Assessing the Impact of Nontariff Measures on Imports and Overall Protection in OIC

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ABSTRACT

The paper discusses the decline in tariffs and the increasing use of nontariff measures (NTMs) in countries constituting the Organization of Islamic Cooperation (OIC). The paper calculates frequency ratios (number of imports subject to NTMs), coverage ratios (Import value subject to NTMs), tariff equivalent (AVEs) of NTMs, and overall protection (protection provided by tariff and AVEs) for the years 1997 to 2015. The analysis shows that the usage of NTMs has increased in recent decades. More than 50 percent of trade in most countries was subject to NTMs as of 2015. The AVEs of NTMs and overall protection have increased with a significant decline in simple average effectively applied tariff. As a result, NTMs evolved into a dominant source of overall protection. The protection given by AVEs has increased from 35 percent in 1997 to 71 percent in 2015. The paper recommends the OIC members to review and simplify the use of NTMs and harmonize with trading partners.

ملخص

تناقش الورقة البحثية انخفاض الرسوم الجمركية وزيادة استخدام التدابير غير الجمركية (NTMs) في البلدان التي تشكل أعضاء منظمة التعاون الإسلامي (OIC). وتحسب نسب التواتر (عدد الواردات الخاضعة للتدابير غير التعريفية)، ونسب التغطية (قيمة الاستيراد الخاضعة للتدابير غير التعريفية)، ومعادل التعريفة (AVEs) للتدابير غير التعريفية، والحماية الشاملة (الحماية التي توفرها التعريفة الجمركية ومعادل التعريفة) للأعوام ما بين 1997 و 2015. ويُظهر التحليل أن استخدام التدابير غير التعريفية قد ازداد في العقود الأخيرة. وأكثر من 50 في المائة من التجارة في معظم البلدان خضعت للتدابير غير التعريفية اعتبارا من عام 2015. وازدادت الحدود الدنيا للقيمة المضافة للتدابير غير

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التعريفية والحماية الشاملة مع انخفاض كبير في متوسط الرسوم الجمركية المطبقة بفاعلية. ونتيجة لذلك، تطورت التدابير غير التعريفية لتصبح مصدرا مهيمنا للحماية الشاملة. وزادت الحماية التي يمنحها معادل التعريفات من 35 بالمائة المسجلة عام 1997 إلى 71 بالمائة في 2015. وتوصي الورقة البحثية أعضاء منظمة التعاون الإسلامي بمراجعة وتبسيط استخدام التدابير غير التعريفية والتنسيق مع الشركاء التجاريين.

ABSTRAITE

Ce document porte sur le déclin des tarifs douaniers et l'utilisation croissante des mesures non tarifaires (MNT) dans les pays constituant l'Organisation de la coopération islamique (OCI). Le document calcule les ratios de fréquence (nombre d'importations soumises aux MNT), les ratios de couverture (valeur des importations soumises aux MNT), les équivalents tarifaires (EAV) des MNT et la protection globale (protection fournie par le tarif et les EAV) pour les années 1997 à 2015. L'analyse montre que l'utilisation des MNT a augmenté au cours des dernières décennies. Plus de 50 % du commerce dans la plupart des pays était soumis à des MNT en 2015. Les EAV des MNT et la protection globale ont augmenté avec une baisse significative du tarif moyen simple effectivement appliqué. Par conséquent, les MNT ont évolué pour devenir une source dominante de protection globale. La protection accordée par les EAV est passée de 35 % en 1997 à 71 % en 2015. Le document recommande aux membres de l'OCI de revoir et de simplifier l'utilisation des MNT et de les harmoniser avec les partenaires commerciaux.

1. Introduction

Tariffs have declined globally over the last decades due to bilateral and multilateral negotiations and successive rounds of the World Trade Organization (WTO). According to World Bank data, the global average tariff declined from 15.58 percent in 1994 to 5.17 percent in 2017. However, the term trade protection is often understated by defining it in terms of tariffs only. Apart from the tariffs, the nontariff measures (NTMs) have substantially increased during the last decade. The number of product lines subject to at least one category of NTMs has increased from 1456 to 2852 from 1997 to 2015.[3]

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[3] UNCTAD-TRAINS

NTMs are defined as *"Policy measures other than ordinary customs tariffs that can potentially have an economic effect on international trade in goods, changing quantities traded, or prices or both."* (UNCTAD, 2019). These include a broad range of policy instruments such as quota, price control, monopolistic measures, etc. However, the most popular and widely applied measures are sanitary and phytosanitary measures (SPS) and technical trade barriers (TBT).

NTMs have complex taxonomy, making it difficult to measure and monitor them. MAST classifies NTMs into 16 main chapters, divided into 90 sub-chapters, including import and export-related measures.[4] Out of 16 groups, 15 groups are related to imports. Each sub-chapter is further decomposed into sub-measures. According to this classification, there are 358 measures with a unique NTM code.[5] In this paper, we focus on NTMs imposed on imports. These measures are related to food safety measures, labeling requirements, pre-shipment inspection, licensing, quotas and other control measures, taxes other than custom tariffs, and anti-competitive measures.

