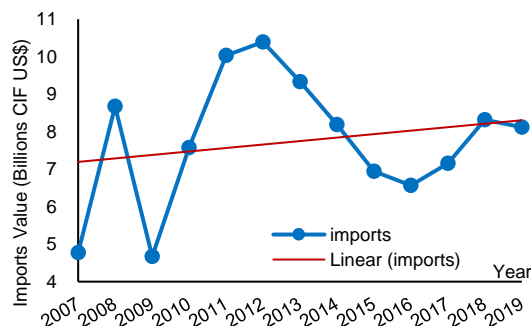


Figure 1 Total Indonesian import value for mandatory SNI products (BPS, 2008-2020).

Figure 1, which presents an overview of Indonesian imports between 2007 and 2019, highlights the linear upward trend experienced by Indonesia's imports; however, the values tended to fluctuate. It indicates that the effects of mandatory SNI and mutual recognition on Indonesian imports appear to be uncertain. Thus, the objective of this paper is to analyze the influence of mandatory standards policy and mutual recognition agreements on Indonesian imports between 2007 and 2019. While most of the Indonesian empirical studies commonly looked at the effect of standardization policy on Indonesian imports of particular products, very few studies, especially recently in Indonesia, examined all products that are regulated to comply with SNI. For example, the enactment of mandatory standards is a substantial barrier for exporters to sell steel products in the Indonesian market (Hartati, 2018). Additionally, compulsory promulgation of primary battery standards partially has no significant effect on Indonesia's import value of primary batteries (Susanto & Kristiningrum, 2019). Therefore, this research would support already existing Indonesian literature by determining the extent of beneficial impacts standardization policy has on Indonesian trade on a global scale.

Additionally, very few analyses in Indonesia estimate how mutual recognition agreements affect Indonesian imports. For instance, Wibowo and Suprpto (2018) investigated the effectiveness of the ASEAN Sectoral Mutual Recognition Arrangement on Electrical and Electronic Equipment (ASEAN EE MRA) which came into force since 2010, based on the readiness of SNI to the ASEAN Agreed Standard, Conformity Assessment Bodies (CABs), and its utilization by business actors in Indonesia. They pointed out that the implementation of the ASEAN EE MRA related

to mutual recognition and acceptance of testing results and product certificates is not effective. Therefore, this research provides a broader viewpoint to stakeholders in terms of the policy-making process regarding the activity of standardization, technical regulation, and conformity assessment procedures (STRACAP) in Indonesia, especially from the aspects of the IAF MLA and the ILAC MRA.

2. LITERATURE REVIEW

The discussion regarding the link between standardization and global trade has been carried out across empirical research. The phenomenon is varied in both studies of inter-countries and a solitary country, as well as both research of cross-products and a single product. Some scholars have declared that standardization harms trade because the trader must comply with the product standards. Other researchers have disputed this claim and stated that standardization has a positive effect on trade since they reduce the scepticism about product quality. Thus, standardization has an ambiguous influence on trade.

For a country analysis, Swann *et al.* (1996) investigated the influence of standards on British trade performance. They used multi-sectoral trade data at the 3-digit level Standard Industrial Classification (SIC) from 1985 to 1991, which were evaluated by appraising British trade equations. Their findings claim that British standards stimulated British imports and exports, even though there is a slightly greater impact on exports than on imports. Similarly, Yang (2013) estimates the effect of China's trade size from 33 sectors with the rest of the world using panel data analysis. Yang (2003) pointed out that globally harmonized mandatory standards boost China's growth of imports. Besides, China's national compulsory standards harms exports while increasing imports.

A decade after Swann *et al.* (1996), Blind and Jungmittag (2006) analyzed the leverage of patents and standards on German-Britain bilateral trade. They used a similar methodological approach as Swann *et al.* (1996) but extended the database by adding more detail. Blind and Jungmittag (2006) found that German international standards have a positive impact, while the national ones harm the German trade balance.

For a specific product analysis, Masood and Brümmer (2014) studied the impact of the Global Good Agricultural Practices (GlobalGAP) standard, on the European Union

(EU) banana imports from 74 exporting countries. The dataset consisted of three-year panel data between 2010 and 2012 along with the gravity model for the analysis of the effect of standards on trade. The results indicate that the voluntary application of the GlobalGAP standard has a positive and significant impact on EU banana imports.

It can be explained that, theoretically, the variation in product quality raises problems for market theory (Akerlof, 1970). Information about the quality that is asymmetrically disseminated is likely to obstruct the development of a market (Buchegger & Riedl, 2005). In other words, uncertainty about the quality of a product can lead to market failure. Akerlof (1970) contends that one method to ward off quality doubt is through guarantees. Standards provide a guarantee of the product quality to diminish uncertainty in economic activity, including in trade (Yang, 2013).

For consumers, standards play an essential role in saving uncertainty costs as reflected in the subtraction in time and effort to find and assess the quality of a product (Jones & Hudson, 1996). On the contrary, producers need additional capital and labor; therefore, standards may lead to an increase in variable production costs that indicate the emergence of technical barriers to trade as a result of the enforcement of technical regulations (Maskus *et al.*, 2013). Nevertheless, standardization might lower coordination costs in outlying facilities throughout the nation to ensure that standardization has a vital function in the global value chain. In addition, since they are abroad based, stages of production are inclined to require a lot of coordination, standardization may lessen transaction costs, especially those associated with the value chain (Den Butter *et al.*, 2007).

