

Assessing the impact of Trade Facilitation Agreement on Morocco's export performance: An ex-post analysis using structural gravity model

Anas CHEKROUNI, (PHD Dr. In Economics and Management)

Laboratoire d'Etude et de recherches Economiques et Sociales (LERES)

Faculté des Sciences Juridiques Economiques et Sociales de Meknès

Université Moulay Ismaïl, Maroc

Mohammed BENCHEKARA, (Professor of higher education)

Laboratoire d'Etude et de recherches Economiques et Sociales (LERES)

Faculté des Sciences Juridiques Economiques et Sociales de Meknès

Université Moulay Ismaïl, Maroc

Correspondence address :	Faculté des Sciences Juridiques Economiques et Sociales de Meknès B.P : 3201 Toulal, Mèknes +212 5 35 45 20 92/93 Université Moulay Ismaïl -Meknès Meknès (Maroc)
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Abstract:

The primary aim of this paper is to assess the ex-post impact of the Trade Facilitation Agreement (TFA) on Morocco's export performance following its ratification in 2019. The study goes beyond merely assessing the presence and magnitude of this impact (overall impact) to investigate its distribution across various policy areas (differentiated impact by policy domains). Using the OECD Trade Facilitation Indicators (TEIs) and employing the structural gravity model, estimates on panel data covering the years 2017 and 2019 suggest that the implementation of the TFA by Morocco contributes to a significant improvement in the intensive export margin. Concretely, the implementation of the TFA by Morocco contributes to an improvement ranging between 6.1% and 6.3%. However, this positive outcome appears primarily driven by Morocco's pre-existing commitment reflected in its average OECD TFIs scores, rather than by improvements in partner countries. Furthermore, the findings confirm heterogeneity in the impact across specific TFA policy areas. The magnitude of impact varies notably among reform domains. Particularly, internal and external cooperation among border agencies, streamlining procedures, and the use of automated processes appear to have the greatest impact on export value, compared to areas such as transparency and predictability. This promising result opens up additional improvement opportunities since it concerns areas in which Morocco has not yet achieved its best performance.

Keywords: Trade facilitation, Trade facilitation agreement, Intensive export margin, Structural gravity model

JEL Classification: F13, F14, C33

Paper type: Empirical Research

Résumé:

L'objectif principal de ce papier est d'évaluer l'impact ex post de l'Accord sur la facilitation des échanges (AFE) sur la performance à l'exportation du Maroc, après sa ratification en 2019. L'étude ne se limite pas à examiner la présence et l'ampleur de cet impact (impact global), mais explore également sa répartition à travers différents domaines d'intervention politique (impact différencié par domaines d'actions). Moyennant l'exploitation des indicateurs de facilitation des échanges de l'OCDE (IFE), ainsi que le modèle de gravité structurelle, les estimations sur les données de panel couvrant les années 2017 et 2019 suggèrent que la mise en œuvre de l'AFE par le Maroc contribue à une amélioration significative de la marge intensive d'exportation. Concrètement, la mise en œuvre de l'AFE par le Maroc contribue à une amélioration de la performance à l'exportation comprise, entre 6,1% et 6,3 %. Cependant, il a été prouvé que l'impact positif associé à l'AFE est essentiellement le résultat de l'auto-engagement du Maroc, reflété par les scores moyens des IFE, et non associé à ceux des pays partenaires. En outre, les résultats confirment l'hétérogénéité de l'impact à travers des domaines politiques spécifiques de l'AFE. L'ampleur de l'impact varie notablement parmi les domaines de réforme. En particulier, la coopération interne et externe entre agences frontalières, la rationalisation des procédures et l'utilisation de processus automatisés semblent influencer le plus sur la valeur des exportations, en comparaison avec des domaines tels que la transparence et la prévisibilité. Ce résultat prometteur ouvre des opportunités d'amélioration supplémentaires puisqu'il s'agit notamment des domaines dans lesquels le Maroc n'a pas encore atteint sa meilleure performance.

Mots clés : Facilitation des échanges, Accord sur la facilitation des échanges, Marge intensive d'exportation, Modèle de gravité structurel

Classification JEL : F13, F14, C33

Type de l'article : Recherche Empirique

1. Introduction

The Trade Facilitation Agreement (TFA), ratified by two-thirds of the World Trade Organization (WTO) members and entered into force on February 22, 2017, represents a historic milestone in international trade. Indeed, it stands as the first successful multilateral trade agreement since the establishment of the WTO, proactively addressing the escalating fragmentation of international trade regulations and practices (Bonciu & Moldoveanu, 2014). Its innovative structure takes into consideration the specific capacities of developing countries (DCs) and least developed countries (LDCs), linking their commitments to their own assessment of their ability to implement its provisions. The primary objective of the TFA is to simplify and expedite customs clearance and transit procedures for goods at the international level, fostering enhanced collaboration among border authorities, customs administrations, and other stakeholders. Furthermore, the TFA emphasizes technical assistance and capacity building for DCs and LDCs to enable them to fully harness the benefits of the agreement.

In addition to this unprecedented turn of events in the negotiation of WTO multilateral agreements, the implementation of the TFA and its impact on international trade in general and exports, in particular, is also justified on empirical grounds. According to the (WTO, 2015), the benefits arising from the increase in exports resulting from the implementation of the TFA could range from 750 billion to more than 1,000 billion dollars annually depending on the scenarios envisaged. In a full implementation scenario, full implementation of the TFA could increase world exports by between \$1800 billion and \$3600 billion, depending on the countries concerned. For developing countries, which account for a significant share of the gains, the increase in their exports could reach 730 billion dollars per year if the TFA provisions were fully implemented. This growth could boost their exports by an additional 3.5% per year by 2030. This positive impact on exports stems from lower transaction costs at the border and faster delivery of exports. In this regard, the estimates of (Duval & Utoktham, 2022) on the ex-post impact of the implementation of the TFA on international trade costs are evident. The implementation of TFA could reduce trade costs by 1 to 4% on average.

Recognition of this considerable community of interest, as well as the additional benefits stemming from a full implementation of the TFA, led Morocco to ratify its provisions on May 14, 2019. This act demonstrates the strong political will of the Moroccan authorities to strengthen the competitiveness of the national economy, boost export performance in particular, and reduce transaction costs related to customs and border formalities for the benefit of exporting companies. Given the crucial importance of the TFA for Morocco, the emerging issue of trade facilitation within this framework constitutes a fundamental and promising research area.