NTMs are meant to achieve non-trade objectives, including human health, animal welfare, and environmental concerns. However, they can have a potential protectionist impact. Unlike tariffs, NTMs are not tractable and not easy to quantify and monitor. Similarly, the relationship between NTMs, trade, and welfare is not straightforward. Many NTMs can impede trade by hindering market access, raising trade costs, and lowering exports, but at the same time can be traded facilitating by correcting market failures.

With the global reduction in tariffs, NTM became a more prominent policy tool. NTMs significantly contribute to the trade costs in developing countries (World Bank and UNCTAD,2018). NTMs are initially not imposed for protectionism intent; however, they impose fixed and variable costs and may drive exporters out of the market. Developing countries are constrained by the financial and technical capacity to bear such costs. Moreover, the discriminatory treatment (imposing more

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[4] United Nation Conference on Trade and Development (UNCTAD) established Multi Agency Support Team (MAST) to work on taxonomy of NTMs in 2006 and the NTM classification is provide by MAST

[5] The international classification of NTMs prepared by UNCTAD can be assessed at: https://unctad.org/system/files/official-document/ditctab2019d5_en.pdf

NTMs for certain trading partners) also leads to protectionism (Shepotylo,2016). NTMs become nontariff barriers (NTBs) by increasing trade costs and impeding trade. Such costs include production costs, transportation costs, and transaction costs. Studies conclude that harmonization with trading partners can lead to export diversification by reducing the cost burden of exporters (Shepherd,2015). Implicit costs associated with NTMs include transparency and information cost and can impede trade. For example, lack of transparency in the administrative process, complex documentation, and outdated custom procedures may lead to transaction costs, such costs associated with NTM merely to market losses and welfare losses in general.

1.1 Problem Statement and Objective of the Study

Despite the substantial decline in tariffs, trade costs and trade protection are rising due to the increasing usage of the NTMs. In developing countries, NTMs significantly contribute to trade costs (UNCTAD-WB 2018), contribute significantly to trade protection (Niu et al., 2018), and play a role in invisible trade barriers.[6] With the proliferation of NTMs and the decline in tariffs, the critical question is, do NTMs have a price-raising effect, and how much does it contribute to the protection compared to the tariffs.

Furthermore, the majority of the OIC member countries are developing, and studies reveal that developing countries tend to have more protective policies than developed countries (Niu et al., 2018; Kee et al., 2009). On the other hand, the OIC economic outlook reports that the decline in trade costs among OIC members was insignificant compared to the rest of the world. On average, OIC countries' trade costs decreased by 9% compared to a 20% cost reduction in the developed world from 1995 to 2010 (OIC outlook report, 2014). Moreover, numerous studies discuss NTMs in OECD countries. However, there is a dearth of literature examining all the NTMs in OIC countries in general and calculating AVEs. Hence, the paper in hand fills these gaps in the literature.

Therefore the main objective is to measure the price-raising effect of NTMs in the form of AVEs and compare the protection given by NTMs

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[6] NTMs is a neutral concept and all NTMs are not necessarily non-tariff barriers (NTBs)

and by tariffs over the years in OIC member countries. We will examine the prevalence of the core NTMs in OIC members across the sectors, calculate the AVEs of NTMs, and measure the protection by combining the tariffs and AVEs of NTMs. We will calculate the AVES for different product groups using product-level AVEs from Niu et al. (2018) and discuss the evolution of NTMs, tariffs, and overall protection in some OIC members. We also find the most protected sector with NTMs than Tariffs. The rest of the paper is organized as follows. Section 2 provides the literature review. Then, section 3 gives the methodology and the data used, while section 4 discusses the results. Finally, section 5 concludes the paper.

2.   Literature Review

The proliferation of NTMs as a trade policy tool after the 2008 financial crisis stimulated the discussion on NTMs among researchers. The increasing use of NTMs as a protectionist tool may preclude the economic benefit of trade liberalization in the form of a declining tariff. The existing literature on Nontariff measures mainly focuses on two broad areas: the effect of NTMs on trade and the substitutability between tariffs and NTMs.

A strand of literature quantifies the NTMs by calculating the tariff equivalent of NTMs using different methodologies. Kee et al.'s (2009) pioneering work calculates the AVEs of NTBs using import values normalized to unity.[7] They measure the trade restrictiveness index using NTBs and Tariff and find that NTBs contribute more than a tariff in restricting trade. Moreover, they find that tariffs and NTBs are substitutes after controlling for product and country fixed effects. They also found that the effect of NTBs on imports in the agriculture sector was greater than in the manufacturing sector. They use data for 2002 and do not comment on the evolution of NTBs. Niu et al. (2018) adopted the methodology of Kee et al. (2009) and extended the discussion using discrete data from the years 1997 to 2015 for 97 countries. They comment that NTMs evolved as a more dominant protectionist policy tool than the tariff, as average AVEs and overall protection increased over time with the decline in average tariff. They report that NTMs contribute more than

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[7] Kee et al. (2009) imposed parameter restrictions and restricts NTMs to be NTBs.

a tariff in overall protection and low-income countries have higher AVEs than high-income countries.