Moreover, the International Organization for Standardization (ISO) stipulated ISO 9000, which is an international standard for the quality management system (QMS). Additionally, ISO 9000 is one of the most commonly applied standards by any organization (Clougherty & Grajek, 2013). The number of empirical studies on the impact of mutual recognition on international trade is likely limited to the International Accreditation Forum Multilateral Recognition Arrangement (IAF-MLA) on the QMS. Although the ISO 9000 certification provides product quality insurance, Pototski and Prakash (2009) find that the imports decrease in a country that has more certifications of ISO 9000. However, Blind *et al.* (2015) stated that mutual recognition agreements (MRA) on

certification of food, beverage, and tobacco products positively correlated with trade. They added that bilateral trade flows between MRA member countries were larger than non-members. Three years later, Blind *et al.* (2018) pointed out that certification plays a vital role in trade. Additionally, they claimed that trade becomes more significant for countries that have IAF-MLA signatories.

In theory, Pelkmans (2005) opines that mutual recognition is an extraordinary innovation in smoothing cross-border economic activities between countries. Mutual recognition (MR) is widely believed to reduce the barriers to the trade of thousands of goods and services. However, a strange paradox has emerged. Although MR is universally praised for its benefits, it has little contribution to the actual realization of unrestricted movement in the single market. Pelkmans (2005) adds that there are difficulties in interpreting the effects of MR equality. These complications might lead to an increase in transaction costs, which then require a long process to reduce them.

3. METHODOLOGY

This study was carried out by looking at 136 SNI of products that are compulsorily imposed by the Government of Indonesia as of December 2019. Since the observation period for this research is between 2007 and 2019, it brings us to three application periods of the 10-digit harmonized system (HS) code in Indonesia: HS2007, HS2012, and HS2017. To avoid estimation errors, a manual correlation of three periods of products' HS code was conducted and hence, this research has a total of 300 products.

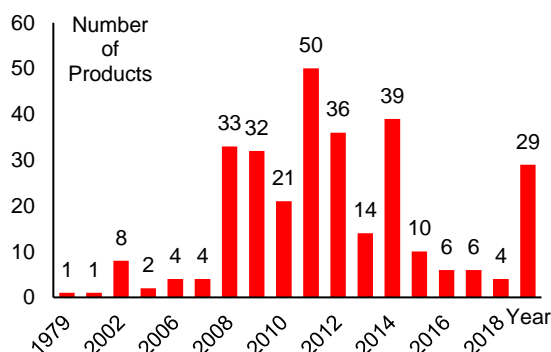


Figure 2 Number of products subjects to mandatory SNI based on the initial year of enforcement (BSN, 2019).

Figure 2 summarizes the number of products that were required to implement mandatory SNI based on the initial year of

enforcement. The data in Figure 2 shows that the percentage of products required to apply mandatory SNI in the period from 2007 to 2019 is 94.67%. This high percentage explains the chosen 2007 to 2019 observation period.

Furthermore, the data on import value has been collected from the annual publication of *Badan Pusat Statistik* (BPS) [Central Statistics Agency] in the units of US\$ CIF. The data on Indonesian imports is the import value from 103 trading partners, who are members of the International Laboratory Accreditation Cooperation (ILAC). They have signed the Mutual Recognition Arrangement (MRA) on Testing Laboratories.

Additionally, the data on Indonesia's tariff was obtained from several regulations of the Minister of Finance, in percent units (*ad valorem* tariff). The Most Favoured Nation (MFN) tariff is imposed on most trading partners, while the non-MFN tariffs are applied to countries with agreements. Those agreements are between Indonesia and Thailand, Singapore, Malaysia, the Philippines, Viet Nam, China, Japan, South Korea, Australia, New Zealand, India, Pakistan, and Chile.

Regarding the data on two mutual recognition agreements, the first is the Mutual Recognition Arrangement (MRA) for Testing Laboratories. There are 103 countries that have signed the International Laboratory Accreditation Cooperation (ILAC) MRA for Testing Laboratories, not including Indonesia (ILAC, 2019). The second is the Multilateral Recognition Arrangement (MLA) on the Quality Management System (QMS). There are 79 countries that have signed the International Accreditation Forum (IAF) MLA on QMS, excluding Indonesia (IAF, 2019). Interestingly, all of the 79 countries have also signed the ILAC MRA for Testing Laboratories. Both mutual recognition data are then interacted with each other and are treated as a dummy variable, where 1 is when the MRA/MLA has been signed and 0 is otherwise.

