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The impact of Non-Tariff Measure on trade in the case of 12 Arab countries

Masoud Ali Khalid[1,2], Narmen M. Ghafor[1]
Department of Economics, College of Administration & Economics, University of Slemani, Slemanai, Iraq[1,2]
Department of Accounting by IT, College of Administration & Financial Science, Cihan University-Slemani, Slemani, Iraq1
Masood.khalid@sulicihan.edu.krd

Abstract:

Non-tariff measures such as food safety and technical standards can be used to obtain the non-trade goal of protecting the safety and health of consumers. On the other hand, they can also be used as a trade-safe tool to drive a price gap between domestic and foreign producers. This study investigates the impacts of NTMs on trade for 12 Arabic countries over the period of 1999-2014 with a specific focus on animals, vegetable, vehicle, Plastic, Population, distance and Language. We employ theoretical framework of gravity model by applying panel data estimation. Our results indicate that animal, vehicle and population variables are positive and statistically significant. Meaning that our three variables have a positive impact on GDP, in other words, three variables are supportive tools to GDP and economic growth in the Arabian countries.
Keywords: Non-tariff measures (NTMs), gravity model, Arab countries, and Panel data.

الملخص:

يمكن استخدام التدابير غير التعريفية مثل سلامة الأغذية والمعايير الفنية لتحقيق الهدف غير التجاري المتمثل في حماية سلامة وصحة المستهلكين. من ناحية أخرى ، يمكن استخدامها أيضًا كأداة آمنة للتجارة لسد فجوة السعر بين المنتجين المحليي والأجنبي. تبحث هذه الدراسة في تأثير هذه الآليات على التجارة في 12 دولة عربية خلال الفترة 1999-2014 مع التركيز بشكل خاص على الحيوانات والخضروات والمركبات والبلاستيك والسكان والمسافة واللغة. نحن نستخدم الإطار النظري لنموذج الجاذبية من خلال تطبيق تقدير بيانات اللوحة. تشير نتائجنا إلى أن متغيرات الحيوانات والمركبات والسكان إيجابية ومهمة إحصائياً. بمعنى أن للمتغيرات الثلاثة تأثير إيجابي على الناتج المحلي الإجمالي ، بمعنى آخر ، فإن المتغيرات الثلاثة هي أدوات داعمة للناتج المحلي الإجمالي والنمو الاقتصادي في البلدان العربية.، نموذج الجاذبية ، الدول العربية ، وبيانات اللوحة(NTMs) : التدابير غير التعريفية. الكلمات المفتاحية

پوختە:

پێناسەی جگە لەگومرگی ئەمرۆ وەکو ئامرازێکی سەلامەتی خۆراک و ستانداردی تەکنیکی و ئامانجێکی نابازرگانی بۆ پاراستنی تەندروستی و سەلامەتی بەکار بەر بەکار دەهێندرێت، لەلایەکی ترەوە ئەتوانرێت وەکو ئامرازێکی سەلامەتی بازرگانی بەکاربێت بۆ پرکردنەوەی ئەو بۆشاییەی نرخ کە لەنێوان بەرهەمهێنی ناو خۆ و دەرەکیدا دروست دەبێت. لەبەرئەوە ئەم توێژینەوەیە لێکۆڵینەوەیەکە لەسەرکاریگەری سیاسەتی پێناسەی جگەلەگومرگی لەسەر بازرگانی بۆ 12 وڵاتی عەرەبی لەنێوان ساڵەکانی 1999 بۆ 2014 لەگەڵ بایەخدانی زیاتر بەگۆڕاوی بەرهەمی ئاژەڵ و سەوزەوات و ئۆتۆمۆبیل و پلاستیک و دانیشتوان و ماوەی دووری نێوان وڵاتان و زمان. وە هەروەها لەم توێژینەوەیەدا هەستاوین بەبەکارهێنانی گرافیتی مۆدێل لەگەڵ پانێڵ داتا بۆ شیکاری داتاکانمان. ئەنجامی توێژینەوەکەمان ئەوە دەر دەخات کە هەردوو گۆڕاوی ئاژەڵ و ئۆتۆمۆبیل لەگەڵ دانیشتوان لەڕوی ئامارەوە مەعنەوی یە و پۆزەتیفە. کەئەمەش ئەنجامێکی گرنگە بۆ وڵاتانی عەرەبی.

