



Original Article

# Evaluating the impact of EU non-tariff measures on Vietnam's textile exports

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Received: October 29, 2023

Revised: November 20, 2023; Accepted: December 25, 2023

**Abstract:** With the development process and international economic integration, the importance of non-tariff measures (NTMs) was stimulated significantly in international trade. This shift has played a vital role in placing NTMs in the limelight of Vietnam's exportation, particularly textile exports. The gravity model has been applied in this article to analyze the current regulations related to NTMs and to assess the impact of NTMs from the EU on textile exported products from Vietnam. The research findings have shown that technical barriers (TBTs) to trade are the most common and stringent regulations from the EU towards Vietnam's textile exportation, while, sanitary and phytosanitary measures (SPSs) are not statistically significant. There are other types of NTMs (apart from SPSs and TBTs) that can increase export turnover. Based on these findings, the paper proposes some recommendations to enhance the exportation of textiles for the Vietnamese government and firms in the upcoming period.

**Keywords:** Non-tariff measures (NTMs), European Union - Vietnam Free Trade Agreement (EVFTA), textile exportation, gravity model.

## 1. Introduction

Along with the process of international economic integration and the formation of both bilateral and multilateral free trade agreements (FTAs), tariffs have been gradually reduced or even exempted, to support countries in opening their markets and freely exchanging goods. Therefore, the role of NTMs is becoming increasingly vital to regulate market access and

protect the environment as well as consumer health. According to UNCTAD (2019), NTMs can be defined as policy measures, in addition to conventional customs tariffs, that can potentially create an economic impact on international trade in goods, changing the quantity traded or prices or both. Almost 60% of the imported products in the world need to comply with at least one NTM (UNCTAD, 2022). Due to the current context, firms in general, as well as Vietnamese textile

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<https://doi.org/10.57110/vnujeb.v2i6.231>

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enterprises in particular, have generated great efforts to improve operational efficiency in the direction of increasingly approaching international standards and requirements from NTMs.

Based on the importance of NTMs in international trade, many papers have been conducted to analyse and figure out their role in goods exchange. According to Nicita and Seiermann (2016), an increase in the number of NTMs from large economies would adversely affect the exportation of smaller and more vulnerable economies. Besides, the article also highlights the complexity of meeting requirements from NTMs compared to tariffs. Wood et al. (2019) focus on the empirical study of international trade amongst China, South Korea and Japan. They conclude that almost all products exported in a region can benefit from NTMs, especially manufactured industrial goods, whereas, agricultural products suffer from negative influences.

Despite having social aims, including public health, environmental protection, wildlife conservation, and food security improvement, some nations would impose NTMs for trade protection purposes. In particular, textiles are one of the most affected commodities. According to I-TIP (WTO), until June 2023, a total of 594 NTMs were applied worldwide on textile products (excluding technical barriers to trade - TBTs). Dang et al. (2021) clarified the impacts of NTMs on the textile exportation of Vietnam from 2010 to 2019. The research showed that the relationship between NTMs of partner countries, especially TBTs and Vietnam's textile export performance, depends on other factors, such as FTAs and regional linkages. Focusing on Vietnam's textile and garment exports to the EU, Nguyen & Pham (2021) and Vu and Tran (2020) demonstrated that TBTs are the main barriers to Vietnam promoting exports of such commodities to the EU. Most of the studies primarily used qualitative research methods to compare and analyze the NTM regulations from the EU concerning Vietnam's textile exports.

Textiles are one of the major products exported from Vietnam; however, with the effects of the drastic changes of ongoing market trends, not only textiles but also other sectors are facing various significant challenges in 2023. In order to maintain the market share and keep

orders from our main partners, particularly the EU, it is necessary to conduct research, identify and measure the level of impact of non-tariff barriers from the EU on Vietnam's textile exports. The paper is structured into four parts; namely (1) Introduction, (2) Estimated model, (3) Findings and Discussion, (4) Conclusion and some recommendations.