Moreover, this study employed the gravity equation as an analytical tool to answer the research questions. Gravity equation has broadly been used to investigate the empirical leverages of various policies on international trade flows (Anderson & Van Wincoop, 2003). Although many scholars argue that there is no strong theoretical foundation to justify the standard gravity equation (Deardorff, 1998; Anderson, 2011; Ambarita and Sirait, 2020), some researchers attempted to develop and flesh out the gravity equation, one of whom was

Batra (2006). According to Ambarita and Sirait (2020), Batra's gravity model is as follows:

$$\ln T_{ij} = \beta_0 + \beta_1 \ln Y_i + \beta_2 \ln Y_j + \beta_3 \ln D_{ij} + \sum_{s=1}^N \lambda_s G_s \quad (3.1)$$

where T_{ij} is the trade flows between country i and country j , Y_i and Y_j depict the economic size of country i and j , measured by Gross Domestic Products (GDP), D_{ij} is the geographic distance

between both countries, and G_s are the other factors that affect trade between country i and j . The other factors G_s in this study include Indonesia's real effective exchange rate ($reerindo_t$), import duties ($tariff_{jkt}$), a dummy variable for mandatory SNI ($dSNI_{kt}$), and a dummy variable for mutual recognition ($dMLAMRA_{jt}$). By following Equation 3.1, the gravity models used in this research are specified as follows:

$$\limport_{jkt} = \alpha_{jkt} + \beta_1 \cdot \ln lrgdpindo_t + \beta_2 \cdot \ln lrgdp_{jt} + \beta_3 \cdot \ln ldist_j + \beta_4 \cdot reerindo_t + \beta_5 \cdot tariff_{jkt} + \beta_6 \cdot dSNI_{kt} + \beta_7 \cdot dMLAMRA_{jt} + FE_k + \gamma \cdot timetrend_t + \varepsilon_{jkt} \quad (3.2)$$

$$\limport_{jkt} = \alpha_{jkt} + \beta_1 \cdot \ln lrgdpindo_t + \beta_2 \cdot \ln lrgdp_{jt} + \beta_3 \cdot \ln ldist_j + \beta_4 \cdot reerindo_t + \beta_7 \cdot dMLAMRA_{jt} + \beta_8 \cdot (tariff_{jkt} \times dSNI_{kt}) + FE_k + \gamma \cdot timetrend_t + \varepsilon_{jkt} \quad (3.3)$$

$$\limport_{jkt} = \alpha_{jkt} + \beta_1 \cdot \ln lrgdpindo_t + \beta_2 \cdot \ln lrgdp_{jt} + \beta_3 \cdot \ln ldist_j + \beta_4 \cdot reerindo_t + \beta_5 \cdot tariff_{jkt} + \beta_6 \cdot dSNI_{kt} + \beta_7 \cdot dMLAMRA_{jt} + \beta_8 \cdot (tariff_{jkt} \times dSNI_{kt}) + FE_k + \gamma \cdot timetrend_t + \varepsilon_{jkt} \quad (3.4)$$

Based on the three equations above, α , β , γ , and ε are constants, regression coefficients, time trend coefficient, and errors, respectively. The dependent variable \limport_{jkt} stands for the natural logarithm of the Indonesian import value from country j , of products k , in year t ; $\ln lrgdpindo_t$ is the natural logarithm of Indonesian Gross Domestic Products (GDP) in year t , while $\ln lrgdp_{jt}$ is the natural logarithm of GDP for country j in year t ; $\ln ldist_j$ is the natural logarithm of geographic distance between Indonesia and country j ; $reerindo_t$ is the real effective exchange rate of Indonesia in year t . Furthermore, $tariff_{jkt}$ is import duty imposed by Indonesia for product k , country j , and in year t . $dSNI_{kt}$ is a dummy variable standing in for the mandatory enactment of SNI for products k in year t (1=mandatory; 0=otherwise).

This paper uses a real effective exchange rate (REER) rather than a real exchange rate (RER) as REER provides a better way to measure the country's competitiveness in global trade (Matlasedi, 2016). Couharde *et al.* (2018, p.8) defined the REER as "the real effective exchange rate of country i in period t ($REER_{i,t}$) is calculated as the weighted average of real bilateral exchange rates against each of its N trading partners j ". The relationship between REER and RER is designated by Pratikto (2012, p.155) as "an increase in REER is interpreted as an appreciation in domestic currency (Rupiah), and vice versa". With the appreciation of the local currency, the price of goods in the country becomes relatively more expensive than the price of goods abroad. This would result in domestic residents buying more imported products. In other words, exchange rate

appreciation has a positive correlation with imports (Mankiw, 2015).

Additionally, $dMLAMRA_{jt}$ is another dummy variable that represents an interaction between the IAF MLA on QMS and the ILAC MRA on Testing Laboratories, as well as the interaction IAF MLA and IAF MRA between Indonesia and country j in year t . The interaction between the two dummy variables is based on all technical regulations for mandatory enforcement of SNI. Those technical regulations require SNI conformity certificates to be issued by product certification bodies that have been accredited by KAN. The issuance of the certificate is through the testing for quality compliance and auditing the application of a quality management system based on ISO 9001 standards. The certificate of test results can be published by an overseas testing laboratory that has been accredited by the relevant national accreditation body that has signed the ILAC MRA. Furthermore, the conformance certificate of the quality management system (ISO 9001) can be issued by an abroad certification body that has also been accredited by the relevant national accreditation body that has signed the IAF MLA. This is the basis for the interaction of the two IAF MLA dummy variables and ILAC MRA between Indonesia and countries j . In addition, FE_k is a fixed effect for product k .