کلیلە وشە: پێناسەی جگەلەگومرگی، گرافیدی مۆدێل، وڵاتانی عەرەبی، پانێڵ داتا.

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Introduction

In the light of declining tariffs, quotas and bans due to international and bilateral deals, and non-tariff measures (NTMs) are on the surge over the last three decades. Countries are looking for alternatives to protect what traditional trade policy instruments used to do. NTMs, such as sanitary and phytosanitary (SPS) measures and technical barriers, introduce methods that are partly regulated under the World Trade Organization's SPS Agreement (WTO), but their model and use is less limited and more adaptable. There are major concerns that SPS regulations are being applied as protective tools on a regular basis. In principle, NTMs are intended to provide opportunities for countries to protect animal, human and plant health. However, they can also be used as tools for achieving specific policy goals, like preserving local producers, because of their design, while members of the WTO are required to protect themselves from applying measures for any safety reason. There is limited information about NTM's trade impacts. Economic theory does not have a specific forecast of the effect of trade standards. Rather, the theory states that SPS measures have an effect on food, agriculture and industry trade could be different and don't always be negative. Even though the costs increased of production that could rise to meet higher NTM standards and decrease trade, information on the quality of food and product safety, which can lead to increased customer trust and confidence in Products from other countries, reduces Cost of transaction, and therefore promotes trade. In addition, trade can increase as a result of increased efficiency of producers as quality signals contribute to the competitiveness of international producers that meet strict standards. This demonstrates that the stated trade impact of standards relies on related domestic to overseas production costs and consumer willing to pay a better price to be paid for healthier products (WTO, 2012). Governments have distinct NTMs at hand to obtain a certain health and safety goal. These measures involve different effects with regard to trade as some impact fixed expenses and therefore entry into the market, and instead of some impact firms ' post-entry activities, thus component transaction costs and determining the various impacts is therefore an evidence based concern. Current empirical studies on NTM focused on forgone trade using gravity model, linear minimum squares, PPM probability and panel data model. They demonstrate that NTMs hinder overall trade level. In addition, (De Frahan and Vancauteren, 2006; Disdier et al., 2008; Anders and Caswell, 2009). But Fontagné et al. (2005) and Disdier et al. (2008) they found negative and Positive impacts after viewing different fields. These methods concentrate on overall measure instead of trade impacts of various restrictions which decrease health and safety risks equivalently testing, inspection and approval processes or standards for containment procedures, pesticide levels, labeling or application for regional action. Furthermore, the only two researches dealing with the effect on trade of various regulatory measures Schlueter et al. (2009) and Fassarella et al. (2011). The two study results look particularly at the meat sector Schlueter et al. (2009) evaluate the effect on trade in meat products of different types of NTMs. The researchers obtain the different regulatory tools from the WTO's NTMs Information Management System and the International Portal on Animal, Plant health and safety of food. They set up 29 different regulatory tools in 6 measures for agricultural and food safety. Schlueter et al. (2009) used a (PPML) gravity approach on trade flows of meat product on the HS4 digit level. They found a positive impact of NTMs On the trade in meat products which aggregated over all regulatory instruments and different impacts indicate disaggregated results. Conformity evaluation encourages trade in the meat industry in particular. In a related way Fassarella et al. (2011) assess the impact of SPS and TBT measures between 1996 and 2009 on Brazilian exports of livestock

to major global importers. They found an insignificant effect of aggregated TBT and SPS measures on Brazilian poultry meat exports by implying a PPML method. On the disaggregated point, they found measures for conformity assessment decline the volume of exports of poultry from Brazil to its main trading partners, although quarantine condition and labelling requirements surge the volume of trade in Brazilian poultry. As results on aggregated and disaggregated NTMs are unclear throughout the studies, the issue even contradicts one another; the subject involves more insight and research. Trade concerns data base conquers restrictions of notification based data, as government motivations to report a concern increase if a measure applied possibly impacts trade.