The non-constained empirical studies suggests that NTMs have a mixed effect on trade. NTMs have both positive and negative effects, depending on the country, product, and type of NTMs. Trade-enhancing effects include quality insurance, environmental safety, consumer protection, reducing information asymmetry, and increasing consumers' confidence in imported products. On the other hand, the trade restricting effect includes discouraging trade by increasing the trade costs and imported prices. A recent study by (Hai Luu & Parsons, 2022) shows that the adverse effect of technical measures of the importers' on the exports of Vietnam overshadows the demand enancing effect. Kee et al. (2009) and Niu et al. (2018) restrict the parameters to be non-positive, forcing the NTMs to have trade-reducing effects (NTBs). Beghin et al.(2015) address this limitation and re-estimate the model proposed by Kee et al. (2009), and relax the restriction to estimate the trade restiveness index in the presence of market imperfection (allowing for both positive and negative effects). They use the data on technical regulations for the years 2001 to 2003. The results show that out of the 12 percent of product lines affected by technical regulations, 39 percent indicate the facilitating trade effect of NTMs. A study by Peci & Sanjuán (2020) aslo find the dual effect of NTMs, based on AVEs. They study the pork trade in china conclude that AVEs are not symetrical.

The above studies do not include the regulatory environment in the analysis. Cadot et al. (2018) estimate the trade effects of NTMs on trade volume and trade value captured in AVEs, considering the regulatory distance. They separately evaluate the price effect and volume effect and assert that price-based effect can facilitate trade, but at the same point, they recognize that the trade cost of NTMs often reduces trade volume. The price-based estimation result shows that NTMs reduce information asymmetries and enhance consumers' confidence in imported products. On the other hand, the volume-based estimates show that trade costs from NTMs often reduce trade volume, except in sanitary and phytosanitary areas requiring a close regulatory environment. One of their important conclusions is that the regulatory differences are the key contributor to NTM-related trade costs.[8]

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[8] See Cadot et al. (2018) Annex 6; P.29 for methodology of measuring regulatory distance.

The studies discussed above do not differentiate the type of NTMs and do not consider the number of NTMs; instead, they largely use a dummy variable for the presence or absence of NTMs. For example, a product could be subject to TBT, price control, and Quantity control at the same time. Grübler et al. (2016) calculates the AVEs of NTMs for 103 WTO member states from 2002 to 2011 and distinguishes the type of NTMs and the number of NTMs across countries and products. They found that NTMs can distort or increase trade depending on the reporter and product under discussion. They compare the use of NTMs by income group and conclude that although the use of NTMs was higher in developed countries than in emerging countries, the effect of NTMs was more negligible in more affluent countries in the form of decreasing AVEs.

Researchers discuss that developed countries are usually the standard settler, and developing countries bear the cost of complying with them due to the constraints such as capital and infrastructure. Moreover, the NTMs imposed by developing countries and their trading partners are more restrictive (Bratt,2017; Devadason et al., 2018). Also, stricker imports are trade restrictive (Fiankor et al., 2021). Bratt (2017) calculates bilateral AVEs following the methodology developed by Kee et al. (2009) for 81 countries (6480 exporter–importer pairs) at the HS 6-digit level using data from the year 2003 to 2016. Results show that low-income importers impose fewer NTMs in relative terms compared to high-income and upper-middle-income importers, yet the more restrictive ones. Furthermore, the impact of NTMs was seen to decline with income. The impact of NTMs on trade was both positive and negative, but most of the trade facilitating NTMs were statistically insignificant.

Other studies discuss NTMs without calculating the AVEs of NTMs. Liu et al. (2019) examine the impact of NTMs on agriculture exports. They compare the real export value in the presence of NTMs and predicted export value in the absence of NTMs to see the effect of NTMs on exports. They conclude that the actual exports were far less than the predicted values. Hu and He (2020) discuss that the export deflation effect of exporter market expansion occurs given the low incidence of NTM in the new export market. It means that deflation tends to be less costly if the incidence of NTM in the new potential market is low. This implies that NTM are likely to impede exporters from entering a new market.

Baghdadi et al. (2019) investigate the impact of NTMs on Tunisian imports for the years 2000 to 2009 using firm's level data. The study finds that large and medium firms (importers) from non-EU partners that comply with NTMs (Pre-Shipment inspection and technical barrier to trade) seem to increase their market shares. However, the analysis is based on the notion that small firms are less efficient, and NTMs can push less efficient firms to exit the market. The firms having the capacity to stay will benefit from the information content of NTMs. Assuming that such impact is stronger in the case of distant partners, the study uses non-EU partners.

Orifice (2017) discusses the relationship between the tariff reduction by importers and the probability of raising NTM (technical barriers and sanitary and phytosanitary) concerns by exporters. They report a significant negative correlation between the Specific Trade Concern (STC) and effectively applied tariff, meaning that the STC raised by exporters increases with the reduction in tariff. They argue that when tariffs decline, nontariff measures become more barriers to trade with a protectionist effect, and this causes the increase in STC by exporters.

