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The political economy of non-tariff measures

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Abstract

Over the last decades, non-tariff measures (NTMs) have seen an important upsurge. However, little research has focused on the political economy of non-tariff protection, and the existing studies are mainly based on a single country or a specific type of measures. This paper seeks to fill the gap by empirically evaluating the determinants of NTMs in several countries, both developed and developing. Overall results show certain protectionist purposes behind the adoption of NTMs. This conclusion is reinforced for restrictive measures (i.e. subject to trade concerns), but does not hold for non-restrictive measures, suggesting the legitimate goal of several NTMs. Furthermore, transnational lobbying, defined as the influence exerted by national business groups during the Ministerial Conferences - the highest authority of the World Trade Organization (WTO) - increases the probability of adopting NTMs in both developed and developing countries.

JEL codes: F13, F14, D72

Keywords: Non-tariff Measures, Political Economy, International Trade, Lobbying

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1 Introduction

Over the last decades, multilateral and regional trade negotiations have led to massive liberalization through tariff reductions, in both developed and developing countries. As a result, attention has shifted towards non-tariff measures (NTMs), which are more diverse and complex policy instruments. The main objective of early measures (e.g. quotas, antidumping duties) was to replace tariff protection ([Anderson & Schmitt, 2003](#); [Baldwin, 1984](#)). Over the years, globalization has been associated with greater interdependency among states and new types of NTMs have proliferated in response to public policy objectives (i.e. health and safety of consumers, environmental protection). However, the same NTMs may be used to pursue both legitimate and protectionist goals and the boundary between the different motivations is very thin. Depending on the reasons that lie behind the adoption and design of NTMs, trade effects may be very different. For instance, if NTMs seek to correct a market failure such as information asymmetry, trade may be enhanced as consumer confidence in the foreign product will increase demand for it. On the contrary, when countries employ NTMs to protect domestic producers, they induce negative trade effects on partners. This paper analyzes the reasons that may prompt a government to implement non-tariff protection in the manufacturing industries.¹

Both developed and developing countries are concerned with NTMs. On average, slightly more than half of a country's imports and almost half of its imported products are affected by at least one NTM. Some products, especially in the agri-food sector, are highly regulated, in response to growing concerns regarding health, safety and environmental quality, whereas some other products are as a matter of course less affected by non-tariff protection ([Gourdon, 2014](#)).

Different types of measures exist and, owing to the UNCTAD (United Nations Conference on Trade and Development) new coding system, NTMs can be classified according to their intended goal ([Cadot *et al.*, 2012](#)). Sanitary and phytosanitary measures (SPS) and technical

¹Manufacturing industries include the agri-food sector.

barriers to trade (TBT), also known as technical measures, are officially designed to achieve public policy objectives. They constitute the bulk of NTMs, applying to a wide range of products. However, these are complex policy tools and, despite their official status, they can also be used for political economy reasons, becoming unnecessary barriers to trade (WTO, 2012). Non-technical measures, such as contingent, quantity or price control measures, are trade regulatory instruments. Unlike SPS and TBT measures, their distortionary effect on trade is well documented, since they are easier to quantify (Gourdon & Nicita, 2013). In other words, if tariffs are committed to in the WTO and difficult to raise, governments have more room for maneuver when it comes to NTMs, being able to respond to pressures from both producer and consumer lobbies.

However, NTMs are equally subject to international scrutiny and discipline. Increasing efforts are made by the WTO to boost the transparency of trade policies worldwide. Under the SPS and TBT Agreements, WTO members are required to notify all the adopted regulations. Nevertheless, there may be little incentive for countries to do so. As this may jeopardize the transparency process, alternative mechanisms have been implemented. For instance, exporters that are negatively affected by SPS and TBT measures imposed by their trading partners can raise Specific Trade Concerns (STCs) in the SPS and TBT Committees at the WTO. In this case, issues with market access faced by exporters are believed to stem from the infringement of the previously mentioned agreements by the importing country (Baccheta *et al.*, 2012). STCs are therefore an interesting source of information as they reveal the restrictive character of certain technical measures. One example is the concern raised in October 2009, by Brazil against South Africa.² South African imports of beef and pork meat from Brazil had been suspended, because of a foot-and-mouth disease (FMD) outbreak. However, the FMD outbreak had only affected the bovine herd and South Africa's rejection of Brazilian pork meat could not be scientifically justified. By raising an STC, Brazil required South Africa to respect the SPS Agreement, so that exports of the affected products could resume soon, as the ban was unjustified and excessive.

²SPS-STC no. 287 <http://spsims.wto.org/web/pages/edition/stc/SpecificTradeConcern.aspx?ID=860568>.

As for non-technical measures, they are not the subject of specific trade concerns discussions. The motivations behind their use are easier to understand. However, they can be challenged through the Dispute Settlement Mechanism.

Our contributions to the existing literature are three-fold. First, we explore the political economy determinants of NTMs in several countries, both developed and developing. The study includes several types of NTMs, from both technical and non-technical categories. Relying on the most recent and comprehensive dataset on NTMs, our analysis is run at a highly disaggregated level - the 6-digit level of the Harmonized System (HS).

Second, we take into account the fact that NTMs may be adopted for both protectionist and legitimate purposes. On the one hand, as previously mentioned, non-technical measures have been traditionally used as instruments of commercial policy and their trade restrictive character is well-documented. On the other hand, technical measures, such as SPS and TBT measures, may pursue both public policy and political economy objectives, inducing different effects on trade. Therefore, besides the analysis conducted on all NTMs taken together, regardless their nature, we also distinguish between restrictive and non-restrictive measures. This analysis is intended to shed more light on the reasons leading governments to adopt NTMs. In order to track restrictive measures, we proceed as follows: non-technical measures are considered as *de facto* restrictive, whereas technical measures are considered as restrictive only if they have been raised as concerns in the SPS and/or TBT Committees at the WTO.

Third, we go a step further and examine the influence of transnational lobbying on the adoption of NTMs at the national level. As national policies increasingly fall under the influence of international rules, governments become more and more limited in their power to set trade policy and raise trade barriers. Hence, beyond national lobbying, we expect transnational lobbying to play an important role in trade policy decisions. Over the last decade, the WTO has increased its openness towards non-governmental actors ([Steffek & Kissling, 2006](#); [Van den Bossche, 2008](#)) and national interest groups have been allowed to

attend the Ministerial Conferences (MCs), the highest decision-making body of the WTO. Various interests are represented at these conferences, such as business associations, non-governmental organizations (NGOs), labor unions, and institutions ([Hanegraaff *et al.*, 2011](#)). We focus on national business groups, as they can easily be attributed to a given industry. The influence exerted by these groups during MCs can have further implications for national policy decisions through different mechanisms. For instance, the pressure exerted by business groups during these multilateral negotiations may lead to an international consensus regarding NTMs to the advantage of their origin countries. All members have to comply with the WTO's decisions and transnational lobbying is a way for some organizations to turn the situation in their favor. Also, the influence of business groups may be such that an international consensus is not reached, which might be exactly what they expect, in order to maintain their national NTMs. Although we are not able to disentangle the different mechanisms at play, we can investigate the influence of transnational lobbying on the adoption of NTMs at the national level. Relying on an original and exhaustive dataset including all business groups that have attended the WTO MCs over time, we proxy transnational lobbying through the participation of national business groups at the MCs.

Our results suggest that, beyond their legitimate purposes, NTMs are also driven by political and economic motivations, in both developed and developing countries. Products that have experienced reductions in tariffs and sectors confronted with import competition and characterized by high levels of employment are the ones with a higher probability of receiving NTM protection. These results are reinforced for restrictive NTMs, but do not hold for non-restrictive measures. Finally, transnational lobbying also influences positively and significantly the adoption of NTMs at the national level, in both developed and developing countries.

The paper is organized as follows. Section 2 reviews the literature on the political economy determinants of protection. Section 3 describes the data. Section 4 presents the empirical strategy, while Section 5 reports the results and some robustness checks. Section 6 concludes.

2 Literature review

This paper contributes to the empirical literature on the political economy determinants of NTMs. Over the last two decades, two major developments have sparked important advances in the empirical and theoretical literature on the political economy of trade policy instruments. First, [Trefler \(1993\)](#) addresses the problem of endogeneity between NTM protection and import penetration, focusing on the United States (US). A rise in import penetration leads to greater protection. The magnitude of this effect is 10 times more important than in previous models where protection has been treated as exogenous. [Lee & Swagel \(2000\)](#) extend Trefler’s study to 41 countries. Results show that, even after controlling for industry and country specific factors, governments grant more NTM protection to industries that are weak, in decline, politically important, or threatened by import competition. Second, the “protection for sale” (PFS) model, introduced by [Grossman & Helpman \(1994\)](#), marks a milestone in the literature, offering theoretical foundations for the influence of interest groups on trade protection through political contributions. The model explains tariff protection through three variables: import penetration, import demand elasticity and whether an industry is politically organized or not. The level of protection granted by a government maximizes a combination of the general welfare and the contributions of politically organized groups. Results show that trade protection should be higher in industries represented by lobbies and with a lower import elasticity. Also, protection is expected to be more important within politically organized sectors with a low import penetration ratio.

