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DOES IMPORTED INPUT AFFECT EXPORT QUALITY? CASE OF INDONESIA IN THE PERIOD OF 2010-2015

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ABSTRACT

This study aims to find empirical evidence of whether importing input as an external source of knowledge and technology transfer for developing countries affects export quality. Empirical data shows that over 75 percent of Indonesia's total import values are intermediate products used in the manufacturing process. This study combines custom data with a dataset of Indonesia's Firm-Level data of the Large and Medium Manufacturing Industry from 2010 to 2015. It applies the fixed-effect regression method and finds that imported input has a small effect on the export quality with a 10 percent significance level. Given its numerous populations, this study indicates that increasing imported input aims to meet Indonesian domestic demand instead of export quality.

Keywords: *Export quality, imported input, manufacturing industry, Indonesia*
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Introduction

In developing countries export quality has been considered an important key in producing economic growth. Recent empirical works show that countries with higher-quality products tend to export to rich countries, earn higher incomes, and achieve faster growth (Hallak, 2006; Manova & Yu, 2017). By contrast, countries that continue to produce "poor-country" goods will remain poor (Hausmann et al., 2007). In relation to balance of payments problem, Anwar & Sun (2018) argue that increasing export incomes through exporting high-quality products can be an alternative to overcome that issue.

There is a theoretical consensus that access to advanced technology helps developing countries improve their export performances regarding quality aspects. Imported input is widely recognized as an external source of technology transfer. Due to their limitation in presenting technology directly, countries may take advantage of import activities as an indirect method to upgrade the quality of their exported products. Moreover, empirical evidence has shown the positive impact of imported input on export quality upgrading not only mediated by its embedded technology but also related to the quality and variety of imported input

(Bas & Strauss-Khan, 2015; Manova & Yu, 2017). Importing input will increase knowledge and certain technologies that can be utilized to produce high-quality products (Amighini & Sanfilippo, 2014; Anwar & Sun, 2018; Bas & Strauss-Khan, 2015).

This study examines whether the imported input has an impact on the quality of export as measured by the unit value. The motivation for the study stems from the fact that imported input plays an important role in developing countries where firms depend on foreign technology to upgrade their production process. Relying on Indonesia as a case study, this study enriches the literature that mainly focused on developing country cases, such as Africa (Amighini & Sanfilippo, 2014) and Ecuador (Bas & Paunov, 2021). Over the observation period, the share of manufacturing value added in GDP dropped from 22.04 percent in 2010 to 21.54 percent in 2015 (BPS, 2022). The sector contributes to 75.90 percent of total export value (BPS, 2021). Meanwhile, the input of production is mostly sourced by import, reaching up to 75.68 percent of Indonesia's total import value.

The huge domestic market considering its generous population makes Indonesia an interesting object of study. The industry faces the choice to produce goods in order to meet domestic needs or export purposes with certain qualities demanded by the international market since the production capacity remains low. Besides, Indonesia had experienced slow-down manufacturing growth after the Asian Financial Crisis with the level absorption of labor remaining significant between many companies from medium to small and medium enterprises impacted collapse (Tambunan, 2020). Hence, this study provides economic interest since human capital plays an important role in properly absorbing spillovers from imported input. This study also focused on the product-industry level and it complements recent evidence that was analyzed at the product-country and product-firm levels. Analysis at this level has advantages, one of which is in linking it to policies that are generally formulated at the industry level.

To investigate the relationship between imported input and export quality, this study employed industry-level panel data which rely on a rich dataset of industries' export transactions and the Annual Survey of Indonesia's Large and Medium Manufacturing Industry from BPS from 2010 – to 2015. The main challenge of this study is to deal with the lack of quality measurement. To address this issue, in line with several similar studies (e.g. Amighini & Sanfilippo, 2014; Anwar & Sun, 2018; Hu, Parsley & Tan, 2021; Torres-Mazzi & Foster-McGregor, 2021), this study relies on export unit value as a proxy for export quality. Moreover, a distinctive feature of survey datasets is that it provides industry-level imports and other important information which allows this study to explore some predictions of the model with various control variables.

