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Please cite this paper as:

Moïsé, E., T. Orliac and P. Minor (2011-08-22), "Trade Facilitation Indicators: The Impact on Trade Costs", *OECD Trade Policy Papers*, No. 118, OECD Publishing, Paris.
http://dx.doi.org/10.1787/5kg6nk654hmr-en

OECD Trade Policy Papers No. 118

# Trade Facilitation Indicators

## THE IMPACT ON TRADE COSTS

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OECD

## OECD TRADE POLICY WORKING PAPERS

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# Abstract

## Trade Facilitation Indicators: The Impact on Trade Costs

This report presents the findings of the OECD indicators for assessing the economic and trade impact of specific trade facilitation measures in OECD countries. Twelve trade facilitation indicators (TFIs) have been constructed, corresponding to the main policy areas under negotiation at the WTO, with the aim to estimate the impact of addressing specific facilitation hurdles in the trade procedures of a given country. For OECD countries, the policy areas that seem to have the greatest impact on trade volumes and trade costs are advance rulings, information availability, formalities and procedures and inter-agency cooperation. If all TFIs are added their cost reduction potential would reach almost 10% of trade costs, which is an estimate consistent with existing literature. The use of individual trade facilitation indicators should enable countries to better assess which trade facilitation dimensions deserve priority. The OECD TFI project is now expanded to cover countries outside the OECD area.

***Acknowledgements***

The report was written by Evdokia Moise, of the OECD Secretariat, Thomas Orliac, researcher at GEM, Sciences-Po, and Peter Minor, economic consultant on trade and industry, under the direction of Dale Andrew. Frederic Gonzales, of the OECD Secretariat provided statistical assistance. The authors are grateful to the participants of the October 2010 OECD Experts Meeting on Trade Facilitation for their comments and suggestions.

*JEL classification :* F13, F14, H83, L51

*Keywords:* trade facilitation, customs, transparency, simplification, trade costs, trade flows, WTO.

# *Table of contents*

Executive Summary ..... 5

Trade facilitation indicators: The impact on trade costs ..... 7

I. Background and objectives ..... 7

II. The structure of the work and the dataset. ..... 8

III. The impact of trade facilitation indicators on trade flows and trade costs ..... 10

IV. Reflections on the indicators ..... 13

V. Conclusions ..... 26

References ..... 27

Annex 1. The variables ..... 29
Annex 2. The trade facilitation indicators: relevance and organisation of the variables ..... 45
Annex 3. Gravity specifications ..... 48
Annex 4. Calculation of trade costs ..... 51
Annex 5. The trade costs specifications ..... 52
Annex 6. Contribution to the variance ..... 54
Annex 7. Evidence from the us cross database on advance rulings ..... 56

Appendix 1. Correlation between variables within each indicator ..... 61
Appendix 2. Correlation matrix ..... 65
Appendix 3. Gravity and trade costs regressions ..... 66
Appendix 4. Regressions with all the TFIS ..... 70
Appendix 5. Correlation between the tfis and alternative sources ..... 71

## Tables

Table 1. Average standard error among variables ..... 45
Table 2. Variation for each indicator ..... 46
Table 3. US advance rulings ..... 56
Table 4. US imports and advance rulings ..... 57
Table 5. Regression 1-2 predicting advance rulings (R2 = 0.57) ..... 58

Figures

Figure 1. Information availability ..... 14
Figure 2. Enquiry points ..... 14
Figure 3. Opening hours of Customs supports ..... 15
Figure 4. Involvement of the trade community ..... 15
Figure 5. Total number of advance rulings ..... 17
Figure 6. Number of advance rulings and non-oil/gas imports ..... 18
Figure 7. Set period of time by which an AR is issued ..... 19
Figure 8. Appeal procedures ..... 20
Figure 9. Procedure cleared electronically ..... 21
Figure 10. Rate of physical inspections ..... 22
Figure 11. Post clearance audits ..... 23
Figure 12. Percent of pre-arrival processing ..... 23
Figure 13. Authorized traders ..... 24
Figure 14. What are the benefits linked to AT status? ..... 24
Figure 15. Internal border agency co-operation ..... 25
Figure 16. External border agency co-operation ..... 25
Figure A7.1. US advance rulings and US imports (non-oil and gas) ..... 59

# Executive Summary

This paper presents findings from the project designed to develop indicators for assessing the economic and trade impact of specific trade facilitation measures. In particular, twelve trade facilitation indicators (TFIs) have been constructed, corresponding to the main policy areas under negotiation at the WTO. For this first report, the relationship of the TFIs to bilateral trade patterns and trade costs has been studied. The preliminary analysis shows that the TFIs can be exploited in order to identify which areas contribute the most to increases in trade and the greatest reductions in trade costs.

The Trade Facilitation Indicators (TFIs) are consistent with the twelve articles of the WTO Draft Consolidated Negotiating Text on trade facilitation (DCNT), corresponding to twelve large categories of measures included in the negotiations. These twelve indicators are composed of some ninety-eight variables, whose values are drawn from questionnaire replies as well as publicly available data. The relationships between variables in each category were analyzed to identify logical links and attribute different weights according to their relative importance.

Country scores clearly show that the overall performance of countries within each indicator is determined by a handful of critical variables, where we observe the most important disparities between top and bottom performers. These critical variables include information on appeal procedures, advance rulings and penalty provisions for the indicator *information availability;* and, single windows, pre-arrival processing and authorised traders for the indicator covering the simplification of *formalities and procedures*. Other variables, such as acceptance of commercial documents and authenticated copies for the indicator covering simplification of *documents*, or cross-border agency agreements for the indicator *external co-operation* are fairly homogeneous, as all countries in the sample have achieved top performance in these areas. However, it is expected that they would present much more significant performance disparities in a sample including emerging and other developing countries.

When seeking to identify the policy areas that lead to the highest increases in trade flows, the most significant trade facilitation measure seems to be the indicator of *advance rulings.* Other measures significantly contributing to an increase in trade flows are *information availability*, streamlining of *fees and charges*, harmonisation and simplification of *documents*, and *co-operation between border agencies* within the country (*internal*) and with neighbouring countries (*external*). Sector specific analysis shows that these indicators are particularly significant for manufactured goods, but less so for agricultural goods. This is mainly due to the poor reply rate on variables accounting for specificities of agricultural goods. On the other hand increases in agricultural goods trade seem to be particularly linked to improvements in *formalities and procedures*.

When seeking to identify the policy areas that could help achieve the most significant reductions in trade costs, measures to streamline *procedures* and *advance rulings* are the

greatest contributors: the former have the potential of reducing trade costs by 5.4% and the latter by 3.7%. Other measures that have an important cost reduction potential are *automation* (2.7% in total), and measures to streamline *fees and charges* (1.7%). These are quite significant savings bearing in mind that similar studies have estimated that improvements regarding technical barriers to trade taken as a whole would account for 4.5% of trade cost reductions. If we add all the TFIs together, their cost reduction potential would reach almost 10% of trade costs, which is an estimate consistent with several existing studies on the overall impact of trade facilitation on trade costs.

The use of individual trade facilitation indicators should enable countries to better assess which trade facilitation dimensions deserve priority. Future steps in the work could include refining the analysis in a more sector-specific, firm-specific manner and expanding the analysis to cover countries outside the OECD area, including emerging and other developing countries.

# Trade Facilitation Indicators: The Impact on Trade Costs

## I. Background and objectives

Trade facilitation refers to policies and measures aimed at easing trade costs by improving efficiency at each stage of the international trade chain. According to the WTO definition, trade facilitation is the "*simplification of trade procedures",* understood as the "*activities, practices and formalities involved in collecting, presenting, communicating and processing data required for the movement of goods in international trade*".[1] This is the definition also followed by OECD work on trade facilitation, while wider definitions, such as those used by UNCTAD or APEC, may include customs, transport and transit issues, banking and insurance, business practices and telecommunications. Whatever the definition and scope, existing economic analysis of trade facilitation usually draws on the notion of trade transaction costs and seeks to assess the benefits of (efficiency-enhancing) trade facilitating measures by estimating the costs of inefficiency in the various policy areas influencing the movement of goods. Such analysis is usually carried out by using the "work horse" of trade analysis, the gravity model.

Seeking appropriate tools for estimating the costs of inefficiency, the Working Party decided to develop indicators to assess the economic and trade impact of trade facilitation measures [scoping paper TAD/TC/WP(2008)12]. Contrary to previous studies which sought to quantify the overall impact of trade facilitation, the primary aim of this work has been to estimate the impact at the macro level of addressing *specific* facilitation hurdles in the trade procedures of a given country; and provide an indication of the net benefits of *specific* measures at the micro level, focussing on trade facilitation dimensions which directly depend on public sector involvement. The Working Party sought a better understanding of the relative economic importance and relevance of various trade facilitation measures for OECD and non-OECD countries, for several reasons: a) in order to provide a basis for prioritizing trade facilitation actions by governments; b) to better focus advocacy efforts; c) to provide additional support for the successful conclusion of the ongoing WTO negotiations; as well as d) to mobilize technical assistance and capacity building efforts for developing countries in a more targeted way.

At its March 2009 meeting, the Working Party approved the proposed methodology for building trade facilitation indicators [TAD/TC/WP(2009)2] and agreed to provide missing data via a questionnaire. The present report, based on data from the 26 countries that have replied to the questionnaire by June 2010 (25 OECD Members plus Hong Kong, China) completes the construction of the indicators and tests their impact on trade costs.

1. For the purposes of the Doha Round negotiations, discussions aim to "*clarify and improve relevant aspects of Articles V, VIII and X of the GATT 1994 with a view to further expediting the movement, release and clearance of goods, including goods in transit*"

## II. The structure of the work and the dataset

In order to compose specific indicators for each trade facilitation measure or family of measures amenable to economic analysis, we identified, as a first step, the key elements making up each indicator. The current structure of the WTO negotiation process was followed closely in order to maintain the relevance of the resulting indicators for negotiators, implementing authorities and donors. The Draft Consolidated Negotiating Text (DCNT) on trade facilitation includes 12 families of measures, covered in 12 articles of the draft agreement:[2]

**Article 1** Publication and Availability of Information (covering publication; information available through Internet; enquiry points; and notification)

**Article 2** Prior Publication and Consultation (covering intervals between publication and entry into force; opportunity to comment on new and amended rules; and consultations)

**Article 3** Advance Rulings

**Article 4** Appeal Procedures

**Article 5** Other Measures to Enhance Impartiality, Non-Discrimination and Transparency (covering conditions applied to import alerts; detention of shipments; and test procedures)

**Article 6** Disciplines on Fees and Charges Imposed on or in Connection with Importation and Exportation

**Article 7** Release and Clearance of Goods (including pre-arrival processing; separation of release from final determination and payment of Customs duties, taxes, fees and charges; risk management; post clearance audits; average release times; authorised operators; and expedited shipments)

**Article 8** Consularization

**Article 9** Border Agency Cooperation

**Article 10** Formalities Connected with Importation and Exportation (covering their periodic review; reduction; and harmonisation with international standards; the acceptance of commercially available information; use of single windows; disciplines on pre-shipment inspection and customs brokers; and temporary admission of goods)

**Article 11** Freedom of Transit

**Article 12** Customs Cooperation

These twelve families of measures have been re-organized, in order to take into account similarities between measures, underlying shared components, as well as areas where further distinctions were warranted. Another indicator, meant to capture elements of good governance and impartiality of border administrations, was also added.

At this stage, *freedom of transit* [Article 11] has not been used as a separate indicator nor has transit trade and the countries of transit been identified in the sample data. Any proposed transit indicator would include many elements from indicators covering

2. Negotiating Group on Trade Facilitation, *WTO Draft Consolidated Negotiating Text,* TN/TF/W/165/REV.8, 21 April 2011. The text also includes three more articles: Art.13 on Institutional Arrangements; Art.14 on National Committee on Trade Facilitation; and Art.15 on Cross-Cutting Matters; and a Section II on Special and Differential Treatment Provisions for Developing Country Members and Least Developed Country Members.

articles 1, 2, 6, 7, 9 and 10. Because transit trade raises similar publication, fees and formalities and cooperation issues as measures related to non-transit import/export trade, a separate indicator on transit trade incorporating those issues would potentially share many of the attributes of other trade facilitation indicators and, included in the same analysis, would present challenges to statistical estimation, unless transit trade and the country of transit were identified and a separate analysis run on transit trade. In contrast to the many transit issues which share attributes with non-transit indicators, there are certainly issues raised in the DCNT that are unique to transit, such as security, monitoring and guarantees, special border crossing facilities for transit trade, disciplines for fees and standards, or infrastructure issues, which bear no equivalent in the other DCNT articles and would need to be considered separately. However, within the current sample, which includes only four landlocked countries and does not identify the country\ies of transit, the estimation of statistically robust estimates would be difficult, if at all possible. Given the importance of transit for landlocked and transit countries in the developing world, a separate transit indicator, with distinct transit trade data and model will be specified in the next phase of the project on an extended country sample.

This reorganisation result in the following twelve indicators:

| | | |
|---|---|---|
| a. | Information availability | [Art.1+2+11] |
| b. | Involvement of the trade community | [Art.2+11] |
| c. | Advance Rulings | [Art.3] |
| d. | Appeal Procedures | [Art.4] |
| e. | Fees and charges | [Art.6+11] |
| f. | Formalities – Documents | [Art.7+10+11] |
| g. | Formalities – Automation | [Art.7+10+11] |
| h. | Formalities – Procedures | [Art.5+7+10+11] |
| i. | Cooperation – Internal | [Art.9.1+11] |
| j. | Cooperation – External | [Art.9.3+11+12] |
| k. | Consularization | [Art.8] |
| l. | Governance and Impartiality | |

Most measures reflected in the variables (*single window, fees and charges*, etc.) draw on the definitions of the WTO Negotiating Group on Trade Facilitation, to be found in the *Draft Consolidated Negotiating Text* (TN/TF/W/165/REV.8). Annex 1, listing the 98 variables, indicates, where appropriate, the DCNT Article linked to each variable and provides additional annotations to explain the scope and coverage of the variables.

Data were drawn from existing databases and information publicly available on the Internet (Customs websites, official publications such as Customs Codes, annual reports, etc.) for the component variables on trade facilitation measures. This information was supplemented by replies provided by OECD members and observers to the agreed questionnaire.[3] For the purpose of the work, hard data[4] and internal data[5] were favoured to the extent they were available. Each Member's dataset was checked for accuracy in respective capitals.

3. Analysis contained in this paper is based on the 26 replies received by June 2010.

4. Quantitative information (in form of numbers), as opposed to soft data (qualitative information from survey or policy reviews)

5. Collected directly by the Secretariat through the questionnaire and through the relevant members' official agencies

## III. The impact of Trade Facilitation Indicators (TFIs) on trade flows and trade costs

Following the construction of the indicators, their relevance and robustness have been tested through gravity and trade costs models. We sought to evaluate which area (indicator) of trade facilitation leads to higher increases in trade and greatest reductions in trade costs, so as to provide advice for prioritizing trade facilitation policies. However, this does not allow organising the indicators in a preferential implementation order (sequencing). In order to do this, additional data on the implementation date of every relevant variable would be needed. This kind of information is not available in the current dataset, but could be sought for inclusion in the future. As the TFIs do not have a sector specific design (even if they should mainly cover goods), regressions were run for the total economy for different sectors at aggregated levels,[6] but also separately for the manufacturing and agricultural sectors.

### *The impact of the TFIs on bilateral trade patterns*

The relevance of the TFIs was first tested with a gravity equation,[7] linking trade flows to economic attributes and a series of variables controlling for bilateral costs, such as distance.[8] This is based on the premise that trade facilitation measures are supposed to increase bilateral trade flows.[9]

A first important observation is that the most (statistically) meaningful results are obtained when all sectors are included.[10] Sector specific analysis shows that the indicators are particularly significant for manufactured goods, but less so for agricultural goods. This is mainly due to the poor reply rate on variables accounting for specificities of agricultural goods (such as the distinction between perishable and non-perishable goods).

When the **manufacturing sector** is tested separately, almost all TFIs are statistically significant and carry the expected sign (positive, as trade facilitation improvements are expected to increase bilateral trade) with the exception of (f) (*Formalities Documents)* which does not bear the expected sign. Within this group of indicators, *Information Availability* (a), *Advance Rulings* (c) and *Formalities – Procedures* (h) have the highest impact on bilateral trade. A second group includes indicators *Involvement of the trade community* (b), *Appeal Procedures* (d), *Fees and charges* (e), *Formalities – Automation*

6. Sectors follow the ISIC Rev.3 classification for data harmonization reasons. Future research could proceed to introduce further sectoral distinctions and sector specific elements to the TFIs (such as further distinctions between perishable and non perishable goods, or service related issues), but this is beyond the scope of this paper.

7. Based on the most commonly used Anderson and Van Wincoop (2003) model.

8. The results are quite stable for the classical variables of the gravity equation, which bear the expected signs and are statistically significant. The exception is the variable "colony", which could be explained by the country coverage and the range of time used in the study.

9. Details on the challenges of the regression and ways to overcome them are described in Annex 3 and tables in Appendix 3 provide a summary of the results for several sectors.

10. The adjusted $R^2$ is higher than the other sector coverages (in average 0.77) and the number of observations is much more important (between 71 000 and 76 000 depending on the specifications). Note that we also include sector fixed effects when the sector coverage is *all sectors*. The number of observations ranges between 2 100 and 2 400 for the other sector coverages.

(g), *Cooperation – Internal* (i) , *Cooperation – External* (j) and *Governance and Impartiality* (l), for which results are ambiguous.

When the **agricultural sector** is tested separately, almost all the TFIs are non-significant or negative. Thus, indicators (c), (e), (f), (j) and (l) are never significant and indicators (a), (b), (d), (g), (h) and (i) are significant and carry the expected sign depending on the regression specifications (in some cases, significant indicators do not withstand robustness checks).

For the **total economy**, the regression was run combining the values of the different sectors but without aggregating them in one single figure.[11] This coverage, controlled with sector specific fixed effects increases the number of observations: almost all of the indicators are significant and carry the expected sign, with the exception of indicator (f) (*formalities- documents*).

The significant results for indicator (c) (*advance rulings*) are perhaps surprising, and further reflections on the interpretation of the indicator on advance rulings are proposed in Section IV.c. Second, it seems that indicator (f) on *Formalities-Documents* is only significant when applied to the manufacturing sector. On the contrary, indicator (h) on *Formalities- Procedures* fits less well under the agricultural sector coverage. This would seem to indicate that agricultural goods are more sensitive to the procedures (clearance time, pre-arrival processing, per cent of physical inspections), whereas manufacturing goods are more sensitive to the required documentation. Finally indicator (g) (*automation*) is especially significant when we account for all sectors, including services, which corresponds well to the relation of the indicator with IT, as well as its importance for time sensitive goods.

Finally, indicator (d) on *appeal procedures* is never statistically significant. This does not mean necessarily that the indicator is not relevant for trade facilitation, but that its construction needs to be adjusted.[12]

### *The impact of the TFIs on trade costs*

TFIs were then tested as regards their impact on trade costs. This was done on the basis of a new methodology developed by Novy (2008)[13] in order to overcome problems of data coverage that often complicate overall trade costs assessments. According to this method, all that is required to calculate trade costs are data on domestic production relative to exports for each country. Several recent studies use this approach, among them OECD studies testing the STRI (2008a, 2009b) and Shepherd (2009). Trade costs calculated on the basis of this methodology were then decomposed, running several regressions on a set of "classical" variables such as distance, common border, common language, colony, and tested adopting alternative specifications.[14] The results are quite

11. A regression using an aggregated total economy value does not provide sufficient information to be useful.

12. One explanation could be that this indicator relies on several missing data.

13. Based on a variety of gravity related models (including Anderson and van Wincoop (2003), Eaton and Kortum (2002), Chany (2008) or Melitz and Ottaviano (2008), Chen and Novy (2009) derived a micro-founded measure of bilateral trade at the European industry level, showing that this methodology requires limited data and deals well with multilateral resistance issues. The *Novy* calculation of trade costs is explained in Annex 4

14. Alternative specifications are explained in Annex 5.

similar to those obtained in the previous gravity regressions (see Appendix 3).[15] The model is globally significant[16] and performs well for both the manufacturing and the agriculture sectors.

When the **manufacturing sector** is tested separately, almost all the TFIs are significant and carry the expected sign (negative, contrary to gravity, since trade facilitation improvements are expected to reduce trade costs). Most of the indicators that are statistically significant in gravity are also significant in the trade costs specification. Thus indicators (a) (*Information Availability)*, (c) (*Advance Rulings)*, (e) (*Fees and Charges*), (i) (*Internal Cooperation)*, (j) (*External Cooperation*) and (l) (*Governance and Impartiality)* remain significant.[17] Similar to gravity, indicator (f) (*Formalities – Documents)* is significant but carries the wrong sign (positive).