The PFS model has been tested empirically in several papers, but while the original model was designed for tariff protection, early empirical analyses focused on NTMs. [Maggi & Goldberg \(1999\)](#) and [Gawande & Bandyopadhyay \(2000\)](#) provide strong evidence for the PFS model in the US. Their results are not sensitive to the introduction of other variables such as employment, tariffs, earnings per employee and so on, traditionally used in the literature to explain the political economy determinants of protection. However, both studies suffer from two main drawbacks. First, tariffs allow governments to fully capture rents, whereas non-tariff protection does not. Second, the methods they use to distinguish between orga-

nized and non-organized industries are arbitrary and may not be consistent with the PFS model. For instance, when establishing a cutoff level to differentiate between organized and non-organized industries, [Maggi & Goldberg \(1999\)](#) do not consider the fact that political contributions are used to influence not only trade policy, but other policies as well.

The first problem is addressed by [Facchini *et al.* \(2006\)](#). As NTMs do not allow governments to fully capture rents associated with protection, empirical tests of the PFS model using coverage ratios to measure protection may be biased. The authors allow for partial rent capturing and their results suggest that the low amount of protection granted by the US government reflects the importance of general welfare and not the strategic interaction between competing lobbies. The second issue is tackled by [Imai *et al.* \(2013\)](#) who use quantile regressions. Their approach does not need data on political organizations. In order to validate the PFS model, their results should point to a positive relationship between protection and the inverse import penetration ratio for higher quantiles of protection and a negative one for lower quantiles. The test does not provide support for the PFS model as it leads to opposite findings.

As the PFS model is appropriate for a context where political contributions are allowed, all the papers previously cited focused on the US. In order to explore the political economy determinants of trade policies outside the US, original methods have been suggested. There are two main directions for these studies. A first strand of literature investigates the substitution between tariffs and NTMs. Results are mixed. [Moore & Zanardi \(2011\)](#) analyze whether the adoption of anti-dumping measures between 1991 and 2002 has been influenced by reductions in tariffs. Evidence for policy substitution is only found for a few countries that use anti-dumping measures intensively. [Beverelli *et al.* \(2014\)](#) show that policy substitution between tariffs and TBTs occurs in developed countries, where it is less costly to comply with product standards. In developing countries, TBTs are rather used as complements for tariffs. These predictions are based on trade restrictive TBTs, that have been subject to STCs. [Orefice \(2015\)](#) studies whether NTMs become effective barriers to trade as a consequence of reductions in tariffs. To do so, he studies trade restrictive SPS and TBT measures (i.e.

linked to STCs). He finds that both SPS and TBT concerns are expressed by the exporting country after tariff cuts in the importing country.

A second strand of literature investigates the influence of business groups on trade policy, based on different criteria. [Mitra *et al.* \(2002\)](#) adapt the PFS model to Turkey, by considering industries as politically organized if they are members of one of the most important Turkish industrial organizations (the TUSIAD). They find support for the fundamental predictions of the PFS model. Nevertheless, the TUSIAD is a general interest business organization and membership of this organization does not necessarily capture pure trade policy concerns. [Belloc \(2015\)](#) addresses this issue by focusing on protectionist pressures at the European level. She studies the influence of business groups on European trade policy. To do so, she uses consultations organized by the European Union (EU) with the civil society as a proxy for the lobbying power of interest groups. Results show that consultations have a significant and positive impact on NTM protection. [Hanegraaff *et al.* \(2015\)](#) go beyond the previous studies and focus on transnational lobbying. They analyze the factors motivating the presence of domestic organized interests at the WTO MCs during the period 1995-2011. Results show that organized interests without domestic policy attention or access to basic resources will not easily turn their attention to the international level.

This paper investigates further the political economy determinants of NTMs, focusing on several countries, both developed and developing. Compared to the previous studies, we integrate both methods used to analyze the political economy of non-tariff protection in countries where political contributions are banned. First, we consider the potential policy substitution between tariffs and NTMs. Second, we analyze the impact that the participation of domestic business groups at the WTO MCs may have on national policy decisions. Thus, we are able to reveal that not only legitimate, but also political and economic factors trigger the use of NTMs, especially the non-restrictive ones.

3 Data

This section presents the data used in the empirical analysis, their characteristics, the rationale behind their use, as well as some descriptive statistics.

3.1 NTMs

This study relies on the 2014 version of the CEPII NTM-MAP database,³ which uses the UNCTAD TRAINS (Trade Analysis Information System) database as source (Gourdon, 2014). The classification of NTMs has a two-tier structure: import-related measures, imposed by the importing country, and export measures, imposed by the exporting country itself. Import measures are further categorized as either technical or non-technical measures. Technical measures refer to SPS measures, TBTs and pre-shipment inspections. Non-technical measures include hard measures (price and quantity controls), threat measures (anti-dumping and safeguards) and other measures (trade-related finance and investment measures). A detailed classification is presented in Figure 1.

Figure 1 about here

The CEPII NTM-MAP dataset focuses on the first five chapters⁴ of the above classification. Other measures are not included because of difficulties in data collection. NTMs are aggregated at the 6-digit level of the HS classification and spread over 5000 different products. 63 countries are covered, with the EU member states considered separately. Data are available for a single year over the 2010-2012 period.⁵ All in all, the database provides the total number of measures imposed by a country on an HS6 product for each of the five chapters previously mentioned. Due to limited availability of other data needed in the analysis, we restricted our sample to 2 developed (the EU and Japan) and 16 developing countries (see Table 1). Even though countries from the EU have been included separately in the initial dataset, we

³CEPII NTM-MAP: http://www.cepii.fr/cepii/en/bdd_modele/presentation.asp?id=28.

⁴Chapter A (Sanitary and Phytosanitary measures); Chapter B (Technical Barriers to Trade); Chapter C (Pre-shipment inspection and other formalities); Chapter D (Contingent trade-protective measures); Chapter E (Non-automatic licensing, quotas, prohibitions and quantity-control measures other than for SPS or TBT reasons).

⁵In each country, data were collected once between 2010 and 2012.

have also constructed an overall measure for the EU as a whole. Since trade policy is set at the European level and all members have to comply with the European decisions, we believe that this approach is more appropriate.

Table 1 about here

In what follows, we analyze the data more carefully, in order to understand the importance of NTMs for our sample. 38.7% of all products are affected by at least one NTM. As depicted in Figure 2, the majority of NTMs consist in technical measures for each country of the database. For 13 out of 18 countries, technical measures constitute more than 90% of all NTMs. As for the other 5 countries (Colombia, Indonesia, Philippines, Mauritius, India), technical measures account for more than 60% of all NTMs. India has the lowest share, with around 65% of its NTMs being of a technical nature. Nevertheless, NTMs affect these countries to different extents. Among the countries with very high shares of technical measures (over 90%), only 4 (Sri Lanka, China, the EU, Brazil) impose some form of NTMs on more than 60% of their total imports and imported products. Other countries are less affected. In Japan, for example, where 99% of all the adopted measures are technical, NTMs affect less than 30% of total imports and imported products. However, even though the share of imports and imported products is low, the measures imposed may still be very restrictive and seriously limit imports. At this point, we are not able to make any statement about the actual restrictiveness of the measures imposed. On the other hand, India, the country with the lowest share of technical measures, imposes NTMs on more than 65% of its total imports and imported products.

Figure 2 about here

In order to separate restrictive from non-restrictive NTMs, for the second part of the analysis, we rely on STCs. Information on SPS and TBT measures that have been subject to STCs is recorded by the WTO in the SPS and TBT Information Management Systems (IMS).⁶ It refers, among other things, to the exporting country raising the concern, the importing

⁶SPS IMS (<http://spsims.wto.org/web/pages/search/stc/Search.aspx>) and TBT IMS (<http://tbtims.wto.org/web/pages/search/stc/Search.aspx>).

country maintaining the measure, the products involved (detailed at the 4-digit level of the HS classification), the date when the concern was first raised, and the dates when the concern was subsequently raised or resolved. As there exists no database including all these elements for the period under observation in this study, we constructed a detailed database, putting together all the items of information previously mentioned.

To track restrictive SPS and TBT measures, we merge the NTM and STC datasets, proceeding as follows. First, NTMs are unilateral, applying equally to all exporters, whereas STCs are bilateral. In order to match the two datasets, we consider that if at least one exporter has raised a concern against an importer for a given product, SPS and TBT measures imposed on that product, by the importer in question, are restrictive. This approach limits the selection problem which may arise from the fact that some countries never raise STCs as they do not have the financial means to do so or as they may be afraid of retaliatory responses. Our measure encompasses these potential “non-raised” STCs against an importer for a given product, conditional on the fact that there is at least one exporter who raises a concern for the product and importer considered. All SPS and TBT measures that have not been the subject of a concern are considered as legitimate.

Second, NTMs are detailed at the 6-digit level of the HS classification, whereas STCs are detailed at the HS4 level. In order to match the two datasets, we associate each STC with all HS6 digit products within an HS4 heading. This may lead to a slight overestimation of the number of restrictive measures in our sample, but it is the only way to proceed given the available information. In the case of agri-food products, if a disease affects the bovine herd, all HS6 products will be affected. So, even if the information on STCs is detailed at the 4-digit level of HS, we can rightly assume that all products within an HS4 heading are concerned.

Third, in terms of timing, we proceed as follows in order to associate STCs with the corresponding NTMs. NTMs may lead to STCs both before and after their actual implementation.

STCs may refer to NTMs that are still draft regulations (e.g. NTMs not implemented yet).⁷ Indeed, countries are supposed to notify the WTO of the intended adoption of new measures with significant impact on trade before they come into force. Thus, NTMs may lead to STCs even before their implementation (Fontagné *et al.*, 2015). In addition, STCs may refer to NTMs already in force. The majority of STCs are associated with newly implemented measures (Beverelli *et al.*, 2014). Finally, STCs may also be related to existing NTMs.