The result of the study shows that imported input has a positive relationship with the quality of export at 10 percent significance level. In contrast with the findings in previous studies (Amighini & Sanfilippo, 2014; Bas & Paunov, 2021; Bas & Strauss-Khan; 2015), this study suspects that Indonesia's large domestic market has influenced industries to use imported input more directed to produce goods in order to fill domestic needs than export purposes. Furthermore, this study also shows the heterogeneous effect of imported input based on the level of technology owned by the industry. Similarly, a relatively weak relationship between imported input and export quality is found across industries.

The rest of this paper is structured as follows. Section 2 explains related literature or theoretical framework that orients this empirical analysis. Section 3 explores the data and empirical methodology. Section 4 reports the result regarding the impact of imported input on export quality. The last section concludes the paper.

Literature Review

Research has shown that the link between imported input and firm performance relates not only to the reduction of cost but also sizeable effects on their export performance. In the context of quality product upgrading, developing countries generally have difficulty presenting the typical way to achieve such a goal, particularly innovative activities through R&D expenditure. In this regard, the superior embodied technology in imported inputs translates into new learning opportunities which facilitates the firm to upgrade their products (Amighini & Sanfilippo, 2014; Bas & Strauss-Khan, 2015; Torres-Mazzi & Foster-McGregor, 2021). The evidence also indicates that product quality upgrading requires high-quality inputs (Bas & Paunov, 2021; Kugler & Verhoogen, 2012). The input-trade liberalization that led to the changes in the cost of obtaining imported inputs creates incentives for firms to use higher-quality imported inputs which may increase the quality of products (Bas & Paunov, 2021; Bas & Strauss-Kahn, 2015). The use of more varieties of imported inputs may also encourage more technologically capable firms to meet the requirement of the international market with sizeable effects on export performance (Torres-Mazzi & Foster-McGregor, 2021).

The ability of firms to transform imported inputs into improved quality of exported products is likely to vary so that the benefits of the enhanced quality may not be fully utilized. Kugler & Verhoogen (2012) designed two models related to the relationship between the input used and the quality of products. In the first model, input quality and producer capabilities are complementary, so it is very important to minimize production errors and ensure quality control during the production process. This model emphasizes that improving product quality does not require an increase in fixed costs. In the second model, high-quality products are associated with higher marginal input costs because they use higher-quality inputs at a higher price. There is no direct complementarity between input quality and producer capability so apart from requiring high-quality inputs, increasing higher-quality products requires increasing fixed costs, such as spending on R&D activities to improve production techniques and spending on marketing activities to increase perceptions of quality products. In both models, if the scope of product differentiation is large, Kugler & Verhoogen (2012) predict producers with higher capabilities using high-quality inputs at higher prices and selling higher-quality products at higher prices.

Relying on the Kugler & Verhoogen (2012) model, Bas & Paunov (2021) and Torres-Mazzi & Foster-McGregor (2021), investigated the capabilities of producers based on technological capabilities and labor skills as a complement to imported inputs used in the production process. The extent to which producers will benefit from quality or technology from imported inputs also depends on their capacity to understand and properly manage technology which is generally associated with skills and human capital to generate and absorb external sources of knowledge, as well as the role of R&D. Muendler (2004) also emphasizes that to properly utilize imported inputs, manufacturers need to incorporate foreign equipment into the production process and may have to adopt new processes. If producers have insufficient capability so it takes longer to adopt it, the use of imported inputs may not have the optimal impact on improving quality other than costs in the short term.