When the **agricultural sector** is tested separately, all indicators have the expected sign, with the exception of indicator (f) (*formalities-documents*).

For the **total economy**, results remain meaningful as only indicator (f) (*formalities - documents)* does not carry the expected sign.[18] Among all the indicators and irrespective of specification, indicator (a) (*Information Availability)* and (h) (*Formalities – Procedures)* seem to impact the most on trade costs. It cannot be excluded that these indicators account for non observable variables, as they share common dimensions with other indicators (information on advance rulings, procedures, penalties, or legislation for example), but improving the accuracy of the other indicators should also help address this issue. Indicator (c) (*Advance rulings)* seems to impact quite significantly on trade costs and have one of the most sensitive coefficients.

The quantitative contribution of each indicator to the reduction of trade costs is illustrated by a "decomposition of variance" analysis (Annex 6). This provides relative weights to the TFIs and could also be used to weight the TFIs in an aggregate Trade Facilitation Indicator.[19] It appears that the most important indicator as regards manufactured goods trade is indicator (h) (*formalities – procedures)* which accounts for a potential reduction of 5.4% of trade costs. *Advance rulings* (indicator c) accounts for a potential reduction of 3.7% of trade costs, while *Formalities-automation* (g) and *Fees and charges* (e) account for a potential reduction of 2.7% and 1.7% respectively. These results are quite significant, especially if viewed against estimates (Chen and Novy, 2009) that improvements regarding technical barriers to trade taken as a whole would account for 4.5% of trade cost reductions. As a comparison, the "classical" control variables of the

15. All "classical" control variables bear the expected signs.

16. The average Adjusted-$R^2$ ranges between 0.51 for agriculture to 0.72 for manufacturing, indicating that further relevant determinants of trade costs are missing. Checking robustness, PPML and cross-section regressions confirm almost all the time the OLS estimations

17. Note that indicators (i), (j) and (l) become non-significant in cross-section robustness checks, however in this configuration the number of observations drops dramatically (400).

18. The results are practically the same when running the regressions using different indicator compositions and weighting schemes. However, it appears that variable V61 (*Single Window)* plays a leading role in indicator (h) (*Formalities – Procedures)* and when more weight is attributed to this variable (under the EJ scheme), indicator (h) becomes more meaningful.

19. This approach requires running regressions with all the TFIs together (Appendix 4). As the inclusion of correlated variables in the same regression usually raises econometric and interpretation issues, this approach should be considered with caution, even if the correlation matrix (Appendix 2) does not display high correlations between the TFIs.

regressions account for 0.7% (languages), 0.9% (contiguity) or 33% of cost reductions (distance, which incorporates all transport costs)[20]. The results are meaningful for manufactures, especially for indicators (h) (*Formalities – Procedures)* and (e) (*Fees and charges),* while indicators (c) (*Advance Rulings*) and (g) (*Automation*) are also meaningful under an "all-sectors" specification.

Finally, if all TFIs are added[21] it appears that the TFIs could result in an average of 10% of trade cost reductions and almost 14% for manufactures. This is an important outcome, consistent with several studies on the impact of trade facilitation on trade costs.[22]

The results for the other indicators do not necessarily mean that they are not relevant; data shortcomings do not allow firm conclusions to be drawn at this stage. Moreover, it should be kept in mind that the scope of the analysis to date has been limited to OECD countries which share many similar regulatory patterns. A sample including emerging and other developing countries would present much more significant performance disparities and could highlight the impact of other indicators on the trade costs.

## IV. Reflections on the indicators

This section presents reflections on each of the indicators and their possible interpretation. They refer to the sample of 26 countries that have replied to the questionnaire unless otherwise specified. They highlight the most important country variations, what they may mean for country performance, as well as interpretation issues raised by the different variables.

### *(a) Information availability*

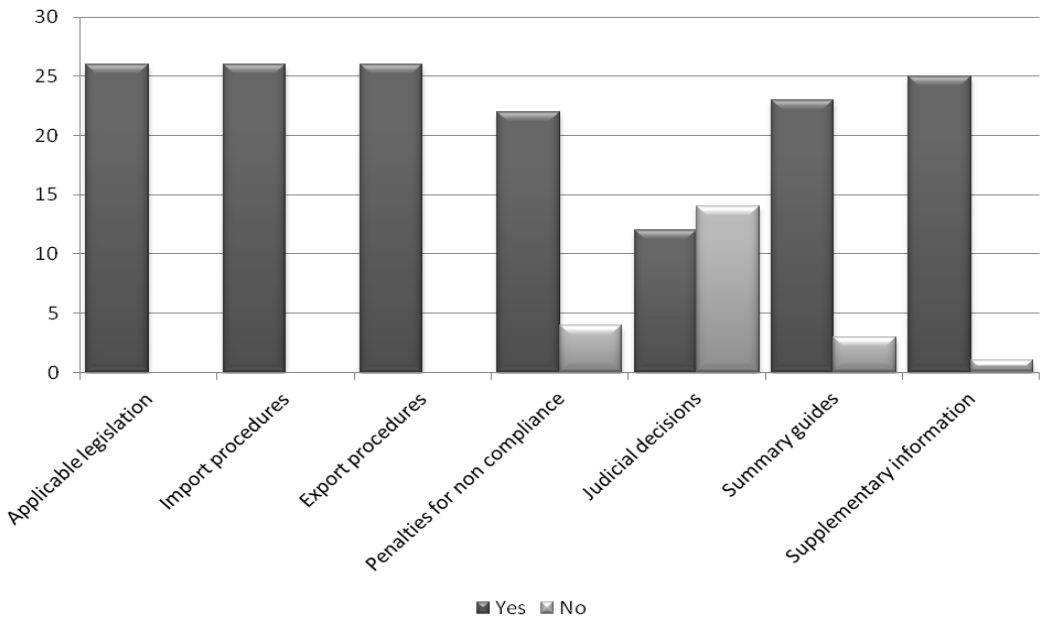
Information on applicable legislation and import and export procedures is commonly available online across the sample. Most countries also offer the possibility to ask for supplementary information. This is typically one of the issues where the current country sample offers very little variation and many variables are attributed the top score throughout the sample. This could change with a wider country coverage including developing or least developed countries. On the other hand, far fewer countries publish penalties for non compliance and examples of judicial decisions. Although almost all countries report in their replies providing information on advance rulings and also on penalties on their website, there rarely seems to be a dedicated page explaining, at least briefly, the different types of penalties and their amounts. We assume that information is essentially provided in the Customs Code.

20. The introduction of a weight/value ratio as in Chen and Novy should decrease the importance of the distance variable. All sector-specific regressions in this paper have been interpreted in this way, showing a more limited value of 8% for distance. If the weight/value ratio is relevant for manufacturing goods or agricultural goods, it is less relevant for services.

21. Apart from "ambiguous" indicators, i.e. indicators too correlated to the others to be included without biasing the outcomes or producing outcomes with unexpected signs.

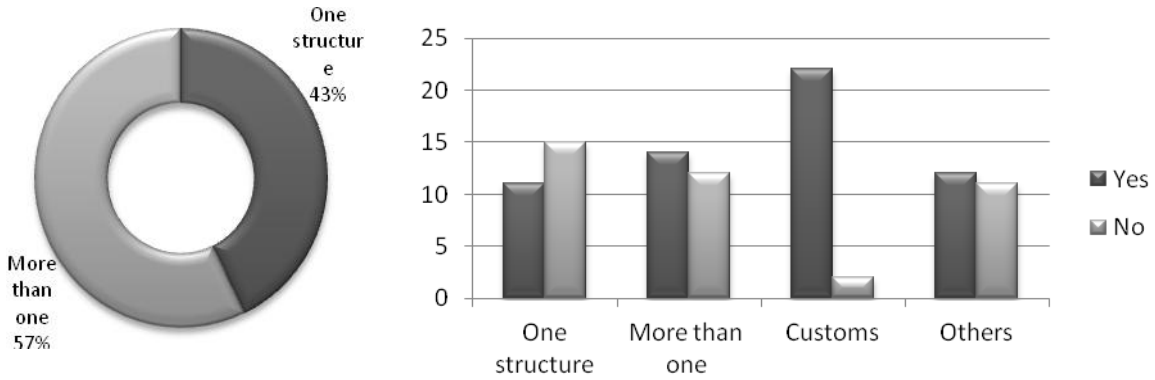
22. OECD, *Quantitative assessment of the benefits of trade facilitation*, TD/TC/WP(2003)31/FINAL.

**Figure 1. Information availability**



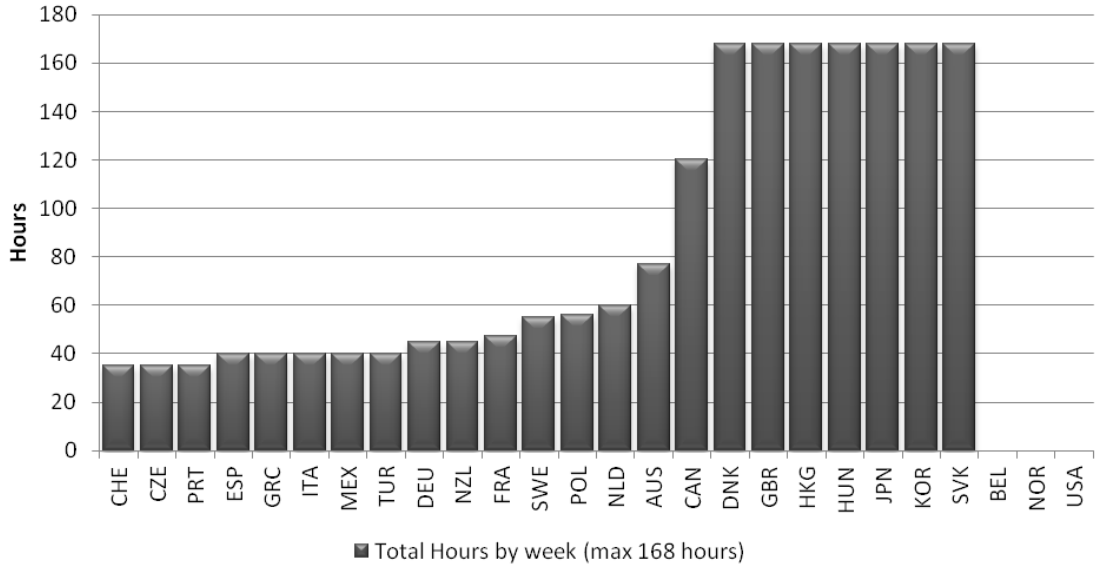

Online content is generally updated by Customs, although some sites also provide links to relevant authorities responsible for different procedures.[23] There only seems to be a single entity acting as an enquiry point in less than half of the sample countries, although the Customs administration does play a central role (Figure 2). Opening hours of Customs supports introduces significant variation across the sample (Figure 3).

**Figure 2. Enquiry points**




23. For example www.businesslink.gov.uk/bdotg/action/layer?r.s=tl&r.lc=en&topicId=1079717544

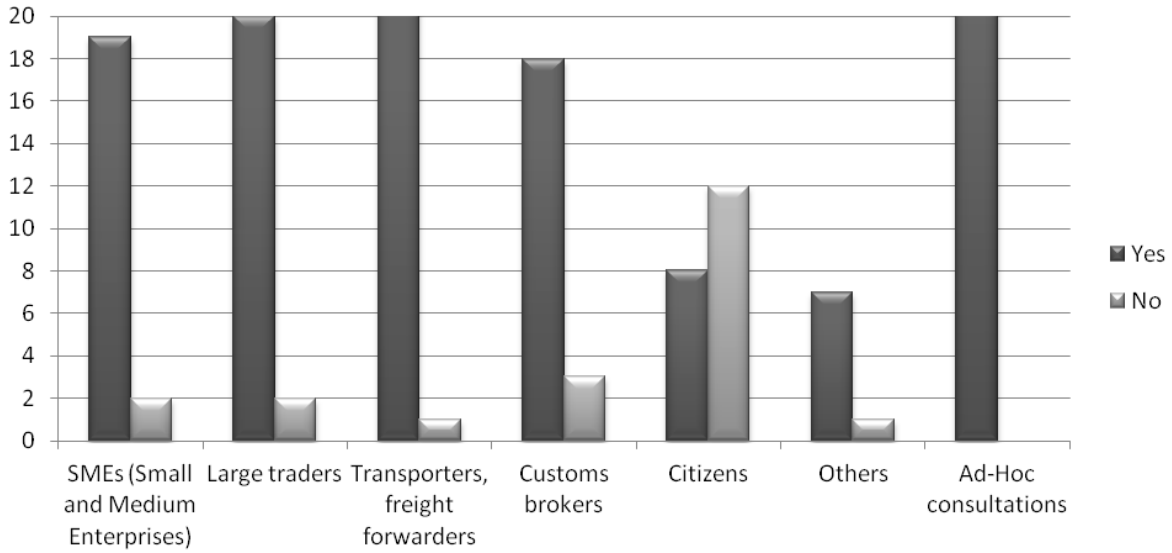
**Figure 3. Opening hours of Customs supports**




### *(b) Involvement of the trade community*

Not surprisingly, there are fewer consultations with citizens than with the various professional communities. The non-implication of citizens should not necessarily be interpreted as a lack of transparency, but could well be due to a lack of interest of non-professionals for issues that can be pretty technical. The average number of consultations on Customs matters is 30 per year per country but there are some disparities across the sample.

**Figure 4. Involvement of the trade community**



### *(c) Advance rulings*

Almost all countries in the sample provide a mechanism for advance rulings, apart from Hong-Kong, China, for which they are irrelevant, as it is a free port.[24] However, levels of use are not at all comparable across countries (between 0 and 28 000 requests per year, depending on the country, see Figure 5, although accurate statistics on this issue do not exist in all countries). They may be issued by national or regional offices.[25] Existing advance ruling mechanisms mainly concern tariff classification (91.96% on average; within the sample they range from 90 to 100%), the second most important area being origin.[26] This is a much more limited scope than the scope of the mandatory advance ruling scheme proposed in the WTO negotiations. The latter may also cover, depending on the outcome of the negotiations, methods used for customs valuation, requirements for duty drawback, use of quotas and the fees and charges applying to a specific good. This means that, based on current data, little can be said about the trade impact of advance rulings in areas other than classification and origin.

The positive results of the indicator on advance rulings are not surprising, as they confirmed the AR's clear benefits to the administration and the traders in terms of predictability, consistency, transparency and reduced disputes. However, the importance of these results in comparison to the other indicators was unexpected, since advance rulings have never before been a subject of significant empirical research by economists or the trade facilitation community. Instead, the trade community has put greater emphasis on formalities such as documents, procedures, and the degree of automation.

One question which must be asked in a gravity model, such as that employed in this analysis, is whether changes in the "dependant" variables (trade volumes or trade costs) are caused by trade facilitation measures such as advance rulings, or, on the contrary, whether trade volumes drive the demand for advance rulings?[27] The construction of the advance rulings indicator includes variables relating to the characteristics of the system (e.g. accessibility of rulings to the general trade, length of time a ruling is in effect, timeliness of issuance and appeal procedures) along with three variables directly related to the number of rulings issued, setting the stage for a potential causal relationship between trade volumes and the number of ARs.[28]

24. For this reason the whole indicator (c) (variables 24 to 32) was dropped from the calculation of the score for Hong Kong, China.

25. Thus for Canada, the majority are issued by regional offices.

26. Very small numbers of advance rulings are reported by Australia, Japan, Korea and the United States on valuation methods, by Australia, Switzerland and the United States on duty drawbacks and by Switzerland and the United States on quotas.

27. See Djankov and Freund (2006)

28. The remaining six variables are not likely tied to trade volumes since they represent administrative procedures more closely related to the management culture of the countries and agencies (e.g. publication, expiration, appeals, and timeliness).

**Figure 5. Total number of advance rulings**

(per year)

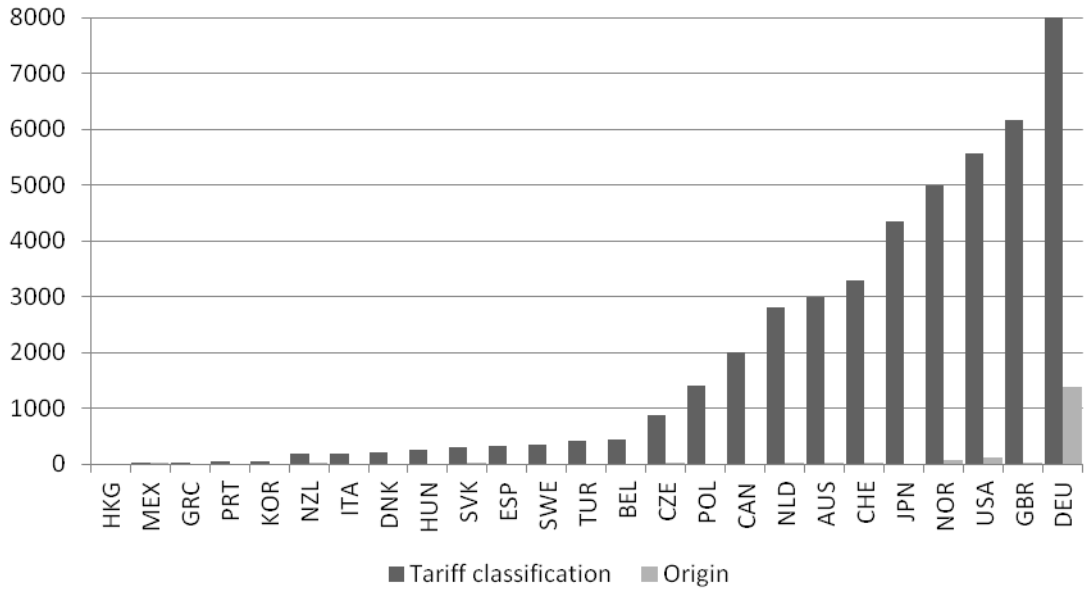


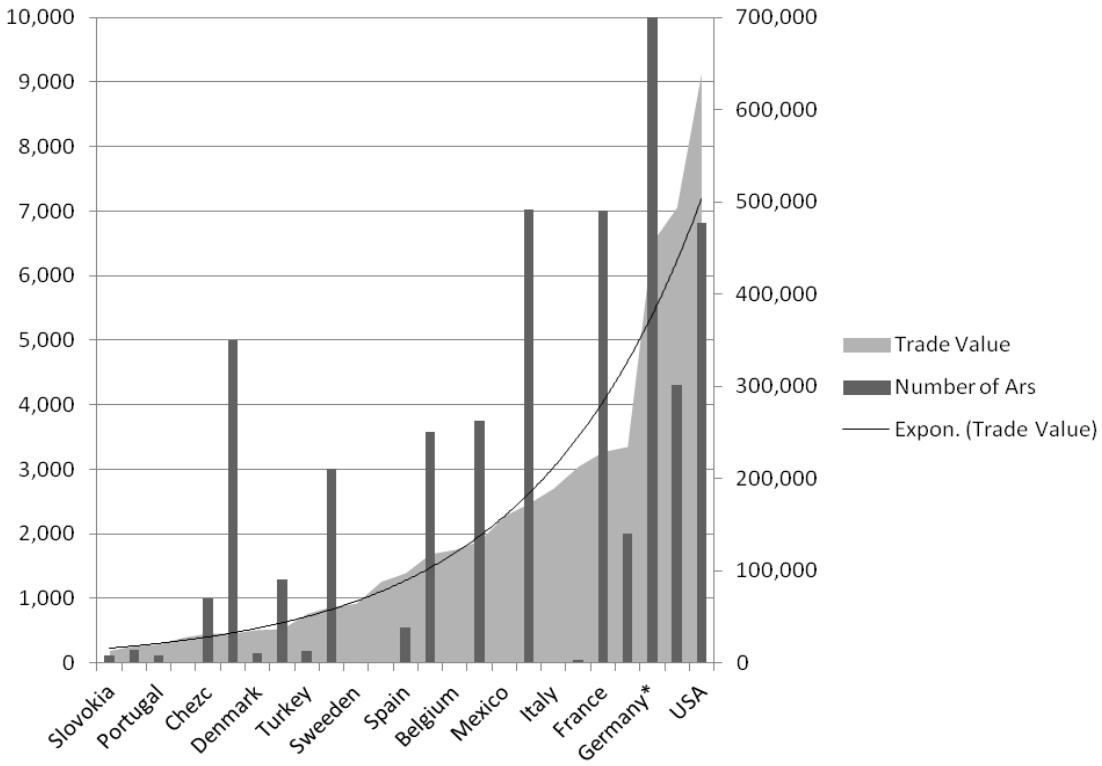

Figure 6 illustrates the relationship between the number of advance rulings reported and non-oil and gas imports.[29] The sample countries are ordered according to their trade volumes (value based, lowest to highest). While a number of the largest traders issue the highest number of advance rulings (United States, Japan and Germany), it is notable that several smaller importers, including Norway, Australia, Switzerland and the Netherlands also issue a significant number of advance rulings, not less than the large traders. A simple correlation between the number of advance rulings and the natural logarithm of trade value results in a correlation coefficient of 0.49. While this simple analysis demonstrates correlation, it does not reveal "close correlation".