Taking into account the Moroccan national context and leveraging the OECD Trade Facilitation Indicators (TFIs), as recently recommended by (CHEKROUNI & EZ-ZAROUKI, 2023), along with the structural gravity approach, the present study aims to address the nearly complete absence of studies evaluating the impact of trade facilitation measures, such as the TFA, on Moroccan trade, particularly concerning its exports. It also proposes some policy implications for Morocco regarding the implementation of trade facilitation under the TFA. In this vein, unlike the counterfactual estimates aimed at ex-ante evaluation (Moïse & Sorescu, 2013; WTO, 2015), we are more focused on an ex-post evaluation wherein we utilize the OECD TFIs due to their policy targeting on one hand and the alignment between the TFIs and the TFA on the other hand. Furthermore, we not only assess the existence of impact and its magnitude (overall impact) but also delve into the distribution of impact across policy intervention areas (differentiated impact by policy domains).

In contrast to (Fontagné et al., 2020; Hillberry & Zhang, 2018), we consider TFIs at both the policy domain and average levels. We also examine the implementation of the TFA by

Morocco, its trading partners, and jointly by Morocco and its importing countries. The objective is to determine whether the implementation of the TFA by Morocco and its trading partners will lead to an increase in export value growth. And whether this increase varies depending on the specific action areas included in the WTO TFA and notified by Morocco as falling under Category A.

The remainder of this paper is structured as follows. The next section reviews the related formal literature. Section 3 outlines the econometric model employed, presents the data utilized, and elucidates the estimation strategy pursued. In Section 4, we present our main empirical results and discuss the related discussions. Finally, we report the main conclusions and discuss the policy implications of our results in Section 5.

2. Literature review

The impact of trade facilitation on trade flows in general and exports in particular has received considerable attention in recent years. However, despite the abundance of literature on the subject, studies on the specific impact of the TFA, after it enters into force, on trade flows in developing countries are limited. The lack of ex-post empirical studies at the national level is evident.

One possible explanation is that the majority of subsequent estimates have focused on counterfactual estimates of the potential impact of the TFA even before its entry into force instead of estimates measuring the real impact of the facilitation measures implemented by countries after their notification as falling under Category A. Another interesting clarification is that most empirical studies have used broad trade facilitation indicators such as the Doing business (DB) trade across border (TAB) or the World Bank logistics performance index (LPI), which do not exactly reflect the specific scope of the TFA. These composite indicators are consistent with a broad conception of trade facilitation and do not fit the narrow focus of the concept, as is the case for the OECD TFIs which are better placed for this type of assessment.

This first block of the literature uses the econometric results of the gravity and Computable General Equilibrium equations "Modelling International Relationships in Applied General Equilibrium" (CGE) MIRAGE to carry out counterfactual analyses of the potential impact of trade facilitation.

In sum, these counterfactual studies (Arvis et al., 2018; Decreux & Fontagne, 2011; G. C. Hufbauer et al., 2010; G. Hufbauer & Schott, 2013; Mevel et al., 2016; Persson, 2013; Portugal-Perez & Wilson, 2012; Zaki, 2014) find that measures aimed at improving trade facilitation-related performance in developing countries specifically are likely to have a more significant positive impact on trade expansion, particularly in exports. By way of example and not exclusion (Decreux & Fontagne, 2011; Zaki, 2014) estimate the impact of trade facilitation on trade using the CGE model. Using data from DB indicators, they represent trade costs as the ad valorem equivalent of time at the border (customs procedures and time spent at the port). The trade facilitation reform is represented by a 50% reduction in these costs. Using the CGE-MIRAGE model, (Decreux & Fontagne, 2011) estimate an increase in world trade of around 2%, or 359 billion dollars. Similarly (Zaki, 2014) finds that the gains from trade facilitation are greater for developing economies (the Middle East, North Africa and sub-Saharan countries) than for developed economies, both in terms of welfare gains and increased trade. For example, exports from sub-Saharan Africa, Latin America and the Middle East increased by 22.3%, 16.2% and 13.8% respectively. Another assessment using the World Bank's LPI (Arvis et al., 2018) suggests that a counterfactual simulation in which all economies move to world leadership (represented by Singapore in the benchmark year) is

associated with an increase in world exports of slightly over 5.0% and a change in real output of 0.3%.

In contrast to these aforementioned counterfactual studies and despite their limited number compared to the literature using the DB, TAB or LPI as a measure of trade facilitation, several empirical studies (Fontagné et al., 2020; Hillberry & Zhang, 2018; Kumar & Shepherd, 2019; Moisé & Sorescu, 2013; WTO, 2015) have examined the effectiveness of trade facilitation policies under the TFA on countries' trade flows using the TFIs developed by the OECD.

For example, (Kumar & Shepherd, 2019) employ a gravity model drawn from the most recent literature to assess the impact of trade facilitation strictly defined, as reflected in the OECD TFIs. The analysis uses data from 63 economies, representing over 90% of global GDP and trade. A counterfactual scenario with full implementation of the TFA would increase world exports by nearly 3.5% compared to 2015 levels, amounting to \$344 billion, and would raise real global output by 0.15%. In another study that combines the gravity model and CGE simulations, (WTO, 2015) estimates the impact of TFA on the value of total exports, using data covering 133 countries for the years 2003-2011. By constructing implementation scenarios, the estimates show that bilateral trade facilitation is associated with a greater effect on trade, especially for DCs in Sub-Saharan Africa and parts of Asia. For LDCs, the estimated increases range from 7% to 18% in the first two scenarios ("cautious" and "liberal"). In the "full" implementation scenario, the observed gains are much greater, with an increase in exports of up to 36%. Globally, export gains from TFA would range from \$750 billion to \$1,000 billion, depending on the extent of implementation. This will lead to an increase in global export growth of around 2.7% per year between 2015 and 2030.

Apart from these notable differences in the aforementioned literature, and in addition to the literature focusing on the potential impact of trade facilitation on exports at the international level (Arvis et al., 2018; Decreux & Fontagne, 2011; Hoekman & Nicita, 2008, 2011; G. Hufbauer & Schott, 2013; Kumar & Shepherd, 2019; Mevel et al., 2016; Portugal-Perez & Wilson, 2012; WTO, 2015; Zaki, 2014), there is a broad consensus in recent empirical literature that trade facilitation contributes to promoting export trade flows, at both the regional (Allali, 2021; Sakyi & Afesorgbor, 2019; Siraj & Khan, 2022; Takpara, 2021; Toševska-Trpčevska et al., 2022) and even national levels (Ahsan et al., 2021; Vu & Tang, 2022; Yu & Luu, 2022). It is evident from this literature that trade facilitation has a positive impact on countries' export performance.