Wooldridge (2009) discussed the issue of an empirical model in which the dependent variable is in logarithmic form, with one or more dummy variables as independent variables. In other words, if β_a is the coefficient of the dummy variable x_a , where $\log(y)$ is the dependent variable, the exact percentage difference in

estimating y when $x_a = 1$ versus when $x_a = 0$ is simplified as

$$100 \cdot [\exp(\beta_a) - 1] \tag{3.5}$$

The coefficient β_a can be positive or negative, and it is essential to retain its sign in calculating equation 3.5.

This paper also interacts a continuous variable of the tariff with a dummy variable of mandatory SNI ($\text{tariff}_{jkt} \times \text{dSNI}_{kt}$). The interaction of both variables is carried out because not all products that are required to comply with SNI experience a tariff reduction. By associating a variable of the tariff with a dummy variable for mandatory SNI, it could be interesting to look at whether the tariff will have an unlike effect on the products that also impose mandatory SNI.

Wooldridge (2009) addressed the issue that the presence of interaction variables between tariff_{jkt} and dSNI_{kt} made the parameters of the original variables more challenging to interpret. In other words, the partial effect of the tariff_{jkt} and dSNI_{kt} cannot be construed by looking only at the regression coefficients. Therefore, it becomes crucial to rebuilding the model so that the coefficients of the original variables become more attractive. Wooldridge (2009) exemplified a model with two explanatory variables and an interaction:

$$y = \beta_p + \beta_q x_q + \beta_r x_r + \beta_s x_q x_r + u \tag{3.6}$$

Wooldridge (2009) argued that β_q is the one-sided impact of x_q on y when $x_r = 0$. He claimed that this is not of interest, so he suggested rebuilding the model as

$$y = \beta_p + \delta_q x_q + \delta_r x_r + \beta_s (x_q - \mu_q)(x_r - \mu_r) + u \tag{3.7}$$

where μ_q and μ_r are the population average of x_q and x_r , respectively. Wooldridge (2009) stated that by multiplying the interaction in the second equation and comparing it to the regression coefficient, δ_q is now the partial effect of x_q to y at the mean value of x_r . It can be simplified as:

$$\delta_q = \beta_q + \beta_s \mu_r \tag{3.8}$$

$$\delta_r = \beta_r + \beta_s \mu_q \tag{3.9}$$

where β_q and β_r are the regression coefficients of x_q and x_r , respectively, and β_s is a regression coefficient of the interacted variable between x_q and x_r .

The equation 3.2 to 3.4 will then be regressed by using linear regression with multi-way fixed effects. Correia (2016) introduces the regression method by using the Stata syntax "*reghdfe*", which makes it possible to control heterogeneous variables that are not observed for each individual or group. The Stata syntax

also includes options: "*vce(cluster)*" and "*absorb*". The option of "*vce*" generally determines the kind of reported standard error, and the option of "*vce(cluster)*" partially conducts the estimation of consistent standard errors even if the observations appear as correlations within the group. The option of "*absorb*" categorizes the variables (including dummy variables), which will be absorbed as a representation of the fixed effects (Correia, 2016).

4. RESULTS AND DISCUSSIONS

In pursuance of answering the research questions, this study occupies limport_{jkt} as a dependent variable; Meanwhile, the independent variables employed include: Irgdpindo_t , Irgdp_{jt} , ldist_j , reerindo_t , tariff_{jkt} , dSNI_{kt} , and dMLAMRA_{jt} . Table 1 summarizes all the variables used in the form of descriptive statistics, which presents a preliminary depiction of the data distribution. The descriptive statistics also consists of the number of observations (N), mean, standard deviation, minimum value, and maximum value.

Table 1 Descriptive statistics.

Variables	N	Mean	Std. Dev.	Min	Max
import_{jkt} (million USD)	50435	1.99	13.2	10^{-6}	702
limport_{jkt}	50435	10.10	3.43	0	20.37
rgdpindo_t (billion USD)	50435	900	180	641	1200
Irgdpindo_t	50435	27.50	0.20	27.19	27.82
rgdp_{jt} (billion USD)	50435	2430	3760	0.92	18300
Irgdp_{jt}	50435	27.56	1.42	20.63	30.54
geo_dist_j (thousand KM)	50435	7.50	4.51	0.89	19.77
ldist_j	50435	8.67	0.81	6.79	9.89
reerindo_t	50435	93.96	4.08	88.16	100.21
tariff_{jkt}	50435	7.07	6.56	0	30
dSNI_{kt}	50435	0.55	0.50	0	1
dMLAMRA_{jt}	50435	0.89	0.31	0	1

Furthermore, Table 2 summarizes the regression results applied to the three estimation models. As can be seen in Table 2, Models 1, 2, and 3 display consistent results. From Model 1, it can be seen that the dummy

Impacts of Mandatory Standards Policy and Signing of International Mutual Recognition Agreements on Indonesian Imports

(Arief Gunawan)

variables for mandatory SNI ($dSNI_{ikt}$) and mutual recognition agreement (MLA/MRA) show statistically insignificant results. The estimation result of a dummy variable for MLA/MRA ($dMLAMRA_{jt}$) is also not statistically significant for Model 2 and 3. Generally speaking, Model 2 and 3 show proper estimation outcomes compared to Model 1.

Table 2 Results of High Dimensional Fixed Effect (HDFE) linear regression (Dep. var. = $limport_{jkt}$).