In addition, most Arab countries have launched a customs union with the aim of strengthening regional intra-trade and advancing their economic integration process with the rest of the world. Moreover, most of the Arabic countries have signed Free Trade Areas Agreements (FTA's) with the United States separately, and have long been engaged individually in agreements with the European Union to establish a Free Trade Area between Arab and EU countries. Moreover, most Arab countries are now members of the Greater Arab Free Trade Area (GAFTA) and most of them are members of the WTO. This proliferation of FTA and other regional integration systems is part of a general worldwide phenomenon. In spite of the increasing role of the WTO in strengthening the multilateral trading system, the number of regional trade arrangements has increased worldwide. After the establishment of the WTO in 1995, more than half of the existing regional trade agreements were established worldwide (WTO, 2005). This has renewed interest in understanding the impact of NTMs on trade in Arab countries as part of political and economic policies to boost their economic background and as the other countries to protect their citizens from threats to trade.
The rest of the paper is as follows. Section 2 contains related information about previous literature. In section 3 we provide benchmark information on the gravity model and data collection. And Section 4 explains the results & discussions. The last section concludes.

1. Literature review

UNCTAD provides a detailed classification of NTMs which differentiates up to 14 types (WTO, 2018), whereas official information is only obtained for half of them. These categories include SPS, TBT, but also controls of price and quantity (licenses, quotas, prohibitions). Some of the regulations may pursue legitimate domestic goals such as ensuring food safety and citizens ' health, in which case, due to a lack of harmonization of national regulations, trade frictions arise. However, some other NTMs may be set up to purposely impose a trade barrier. However, literature aimed at quantifying and assessing the effect of non-tariff measures (NTMs) commonly only relates to non-price and non-quantity trade restrictions, whether at the border, such as the red tape bureaucracy, or behind the border, in which case the SPS and TBT are given more attention (ECORYS, 2009). The gravity equation has now become a common method for analysing NTMs ' trade costs, thus two methods are identified, direct and indirect methods. On the one hand, direct methods evaluate NTMs using inventories of standards and regulations by industry and country and notifications from importers to the WTO concerning the implementation of new regulations and their compliance with international regulations (UNCTAD TRAINS Database), Or objections by traders (WTO Trade Policy Reviews, Core NTM) from which either dummy variables (reflecting or not the presence of an NTM), frequencies or coverage ratios (percentage of products or trade in the NTM sector) are estimated.

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A common argument is that these techniques ignore the importance of each measure to restrict trade, while countries appear to be stricter in reporting their rules (Chen and Novy, 2012). Provided the prevalence of sanitary standards in agri-food products, many programs in the agri-food sector tend to be industry-specific. Grant and Anders (2010), for example, analyses the re-evaluation of seafood trade following tighter food safety measures levied by the US, using as an additional explanatory variable and the number of detainment or denials for a specific exporter.
In addition, Niu, Z., Liu, et al (2018) estimated the ad valorem equivalents of NTMs for 97 countries at the product level and they have shown that the incidence and the intensity of NTMs were both increasing over period, with NTMs becoming an even more dominant source of trade protection. They also investigated the evolution of overall protection derived jointly from tariffs and NTMs. Their results indicated that the overall protection level, for most countries and products, has not decreased despite the fall in tariffs associated with multilateral, regional and bilateral trade agreements in recent decades. Finally, they have documented an increase in overall trade protection during the recent 2008 financial crisis.