## 2. Estimated model

The Gravity Model (GM) in international trade was first introduced by Jan Tinbergen in 1962 and has been widely applied in empirical researches to measure the level of the impact of factors on trade flows between nations. The model is constructed based on the size of economies (using the 2 indexes, namely GNP or GDP) and geographical distance between country *i* and country *j*. Having a multiplicative nature, the gravity model can be estimated with the ordinary least squares (OLS) regression using the natural logarithm function for all variables to obtain a log-linear equation. Specifically, the estimated equation is presented as follows:

$$\ln(X_{ij}) = \ln G + \ln S_i + \ln M_j + \ln \phi_{ij}$$

Where  $X_{ij}$  represents the values of exportation from country *i* to country *j*;  $M_j$  captures all factors from the importer reflecting the aggregate demand of the importing country (such as GDP of the importing nation);  $S_i$  illustrates factors from the exporter (e.g., GDP of exporting country), which indicates their supply capacity;  $G$  is a variable that is not specifically related to either country *i* or country *j*;  $\phi_{ij}$  reflects the ability of entering market *j* of exporter *i*.

Using the basis of secondary data collected from reputable sources, including the World Bank, TRAINS-UNCTAD, ITC, I-TIP, WITS and CEPII, the study used the Ordinary Least Squares (OLS) and the Poisson Pseudo-Maximum Likelihood (PPML) estimation methods for cross-sectional data to evaluate the impact of macroeconomic factors, tariffs, and NTMs of the EU's member nations on textile export goods of Vietnam. The research employs the cross-sectional dataset of 2022 on Vietnam's major textile exports commodities to 27 EU member countries, categorised according to the

Harmonized System (HS) at the 4-digit level (18 product codes: 6104, 6109, 6110, 6201, 6202, 6203, 6204, 6205, 6210, 6307, 6403, 5202, 5305, 5402, 5503, 5603, 5703, 5902). The total number of observations is  $P = 486$  observations (27 countries x 18 product codes).

Inheriting the theoretical foundation of the gravity model by Tinbergen (1962) and its developments by Anderson and Wincoop (2003, 2004), the author proposes the following gravity model:

$$\begin{aligned} \ln(vEXP_{ij}) = & \beta_0 + \beta_1 \ln(cGDP_i) \\ & + \beta_2 \ln(GDP_i) \\ & + \beta_3 \ln(Dist_i) + \beta_4 SPS_{ij} \\ & + \beta_5 TBT_{ij} + \beta_6 other_{ij} \\ & + \beta_7 Inc_i + \beta_8 \ln(TAR_{ij}) \\ & + \varepsilon_{ij} \end{aligned}$$

In this model,  $\beta_0$  represents the constant term,  $\beta_{1-8}$  are the coefficients of explanatory variables, and  $\varepsilon_{i,t}$  shows the unobserved error term. The model includes 1 dependent variable and 8 independent variables, specifically:

Table 1: Variables description

Symbol	Variable	Proxies	Hypothesis relationship	Data source
<b>Dependent variable</b>				
$\ln(vEXP_{ij})$	Exports value of Vietnam's commodity j to country i	Natural logarithm of [(the exports value of commodity j to country i) + 1]		Trademap-ITC
<b>Independent variables</b>				
<b>Macroeconomic factor</b>				
$\ln(cGDP_i)$	Per capita GDP of country i	Natural logarithm of the per capita GDP of the importing country i	+	World Bank
$\ln(GDP_i)$	Total GDP of country i	Natural logarithm of the total GDP of the importing country i	+	
$\ln(Dist_i)$	Bilateral geographic distance from Vietnam to country i	Natural logarithm of the bilateral geographic distance from Vietnam to country i	-	CEPII
$Inc_i$	Dummy variable of income group of country i	value = 1 if country i belongs to high-income group, value = 0 if belongs to other income groups	+	
<b>Tariff factor</b>				
$\ln(TAR_{ij})$	Tariff on commodity j of Vietnam imported from country i	Natural logarithm of [(the tariff on commodity j of Vietnam imported from country i) + 1]	-	Trademap-ITC
<b>NTMs factor</b>				
$SPS_{ij}$	Number of sanitary and phytosanitary measures (SPS)	Total number of SPS measures applied by country i on commodity j	-	TRAINS-UNCTAD
$TBT_{ij}$	Number of technical barriers to trade (TBT)	Total number of TBT measures applied by country i on commodity j	-	
$other_{ij}$	Number of other NTMs	Total number of other NTMs applied by country i on commodity j	-	

Source: Authors.