Although expert opinion would rather indicate that the direction of causality could be from trade volume to AR numbers, other aspects that may influence the significance of advance rulings include the length of validity of advance rulings (fewer AR requests are necessary when the ruling is valid for a greater length of time); or the tariff treatment of concerned products (ARs would be more relevant for higher tariff products). Furthermore, it could be argued that in a less complex trading environment (for instance, if tariff classification did not go beyond the six digit level) advance rulings would be less relevant. Lacking information over time and/or across commodities to undertake a more extensive analysis of the entire sample data, the hypothesis that trade volumes are the critical determinant of advance rulings and that this factor alone determines the significance of the advance ruling indicator was tested with the help of advance rulings datasets provided by a few Member countries. (Annex 7 presents an illustration of the analysis undertaken, focussing on the US CROSS database, which was the most comprehensive AR dataset available to the OECD Secretariat, covering a twenty year period from 1990 to 2010).

29. Oil and gas trade are removed since these are high value products which can mask underlying trends in goods trade.

**Figure 6. Number of advance rulings and non-oil/gas**

in millions of USD, 2002-04 average

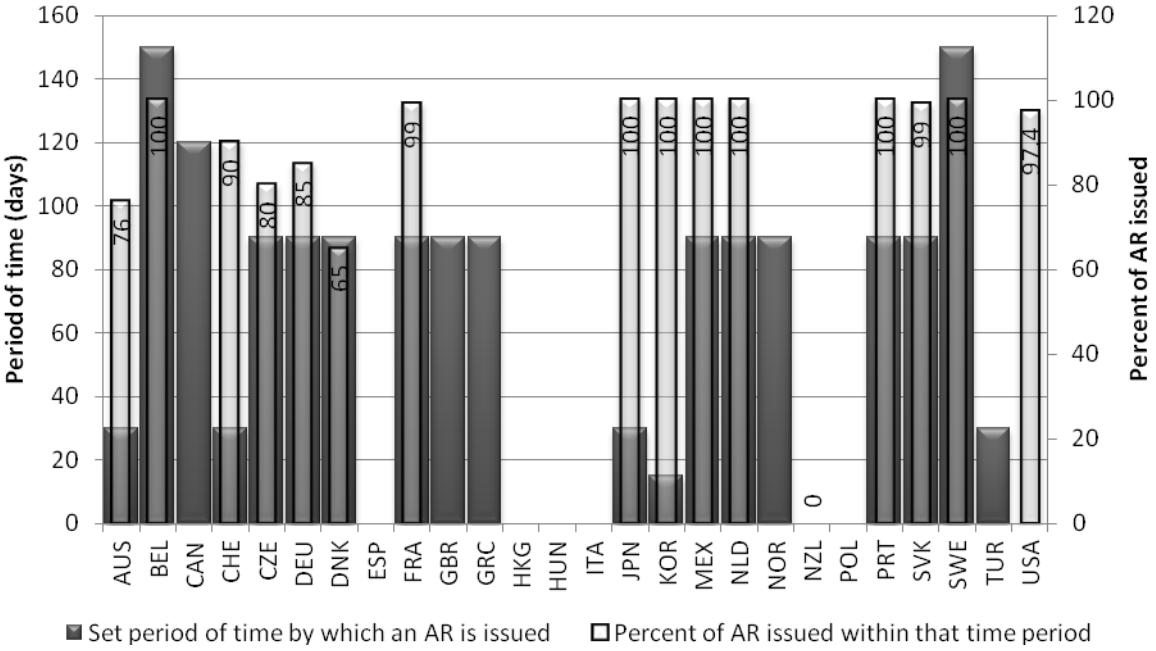



*Source*: OECD TFI questionnaire and data from the GTAP database v.7.

The analysis rejected trade volume as a highly significant determinant of advance rulings. Analysis of cross sectional data demonstrated that the main predictors of the number of advance rulings, in order of importance, are the average tariff levels, the number of tariff lines, the percent of trade entering under a preference program and the number of importers. Trade volumes do impact advance rulings, but only modestly and in selected sectors. The most important factor influencing requests for advance ruling is the structure of the tariff schedule in terms of tariff levels and the complexity of the schedule itself (number of tariff lines). In total, about 60% of the advance ruling requests in the United States can be explained by these four factors.

Based on these findings, the significance of the advance ruling indicator in the current analysis cannot be rejected on the basis of being "closely linked to trade volumes". While the indicator is made up of several other variables, there is no *prima facie* reason to believe they are strongly correlated with trade, but instead these additional variables represent governance issues, such as publication policies, speed and reliability of issuance (see Figure 7), and validity terms. The countries which scored the highest in the advance ruling indicator make an effort to issue rulings quickly, they post rulings for public review, the rulings are not subject to expiration until revoked and an importer can request a review of an advance ruling for modification. The advance rulings indicator likely represents the efforts by customs agencies to encourage compliance through increased communication and confidence between customs administrations and traders.

**Figure 7. Set period of time by which an AR is issued**



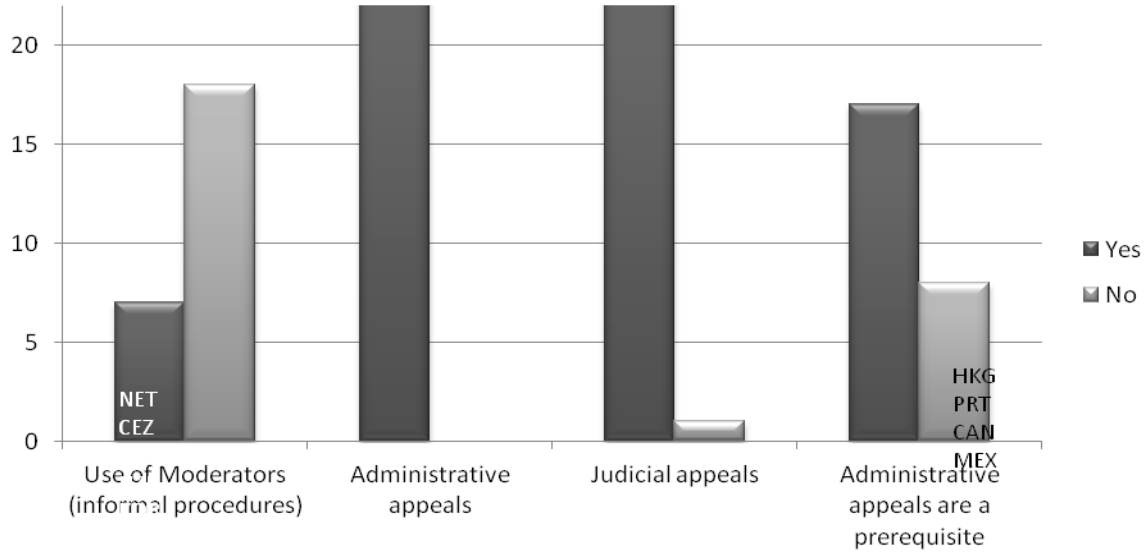

In summary, the significance of advance rulings on trade costs is not a result of correlation with trade volumes, but is likely one of causation. Advance rulings are minimally related to trade volumes. Other factors, such as the complexity of the trade regime and the diversity of products are likely to determine the value (benefit) of advance rulings and their influence on trade volumes. To the extent that advance rulings lower the barriers presented by complex trade regimes, they likely stimulate trade. To the extent advance rulings reduce delays and provide predictability they lower trading costs. At the same time, the construction of the indicator in close relation to WTO negotiating texts may omit other variables of significance for which advance rulings are a strong proxy. For example, advance rulings may be strongly correlated with a particular type of risk management system, which emphasizes interaction and collaboration with the trade community. It is important to bear in mind these considerations, since if advance rulings are a proxy for a particular management style or administrative approach, they will not have the same impact in all countries which attempt to implement them without having put in place good governance systems.

### *(d) Appeal procedures*

Information on appeal procedures on Customs websites is scarce and often not easily accessible. Some information can be found in Customs codes, but almost never in a dedicated page on Customs websites. The scarcity of publicly available data for some countries points to the need for considerable improvements in this area. Appeal procedures follow different patterns across the sample. Moderators are used by only a small group of countries; while administrative appeals are a prerequisite for the judicial stage for two-thirds of the sample countries. The sample confirms the expected tendency to have a much higher number of administrative appeals than judicial appeals.

Outcomes for this indicator have been non-significant for all tested specifications. This does not mean that appeal procedures are not important for trade facilitation, but that the indicator would have to be constructed differently, or dropped as impossible to measure.

**Figure 8. Appeal procedures**




### *(e) Fees and charges*

Although the notion of proportionality between fees and charges and service rendered is quite clear in the legislation of the sample countries and almost all of them indicate that they provide information on fees and their level, such information is very hard to find. Very few countries provide a simple and comprehensive view on the type and level of fees and charges that they apply. Most of the time this information can be found in the Customs Code, but it does not benefit from a dedicated webpage. Publicly available data on fees and charges highlight the paucity of fees and charges-related information and strongly point to the need for OECD countries to improve their performance in this area. Australia, Japan, Hong-Kong, China and New Zealand are among the best providers of this type of information.

### *(f) Formalities - documents*

Most of the sample countries accept commercial documents or authenticated copies when a government agency already holds the original and multiple authorities are involved, without exceptions. The average percent of import procedures that accept copies is 95%. Two thirds of the sample countries no longer request originals when the declaration has been lodged electronically. The number of documents to import or export, is relatively homogeneous across the sample; however less than half of the countries (43%) use a single document.[30]

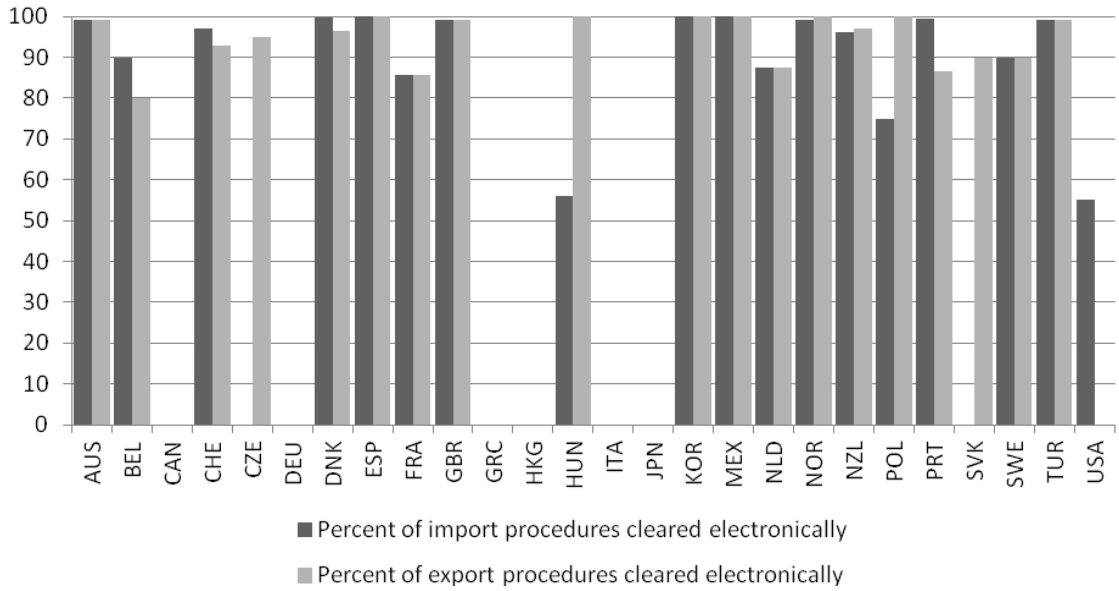
30. Note that the Single Administrative Document (SAD) of the European Union only concern Customs related matters, but not licence issues for example.

International standards compliance has raised interpretation questions: ratification of a treaty does not automatically mean full application and, conversely, a number of the sample countries have not ratified some conventions containing international standards but apply them in practice. Scoring needs to take careful account of this situation. As international standards play a significant role as a multiplier of trade gains at the regional or even global level, the significance of international standards compliance goes far beyond domestic performance.

### *(g) Formalities - automation*

Figure 9 shows that most of import and export procedures are cleared electronically. However these figures need to be put in perspective, since the rates could vary by transport mode. Indeed, even in one of the best performers, Hong-Kong, China, the submission of documents for clearance of goods, including trade declarations, certificate of origin, dutiable commodities permits and cargo manifests has long been carried out electronically by air, water and rail, but the system for electronic submission of advance road cargo information for customs clearance ROCARS) was only launched in May 2010. This could explain the relatively low rate of electronic clearance for countries with an important part of trade by road.

**Figure 9. Procedure cleared electronically**




Information on automation spending is very scarce, a fact that can appear surprising for OECD countries. Data on the rate of irregularities are also quite limited and may suffer from interpretation problems.

### *(h) Formalities - procedures*

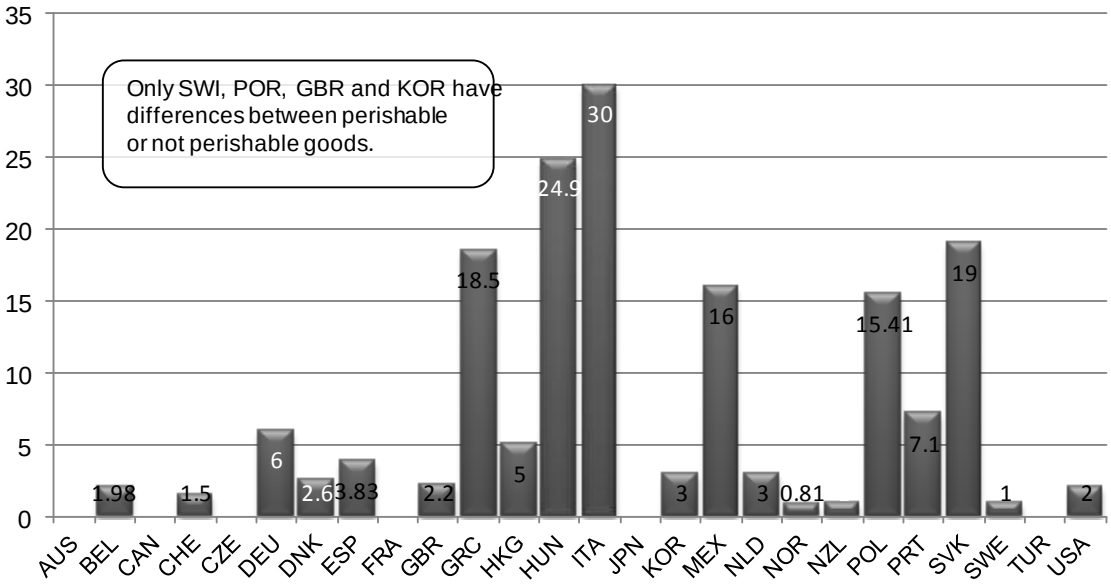
The *Procedures* indicator incorporates a series of very important dimensions of trade facilitation, including single windows, pre-arrival processing, physical inspections, post-clearance audits (PCAs), separation of release from clearance and the concept of authorized traders, all of which play a leading role in indicator (h).

Single Windows are an important trade facilitating measure, which is not yet prevalent in the OECD area. According to the questionnaire only one third of the sample countries use a single window. Presumably for this reason, if more weight is attributed to the *Single Window* variable (V61)[31] indicator (h) appears to have a greater impact on trade volumes and trade costs.

Another interesting dimension is the percentage of physical inspections. The sample presents considerable disparities (Figure 10), even if only one of the responding countries inspects more than 25% of imports. There seems to be no clear relation between the rate of physical inspections and the percentage of post-clearance audits (Figure 11), but the scarcity of data on the latter variable has led us to drop it from the indicator construction at this stage. There seems to be an inverse relationship with the percent of pre-arrival processing, as shown in Figure 12, although information on this variable is still incomplete.

**Figure 10. Rate of physical inspections**

**Per cent of total imports**




31. Under the EJ scheme.

**Figure 11.Post clearance audits**

**Per cent**

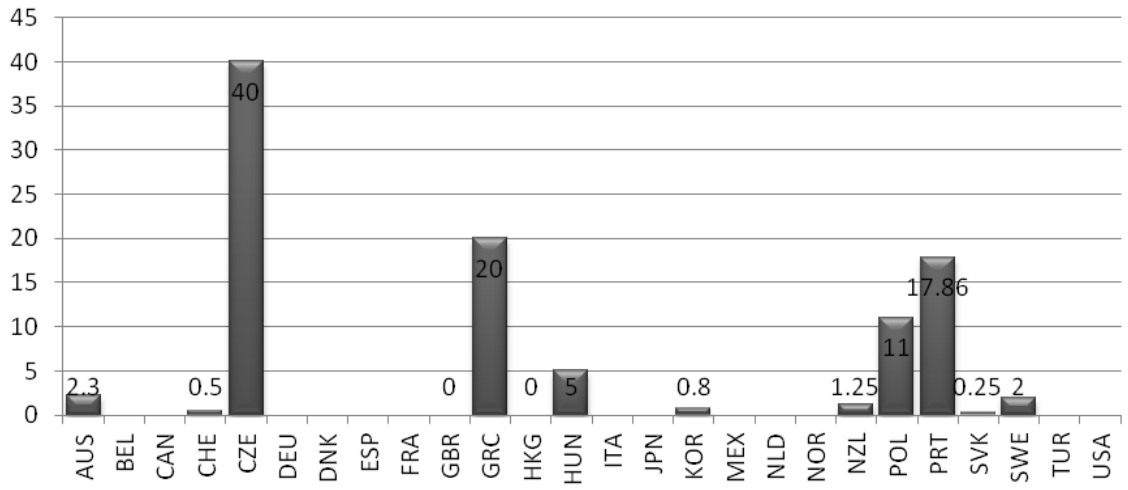
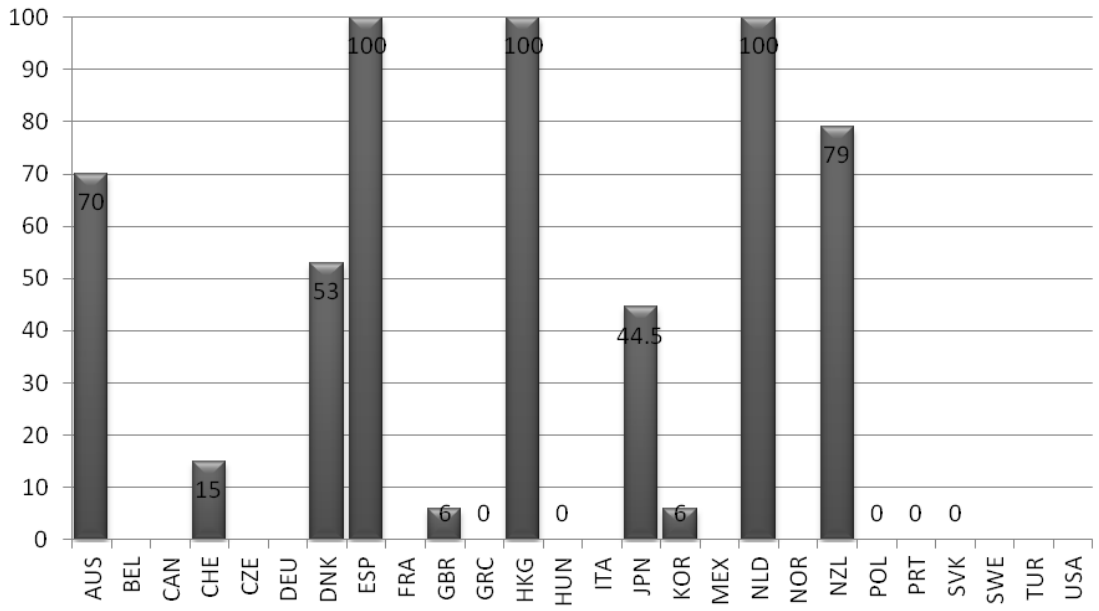



**Figure 12. Percent of pre-arrival processing**




Information on the distinction between perishable and non-perishable goods, is limited. According to replies to the questionnaire, only Italy, Korea, Portugal, Switzerland, and the United Kingdom apply different treatment between perishable and non-perishable goods.