In contrast, Kinzius, L., et al (2018) Investigated the impact of non-tariff measures on trade based on a structural gravity equation and the recently updated Global Trade Alert database, they have found that the implementation of NTMs reduces imports of affected products by up to 12%. Their trade dampening effect is thus comparable to that of trade defense instruments such as anti-dumping duties. It is smaller for exporters that have a free trade agreement with the importing country. Different types of NTBs affect trade to a different extent. Finally, we investigate the effect of behind-the-border measures, showing that they significantly lower the importer's market access.

ECORYS (2009) and Sunesen et al, (2009) used scores based on business attitudes of market access problems as a proxy for the NTM gravity equation indicator; then use NTM tariff equivalent in the CGE system to recreate the economic effect of the EU-US trade deal and the EU-Japan trade agreement, respectively. Even though the coverage of the sector is broad, including 12 manufacturing sectors and 6 service sectors, agri-food is disappeared into a single "processed food" sector. Results of the food sector in gravity estimation suggest that the regulatory divergence implies a trade cost increase of 73% of EU-US food exports and 57% in the opposite direction, and 25% of EU-Japan exports. Even so, the NTM method based on a survey can be rebuked because of the limited representativeness of the sample (of companies) and the measurement subjectivity.

Li and Begin (2012) initiated a meta-analysis to illustrate the variation in trade impacts of health, safety and sanitary regulations and standards found in the past literature and to address for various evaluation methods, NTM measurement, data disaggregation and size, and various strategies to dealing with zero-trade data. Their study reveals that the effect of NTMs on agriculture is determined to be more negative than in manufacturing industries, and is strengthened in this effect as trade flows from developing nations to industrialized states.
Alternatively, the gravity method can be seen as an indirect technique to evaluate the overall trade effect of NTMs rather than the specific impact of a particular NTM. The equation of gravity model belongs to the indirect approach of "quantity gap" by opposition to the "price gap." Indirect methods start by identifying that NTMs (levied by the country of importers) are likely to create trade

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distortions, lower imports, plus higher import prices. Methods of quantity are suggested when any prices may not exist because NTMs are ban and deter trade altogether (Ferrantino, 2006), or when prices are hard to measure and compare, as in the case of highly differentiated products embedding sectors.
In any case, the relatively greater abundance and degree of disaggregation of trade data has encouraged the use of the method to quantity gap, whereas the use of price wedges is very scarce (Bradford, 2003).

The "quantity gap method" compares the value of the importations observed, restricted by NTMs, with the normal value of importations that could have existed in the lack of NTMs. The gravity method makes it possible to estimate what this normal import value would be (Ferrantino, 2006). This is also named the "residual approach to gravity," as the equivalent NTM ad-valorem is achieved from the gravity equation residuals. In the services sector, the residual method has been referred more widely. Previous applications include Park (2002), and later Francois et al. (2005) and Guillin (2011). An application is made for the agri-food sectors Philippidis and Sanjuán (2007a, 2007b). Almost all of these applications have as common factor that the equivalent tariff for NTM feeds into a General Equilibrium System, to better assess the effects of trade liberalization on specific bilateral trade agreements. With the exception of Guillin (2011) who deploys a Heckman two-stage model, none of the earlier residual approach literature has raised the issue of zero trade values.

3. METHODOLOGY AND DATA COLLECTION

3.1 Methodology

Gravity approaches are commonly applied to assess volumes of trade. It is widely Agreed that volumes (or values) of bilateral trade are dictated by trading countries economic scope and multilateral resistance, including trade policies, bilateral geographical distance, common borders, language, membership of free trade areas, etc. (Anderson and van Wincoop, 2003).

Therefore, we apply the following gravity approach to evaluate the impact of NTM on international trade in 12 Arabic countries.

$$\ln(\mathrm{GDP}_{\mathrm{ijt}}) = a_{\mathrm{i}} + a_{\mathrm{j}} + a_{\mathrm{t}} + \beta \ln NTM_{\mathrm{iJt}}\ (Industry + Agriculture\ prpduct) + \gamma_1\, lnpop_{\mathrm{it}} + \gamma_2\, Dist + \gamma_2\, Ln\ Lan + u_{\mathrm{ijt}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

In equation (1), the dependent variable is *GDP ijt*, which is the gross domestic product trade of 12 Arabic countries in year *t*. We provide a set of independent variables such as: *popjt* is the total population; and *distij* is the geographical distance between the two countries; *langij* is an ordinary variable, representing the existence of common official language; industij represents the industry product such as Plastics and Vehicle products and Agriclulij shows the agriculture product such as animals and vegetables.