Furthermore, as observed in studies by (Fontagné et al., 2020; Moisé & Sorescu, 2013), while trade facilitation measures such as those outlined in the TFA can positively impact export-intensive margins, the magnitude of their impact varies considerably from one measure to another. According to these studies, the specifics of the national context and the degree of implementation achieved play a determining role in the significance of each measure and its associated impact. These studies demonstrate that trade flows in each specific country or region respond differently to various components of trade facilitation. This consideration leads us to also examine the heterogeneous impact of TFIs on Moroccan exports and to identify the policy areas that contribute most to this impact.

Overall, regardless of the level of analysis considered, the available econometric estimates of the impact of the TFA on export performance generally confirm the effect on key export performance indicators such as export growth, mainly measured by the export intensive margin. Hence, based on this empirical literature, we propose the following hypotheses:

H1: The effective implementation of the TFA by Morocco and its trading partners has driven a positive and statistically significant impact on Morocco's export performance.

H2: Morocco's export performance exhibits heterogeneous responses to the specific reform areas included in the TFA and notified by Morocco under Category A.

3. Research methodology

In line with our approach to impact assessment, we first consider the overall impact. Since we use the OECD's TFIs as an indicator of TFA, we also examine the impact of specific policy areas. The aim here is to identify policy targeting. As for the measurement of export performance, we use the intensive export margin for both types of impact.

3.1. Data, sources and descriptive statistics

The econometric models used in our study are estimated on a panel dataset. The gravity econometric specifications are applied to a representative sample covering 187 importing countries. The time coverage is limited to two years, 2017 and 2019. This choice depends, on the one hand, on the availability of OECD TFIs for Morocco, and the other hand, on the possibility of acquiring data on Moroccan exports. These temporal and geographical differences are mainly explained by the different data sets from distinct sources. Our dependent variable, the intensive export margin, is sourced from the United Nations Comtrade database. TFIs variables are obtained from the OECD database. Finally, to isolate the effect of TFA on export performance, we also need to include other control variables that may affect the intensive export margin. These variables are drawn from both the World Bank's Development Indicators (WDI) database and the «Centre d'études prospectives et d'informations internationales» (CEPII).

Table 1: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
EXPijt	494	109208.36	587822.71	0	7065973
Ln(distance)	448	8.614	0.701	5.601	9.867
Ln (gdp-j)	387	17.358	2.377	10.612	23.788
Ln (pop-j)	422	8.376	2.412	2.431	14.15
Contiguïté-ij	442	0.009	0.095	0	1
Comlang_off	448	0.263	0.441	0	1
Colony-ij	448	0.009	0.094	0	1
Comcol-ij	448	0.143	0.35	0	1
Landlocked-ij	440	0.164	0.37	0	1
Rta-ij	478	0.205	0.404	0	1
IFE-ij	325	1.27	0.277	0.592	1.709
IFE-i	494	1.483	0.075	1.408	1.557
IFE-j	325	1.137	0.449	0.225	1.876
Transparency and predictability	494	1.61	0.152	1.459	1.761
Process streamlining	494	1.5975	0.028	1.57	1.625
Automation	494	1.58	0.040	1.54	1.62
Internal and external cooperation	494	0.75	0.02	0.73	0.77

Source: Authors

Based on the structural model of (Anderson & Wincoop, 2003), which provides a rigorous theoretical foundation, we consider four categories of control variables: a set of geographic controls that capture bilateral distance, contiguity, and landlockedness; a second set of variables that capture cultural distance, using common official or unofficial language, the existence of colonial relations, and having a common colonizer; a third set of variables that control for trade policy, using the existence of regional trade agreements (RTAs); and a fourth set of variables that control for the size of the importer's market, using GDP and population size. The descriptive statistics for these variables are presented in Table 1.

As previously mentioned, the variable of interest, the implementation of the TFA, is derived from the OECD's TFIs. Designed as composite performance indicators that reflect and closely approximate the TFA provisions, they allow for tracking specific areas where progress has been made in TFA implementation. Their main added value lies in identifying changes both in the regulatory frameworks of trade facilitation measures (i.e., their adoption) and in their practical implementation (Silvia & Carolin, 2022). The TFIs thus measure the actual degree of introduction and implementation of the TFA by countries in absolute terms, but also their performance relative to others. As shown in the table below, the OECD TFIs comprise eleven sub-indicators, each covering several related variables, for a total of 155 measures. Ten of these sub-indicators correspond to ten specific TFA provisions, except for "governance and impartiality", which does not fall within its scope.

Table 2 : The Structure of the OECD Trade Facilitation Indicators (TFIs)

Indicator	Description
(A) Information Availability	Enquiry points; publication of trade information, including on the Internet.
(B) Involvement of the Trade Community	Structures for consultations; established guidelines for consultations; publications of drafts; existence of notice-and-comment frameworks.
(C) Advance Rulings	Prior statements by the administration to requesting traders concerning the classification, origin, valuation method, etc., applied to specific goods at the time of importation; the rules and process applied to such statements.
(D) Appeal Procedures	The possibility and modalities to appeal administrative decisions by border agencies.
(E) Fees and Charges	Disciplines on the fees and charges imposed on imports and exports; disciplines on penalties.
(F) Formalities – Documents	Acceptance of copies, simplification of trade documents; harmonization in accordance with international standards.
(G) Formalities – Automation	Electronic exchange of data; use of automated risk management; automated border procedures; electronic payments.
(H) Formalities – Procedures	Streamlining of border controls; single submission points for all required documentation; pre-arrival processing; release of goods separated from final determination and payment of Customs duties; treatment of perishable goods; post-clearance audits; authorized operators.
(I) Internal Co-operation	Control delegation to Customs authorities; institutionalized mechanism supporting cooperation between various border agencies of the country; coordination.
(J) External Co-operation	Co-operation with neighboring and third countries.
(K) Governance and Impartiality	Customs structures and functions; accountability; ethics policy.

Source: Compiled by the authors from Annex C of the report "Trade Facilitation and the Global Economy" (OECD, 2018, p. 123)

The construction of the TFIs as composite indicators is based on a "multiple binary" scoring system (Orliac, 2012), in which each variable is normalized into scores ranging from 0 to 2, where 0 represents the worst possible performance, 2 corresponds to the best performance, and 1 to an intermediate performance. These scores are designed to reflect a multifaceted

assessment of a country's trade facilitation environment, encompassing both the legal framework and the implementation status of various trade facilitation measures. Additionally, they provide a single, overall score for each country, calculated as the average of eleven sub-scores, where each sub-score is weighted equally. In our estimations, we use both the individual score of each measure and the overall combined average score.

For the sake of convenience, Table 3 provides a comprehensive overview of the variables used in our regressions, including their definitions and data sources.