Taking into account all these aspects, we assume that a new NTM could lead to STCs one year before its implementation, during the year of implementation or one year after. For instance, a measure implemented in 2011 might have been subject to STCs for the first time in 2010, 2011 or 2012. For existing measures still in force, we apply the same reasoning for the first time STCs were raised. A measure implemented in 2006 and still in force in 2011 could have led to STCs for the first time in 2005, 2006 or 2007. However, if the concern has not been solved in the meanwhile, it could be subsequently raised after 2007, up until 2011.

Our NTM data refer to all measures in force in a given year, but we do not know exactly when they were adopted. If we consider the stock of NTMs in 2011, these measures could have been implemented in 2011 or earlier. According to the previous considerations, for the measures adopted in 2011, we consider the earliest raised STCs, that is STCs raised in 2010, 2011 and 2012. For the measures implemented earlier but still in force in 2011, we consider subsequently raised STCs in 2011. All in all, for the stock of measures in 2011, we include in the analysis, not only concerns raised for the first time in 2010, 2011 and 2012, but also concerns raised earlier and subsequently raised in 2011. These ideas are summarized in Figure 3.

Figure 3 about here

Overall, 91 SPS STCs and 195 TBT STCs were raised for the first time during the 2009-2013

⁷For instance, in 2011, Turkey raised concern over Brazil's draft resolution which would define permitted levels of tar, nicotine and carbon monoxide in cigarette smoke and prohibit the use of a comprehensive list of additives in all tobacco-related products manufactured and sold in Brazil (Brazil – Draft Resolution No. 112, 29 November 2010; maximum levels of tar, nicotine and carbon monoxide permitted on tobacco products and prohibition of additives (G/TBT/N/BRA/407)).

period. Additionally, over the same period, 61 SPS STCs and 145 TBT STCs were subsequently raised.

Furthermore, 23.62% of all products affected by SPS and/or TBT measures have been subject to SPS and/or TBT trade concerns, underlying the importance of separating restrictive measures from non-restrictive ones. However, the fact of relying on STCs to track restrictive SPS and TBT measures may be problematic because of their endogenous nature. For instance, if a product is affected by very high tariffs, there will be no STCs, as there are no imports. In our dataset, 26.5% of all products are subject to tariffs higher than 15%. A careful analysis of the data shows that among products with tariffs higher than 15% and affected by SPS and/or TBT measures, 21% have also been subject to STCs. This share is comparable to the share of STCs for the whole sample (23.62%), meaning that the issue previously mentioned should be of no concern for the current study.

3.2 Tariffs

To investigate the political economy of NTMs, we also consider tariffs. As previously mentioned, reductions in tariffs may have pushed countries to pursue trade policy goals through NTMs (Anderson & Schmitt, 2003; Bagwell & Staiger, 2001; Ederington, 2001; Ederington & Bajona, 2010). The use of NTMs to partly compensate for reductions in tariffs is known as trade policy substitution. However, tariffs and NTMs are not necessarily substitutes. They may also be complementary instruments (Essaji, 2010). In order to detect potential substitution or complementary effects between tariffs and NTMs, we use the variation in tariffs between 2007 and 2010. We also use 2007 tariffs to take into account the initial level of protection.

Data on tariffs are drawn from MACMap,⁸ a database jointly developed by the ITC (International Trade Center) and the CEPII (Le Centre d'Etudes Prospectives et d'Informations Internationales). MACMap contains exhaustive information on bilateral applied tariff duties

⁸Market Access Map http://www.cepii.fr/cepii/en/bdd_modele/presentation.asp?id=12

at the 6 digit-level of the HS, taking regional agreements and trade preferences into account. As MAcMap provides information for each importer-exporter-product triplet, we aggregate tariffs at the importer-product level, by computing trade-weighted average tariffs. Trade-weighted average tariffs refer to the average of effectively applied tariff rates, weighted by the product import shares, for each partner country. Import data necessary to compute the weighted average tariffs are extracted from BACI.⁹

The MAcMap database was chosen for several reasons. First, since many preferential tariffs are set to zero and cannot be subject to further reductions, it seems reasonable to use effectively applied tariffs, which are more conservative, instead of most-favored nation (MFN) applied tariffs. Second, for several countries used in the analysis, data on MFN applied tariffs are missing for more recent years in other databases, such as TRAINS, and we are not able to precisely infer their values.

3.3 Import-demand elasticities and industrial variables

In order to further explore the political economy of NTMs, we rely on the product and industry characteristics traditionally used in the literature (Belloc, 2015; Gawande & Bandyopadhyay, 2000; Maggi & Goldberg, 1999; Trefler, 1993).

Import demand elasticities at the country and product (HS 6-digit) level are extracted from Kee *et al.* (2008).¹⁰ As far as the EU is concerned, these data are available for each individual country in the EU. Therefore, we compute a weighted sum for the EU as a whole, where the weights are the share of the individual country's imports over total European imports.

The industrial variables included in the analysis are the total number of employees, the annual average earnings per employee, the labor share (the share of output destined to wages),

⁹BACI provides bilateral values and quantities of imports at a highly disaggregated level (HS6), for over 200 countries and it is updated every year. The advantage of BACI over other databases, such as COMTRADE, is that it reconciles the declarations of the exporter and the importer. http://www.cepii.fr/cepii/fr/bdd_modele/presentation.asp?id=1. a dataset also constructed by the CEPII.

¹⁰Available on the World Bank website: <http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:22574446~pagePK:64214825~piPK:64214943~theSitePK:469382,00.html>.

the import penetration ratio (computed as imports over value added) and the export ratio (the ratio between exports and value added). Industrial data are provided by the United Nations Industrial Development Organization (UNIDO, 2013) and detailed at the 3-digit level of the International Standard Industrial Classification (ISIC) for each country. Concordance with HS classification at the 6-digit level is achieved on the basis of the international system concordance tables. Trade data necessary to compute import penetration rates and export ratios are extracted from BACI. As in the case of NTMs, data include the EU member states separately. We therefore aggregate the number of employees, the output, the earnings, the value added, the imports and the exports at the European level for each 3-digit industry, in order to compute our indicators for the EU as a whole. As NTMs cover the 2010-2012 period, in order to reduce the potential endogeneity problems,¹¹ we use industrial data corresponding to 2007, with few exceptions.¹² In order to deal with the skewness of the data, we take logs of all independent variables.

3.4 Transnational lobbying

Ministerial Conferences are the highest decision-making body of the WTO (Figure 4), and they are held every two years. All WTO members are present to discuss different trade-related topics.

Figure 4 about here

Since 1996, non-governmental actors have been invited to participate in these MCs. Information on all the business groups attending the MCs during the period 1996-2011 has been collected by [Hanegraaff *et al.* \(2011\)](#), who kindly provided us with the data. The database contains information on each participating business group and the industry it represents, classified according to the 3-digit level of ISIC. For some business groups, information at the 3-digit level was missing. However, information at the 2-digit level was available. For these cases, the missing sectors at the 3-digit level have been replaced with all possible 3-digit

¹¹One potential problem may be caused by reverse causality between import penetration and the presence of NTMs. For instance, high import penetration ratios may lead to a greater probability of adopting NTMs. However, the presence of NTMs may hinder trade, leading to low import penetration ratios.

¹²For Egypt, Nepal, Peru and the Philippines, 2007 data are not available and 2006 data are therefore used.

sectors within a 2-digit sector.

We restrict our sample to countries for which we have information on NTMs. Of course, not all of them attend the MCs. As we use an exhaustive dataset of MC participants, we consider that if a country is not in the dataset, it means that this country was absent from the Ministerial Conferences.

Table 2 depicts the evolution in the participation of national business groups in MCs over time.¹³ The number of organizations present at the MCs and therefore the number of industries and countries involved has increased over time, except for the last two MCs. Their reduced presence at the last two MCs might be explained by the economic crisis. The fact that interest groups are supposed to pay all costs associated with participation may induce a bias towards participation of lobbies from developed countries.

Table 2 about here

Indeed, as shown in Figure 5, developed countries are more represented than developing countries. Groups representing both individual countries from the EU and the EU as a whole attend these conferences. However, we restrict our focus to the EU as a whole, as trade policy is set at the European level. We note that the EU is by far the most represented region in terms of business groups. Among the developing countries, business groups from India participate the most in the MCs.

Figure 5 about here

4 Empirical strategy

This section aims to investigate the political economy factors that lead to the adoption of NTMs in both developed and developing countries. First, we test whether NTMs are more likely to affect products that have experienced reductions in tariffs or industries characterized by high levels of employment, import competition and so on. Second, we analyze whether

¹³Transnational business groups are excluded from this analysis.

transnational lobbying also influences the probability of adopting NTMs at the national level. A pure cross-sectional study is conducted as NTMs are available for a single year between 2010 and 2012.

We start by estimating the following equation through a linear probability model (LPM), in order to maintain a high level of disaggregation of the data (HS6). As non-linear models suffer from the incidental parameter problem caused by the large set of fixed effects, the use of an LPM seems the most appropriate solution. This approach also helps us to go beyond the debate on the coverage and frequency ratios previously used in the literature.¹⁴ The use of an LPM does not seem limiting since we are interested in the determinants of NTMs and not in their trade or welfare effects.

$$NTM_{ksi} = \alpha_0 + \alpha_1 \cdot \mathbf{X}_{ki} + \alpha_2 \cdot \mathbf{D}_{si} + \delta_k + \gamma_i + \epsilon_{ksi} \quad (1)$$

We use two definitions of the dependent variable. First, NTM_{ksi} is a dummy variable set to 1 if country i notifies at least one NTM on product k (6-digit of the HS classification) of industry s (3-digit ISIC codes) (0 otherwise). As a robustness check, we will also change the dependent variable with the number of measures, instead of using a dummy variable.