In addition, the two-stage method is seized by the two regression equations (2) and (3) specified below:

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Stage 1: Model of sample selection for trade probability is shown below:

$$\ln(\mathrm{GDP}_{\mathrm{ijt}}) = a_{\mathrm{i}} + a_{\mathrm{j}} + a_{\mathrm{t}} + \beta \ln NTM_{\mathrm{iJt}} + \gamma_1 GravityControls_{\mathrm{ijt}} + u_{\mathrm{ijt}} \dots\dots\dots\dots\dots\dots\dots (2)$$

Stage 2: The trade flow equation [non-linear least squares estimation]

$$\ln(\mathrm{GDP}_{\mathrm{ijt}}) = a_{\mathrm{i}} + a_{\mathrm{j}} + a_{\mathrm{t}} + \beta \ln NTM_{\mathrm{iJt}} + \gamma_1 GravityControls_{\mathrm{ijt}} + u_{\mathrm{ijt}} + \theta\eta_{\mathrm{ijt}}\eta Z\varepsilon + \ln\{trade[\delta \mathrm{Z}_{\mathrm{ijt}} + \eta_{\mathrm{ijt}}] - 1\} + \varepsilon_{\mathrm{ijt}} \dots\dots\dots (3)$$

Where γ_1 is a vector flow coefficients, $\eta_{\mathrm{ijt}} = \varphi(\mathrm{Z}_{\mathrm{ijt}})/\Phi(\mathrm{Z}_{\mathrm{ijt}})$ is the inverse Mills ratio and $\mathrm{Z}_{\mathrm{ijt}} = \Phi(\mathrm{P}_{\mathrm{ijt}})$, in which $\mathrm{P}_{\mathrm{ijt}}$ are the evaluations from the regression model in stage 1.

The first stage, equation (2), is the sample selection model, whereby dependent variable is the presence of country i's trade country j in year t, and the independent variables are the same as those in regression equation (1), which involve of the NTM notification variable and the independent variables in any gravity approach, all indicated by vector Gravity model. The second stage, equation (3), is the trade flow equation, whereby the dependent variable is the log value of country *i*'s trade to country *j* in year *t*.

This allows us to determine the NTM effect of positive trade flows on the sample of country pairs. Helpman et al. (2008) illustrate that a transformation of equation (3) that will give consistent estimates is:

$$\ln(\mathrm{GDP}_{\mathrm{ijt}}) = a_{\mathrm{i}} + a_{\mathrm{j}} + a_{\mathrm{t}} + \beta \ln NTM_{\mathrm{iJt}} + \gamma_1 GravityControls_{\mathrm{ijt}} + u_{\mathrm{ijt}} + \theta\eta_{\mathrm{ijt}} + Z_{\mathrm{ijt1}} + Z_{\mathrm{ijt2}} + Z_{\mathrm{ijt3}} + \varepsilon_{\mathrm{ijt}} \dots\dots\dots\dots (4)$$

Where the polynomial in $Z_{\mathrm{ijt1}} = Z_{\mathrm{ijt2}} + \eta_{\mathrm{ijt}}$ is an approximation of an arbitrary and increasing function of the latent variable Z_{ijt}.

Regarding NTMs, coefficients in the panel OLS regression shows an important impact on verdict to trade of such variables. Therefore, NTMs act as an important trade barrier for the concerned goods. Moreover, in the regression part of the estimation way, differences among these variables show up. Therefore, the effect of NTM is positive and statistically significant, and it indicates that when the barrier was removed, NTMs do increase trade.