### 3. Findings and discussion

#### 3.1. The current situation of NTMs application by the EU on Vietnam's textile exports

According to the General Department of Vietnam Customs, in 2022, the total trade

turnover between Vietnam and the European Union (EU) reached 62.2 billion USD; an increase of 9.2%, compared to that of 2021. The export value of textile products to the EU market reached 4.7 billion USD. In 2022, EU27, which includes 27 member nations after the event of the

United Kingdom leaving the EU (Brexit), has become the second largest import market for Vietnam, following the United States.

Figure 1 illustrates the author’s calculation and synthesis of two indexes, including the Coverage Ratio (CR) and the Frequency Ratio (FR) of NTMs from the EU to Vietnam’s textile exportation using data collected in the year 2022 from the TRAINS-UNCTAD database. Figure 1 indicates that Technical Barriers to Trade (TBTs) are the type of NTMs with the highest frequency and having the most significant impact, when it influences 100% of Vietnam’s textile export products codes to the EU market. On the contrary, Sanitary and Phytosanitary (SPSs) measures have a slight impact on Vietnam's textile products, with the CR index at a very low level of only about 0.013%, due to the fact that the NTMs in this group have only taken

effect since 2020 and primarily affected several textile input material codes, such as 5201; 5202; 5301; 5302; 5303; 5305; and 5607.

In addition, for measures belonging to Chapter C (Pre-shipment inspection and other formalities) and Chapter E (Non-automatic import licensing, quotas, prohibitions, quantity-control measures and other restrictions not including sanitary and phytosanitary measures or measures relating to technical barriers to trade), impacts of these on Vietnam’s textile export products are quite considerable, regarding the value of the Frequency Ratio (FR) index, which only equals to half the figure of the Coverage Ratio (CR) index. Measures under Chapter C and E appear and cover in the majority of Vietnam’s textile product codes exported to the EU market, as well as being in effect for a long period.

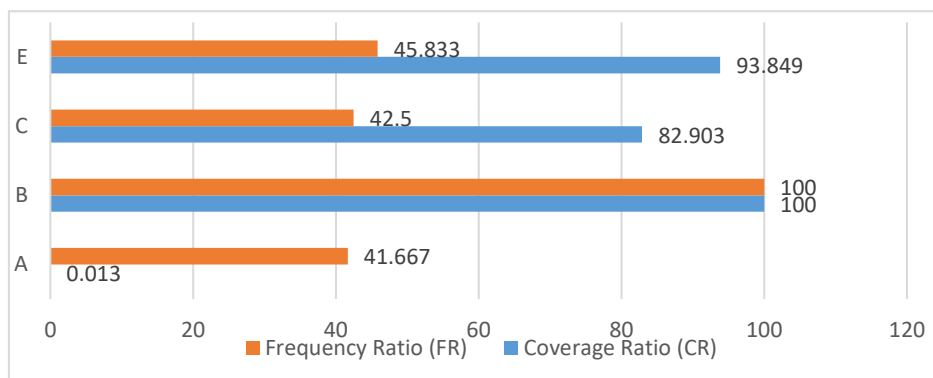


Figure 1: Coverage ratio and frequency ratio of NTMs from EU to textile exports of Vietnam in 2022

Note: [A] SPSs; [B] TBTs; [C] Pre-shipment inspection and other formalities;

[E] Non-automatic import licensing, quotas, prohibitions, quantity-control measures and other restrictions not including sanitary and phytosanitary measures or measures relating to technical barriers to trade.

Source: Authors calculate and compile from TRAINS-UNCTAD.

### 3.2. Descriptive statistics

Table 2 illustrates the data description of variables in the research model. The natural logarithm function for the average textile export value of Vietnam is 5.552, with a maximum value of 13.52481 and a minimum value of 0 for trade flows equal to 0. Overall, the variation in Vietnam’s textile export value of product codes is not significant (a standard deviation of only 3.9). The high average value and low standard deviation indicate that Vietnam’s textile export activities to the EU market are developing rapidly and there is not much variation among

Vietnam’s different textile product codes classified under the HS 4-digit level.

About NTMs variables: The average value of SPS measures is 0.333333, with the highest value of 3 (for 5305 and 5202 products) and the lowest of 0 (for all other product codes). Besides, TBTs have an average value of 4.444444, with the highest value of 5 (for product codes 5305, 5202, 6109, 6201, 6202, 6203, 6204, 6205, 6307) and the lowest value of 2 (for product code 6403). The other NTMs (otherij)’s highest value is 3, the lowest value is 0, with an average value of 1.666667. The results indicate a significant

variation in the number of NTMs across different textile product codes (with standard deviations of 0.9437805, 0.8323362, and 1.375785 respectively).