Finally, although information on authorized traders is still incomplete, in the countries which have provided relevant data authorized traders are a limited percentage of total traders but they handle a very significant percentage of total trade (Figure 13). The benefits linked to the Authorized Trader status vary across countries (Figure 14) even

among European countries. AT status generally offers reduced physical and documentary controls and a reduced release time, although other benefits, such as the possibility of periodic declarations and of local clearance are less widespread. This measure needs to be viewed also in a larger, regional or even global context, since the lack of mutual recognition of authorized trader schemes can limit the benefits these schemes bring at the national level.

**Figure 13. Authorized traders**

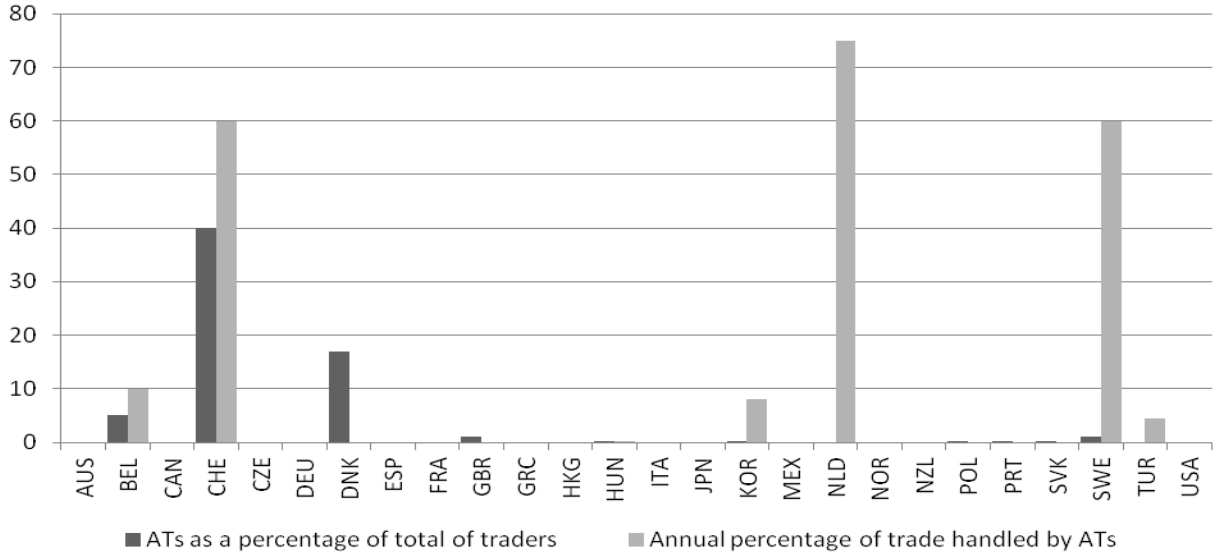
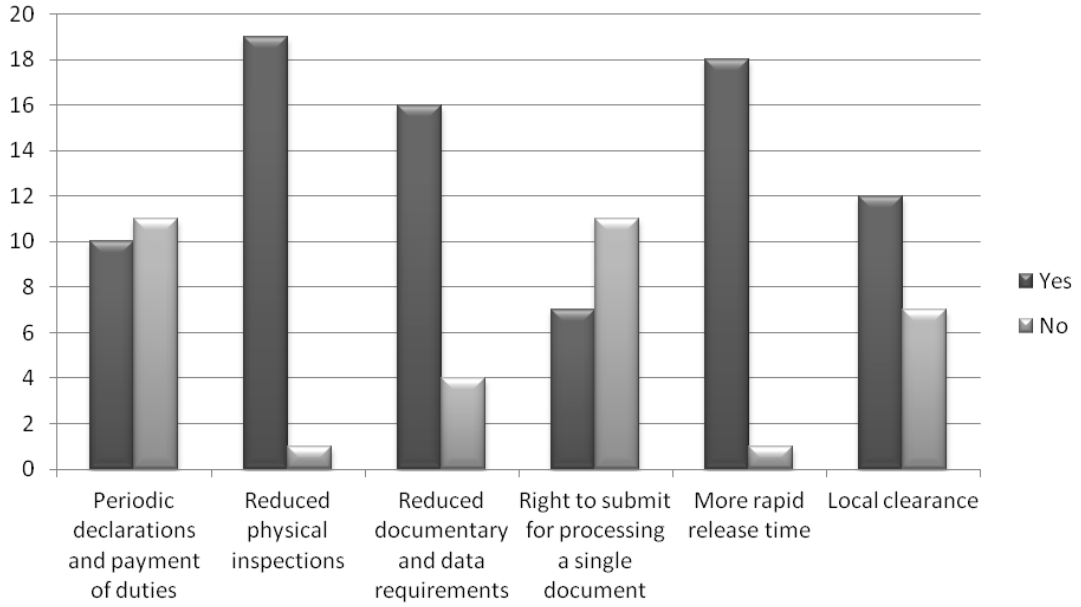


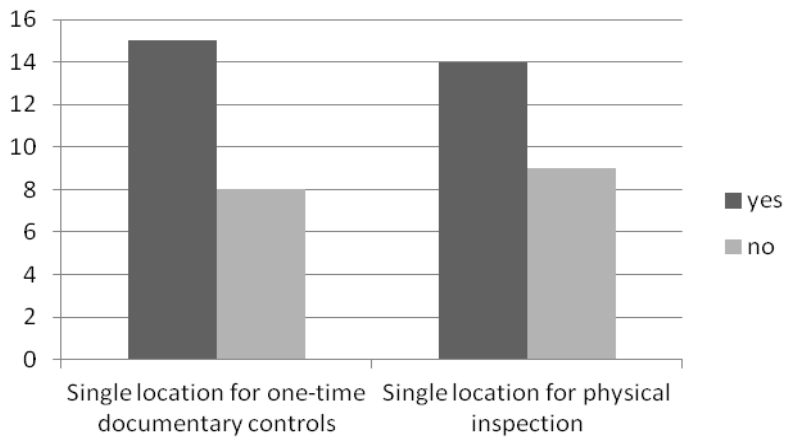

**Figure 14. What are the benefits linked to AT status?**



### *(i) Internal co-operation*

A little less than half of the sample countries provide evidence of significant border agency co-operation both for one-time documentary controls and for co-ordinated physical inspections. As the co-operation between border agencies has been identified in time release studies as an important factor for reducing import lead time, we explored the relation of international cooperation variables to average clearance times. The link was only partially supported by correlation tests.

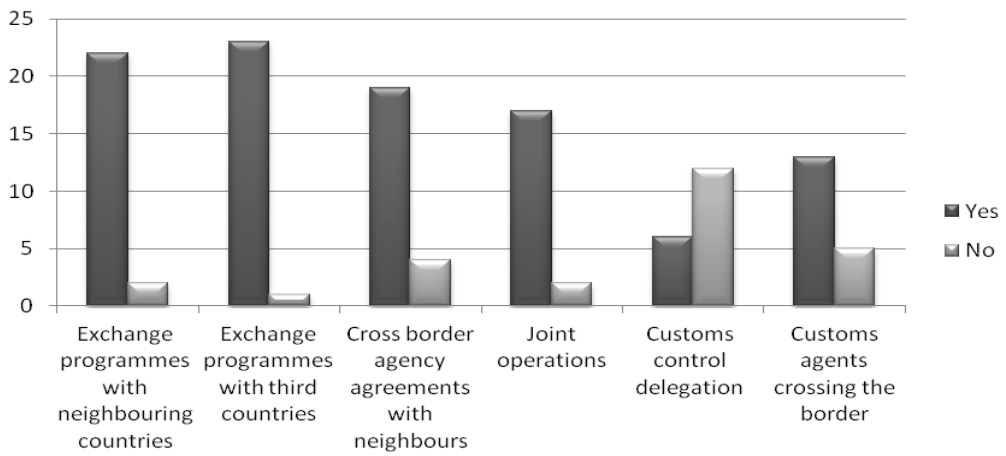
**Figure 15. Internal border agency co-operation**




### *(j) External co-operation*

Almost all sample countries are involved in extensive co-operation and exchange programmes with neighbouring and third countries. Joint operations are quite widespread and almost all the sample countries have cross border agency agreements with neighbouring countries allowing Customs agents to cross the border. However, only six countries report agreements that allow delegating Customs control, of which five are EU countries.

**Figure 16. External border agency co-operation**



### *(k) Consularization*

Not surprisingly, none of the sample countries impose consular transaction requirements. The *"procedure of obtaining from a consul of the importing Member in the territory of the exporting Member, or in the territory of a third party, a consular invoice or a consular visa for a commercial invoice, certificate of origin, manifest, shippers' export declaration, or any other customs documentation in connection with the importation of the good"* is a practice that can be found only in some developing countries. All OECD countries and most major non-OECD countries do not impose such formality. At this stage of the analysis this indicator was not tested further. It may need to be further developed when expanding the country sample to non-OECD countries.

## V. Conclusions

The work on developing Trade Facilitation Indicators undertaken to date has allowed us to build a set of indicators covering the different dimensions of trade facilitation. Despite some problems with missing data and a few ambiguous results, the indicators appear robust and almost all of them can be tested for their impact on trade flows or trade costs.

The main findings indicate that some indicators have a larger impact than others on trade flows and trade costs, at least in the current data and country sample. Sector specific results show that the indicators are especially valuable for manufactured goods. This conclusion is consistent with the way the indicators are built, as agricultural goods specificities (especially the perishable/non-perishable nature of goods) are poorly accounted for by the indicators due to the lack of replies to the questionnaire in this particular area.

Indicators that seem to have the greatest impact on trade volumes and trade costs for manufacturing goods are:

- Indicator (c), *Advance Rulings*
- Indicator (e), *Fees and Charges*
- Indicator (g), *Formalities – Automation*, and
- Indicator (h), *Formalities - Procedures*

Seeking to assess the relative importance of the different dimensions of trade facilitation, it appears that indicator (h) accounts for 5.4% of potential trade cost savings, indicator (c) for 3.7%, indicator (g) for 2.7%, and indicator (e) for 1.7%. These results are quite significant, especially when viewed against estimates on the impact of the entire category of TBTs, which are shown to account for 4.5% of potential trade cost reductions. The results for other indicators, while statistically not significant, are inconclusive at this stage, due to data shortcomings. The limited country coverage of the paper, covering only OECD countries which share many similar regulatory patterns, should also be kept in mind.

The use of the indicators should enable countries to better assess which trade facilitation dimensions deserve priority. On the other hand, data constraints have not permitted, at least not at this stage, to provide indications about the best implementation sequence of various measures.

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# Annex 1.
# The Variables

The twelve indicators contain a total of ninety-eight variables. However, variables, for which there was insufficient data (either no, or insufficient, publicly available sources, or a very poor reply rate in the questionnaire), were not used as input ***at least at this stage of the data compilation.*** Within each indicator, all variables have not necessarily been used to build the indicator, but may serve as control or weighting variables.

Putting together the dataset confirmed that data for some variables are more difficult to obtain than for others. This is the case for some data previously identified as "publicly available", but more frequently for data provided through the questionnaire (the average rate of reply was 78.6%). As a result some variables are not sufficiently supported across the sample. It is therefore proposed to drop from the construction of the indicators variables for which the rate of reply (or publicly available data) is under 50%. These are:

- V17 on production of electronic user manuals when new systems are implemented,
- V23 on the publication of drafts,
- V32 on the motivation of refusal to issue or revocation of an advance ruling,
- V36 (Q22) on the percent of appeals introduced by Customs and resolved in favour of traders,
- V42 (Q24) on the total amount of collected fees,
- V45 on the reduction of the number of fees,
- V52 on the number of documents, as indicated by Customs,
- V56 (Q32) on the amount spent on automation,
- V57 (Q33) on the ratio of irregularities,
- V66 (Q34.1) on possible differences in physical inspections between perishable and non-perishable goods,
- V69 (Q36.5) on possible differences between perishable and non-perishable goods as regards separation of release from final determination and payment of duties and
- V70 (Q36.4) on the percentage of goods released separately from final determination and payment of duties
- V76 on laboratory accreditation, and
- V82 on regular meetings held between different government authorities.

Although these variables are not irrelevant, they cannot be included at this stage of the compilation and it is expected that related information for countries beyond the OECD sample could be even more difficult to obtain. After having dropped the above variables from the dataset, the indicators would be composed of 84 variables. The list of variables composing each indicator is presented below.

***Scores follow a multiple binary scheme where the top score (2) generally corresponds to the best performance***

## Indicator (a) – Information availability

### Variable 1. Establishment of a national Customs website*

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>******** | (0) There is no clearly identified Customs' website on the Internet.<br>(1) There is an official website.<br>(2) The website makes available a minimal set of information related to import or export procedures** in one of the official WTO languages.*** | 1.2 |

* A national Customs website can be part of a wider website like the Ministry of Trade and Finance website. Official directories, country replies to the questionnaire and replies from Google to the following keywords "*Country Name + customs*", "*Nom du Pays + douane*" and "*Pais + Aduanas*" were used to identify such Customs'website.

** An official Customs website should at least cover the description of importation, exportation and transit procedures, electronic links to the forms and documents required, and the relevant legislation.

*** The official WTO languages are English (EN), Spanish (ES) and French (FR).

### Variable 2. Customs online feedback

| Scale & weight | Definition |
|---|---|
| **0 1 2**<br>****** | (0) There is no possibility to provide feedback.*<br>(1) There is a possibility by telephone or human contact only.<br>(2) There are online means (email, forms) to provide feedback. |

* i.e. the possibility for users to provide feedback on the organization of the website: user-friendliness of the website, availability of information, explanation on new systems…

### Variable 3. Publication of rate of duties

| Scale & weight | Definition |
|---|---|
| **0 1 2**<br>******** | (0) It is not possible to find the rate of duties on the Customs website.<br>(1) There is information (or an electronic link) on the rate of duties.<br>(2) Information is regularly updated.* |

* The date of the last update must be displayed.

### Variable 4. Establishment of Enquiry Points

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 2**<br>******* | (0) There are no Enquiry points to answer reasonable enquiries.*<br>(2) There are one or more enquiry points. | 1.3.1 |

* Enquiries of traders may refer to issues covered by [DCNT 1.1.1] such as: importation, exportation and transit procedures, applicable rate of duties, rules for classification or valuation, fees and taxes, restrictions or prohibitions, penalty provisions, appeal procedures and agreements with third countries.

### Variable 5. Possibility to ask questions to Customs

| Scale & weight | Definition |
|---|---|
| **0 1 2**<br>****** | (0) There is no possibility to ask questions on Customs related matters.*<br>(1) It is possible to ask questions by electronic means or a telephone hotline.<br>(2) There is a full time hotline (7/24). |

* Questions cover the same areas as the "reasonable enquiries" (See variable 4). Here, the enquiry point is the Customs.

**Variable 6. Information on import and export procedures**

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>******* | (0) There is not enough information on procedures, required forms and documents.<br>(1) There is enough information.*<br>(2) There are summary guides and/or specific highlights on these topics. | 1.1.1<br>(a) |

* The quantity of information is enough to understand the basic steps of the import or export procedures. The variable does not suggest a standardized minimum level of information, which would vary depending on the more or less burdensome regulations of each country and the friendliness of each customs website.

**Variable 7. Procedures of border agencies**

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>****** | (0) There is no possibility to download the required documents and forms.<br>(1) Some documents and forms are available for downloading on the Customs website.<br>(2) All required forms and documents are available online. | 1.1.1<br>(a) |

**Variable 8. Procedures published at least xx days before entry into force**

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>****** | (0) There is no interval between the publication of new or amended trade related laws and regulations, and their entry into force.<br>(1) The average time between publication end entry into force* is below the OECD average.<br>(2) The average time between publication end entry into force is on or above the OECD average. | 2.1.1 |

* Average time is the interval generally applied in the country, whether on the basis of applicable rules, such as an Information Act, or on the basis of practice.

**Variable 9. Publication of agreements with third countries relating to the above issues**

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>****** | (0) There is no information on the official customs website about international agreements relating to importation, exportation or transit.<br>(1) Such agreements are available on the official customs website.*<br>(2) Agreements are available together with topic-specific annotations.** | 1.1.1<br>(i) |

* At least an electronic link exists.
** The most relevant parts of the agreements (related to export, import or transit matters) are explained and highlighted.

**Variable 10. Information on Appeal procedures on internet**

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>******* | (0) The official customs website does not provide any information on appeal procedures.<br>(1) The information is displayed on the Customs website.<br>(2) Information is displayed and there is user-friendly guidance on procedures. | 1.1.1<br>(h) |

**Variable 11. Publication of decisions and examples of customs classification**

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 2**<br>****** | (0) Decisions and examples of customs classification are not published.<br>(2) Decisions and examples of customs classification are publicly available | 1.1.1<br>(d) |

**Variable 12. Publication of necessary information on advance rulings***

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>******* | (0) Information is not displayed on the customs website or it is only available in the relevant legislation (Customs Code).<br>(1) There is a specific page on the Customs website dealing with Advance Ruling procedures.<br>(2) There is a specific page and an online request procedure is available (forms sent by email) | 3.1.4 |

* An advance ruling is a written decision provided by a Member to an applicant prior to the importation of a good covered by the application that sets forth the treatment the Member shall provide to the good at the time of importation. It may cover tariff classification, valuation methods and their application, duty drawback, quotas, or origin of the good. Following this definition, Binding Tariff Information (BTI) is regarded as an advance ruling mechanism.

**Variable 13. Publication of penalty provisions for breaches of import and export formalities**

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>******* | (0) There is no information on penalty procedures and the amount of penalties.*<br>(1) There is no information available on the Customs website, but it is available in the relevant legislation (Customs Code).<br>(2) Information is displayed on a dedicated page in the Customs website. | 1.1.1<br>(g) |

* Including in the relevant legislation.

**Variable 14. Internet publication of applicable legislation**

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>****** | (0) There is no information on the Customs website.<br>(1) Traders can find the relevant legislation on the customs website.*<br>(2) There are quick references among the different pages of the website or user friendly guidance on key issues. | 1.2.1<br>(c) |

* Through electronic links or a specific page.

**Variable 15. Publication of judicial decision examples**

| Scale & weight | Definition |
|---|---|
| **0 2**<br>****** | (0) No examples of judicial decisions are published on the Customs website.<br>(2) Examples of judicial decisions are published on the Customs website (or electronic link). |

**Variable 16. Use of a specific hub for professional users***

| Scale & weight | Definition |
|---|---|
| **0 2**<br>***** | (0) There is no hub for professional users.<br>(2) There is a dedicated page for companies or a “pro” version of the website. |

* A specific hub for professional users should be understood as a dedicated page for companies that provides specific information on tools for electronic interfaces and downloadable forms. It is more than a simple (or quick) distinction between companies and private individuals.

**Variable 17. User manuals**

| Scale & weight | Definition |
|---|---|
| **0 2**<br>****** | (0) There are no electronic manuals to help users when a new system is implemented.<br>(2) Electronic manuals are available. |

**Variable 18. Quality/User friendliness of the research/help function of the Customs website***

| Scale & weight | Definition |
|---|---|
| **0 1 2**<br>***** | (0) There is no research function or less than 2 positive matches.**<br>(1) There are positive matches for at least 2 key words.<br>(2) There are positive matches for at least 4 key words. |

* Almost each website has a research function (or a help or FAQ section), but their user-friendliness varies. This variable explores the answers of the research function to six key words: appeal, import procedures, penalty, advance ruling, classification and fees.
** We count a positive match when an answer is linked to relevant and sufficient information.

## Indicator (b) - Involvement of trade community

### Variable 19. Communication of policy objectives*

| Scale & weight | Definition | DCNT |
|---|---|---|
| 0 2<br>* | (0) Policy objectives are not available.<br>(2) Policy objectives are publicly available. | 2.2 |

* Members "shall provide opportunities and a reasonable time period to traders and other interested parties to comment on the proposed introduction or amendment of [trade-related] and [customs] laws and regulations." The proposal for Members to provide information of the policy objectives pursued [TN/TF/W/165/Rev.2] no longer figures in the DCNT.