Models	(1)	(2)	(3)
Independent Variables			
$_cons$	-536.3** *	-500.0** *	-532.1** *
	(75.1)	(74.3)	(75.0)
$Irgdpindo_t$	19.76***	18.42***	19.60***
	(2.77)	(2.74)	(2.76)
$Irgdp_{jt}$	0.92***	0.92***	0.92***
	(0.04)	(0.04)	(0.04)
$ldist_j$	-1.63***	-1.63***	-1.62***
	(0.07)	(0.07)	(0.07)
$reerindo_t$	-0.006**	-0.005**	-0.006**
	(0.003)	(0.003)	(0.003)
$tariff_{jkt}$	-0.031** *		-0.048** *
	(0.008)		(0.009)
$dSNI_{ikt}$	-0.11		-0.27***
	(0.07)		(0.09)
$dMLAMRA_{jt}$	0.20	0.20	0.20
	(0.13)	(0.13)	(0.13)
$dSNI_{ikt}\#c.tariff_{jkt}$		-0.028** *	0.024***
		(0.008)	(0.008)
$timetrend_t$	-1.09***	-1.04***	-1.09***
	(0.15)	(0.14)	(0.15)
N	50435	50435	50435
R^2	0.3440	0.3441	0.3444
$adj. R^2$	0.3400	0.3400	0.3404
$Prob>F$	0.0000	0.0000	0.0000

Note:

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; HDFE Linear regression, absorbing 1 HDFE group; Statistics robust to heteroskedasticity

The first interpretation of the regression results is regarding the overall model fit. The R^2 value of 0.344 indicates that all independent

variables simultaneously affect the dependent variable by 34.4%, while other variables outside the model influence the rest. Meanwhile, a small $Prob>F$ value of 0.00 shows that the independent variables accurately project the dependent variable. It seems likely that this small R^2 is due to the existence of other independent variables outside the model, which provides a greater influence on the dependent variable. Thus, there is a strong possibility that R^2 could be enhanced by adding some independent variables which are directly related to the dependent variable for future research.

The second interpretation is for the three variables' coefficients of the gravity model: log of Indonesia's real GDP ($Irgdpindo_t$), log of partner countries' real GDP ($Irgdp_{jt}$), and log of geographical distance ($ldist_j$). From the Model 3, every one percent growth in $Irgdpindo_t$ will encourage an increase in imports by 19.6%, assuming all variables are considered constant. The same interpretation is that every one percent growth in $Irgdp_{jt}$ will result in an increase of Indonesian imports by 0.92%, and each addition in $ldist_j$ by one percent will lead to a decrease of 1.62% of Indonesian imports. The estimation results on the three variables of the standard gravity equation are in accordance with the study by Ambarita and Sirait (2020), where the economic size of Indonesia and partner countries j (measured in GDP) is positively correlated to Indonesian imports, while geographic distance is negatively correlated. It indicates the accuracy in choosing the gravity equation model in measuring the flow of Indonesia's imports from partner countries.

The third interpretation is about Indonesia's Real Effective Exchange Rate ($reerindo_t$). From Model 3, it can be interpreted that the value of Indonesia's imports will slightly decline by 0.6% as a consequence of each unit's $reerindo_t$ upsurge. This variable presents a negative association and very slight impacts on Indonesian imports. It is contrary to the macroeconomics literature by Mankiw (2015), which stated that $reerindo_t$ is expected to have a positive link with Indonesian imports. Based on the limited data available, the negative correlation and the quite small regression coefficient of $reerindo_t$ might indicate that other variables are more significant in influencing Indonesian imports for products subject to SNI. Another possibility is that the price elasticity for products regulated to comply with the SNI is deficient and, therefore, $reerindo_t$ does not affect Indonesian imports.

Furthermore, the fourth interpretation is regarding the effect size calculation of the dummy variable $dMLAMRA_{jt}$ on Indonesia's import, by ensuing equation 3.5, which is 22.14. It can be construed that the difference in predicted Indonesia's import value from trading partners who have MLA/MRA ($dMLAMRA_{jt} = 1$) compared to non-MLA/MRA countries ($dMLAMRA_{jt} = 0$) is around 20%. Variable MLA/MRA shows a positive correlation with Indonesia's imports, and this result arguably matches the estimation results of Clougherty and Grajek (2013) and Blind *et al.* (2018). Perhaps this result is as expected but is probably also interesting because this preliminary study can interestingly provide a reasonable link between mutual recognition agreement and Indonesian imports. The positive result indicates that even though the Indonesian government applies strict regulations on goods from abroad to obtain SNI certification, the existence of IAF-MLA and ILAC-MRA cut down the process of product testing and QMS certification to issue the *Sertifikat Produk Penggunaan Tanda SNI* (SPPT SNI) [product certificate for using the SNI mark]. It is consistent with Muse (2008), who argues that the purpose of the mutual recognition agreement (in this case, IAF-MLA and ILAC-MRA) is to promote global trade. However, the regression result for the $dMLAMRA_{jt}$ variable is not statistically significant. It seems likely that this finding is because most of the products that are subject to mandatory SNI are imported from MLA/MRA countries (89%), so that the $dMLAMRA_{jt}$ data had only slight variations as shown in Table 1 (Descriptive Statistics).