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3.2 Data collection

Table 1 Variable descriptions and sources

Variable	Description	Sources
GDP	Gross Domestic Product	World Development Indicators (WDI) 2019.
Dist	Distance between capital of each countries	the CEPII database (the Centre d'Etudes Prospectives et d'Informations Internationales in France database)2019
Plas	Plastics	UNCTAD-Trade Analysis Information System (TRAINS) 2019.
Veh	Vehicle	UNCTAD-Trade Analysis Information System (TRAINS) 2019.
Anim	Animals	UNCTAD-Trade Analysis Information System (TRAINS) 2019.
Vege	Vegetables	UNCTAD-Trade Analysis Information System (TRAINS) 2019.
POP	Total Population	World Development Indicators (WDI) 2019.
Lan	Language	An ordinary variable as we put two vale (0 and 1)

4. Results and Discussions

Table 1 presents the OLS estimation results which show that 3 variables are statistically significant but two of them are negative such as Distance, Population, while Vehicle is positive. Meaning that Arab countries are needs that commodity, and it plays an important role in trade and economic growth. This result of data could be used to evaluate the ordinary least squares (OLS) consistent. Furthermore, remain variables of our estimations are in significant such as Animal, Vegetable and Plastic. Meaning that, the sample of our data indicate that, as some countries do not trade with each other, in some years, it means that NTM is less important than tariff. In addition, we also used language as a binary variable in our sample countries, we put 1 if all Arab countries use the same language and zero otherwise, and this variable is not an important tool in international trade between Arab and foreign countries regarding in NTMs.

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Table 2 Pooled OLS Regression: Dependent variable is GDP.

Variable	*Coefficient*	Standard Error	*T ratio*
Constant	118.2566	9.81723	0.000*
Ln POP	-.0003694	.0000662	0.000
LDist	-1.170841	.2699968	0.000*
Ln Lnag	1.248581	8.857855	0.888
LAnim	.0001277	.0000867	0.557
LVege	.0001277	.0002166	0.557
LPlas	-2.45e-06	8.95e-06	0.785
LVeh	.0100635	.0049378	0.043*
Hausman Random effect (POP)	.0000437		
N	191		
Countries	12		
Min obs	15		
Max obs	16		
Av obs	15.9		
R-sq within	0.947		
R-sq between	0.953		
R-sq overall	0.972		

* denote significance at 1% level. Values in parentheses are heteroscedasticity consistent *t*-statistics and values in brackets are *p*-values.

In addition, table 3 and table 4 presents the results of the selected agricultural and industry commodities as we have mentioned previously in table 2, by using the fixed and random effect model and we estimate 7 different variables namely population, distance and language as a binary variable, animals, vegetables, plastic and vehicles. Results reveal that population has an enormous impact on international trade among Arab countries with the foreign countries, meaning that when the population increase it push the government policy to rethink about those commodities which is necessary for their people. For this reason, population variable in our estimation is positive and statistically significant. Moreover, another variable such as Animal and vehicle are another important good which could be it's a good idea the Arab countries should not hesitate to import it because most of the Arab countries maybe cannot produce animals and vehicles, for first one maybe it's related to the climate and environment, and most of the diverse animals cannot live in the hot weather. For the second commodities might be related to the labor skills which also most of the Arabian countries may not afford labor intensive and heavy industry to produce a good amount of them for their people. For these circumstances they have to import it without any difficult requirement such as NTM. Furthermore, the other variables are not an important in our sample countries. The reason for this maybe is that they have a local capacity to produce them. Finally, the distance variables play a negative and statistically significant role in the panel estimation. It means that wherever the country's partner is far or close to the Arabian countries may not important for them because standard and quality are the most common policy, which Arab and other countries require from exporter countries to do so.

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Table 3 Fixed Effects Results: Dependent variable is GDP.