### Variable 20. Consultations between traders and government

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>****** | (0) There are no consultations between traders and government.<br>(1) There are specific consultations when introducing or amending trade related laws, regulations and administrative rulings of general application.<br>(2) There are one or more structures for regular consultations. | 2.2 and 2.3 |

### Variable 21. Targeted stakeholders*

| Scale & weight | Definition |
|---|---|
| **0 1 2**<br>******* | (0) There are less than 2 stakeholder groups** involved.<br>(1) There are at least 3 stakeholder groups involved.<br>(2) There are 4 or more stakeholder groups involved. |

* This variable refers to the scope of the consultations launched by the authorities on Customs and border related matters.

** The stakeholder groups are: Small and Medium Enterprises (SMEs), Large traders, Transporters, Customs brokers and Citizens.

### Variable 22. Number of Consultations*

| Scale & weight | Definition |
|---|---|
| **0 1 2**<br>***** | (0) There are no consultations.<br>(1) The number is below the OECD average.<br>(2) The number is on or above the OECD average. |

* Average number of consultations, including both regular and specific consultations, open to all parties, taking place per year.

### Variable 23. Publication of drafts

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 2**<br>****** | (0) Drafts* are not published before the entry into force of a regulation.<br>(2) The trading community is involved at the stage of drafting new trade related regulation. | 2.1 and 2.2 |

* Drafts (or summaries) of trade related laws, regulations or administrative rulings of general application.

## Indicator (c) - Advance rulings

**Variable 24. Number of advance ruling requests on tariff classification**

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>****** | (0) The number is below the 30th percentile of the sample.<br>(1) The number is between the 30th and the 70th percentile of the sample.<br>(2) The number is above the 70th percentile of the sample. | 3.1.7 |

**Variable 25. Number of advance ruling requests on origin**

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>****** | (0) The number is below the 30th percentile of the sample.<br>(1) The number is between the 30th and the 70th percentile of the sample.<br>(2) The number is above the 70th percentile of the sample. | 3.1.7 |

**Variable 26. Number of advance ruling requests (total)**

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>****** | (0) The number is below the 30th percentile of the sample.<br>(1) The number is between the 30th and the 70th percentile of the sample.<br>(2) The number is above the 70th percentile of the sample. | 3.1.7 |

**Variable 27. Length of time for which the advance ruling is valid (duration*)**

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 2**<br>***** | (0) Below the OECD average.<br>(2) On or above the OECD average. | 3.1.3 |

* Advance rulings apply with respect to the applicant during a set period of time, unless the facts or circumstances supporting the original ruling have changed. The validity of the ruling may vary according to the policy area. The variable focuses on tariff classification.

**Variable 28. Publication of average issuance time**

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>****** | (0) An average issuance time is not published on the Customs website or the related legislation.<br>(1) The issuance time is above the OECD average.<br>(2) The issuance time is on or below the OECD average. | 3.1.4(b) |

**Variable 29. Percentage of advance rulings issued within the published time period**

| Scale & weight | Definition |
|---|---|
| **[0 2]**<br>***** | It is the score of variable 28 (issuance time) weighed by the percentage of advance rulings issued within that time period (Question 15.2). This is a continuous variable which ranges between 0 and 2.* |

* Assuming that the score of the variable 28 is 2 and the percentage of advance rulings issued within the published time period is 80%, then the final score of variable 29 will be 1.6 (e.g. 2*80%).

**Variable 30. Publication of advance rulings of general interest**

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 2**<br>****** | (0) Advance rulings of significant interest to other interested parties (governments, traders…) are not published.<br>(2) Advance rulings of general interest are publicly available. | 3.1.6 |

**Variable 31. Possibility to request a review of an advance ruling or its revocation / modification**

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 2**<br>****** | (0) It is not possible.<br>(2) It is possible. | 3.1.5 |

**Variable 32. Refusal to issue or revocation of advance ruling are motivated**

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 2**<br>****** | (0) Refusal to issue or revocation are not motivated.<br>(2) They are motivated. | 3.1.3bis |

## Indicator (d) - Appeal procedures

**Variable 33. Publication of information on procedural rules for appeal***

| Scale & weight | Definition |
|---|---|
| 0 2<br>**** | (0) There is no appeal mechanism for Customs matters or the related laws are not publicly available.<br>(2) There is an appeal mechanism and it is explained in the Customs Code. |

* This variable is different from variable 10, which only refers to information displayed on the Customs website.

**Variable 34. Appeal procedures**

| Scale & weight | Definition | DCNT |
|---|---|---|
| 0 2<br>** | (0) There is no possibility of judicial appeal.<br>(2) Possibility of judicial appeal following, or independent of, the administrative appeal. | 4.1 |

**Variable 35. Availability of information on the motives of the administration's decisions**

| Scale & weight | Definition | DCNT |
|---|---|---|
| 0 2<br>*** | (0) There is no information on the motives.<br>(2) Information about the motives of the administration's decision is provided. | 4.1.5 |

**Variable 36. Per cent of appeals introduced by Customs or other border agencies resolved in favour of traders**

| Scale & weight | Definition |
|---|---|
| 0 2<br>** | (0) The percentage is above the OECD average.<br>(2) The percentage is on or below the OECD average. |

**Variable 37. Per cent of appeals introduced by traders resolved in favour of Customs or other border agencies**

| Scale & weight | Definition |
|---|---|
| 0 2<br>*** | (0) The percentage is below the OECD average.<br>(2) The percentage is on or above the OECD average. |

**Variable 38. Number of administrative appeals per year**

| Scale & weight | Definition |
|---|---|
| 0 2<br>* | (0) The average yearly number of administrative appeals is above the OECD average.<br>(2) The average yearly number of administrative appeals is on or below the OECD average. |

**Variable 39. Number of judicial appeals per year**

| Scale & weight | Definition |
|---|---|
| 0 2<br>* | (0) The average yearly number of judicial appeals is above the OECD average.<br>(2) The average yearly number of judicial appeals is on or below the OECD average. |

## Indicator (e) – Fees and charges

### Variable 40. Publication of Fees and Charges*

| Scale & weight | Definition | DCNT |
|---|---|---|
| 0 1 2<br>*** | (0) Information on fees and charges is not published.**<br>(1) Information is available in paper publications (Gazette, Bulletin, Customs Code).<br>(2) Information is displayed on the Customs website (on a dedicated page). | 6.1.4 |

* This variable refers to all fees and charges (other than import/export duties or other than taxes within the purview of GATT Article III) imposed by customs and other government agencies (including bodies that act on behalf of government agencies) for services rendered in connection with importation or exportation of goods or for any formality required for undertaking such importation or exportation. [DCNT 6.1.1]

** This information shall include the fees and charges that will be applied, reason for such fees or charges, the responsible authority, and when and how payment is to be made. [DCNT 6.1.4]

### Variable 41. Evaluation of fees and charges

| Scale & weight | Definition | DCNT |
|---|---|---|
| 0 2<br>** | (0) Fees and charges are calculated on an ad-valorem basis.*<br>(2) Fees and charges are not calculated on an ad-valorem basis. | 6.1.3 |

* However, the score is (2) if the fees and charges are limited to the approximate cost of the service rendered.

### Variable 42. Total fees collected (quantity in USD)

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>** | (0) The ratio* is above the 70th percentile of the sample.<br>(1) The ratio is between the 30th and the 70th percentile of the sample.<br>(2) The ratio is below the 30th percentile of the sample. |

* i.e. the value of fees collected in one year divided by the value of trade flows during that same year).

### Variable 43. Fees transparency

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>*** | (0) There is no information about fees and charges.*<br>(1) Insufficient information about fees and charges.**<br>(2) The top score is granted if all applicable fees or charges have been accounted for. |

* There are no answers to Q25.1 to Q25.4 of the questionnaire.

** The answers do not reflect the whole set of fees and charges applied in the country.

### Variable 44. Total Fees collected (number - diversity)

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>** | (0) The number is above the 70th percentile of the sample<br>(1) The number is between the 30th and 70th percentile of the sample<br>(2) The number is below the 30th percentile of the sample |

### Variable 45. Reduction of the Number of Fees*

| Scale & weight | Definition | DCNT |
|---|---|---|
| 0 1 2<br>** | (0) The number is above the 70th percentile of the sample<br>(1) The number is between the 30th and 70th percentile of the sample<br>(2) The number is below the 30th percentile of the sample | 6.1.6 |

* This variable needs several years to be computed.

## Indicator (f) – Formalities - documents

### Variable 46. Use of copies*

| Scale & weight | Definition | DCNT |
|---|---|---|
| 0 1 2<br>** | (0) Customs and other border agencies do not accept copies of documents.<br>(1) Copies are accepted with exceptions (related to the type of good, the circumstances or the agency).<br>(2) Copies are accepted without exceptions | 10.2(1) and 10.2(2) |

* [When import, export and transit formalities of Members require presentation of supporting data or documents, Members shall endeavour to accept copies of such documents]. [Where a government agency of a Member already holds the original of a required document, any other agency of that Member shall accept a copy authenticated by the agency holding the original in lieu of the original document.] DCNT 10.2 (1) and (2)]

### Variable 47. Percent of procedures that accept copies

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>* | (0) The number is below the 30th percentile of the sample<br>(1) The number is between the 30th and 70th percentile of the sample<br>(2) The number is above the 70th percentile of the sample |

### Variable 48. Copies in cases of electronic lodging

| Scale & weight | Definition | DCNT |
|---|---|---|
| 0 1 2<br>** | (0) In cases of electronic lodging Customs and other border agencies do not accept copies of documents.<br>(1) Copies are accepted with exceptions (related to the type of good, the circumstances or the agency).<br>(2) Copies are accepted without exceptions | 10.2(1) |

### Variable 49. International Standards compliance*

| Scale & weight | Definition | DCNT |
|---|---|---|
| 0 1 2<br>** | (0) The rate of ratification is below the 30th percentile of the sample.<br>(1) The rate of ratification is between the 30th and 70th percentile of the sample.<br>(2) The rate of ratification is above the 70th percentile of the sample. | 10.3.5 |

* [… the term "international standards" shall be understood to refer to standards for facilitating trade promulgated by the relevant international intergovernmental organizations whose membership is open to all WTO Members. [DCNT 10.3.5]. To calculate this variable we have counted ratifications to the following conventions: Convention (2005) on Facilitation of International Maritime Traffic, Convention (2006) on International Civil Aviation, Convention (1990) on the Temporary Admission of Goods (Istanbul Convention), International Convention (1986) on the Harmonized Commodity Description and Coding System (HS Convention), General Annex of the International Convention (1999) on the Simplification and Harmonisation of Customs procedures (Revised Kyoto Convention) as proposed in DCNT 10.3.6.

### Variable 50. Number of documents for import*

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>*** | (0) The number is above the 70th percentile of the sample.<br>(1) The number is between the 30th and 70th percentile of the sample.<br>(2) The number is below the 30th percentile of the sample. |

* We refer to the Doing Business indicator [Trading Across the Border – Number of documents to import]. It records documents required for clearance by government ministries, customs authorities, port and container terminal authorities (transport documents), health and technical control agencies and banks. Since payment is by letter of credit, all documents required by banks for the issuance or securing of a letter of credit are also taken into account. Documents that are renewed annually and that do not require renewal per shipment (for example, an annual tax clearance certificate) are not included. Doing Business data are based on specific assumptions about the business and the traded goods. The full methodology is provided on the Doing Business website.[32]

32. www.doingbusiness.org/MethodologySurveys/TradingAcrossBorders.aspx

**Variable 51. Number of documents for export***

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>** | (0) The number is above the 70th percentile of the sample.<br>(1) The number is between the 30th and 70th percentile of the sample.<br>(2) The number is below the 30th percentile of the sample. |

* We refer to the Doing Business indicator [Trading Across the Border – Number of documents to export]. See variable 50 for methodological details.

**Variable 52. Number of documents for import - According to Customs***

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>*** | (0) The number is above the 70th percentile of the sample.<br>(1) The number is between the 30th and 70th percentile of the sample.<br>(2) The number is below the 30th percentile of the sample. |

* Doing Business refers to several assumptions to set the number of documents required to import which are not always accurate, depending on the cases. This variable reflects the number of documents for import required in a typical case, as provided by Customs in the questionnaire.

## Indicator (g) – Formalities - automation

**Variable 53. Per cent of import declarations cleared electronically**

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>** | (0) The number is below the 30th percentile of the sample.<br>(1) The number is between the 30th and 70th percentile of the sample.<br>(2) The number is above the 70th percentile of the sample. |

**Variable 54. Per cent of export declarations cleared electronically**

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>** | (0) The number is below the 30th percentile of the sample.<br>(1) The number is between the 30th and 70th percentile of the sample.<br>(2) The number is above the 70th percentile of the sample. |

**Variable 55. Per cent of procedures that can be expedited electronically***

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>** | (0) The number is below the 30th percentile of the sample.<br>(1) The number is between the 30th and 70th percentile of the sample.<br>(2) The number is above the 70th percentile of the sample. |

* Lacking sufficient replies from OECD Members to the questionnaire, a variable from the Logistic Performance Index (LPI) was used as a proxy. It is the reply to the following question: "can Customs declarations be submitted and processed electronically?" (percent of respondents answering high/very high).

**Variable 56. Automation spending* (in USD)**

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>* | (0) The amount is below the 30th percentile of the sample.<br>(1) The amount is between the 30th and 70th percentile of the sample.<br>(2) The amount is above the 70th percentile of the sample. |

* This variable refers to the amount spent for automating formalities connected with importation, exportation or transit, whether in charge of the Customs agencies or other agencies dealing with goods import, export or transit, such as sanitary and phytosanitary control agencies, port authorities, etc. during the current year.

**Variable 57. Ratio of irregularities***

| Scale & weight | Definition |
|---|---|
| **0 1 2**<br>*** | (0) The number is below the 30th percentile of the sample.<br>(1) The number is between the 30th and 70th percentile of the sample.<br>(2) The number is above the 70th percentile of the sample. |

* This variable refers to the number of irregularities divided by the number of examinations. Irregularities here cover both fraud and unintentional mistakes [called "Minor breaches" in DCNT 6.2.11] i.e inadvertent omissions or mistakes, including mistakes in interpretation of a customs law, regulation or procedural requirements, made without fraudulent intent or gross negligence.

**Variable 58. Use of Risk Management***

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>** | (0) There are no risk management procedures in place.<br>(1) Risk management in the process of implementation, not yet fully operational.<br>(2) There is a fully operational procedure. | 7.3 |

* Risk Management means the systematic application of management procedures and practices providing customs [and other relevant border agencies] with the necessary information to address movements or consignments which present a risk] [DCNT 7.3.6(b)]. [Risk means the potential for non-compliance with customs and/or other relevant laws, regulations or procedural requirements connected with the importation, exportation or transit of goods [DCNT 7.3.6(a)]. Members shall concentrate customs control [and other relevant border controls] on high risk consignments and expedite the release of low risk consignments. [DCNT 7.3.2].

**Variable 59. IT Systems capable of accepting EDI and exchanging data electronically***

| Scale & weight | Definition |
|---|---|
| **0 1 2**<br>** | (0) IT systems are not ready for EDI.<br>(1) In the process of implementation, not yet fully operational.<br>(2) IT systems are ready for EDI. |

* An EDI system is an interface providing access to an electronic declaration system.

**Variable 60. Digital certificates and signatures are in place**

| Scale & weight | Definition |
|---|---|
| **0 2**<br>** | (0) No use of electronic signatures.<br>(2) Use of electronic signatures |

## Indicator (h) – Formalities - procedures

**Variable 61. Single Window***

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>*** | (0) There is no Single Window.<br>(1) A single window is planned or in the process of implementation.**<br>(2) There is a Single Window. | 10.4.1 |

* A Single Window is defined as a facility that allows parties involved in trade and transport to lodge standardized documentation and/or data with a single entry point to fulfil all import, export and transit-related regulatory requirements [UN/CEFACT Recommendation No.33]. Where information provided by national Customs websites or the Questionnaire (Q30) is not sufficient, the data is completed from overviews on national single windows available on the WCO33 and SITPRO34 websites.

** It can be a facility already in place acting as a Single Window (i.e. not covering all the aspects of a Single Windows facility) or a facility in the process of implementation but not yet fully operational.

33. www.wcoomd.org/sw_overview.htm

34. www.sitpro.org.uk/policy/singwin/intexamples.html

**Variable 62. Publication of Average Clearance Time**

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 2**<br>****** | (0) The average time for the release and clearance of goods is not published in a consistent manner on a periodic basis.<br>(2) The average time for the release and clearance of goods is published in a consistent manner on a periodic basis, for major customs offices. | 7.5.1 |

**Variable 63. Clearance Time***

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>****** | (0) The number is above the 70th percentile of the sample.<br>(1) The number is between the 30th and 70th percentile of the sample.<br>(2) The number is below the 30th percentile of the sample. | |

* The number (of days) is provided by the Logistic Performance Index (LPI) [Clearance time].

**Variable 64. Percent of pre-arrival processing***

| Scale & weight | Definition | DCNT |
|---|---|---|
| **[0 2]**<br>******* | The score is the percentage multiplied by the top score (2).<br>So, 20% of pre-arrival processing gives a score of 0.4 (i.e. 0.20*2)<br>This is a continuous variable, i.e. the score of the variable ranges from 0 to 2. | 7.1.1 |

* [Members shall adopt or maintain procedures for traders [with good compliance records] to submit import documentation and other required information or, where the Member so provides, their electronic equivalent, to customs [and other relevant border agencies] for [processing] [examination] prior to the arrival of goods with a view to expediting the [clearance and] release of goods upon arrival].

**Variable 65. Per cent of physical inspections**

| Scale & weight | Definition |
|---|---|
| **0 1 2**<br>******* | (0) The number is above the 70th percentile of the sample.<br>(1) The number is between the 30th and 70th percentile of the sample.<br>(2) The number is below the 30th percentile of the sample. |

**Variable 66. Per cent of physical inspections - as regards perishable/ non-perishable goods**

| Scale & weight | Definition |
|---|---|
| **0 2**<br>****** | (0) There is no difference of treatment.<br>(2) There are differences of treatment. |

**Variable 67. Per cent of Post-clearance Audits (PCAs) carried out***

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>****** | (0) The number is below the 30th percentile of the sample.<br>(1) The number is between the 30th and 70th percentile of the sample.<br>(2) The number is above the 70th percentile of the sample. | 7.4 |

* Including both regular audit and targeted audit, in accordance with DCNT 7.4.5

**Variable 68. Separation of release from final determination and payment of Customs duties***

| Scale & weight | Definition | DCNT |
|---|---|---|
| **0 1 2**<br>******* | (0) There is no such mechanism.<br>(1) Yes, but it is restricted to the Authorized Trader status.<br>(2) Yes, without conditions other than the submission of guarantee | 7.2.1 |

* [ … procedures [providing][allowing] an importer [or its agent] [the opportunity] to obtain the release of goods prior to final determination and payment of customs] duties, taxes, fees and charges, upon provision of sufficient guarantee [as determined by the Member itself] [where these are not determined at or prior to arrival][ where there is delay in the final determination of customs duties, taxes, fees and charges].

**Variable 69. Treatment of perishable and non perishable goods concerning the separation of release**

| Scale & weight | Definition |
|---|---|
| 0 2<br>*** | (0) There is no difference of treatment.<br>(2) There are differences of treatment. |

**Variable 70. Per cent of releases prior to final determination and payment of Customs duties**

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>** | (0) The number is below the 30th percentile of the sample.<br>(1) The number is between the 30th and 70th percentile of the sample.<br>(2) The number is above the 70th percentile of the sample. |

**Variable 71. Elimination of pre-shipment inspection**

| Scale & weight | Definition | DCNT |
|---|---|---|
| 0 2<br>** | (0) The country requires pre-shipment inspection on Customs matters.<br>(2) No pre-shipment inspection is required on Customs matters. | 10.5 |

**Variable 72. Authorized operators* as a percentage of total traders**

| Scale & weight | Definition | DCNT |
|---|---|---|
| 0 1 2<br>** | (0) The number is below the 30th percentile of the sample.<br>(1) The number is between the 30th and 70th percentile of the sample.<br>(2) The number is above the 70th percentile of the sample. | 7.6 |

* These operators (including SMEs) meet specific criteria specified in DCNT 7.6.1 related to compliance with customs (and other agencies) requirements. They benefit from additional facilitation measures [DCNT 7.6.3].