In addition, the insignificance of the $dMLAMRA_{jt}$ variable's regression result could likely be reviewed from some factors. The first factor is the reciprocity principle, as mandated by Article 36 Paragraph 2 of Law Number 20 of 2014 on Standardization and Conformity Assessment. In more detail, the Law states that conformity assessment activities can be carried out by CABs located overseas that have been accredited in that country based on reciprocity principle, as long as there is a mutual recognition agreement between KAN and international accreditation agencies. The second factor is the laboratory test result certificates from which countries that have been accepted by regulators in Indonesia for the 136 mandatory SNIs. This factor is essential because product certification bodies can use the certificate of laboratory test results to issue an SNI compliance certificate to a product. The third factor is the correlation between the SPPT

SNI and the ISO 9001 certificate (quality management system). According to the technical regulations on the mandatory enforcement of SNI, it could be assumed that SPPT SNI does not automatically accept a certificate of the quality management system. However, the product certification bodies that provide SPPT SNI seem to have to carry out audits on certain aspects, for example, an audit for the quality management system. In summary, those three factors from this preliminary research arguably might be used as considerations for further studies.

The fifth interpretation is about the one-sided effect of $tariff_{jkt}$ and $dSNI_{kt}$ from Model 1. As for β_5 ($tariff_{jkt}$), Indonesia's imports will decline by 3.1% due to the increase in the $tariff_{jkt}$ by one percentage point, and it is statistically significant. This outcome is consistent with the results from Veranian (2018). Moreover, the effect size calculation (β_6) of the dummy variable $dSNI_{kt}$ on Indonesia's import is following equation 3.5, which is -10.42. It can be interpreted that the difference in estimated import value between when $dSNI_{kt} = 1$ and when $dSNI_{kt} = 0$ is about 10.42%. The negative value shows that the mandatory SNI imposition has a negative impact on Indonesia's imports; nevertheless, it is not statistically significant. Additionally, the independent-variable of $dSNI_{kt}$ also shows the same effect as $tariff_{jkt}$. This discovery matches the results of Anders and Caswell (2009) and Hartati (2018). It suggests that there is an indication of a protectionist motive for implementing import duty and obligatory SNI in Indonesia's trade policy. Accordingly, the imposition of mandatory standard policy as a non-tariff barrier has a negative impact on Indonesia's imports which is equivalent to a three-percentage point increase in imports duty rates. Considering the average of import duty rate for 300 items that are subject to mandatory SNI is about 7%, the impact of compulsory standards policy on Indonesia's imports can be regarded as quite big. It suggests that the tendency of the Government of Indonesia to increase the application of non-tariff barriers, particularly the mandatory standard policy, to carry out the mandate of the law to protect the domestic market from an influx of low-quality imported goods.

The last interpretation is about the interaction variable between $tariff_{jkt}$ and $dSNI_{kt}$. We must be careful in interpreting these two variables because Model 3 has both partial and simultaneous effects of $tariff_{jkt}$ and $dSNI_{kt}$ on Indonesian imports. If we simply look at the coefficients of the two variables, we might get

the correct interpretation that the two $tariff_{jkt}$ and $dSNI_{kt}$ variables have negative impacts on Indonesian imports. However, the results of that interpretation may also not be exactly correct as a consequence of the simultaneous effect of both variables $tariff_{jkt}$ and $dSNI_{kt}$. The one-sided effect of $tariff_{jkt}$ (δ_5) can be obtained by following equation 3.8, and the partial impact of $dSNI_{kt}$ (δ_6) through equation 3.9. Therefore, we can get δ_5 by -0.035 , which indicates that Indonesian imports will increase by 3.5% as a result of a one percentage point tariff reduction.

Additionally, we obtain δ_6 by -0.1 , which then is interpreted by the following equation 3.5. The result indicates that the enactment of mandatory SNI can lead to a decrease in Indonesia's imports by 9.52%. Therefore, this result suggests that the application of mandatory standards policy as a non-tariff barrier has a more significant impact almost three times compared to the tariff barriers. Furthermore, the simultaneous impact of $tariff_{jkt}$ and $dSNI_{kt}$ has a positive correlation with Indonesian imports. The interpretation is when the mandatory SNI is imposed, every one percent upsurge on $tariff_{jkt}$ will lead to an increase in Indonesian import by 0.024%. An interesting finding is that both partial and simultaneous impacts of those two variables are statistically significant.

Following this, there is a fascinating finding in the estimation result of the interaction of independent variables of import duty and mandatory SNI ($tariff_{jkt}$ and $dSNI_{kt}$). This variable has a positive correlation with Indonesian imports, and the association is statistically significant. The evidence seems contrary to the conceptual outlook because both $tariff_{jkt}$ and $dSNI_{kt}$ partially have a negative relationship with Indonesia's imports. There are two possible explanations for this finding.

The first possibility is associated with transaction costs because tariff barriers can cause an increase in transaction costs. If tariffs only experience a slight decrease, but certain products are regulated to meet quality requirements, it can result in a fairly high increase in transaction costs. However, this explanation has not been considered since this study was not designed to test what it costs for a product to comply with the standards. Additionally, it can be argued that higher transaction costs will raise the products' price so that the demand for the products declines. In other words, the interaction of $tariff_{jkt}$ and $dSNI_{kt}$ should have a negative correlation with Indonesian imports. However, the evidence indicates the opposite. This may be due to the

fact that all mandatory products are essential goods whose prices are inelastic; therefore, the price does not influence import demand. Nevertheless, this explanation is only a possibility because this research did not investigate the effect of the elasticity of prices of goods on Indonesian imports.