Second, we distinguish between restrictive and non-restrictive measures as mentioned in Section 3. We consider that SPS and TBT measures that have been subject to STCs are restrictive, whereas those that have not been raised as concerns are legitimate and address market failures, such as information asymmetries, consumer health or environmental protection. As for the other types of NTMs (i.e. pre-shipment inspections, contingent-trade protective measures, quantity measures), they are all considered as *de facto* restrictive and left unchanged. We then estimate equation 1 again separately for restrictive and non-restrictive measures.

¹⁴Coverage ratios, i.e. the share of imports affected by at least one NTM, suffer from the endogeneity of the value of imports, whereas frequency ratios, i.e. the share of products affected by at least one NTM, do not take into account the value of imports.

\mathbf{X}_{ki} is a vector of variables at the product level k for country i , i.e. 2007 tariffs, tariff variation (between 2007 and 2010) and import-demand elasticities. \mathbf{D}_{si} is a vector of control variables at the industry level s for country i , i.e. employment, earnings (per employee), labor share, import penetration and export ratios. Product (δ_k) and country (γ_i) fixed effects are introduced to control for any product and country characteristics affecting the probability of NTM imposition.

In the second part of the analysis, we test whether transnational lobbying influences the adoption of NTMs at the national level. In equation (1) we introduce a proxy for lobbying influence at the transnational level. The following econometric specification is then estimated.

$$NTM_{ksi} = \alpha_0 + \alpha_1 \cdot \mathbf{X}_{ki} + \alpha_2 \cdot \mathbf{D}_{si} + \alpha_3 \cdot \textit{presence_MC}_{si} + \delta_k + \gamma_i + \epsilon_{ksi} \quad (2)$$

The measure for transnational lobbying is a dummy variable set to 1 if at least one business group from a specific industry s and from a given country i has attended at least one of the eight MCs during the period 1996-2011, and 0 otherwise. The choice of a dummy variable is dictated by the fact that many industries do not attend these MCs, meaning that there would be many zeros associated with the main independent variable. However, we conduct some robustness checks where transnational lobbying is proxied by the number of interest groups that have attended the MCs.

Results presented in the following section are robust to heteroskedasticity.

5 Results

This section is organized as follows. Subsection 5.1 describes the results from the estimation of equation (1), referring to the first channel used to study the political economy of NTMs: the substitution between tariffs and NTMs, controlling for product and industry characteristics in each country. Subsection 5.2 presents the results of equation (2), considering the second channel used for the analysis of the political economy of NTMs: the influence of transnational lobbying on the adoption of NTMs at the national level. Finally, subsection

5.3 presents several robustness checks.

5.1 Policy substitution

We first investigate the main factors that lead countries to adopt NTMs (Table 3). The dependent variable is a dummy set to 1 if a country notifies at least one NTM on an HS6 product (0 otherwise). The first column provides results for the entire sample of countries. In the next column, we restrict our focus to developed countries. The last column refers to developing countries. Results are presented for the EU. As previously mentioned, trade policy is set at the European level and it is more appropriate to analyze the EU as a whole. However, as a robustness check we will also consider the European member states separately.

Table 3 about here

The estimation over the entire sample shows that the initial level of tariffs (2007 tariffs) has a positive and significant impact on the probability of adopting additional NTMs. Thus, products characterized by high tariffs in 2007 experienced a more important increase in the probability of receiving non-tariff protection during the 2010-2012 period. Moreover, the coefficient on tariff variation between 2007 and 2010 is negative and statistically significant, providing evidence that, on average, there is policy substitution. For instance, a 1% reduction in tariffs over the period 2007-2010 increased the probability of having extra NTMs by 16%. This suggests that NTMs are mainly used to replace tariffs. These results are in line with the predictions of the status quo model by [Corden \(1974\)](#) and [Lavergne \(1983\)](#). Governments seek to maintain the status quo: if protection granted through tariffs has decreased, in order to maintain the same level of protection, governments may replace it by NTMs. Therefore, a negative coefficient on tariff variation would reveal protectionist intentions behind the adoption of NTMs. These results are also in line with the conclusions of more recent empirical tests ([Beverelli *et al.*, 2014](#); [Moore & Zanardi, 2011](#); [Orefice, 2015](#)).

We note that industries characterized by high levels of employment are associated with a higher probability of being granted NTM protection. In industries where the employment level increases by 1%, the probability of adopting NTMs increases by 5%. This result sup-

ports the adding machine model by [Caves \(1976\)](#), who argues that industries with high levels of employment receive greater protection, as governments may be interested in their political support. The results are also in line with empirical tests ([Belloc, 2015](#); [Gawande & Bandyopadhyay, 2000](#); [Trefler, 1993](#)).

According to the social change model ([Ball, 1967](#); [Constantopoulos, 1974](#); [Fieleke, 1976](#)), governments may act on social justice grounds, trying to protect low income groups. As a consequence, protection should be higher in industries with low earnings per employee and with an important labor share. However, there is no clear consensus regarding the expected evolution of these two variables. In our case, policy makers do not seem to grant more protection to weak industries. We find that earnings per employee have a positive and significant effect on the probability of adopting additional NTMs. Similarly, industries with an important labor share tend to be characterized by a smaller probability of being granted NTM protection and the results are statistically significant. One potential explanation may be linked to the fact that if sectors with low earnings per employee and high labor shares are also affected by important immigration issues, governments may be less willing to protect them through NTMs.

Furthermore, we show that the probability of adopting NTMs is more important in industries affected by high import penetration ratios. If import competition increases by 1%, the likelihood for a product to be subject to NTMs increases by 1.2%. These results are in line with the comparative cost hypothesis by [Feenstra & Bhagwati \(1982\)](#), who suggest that protection should be higher in industries affected by import competition. [Trefler \(1993\)](#) was the first to show empirically that NTM protection is significantly higher in industries characterized by high levels of import penetration. Other papers find similar results ([Belloc, 2015](#); [Gawande & Bandyopadhyay, 2000](#); [Lee & Swagel, 2000](#); [Maggi & Goldberg, 1999](#)). As for exports, [Feenstra & Bhagwati \(1982\)](#) predict that protection should be higher in industries with a low ratio of exports. In our case, export ratios have a positive sign.

Finally, according to the protection for sale model, by [Grossman & Helpman \(1994\)](#), protec-

tion should be higher in industries with low import-demand elasticities. Indeed, our results support this theory. Low import-demand elasticities significantly increase the probability for a product to be affected by NTMs. If import-demand elasticity decreases by 1%, the probability of having NTMs on an HS6 product increases by 1%.

For the subsamples of developed and developing countries, results are in line with those obtained for the whole sample. In the case of developed countries, except for export ratios, all variables have the same sign as in the case of the entire sample of countries. The coefficient on exports is negative and statistically significant. This suggests that the probability for a product to be affected by NTMs is lower within an industry characterized by a high export ratio. The idea is that an industry able to export is competitive enough, hence it does not look for protection. Also, an exporting industry seeks to avoid foreign retaliation, which makes it less likely to lobby for protection. The coefficient on tariff variation, although negative, is no longer statistically significant. As we only have two developed countries in our subsample, this might be due to the fact that there was not much variation in tariffs over the period considered. When it comes to the developing countries, results are identical in terms of signs and significance to those obtained for the whole sample of countries.

The CEPII NTM-MAP database also allows us to differentiate between technical and non-technical measures. Technical measures include SPS and TBT measures and pre-shipment inspections, while non-technical measures include contingent trade protective measures and quantity measures.¹⁵ Therefore, we run the previous analysis on both technical and non-technical measures to check whether there are important differences depending on the type of measures we analyze. As before, the first two columns refer to the whole sample of countries, the second two columns focus on developed countries and the last two columns analyze developing countries.

Table 4 about here

¹⁵We rely on the MAST classification, which includes pre-shipment inspections among technical measures, along with SPS and TBT measures. Some other classifications include pre-shipment inspections in the group of non-technical measures. When pre-shipment inspections are considered as non-technical measures, the results presented in what follows still hold.

When the whole sample of countries is considered, the coefficient on tariff variation is negative and highly significant for technical measures and positive and highly significant for non-technical measures. This suggests that technical measures are used to replace tariff protection, whereas non-technical measures are used as complements to tariff protection. Technical measures might be preferred to substitute tariff protection because they are complex policy measures, more difficult to track. Even if results are not systematically significant for the developed and developing countries separately, coefficients have the same sign. For the developed countries, tariff variation does not significantly influence the probability of having neither technical measures nor non-technical measures. As for the developing countries, it seems that tariffs and non-technical measures are complementary instruments since the coefficient on tariff variation is positive and highly significant. Tariff variation does not seem to influence significantly the probability for a product to be subject to technical measures. Concerning the industrial variables, the results for technical measures are in line with those obtained for all NTMs taken together. For non-technical measures the results are more mixed.