NTMs may have purely protectionist intentions as countries substitute NTMs for declining tariffs. Many studies investigate the substitutability between tariffs and NTMs. Kee et al. (2009) estimate AVEs of NTBs. They explored the relationship between tariffs and estimated AVEs and suggested a policy substitution. However, in the analysis, the parameters were constrained to be non-positive, suggesting a negative effect. Based on the methodology of Kee et al. (2009), other studies confirmed the substitution between tariffs and NTMs (Limso and Tovar 2011; Ronen & Ronen 2017). Ronen and Ronen (2017) prove that the two policy instruments are substitutes for developing countries while complementing each other in high-income countries. Furthermore, they show that substitutivity tends to decrease with an increase in economic development. Niu et al. (2020) established the policy substitution using AVEs of core NTMs and tariffs for panel data covering 80 countries, including OIC, from 2003 to 2015. Other studies use proxy measures to establish the tariff and NTM relationship, which is not directly comparable to tariff (Beverelli et al., 2019; Beverelli et al., 2014; Tudelamarco et al., 2014). The latest studies largely agree that NTMs and tariffs are substitutes.

2.1 Conclusion of the Discussion in the Literature

To conclude the literature, NTMs have increased globally with the decline in tariffs. The contribution of NTMs to trade protection is more significant compared to tariffs. The price-raising effect of NTMs calculated as AVEs is higher in developing countries. Developing countries have relatively more restrictive regimes. The literature has almost focused on OECD countries and Western economies. Although there has been discussion on NTMs among OIC members, it's limited regarding types of NTMs, data, sectors, and countries. Our paper fills the gap in the literature. First, it calculates the prevalence score of core NTMs in some of the OIC members. It calculates AVEs for individual product groups in the agriculture and manufacturing sectors to see the evolution of NTMs in the form of AVEs. Finally, the paper measures the overall protection given tariffs and NTMs from 1997 to 2015 with three years intervals.

3.   Methodology

The techniques to quantify nontariff measures include simple inventory measures (frequency counts and coverage ratio), price gap model, gravity model, partial equilibrium analysis, and computable general equilibrium model. This paper relies on the simple inventory measures to see the pervasiveness of NTMs. To calculates the AVEs, we use the product level AVEs already available, and combines tariffs and AVEs to see overall protection. The information on the NTMs has not been improved since 2015, to save time, we rely on the product-level AVEs estimates calculated by Niu et al. (2018).

The AVEs are estimated at the product level using import values evaluated at exogeneous world prices, which are normalized to unity. This makes import quantities equal to import value.[9] Thus, the estimated AVEs are the price effect of NTMs on imports and are comparable to tariffs.
The paper calculates frequency indices, coverage ratios, AVEs for different product groups, and overall protection by combining the tariff data and AVEs data.

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[9] See Niu et al. (2018) for the methodology used to compute AVEs of NTMs.

The frequency ratio is defined as the percentage of the number of imported products in the group affected by at least one category of core NTMs being considered.

Following Nicita and Gourdon (2013), the frequency index of NTMs imposed by country j is calculated using the following equation:

$$F_{ijk} = \left[\frac{\sum D_{ijk}M_{ij}}{\sum M_{ij}}\right] * 100 \qquad (1)$$

where F_{ijk} is the frequency index for a group of products, i, in country j for a particular category of the core NTMs, k; M_{ij} is a dummy variable that indicates whether there are imports of those products, i, into country j, and D_{ijk} is a dummy variable reflecting the presence of at least one of the core NTMs in the category being considered, k, for the product group, i in country j. The measured frequency lies between 0 and 1, and the greater the value, the higher frequency of core NTMs; in this paper, we represent the frequency index as lying between 0 and 100 percent.

The importance of NTMs on overall imports is measured using the coverage ratio. The coverage ratio is defined as the share of the value of imports subject to at least one category of core NTMs being considered for a country, with a higher value indicating greater coverage by core NTMs.

The coverage ratio formula, also adopted from Nicita and Gourdon (2013), is given as:

$$C_{ijk} = \left[\frac{\sum D_{ijk}V_{ij}}{\sum V_{ij}}\right] * 100 \qquad (2)$$

where C_{ijk} is the coverage ratio for a group of products, i, for a particular category of the core NTMs, k, in country j; V_{ij} is the import value of these products i in country j, and D_{ijk} is a dummy variable reflecting the presence or absence of at least one category of the core NTMs in the category being considered, k, for the product group, i, in country j.

The frequency ratio and coverage ratio use a dummy variable for the presence and absence of certain NTM for the specific product and do not account for several measures applied on the same product.

As mentioned earlier, we are using the information on AVEs at the product level calculated by Niu et al. (2018) to measure the AVEs across the sectors.