The second probability is connected to the short-term and long-term impact of mandatory standards. In the short-term, partner countries may experience trade shocks, where their products cannot meet the standards required by the importing country. However, in the long-term, it is probable for partner countries to have the ability to obtain quality conformity certificates so that their commodities can penetrate the importer's country market. This explanation is more plausible since initially, partner countries will learn what quality requirements are needed to export their commodities. Additionally, partner countries need time for their products to meet the standards after which they can obtain conformity certificates.

5. CONCLUSION

This study explored the extent of the influence of mandatory standards policy and the signing of international mutual recognition agreements on Indonesian imports. A key outcome of this empirical study is that mandatory standards policy has a negative impact on Indonesian imports. This may be due to the protectionist motives carried out by the Indonesian government. It is in line with the Law of the Republic of Indonesia Number 20 of 2014 regarding Standardization and Conformity Assessment, in which the mandatory application of SNI is to protect domestic consumers from low-quality products.

Another crucial finding of this research is that the signing of a mutual recognition agreement (MRA) of the conformity assessment results has a positive effect on Indonesian imports. MRA can likely reduce the effect of non-tariff barriers in international trade, where MRA provides stimulation to the presence of trade creation.

It is necessary to consider which findings are most useful for policy purposes. One policy implication is to increase the number of mandatory SNI enactments. The government can take into account the short-term and long-term effects of mandatory standard policies on Indonesian imports, especially as they relate to consumer protection and the competitiveness of

domestic producers. Another policy recommendation might be to estimate how much mutual recognition agreement could increase Indonesian exports because this outcome suggests that mutual recognition agreements boost Indonesian imports. By doing so, the Indonesian government can obtain valuable input which could help local entrepreneurs to produce goods that can enter the global market.

ACKNOWLEDGEMENTS

This research was under the guidance of Professor Toshihiro Kudo, from the National Graduation Institute for Policy Studies (GRIPS) in Tokyo, Japan, and Vid Adrison Ph.D. from the master's Program in Economic Planning and Development Policy, University of Indonesia.

REFERENCES

- Akerlof, G. A. (1970). The Market for «Lemons»: Quality Uncertainty and the Market Mechanism "in Quarterly. *Journal of Economics*, 84.
- Ambarita, Y. M. R., & Sirait, T. (2019). Penerapan Model Gravitasi Data Panel: Kajian Perdagangan Internasional Indonesia ke Negara Anggota ASEAN. In *Seminar Nasional Official Statistics* (Vol. 2019, No. 1, pp. 726-737).
- Anderson, J. E., & Van Wincoop, E. (2003). Gravity with gravitas: A solution to the border puzzle. *American economic review*, 93(1), 170-192.
- Anderson, J. E. (2011). The Gravity Model: Annual Review of Economics. Batra, A. (2006). India's global trade potential: The gravity model approach. *Global Economic Review*, 35(3), 327-361.
- Blind*, K., & Jungmittag, A. (2005). Trade and the Impact of Innovations and Standards: The Case of Germany and the UK. *Applied economics*, 37(12), 1385-1398.
- Blind, K., Mangelsdorf, A., & Pohlisch, J. (2018). The effects of cooperation in accreditation on international trade: Empirical evidence on ISO 9000 certifications. *International Journal of Production Economics*, 198, 50-59.
- Blind, K., Mangelsdorf, A., & Wilson, J. S. (2013). 12 Mutual Recognition of Accreditation: Does it Matter to Trade? Evidence from the Food, Beverage, and Tobacco Industry. In *Nontariff Measures with Market Imperfections: Trade and Welfare Implications*. Emerald Group Publishing Limited. BPS. (2008-2020). Indonesian Foreign Trade Statistics on Imports 2007-2019 (in Indonesian). Jakarta: Central Agency of Statistics.
- BSN. (2019). Technical Regulations (Mandatory SNI). Retrieved from [https://bsn.go.id/uploads/download/12_sni_wajib\(share\)_des_2019_1.pdf](https://bsn.go.id/uploads/download/12_sni_wajib(share)_des_2019_1.pdf), on March 25, 2020
- (2020a). Statistics of SNI (in Indonesian). Retrieved June 9, 2020, from https://bsn.go.id/uploads/download/statistik_sni_februari_2020.pdf
- (2020b). Technical regulation (mandatory SNI) (in Indonesian). Retrieved June 9, 2020, from https://bsn.go.id/main/bsn/isi_bsn/20054/regulasi-teknis-sni-yang-diwajibkan
- (2020c). National Standardization Agency Performance Report 2019 (in Indonesian). Retrieved June 9, 2020, from https://bsn.go.id/uploads/download/laporan_kinerja_bsn_2019.pdf
- Buchegger, R., & Riedl, R. (2005). *Asymmetric information as a cause for market failure- Application Service Providing (ASP) in Austria* (No. 0501). Working Paper.
- Clougherty, J. A., & Grajek, M. (2014). International standards and international trade: Empirical evidence from ISO 9000 diffusion. *International Journal of Industrial Organization*, 36, 70-82.
- Correia, S. (2016). A feasible estimator for linear models with multi-way fixed effects. *Preprint at http://scorreia.com/research/hdfe.pdf*.
- Couharde, C., Delatte, A. L., Grekou, C., Mignon, V., & Morvillier, F. (2018). EQCHANGE: A world database on actual and equilibrium effective exchange rates. *International economics*, 156, 206-230.
- Deardorff, A. (1998). Determinants of bilateral trade: does gravity work in a neoclassical world?. In *The regionalization of the world economy* (pp. 7-32). University of Chicago Press.
- Deardorff, A. V., & Stern, R. M. (1983). Economic effects of the Tokyo Round. *Southern Economic Journal*, 605-624. Deardorff, A. V., & Stern, R. M. (1998). *Measurement of nontariff*