Of course, the adoption of NTMs for legitimate reasons cannot be ruled out with the previous estimations. Therefore, we distinguish between restrictive and non-restrictive measures and run the same analysis as before for each category of NTMs. Among the restrictive measures we count the SPS and TBT measures that have been subject to STCs, along with all the other measures (i.e. pre-shipment inspections, contingent trade protective measures and quantity measures), which are considered as *de facto* restrictive. By contrast, non-restrictive measures are SPS and TBT measures that have not given rise to STCs. In Table 5, we report the regression results of equation (1) for both restrictive and non-restrictive measures. As before, we start by estimating the equation for the entire sample. Then, the sample is split into developed and developing countries. Results are reported for the EU as a whole, since STCs are reported for the EU as a whole and not for individual countries from the EU.

Table 5 about here

As far as the non-restrictive measures are concerned, previous conclusions still hold. When the entire sample is considered, NTMs are used to replace tariff protection. The coefficient

is higher than in the previous case. For instance, a 1% decrease in tariffs over the 2007-2010 period increased the probability of adopting NTMs by 27%. When the sample is split between developed and developing countries, the coefficient on tariff variation is significant only in the case of developing countries. For developing countries, a 1% decrease in tariffs has led to an increase of 28% in the probability of implementing NTMs.

All the other results are in line with those obtained for the whole sample of countries. For instance, a 1% increase in the level of employment led to an increase of 4% in the probability of implementing NTMs for the whole sample of countries, of 25% for the developed countries and of 5% for the developing countries. Also, a 1% increase in the import penetration implied an increase of 1.5% in the likelihood of adopting NTMs for the whole sample of countries, of 11% for the developed countries and of 2% for the developing countries. As for the export ratio, coefficients are negative and very significant. A 1% increase in the export ratio led to a decrease of 1% in the probability of adopting NTMs for the whole sample of countries, of 12% for the developed countries and of 0.7% for the developing countries. Some variables, such as earnings and elasticities, lose their significance.

When we focus on non-restrictive measures instead of restrictive measures, results are very different compared to those obtained before. We no longer find evidence for policy substitution. Tariffs seem to be complements for non-restrictive measures. In the case of the whole sample of countries, for instance, a 1% increase in tariffs has increased the probability of adopting non-restrictive NTMs by 12%.

As for the other variables, results are very mixed. The adoption of non-restrictive NTMs does not seem to respond to the same political and economic factors that trigger the implementation of restrictive measures. For instance, import competition does not affect the adoption of non-restrictive NTMs for the whole sample of countries. It has a significant influence in the case of the developing countries, but the sign is negative. Employment has a positive and significant impact on the adoption of non-restrictive NTMs only for the whole sample of countries. When the sample is split between developed and developing countries, results

are opposite to those obtained for restrictive measures. Generally, the results obtained for restrictive measures do not hold for non-restrictive measures, showing the legitimate character of these measures.

All in all, when we distinguish between restrictive and non-restrictive measures, we can show that despite the legitimate character of certain NTMs, political and economic factors also drive the use of NTMs. When all the measures are considered together, without distinguishing between legitimate and non-legitimate measures, the political economy reasons seem to prevail.

5.2 Transnational lobbying

We now investigate whether transnational lobbying influences the adoption of NTMs at the national level. To do so, we estimate equation (2).

During Ministerial Conferences, negotiations are mainly conducted by states. One may argue that the impact of domestic interest groups on the transnational decision-making process - which may have further implications on national trade policies - is rather limited. Lobbying at the national level would seem a more appropriate solution for domestic business groups. However, the participation of domestic business groups at MCs has grown over time. Since business groups are willing to pay all the costs associated with the participation in these conferences, their impact may not be insignificant. Moreover, the weakening of the national decision-making process makes interest groups likely also to go lobby at the transnational level ([Hanegraaff *et al.*, 2011](#)).

Indeed, interviews conducted by [Hanegraaff \(2015\)](#) with the interest groups that attended the 2011 MC in Geneva show that advocacy was the primary reason they gave for their participation. Even interest groups for whom advocacy was not the primary goal declared that they practiced it at some point. Moreover, when asked if they thought that they had an impact on the decision-making process, all interest groups from all over the world said that

they attended conferences to influence decisions. Therefore, the influence of transnational lobbying and its further implications for national trade policies seem to be an interesting area to explore.

In Table 6, we report the regression results of equation (2) when the dependent variable is a dummy set to 1 if a country notifies at least one NTM on an HS6 product (0 otherwise). In these estimations, we add a measure for transnational lobbying.

Table 6 about here

For instance, when the whole sample of countries is considered, the coefficient on the lobbying variable is positive and highly significant. In other words, if at least one business group representing a given industry attended at least one of the eight MCs held during the time span considered (1996-2011), the probability for the products within that industry to be subject to NTMs increased. Results are stable when we distinguish between developed and developing countries and the impact seems even greater in the case of developing countries. The coefficients associated with all the other variables are exactly the same in terms of signs and significance as those obtained in Table 3 for the whole sample of countries, but also for the developed and developing countries separately.

5.3 Sensitivity analysis

This section presents the results of various robustness checks. First, we focus on sensitivity tests related to the estimations presented in Subsection 5.1. We run the analysis for the case where the European member states are considered separately. Table 7 shows the outcome of this estimation. The results are very similar in terms of sign, magnitude and significance to those obtained for the EU as a whole (Table 3). We find evidence for policy substitution for the whole sample of countries. The initial level of tariffs is also positive and significant. High levels of employment or import penetration lead to a higher probability of adopting NTMs.

Table 7 about here

Also, as mentioned in the data section, tariffs have been computed as a weighted average.

However, given the endogeneity problems associated with the computation of tariffs as a weighted average, we carry out a robustness check using a simple average. The results of the estimation of equation (1) in the case where tariffs are computed as a simple average are summarized in Table 8. Although the coefficients on tariff variation appear to be higher, their sign and statistical significance are unchanged (see Table 3 for comparison).

Table 8 about here

As a further sensitivity test, we replace the dependent variable with the number of NTMs affecting an HS6 product; that is, instead of a dummy variable set to 1 if an NTM affects a product, the dependent variable is defined as the logarithm of 1 plus the number of measures. For computational reasons, we rely on an OLS estimation. Results are presented in Table 9 and they are very similar to those shown in Table 3, where the dependent variable is binary. For instance, a 1% reduction in tariffs over the 2007-2010 period led to an increase of 0.2 in the number of measures for the whole sample of countries. The results for developed countries are still not significant. As for the developing countries, a 1% decrease in tariffs over the period already mentioned led to an increase of 0.571 in the number of NTMs. The coefficient on the initial level of tariffs is still positive and significant. The other variables have the same effect on the number of NTMs adopted, as they had before on the probability of implementing NTMs. For instance, governments tend to grant more NTMs to industries with high import penetration ratios and characterized by a high level of employment. Also, products with low import demand elasticities are granted more NTMs.

Table 9 about here

Second, we show some sensitivity tests associated with the estimations presented in Subsection 5.2. Besides the influence of transnational lobbying on the adoption of all NTMs, we also study the effect of transnational lobbying on the probability of adopting restrictive NTMs. In equation (2), the dependent variable is replaced with a dummy set to 1 if at least one restrictive measure affects a product line. The main independent variable is, as in the previous case, a dummy variable equal to 1 if at least one business group representing a given industry from a given country attended at least one of the eight MCs held over the period 1996-2011. Results are presented in Table 10. We note that transnational lobbying has a

positive and significant impact on the probability of adopting restrictive NTMs at the national level. Besides the transnational lobbying, all the other political and economic factors appearing to have an influence on the adoption of all NTMs (see Table 7) seem to have an effect on the adoption of restrictive NTMs as well.

Table 10 about here

If we replace the proxy used for transnational lobbying with the number of interest groups representing a given industry from a given country that attended MCs over the period 1996-2011, the previous results still hold. The higher the number of business groups from a given industry and country present at MCs, the higher the probability of implementing restrictive NTMs. All the other variables are similar in terms of sign and significance to those presented in Table 11.

6 Conclusion

This paper studies the political economy determinants of NTMs in several countries, both developed and developing. Two channels have been considered. First, we explored substitution between tariffs and NTMs. Second, we analyzed the effect of transnational lobbying on the adoption of NTMs at the national level.

As far as the first channel is concerned, the results show that NTMs are substitutes for tariff protection, even after controlling for product and country fixed effects and other variables at the product and industry level for each country. Overall, the results point to protectionist intentions behind the adoption of NTMs. Beyond their legitimate purposes, NTMs are also driven by political and economic motivations, in both developed and developing countries. For instance, sectors confronted with import competition, characterized by high levels of employment and products with low import demand elasticities tend to receive more NTM protection. These results are reinforced by the analysis conducted on restrictive NTMs. When we consider only non-restrictive NTMs, however, these results no longer hold, suggesting the legitimate character of several NTMs. These findings are true for both developed and developing countries.

The second channel explores the influence exerted by national business groups at the transnational level on the adoption of NTMs in their home countries. Since 1996, the WTO has welcomed the participation of non-state actors at MCs, its highest decision-making body. Thus, domestic business groups started attending the conferences, aiming to influence trade policy decisions. Results show that the fact of having attended at least one MC during the period 1996-2011 had a significant positive influence on the probability of adopting additional NTMs, in both developed and developing countries.

In this study, we consider business groups. The influence of non-economic organizations such as NGOs, which also attend the MCs, is not explored. This issue invites further research.