Data and Research Methods

Data

The data used in this study are a balanced panel dataset that includes a large sample of 2,782 products at the HS 6-digit level. The data consist of 16,692 observations from 2010 to 2015. It is generated from two main data sources from the Indonesia Central Bureau of Statistics (Badan Pusat Statistik or BPS): the customs dataset covering all export information and the Annual Survey of Indonesia's Large and Medium Manufacturing Industry. This study analyzes at the product-industry level because the export transaction dataset does not contain any firm identifiers, such as name, address, etc. Considering the annual survey dataset contains 5-digit

ISIC information, a key step to match the two main data sources is by concordance of the HS 6-digit level product code to the 5-digit ISIC level using Concordance Table provided by BPS. In addition, over the sample period, the provision of HS has changed, specifically from HS 2007 to HS 2012. Further the first thing the study had to do is to conduct a HS conversion of trade transactions during 2010 - 2011 to HS 2012 version using the Correlation Table developed by United Nations Statistic Division.

Variable Description

Export unit value. The export unit value, a common proxy of export quality, is constructed using BPS' customs dataset issued by the Directorate General of Customs and Excise. This dataset reports comprehensive monthly product-destination level trade information, such as free-on-board export value (in USD) and export volume (in kilogram) for each transaction in the detailed Harmonized System (HS) 10-digit product code. Following Manova & Yu (2017), Hu et al. (2021), and others, this study aggregates the customs data to an annual level. Also, the aggregation is conducted to the product category, particularly to the HS 6-digit level to avoid errors in inputting code and to comply with the international standard of product classification. As many studies (e.g. Anwar & Sun, 2018; Hu et al., 2021; Manova & Yu, 2017) and considering the data availability, export unit value is constructed by dividing export value with export volume.

In regard to imported input value, the second main dataset is the Annual Survey of Indonesia Large and Medium Manufacturing Industry which provides detailed manufacturing firm-level information, such as input values both domestic and import, employee, value-added, the 5-digit of Indonesian Standard Industrial Classification 2009 (Klasifikasi Baku Lapangan Usaha Indonesia or KBLI) which corresponding to International Standard Industrial Classification (ISIC) Rev.4. The value of imported input at the industry level is calculated by summing up the value of inputs sourced from foreign for all firms that are classified at the identical ISIC 5-digit level. All imported input values in Rupiah are converted to USD currency using average annual exchange rates.

To determine the independent effect of imported input on export quality, the analysis controls for a number of variables. First, labor productivity. This study measures labor productivity as a value-added per worker at the industry level. Unlike the old trade theory which proved that unit value is positively associated with labor productivity, the new trade theory model shows that labor productivity has an inverse relationship with product quality (Manova & Yu, 2017; Schott, 2004). Second, skill intensity. Following Bas & Paunov (2021), this study uses another industry-level time-varying control including skill intensity which is measured as the share of non-production workers relative to the total workers. Both of those explanatory variables were obtained from BPS' annual surveys. Third, foreign direct investment is known as one of the mechanisms to generate knowledge and technology spillovers to produce higher product quality (Amighini & Sanfilippo, 2014; Anwar & Sun, 2018; Harding & Javorcik, 2012). This study also employs net inflows of foreign direct investment data (as a share of GDP) at the country level from World Bank.

Fourth, natural resource dependency. Indonesia is one of the resource-rich developing countries that had experienced a high degree of natural dependencies as the main engine of economic growth, such as oil and gas. The higher natural resources dependency has been identified as a possible cause of lower manufacturing production (Muhamad et al., 2021) and contributes to lower manufacturing capabilities to diversify and upgrade the quality of the product because there is no backward and forward linkage between resources commodities to other economic sectors, specifically manufacturing sector (Amighini & Sanfilippo, 2014). Following Amighini & Sanfilippo (2014), this study employs total natural resources rent data (as a share of GDP) at the country level from World Bank as a proxy of this variable. Fifth, the real effective exchange rate that is used to control the fluctuations of the Rupiah relative to the foreign currency (respectively USD) is obtained from the Federal Reserve Bank of St.