Variable	*Coefficient*	Standard Error	*T ratio*
Constant	72.75947	8.128021	0.000*
Ln POP	.0033292	.0005487	0.000*
LDist	.2548974	.9450172	0.788
Ln Lnag	5.147283	5.070253	0.314
LAnim	.0718586	.0228891	0.002*
LVege	.0000897	.000125	0.476
LPlas	-9.30e-07	5.16e-06	0.857
LVeh	.0203965	.0035429	0.000*
Hausman Random effect (POP)	.0000437		
N	191		
Countries	12		
Min obs	15		
Max obs	16		
Av obs	15.9		
R-sq within	0.947		
R-sq between	0.953		
R-sq overall	0.972		

* Denote significance at 1% level. Values in parentheses are heteroscedaticity consistent *t*-statistics and values in brackets are *p*-values.

Finally, the estimation in table 4 recommends that the economic size of the trade partners would not contribute significantly to enhancement imports of plastic. However, the developing countries standards have a negative and significant effect on vehicle, so for any additional standard requirement imports decrease by about 0.2 %. This indicates the results of Chevassus-Lozza et al. (2008) and Van Tongeren et al.(2010). Moreover, Distance variable does not significantly inhibit the plastic commodity. Furthermore, the results show that higher prices have a significant impact on exports at this trade margin. This indicates that high regulatory costs often lead to higher prices that in turn have a negative impact on exports. In addition, only Vehicle, animal and population are positive and statistically significant, meaning that importing any kind of these commodities into the developing countries lead and effect on economic seriously. In addition, the rest of other variables are not statistically significant. The estimates suggest that vehicle standards have a substantial and specific correlation with exports from industrial countries, so that potential. Even with standard requirements, exporters are not discouraged. An assessment of the Arabic countries directives on Vehicle and Animal standards indicate that there has been a relative long term stability in the directives, which provides exporters the export flexibility at the trade margin. Income in exporting countries greatly encourages exports of these commodities. This might be a result of the demands of government and organic production in this sector, which Arabic countries are trying to fulfill.

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Table 4 Random Effects Results: Dependent variable is GDP.

Variable	*Coefficient*	Standard Error	*T ratio*
Constant	118.2566	9.81723	0.000*
Ln POP	3.09e-06	1.10e-06	0.005*
Ln Lnag	1.248581	.0503601	0.888
LAnim	.0768933	.0250567	0.002*
LVege	.0001277	.0002166	0.555
LPlas	-2.45e-06	8.95e-06	0.784
LVeh	.0214016	.003841	0.000*
LDist	-.2053197	.0503601	0.000*
Hausman Random effect (POP)	.0000437		
N	191		
Countries	12		
Min obs	15		
Max obs	16		
Av obs	15.9		
R-sq within	0.947		
R-sq between	0.953		
R-sq overall	0.972		

* Denote significance at 1% level. Values in parentheses are heteroscedaticity consistent *t*-statistics and values in brackets are *p*-values.

5. Concluding Remarks:

This study analyzes the trade-based effects of NTM in 12 Arab countries over the span 1999–2014. By applying a two-stage gravity approach and we have applied panel data method; we notice that NTM does not decrease the import of commodities. We also find that the effects of NTM vary and depending on the level of economic development of the country and products.

Our results indicate that animal, vehicle and population variables are positive and statistically significant. Meaning that our three variables have an important impact on GDP in the Arab countries, in other words, these variables are helpful tools to GDP and economic growth in the sample countries estimation. In addition, Distance is those variable that negatively impacted on trade in our sample countries, the reason is that, if the number of kilometers is more, it leads to increase the cost of those products and then it's negatively impacts on trade. Furthermore, plastic is another product which is play a negative role in our estimation, the reason for this is related to those trade policies applied by Arab countries.

All in all, Most of the Arab countries are not stay with the same level of developed countries based on their technology such as quality control, and they cannot use the latest technology for the safety, health and trade reasons, that's why they are fail to applying NTMs tools in their trade relations.

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Appendix

List of the countries in our estimation

Countries Group	Members
Importers (Developing countries)	Algeria, Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, United Arab Emirates.
Exporters (Developing and developed countries)	USA, Japan, Australia, South Korea, China, Malaysia.

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