Finally, the overall protection is calculated by combining tariffs and AVEs, using the formula given as:

$$T_{nc} = t_{nc} + Ave_{nc} \qquad (3)$$

Where the overall protection T_{nc}, is the sum of tariffs imposed by country c on product n, t_{nc} And AVEs of NTMs imposed by country c on product n, Ave_{nc}.

3.1 Data

The import data is taken from UN COMTRADE. The NTM data is taken from UNCTAD's TRAINS. The data on effectively applied tariffs are taken from the WITS database at 6-digit product aggregation.[10] The estimated AVEs from 1997 to 2015 are extracted from Niu et al. (2018).[11]

The NTMs considered in the estimation of AVEs are the core NTMs namely: Quantity Restrictions (TRAINS M3 code A1, B1, E1-E3, G33), technical measures (TRAINS M3 code A, B, C), Price control measures (TRAINS M3 code F1-F3), and Monopolistic measures (TRAINS M3 code H). Like the inventory measures, a dummy variable represents the NTM measure in estimating AVEs. i.e., the core NTM takes the value 1 if one of the mentioned measures is in place and zero otherwise.

Due to the data restrictions, we could not include all the OIC members in the discussion. The countries included in the analysis are provided in the endnote.

4. Results and Discussion

The analysis includes two parts: In first part we discuss the pervasiveness of NTMs. In the second part we calculate sectoral AVEs, and later overall protection.

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[10] Effectively applied tariff is the lowest available tariff between preferential and MFN
[11] The data is available at https://www.nottingham.ac.uk/gep/links/index.aspx

4.1   Descriptive Statistics

Table 1 reports the coverage ratio and frequency index of 31 OIC members. Looking at the coverage ratio, in 19 OIC members, more than 50 percent of trade is affected by NTMs as of 2015. For some countries, the statistics are given for 2016. Nigeria has the highest coverage ratio, followed by Saudi Arabia and UAE. With a few exceptions, the coverage ratio is greater than the frequency index in most OIC members, suggesting a high impact of NTMs.

Table.1: Frequency index and coverage ratio of OIC countries 2015-2016*

	ISO3	Reporter	Coverage Ratio	Frequency Index
1	NER	Nigeria	94.33	85.9
2	SAU	Saudi Arabia	75.45	70.28
3	ARE	United Arab Emirates	73.06	60.19
4	TUN	Tunisia	70.63	58.17
5	IDN	Indonesia	68.95	56.33
6	QAT	Qatar	67.94	60.36
7	BEN	Benin	64.11	32.73
8	KGZ	Kyrgyzstan	62.81	55.4
9	BFA	Burkina Faso	61.76	26.46
10	GMB	The Gambia	61.25	14.75
11	TUR	Turkey	60.74	67.62
12	BHR	Bahrain	58.6	48.13
13	LBN	Lebanon	57.28	26.37
14	MAR	Morocco	57.25	44.55
15	TJK	Tajikistan	55.76	34.69
16	MYS	Malaysia	54.96	36.6
17	OMN	Oman	54.78	53.27
18	DZA	Algeria	52.9	53.17
19	GUY	Guyana	52.53	71.83
20	SEN	Senegal	48.3	28.77
21	CMR	Cameroon	46.8	18.71
22	BRN	Brunei Darussalam	44.47	25.18
23	KWT	Kuwait	41.37	23.56
24	MRT	Mauritania	36.58	17.93
25	PAK	Pakistan	33.12	15.24

26	JOR	Jordan	31.25	17.02
27	NGA	Niger	28.51	18.78
28	TGO	Togo	24	17
29	AFG	Afghanistan	22.74	13.3
30	CIV	Côte D'Ivoire	21.87	18.71
31	SUR	Suriname	12.27	14.18

Source: WITS and own calculation based on UNCTAD's TRAINS data

*The available statistics are taken from WITS to save time and resources. WITS report the frequency index and coverage ratio for 2015 and some countries in 2016. For some of the countries for which the statistics were not available, the FI and CR are calculated using data from UNCTAD's TRAINS. Note that WITS exclude the NTMs covering 95 percent of the products in the calculation.

Table 2: Evolution of NTMs in OIC 1997-2015

Years	A	B	C	E	F	Total
1997	3,627	8,065	104	2,760	0	14,556
1998	821	286	0	881	0	1,988
1999	1,855	1,922	22,978	68,064	0	94,819
2000	15,317	1,062	2,842	5,944	110	25,275
2001	378,177	2,577	28	994	0	381,776
2002	36,928	159	488	1,644	10	39,229
2003	9,548	6,640	985	1,293	0	18,466
2004	5,691	66,655	5,331	17,159	0	94,836
2005	27,059	47,524	16,584	6,540	5,876	103,583
2006	3,668	97,863	18,488	232,651	0	352,670
2007	9,432	21,471	22,824	2,388	0	56,115
2008	21,126	7,758	13,419	4,625	0	46,928
2009	9,757	9,210	3,111	1,353	6	23,437
2010	160,853	17,202	4,621	197,201	0	379,877
2011	1,028,522	155,461	236,174	129,178	0	1,549,335
2012	92,559	13,010	51,613	4,056	112	161,350
2013	114,920	155,156	450,107	230,031	0	950,214
2014	195,224	14,605	10,107	26,471	0	246,407
2015	87,070	53,856	22,185	48,088	0	211,199
Total	2,202,154	680,482	881,989	981,321	6,114	4,752,060