Louis. Lastly, a dummy variable is included to control economic shocks where 1 if 2013 and 0 otherwise. The dummy uses to capture the economic shocks considered Indonesia's current account experienced its first deficit in 2013 since 2009 caused by petroleum global price shocks following with the high inflation rate.

Model Specification

To investigate the impact of imported input on export quality, this study adopts Amighini & Sanfilippo (2014) model, with some modifications, as follows:

$$\ln EUV_{ijt} = \beta_0 + \beta_1 \ln IMPORT_{jt} + \gamma X_{jt} + \delta_i + \varepsilon_{ijt} \qquad (1)$$

where i, j, and t stand respectively for the exported product at HS 6-digit level, manufacturing sector at 5-digit ISIC level, and time (year). $\ln EUV_{ijt}$ is a log of export unit value, a proxy of export quality, as a dependent variable. $\ln IMPORT_{jt}$ is a log of imported input value as a variable of interest. β_1 captures the impact of imported input on the quality of the exported product. In condition that imported input is beneficial, this study expects β_1 is positive and statistically significant. X represents control variables including labor productivity, skill intensity, natural resources dependency, foreign direct investment, real effective exchange rate, and 2013 dummy. Due to large differences in unit value across products, the specification model of this study also includes product fixed effect (δ_i). By including product fixed effect, it will absorb all time-invariant product characteristics that might be important for unit values. Lastly, ε_{ijt} represents error terms.

Finding and Discussion

Statistic Descriptive

Table 1 shows descriptive statistics for each variable used in the estimation. In general, the average unit value of exported products is USD63.72/kg, with a minimum value of USD0.0004/kg and a maximum value of USD56,082.7/kg. Furthermore, the average value of industrial imported input is USD238 million. During the period of study, there are manufacturing industries that do not use imported inputs for production processes, shown by a minimum value of imported inputs of USD0.

Table 1: Statistic Descriptive

Variable	Obs.	Mean	Std. Dev.	Min	Max
Export unit value	16,692	63.715	1283.517	0.0004	56082.72
Import	16,692	238026.1	473778.3	0	5448228
REER	16,692	94.157	5.083	87.112	100
Investment	16,692	2.385	0.247	2.025	2.819
Productivity	16,692	42.186	94.289	0.861	1083.437
Natural resources	16,692	5.819	1.672	3.117	8.397
Dummy 2013 (1 if 2013; 0 otherwise)	16,692	0.5	0.5	0	1
Skill intensity	16,692	19.206	9.693	1.072	76.540

Notes: export unit value is a proxy for export quality, constructed by dividing export value with export volume (USD/kg); import: imported input value in thousand USD; REER: real effective exchange rate; investment: foreign direct investment, net inflows (% of GDP); productivity: labor productivity (value-added per worker); natural resources: natural resources dependency measured by total natural resources rents (% of GDP); Dummy 2013: dummy variable, 1 for 2013, 0 otherwise; skill intensity: share of non-production worker relative to the total workforce.

Baseline Estimates

As shown in Table 2 below, this study employed multiple steps starting from excluding all control variables in column (1) and then adding relevant control one by one from column (2) to column (5). All models present the results that the coefficient of interest on imported input is 0.0096 – 0.0113 and significant at the 10 percent level. These results further suggest that the effect of imported inputs with regard to the export quality appears to be relatively small. Over the observation period, the 1 percent higher imported input value suggests that the export unit value will increase to only 0.01 percent, ceteris paribus. This evidence is relatively in contrast with the findings of other related works, particularly Amighini & Sanfilippo (2014), that show imported input in African economies has a strong significant effect to increases countries' export quality.

As for controls, this study finds a negative and highly statistically significant relationship between natural resources dependency and export quality, which suggest that country with abundant natural resources have a lack of economic diversification because there is no backward and forward linkage from resource commodities. In this regard, driving structural reformation through local processing can be taken as a viable strategy. The result also indicates a positive and strong relationship between foreign direct investment and export quality, which is consistent with the previous findings (Harding & Javorcik, 2012) that the presence of foreign direct investment provides local industry with access to advanced technology, capital, and other positive spillover related to export quality upgrading.