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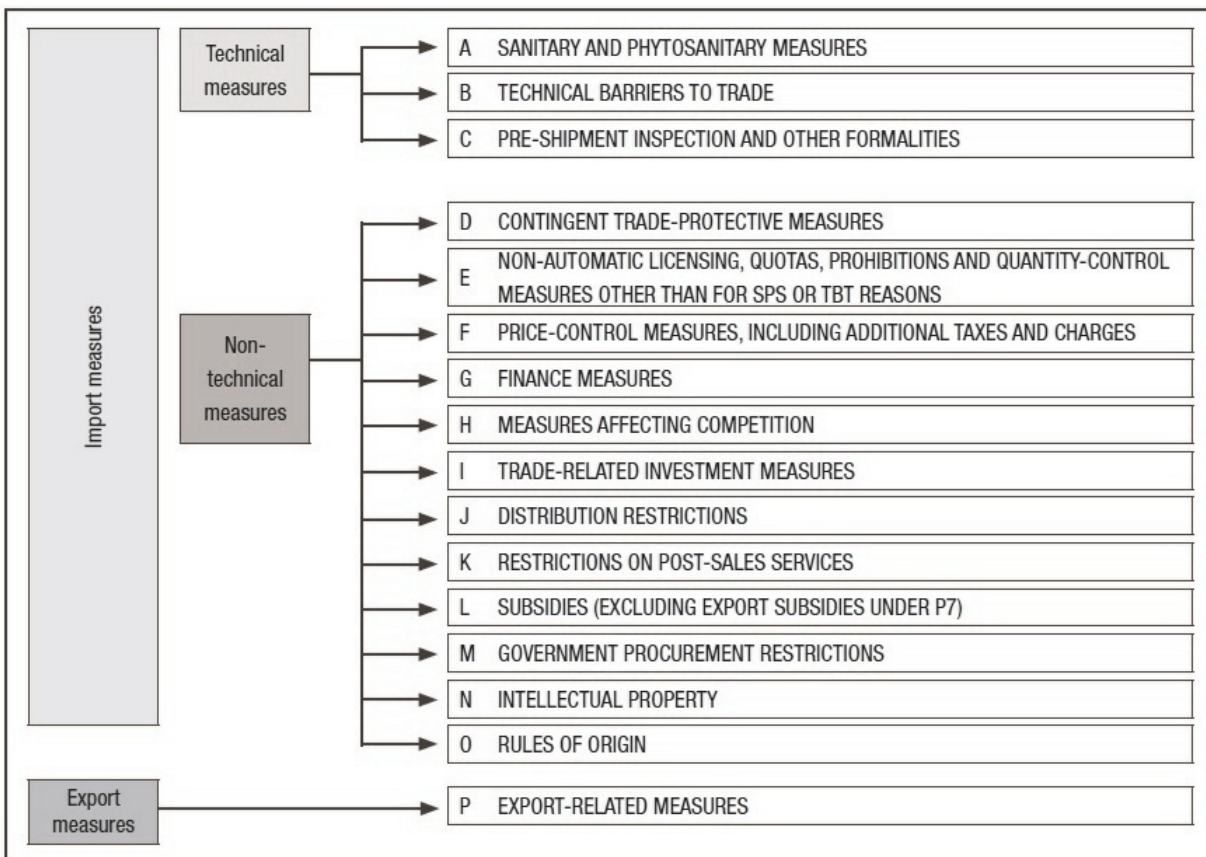
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Figure 1: Classification of NTMs

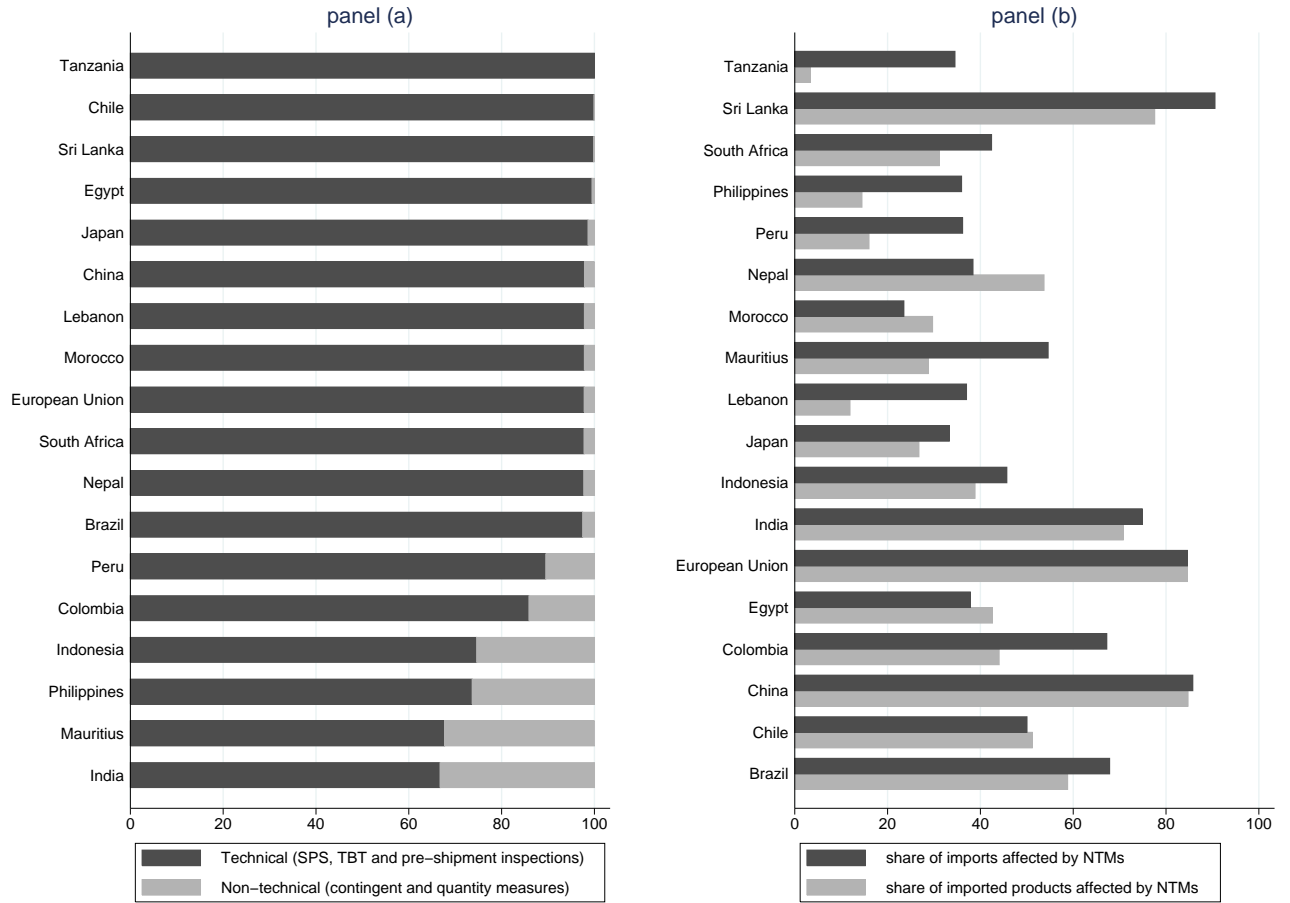


Source: UNCTAD Secretariat ([Gourdon, 2014](#))

Figure 2:

Shares of technical and non-technical measures: panel (a)

Share of imports and imported products affected by at least 1 NTM: panel (b)