Source: Author's calculation based on UNCTAD's TRAINS data

Table 2 reports the evolution of NTMs over time in 35 OIC members from 1997 to 2015.[i] The cumulative score shows the existing NTMs in a specific year and newly added NTMs each year. The data indicate that NTMs started increasing in 2001. The highest recorded is in 2011. The table covers A - Sanitary and phytosanitary measures. B - Technical barriers to trade, C - Pre-shipment inspection and other formalities, E- Non-automatic import licensing, quotas, prohibitions, quantity-control measures, and other restrictions other than SPS or TBT measures, and F - Price control measures, including additional taxes and charges. Sanitary and phytosanitary measures are mostly applied NTMs, followed by E. F is the least applied NTMs. Note that each category of core NTMs is further subdivisions, each chapter serving the same objectives.

From table 2, we see the NTMs in use in 2011 are the highest. This suggests that OIC members increased the usage of NTMs after the financial crisis of 2008 which is consistent with Niu et al. (2018). This situation is very similar to the data on NTMs in the pandemic. For example, UNCTAD data reports 303 additional NTMs imposed by countries between Jan 2020- Jan 2021, some of which were later terminated. Most of the measures were applied to basic food items, live animals, and Covid-related medical supplies. The data shows that the additional tariff and NTMs imposed on imports and exports amid the pandemic by developing countries are significantly higher compared to the developed world. The NTMs were imposed to restrict trade, and tariff measures were applied to facilitate trade.

In the second part of the analysis, we discuss the changes in tariffs over the years, the AVEs of NTMs, and the overall protection in terms of tariffs and NTMs.

4.2 Decline in tariff

The world has witnessed the global decline in tariffs since the Uruguay Round conclusion in 1994, especially in developing countries, including OIC members. The tariff data is plotted in figure 1.[ii] The discrete data is plotted with three-year gaps due to the non-availability of data each year. Data from the previous year is adopted for the countries for which tariff data was not available. The figure shows a clear downward trend in average tariff in OIC members from 2000 to 2015. The average tariffs are halved from 2000 to 2015.

The tariff was less than 5 percent in Brunei, Turkey, Kuwait, and Kyrgyzstan in 2000. Among the 23 countries included, the tariff was highest in Morocco at 29 percent, followed by Tunisia at 28 percent, Egypt at 25 percent, and Algeria, Nigeria, Jordan, and Pakistan, all at 24 percent in 2000. However, tariffs declined substantially over the years, and in 2015 average tariff in Morocco was 4 percent, 6 percent in Tunisia,7 percent in Egypt, and 6 percent in Jordan. Tariff decline was comparatively less in Pakistan, Nigeria, and Alegria, almost 50 percent decline from 2000 to 2015. The tariff was already less in Brunei and GCC members than in other OIC members. In Cote d'Ivoire, the tariff remained unchanged over the years.

**Figure 1:** Tariff decline in OIC members
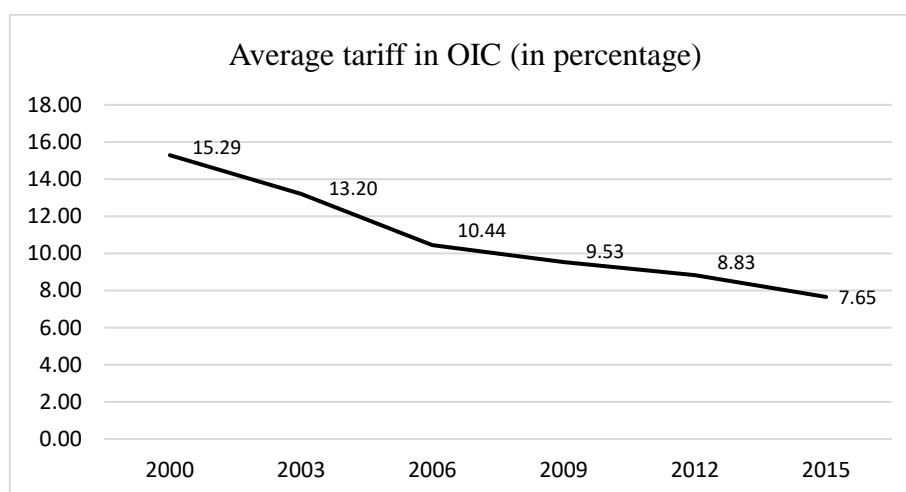
Source: Author's calculation based on WITS data

4.3   AVEs of NTMs

Using the information on AVEs at the product level, we calculate the AVEs of NTMs each year. The countries with the highest AVEs of NTMs identified by Niu et al. (2018) were OIC member states. For example, the countries with average AVEs of more than 80 percent as of 2015, in the entire sample of 97 countries, are low-income OIC countries (Benin, Burkina Faso, Niger, Nigeria, and Senegal). Figure 2 gives the average AVEs increase in OIC countries using available data for 9 OIC countries. The countries are selected based on the information available for both

years.[12] The largest increase is seen in Lebanon (70 percent), followed by Tunisia (68 percent) and Egypt (66 percent). Cote d'Ivoire was the only OIC member where the AVEs decreased from 61 percent to 9 percent from 2003 to 2015. Unlike all the other countries where the tariff declined and the AVEs surged, the tariff in Cote d'Ivoire remained unchanged from 2000 to 2015, and AVEs declined. The results suggest the possibility of substitution between tariffs and NTMs.