Table 2 also describes macroeconomic variables in the model. The average values of the economic scale variable  $i$ , represented by the natural logarithm of Gross Domestic Product ( $\ln(\text{GDP}_i)$ ) and the natural logarithm of per capita Gross Domestic Product ( $\ln(\text{cGDP}_i)$ ), are 26.22935 and 10.41641, respectively. The statistical results of the  $\ln(\text{Dist}_i)$  variable indicate that the shortest geographical distance is between Vietnam and Cyprus, with a distance of

approximately 8.873682 thousand kilometers. The furthest distance is between Vietnam and Portugal, at about 9.263786 thousand kilometers. The dummy variable  $\text{Inci}$  reveals minimal variation in the income group of EU member countries, with only a slight difference of 0.1890472, and only Bulgaria being classified as a non-high-income country. The tariff barriers ( $\ln(\text{TAR}_{ij})$ ) for textile products from Vietnam have been significantly reduced, with some products having the lowest tariff rate of 0%, while the highest value of the variable is 2.397895.

Table 2: Descriptive statistics

	<b>Observation</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
$\ln(\text{vEXP}_{ij})$	486	5.552922	3.985569	0	13.52481
$\ln(\text{cGDP}_i)$	486	10.41641	0.5479178	9.530427	11.74741
$\ln(\text{GDP}_i)$	486	26.22935	1.404679	23.60051	29.0352
$\ln(\text{Dist}_i)$	486	9.031695	0.0920556	8.873682	9.263786
$\text{SPS}_{ij}$	486	0.333333	0.9437805	0	3
$\text{TBT}_{ij}$	486	4.444444	0.8323362	2	5
$\text{other}_{ij}$	486	1.666667	1.375785	0	3
$\text{Inci}$	486	0.962963	0.1890472	0	1
$\ln(\text{TAR}_{ij})$	486	1.835164	0.7560364	0	2.397895

Source: Authors compile from STATA 14.

### 3.3. Regression result

After conducting descriptive statistics, correlation analysis, and tests including multicollinearity tests using the Variance Inflation Factor (VIF) index, and the White test for Heteroskedasticity with cross-sectional data, the initial Ordinary Least Squares (OLS) regression model revealed the presence of heteroskedasticity at a significant level of 1% ( $0.0000 < \alpha = 1\%$ ). Therefore, the author proceeded to estimate the regression model using the Poisson Pseudo Maximum Likelihood (PPML) method to mitigate the impact of zero trade flows and taxes and to address the problem of heteroskedasticity and improve the reliability of the results of the estimated model.

The result of PPML regression model illustrates that most of the factors included in the model are statistically significant at the 1% level (other than some variables, namely GDP per capita -  $\ln(\text{cGDP}_i)$ , Geographical distance -

$\ln(\text{Dist}_i)$ , Number of SPSs measures -  $\text{SPS}_{ij}$ , and the dummy variable for income groups -  $\text{Inci}$ ). Amongst them, there are two variables having negative correlations with textile exports value, including the number of SPS measures ( $\text{SPS}_{ij}$ ) and the number of TBT measures ( $\text{TBT}_{ij}$ ). On the other hand, the other variables have a positive correlation with Vietnam's textile export values for product code  $j$ .

Regarding the group of NTMs variables, the research results indicate that while SPS measures and TBTs negatively affect the export value of product  $j$ , other NTM variables have a positive effect. The presence of such contradictory results regarding the impact of different NTMs on an export sector is consistent with previous studies, such as Dang et al. (2021) and Pham & Nguyen (2022). To be more specific:

Among the included NTMs in the model, TBTs are identified as the factor with the strongest positive impact on Vietnam's textile

exports to the EU market, which matches our initial hypothesis expectation. This is also the group of measures that are currently being applied most frequently to Vietnam's textile products. All studied textile commodities are influenced by many different TBT measures. A good example can be the regulations on chemical limits in final products (B22); EC/1907/2006 (REACH) regulations on registration, notification, evaluation, and authorization of chemicals related to textiles, footwear, and accessories (B14), as well as requirements for packaging, preservation, and labeling of products (B82, B32, B31). The variable  $TBT_{ij}$  has a negative impact on the dependent variable and is statistically significant at a 1% level. The findings are consistent with some previous studies, particularly Nguyen (2022). This indicates that for every additional TBT measure, the textile and apparel export value is reduced by 1.123 times. This aligns with the reality, as the number of TBT measures applied to Vietnam's textile products is significantly higher compared to other types of NTMs; they also have a large scale of application and are continuously updated and renewed.