**Variable 73. Annual percentage of trade handled by authorized traders**

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>*** | (0) Less than 10%<br>(1) Between 10 and 50%<br>(2) More than 50% |

**Variable 74. How long does it take to obtain AT certification**

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>* | (0) The number is above the 70th percentile of the sample.<br>(1) The number is between the 30th and 70th percentile of the sample.<br>(2) The number is below the 30th percentile of the sample. |

**Variable 75. Authorized traders' benefits***

| Scale & weight | Definition | DCNT |
|---|---|---|
| 0 1 2<br>** | (0) Less than 2 positive replies to Q40.1- 6 of the Questionnaire<br>(1) Between 2 and 4 positive replies.<br>(2) More than 4 positive replies. | 7.6.3 |

*As specified in DCNT 7.6.3

**Variable 76. Laboratory accreditation**

| Scale & weight | Definition |
|---|---|
| 0 2<br>** | (0) There is no legal basis for laboratory accreditation<br>(2) The legal basis for laboratory accreditation is established. |

**Variable 77. Simplification of procedures* (time)**

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>** | (0) The number is below the 30th percentile of the sample.<br>(1) The number is between the 30th and 70th percentile of the sample.<br>(2) The number is above the 70th percentile of the sample. |

* As a proxy, we use the percent of respondents answering high/very high to the following question from the Logictic Performance Index (LPI): "Evolution of customs clearance procedures over the three years".

**Variable 78. Simplification of procedures* (cost)**

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>** | (0) The number is below the 30th percentile of the sample.<br>(1) The number is between the 30th and 70th percentile of the sample.<br>(2) The number is above the 70th percentile of the sample. |

* As a proxy, we use the variation over the last three years of the cost to import (USD per container), according to the Doing Business database [Trading Across Border].

## Indicator (i) – Border Agency Co-operation (internal)

**Variable 79. Co-operation between agencies at the national level (internal cooperation)**

| Scale & weight | Definition | DCNT |
|---|---|---|
| 0 1 2<br>** | (0) There is no cooperation between the various border agencies.<br>(1) National legislation allows for cooperation and mutual assistance between customs and other relevant authorities.<br>(2) National legislation encourages cooperation and roles and responsibilities are clearly established. | 9.1 |

**Variable 80. Co-operation between agencies on the ground at the national level (internal cooperation)**

| Scale & weight | Definition | |
|---|---|---|
| 0 1 2<br>** | (0) There is no cooperation on documentary and physical controls.*<br>(1) There is cooperation on either documentary or physical controls.<br>(2) There is cooperation on both documentary and physical controls. | 9.2 |

* Establishing a single location for one time documentary controls and/or a single location for physical verification of consignments.

**Variable 81. Control delegation at the national level***

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>*** | (0) The number is below the 30th percentile of the sample.<br>(1) The number is between the 30th and 70th percentile of the sample.<br>(2) The number is above the 70th percentile of the sample. |

* The variable refers to the number of government agencies which delegate controls to Customs authorities.

**Variable 82. Regular meetings are held at the national level (including training seminars)**

| Scale & weight | Definition |
|---|---|
| 0 1 2<br>** | (0) There are no meetings between the different public agencies involved in the procedures required to import or export goods.<br>(1) Regular meetings are held to improve cooperation.<br>(2) These meetings also include the private sector. |

## Indicator (j) - Border Agency Co-operation (external)

**Variable 83. Exchange programmes at the international level (external cooperation)**

| Scale & weight | Definition | DCNT |
|---|---|---|
| 0 1 2<br>*** | (0) There are no exchange programmes.<br>(1) There are exchange programmes with neighbouring countries.<br>(2) There are exchange programmes with neighbouring and third countries. | 9.3 |

**Variable 84. International Co-ordination***

| Scale & weight | Definition | DCNT |
|---|---|---|
| 0 1 2<br>** | (0) Coordination with neighbouring countries is low. [0%-25%[<br>(1) Coordination with neighbouring countries is medium. [25%-75%[<br>(2) Coordination with neighbouring countries is high. [75%-100%] | 9.3 |

* This variable checks the coordination of the procedures and formalities with neighbouring countries as per DCNT 9.3

## Indicator (k) - Consularisation

**Variable 85. Consular transaction requirements***

| Scale & weight | Definition | DCNT |
|---|---|---|
| 0 2<br>** | (0) The country imposes consular transaction requirements.<br>(2) The country does not impose consular transaction requirements. | 8.1 |

* Defined as "the procedure of obtaining from a consul of the importing Member in the territory of the exporting Member, or in the territory of a third party, a consular invoice or a consular visa for a commercial invoice, certificate of origin, manifest, shippers' export declaration, or any other customs documentation in connection with the importation of the good". [DCNT 8.1]

## Indicator (l) – Governance and Impartiality

**Variable 86. Clearly established and transparent structures and functions**

| Scale & weight | Definition |
|---|---|
| 0 2<br>*** | (0) Structures and functions of the Customs administration are not publicly described.<br>(2) Structures and functions are publicly available. |

**Variable 87. Effective sanctions against misconduct**

| Scale & weight | Definition |
|---|---|
| 0 2<br>** | (0) Information about sanctions against misconduct is not available.<br>(2) The code of conduct includes disciplinary provisions specifying what constitutes misconduct and the sanctions which apply. |

**Variable 88. Establishment of a code of conduct**

| Scale & weight | Definition |
|---|---|
| 0 2<br>*** | (0) There is no Code of conduct.<br>(2) A code setting out ethics policy is developed, published and made available to all employees. |

**Variable 89. Ethics policy**

| Scale & weight | Definition |
|---|---|
| 0 2<br>** | (0) There is no ethics policy.<br>(2) A help desk is established to guide staff on ethical issues. The ethics policy observes all of the principles of the Revised Arusha Declaration. |

**Variable 90. Clear provisions for the financing of the Customs administration**

| Scale & weight | Definition |
|---|---|
| 0 2<br>** | (0) There is no public information as to the financing of the Customs administration.<br>(2) Financing is determined and set out in legal provisions and related information is publicly available. |

**Variable 91. Customs valuation**

| Scale & weight | Definition |
|---|---|
| 0 2<br>** | (0) There is not enough information on the Customs website.<br>(2) There is clear information on the Customs website.* |

* Related legislation, a specific page or a guide on valuation are easily accessible.

**Variable 92. Efficient internal communication about policies and procedures**

| Scale & weight | Definition |
|---|---|
| 0 2<br>** | (2) Arrangements are in place to ensure that staff receives relevant information in good time about new legislation and regulation, and changes to existing legislation and regulation. |

**Variable 93. Internal systems audit function**

| Scale & weight | Definition |
|---|---|
| **0 2**<br>******* | (0) There is no internal audit mechanism.<br>(2) An audit function for internal systems is established, adequately empowered and operational. |

**Variable 94. Transparency and proportionality of non-compliance penalties**

| Scale & weight | Definition |
|---|---|
| **0 2**<br>****** | (0) There is no publicly available information on non-compliance penalties.<br>(2) Systems of non-compliance penalties are transparent and balanced. |

**Variable 95. Publication of an annual Customs report**

| Scale & weight | Definition |
|---|---|
| **0 1 2**<br>****** | (0) Customs do not publish annual activity reports.<br>(1) Annual reports are available, but they contain insufficient information on customs activities.*<br>(2) Annual reports are available and contain sufficient information on Customs activities. |

* No information on budget and duties collected, complaints or efficiency indicators.

## Additional variables

**Variable 96. Customs Revenue**

| Scale & weight | Definition | Years Coverage | Currency |
|---|---|---|---|
| **[value]**<br>***** | Import duty<br>Excise duty<br>Total duty<br>Percent of total duty in the government revenue.<br>Annual operating budget of the Customs service. | Three last years | National and Euros |

**Variable 97. The average cost/collection ratio of your Customs Service***

| Scale & weight | Definition |
|---|---|
| **0 1 2**<br>***** | (0) The number is above the 70th percentile of the sample.<br>(1) The number is between the 30th and 70th percentile of the sample.<br>(2) The number is below the 30th percentile of the sample. |

* This ratio is the value of duties collected for every USD 1 (or EUR 1) received by public funds (operational budget). [It could be also the customs expenditures for every USD 1 (or EUR 1) collected].

**Variable 98. A *de minimis* procedure***

| Scale & weight | Definition |
|---|---|
| **0 2**<br>***** | (0) Customs do not apply a *de minimis* procedure.<br>(2) Yes, such a procedure exists. |

* Procedure under which customs duties and taxes are not assessed for goods under a specified value. Where no customs duties are in place a *de minimis* procedure is irrelevant.

# Annex 2.

# The Trade Facilitation Indicators: Relevance and Organisation of the Variables

### *Relevance of the variables*

Some of the variables do not vary a lot within the OECD sample and could lead to irrelevant categories when the TFIs are tested (although the situation is expected to be different when the sample is extended to non-OECD countries). As shown in Table 1, providing the average standard error among variables based on the equal weighting scheme, this problem is limited to very few variables (59, 70, 86), comforting as to the general relevance of the remaining variables. Aggregated standard errors in Table 2 show that there is sufficient variation within each indicator.

**Table 1. Average standard error among variables**

| ID | Standard error | ID | Standard error | ID | Standard error | ID | Standard error | ID | Standard error | ID | Standard error |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.288104066 | 19 | 0.611249846 | 37 | 0.822124886 | 55 | 0.824525256 | 73 | 0.702901946 | 91 | 1.029857301 |
| 2 | 0.963770592 | 20 | 0.599736438 | 38 | 0.834057656 | 56 | 0.714059817 | 74 | 0.782718482 | 92 | 0.775106776 |
| 3 | 0.417028828 | 21 | 0.731018024 | 39 | 0.864312197 | 57 | 0.722315119 | 75 | 0.864312197 | 93 | 0.883715102 |
| 4 | 0.581087203 | 22 | 0.782718482 | 40 | 0.782718482 | 58 | 0.717137166 | 76 | 0.849836586 | 94 | 1.029857301 |
| 5 | 0.650326765 | 23 | 0.9258201 | 41 | 0.984731928 | 59 | | 77 | 0.457696587 | 95 | 0.843482336 |
| 6 | 0.457696587 | 24 | 0.850482309 | 42 | | 60 | 1.032795559 | 78 | 0.814881354 | 96 | 0.950051263 |
| 7 | 0.657951695 | 25 | 0.782718482 | 43 | 0.714059817 | 61 | 0.895751942 | 79 | 0.981649817 | | |
| 8 | 0.511766316 | 26 | 0.790256875 | 44 | 0.787752093 | 62 | 0.457696587 | 80 | 0.848155404 | | |
| 9 | 0.49102619 | 27 | 0.73317761 | 45 | | 63 | 0.834057656 | 81 | 0.886882892 | | |
| 10 | 0.850482309 | 28 | 0.795242772 | 46 | 0.790256875 | 64 | 0.742293476 | 82 | 0.881917104 | | |
| 11 | 0.843482336 | 29 | 0.619192385 | 47 | 0.457696587 | 65 | 0.850482309 | 83 | 0.722315119 | | |
| 12 | 0.775106776 | 30 | 0.843482336 | 48 | 0.864312197 | 66 | 0.775106776 | 84 | 0.767419576 | | |
| 13 | 0.789542034 | 31 | 0.775106776 | 49 | 0.446191752 | 67 | 0.727766631 | 85 | 1.013739604 | | |
| 14 | 0.417028828 | 32 | 0.940324692 | 50 | 0.671262158 | 68 | 0.843482336 | 86 | | | |
| 15 | 0.897955517 | 33 | 1.021507837 | 51 | 0.694415898 | 69 | | 87 | 0.789542034 | | |
| 16 | 0.973969507 | 34 | 0.688700443 | 52 | | 70 | | 88 | 0.900336637 | | |
| 17 | 0.872871561 | 35 | 1.032795559 | 53 | 0.852802865 | 71 | 1.069044968 | 89 | 0.417028828 | | |
| 18 | 0.638055346 | 36 | 0.634950435 | 54 | 0.5830274 | 72 | 0.790256875 | 90 | 0.666666667 | | |

ID corresponds to variables' number. All variables range from 0 to 2.

**Table 2. Variation for each indicator**

| Categories | Standard errors |
|---|---|
| Information availability | 0.238029126 |
| Involvement of trade community | 0.461416027 |
| Advance rulings | 0.403985207 |
| Appeal procedures | 0.533735364 |
| Fees and charges | 0.32384486 |
| Formalities / documents | 0.421233357 |
| Formalities / automation | 0.470401021 |
| Formalities / procedures | 0.218598626 |
| Border Agency Cooperation - Internal | 0.684458111 |
| Border Agency Cooperation - External | 0.678284192 |
| Consularization | 0 |
| Governance and Impartiality | 0.392912639 |

The correlation between variables within each indicator has also been explored (a correlation matrix is provided in Appendix 1). A statistical analysis of the choice of variables within each indicator highlights possible causality and correlation links between them. As a strong correlation between variables could be interpreted as *double counting*, distorting the final outcome for this indicator, correlation issues among variables may have to be accounted and compensated for. Although some indicator methodologies favour strong correlations,[35] the TFIs were not limited to highly correlated variables in order to capture as many dimensions as possible within each indicator. Regression testing does not seem to invalidate this approach.

The average correlation rate among variables within each indicator is not very high, at 0.3, and the majority of rates are positive, indicating factors that go in the same direction. The most significant exception is variables 1 and 2 (online information) in the **information availability** indicator, which are negatively correlated to the other variables within the indicator. Correlations greater than 0.5 within the indicators can often be explained by obvious shared dimensions between variables. For instance:

- For **advance rulings**, variables 24 and 25 are sub-totals of variable 26 (AR number on classification, on origin, and total) and are not used simultaneously in the indicator. Variables 30 (publication of AR of general interest) and 32 (motivation of refusal to issue) share a common transparency dimension.

- For **formalities/documents**, variables 47 (acceptance of copies) and 49 (international standards compliance) are highly correlated, presumably because acceptance of copies is consistent with the relevant standards contained in Chapter 3, General Annex of the Revised Kyoto Convention (in particular: GA 3.15, 3.16, 3.17 and 3.19).

- For **formalities/procedures**, variables are highly correlated between them and in particular to the set of variables regarding authorized traders. This creates difficulties for validating this indicator either through gravity or through trade cost measurement.

35. The World Governance Indicators see such correlations as a positive signal about the underlying governance model.

The problem is overcome when applying Expert Judgement weighting, e.g. different weights to variables within the indicator.

Variables used in the TFIs are also correlated to other datasets commonly used in indicators such as the World Bank Logistics Performance Index (LPI) and Doing Business (DB), the Global Competitiveness Report (GCR), or the World Competitiveness Yearbook (WCY). This is particularly true for indicators (a) and (b) (*information availability* and *involvement of the trade community*).[36] This characteristic could be usefully exploited to undertake robustness checks.

Finally checking for correlations between indicators did not reveal correlation problems for most of the indicators, with the exception of indicator (i) *Cooperation – Internal* and (j) *Cooperation – External* which are negatively correlated with each other.

### *Dealing with country specificities*

In the case of countries where some measures or policies are not applied, the related variables or indicators are dropped. There is only one case where an entire indicator is irrelevant for a country (it concerns advancing rulings for Hong-Kong, China, where no duties exist). This problem generally concerns individual variables only. For example, variables 72 to 75 (relating to authorised traders) are not included in New Zealand's dataset as the country does not operate an authorized trader regime, but makes these provisions available to all traders unless they have been found non-compliant.

In the case of European Union countries, some, but not all, variables are attributed the same score because the same EU regulation applies. This does not mean that all EU countries end up with the same score, as many variables refer to national implementation issues and not to regulation defined at the EU level.

36. Some examples include, for indicator (a) the WGI *governance effectiveness, rule of law and regulatory quality;* for indicator (b) the LPI *Do you receive adequate and timely information when regulations change?* and *Transparency of government policy is satisfactory,* for indicators (g) and (h) (*formalities / automation* and *formalities / procedures),* the GCR indicator *Burden of customs procedures.*

# Annex 3.

## Gravity Specifications

The log-linearized form used by Anderson and Van Wincoop (2003) is:

$$\log(X_{ij}^k) = \log Y_i^k + \log E_j^k - \log Y^k + (1-\sigma_k)[\log t_{ij}^k - \log \Pi_i^k - \log P_j^k].$$

Their work shows that leaving the multilateral resistance out of an empirical estimation lead to biased estimates. The problem is to assess these two terms, $\Pi_i^k$ and $P_j^k$. Different approaches exist: one can use non-linear estimation as in Anderson and Van Wincoop, Taylor series approximation as in Baier and Bergstrand (2009), or the easiest way with a remoteness index or fixed effects. Each method has its positive and negative aspects, for instance fixed effects give unbiased parameter estimates but could include/absorb other invariant key parameters. Finally it is necessary to proxy $t_{ij}^k$, by ad-hoc (and available) variables as distance. The Global Enabling Trade Report (World Economic Forum – *Appendix B*, 2009) provides a good explanation of the usual attributes included in a gravity equation. The previous considerations lead to the following regression:

$$\ln x_{ijt}^k = \beta_0^k + \beta_1^k \ln DIST_{ij} + \beta_2^k Contig_{ij} + \beta_3^k Lang_{ij} + \beta_4^k Col_{ij} + \beta_5^k TFI_j^c + D_{it} + D_{jt} + D_t + D_k + \varepsilon_{ijt}^k$$

Subscripts $i$, $j$, $k$, and $t$ indicate respectively exporting country, importing country, sector, and year.[37] The variables are the logarithm of bilateral trade $(x_{ij})$, the logarithm of bilateral distance $(DIST)$ and a series of usual bilateral dummies, common border $(Contig)$, common language $(Lang)$ and common colony ties $(Col)$. In order to deal with the multilateral resistance issues and any unobserved variation over years, we also include country-year fixed effects and year dummies to capture year effects common to all countries. The inclusion of variables that only vary across country pairs prevents us from controlling for country pair fixed effects. Following the same logic, the inclusion of our indicators is incompatible with country fixed effects.[38] In order to resolve this problem, the solutions are to run a regression without fixed effects accounting for the

37. TFIs are built for the year 2008 (with the latest information available, covering 2009). In order to enlarge the number of observations, take into account for multilateral resistance and price variation, we run Panels covering 2000-08. One could say that the indicators do not cover this period, but considering the way they were built, they could be viewed as relatively stable over time (at least for some categories). The extension of the indicators (by including implementation data, for example) could be extremely valuable in this case. We also run a cross section regression (for 2007) as a robustness check.

38. We face perfect collinearity between the TFIs $(\beta_5^k TFI_j^c)$ and the fixed effects, which are both country specific. Subscript $c$ indicates the TFI idicator.

same dimension, with the risk of bias estimates, to build a measure of economic remoteness or to directly calculate the multilateral resistances.[39]

In our analysis we first run a regression (Reg1) without country or country-pair fixed effects, reintroducing the output variables in the regression.[40]

**(1)**

$$\ln x_{ijt}^k = \beta_0^k + \beta_1^k \ln DIST_{ij} + \beta_2^k Contig_{ij} + \beta_3^k Lang_{ij} + \beta_4^k Col_{ij} + \beta_5^k Y_{it} + \beta_6^k E_{jt} + \beta_7^k TFI_j^c + D_t + D_k + \varepsilon_{ij}^k$$

We also run a similar regression (Reg1bis) introducing the geometric average of the TFIs:

$$TFI_*^c = \sqrt[2]{TFI_i^c TFI_j^c}$$

The regression is the following:

**(1bis)**

$$\ln x_{ijt}^k = \beta_0^k + \beta_1^k \ln DIST_{ij} + \beta_2^k Contig_{ij} + \beta_3^k Lang_{ij} + \beta_4^k Col_{ij} + \beta_5^k Y_{it} + \beta_6^k E_{jt} + \beta_7^k TFI_*^c + D_t + D_k + \varepsilon_{ij}^k$$

The utility of this formulation is explained in Annex 4. Note that it accounts for both importer and exporter dimensions.

Then we run another regression introducing country-pair year fixed effects. They should account for all attributes related to this dimension and so we drop all variables sharing this dimension like distance. If this specification is better than the previous one, as it accounts for more dimensions, it is not possible to use it due to the important lack of degree of freedom in the regression. That is why we prefer to use the country-pair fixed effects. This leads to the regression (reg2_cp):

**(2)** $\ln x_{ijt}^k = \beta_0^k + \beta_1^k TFI_j^c + \beta_2^k TFI_i^c + D_{ij} + D_t + \varepsilon_{ij}^k$

We could also include other country specific attributes to avoid that TFIs' variables rely on underlying elements. Indeed, under such a configuration TFIs could play the role of fixed effects as they do not vary across time (at this stage of the compilation). So results of *reg2* should be used carefully.

Finally we also run a third specification (reg3) introducing a remoteness variable:

**(3)**

$$\ln x_{ijt}^k = \beta_0^k + \beta_1^k \ln DIST_{ij} + \beta_2^k Contig_{ij} + \beta_3^k Lang_{ij} + \beta_4^k Col_{ij} + \beta_5^k Y_{it} + \beta_6^k E_{jt} + \beta_7^k REM_{i,2005} + \beta_8^k TFI_j^c + D_t + D_k + \varepsilon_{ij}^k$$

39. Building a remoteness variable is however a second best. The Global Enabling Trade Report (World Economic Forum – *Appendix B*, 2009) provides a methodology for building such a remoteness variable $(REM_i)$. Direct calculation of the multilateral resistances is more complex. However, the OECD (2009b) uses a specific software to deal with this issue.