Table 3: Variable Definitions and Data Sources

Variable	Definition	Source
Outcome variable		
EXP _{ijt}	Exports from Morocco (i) to country (j) in year t, in thousands of current dollars.	UN Comtrade Database
Variables of interest		
IFE _{ij}	Geometric mean of TFIs for importing countries and Morocco: $IFE_{ij} = \sqrt{IFE_i * IFE_j}$	OECD
IFE _i	Average trade facilitation performance of Morocco, measured by the average of the 11 OECD TFIs.	OECD
IFE _j	Average trade facilitation performance of the importing country (j), measured by the average of the 11 OECD TFIs.	OECD
Transparency-predictability _{it}	Transparency and predictability are measured by the average of indicators A, B, C, D, and E.	OECD
Streamlining-processes _{it}	Streamlining of processes is measured by the average of indicators F and H.	OECD
Automation _{it}	Measured by the composite indicator G.	OECD
cooperation _{it}	Measured by the average of indicators I and J.	OECD
Control variables		
Dist _{ij}	Geographic distance between Morocco (i) and the importing country (j) in kilometers.	CEPII
GDP _{jt}	GDP of the importing country (j) in year t, in thousands of current dollars.	WDI
Pop _{it}	Population of the importing country (j) in year t, in thousands of current dollars.	WDI
Contig _{ij}	Dummy variable for contiguity equal to 1 if Morocco (i) and the importing country (j) share a common border and zero otherwise.	CEPII
Comlang-off _{ij}	Dummy variable for common official language equal to 1 if Morocco (i) and the importing country (j) use the same official language and zero otherwise.	CEPII
Colony _{ij}	Dummy variable equal to 1 if Morocco (i) and the importing country (j) had a colonial relationship and zero otherwise.	CEPII
Comcol _{ij}	Dummy variable equal to 1 if Morocco (i) and the importing country (j) had a common colonizer after 1945 and zero otherwise.	CEPII
Rtai _{ij}	Dummy variable equal to 1 if Morocco (i) and the importing country (j) are members of the same regional trade agreement and zero otherwise.	CEPII
Landlocked _j	Dummy variable equal to 1 if the importing country (j) is landlocked and zero otherwise.	CEPII

Source : Authors

3.2. Estimation strategy

Drawing on the OECD's TFIs, our econometric model of export performance is generally inspired by that of (Moisé & Sorescu, 2013), which builds on the structural gravity model of (Anderson & van Wincoop, 2004), whose specifications provide rigorous theoretical and econometric foundations. The structural gravity system is given by:

$$Y_{ij} = \frac{PIBi PIBj}{PIB} \left(\frac{\tau_{ij}}{\Phi_i \Phi_j} \right)^{1-\sigma}$$

Where Y_{ij} represents the exports from country (i) to country (j), GDP_i , GDP_j , and GDP_w denote the income levels of the exporter, importer, and the world, respectively, τ_{ij} is the bilateral trade cost, and Φ_j and Φ_i represent, respectively, the importer (Φ_j) and exporter (Φ_i) multilateral resistance terms. In its log-linearized version and with an additive error term ε_{ij} , the structural gravity equation is given as follows:

$$\ln(Y_{ij}) = -\ln(PIB) + \ln(PIBi) + \ln(PIBj) + (1 - \sigma) (\ln(\tau_{ij}) - \ln(\Phi_j) - \ln(\Phi_i)) + \varepsilon_{ij}$$

Unlike these authors, we apply this model to the case of a single exporting country, Morocco. To capture the effect of the WTO's TFA, the OECD's TFIs of Morocco and the importing countries were included in the dataset. The model is estimated on a panel dataset of 187 Moroccan importing countries for the years 2017 and 2019 using the PPML estimator as suggested by (Silva & Tenreyro, 2006), first without fixed effects, then with fixed effects by importing country, by year, and by country pair (Egger & Nigai, 2015).

The use of PPML addresses several econometric challenges, such as preserving the multiplicative form of the gravity model, accounting for heteroscedasticity in trade data and endogeneity of trade policy, while exploiting the information contained in zero trade flows. This estimator also ensures the identity of gravity fixed effects with their corresponding structural terms (Arvis & Shepherd, 2013) and thus allows for proper control of multilateral resistance terms, which is one of the notable difficulties of structural gravity. Unlike other estimators such as the Ordinary Least Squares estimator or even the Heckman selection model, current practice in the applied international economics literature suggests that PPML is the most commonly used estimator for structural gravity. The ability to produce consistent estimates and deal with a range of econometric challenges empirically are key factors in this trend (Shepherd, 2016).

Building on these methodological clarifications, we employ the structural gravity model in exponential form (in line with the PPML estimator) rather than logarithmic form, where export performance, measured by the intensive export margin of Morocco towards its importing countries, depends on factors such as geography (bilateral distance, contiguity, and landlockedness), cultural distance (common official/non-official language, colonial ties, having a common colonizer), trade policies (regional trade agreements), and the size of the importing country's market measured by GDP and population size.

Therefore, in our estimation strategy, we first consider a specification including the geometric mean of TFIs for the importing countries and Morocco ($IFE_{ij} = \dots$). This mitigates accuracy issues since in our database, the importing country index is calculated with several missing variables, while Morocco's index is calculated with no missing variables (Moisé et al., 2011). The first specification is then:

- **Model 1 :**

$$EXP_{ijt} = \beta_0 + \beta_1 \ln(dist_{ijt}) + \beta_2 \ln(GDP_{jt}) + \beta_3 \ln(Pop_{jt}) + \beta_4(contig_{ijt}) + \beta_5(comlang_off_{ijt}) + \beta_6(colony_{ijt}) + \beta_7(comcol_{ijt}) + \beta_8(rta_{ijt}) + \beta_9(landlocked_{ijt}) + \beta_{10} \ln(IFE_{ijt}) + \varepsilon_{ijt}$$

To further test whether Morocco's exports can vary in response to its own reforms, or those of its trading partners, we propose a similar specification in which we consider both TFIs for Morocco and the importing countries:

- **Model 2 :**

$$EXPijt = \beta_0 + \beta_1 \ln(distij) + \beta_2 \ln(GDPjt) + \beta_3 \ln(Popjt) + \beta_4(contigij) + \beta_5(comlang_offij) + \beta_6(colonyij) + \beta_7(comcolij) + \beta_8(rtaij) + \beta_9(landlockedij) + \beta_{10} \ln(IFEjt) + \varepsilon_{ijt}$$