Source: Author's calculations based on the CEPII NTM-MAP dataset

Figure 3: Matching STCs and NTMs

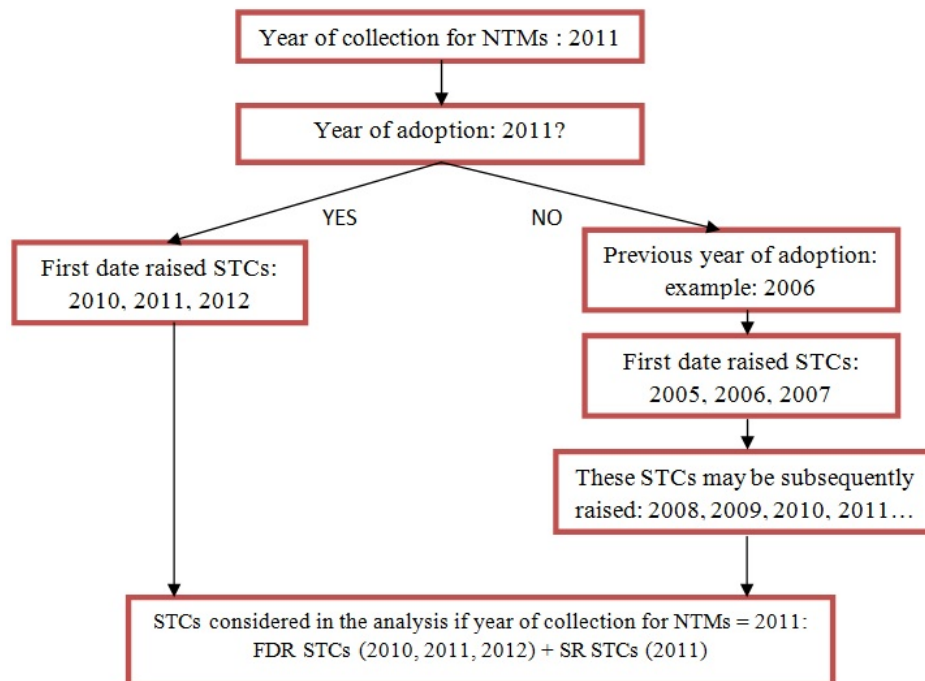
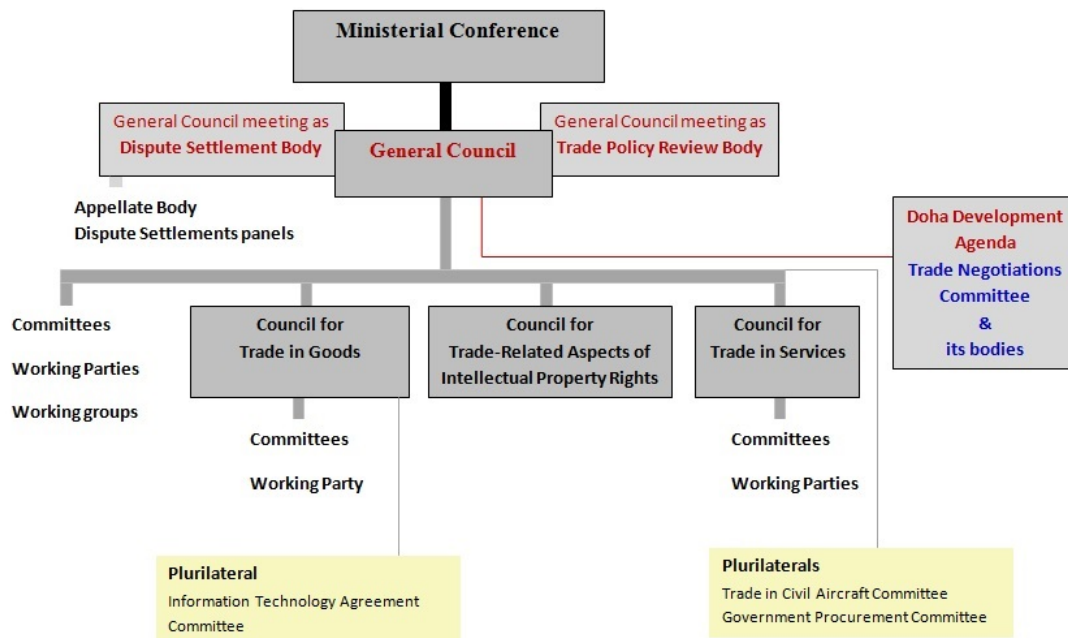
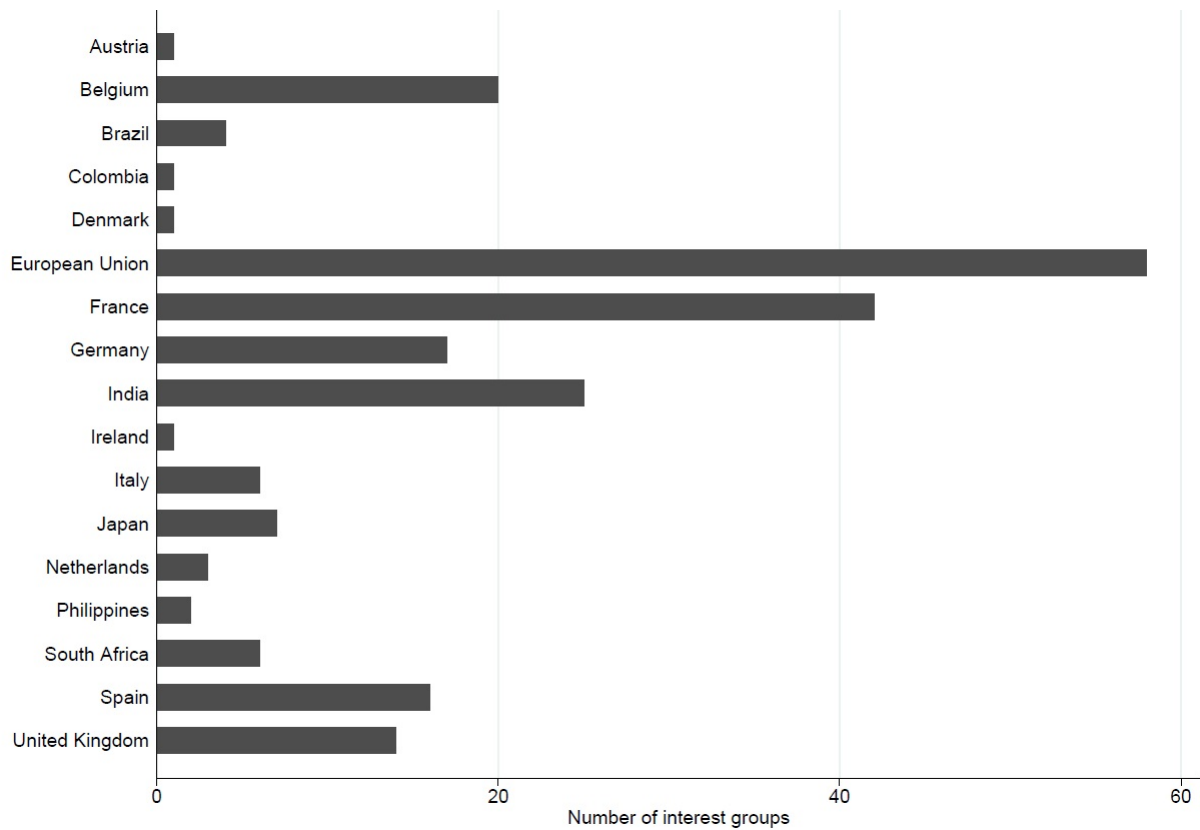


Figure 4: Structure of the WTO



Source: WTO

Figure 5: Business groups having attended the WTO MCs over time by country



Note: Author's calculations based on [Hanegraaff *et al.* \(2011\)](#).

If a country is not included, it means 0 participation (exhaustive dataset).

Table 1: List of countries

Region	Country name	Year
Latin America	Brazil	2012
	Chile	2012
	Colombia	2012
	Peru	2012
Africa	Mauritius	2011
	South Africa	2011
	Tanzania	2011
Asia	China	2012
	India	2012
	Indonesia	2009
	Nepal	2012
	Philippines	2010
	Sri Lanka	2012
Middle East & North Africa	Egypt	2011
	Lebanon	2011
	Morocco	2011
Developed	European Union	2011
	Japan	2011

Table 2: The interest group system of the WTO

Ministerial Conferences	Year	nb. of business groups	nb. of industries	nb. of countries
Singapore	1996	1	1	1
Geneva	1998	1	1	1
Seattle	1999	31	25	6
Doha	2001	43	29	12
Cancún	2003	67	41	16
Hong Kong	2005	47	34	11
Geneva	2009	24	21	7
Geneva	2011	10	10	6

Note: Author's calculations based on [Hanegraaff *et al.* \(2011\)](#)

Table 3: Determinants of NTMs

Countries:	All	Developed	Developing
Dependent variable:	Dummy NTMs	Dummy NTMs	Dummy NTMs
<i>tariff variation_{ki}</i>	-0.160*** (0.057)	-0.244 (0.274)	-0.115* (0.067)
<i>tariffs 2007_{ki}</i>	0.166*** (0.039)	0.519*** (0.164)	0.114*** (0.043)
<i>employment_{si}</i>	0.051*** (0.004)	0.083** (0.032)	0.047*** (0.004)
<i>earnings_{si}</i>	0.039*** (0.008)	0.604*** (0.070)	0.031*** (0.008)
<i>labor share_{si}</i>	-0.027*** (0.006)	-0.484*** (0.075)	-0.030*** (0.006)
<i>import penetration_{si}</i>	0.012*** (0.003)	0.153*** (0.022)	0.012*** (0.004)
<i>export ratio_{si}</i>	0.005* (0.003)	-0.056*** (0.012)	0.003 (0.003)
<i>elasticity_{ki}</i>	-0.013*** (0.002)	-0.030*** (0.009)	-0.012*** (0.002)
Observations	37127	4618	31448
R ²	0.461	0.739	0.456
Product fixed effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes

Note:

Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The European Union is considered as a whole.

Table 4: Determinants of technical and non-technical NTMs

Countries:	All		Developed		Developing	
Dependent variable:	Technical	Non-Technical	Technical	Non-Technical	Technical	Non-Technical
<i>tariff variation_{ki}</i>	-0.153*** (0.057)	0.272*** (0.046)	-0.184 (0.274)	0.322 (0.241)	-0.105 (0.067)	0.184*** (0.044)
<i>tariffs 2007_{ki}</i>	0.148*** (0.039)	0.161*** (0.028)	0.561*** (0.181)	-0.202 (0.200)	0.091** (0.043)	0.167*** (0.029)
<i>employment_{si}</i>	0.053*** (0.004)	-0.005* (0.002)	0.078** (0.032)	0.102*** (0.016)	0.048*** (0.004)	0.007*** (0.003)
<i>earnings_{si}</i>	0.042*** (0.008)	0.011* (0.006)	0.587*** (0.070)	0.436*** (0.050)	0.034*** (0.008)	0.010 (0.006)
<i>labor share_{si}</i>	-0.036*** (0.006)	0.015*** (0.003)	-0.490*** (0.075)	-0.465*** (0.048)	-0.040*** (0.006)	0.016*** (0.003)
<i>import penetration_{si}</i>	0.012*** (0.003)	0.001 (0.002)	0.160*** (0.022)	0.069*** (0.012)	0.012*** (0.004)	0.003 (0.002)
<i>export ratio_{si}</i>	0.006** (0.003)	-0.017*** (0.002)	-0.055*** (0.012)	-0.026*** (0.007)	0.004 (0.003)	-0.018*** (0.002)
<i>elasticity_{ki}</i>	-0.011*** (0.002)	-0.007*** (0.002)	-0.028*** (0.009)	-0.007 (0.007)	-0.011*** (0.002)	-0.007*** (0.002)
Observations	37127	37127	4618	4618	31448	31448
R ²	0.474	0.418	0.738	0.581	0.472	0.446
Product FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes

Note:

Technical: dummy = 1 if at least 1 technical measure affects an HS6 product (0 otherwise)

Non-technical: dummy = 1 if at least 1 non-technical measure affects an HS6 product (0 otherwise)

Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The European Union is considered as a whole.