40. Which are country-year specific and were dropped from the specification.

Baseline results are estimated by the Ordinary Least Square (OLS) with robust standard errors. Tables in Annex 8 provide a summary of the results for several sectors. As a robustness check we also report the results obtained by the Poisson Pseudo-Maximum Likelihood estimation (PPML) and a cross section estimation.[41]

## The remoteness index

The global enabling trade report follows the following construction for the economic remoteness index :

$$REM_i = \sum_{i\ to\ j} DIST_{ij} \frac{GDP_j}{\sum_{k \neq i} GDP_k}$$

where $\frac{GDP_j}{\sum_{k \neq i} GDP_k}$ is proxied by the share of country $j$'s GDP in world GDP less country $i$'s share. It corresponds to the sum of distances between $i$ and all the other countries weighted by the share of each country in world's GDP. We use 2005 as a reference year.

41. *PPML* has the advantage of dealing with the heteroskedasticity issue (Wooldbridge 2008) and the presence of zeros (Silva and Tenreyro, 2006). With *PPML*, the gravity model can be estimated in its orginal multiplicative form, without being log-linearized.

# Annex 4.

## Calculation of Trade Costs

Novy (2010) develops a simple measure of bilateral trade costs derived from the gravity model of Anderson and van Wincoop (2003). After several rearrangements of the basic gravity equation and the multilateral resistance terms, he derives an expression for the geometric average of trade costs in both directions, a measure of bilateral trade costs $(t_{ij}t_{ji})$ relative to domestic trade costs $(t_{ii}t_{jj})$. Chen and Novy (2009) generalized the model at the sectoral level, leading to the following expression of trade costs $(\theta_{ij}^k)$:

$$\theta_{ij}^k = \left(\frac{t_{ij}^k t_{ji}^k}{t_{ii}^k t_{jj}^k}\right)^{\frac{1}{2}} = \left(\frac{x_{ii}^k x_{jj}^k}{x_{ij}^k x_{ji}^k}\right)^{\frac{1}{2(\sigma_k - 1)}}$$

where $x_{ii}^k$ denotes the production sold domestically for country $i$ (i.e. domestic output minus exports) and sector $k$, $x_{ij}^k$ the exports from $i$ to $j$, for sector $k$, and $\sigma_k$ the elasticity of substitution across goods[42] for sector $k$. Novy's measure captures the fact that a decrease (increase) in trade costs, increases (reduces) international trade relatively to domestic trade flows. Thus trade costs are captured only by inferring them from observable trade flows.[43]

As reminded previously, these trade costs are a geometric average of trade costs in both directions. It can be important, as pointed out by Shepherd (2009) who attributes improvements in China (decrease of trade costs) to the progress China made in lowering its own barriers but also to its WTO accession, including through better market access for Chinese products in foreign markets.

42. It is assumed to be the same across all countries and goods (Anderson and van Wincoop, 2003). Following the common rule, the elasticity of substitution is set equal to 8 (Novy, 2008). Note that this elasticity may vary across sector and estimates and could be more or less sensitive to the value chosen. See Shepherd (2009) for a discussion on elasticity of substitution issues.

43. However, intra-national trade $x_{ii}^k$ is calculated with domestic output at the sector level.

# Annex 5.

## The Trade Costs Specifications

In our analysis we run the following specifications:

- **Specification 1 (S1):** We introduce an interacted variable of the TFIs as independent variable in the regression. The variables are computed as a geometric mean of both directions.

- **Specification 2 (S2):** We include the country specific TFIs (for country $i$ and country $j$).

Whatever the specification, in order to calculate trade costs we need specific data, like intra-national trade.[44] To do that, we use a new database[45] provided by Miroudot, Sauvage and Shepherd (*forthcoming*), which includes all necessary variables to run such models.

In the first specification we use a transformation of the TFIs. The interacted variable is computed as a geometric mean of both directions:

$$TFI_*^c = \sqrt[2]{TFI_i^c TFI_j^c}$$

This computation appears well adapted to Novy's methodology and also provides a more accurate index, since a poor index can be merged with a more accurate one.[46] As a counterpart of such transformation, it is more difficult to conclude on the country specific part. We face the same issues as in the gravity equations:

- the list of controls varies within each study and it is not possible and even desirable to add too many variables.

- if we include fixed effects, regressions must be more accurate (Fixed effects account for all *their* dimensions), but we have to deal with perfect collinearity between the attributes and the fixed effects of the same dimension.

So, the first specification (*reg4*) is:

44. Intra-national trade is simply the difference between production (domestic output) and export.

45. A quick overview of the database specifications is provided at the end of this Annex

46. A "poor" index is an index based on a country $(a)$ with several missing variables, by opposition to an index of a country $(b)$ computed without missing variables. The geometric average of $a$ and $b$ will smooth such accuracy issues.

**(4)**

$$\tau_{ijt}^{k} = \beta_0^k + \beta_1^k \ln DIST_{ij} + \beta_2^k Contig_{ij} + \beta_3^k Lang_{ij} + \beta_4^k Col_{ij} + \beta_5^k TFI_*^c + D_{it} + D_t + D_k + \varepsilon_{ijt}^k$$

Subscripts and variables are the same as in the gravity equation. Other variables stand for trade costs $(\tau_{ijt}^k)$, the interacted index $(TFI_*^c)$ and a country-time dummy $(D_{it})$. Tables in Annex 8 provide the results, with OLS estimation and robust standard errors.

Then, we test a second specification, following the previous specification without an interacted index but a country specific index, in order to extract the impact of each country on trade costs. Note that as for gravity regressions, country-pair-time dummies are dropped due to the lack of degree of freedom, so we favour the country-pair dummies. This leads to the following regression (reg5_cp):

**(5)** $\tau_{ijt}^k = \beta_0^k + \beta_1^k TFI_j + \beta_2^k TFI_i + D_{ij} + D_t + D_k + \varepsilon_{ijt}^k$

As for the corresponding gravity equation **(2)**, we are faced with fixed effect issues as the TFIs could account for country-specific fixed effects by construction under such specification. Indeed, as the indicators do not vary across time and are the unique country-specific variables included in the regressions, they could act as fixed effects covering the same dimension. Accordingly, this regression should be used as a complementary tool only.

### The trade costs database

The database used by Miroudot, Sauvage and Shepherd (2010) includes the variables needed for the calculation of trade costs at the sectoral level according to the methodology proposed by Chen and Novy (2009). It uses a classification of 29 sectors based on ISIC Rev.3. Domestic trade flows in a given industry are calculated as gross output minus exports. The database covers a wide range of countries and years by combining different data sources. It uses primarily data from the OECD's STAN database, Eurostat and the EU-KLEMS project, completed with national sources as well as information from OECD's Input-Output tables. Gross output/value-added ratios are used for some non-OECD economies where no data on gross output are available. Trade data come from the OECD ITCS database for goods and the OECD TISP database for services, completed with UN data for non-OECD countries.

# Annex 6.

## Contribution to the Variance

The contribution of each explanatory variable $(var_m)$ to the total variance of $\tau_{ijt}^k$ is calculated as:

$c_m = \beta_m^k cov(var_m, \tau_{ijt}^k)/var(\tau_{ijt}^k)$ where $\beta_m$ is the partial regression coefficient of the main regression. The first table (A) provides the results for all variables, without data cleaning, eg. *Without dropping the non-significant variables, the "correlated" variables or the variables which do not bear the expected signs*. Fixed effects are not reported.

**Table (A)**

| Variables | Allsectors | Manufacture | Agriculture |
|---|---|---|---|
| Distance | 0.1219832 | 0.3757817 | 0.3218164 |
| Language | -0.0010912 | 0.0080058 | 0.0141814 |
| Contiguity | 0.0049999 | 0.0086096 | 0.0169311 |
| Colony | -0.0000132 | 0.0017971 | 0.0091415 |
| TFI (a) | 0.0166545 | -0.0032856 | 0.0146686 |
| TFI (b) | -0.0042474 | -0.0165852 | -0.0132058 |
| TFI (c) | 0.0366809 | 0.0731933 | 0.0313421 |
| TFI (d) | -0.0002984 | -0.0021532 | 0.0004747 |
| TFI (e) | 0.0028812 | 0.0118199 | 0.0016537 |
| TFI (f) | -0.0000639 | 0.0010075 | 0.0110249 |
| TFI (g) | 0.0459798 | 0.053976 | 0.0795318 |
| TFI (h) | 0.0116362 | 0.0679939 | 0.0258553 |
| TFI (i) | -0.0886707 | -0.1925854 | -0.0931335 |
| TFI (j) | 0.0612996 | 0.1589718 | 0.0453592 |
| TFI (l) | 0.0195569 | 0.0166539 | 0.0071849 |
| Total | 0.2272874 | 0.5632011 | 0.4728263 |

The negative signs are quite surprising. However, the related variables are not significant or do not bear the expected signs. Moreover some of them have potential correlation issues, as TFI (b). Table (B) provides the results after data cleaning (non-significant variables, "correlated" variables and variables which do not bear the expected sign have been dropped).

**Table (B)**

| Variables | Allsectors | Manufacture | Agriculture |
|---|---|---|---|
| Distance | 0.1070711 | 0.3344235 | 0.2762951 |
| Language | -0.0015283 | 0.0068713 | 0.0140451 |
| Contiguity | 0.004324 | 0.0097941 | 0.0240083 |
| Colony | 0.0023228 | 0.0048329 | 0.0087691 |
| TFI (a) | 0.0196543 | | 0.0136896 |
| TFI (b) | | | |
| TFI (c) | 0.0105842 | 0.0365509 | 0.0005088 |
| TFI (d) | | | |
| TFI (e) | 0.0070919 | 0.0169719 | 0.0164992 |
| TFI (f) | | 0.0018265 | 0.0097603 |
| TFI (g) | 0.0213848 | 0.0269781 | 0.0456419 |
| TFI (h) | 0.0099252 | 0.0540653 | 0.0165644 |
| TFI (i) | | | |
| TFI (j) | 0.0005163 | 0.0115699 | 0.0018058 |
| TFI (l) | -0.0032808 | -0.0116493 | -0.0063218 |
| Total | 0.1780655 | 0.4922351 | 0.4212658 |

# Annex 7.

## Evidence from the US Cross Database on Advance Rulings

Advance rulings are issued for a number of trade-related matters related to classification, valuation, origin and local concerns. Table 3 illustrates a typical break down of advance rulings, with more than 90% of advance rulings accounted for by classification issues. These ratios remain fairly consistent in the CROSS database over time. It is important to note that in the CROSS database classification issues can include rulings about tariff preferences and questions of valuation, if they relate to selected US preference programs. This is especially true in the context of outward processing regimes such as the Caribbean Basin Economic Recovery Act (CBERA) or programs related to offshore processing of goods assembled from US components, which are classified in HS tariff chapters, 98 and 99.

**Table 3. US advance rulings**

1990-2010 by type of ruling (number of rulings and per cent)

| Type of ruling | Number of rulings | Per cent of rulings |
|---|---|---|
| Classification | 153 044 | 93% |
| Carriers | 4 630 | 3% |
| Markings | 2 978 | 2% |
| Valuation | 942 | 1% |
| Other | 2 232 | 1% |
| Total | 163 826 | 100% |

*Source*: US CROSS Database. Analysis by Peter Minor.

Table 4 illustrates a cross section of rulings for 2004 by harmonized system section heading and compares the number of rulings to the value of trade.[47] It is notable that textiles and apparel, which accounted for 6% of US imports in 2004, accounted for 37% of US advance rulings over that period. Meanwhile, vehicles and transport equipment accounted for 14% of US imports, but only 1% of advance rulings. Chemicals and allied products accounted for 7% of US import value and had a similar level of advance rulings.

47. The data represent all rulings which indicated a specific HS number. Non-classification advance rulings frequently do not reference a specific HS number and are not represented. In contrast, a classification ruling may reference several HS numbers, and these are counted as separate instances.

**Table 4. US imports and advance rulings**

by HS section heading 2004 (millions of USD and number of rulings)

| | Trade value | | Advance rulings | |
|---|---|---|---|---|
| **Section** | **Millions of USD** | **Per cent** | **Number** | **Per cent** |
| I-Live Animals; Animal Products | 17 391 | 1% | 54 | <1% |
| II-Vegetable Products | 16 261 | 1% | 43 | <1% |
| III-Animal or Vegetable Fats and Oils | 2 239 | <1% | 1 | <1% |
| IV-Prepared Foodstuffs; Beverages, Spirits; Tobacco | 29 960 | 2% | 638 | 5% |
| V-Mineral Products | 210 910 | 14% | 26 | < 1% |
| VI-Products of the Chemical or Allied Industries | 101 734 | 7% | 799 | 7% |
| VII-Plastics and Articles Thereof Rubber | 40,097 | 3% | 628 | 5% |
| VIII-Raw Hides, Handbags and Travel Goods | 9 558 | 1% | 491 | 4% |
| IX-Wood Articles and Articles of Wood Wicker etc. | 23 554 | 2% | 242 | 2% |
| X-Pulp Wood and Paper | 24 037 | 2% | 304 | 3% |
| XI-Textiles and Apparel | 86 802 | 6% | 4,419 | 37% |
| XII-Footwear and Headwear | 19 626 | 1% | 570 | 5% |
| XIII-Articles of Stone, Glass and Cement | 14 631 | 1% | 297 | 3% |
| XIV-Natural or Cultured Pearls and Precious Metals | 33 414 | 2% | 159 | 1% |
| XV-Base Metals | 77 933 | 5% | 609 | 5% |
| XVI-Machinery and Electrical Equipment | 385 626 | 26% | 904 | 8% |
| XVII-Vehicles, Aircraft and Vessels | 210 788 | 14% | 95 | 1% |
| XVIII-Optical, Photographic and Measuring Instruments | 49 828 | 3% | 222 | 2% |
| XIX-Arms | 1 349 | <1% | 7 | <1% |
| XX-Misc Manufactured | 58 983 | 4% | 1,187 | 10% |
| XXI-Works of Art | 5 301 | <1% | 22 | <1% |
| XXII-Special Classification | 49 685 | 3% | 103 | 1% |
| Total | 1 469 704 | 100% | 11,820 | 100% |

*Source*: US CROSS Database and US Imports of Merchandise Trade CD ROM. Analysis by Peter Minor.

A cross sectional regression was run for 2004 to establish the predictors of advance rulings. Equation A.7-1 includes the number of advance rulings by HS-2 chapter as predicted by several variables, including trade value, number of tariff lines, trade weighted tariff rate, percent of goods entering under tariff preference and the number of importers. Including the average tariff level and the number of tariff lines recognizes that advance rulings are more likely to be issued when tariffs are high or when there are a large number of tariff lines, reflecting product diversity within a chapter. The number of importers is also a proxy for product diversity, but is not tied to the number of tariff lines (more importers are likely to import more varied imports) and the complexity of the supply chain. Variables for preference programs were included with a similar rational to the inclusion of the average tariff – importers will be interested in claiming preferences

which may be dependent on tariff classification.[48] The percent of air freight was included as a proxy for time sensitive products.[49]

Equation A.7-1

$$numar_k^{2004} = \beta_0 + \beta_1 tradeval_k^{2004} + \beta_2 advaltar_k^{2004} + \beta_3 numtarline_k^{2004} + \beta_4 pctpref_k^{2004} + \beta_5 pctair_k^{2004} + \beta_6 numimptr_k^{2004} + \varepsilon_i$$

Where:

*numar*= number of advance rulings in HS-2 chapter *k* in 2004

*tradeval*=trade value in HS-2 chapter *k* in 2004

*advaltar*=trade weighted ad-valorem MFN tariff in HS-2 chapter *k* in 2004

*numtarline*=number of HS-8 digit tariff lines in HS-2 chapter *k* in 2004

*pctpref* = percent of preferential trade in HS-2 chapter *k* in 2004

*pctair*=percent of air freight in trade in HS-2 chapter *k* in 2004

*numimptr*=number of importers of record in HS-2 chapter *k* in 2004

The initial results of running equation 1 rejected trade value (*tradeval*) and the percent of trade air freight (*pctair*). Equation A.7-1 was then re-specified as equation A.7-2:

$$numar_k^{2004} = \beta_0 + \beta_1 advaltar_k^{2004} + \beta_2 numtarline_k^{2004} + \beta_3 pctpref_k^{2004} + \beta \quad numimptr_k^{2004} + \varepsilon_i$$

Equation A.7-2 results in an R squared of 0.57. Table 5 summarizes the t statistics and the contribution to variance of each variable to the regression.[50]

**Table 5. Regression 1-2 predicting advance rulings (R2 = 0.57)**

| Name of variable | Abbreviation | Pr> (t) | Co-efficient | Partial R |
|---|---|---|---|---|
| Ad valorem tariff | advaltar | < 0.001 | 37.927 | 0.304 |
| Number of tariff lines | numtarline | 0.024 | 0.229 | 0.166 |
| Per cent trade preferential | pctpref | < 0.001 | 27.780 | 0.059 |
| Number of importers | numimptr | 0.005 | 0.016 | 0.059 |

*Source*: US Cross database and various sources from author's calculations.

48. An interactive variable between tariff level and preference percentage was not tested, but might provide further insight.

49. A more direct measure of time sensitivity would be to employ Hummels 2007 measures of the value of time by HS4 sub-heading, but was not employed here.

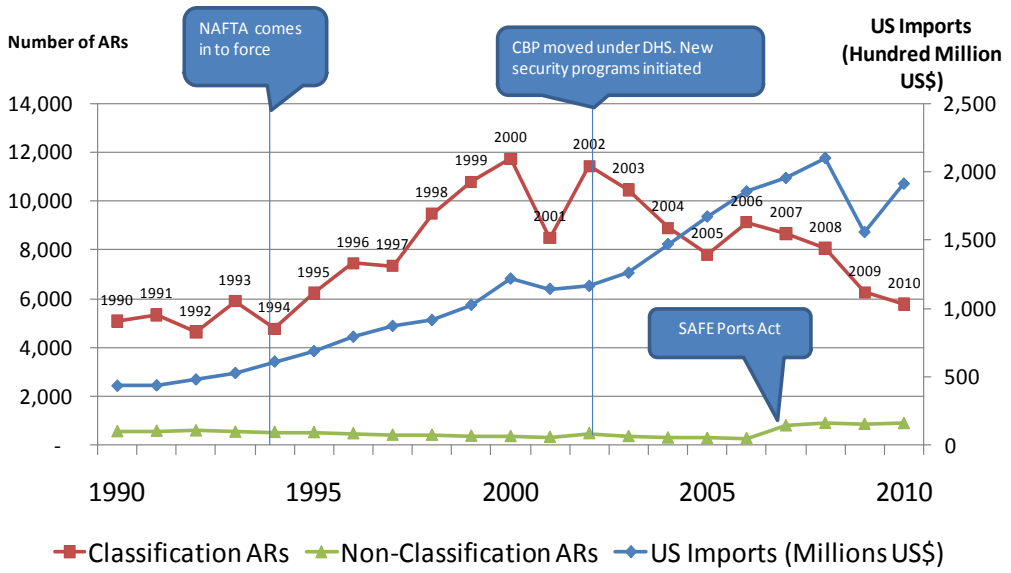
50. The database was further segmented into agricultural and non-agricultural trade. The regression for non-agricultural trade resulted in an R squared of 0.47 with the same variables of significance.

The results of equation 1 reject trade value as an explanatory factor in advance rulings. Moreover, equation 2 underscores the focus on the number of HS-8 tariff lines and the *ad valorem* tariff levels as strong predictors of the number of advance rulings, accounting for nearly half of the variation in advance rulings. The variables are highly significant. The number of importers and the percent of preferential trade also play a role in determining the number of advance rulings, but to a lesser extent.

Figure A7.1 illustrates the overall trend of advance rulings issued and trade value over the twenty year period. Once again, the relationship between trade value and advance rulings is ambiguous. From 1990 to 1994 trade grew, while classification advance rulings did not increase in a corresponding amount. Beginning in 1994, classification advance rulings increased dramatically while trade continued its steady growth.[51] After 2000, the issuance of advance rulings declines almost continuously through 2010.[52]

**Figure A7.1. US advance rulings and US imports (non-oil and gas)**

1990-2010 (number of ARs and millions of USD)




*Source*: US Cross database and US Imports of Merchandise Trade CD ROM.