Figure 2: Tariff equivalent (AVEs) of nontariff measures in OIC (1997 - 2015)
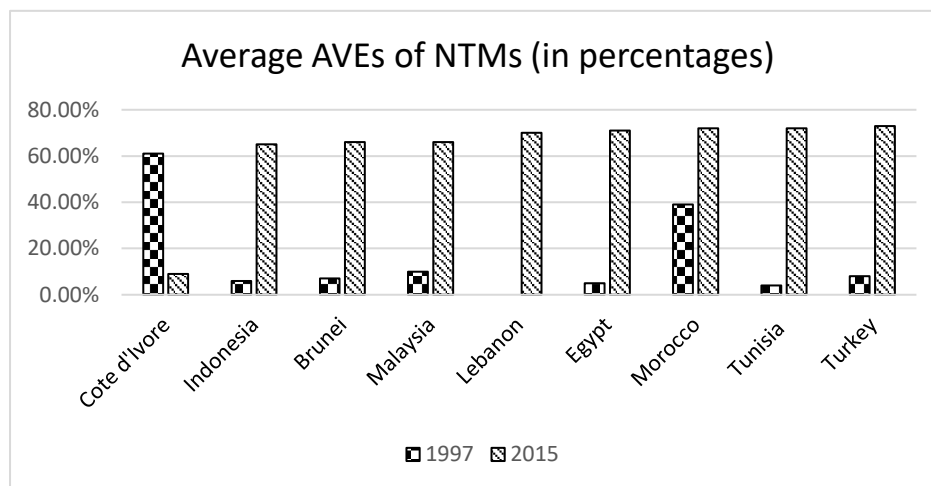
The authors' calculation is based on Niu et al. (2018)

Using the product-level AVEs, we calculate the AVEs for different product groups in the agriculture and manufacturing sectors.[13] Then we compute the average for the agriculture sector and manufacturing sector.[14] The sectoral analysis shows that the agriculture sector in OIC countries is more restrictive than the manufacturing sector. Within the agriculture sector, the prepared foodstuffs have the highest average AVEs. As discussed earlier, the most applied NTMs in OIC are SPS, mostly applied

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[12] All the AVEs for all individual products in all countries from 1997 to 2015 is not available. Some of the AVEs are zero and some are missing.
[13] The grouping is based on Harmonized System (HS),
https://wits.worldbank.org/trade/country-byhs6product.aspx?lang=en
[14] Note that the average is not the average of AVEs of the product groups but the average of all the product-level AVEs in agriculture sector

to the agriculture trade. The average AVEs in the agriculture sector is 10 percent greater than the manufacturing average.

Table 3: AVEs of NTMs by sector in OIC (2015)

Industry Code	Industry Name	AVEs
1-5	Live animals	0.50
6-14	Vegetable products	0.53
15	Fats and oils	0.57
16-24	Prepared foodstuffs	0.75
Agricultural mean (1-24)		0.60
25-27	Mineral products	0.37
28-38	Chemical products	0.45
39-40	Rubber and plastics	0.42
41-43	Raw hide and skins	0.36
44-46	Wood	0.33
47-49	Paper	0.41
50-63	Textile	0.38
64-67	Footwear	0.54
68-70	Stone and cement	0.47
71-83	Base metals	0.47
84-85	Machinery and electrical equipment	0.53
86-89	Motor vehicles	0.61
90-92	Optical and medical instruments	0.67
93-96	Miscellaneous goods	0.70
Manufacturing mean (25-96)		0.48
Total mean		0.49

The authors' calculation is based on Niu et al. (2018)

The cost of NTMs in all the product groups in the agriculture sector is greater than 50 percent. Most OIC members protect the agriculture sector because the major export items come from the agriculture sector for example, in Pakistan. In the manufacturing sector, the cost is highest (70 percent) for miscellaneous goods, including all kinds of weapons, furniture, toys, stationery, and sanitary.

The next section calculates the overall protection by combining the tariff and total mean of AVEs of NTMs.

4.4 Overall protection

The overall protection estimated using equation (3) is given in table 4.[iii] It combines the average tariff and average AVEs of NTMs to get the figure for average protection from 1997 to 2015.[15] NTMs give an increase in overall protection as tariffs decline over time. The results show that the average AVEs of NTMs are almost equal to the average tariff in 1997, contributing to 35 percent overall protection. The tariff declined from 17 percent in 1997 to 8 percent in 2015.