Furthermore, exchange rate appreciation provides incentives for the manufacturing industry to improve the quality of export by accessing higher quality imported inputs at higher prices so that foreign buyers feel it is reasonable to spend more money for higher quality products. In addition, as can be expected, since the economic shock in 2013 the quality of Indonesia's export products has decreased. The macroeconomic shocks due to the current account deficit and high inflation hampered the ability of the domestic manufacturing industry to produce higher-quality output.

Table 2: Effects of Imported Input on Export Quality, Baseline Estimates

Dependent Variable: ln (export unit value)					
	(1)	(2)	(3)	(4)	(5)
ln (import)	0.0101* (0.0058)	0.0097* (0.0058)	0.0096* (0.0058)	0.0113* (0.0059)	0.0104* (0.0059)
ln (natural resources)		-0.0748*** (0.0211)	-0.8664*** (0.0895)	-0.8520*** (0.0906)	-0.9675*** (0.0980)
REER			0.0728*** (0.0075)	0.0718*** (0.0076)	0.0738*** (0.0077)
ln (investment)			2.2480*** (0.1983)	2.2128*** (0.2018)	2.4937*** (0.2199)
ln (productivity)				-0.0121 (0.0127)	-0.0163 (0.0128)
ln (skill intensity)				-0.0507 (0.0348)	-0.0487 (0.0348)
dummy_2013					-0.0929*** (0.0243)
_cons	1.517*** (0.0612)	1.648*** (0.0729)	-5.794*** (0.7284)	-5.525*** (0.7606)	-5.698*** (0.7653)

Dependent Variable: ln (export unit value)					
Observations	16,204	16,204	16,204	16,204	16,204
Number of HS	2,741	2,741	2,741	2,741	2,741
R-squared Within	0.0003	0.0016	0.0119	0.0124	0.0132
Notes: ***p<0.01, **p<0.05, *p<0.1. Robust standard error in parentheses.					

Heterogeneous Effects

In this section, this study explores whether the effects are heterogeneous across industries. The theoretical channel of this work is the industry will benefit from foreign input depending on their capability to understand and manage technology properly (Kugler & Verhoogen, 2012; Manova & Yu, 2017; Torres-Mazzi & Foster-McGregor, 2021). Studies have emphasized the importance of technological capabilities to achieve such a goal, particularly through R&D activities to absorb external sources of knowledge and technology.

Recent studies suggest that sectors exhibit a wide range of responses to imported input changes but whether the impact of imported input extend also to industries with different technology intensity levels seems to be relatively underexplored. For example, Amighini & Sanfilippo (2014) examine the impact across sectors and document that imported input only has a significant effect on export quality in the manufacturing sector. However, the study found no statistically significant relation between imported input and export quality in other economic sectors: agriculture, mining, and services.

Therefore, to fill the gap, as shown in Table 3 this study then split the sample into three groups of industries: (i) medium-high and high technology (MHT); (ii) medium technology (MT); and (iii) low technology (LT). The technology classification is developed by UNIDO which classifies manufacturing industries at the 2-digit ISIC level based on R&D expenditure on the production of manufactured products which the higher R&D expenditure is grouped as high technology industry.

Table 3: Manufacturing Industries at 2-Digit ISIC Level Based on Technological Intensity

ISIC 2-digit	Industry
Medium-high and high-technology	
20	Chemicals and chemical products
21	Pharmaceuticals
26	Computer, electronic and optical products
27	Electrical equipment
28	Machinery and equipment
29	Motor vehicles, trailers, and semi-trailers
30	Other transport equipment except ships and boats
Medium technology	
22	Rubber and plastics products
23	Other non-metallic mineral products
24	Basic metals
32	Other manufacturing
Low technology	
10	Food products
11	Beverages

ISIC 2-digit	Industry
12	Tobacco products
13	Textiles
14	Wearing apparel
15	Leather and related products
16	Wood and products of wood and cork
17	Paper and paper products
18	Printing and reproduction of recorded media
19	Coke and refined petroleum products
25	Fabricated metal products
31	Furniture

Source: UNIDO (n.d).