- **Model 3 :**

$$EXPijt = \beta_0 + \beta_1 \ln(distij) + \beta_2 \ln(GDPjt) + \beta_3 \ln(Popjt) + \beta_4(contigij) + \beta_5(comlang_offij) + \beta_6(colonyij) + \beta_7(comcolij) + \beta_8(rtaij) + \beta_9(landlockedij) + \beta_{10} \ln(IFEit) + \varepsilon_{ijt}$$

Furthermore, to check the robustness of our results, and in line with gravity theory, we control for both multilateral resistance terms and endogeneity of trade policy variables, by incorporating importer-time fixed effects and country-pair fixed effects (Yotov et al., 2016). The use of importer-time fixed effects allows us to control for unobserved multilateral resistance, and potentially any other observable and unobservable characteristics that vary over time for each importer, respectively. To accomplish this objective, the study excludes time-invariant pair variables and substitutes them with country-pair fixed effects. This approach effectively controls for all unobserved, time-invariant bilateral trade costs specific to each country pair, offering a comprehensive and flexible framework for estimation. Consequently, the models are structured in the following manner:

- **Model 4 :**

$$EXPijt = \beta_0 + \beta_1 \ln(distij) + \beta_2 \ln(GDPjt) + \beta_3 \ln(Popjt) + \beta_4 \ln(IFEijt) + Dj + Dij + Dt + \varepsilon_{ijt}$$

- **Model 5 :**

$$EXPijt = \beta_0 + \beta_1 \ln(distij) + \beta_2 \ln(GDPjt) + \beta_3 \ln(Popjt) + \beta_4 \ln(IFEjt) + Dj + Dij + Dt + \varepsilon_{ijt}$$

- **Model 6 :**

$$EXPijt = \beta_0 + \beta_1 \ln(distij) + \beta_2 \ln(GDPjt) + \beta_3 \ln(Popjt) + \beta_4 \ln(IFEit) + Dj + Dij + Dt + \varepsilon_{ijt}$$

Moreover, to identify the areas of trade facilitation that seem to have the greatest impact on Morocco's export performance, we propose an analysis of areas of action. First, we group the sub-indicators according to their disciplines, drawing inspiration from the work of (Moïse & Sorescu, 2021), under four main areas of action: "Transparency and predictability" include measures related to information availability, trader involvement, fees and charges, advance rulings, and appeal procedures; "Streamlining of processes" includes indicators on documents and procedures; "Automation" reflected by the indicator formalities and automation, and "Cooperation between border agencies" covers both cooperation between national and cross-border agencies, as well as indicators related to internal and external cooperation. Thus, we propose the following econometric specifications, without and with fixed effects to check the robustness of the results:

- **Model 7 :**

$$EXPijt = \beta_0 + \beta_1 \ln(distij) + \beta_2 \ln(GDPjt) + \beta_3 \ln(Popjt) + \beta_4(contigij) + \beta_5(comlang_offij) + \beta_6(colonyij) + \beta_7(comcolij) + \beta_8(rtaij) + \beta_9(landlockedij) + \beta_{10} \ln(Transparency-predictabilityit) + \varepsilon_{ijt}$$

- **Model 8 :**

$$EXPijt = \beta_0 + \beta_1 \ln(distij) + \beta_2 \ln(GDPjt) + \beta_3 \ln(Popjt) + \beta_4 \ln(Transparency-predictabilityit) + Dj + Dij + Dt + \varepsilon_{ijt}$$

- **Model 9 :**

$$EXPijt = \beta_0 + \beta_1 \ln(distij) + \beta_2 \ln(GDPjt) + \beta_3 \ln(Popjt) + \beta_4(contigij) + \beta_5(comlang_offij) + \beta_6(colonyij) + \beta_7(comcolij) + \beta_8(rtaij) + \beta_9(landlockedij) + \beta_{10} \ln(Streamlining-processesit) + \varepsilon_{ijt}$$

- **Model 10 :**

$$EXPijt = \beta_0 + \beta_1 \ln(distij) + \beta_2 \ln(GDPjt) + \beta_3 \ln(Popjt) + \beta_4 \ln(Streamlining_processesit) + Dj + Dij + Dt + \varepsilon_{ijt}$$

- **Model 11 :**

$$EXPijt = \beta_0 + \beta_1 \ln(distij) + \beta_2 \ln(GDPjt) + \beta_3 \ln(Popjt) + \beta_4 (contigij) + \beta_5 (comlang_offij) + \beta_6 (colonyij) + \beta_7 (comcolij) + \beta_8 (rtaij) + \beta_9 (landlockedij) + \beta_{10} \ln(Automationit) + \varepsilon_{ijt}$$

- **Model 12 :**

$$EXPijt = \beta_0 + \beta_1 \ln(distij) + \beta_2 \ln(GDPjt) + \beta_3 \ln(Popjt) + \beta_4 \ln(Automationit) + Dj + Dij + Dt + \varepsilon_{ijt}$$

- **Model 13 :**

$$EXPijt = \beta_0 + \beta_1 \ln(distij) + \beta_2 \ln(GDPjt) + \beta_3 \ln(Popjt) + \beta_4 (contigij) + \beta_5 (comlang_offij) + \beta_6 (colonyij) + \beta_7 (comcolij) + \beta_8 (rtaij) + \beta_9 (landlockedij) + \beta_{10} \ln(cooperationit) + \varepsilon_{ijt}$$

- **Model 14 :**

$$EXPijt = \beta_0 + \beta_1 \ln(distij) + \beta_2 \ln(GDPjt) + \beta_3 \ln(Popjt) + \beta_4 \ln(cooperationit) + Dj + Dij + Dt + \varepsilon_{ijt}$$

4. Results and discussion

This section delves into the key findings of our study. We begin by presenting the results of various econometric regressions, specifically focusing on the impact of TFIs on the intensive export margin of Morocco. Subsequently, we test whether the intensive export margin exhibits differential responses to the TFA's diverse areas of action. We then engage in a detailed discussion of the results. For ease of reference, the results are presented in the subsequent tables. The estimates from the different specifications of the augmented gravity model with the introduction of the TFIs variables, at the bilateral level (IFE_{ijt}) and unilateral level (IFE_{it} and IFE_{jt}), are illustrated in Table 4.

For the classical variables of the gravity equation, the estimates generally display stable results in terms of statistical significance and expected signs. The estimated coefficients representing the economic size of importing countries are positive and statistically significant. A 10% increase in the importer's GDP will lead to an increase in export value between 3.7% and 6%. Additionally, if the partner country's population increases by 10%, the export value will increase between 3.3% and 5.2%.