The research finds an inverse correlation between the number of SPSs measures and the dependent variable, however, it is not statistically significant. This can be explained by the current situation that only textile raw materials and waste, specifically including textile waste and recycled fibers (product codes 5202 and 5305), are being applied by SPSs measures. These commodities are relatively smaller in export values compared to finished textile products. Additionally, the SPS measures targeting textile and apparel products from the EU are still new to Vietnamese firms, having come into effect since March 2020, therefore, enterprises have not yet fully adapted to these measures.

The variable representing the number of other NTMs ( $other_{ij}$ ) in addition to SPSs and TBTs, shows a positive correlation with the dependent variable, indicating that an increase in the number of other NTMs leads to an increase in Vietnam's textile export value, which is inconsistent with hypothetical expectations. These NTMs belong to Chapter C and E in the UNCTAD (2019) classification, primarily

related to pre-import inspection requirements to ensure that products do not contain or are not made from endangered flora and fauna species, as well as products being free from dog or cat fur. These requirements have existed for a long time and are not too difficult to comply with as Vietnam already has relatively strict regulations in terms of the conservation of endangered species. Moreover, most of Vietnam's textile export products do not originate from animals or use domestic animals' fur as an ingredient. Therefore, Vietnam's domestic firms would experience less challenges to adapt and comply with them, explaining the positive correlation between the other NTMs variable and the dependent variable in the regression model.

About the economic scale of country  $i$ ; the variable GDP of the partner country is highly statistically significant (at a significance level of 1%) and has a direct correlation with the export value of textile products from Vietnam in the model, which is consistent with our hypothetical expectations. This means that the more developed a country is, such as member nations of the EU, the more potential it holds as a market for Vietnam's textile industry. However, based on the results, it can be observed that the population of country  $i$  is not a factor influencing Vietnam's textile exports, as the variable GDP per capita does not hold statistical significance in the final results. Most EU member countries have aging populations and high GDP levels, resulting in relatively small variations in GDP per capita among these economies, rendering the variable statistically insignificant.

The result of the regression model shows that geographical distance –  $\ln(Dist_i)$  positively affects the export values of Vietnam, and also is not statistically significant, which is consistent with several previous studies, including Dang et al. (2021), Nicita and Seiermann (2016), and Nguyen (2022). In fact, the bilateral geographical distances from Vietnam to EU member countries are not highly varied, leading to comparable transportation and logistics costs for delivering textile products to these markets. Furthermore, along with the rapid and vast developments of transportation and logistics services, connecting faraway places is no longer a pressing problem, especially for textile products, which do not show statistical significance of the variable.

The direct correlation between tariffs ( $\ln(\text{TAR}_{ij})$ ) and the textile export value of Vietnam indicates when Vietnam's major textile products are taxed higher, the value of exportation is also relatively higher. Based on the theoretical framework and the hypothesis expectation, the result is highly irrational; however, in practical terms, after the EVFTA officially came into effect on August 1, 2020, the tariff barriers imposed by EU nations were significantly reduced, especially for raw textile material product codes. However, the exported commodities with higher value are currently textile final products, including 11 codes: 6104,

6109, 6110, 6201, 6202, 6203, 6204, 6205, 6210, 6307, and 6403, which are being imposed by higher tariff rates compared to raw textile materials. Additionally, although textile material products have experienced significant tariff reductions, or have even been cut down to zero, they are now affected by various new NTMs, posing challenges for Vietnamese firms to comply with these regulations. Moreover, with a focus on sustainable and green development, exporting textile material products to the EU market has become even more difficult, leading to a positive correlation in the regression results.

Table 3: Gravity model results

	OLS	PPML
$\beta_0$	-48.78***	-31.44***
$\ln(\text{cGDP}_i)$	0.690**	0.0885
$\ln(\text{GDP}_i)$	1.342***	1.071***
$\ln(\text{Dist}_i)$	1.092	0.943
$\text{SPS}_{ij}$	-0.217	-0.433
$\text{TBT}_{ij}$	-0.823***	-1.123***
$\text{other}_{ij}$	0.730***	0.511***
$\text{Inc}_i$	1.345*	1.357
$\ln(\text{TAR}_{ij})$	1.799***	2.315***
Observations	486	486
$R^2$	0.5885	0.7587

Note: (\*), (\*\*), and (\*\*\*) are equivalent to significance levels of 10%, 5% and 1%.