Table 5: Determinants of restrictive and non-restrictive measures

Countries:	All		Developed		Developing	
Dependent variable:	Restr.	Non-restr.	Restr.	Non-restr.	Restr.	Non-restr.
<i>tariff variation_{ki}</i>	-0.267*** (0.052)	0.114** (0.056)	0.211 (0.286)	-0.422 (0.352)	-0.283*** (0.056)	0.169*** (0.061)
<i>tariffs 2007_{ki}</i>	0.180*** (0.037)	-0.011 (0.038)	-0.149 (0.230)	0.700** (0.337)	0.126*** (0.037)	-0.012 (0.040)
<i>employment_{si}</i>	0.035*** (0.003)	0.016*** (0.004)	0.245*** (0.035)	-0.160*** (0.037)	0.054*** (0.004)	-0.006 (0.004)
<i>earnings_{si}</i>	-0.002 (0.007)	0.041*** (0.007)	0.392*** (0.059)	0.203*** (0.065)	0.001 (0.007)	0.030*** (0.007)
<i>labor share_{si}</i>	-0.039*** (0.005)	0.012** (0.005)	-0.557*** (0.051)	0.066 (0.069)	-0.035*** (0.005)	0.004 (0.005)
<i>import penetration_{si}</i>	0.015*** (0.003)	-0.002 (0.003)	0.107*** (0.022)	0.045 (0.028)	0.022*** (0.003)	-0.009** (0.004)
<i>export ratio_{si}</i>	-0.011*** (0.002)	0.015*** (0.003)	-0.123*** (0.010)	0.070*** (0.014)	-0.007*** (0.002)	0.009*** (0.003)
<i>elasticity_{ki}</i>	-0.001 (0.002)	-0.013*** (0.002)	0.007 (0.009)	-0.039*** (0.010)	-0.000 (0.002)	-0.013*** (0.002)
Observations	37253	37253	4654	4654	31549	31549
R ²	0.481	0.257	0.729	0.548	0.482	0.299
Product FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes

Note:

Restr.: dummy = 1 if at least one restrictive measure affects an HS6 product (0 otherwise)

Non-restr.: dummy = 1 if at least one non-restrictive measure affects an HS6 product (0 otherwise)

Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The European Union is considered as a whole.

Table 6: Lobbying influence on the adoption of NTMs

Countries:	All	Developed	Developing
Dependent variable:	Dummy NTMs	Dummy NTMs	Dummy NTMs
<i>presence MC_{ki}</i>	0.069*** (0.008)	0.034* (0.019)	0.121*** (0.011)
<i>tariff variation_{ki}</i>	-0.170*** (0.060)	-0.290 (0.277)	-0.115* (0.069)
<i>tariffs 2007</i>	0.180*** (0.040)	0.579*** (0.182)	0.140*** (0.043)
<i>employment</i>	0.050*** (0.004)	0.105*** (0.035)	0.044*** (0.004)
<i>earnings</i>	0.031*** (0.008)	0.580*** (0.071)	0.017** (0.008)
<i>labor share</i>	-0.023*** (0.006)	-0.486*** (0.075)	-0.024*** (0.006)
<i>import penetration</i>	0.010*** (0.003)	0.150*** (0.022)	0.008** (0.004)
<i>export ratio</i>	0.004 (0.003)	-0.052*** (0.012)	0.001 (0.003)
<i>elasticity</i>	-0.013*** (0.002)	-0.031*** (0.009)	-0.012*** (0.002)
Observations	37253	4654	31549
R ²	0.460	0.736	0.457
Product FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes

Note:

Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The European Union is considered as a whole.

Table 7: Robustness: Determinants of NTMs

Countries:	All	Developed	Developing
Dependent variables:	Dummy NTMs	Dummy NTMs	Dummy NTMs
<i>tariff variation_{ki}</i>	-0.300*** (0.041)	-0.256** (0.117)	-0.115* (0.067)
<i>tariffs 2007_{ki}</i>	0.209*** (0.038)	0.220*** (0.080)	0.114*** (0.043)
<i>employment_{si}</i>	0.037*** (0.002)	0.018*** (0.002)	0.047*** (0.004)
<i>earnings_{si}</i>	0.009 (0.006)	0.050*** (0.006)	0.031*** (0.008)
<i>labor share_{si}</i>	-0.004 (0.004)	-0.006** (0.003)	-0.030*** (0.006)
<i>import penetration_{si}</i>	0.007*** (0.002)	0.025*** (0.002)	0.012*** (0.004)
<i>export ratio_{si}</i>	0.001 (0.002)	-0.013*** (0.002)	0.003 (0.003)
<i>elasticity_{ki}</i>	-0.010*** (0.001)	-0.009*** (0.001)	-0.012*** (0.002)
Observations	94050	62362	31448
R ²	0.590	0.827	0.456
Product FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes

Note:

Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Members from the European Union are considered separately.

Table 8: Robustness: Determinants of NTMs

Countries:	All	Developed	Developing
Dependent variable:	Dummy NTMs	Dummy NTMs	Dummy NTMs
<i>tariff variation_{ki}</i>	-0.209*** (0.071)	-0.245 (0.303)	-0.169** (0.082)
<i>tariffs 2007_{ki}</i>	0.185*** (0.041)	0.530*** (0.173)	0.132*** (0.044)
<i>employment_{si}</i>	0.051*** (0.004)	0.085*** (0.032)	0.047*** (0.004)
<i>earnings_{si}</i>	0.039*** (0.008)	0.600*** (0.069)	0.031*** (0.008)
<i>labor share_{si}</i>	-0.027*** (0.006)	-0.492*** (0.075)	-0.031*** (0.006)
<i>import penetration_{si}</i>	0.013*** (0.003)	0.153*** (0.022)	0.013*** (0.004)
<i>export ratio_{si}</i>	0.005* (0.003)	-0.055*** (0.012)	0.003 (0.003)
<i>elasticity_{ki}</i>	-0.013*** (0.002)	-0.031*** (0.009)	-0.013*** (0.002)
Observations	37253	4654	31549
R ²	0.458	0.735	0.455
Product FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes

Note:

Tariffs are computed as a simple average.

Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The European Union is considered as a whole.

Table 9: Robustness: Determinants of NTMs

Countries:	All	Developed	Developing
Dependent variable:	Nb. of NTMs	Nb. of NTMs	Nb. of NTMs
<i>tariff variation_{ki}</i>	-0.205* (0.112)	0.610 (0.446)	-0.571*** (0.128)
<i>tariffs 2007_{ki}</i>	0.199*** (0.070)	0.444** (0.209)	0.015 (0.068)
<i>employment_{si}</i>	0.094*** (0.007)	-0.038 (0.061)	0.097*** (0.007)
<i>earnings_{si}</i>	0.043*** (0.012)	0.545*** (0.116)	0.061*** (0.013)
<i>labor share_{si}</i>	-0.076*** (0.009)	-0.691*** (0.133)	-0.083*** (0.010)
<i>import penetration_{si}</i>	0.019*** (0.006)	0.152*** (0.041)	0.009 (0.006)
<i>export ratio_{si}</i>	0.024*** (0.004)	-0.052** (0.023)	0.036*** (0.005)
<i>elasticity_{ki}</i>	-0.036*** (0.004)	-0.038** (0.017)	-0.031*** (0.004)
Observations	37253	4654	31549
R ²	0.603	0.763	0.623
Product FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes

Note:Nb. of NTMs = $\log(1 + \text{number of NTMs affecting an HS6 product})$

Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The European Union is considered as a whole.

Table 10: Robustness: Lobbying influence on the adoption of restrictive NTMs

Countries:	All	Developed	Developing
Dependent variable:	Restrictive	Restrictive	Restrictive
<i>presence MC_{si}</i>	0.048*** (0.007)	0.071*** (0.020)	0.045*** (0.010)
<i>tariff variation_{ki}</i>	-0.278*** (0.052)	0.047 (0.288)	-0.283*** (0.056)
<i>tariffs 2007_{ki}</i>	0.187*** (0.037)	-0.091 (0.225)	0.135*** (0.037)
<i>employment_{si}</i>	0.034*** (0.003)	0.287*** (0.039)	0.052*** (0.004)
<i>earnings_{si}</i>	-0.007 (0.007)	0.362*** (0.061)	-0.004 (0.007)
<i>labor share_{si}</i>	-0.036*** (0.005)	-0.547*** (0.052)	-0.033*** (0.005)
<i>import penetration_{si}</i>	0.013*** (0.003)	0.105*** (0.022)	0.020*** (0.003)
<i>export ratio_{si}</i>	-0.011*** (0.002)	-0.121*** (0.011)	-0.007*** (0.002)
<i>elasticity_{ki}</i>	-0.000 (0.002)	0.008 (0.009)	0.000 (0.002)
Observations	37253	4654	31549
R ²	0.482	0.731	0.483
Product FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes

Note:

Restrictive: dummy = 1 if at least a restrictive NTM affects an HS6 product

Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The European Union is considered as a whole.