Impacts of Mandatory Standards Policy and Signing of International Mutual Recognition Agreements on Indonesian Imports

(Arief Gunawan)

- barriers* (Vol. 179). University of Michigan Press.
- Den Butter, F. A., Groot, S., & Lazrak, F. (2007). The transaction costs perspective on standards as a source of trade and productivity growth. Gandal, N., & Shy, O. (2001). Standardization policy and international trade. *Journal of International Economics*, 53(2), 363-383.
- Hartati, D. M. (2018). The Evaluation of Indonesian National Standardization (SNI) Policy towards Import in Steel Industry. *JPAS (Journal of Public Administration Studies)*, 2(2), 1-8.
- Hudson, J., & Jones, P. (2004). The Impact of Standardization on International Trade, *Homo Oeconomicus. EURAS Yearbook of Standardization*, 4, 1-20.
- IAF. (2019). IAF MLA. Retrieved from https://www.iaf.nu/articles/IAF_MLA/14, on December 20, 2019.
- ILAC. (2019). ILAC MRA and signatories. Retrieved from <https://ilac.org/ilac-mra-and-signatories/>, on December 20, 2019.
- Hudson, J., & Jones, P. (2004). The Impact of Standardization on International Trade, *Homo Oeconomicus. EURAS Yearbook of Standardization*, 4, 1-20.
- Law of the Republic of Indonesia Number 20 of 2014. Standardization and Conformity Assessment. September 17, 2014. State Gazette of the Republic of Indonesia of 2014 Number 216. Jakarta.
- Mankiw, N. G. (2015). *Macroeconomics* (9th ed.). New York: Worth Publisher.
- Maskus, K. E., Otsuki, T., & Wilson, J. S. (2013). Do foreign product standards matter? Impacts on costs for developing country exporters. *Asia-Pacific Journal of Accounting & Economics*, 20(1), 37-57.
- Maskus, K. E., Otsuki, T., & Wilson, J. S. (2005). *The cost of compliance with product standards for firms in developing countries: An econometric study*. The World Bank.
- Masood, A., & Brümmer, B. (2014). *Impact of GlobalGAP certification on EU banana imports: a gravity modeling approach* (No. 49). GlobalFood Discussion Papers..
- Matlasedi, N. T. (2016). *The impact of the real effective exchange rate on South Africa's trade balance* (Doctoral dissertation).
- Muse, R. (2008). What's in a Name: Accreditation vs. Certification. Available on <http://anab.org/media/4332/muse.pdf> Accessed on, 15(10), 2010.
- Pelkmans, J. (2005). Mutual recognition in goods and services: an economic perspective. In *The principle of mutual recognition in the european integration process* (pp. 85-128).
- Palgrave Macmillan, London. Potoski, M., & Prakash, A. (2009). Information asymmetries as trade barriers: ISO 9000 increases international commerce. *Journal of Policy Analysis and Management*, 28(2), 221-238.
- Pratikto, R. (2012). Dynamics of Indonesia's international trade a VAR approach. *Procedia Economics and Finance*, 4, 149-159..
- Susanto, D. A., & Kristiningrum, E. (2019). Influence of the enforcement of mandatory SNI for primary batteries on the import of Indonesia primer battery products [in Indonesian]. *Jurnal Standardisasi*, 21(2), 91-100.
- Swann, P., Temple, P., & Shurmer, M. (1996). Standards and trade performance: the UK experience. *The Economic Journal*, 106(438), 1297-1313.
- UNCTAD. (2020). TRAINS: Non-Tariff Measures (NTMs) based on official regulations. Retrieved June, 02, 2020, from <https://trains.unctad.org/Forms/TableView.aspx?mode=modify&action=search>
- Veranian, M. (2018). Argentina's import restrictive policies and their effects on trade (*Unpublished master's thesis*). Erasmus School of Economics, Erasmus Universiteit Rotterdam, Rotterdam, The Netherlands.
- Wibowo, A., & Suprpto, S. (2018). Effectiveness of ASEAN Sectoral Mutual Recognition Arrangement on Electrical and Electronic Equipment (ASEAN EE MRA) Implementation for Indonesia (in Indonesian). *Jurnal Standardisasi*, 19(3), 231-240.
- Wooldridge, J. M. (2015). *Introductory econometrics: A modern approach*. Cengage learning.
- Yang, L. (2013). Do National Standards Impact Foreign Trade? Evidence from China's Foreign Trade and Sino-US Bilateral Trade. *Frontiers of Economics in China*, 8(1), 113-145.