Geographic distance and landlockedness negatively affect the value of Moroccan exports, with their estimated coefficients ranging between (1.57-1.74) and (0.54-0.60), respectively. These results imply that a 10% increase in the distance between Morocco and its partners leads to a 15.7%-17.4% decrease in export value, while Morocco's exports to a landlocked country will be 5.4%-6% lower than Moroccan exports to a non-landlocked country.

Colonial ties between Morocco and importing countries also appear to have a significant impact on Moroccan exports. The existence of a colonial history leads to statistically significant increases in exports ranging from 10.6% to 11.1%, depending on the model specification. However, the results confirm that the implementation of RTAs between Morocco and its trading partners does not have a significant impact on Moroccan exports (in all models) and shows a negative sign. This is an expected result since, ultimately, Morocco's trade with its main partners, with which it has concluded around ten Free Trade Agreements (FTAs), shows a chronic trade deficit.

It is currently clear that Morocco experiences a structural trade deficit under most of its concluded trade agreements. Admittedly, the open policy advocated by Morocco through these RTAs has mainly benefited imports rather than exports (Alaoui, 2019), and the general trend has been characterized by a more sustained increase in imports compared to

merchandise exports (Ires, 2013). On the other hand, it is worth noting that sharing a common border with the importing country is highly significant, with the existence of a common border for Morocco leading to statistically significant reductions in export value between 26.3% and 29.4%. This result, although contrary to the expected sign, finds its explanation in the closure of the borders between Morocco and Algeria since 1994.

Table 4 : Empirical Results of TFA Implementation on the Extensive Export Margin

Dependent Variable	(1) EXP _{ijt}	(2) EXP _{ijt}	(3) EXP _{ijt}	(4) EXP _{ijt}	(5) EXP _{ijt}	(6) EXP _{ijt}
Ln_dist _{ijt}	-1.715*** [-6.73]	-1.594*** [-10.22]	-1.748*** [-6.94]	-1.621*** [-9.83]	-1.710*** [-6.72]	-1.577*** [-10.47]
Ln_gdp _{ijt}	0.494*** [3.49]	0.453** [2.68]	0.572*** [5.17]	0.597*** [4.67]	0.474** [2.85]	0.377** [1.98]
Ln_pop _{ijt}	0.396** [2.58]	0.455*** [3.35]	0.336** [2.46]	0.330** [2.69]	0.413** [2.52]	0.520*** [3.47]
Contig _{ijt}	-2.671*** [-5.56]		-2.944*** [-6.67]		-2.635*** [-5.14]	
Comlang_off _{ijt}	0.267 [1.37]		0.225 [1.18]		0.282 [1.45]	
Colony _{ijt}	1.076*** [4.30]		1.114*** [4.57]		1.059*** [4.22]	
Comcol _{ijt}	0.573 [1.55]		0.722** [2.06]		0.564 [1.52]	
Landlocked _j	-0.549** [-2.03]		-0.609** [-2.30]		-0.547** [-2.02]	
Rtai _j	-0.377 [-1.04]		-0.388 [-1.11]		-0.386 [-1.06]	
IFE_{ijt}	0.596 [1.02]	1.216 [1.43]				
IFE_{it}			0.630*** [4.20]	0.612*** [3.42]		
IFE_{jt}					0.422 [0.83]	0.977 [1.52]
Constant	11.44*** [5.21]	9.648*** [4.47]	10.71*** [4.99]	9.192*** [4.50]	11.87*** [5.07]	10.70*** [4.55]
Observations	313	288	369	327	313	288
FE- importer	No	Yes	No	Yes	No	Yes
FE - year	No	Yes	No	Yes	No	Yes
FE - Pairs	No	Yes	No	Yes	No	Yes
Pseudo R-squared	0.900	0.709	0.903	0.703	0.899	0.710

Note: Robust standard errors are clustered by country pairs. Significance levels (t-statistics in parentheses) are * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors

Regarding our variable of interest related to the WTO's TFA, the estimates from the different specifications converge with those of the empirical results of (Fontagné et al., 2020; Hillberry & Zhang, 2018; Kumar & Shepherd, 2019; Moïse & Sorescu, 2013; WTO, 2015). Morocco's implementation of the TFA contributes to an improvement in export performance between 6.1% and 6.3% (models 3 and 4) during the period considered, a result not confirmed in the case of implementation by importing countries (models 5 and 6) or in the case of joint implementation (models 1 and 2).

In comparison with previous studies, our empirical results are more aligned with some, especially those incorporating recent developments in the international trade literature in their methodologies. This convergence is particularly evident with the estimates of (Kumar & Shepherd, 2019), which show a 6.58% increase in Moroccan exports following the

improvement of TFIs. This expected result is of crucial importance, insofar as we can affirm that improving Morocco's trade facilitation policy performance will have a very significant and positive impact on export performance. It is also relevant to emphasize that the results obtained support the hypothesis of a statistically significant increase in export performance following TFA accession. This improvement is mainly attributable to Morocco's own participation in the agreement, and not to that of its partner countries. Thus, taking into account this empirical finding, it is important to emphasize that our first research hypothesis has only been partially confirmed.

As previously explained, after confirming the impact on the average TFIs score, the next step is to assess the impact of specific TFA areas, as presented in specifications (7-14) above. The aim is to identify the specific TFA areas and measures that appear to have the greatest influence on export performance. The results are illustrated in Table 5.

Table 5: Empirical Results of TFA Implementation on the Extensive Export Margin (by policy areas)

Dependent Variable	(7) EXPijt	(8) EXPijt	(9) EXPijt	(10) EXPijt	(11) EXPijt	(12) EXPijt	(13) EXPijt	(14) EXPijt
Ln_distij	-1.748*** [-6.94]	-1.621*** [-9.83]	-1.748*** [-6.94]	-1.621*** [-9.83]	-1.748*** [-6.94]	-1.621*** [-9.83]	-1.748*** [-6.94]	-1.621*** [-9.83]
Ln_gdpjt	0.572*** [5.17]	0.597*** [4.67]	0.572*** [5.17]	0.597*** [4.67]	0.572*** [5.17]	0.597*** [4.67]	0.572*** [5.17]	0.597*** [4.67]
Ln_popit	0.336** [2.46]	0.330** [2.69]	0.336** [2.46]	0.330** [2.69]	0.336** [2.46]	0.330** [2.69]	0.336** [2.46]	0.330** [2.69]
Contigij	-2.944*** [-6.67]		-2.944*** [-6.67]		-2.944*** [-6.67]		-2.944*** [-6.67]	
Comlang_offij	0.225 [1.18]		0.225 [1.18]		0.225 [1.18]		0.225 [1.18]	
Colonyij	1.114*** [4.57]		1.114*** [4.57]		1.114*** [4.57]		1.114*** [4.57]	
comcolij	0.722** [2.06]		0.722** [2.06]		0.722** [2.06]		0.722** [2.06]	
landlockedj	-0.609** [-2.30]		-0.609** [-2.30]		-0.609** [-2.30]		-0.609** [-2.30]	
Rtaij	-0.388 [-1.11]		-0.388 [-1.11]		-0.388 [-1.11]		-0.388 [-1.11]	
Transparency- predictabilityit	0.310*** [4.20]	0.301*** [3.42]						
Streamlining- processesit			1.708*** [4.20]	1.657*** [3.42]				
Automationit					1.174*** [4.20]	1.139*** [3.42]		
Cooperationit							2.348*** [4.20]	2.279*** [3.42]
Constant	11.15*** [5.16]	9.615*** [4.60]	8.921*** [4.18]	7.452*** [3.87]	6.999** [3.16]	5.587** [2.87]	9.888*** [4.64]	8.390*** [4.25]
Observations	369	327	369	327	369	327	369	327
FE- importer	No	Yes	No	Yes	No	Yes	No	Yes
FE - year	No	Yes	No	Yes	No	Yes	No	Yes
FE - Pairs	No	Yes	No	Yes	No	Yes	No	Yes
Pseudo R squared	0.903	0.703	0.903	0.703	0.903	0.703	0.903	0.703