Table 4 below replicates the baseline estimates (specification 5 in Table 1) by grouping samples based on the technology intensity level. This study finds that the coefficient on import for MHT industries in column (1) is 0.0173 and significant at the 10 percent level, which is consistent with the baseline result. The result further suggests that the effect of imported inputs with regard to the export quality in medium-high and high-technology firms appears to be relatively small. Over the observation period, the 1 percent higher imported input value suggests that the export unit value will increase to only 0.02 percent, ceteris paribus. Moreover, imported input is non-significant for MT and LT industries as shown in columns (2) and (3). The result confirmed that firms in MHT industries that have extensive technological resources are more likely to have powerful capability to utilize the advantages of the quality and variety provided by imported inputs to improve their quality of exports.

Table 4: Heterogeneous effects

Dependent Variable: ln (export unit value)			
	MHT Industries	**MT Industries**	**LT Industries**
	(1)	(2)	(3)
ln (import)	0.0173*	-0.0004	0.0107
	(0.0088)	(0.0191)	(0.0088)
ln (natural resources)	-1.0916***	-0.9181***	-0.9105***
	(0.1866)	(0.2331)	(0.1213)
REER	0.0856***	0.0717***	0.0667***
	(0.0148)	(0.0179)	(0.0093)
ln (investment)	2.7769***	2.6122***	2.2681***
	(0.4155)	(0.5326)	(0.2741)
ln (productivity)	-0.0177	-0.0083	-0.0197
	(0.0173)	(0.0310)	(0.0236)
ln (skill intensity)	-0.0936	-0.0665	-0.0028
	(0.0637)	(0.0789)	(0.0459)
dummy_2013	-0.1006**	-0.0833	-0.0966**
	(0.0468)	(0.0659)	(0.0285)
_cons	-6.5458***	-5.9016**	-5.0769***
	(1.4487)	(1.8276)	(0.9329)
Observation	6,055	3,109	7,040
Number of HS	1,020	521	1,200
R-squared Within	0.0125	0.0133	0.0166

Notes: ***p<0.01, **p<0.05, *p<0.1. Robust standard error in parentheses. All specifications include control variables as in the last column of Table 1.

The coefficient of natural resources dependency is negative and remains strongly significant at the 1 percent significance level in all estimations, indicating a higher degree of natural resources dependency is likely to be a critical obstacle to domestic industrialization, including export quality upgrading. The real exchange rate shows a strong relationship with export quality which is consistent with the baseline result. In addition, this study obtained suggestive evidence of the significant role of foreign direct investment as a potential source of technology spillovers holds across industries and the higher effect found in the MHT industries.

Discussion

The result shows the coefficient on imported input is significant at the 10 percent level meanwhile other related works found that imported input highly correlated with export quality at 1 percent significance level. Since this study cannot conduct an analysis based on the level of input quality and composition of importing partner countries that might be contributed to the different results (e.g. Amighini & Sanfilippo, 2014; Bas & Paunov, 2021), one possible explanation for this unexpected finding is because domestic orientation still accounts for the main objective of manufacturing production rather than export.

Known as a developing country with numerous populations, Indonesia becomes a country with a huge domestic market. In this regard, as the capacity of industry to produce remains low, manufactured goods produced by industries are often closely correlated with higher absorption at the national level. Consequently, the capacity to export becomes lower. To take a closer look, the automotive industry provides a relevant overview of how the increase in imported input may have no significant impact on export quality related to the large local market. As the automotive industry also categorizes as a high-tech industry, the discussion will also relate to the result of the heterogeneity effect previously mentioned.