Source: Authors compile from STATA 14.

#### 4. Conclusion and some recommendations

The article evaluates the impact of NTMs on Vietnam's textile exports to the EU in 2022. The results have illustrated that four main factors significantly affect the export volume at a significance level of 1%, including the economic scale of country  $i$ , technical barriers to trade (TBTs), other NTMs in trade (excluding SPS and TBT measures), and tariff measures. To be more specific, the economic scale of country  $i$ , other NTMs (excluding SPS and TBT measures), and tariff measures positively influence the dependent variable. On the other hand, technical barriers to trade (TBTs) have a negative impact on Vietnam's textile exports value to the EU market.

According to the results, the author proposes several following recommendations:

Firstly, the government should create a coherent and synchronized plan for the development of the textile industry. The research results highlight the crucial role of complying with TBT measures from the EU in promoting Vietnam's textile exportation. Additionally, meeting the requirements of the EVFTA, particularly regarding rules of origin, is essential to utilize tariff preferences.

In reality, supporting industries supplying the textile sector, such as natural fibers like cotton, jute, flax, silk, and synthetic fibers, as well as garment accessories, particularly buttons and zippers, still heavily rely on other countries, especially China. Therefore, planning and developing a synchronized project for textile supporting sectors, as well as localizing the textile industry, can help Vietnamese enterprises meet foreign standards of TBT measures and

increase the value-added of our textile exports. To improve the quality and efficiency of the supporting industries, the government can enhance the ability to attract foreign direct investment (FDI) into the textile sector by providing tax incentives, streamlining administrative procedures, protecting copyrights and intellectual property rights of investors, and focusing on regulations regarding technology transfer from foreign enterprises investing in this field. By doing this, not only can the government attract foreign capital inflows, but also ensure the benefits to domestic firms.

Secondly, enterprises need to proactively invest in and innovate technology to enhance the competitiveness of their exported goods. In addition to the opportunities created by the government, textile firms themselves should focus on investing in technology innovation and production lines to improve product quality and meet the technical requirements set by the EU. Especially with the market's sustainable development orientation, expanding capital deepening and greening the textile industry in Vietnam is crucial. Furthermore, there is a need to gradually shift towards a product design stage to increase the competitiveness of products in both the international market in general and the EU market in particular - one of the most demanding markets. By investing in design capabilities, Vietnamese firms can enhance the attractiveness and uniqueness of their products, making them stand out in the competitive marketplace.

In the first 6 months of 2023, the number of textile orders from major markets, such as the EU, Japan, or the United States decreased greatly compared to the same period in 2022. The main reason is due to the large amount of inventory from the Covid-19 pandemic, along with the reopening of China, causing a significant decline in the global demand. The current orders are mostly small-scale and require fast production. Therefore, it is even more necessary to improve the quality and capacity of production lines to ensure not only compliance with quality standards and NTM regulations in line with sustainable and environmentally friendly trends, but also to meet the requirements for timely and speedy product supply.

Thirdly, enterprises need to strengthen market research and enhance their knowledge of

NTMs. TBT measures and tariff barriers are the two variables that have the most significant impact on the export turnover of the textile industry. Therefore, it is essential for firms to fully acknowledge the commitments, opportunities, and challenges arising from these measures in order to compete with other countries effectively. According to VCCI (2022), although Vietnam's utilization rate of EVFTA benefits has slightly increased compared to previous years, it still remains low (25.9%). Therefore, enterprises need to study the provisions of the EVFTA and the regulatory documents on NTMs of the EU, especially TBT measures.

The general development strategy of the textile industry in Vietnam until 2030, with a vision towards 2035, has clearly identified that exports will continue to be the main and essential driving force for the development and growth of the entire industry. The development of the industry also comes along with protecting the eco-system, fulfilling social responsibilities, following sustainable development goals and international commitments. Therefore, enhancing knowledge about partner markets and understanding the regulations within NTMs is one of the fundamental steps to boost the textile export turnover in the future.

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