Note: Robust standard errors are clustered by country pairs. Significance levels (t-statistics in parentheses) are
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors

The objective here is twofold: firstly, to test our second research hypothesis concerning the presence of heterogeneous impact across reform domains; and secondly, if such variation exists, to identify the specific domains and measures that appear to exert the greatest influence on export performance.

Similar to the modeling of the average trade facilitation performance, the specifications present stable results for the classical variables of the structural gravity equation, which exhibit the expected signs and statistical significance. The assessment of the impact of trade facilitation areas on export performance demonstrates that all trade facilitation indicators appear to have a very significant and positive effect on the intensive export margin, at the 1% significance level. However, the analysis by area of action allows a distinction of the impact in terms of importance. This result is in line with the previous empirical findings of (Kumar & Shepherd, 2019; Moisé & Sorescu, 2013), confirming the differentiated impact of the TFA by specific action measures.

Thus, the analysis by areas of action reveals that the four selected areas have a positive and highly significant effect on export flows. However, the areas of action that appear to have the greatest influence on the value of Moroccan exports are internal and external cooperation between border agencies, streamlining procedures, and the use of automated processes. These areas of action contribute to an improvement of 23% (model 13-14), 17% (model 9-10), and 11% (model 11-12), respectively. In contrast, in the area of transparency and predictability (model 7-8), a 10% improvement only leads to a 3% increase in the value exported. Furthermore, it is noteworthy to highlight that the results obtained exhibit similarities with the pioneering work of (Moisé & Sorescu, 2013), who assessed the impact of the TFA on trade flows for the lower-middle-income country group, to which Morocco belongs. Indeed, their study revealed that the most beneficial reforms are related to measures concerning formalities, governance and impartiality, information availability, business community involvement, advance rulings, and appeal procedures. These are areas where Morocco has not yet achieved its best performance.

Overall, the results corroborate that Morocco's progress in trade facilitation, particularly the effectiveness of implementing specific TFA reforms, conditions the improvement of its export performance at the macroeconomic level of analysis, despite the differences in magnitude between these specific reform areas.

5. Conclusion and policy implications

This research aims to assess the ex-post impact of the TFA on Morocco's export performance following its ratification in 2019. The study also delves into the implementation of the TFA by Morocco's trading partners and, jointly, by Morocco and its importing countries. Concerning the overall impact on export intensive margin, our findings suggest that the implementation of the TFA by Morocco contributes to an improvement ranging between 6.1% and 6.3%. This anticipated outcome holds crucial significance, as it allows us to argue that enhancing trade facilitation policy performance will lead to a highly significant and positive impact on export performance.

Our findings, however, reveal a nuanced picture. While the hypothesis of statistically robust ex-post evidence linking TFA implementation to export performance holds for Morocco, it is not confirmed in the case of implementation by importing countries or joint implementation efforts. This suggests that the significant improvement in Morocco's export performance associated with the TFA is primarily driven by its own commitment and performance, reflected by the average OECD TFIs score. The unilateral nature of most TFA measures likely contributes to this observation, as partner countries' performance doesn't seem to significantly influence Morocco's export outcomes. This underlines the crucial role of effective

implementation of TFA-specific reforms at the national level in driving improvements in export performance at the macroeconomic level.

Building on these findings, the study delves deeper by examining the distribution of the TFA's impact across different policy areas. Four specific areas are investigated: transparency and predictability, streamlining of procedures, automation, and internal and external cooperation between border agencies. The econometric analysis reveals a positive and highly significant effect of all four areas on export flows. However, the magnitude of this impact varies significantly. Internal and external cooperation between border agencies, streamlining of procedures, and the use of automated processes appear to have the greatest influence on the value of Moroccan exports compared to transparency and predictability. Notably, these latter areas represent opportunities for further improvement, as Morocco has not yet reached its peak performance in these aspects.

While the present study sheds light on the significant impact of the TFA on Morocco's overall export performance, it is crucial to acknowledge a limitation. The analysis focused on the aggregate level, neglecting the potential heterogeneity of the TFA's impact across different export sectors. A disaggregated analysis examining the impact on individual sectors would provide valuable insights into the distribution of benefits and potential areas for further improvement. Particularly, incorporating product-level heterogeneity strengthens the case for trade facilitation reforms like the TFA, as it is likely to unlock additional gains beyond those captured at the aggregate level in this study. This essential consideration presents a promising avenue for future research in subsequent empirical studies.