Parts and accessories (HS 8708) account for one of the manufacturing inputs with a large import value and which rapidly increased from USD1,963 thousand in 2010 to USD2,456 thousand in 2015 (Trade Map, 2021). Despite its level of imported input, the total production is almost entirely absorbed by the domestic market. In 2010, 837,948 units of vehicles were produced meanwhile domestic demand reached 894,164 units, and the rest of the needs were met by imports, respectively (Pusat Kebijakan Pendapatan Negara, 2013). Also, this huge domestic allocation causes the types of vehicles produced to be more adapted to local tastes which are typically easier to produce, require less specification, and lower technology complexity compared to the demand of the international market (e.g. multipurpose vehicle (MPV) in Indonesia versus battery electric vehicle in the European market). Besides, it is widely known that the international market pushes the domestic industry to constantly meet the requirements of the foreign market and maintain the products they sell by upgrading the quality. In line with this view, amid such large domestic needs, such limited production capacity reduces the ability of the industry to export as well as upgrade the quality of products.

At the national level, the share of manufacturing value-added in GDP, commonly used as an indicator of the country's industrialization level, may provide a signal that Indonesia's manufacturing industry has plenty of work that still needs to be done. Over the period, Indonesia's share of manufacturing value-added in GDP dropped from 22.04 percent in 2010 to 21.54 percent in 2015 (BPS, 2022). The decline in Indonesia's manufacturing performance can explain the relatively weak impact of imported input on export quality, together with the other determinants also used as control variables in this study, such as skill intensity. As highlighted in several studies (e.g. Torres-Mazzi & Foster-McGregor, 2021), although in a large number of works imported input has been recognized as a mechanism of technology and knowledge transfer, the use of such input is not strong enough to improve product quality if there is a lack in industry capabilities to absorb and manage that spillovers properly which is generally associated with human capital.

The descriptive statistics table in Table 1 shows that the average skilled labor composition in the manufacturing industry, captured in the skill intensity variable, is only 19 percent of the total workforce. The number means the domestic industry is still dominated by labor-intensive industries with abundant unskilled-labors, such as the apparel industry. A very well-known problem is that this huge number of unskilled-labors makes it difficult for the industry to produce higher quality products. Labor-intensive industries tend to carry out assembly processes with less value-added and they compete more on production efficiency rather than improve the quality of the product in skill-intensive and capital-intensive industries (Manova & Yu, 2017; Schott, 2004).

Conclusion

This study found that the imported input has a small effect on the export quality with 10 percent significance level. The finding makes it crucial to understand that with large domestic demand and low capacity to produce, industries might appear to benefit less from imported input to improve their export quality. This study indicates that industries tend to take advantage of importing to create the production process more efficiently to fill huge domestic demand rather than to export, which might translate into reducing the competitive pressure to meet the requirements of the foreign market through quality upgrading. In addition, the study goes beyond industry heterogeneity in terms of technology intensity and the result across industries is similar to baseline estimates.

Policymakers may consider encouraging domestic manufacturing industries to strengthen the capacity of production, which, may lead to export quality upgrading, as they can enter the foreign market that relatively has high requirements. Since industry capabilities to absorb and manage the spillovers from imported input are generally associated with human capital, this study suggests human capital productivity improvement through investment in training or vocational program. In addition, as more restrictive policies might lead accessing imported inputs to become more difficult or expensive and the manufacturing industry in Indonesia still relies on imported inputs in their production process, policymakers are advised to more address the formulation of tariff and non-tariff policies. This study also recommends the importance of policy action to assist the medium and technology industries that lead to efforts to increase domestic industrialization capabilities.

Declarations

Declarations include Conflict of Interest, Availability of Data and Materials, Author's Contribution, Funding Sources, and Acknowledgements.

Conflict of Interests

There are no conflicts of interest.

Availability of Data and Materials

Data available on request.

Author's Contribution

TH: conceptualization, data curation, formal analysis, writing-original draft, writing-review and editing. KV: conceptualization, formal analysis, writing-original draft, writing-review and editing.

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