Table 4: Overall protection in OIC countries 1997-2015

years	Observations	OIC-	Average	Average	Overall
1997	30911	10	17.54	17.58	35.11
2000	33401	12	50.70	16.88	67.58
2003	45078	15	51.46	14.69	66.15
2006	50111	17	40.78	12.02	52.80
2009	48445	18	65.34	10.92	76.26
2012	49387	19	44.84	9.68	54.52
2015	42769	18	63.25	8.00	71.25

The authors' calculation is based on Niu et al. (2018) and WITS data

On the contrary, AVEs of NTMs continued to increase from 17 percent to 63 percent in 2015. The overall protection, dominated by NTMs protection, increased from 35 percent in 1997 to 71 percent in 2015. For OIC countries, NTMs and tariffs equally contributed to trade protection at the start of 1997, and NTMs have become the dominant source of protection over time. We conclude that the trade-restrictive impact of NTMs is much higher than the tariff in OIC member states. Note that Niu et al. (2018) discuss 97 countries (which include 20 OIC countries), and they concluded that protection provided by NTMs was higher than tariff at the start of the sample also, i.e., 1997. However, we see a different picture showing that the AVEs of NTMs and tariffs were almost equal in 1997. This is because tariffs are the revenue source for developing countries, making it difficult to reduce the tariffs to the minimum level. For example, despite the liberalization policies in Pakistan, tariffs remained the main trade policy tool until 2013 when the government

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[15] Tariff is the simple average effective tariff

introduced a wide range of NTMs as regulatory amendments in The Strategic Trade Policy Framework (STPF) 2012-2015. Similarly, as discussed earlier, the tariffs in some OIC countries were very high in 1997.

5 Conclusion

This paper comments on the tariff decline and increasing use of NTMs as a trade protection tool using available information for some OIC countries. The analysis shows that usage of NTMs is on the rise. The pervasiveness scores show that more than 50 percent of the imports in most OIC members are subject to NTMs. SPS measures are the most widely applied. We calculate the sectoral AVEs for different product groups. Our results show that the agricultural sector is more protected than the manufacturing sector. Furthermore, the data shows that the countries having the highest AVEs were low-income OIC countries. These results are consistent with Niu et al.(2018) and Kee et al. (2009). Since the previous studies did not calculate the AVEs using the actual information on NTMs at the product level, this limits the comparison with other studies in the literature. Nevertheless, we see a clear picture of the evolution of NTMs in OIC with a persistent decline in tariffs.

The paper concludes that although in 1997, tariffs and AVEs of NTMs equally contributed to the overall protection, the pattern has significantly changed over the years. As the tariff declines in OIC member countries, the average AVEs and overall protection increased from 35 percent to 71 percent. The paper confirms that the NTMs evolve as a dominant source of trade protection despite the trade liberalization policies in OIC in the form of tariff cuts. NTMs evolve as dominant protectionist tools. The findings of our research are helpful in monitoring and revising the NTMs sector-wise in developing countries. It also calls for export diversification, which is a problem in developing countries. Another important implication of our research is for the exporters. For example, the regulation in each sector is imposed on raw materials and intermediate goods, which increases the cost of production for the exporters at home. Developing countries can enhance their export competitiveness by monitoring, revising, and streamlining NTMs with partners. Although it is not part of our analysis, but the usage of NTMs has increased amid the pandemic. Although NTMs were imposed during the covid-19 led crisis to ensure the availability of essential supplies, the increased protection

will not be beneficial in the long-run if continued as a response to the economic crisis. This calls for a careful study of NTMs, filtering out the unnecessary NTMs imposed purely for protectionist intent, to uplift the vulnerable countries amid the crisis.

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[i] Countries included in figure 1 are; Afghanistan, Benin, Burkina Faso, Bangladesh, Bahrain, Brunei, Cote d'Ivoire, Cameron, Algeria, Guinea, The Gambia, Guyana, Indonesia, Jordan, Kazakhstan, Kyrgyzstan, Kuwait, Lebanon, Morocco, United Arab Emirates, Mali, Mauritania, Malaysia, Niger, Nigeria, Oman, Pakistan, Qatar, Saudi Arabia, Senegal, Suriname, Togo, Tajikistan, Tunisia, Turkey.

[ii] Countries included in the figure 2 are; Algeria, Bahrain, Benin, Brunei, Burkina Faso, Cameroon, Cote d'Ivoire, Egypt, Arab Rep., Guyana, Indonesia, Jordan, Kuwait, Kyrgyzstan, Lebanon, Malaysia, Morocco, Nigeria, Oman, Pakistan, Saudi Arabia, Togo, Tunisia, Turkey

[iii] The countries included in table 2 are; Afghanistan, Benin, Brunei, Burkina Faso, Cote d'Ivoire, Egypt, The Gambia, Guinea, Indonesia, Kazakhstan, Lebanon, Malaysia, Mali, Morocco, Niger, Nigeria, Pakistan, Senegal, Tunisia, Turkey.