References

- (1). Ahsan, M., Irshad, M. S., Abdullahi, N. M., & Khan, J. (2021). The Impact of Trade Facilitation on Pakistan's International Trade. *Revista Dimensión Empresarial*, 19(3), 91-108.
- (2). Alaoui, A. (2019). *Un Chemin Marocain 1999-2019 : Parcours d'un Royaume en transformation* (Cent Mille Milliards et Descartes&Cie). L'Institut Marocain d'Intelligence Stratégique (IMIS).
- (3). Allali, S. (2021). The impact of the Trade Facilitation Agreement (TFA) on the Arab Maghreb Union's regional integration. *International Journal of Accounting, Finance, Auditing, Management and Economics*, 2(3).
- (4). Anderson, J. E., & Wincoop, E. V. (2003). Gravity with Gravitas: A Solution to the Border Puzzle. *American Economic Review*, 93(1), 170-192.
- (5). Arvis, J.-F., Ojala, L., Wiederer, C., Shepherd, B., Raj, A., Dairabayeva, K., & Kiiski, T. (2018). *Connecting to compete 2018 : Trade logistics in the global economy*. World Bank.
- (6). Arvis, J.-F., & Shepherd, B. (2013). The Poisson quasi-maximum likelihood estimator : A solution to the 'adding up' problem in gravity models. *Applied Economics Letters*, 20(6), 515-519.
- (7). Bonciu, F., & Moldoveanu, M. (2014). The Proliferation of Free Trade Agreements in the Post-Doha Round Period: The Position of the European Union. *Procedia Economics and Finance*, 8, 100-105.
- (8). CHEKROUNI, A., & EZ-ZAROUKI, M. (2023). WTO Trade Facilitation Agreement in Morocco : Evidence using performance indicators analysis. *African Scientific Journal*, 3(20), 890-916.
- (9). Decreux, Y., & Fontagne, L. (2011). Economic Impact of Potential Outcome of the DDA. *SSRN Electronic Journal*.

- (10). Duval, Y., & Utoktham, C. (2022). Has the WTO Trade Facilitation Agreement helped reduce trade costs ? An ex-post analysis. *Trade, Investment and Innovation Working Paper Series*, 02.
- (11). Egger, P. H., & Nigai, S. (2015). Structural gravity with dummies only : Constrained ANOVA-type estimation of gravity models. *Journal of International Economics*, 97(1), 86-99.
- (12). Fontagné, L., Orefice, G., & Piermartini, R. (2020). Making small firms happy? The heterogeneous effect of trade facilitation measures. *Review of International Economics*, 28(3), 565-598.
- (13). Hillberry, R., & Zhang, X. (2018). Policy and performance in customs : Evaluating the trade facilitation agreement. *Review of International Economics*, 26(2), 438-480.
- (14). Hoekman, B., & Nicita, A. (2008). Trade Policy, Trade Costs, and Developing Country Trade. *World Bank Policy Research working paper*, 4797.
- (15). Hoekman, B., & Nicita, A. (2011). Trade Policy, Trade Costs, and Developing Country Trade. *World Development*, 39(12), 2069-2079.
- (16). Hufbauer, G. C., Schott, J. J., Adler, M., Brunel, C., & Foong, W. (2010). Figuring Out the Doha Round. *Peterson Institute for International Economics, Policy Analyses In International Economics*, 91, 73.
- (17). Hufbauer, G., & Schott, J. (2013). *Payoff from the World Trade Agenda* (p. 108) [Report to the ICC Research Foundation]. Peterson Institute for International Economics.
- (18). Ires. (2013). *Les accords de libre-échange conclus par le Maroc : Incidences sur la compétitivité globale du pays et voies d'optimisation* (p. 43). Institut royal des études stratégiques.
- (19). Kumar, U., & Shepherd, B. (2019). Implementing the Trade Facilitation Agreement : From Global Impacts to Value Chains. *ADB South Asia Working Paper Series*, 67.
- (20). Mevel, S., deAlba, J. M., & Oulmane, N. (2016). Regional trade integration and trade facilitation as a pro-industrialization policy tool : The case of North Africa's countries. *Journal of Economic Integration*, 31(3), 569-608.
- (21). Moïsé, E., & Sorescu, S. (2013). Trade Facilitation Indicators : The Potential Impact of Trade Facilitation on Developing Countries' Trade". *OECD Trade Policy Papers*, 144.
- (22). Moïsé, E., & Sorescu, S. (2021). Trade Facilitation in Perishable Agro-Food Products : A Feasibility Study for Addressing At-The-Border Challenges. *OECD TRADE POLICY PAPER N°254*, 36.
- (23). OECD (Éd.). (2018). *Trade facilitation and the global economy*. OECD Publishing.
- (24). Orliac, T. (2012). *The economics of trade facilitation*. Institut d'Études Politiques de Paris-École Doctorale de Sciences Po.
- (25). Persson, M. (2013). Trade facilitation and the extensive margin. *The Journal of International Trade & Economic Development*, 22(5), 658-693. <https://doi.org/10.1080/09638199.2011.587019>
- (26). Portugal-Perez, A., & Wilson, J. S. (2012). Export Performance and Trade Facilitation Reform : Hard and Soft Infrastructure. *World Development*, 40(7), 1295-1307.
- (27). Sakyi, D., & Afesorgbor, S. K. (2019). The Effects of Trade Facilitation on Trade Performance in Africa. *Journal of African Trade*, 6(1-2), 1.
- (28). Shepherd, B. (2016). *The Gravity Model of International Trade : A User Guide (An updated version)* [Manual]. ARTNeT Secretariat, United Nations.
- (29). Silva, J. S., & Tenreyro, S. (2006). The log of gravity. *The Review of Economics and statistics*, 88(4), 641-658.
- (30). Silvia, S., & Carolin, B. (2022). Trade facilitation reforms worldwide : State of play in 2022. *OECD Trade Policy Papers*, 263, 29.

- (31). Siraj, K., & Khan, M. I. (2022). Impact of Trade Facilitation Reforms on The Trade Volume of SAARC Countries. *Sustainable Business and Society in Emerging Economies*, 4(2), 10.
- (32). Takpara, M. M. (2021). Trade Facilitation and Export Performance : Evidence from Economic Community of West African States. *Available at SSRN 4096175*.
- (33). Toševska-Trpčevska, K., Disoska, E. M., Kikerkova, I., & Tonovska, J. (2022). *The impact of trade facilitation indicators on trade between cefta-2006 members*. 10.
- (34). Vu, H. T., & Tang, D. D. (2022). Trade Facilitation and Its Impacts on Vietnam's Trade. In A. T. Nguyen & L. Hens (Éds.), *Global Changes and Sustainable Development in Asian Emerging Market Economies Vol. 1* (p. 513-536). Springer International Publishing.
- (35). WTO (Éd.). (2015). *Speeding up trade : Benefits and challenges of implementing the WTO Trade Facilitation Agreement*. World Trade Organization.
- (36). Yotov, Y. V., Piermartini, R., Monteiro, J.-A., & Larch, M. (2016). *An Advanced Guide to Trade Policy Analysis : The Structural Gravity Model*. WTO iLibrary.
- (37). Yu, Z., & Luu, B. (2022). The effects of trade facilitation on Vietnam's trade relationship with ASEAN countries. *Journal of Management, Economics, and Industrial Organization*, 6(3), 1-15.
- (38). Zaki, C. (2014). An empirical assessment of the trade facilitation initiative : Econometric evidence and global economic effects. *World Trade Review*, 13(1), 103-130.