51. Officials at US Customs and Border Protection (CBP) noted that 1994 saw two important events for traders: first, the North American Free Trade Area (NAFTA) went into effect and the US instituted a new system which held importers responsible for trade documentation spurring new interest by importers for getting documentation correct.

52. CBP officials did not cite any specific cause for this drop in advance rulings, but speculated that it could be the result of the fact that US law does not specify any expiration date for an advance ruling and that the previous ten years had established a vast set of precedents which reduced the need for further advance rulings. They noted that rulings tend to grow after major changes to the trading system and markets, such as reclassification of the harmonized system, product innovation and market forces creating new importers. A further observation is that the average tariff has been declining since 2000.

To further test the relationship between advance rulings and trade, a time series regression was specified relating the growth rate in advance rulings to the corresponding growth rate in trade from one quarter to the same quarter in the following year (quarter-over-quarter). Equation A.7-3 expresses this relationship in growth rates:

$$\Delta numar^{t} = \beta_0 + \beta_1 \Delta tradval^{t} + \varepsilon_i$$

Where*:*

$$\Delta numar^{t} = ln\,(numar^{tq}) - ln\left(numar^{t-1q}\right) \text{ and } \Delta tradval^{t} = ln\,(tradval^{tq}) - ln\left(tradval^{t-1q}\right)$$

Equation A.7-3 was run for total trade and at the HS chapter level.[53] In the overall regression, the quarter-over-quarter logarithmic rate of growth in trade value was significant as a predictor of advance rulings, but explained approximately 5% of the variation in advance rulings over time. When the regressions were run separately at the HS chapter level, a handful of sectors could not reject a relationship between growth rates in advance rulings and the growth rate in trade.[54] In these cases where the growth in trade value was found significant, it explained less than 10% of the total variance in quarter-over-quarter advance ruling growth rates.

53. Equation A.73 was also run at the HS section level, combined, and the R squared was found to be 0.35, however, examination of residuals showed that the estimates were affected by extreme growth rates at both ends of the growth spectrum (negative and positive) with the majority of observations clustered around average growth rates. This is not surprising and supports the fact that as trade disappears or grows extremely rapidly, the number of ARs filed does respond, but not for average growth rates.

54. The sectors for which trade growth was related to advance rulings included textiles and apparel, base metals, headwear and footwear, wood articles and cultured pearls and precious stones.

# Appendix 1. Correlation Between Variables Within Each Indicator

| **TFI (a)** | var1 | var2 | var3 | var4 | var5 | var6 | var7 | var8 | var9 | var10 | var11 | var12 | var13 | var14 | var15 | var16 | var17 | var18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| var1 | 1 | | | | | | | | | | | | | | | | | |
| var2 | 0.27 | 1 | | | | | | | | | | | | | | | | |
| var3 | -0.08 | -0.3 | 1 | | | | | | | | | | | | | | | |
| var4 | -0.06 | 0.09 | -0.24 | 1 | | | | | | | | | | | | | | |
| var5 | -0.15 | -0.08 | 0.41 | 0.05 | 1 | | | | | | | | | | | | | |
| var6 | -0.1 | 0.03 | -0.07 | 0.22 | 0.56 | 1 | | | | | | | | | | | | |
| var7 | 0.18 | 0.39 | 0.47 | -0.24 | 0.41 | 0.33 | 1 | | | | | | | | | | | |
| var8 | 0 | -0.48 | 0.23 | 0 | 0 | -0.31 | -0.23 | 1 | | | | | | | | | | |
| var9 | -0.1 | -0.42 | 0.41 | 0.04 | 0.25 | -0.1 | 0.01 | 0.31 | 1 | | | | | | | | | |
| var10 | -0.14 | 0.17 | 0.31 | -0.32 | 0.38 | 0.06 | **0.62** | -0.06 | -0.07 | 1 | | | | | | | | |
| var11 | -0.17 | -0.4 | 0.46 | 0.13 | 0.33 | 0.37 | 0.27 | 0.25 | **0.63** | 0.09 | 1 | | | | | | | |
| var12 | -0.17 | -0.13 | 0.46 | 0.13 | -0.04 | -0.16 | 0.08 | 0.25 | 0.1 | 0.23 | 0.38 | 1 | | | | | | |
| var13 | -0.17 | 0.13 | -0.11 | 0.13 | **0.52** | **0.63** | 0.27 | -0.25 | -0.16 | 0.38 | 0.06 | -0.25 | 1 | | | | | |
| var14 | -0.08 | 0.18 | -0.05 | 0.16 | 0.41 | **0.89** | 0.47 | -0.23 | -0.07 | 0.04 | 0.46 | -0.11 | 0.46 | 1 | | | | |
| var15 | -0.22 | -0.41 | 0.35 | 0.07 | **0.51** | 0.48 | 0.02 | 0 | 0.48 | -0.01 | **0.76** | 0.22 | 0.22 | 0.35 | 1 | | | |
| var16 | -0.45 | -0.14 | 0.17 | -0.32 | -0.22 | 0.01 | 0.09 | 0.1 | 0.23 | 0.12 | 0.37 | 0.1 | -0.16 | 0.17 | 0.25 | 1 | | |
| var17 | -0.19 | -0.28 | 0.4 | -0.4 | 0.17 | 0.3 | 0.13 | 0.12 | 0.06 | -0.17 | 0.29 | 0 | 0 | 0.4 | 0.38 | 0.42 | 1 | |
| var18 | 0 | -0.17 | 0.36 | -0.14 | 0.47 | 0.5 | 0.48 | 0 | 0.17 | 0.28 | 0.2 | 0 | 0.4 | 0.36 | 0.17 | 0 | 0.37 | 1 |

| TFI (b) | var19 | var20 | var21 | var22 | var23 |
|---|---|---|---|---|---|
| var19 | 1 | | | | |
| var20 | -0.17 | 1 | | | |
| var21 | -0.33 | **0.96** | 1 | | |
| var22 | 0.33 | 0.33 | 0.15 | 1 | |
| var23 | 0.26 | 0.26 | 0.11 | **0.92** | 1 |

| TFI (c) | var24 | var25 | var26 | var27 | var28 | var29 | var30 | var31 | var32 |
|---|---|---|---|---|---|---|---|---|---|
| var24 | 1 | | | | | | | | |
| var25 | **0.57** | 1 | | | | | | | |
| var26 | **0.6** | **0.51** | 1 | | | | | | |
| var27 | 0.26 | 0.22 | 0.16 | 1 | | | | | |
| var28 | -0.1 | 0.2 | -0.06 | 0.02 | 1 | | | | |
| var29 | 0.26 | 0.18 | 0.09 | 0.36 | 0.43 | 1 | | | |
| var30 | 0.13 | 0 | 0.27 | 0.22 | 0.03 | 0.2 | 1 | | |
| var31 | 0.29 | 0.19 | 0.08 | 0.22 | **0.53** | 0.4 | 0.06 | 1 | |
| var32 | 0.03 | 0 | 0.02 | 0.13 | 0.26 | 0.26 | **0.76** | 0.22 | 1 |

| TFI (d) | var33 | var34 | var35 | var36 | var37 | var38 | var39 |
|---|---|---|---|---|---|---|---|
| var33 | 1 | | | | | | |
| var34 | **-0.61** | 1 | | | | | |
| var35 | -0.58 | **0.61** | 1 | | | | |
| var36 | -0.41 | 0.25 | -0.27 | 1 | | | |
| var37 | 0.36 | 0.25 | -0.1 | -0.25 | 1 | | |
| var38 | 0.1 | 0.25 | 0.41 | -0.25 | **0.53** | 1 | |
| var39 | 0 | 0.37 | **0.61** | **-0.25** | 0.37 | **0.93** | 1 |

| TFI (e) | var40 | var41 | var42 | var43 | var44 | var45 |
|---|---|---|---|---|---|---|
| var40 | 1 | | | | | |
| var41 | 0.39 | 1 | | | | |
| var42 | | | | | | |
| var43 | 0.37 | 0.08 | | 1 | | |
| var44 | 0.26 | **0.55** | | **0.77** | 1 | |
| var45 | | | | | | |

| TFI (f) | var46 | var47 | var48 | var49 | var50 | var51 | var52 |
|---|---|---|---|---|---|---|---|
| var46 | 1 | | | | | | |
| var47 | 0.32 | 1 | | | | | |
| var48 | -0.32 | 0.25 | 1 | | | | |
| var49 | 0.38 | **0.73** | 0.01 | 1 | | | |
| var50 | 0.05 | 0.2 | -0.26 | 0.25 | 1 | | |
| var51 | 0.13 | 0.23 | -0.36 | 0.26 | **0.62** | 1 | |
| var52 | | | | | | | |

| TFI (g) | var53 | var54 | var55 | var56 | var57 | var58 | var59 | var60 |
|---|---|---|---|---|---|---|---|---|
| var53 | 1 | | | | | | | |
| var54 | **0.89** | 1 | | | | | | |
| var55 | -0.27 | **-0.19** | 1 | | | | | |
| var56 | 0.32 | **0.68** | 0 | 1 | | | | |
| var57 | 0.05 | -0.08 | 0 | -0.25 | 1 | | | |
| var58 | -0.3 | -0.07 | 0 | 0.33 | 0.33 | 1 | | |
| var59 | | | | | | | | |
| var60 | -0.09 | 0.12 | 0.26 | 0.41 | 0.41 | **0.8** | | 1 |

| TFI (h) | var61 | var62 | var63 | var64 | var65 | var66 | var67 | var68 | var69 | var70 | var71 | var72 | var73 | var74 | var75 | var76 | var77 | var78 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| var61 | 1 | | | | | | | | | | | | | | | | | |
| var62 | | | | | | | | | | | | | | | | | | |
| var63 | -0.05 | | 1 | | | | | | | | | | | | | | | |
| var64 | 0.29 | | 0.44 | 1 | | | | | | | | | | | | | | |
| var65 | -0.18 | | 0.13 | 0.43 | 1 | | | | | | | | | | | | | |
| var66 | -0.29 | | -0.2 | -0.16 | **0.8** | 1 | | | | | | | | | | | | |
| var67 | | | | | | | | | | | | | | | | | | |
| var68 | -0.1 | | 0.12 | **0.59** | **0.67** | 0.36 | | 1 | | | | | | | | | | |
| var69 | | | | | | | | | | | | | | | | | | |
| var70 | | | | | | | | | | | | | | | | | | |
| var71 | 0.26 | | **0.54** | **0.51** | **0.71** | 0.38 | | 0.4 | | | 1 | | | | | | | |
| var72 | -0.29 | | -0.2 | -0.16 | **0.8** | **1** | | 0.36 | | | 0.38 | 1 | | | | | | |
| var73 | 0.15 | | -0.31 | 0.35 | **0.82** | **0.65** | | **0.54** | | | **0.58** | **0.65** | 1 | | | | | |
| var74 | -0.26 | | -0.39 | -0.11 | **0.52** | **0.61** | | **0.69** | | | 0.15 | **0.61** | **0.59** | 1 | | | | |
| var75 | 0.38 | | -0.51 | 0.25 | 0.1 | 0.05 | | **0.6** | | | -0.13 | 0.05 | 0.39 | **0.57** | 1 | | | |
| var76 | -0.29 | | -0.2 | -0.16 | **0.8** | **1** | | 0.36 | | | 0.38 | **1** | **0.65** | **0.61** | 0.05 | 1 | | |
| var77 | 0.32 | | 0.23 | **0.88** | 0.38 | -0.2 | | **0.51** | | | **0.54** | -0.2 | **0.52** | 0.03 | 0.27 | -0.2 | 1 | |
| var78 | **0.54** | | -0.05 | **0.71** | 0 | -0.34 | | 0.2 | | | 0 | -0.34 | 0.17 | -0.31 | 0.45 | -0.34 | **0.6** | 1 |

| TFI (i) | var79 | var80 | var81 | var82 |
|---|---|---|---|---|
| var79 | 1 | | | |
| var80 | 0.45 | 1 | | |
| var81 | **0.64** | 0.5 | 1 | |
| var82 | | | | |

| TFI (j) | var83 | var84 | var85 |
|---|---|---|---|
| var83 | 1 | | |
| var84 | 0.19 | 1 | |
| var85 | 0.17 | **0.75** | 1 |

| TFI (l) | var87 | var88 | var89 | var90 | var91 | var92 | var93 | var94 | var95 | var96 |
|---|---|---|---|---|---|---|---|---|---|---|
| var87 | 1 | | | | | | | | | |
| var88 | 0.35 | 1 | | | | | | | | |
| var89 | 0.5 | 0.18 | 1 | | | | | | | |
| var90 | 0.25 | -0.18 | 0.13 | 1 | | | | | | |
| var91 | **0.63** | 0.22 | 0.32 | 0.4 | 1 | | | | | |
| var92 | 0 | 0.35 | -0.25 | -0.5 | -0.32 | 1 | | | | |
| var93 | 0.5 | 0.35 | 0.25 | 0.5 | **0.79** | 0 | 1 | | | |
| var94 | 0.38 | **0.53** | 0.19 | **0.66** | **0.6** | -0.19 | **0.76** | 1 | | |
| var95 | 0 | 0.35 | 0.5 | 0.25 | 0.16 | 0 | 0.5 | 0.38 | 1 | |
| var96 | 0.09 | 0.3 | 0.3 | -0.3 | 0.46 | 0.34 | 0.43 | 0.13 | 0.34 | 1 |

# Appendix 2. Correlation Matrix

| | TFI (a) | TFI (b) | TFI (c) | TFI (d) | TFI (e) | TFI (f) | TFI (g) | TFI (h) | TFI (i) | TFI (j) | TFI (l) | log_dist | euro | contig | comlang_off |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TFI (a) | 1.00 | | | | | | | | | | | | | | |
| TFI (b) | 0.33 | 1.00 | | | | | | | | | | | | | |
| TFI (c) | 0.40 | 0.03 | 1.00 | | | | | | | | | | | | |
| TFI (d) | 0.45 | 0.06 | 0.17 | 1.00 | | | | | | | | | | | |
| TFI (e) | 0.13 | 0.01 | 0.30 | -0.15 | 1.00 | | | | | | | | | | |
| TFI (f) | -0.40 | 0.05 | -0.21 | 0.12 | -0.12 | 1.00 | | | | | | | | | |
| TFI (g) | 0.28 | 0.28 | 0.12 | 0.14 | -0.19 | 0.18 | 1.00 | | | | | | | | |
| TFI (h) | 0.50 | 0.48 | 0.13 | 0.21 | 0.13 | -0.17 | 0.31 | 1.00 | | | | | | | |
| TFI (i) | 0.50 | 0.33 | 0.41 | 0.09 | 0.15 | -0.11 | 0.49 | 0.40 | 1.00 | | | | | | |
| TFI (j) | 0.50 | 0.30 | 0.37 | 0.07 | 0.16 | -0.15 | 0.37 | 0.31 | 0.97 | 1.00 | | | | | |
| TFI (l) | 0.43 | 0.33 | 0.26 | -0.23 | 0.57 | -0.31 | 0.06 | 0.53 | 0.46 | 0.43 | 1.00 | | | | |
| log_dist | 0.36 | -0.08 | 0.09 | 0.35 | 0.08 | -0.19 | 0.25 | 0.27 | 0.23 | 0.21 | 0.19 | 1.00 | | | |
| euro | 0.09 | 0.02 | -0.17 | -0.12 | -0.15 | -0.15 | -0.01 | -0.12 | -0.12 | -0.09 | -0.04 | -0.20 | 1.00 | | |
| contig | -0.13 | 0.10 | -0.05 | -0.25 | -0.01 | -0.10 | -0.12 | -0.05 | 0.00 | 0.02 | 0.05 | -0.48 | 0.20 | 1.00 | |
| comlang_off | 0.11 | 0.22 | 0.16 | 0.10 | 0.18 | 0.00 | 0.10 | 0.20 | 0.16 | 0.14 | 0.28 | 0.06 | -0.06 | 0.16 | 1.00 |

*(a)* for Information availability, (*b)* for Involvement of trade community, (*c)* for Advance rulings, (*d)* for Appeal procedures, (*e)* for Fees and charges, (*h)* for Formalities / documents, (*g)* for formalities / automation, (*h)* for Formalities / procedures (*i)* for Border Agency Cooperation - internal, (*j)* for Border agency cooperation - External, (l) for Governance and Impartiality

# Appendix 3. Gravity and Trade Costs Regressions

The following tables provide the respective coefficients of every TFI depending on the specification and the sector.

| **All sectors** | TFI (a) | TFI (b) | TFI (c) | TFI (d) | TFI (e) | TFI (f) | TFI (g) | TFI (h) | TFI (i) | TFI (j) | TFI (l) | Adj-R² | Obs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| reg1 | 0.9428*** | 0.2306*** | 0.7083*** | 0.1086*** | 0.1244*** | -0.1431*** | 0.4352*** | 0.7198*** | 0.3304*** | 0.2613*** | 0.3251*** | 0.6411 | 1.60E+04 |
| | -15.2113 | -8.5514 | -16.848 | -3.9487 | -3.0668 | (-4.5413) | -16.3 | -11.1063 | -15.8459 | -15.4198 | -9.4705 | | |
| reg1p | 0.2630*** | 0.0613*** | 0.1765*** | 0.0269*** | 0.0315*** | -0.0497*** | 0.1174*** | 0.2064*** | 0.0841*** | 0.0689*** | 0.0937*** | | 1.60E+04 |
| | -15.504 | -8.1682 | -15.8289 | -3.6635 | -2.9604 | (-6.1665) | -16.1296 | -11.2564 | -15.1366 | -15.1669 | -10.0544 | | |
| reg1bis | 1.1313*** | 0.4123*** | 1.0395*** | 0.1849*** | 0.0841** | 0.1100*** | 0.6598*** | 1.5596*** | 0.5259*** | 0.4071*** | 0.3426*** | 0.6446 | 1.60E+04 |
| | -19.9193 | -17.2194 | -26.3653 | -7.5822 | -2.3057 | -2.5852 | -27.0378 | -16.3809 | -23.6023 | -21.0962 | -12.1832 | | |
| reg1bisp | 0.3062*** | 0.1132*** | 0.2555*** | 0.0424*** | 0.0203** | 0.0008 | 0.1680*** | 0.4432*** | 0.1302*** | 0.1027*** | 0.0978*** | | 1.60E+04 |
| | -20.1348 | -16.5714 | -24.8593 | -6.622 | -2.0932 | -0.0712 | -26.2775 | -16.6257 | -22.5279 | -20.6455 | -13.1454 | | |
| reg2_cp | -1.8432*** | 0.0650*** | 6.3516*** | 0.5878 | 0.7216 | 1.3432** | 0.6433 | -1.0229 | 0.4473 | 0.4608 | -0.2843*** | 0.7264 | 1.60E+04 |
| | (-72.7209) | -3.5424 | -9.2525 | -1.2182 | -0.623 | -2.0576 | . | (-0.9751) | -1.1008 | -1.1619 | (-3.8e+03) | | |
| | -0.2392 | -0.0298 | 3.7965*** | 1.4854*** | 0.9178* | -0.9988 | 1.3566 | -0.7421 | 0.0831 | -0.4141 | 2.7189 | | |
| | (-1.6409) | (-1.6276) | -5.0864 | -8.8029 | -1.9487 | (-1.0175) | . | (-0.6658) | -0.157 | (-0.8403) | . | | |
| reg3 | 0.9514*** | 0.2277*** | 0.7143*** | 0.1170*** | 0.1157*** | -0.1469*** | 0.4337*** | 0.7052*** | 0.3302*** | 0.2623*** | 0.3163*** | 0.6412 | 1.50E+04 |
| | -15.1104 | -8.358 | -16.6921 | -4.206 | -2.8187 | (-4.6009) | -16.0929 | -10.7613 | -15.6554 | -15.3413 | -9.0993 | | |
| reg3p | 0.2631*** | 0.0616*** | 0.1792*** | 0.0285*** | 0.0289*** | -0.0499*** | 0.1170*** | 0.2052*** | 0.0846*** | 0.0693*** | 0.0915*** | | 1.50E+04 |
| | -15.3374 | -8.1268 | -15.8284 | -3.8438 | -2.6962 | (-6.1082) | -15.9769 | -11.099 | -15.1015 | -15.1917 | -9.7404 | | |
| reg4 | -0.8589*** | -0.1427*** | -0.4837*** | -0.0684*** | -0.2196*** | 0.2775*** | -0.3128*** | -1.0703*** | -0.2276*** | -0.1437*** | -0.2937*** | 0.5372 | 1.80E+04 |
| | (-31.7047) | (-11.4727) | (-25.6860) | (-5.4747) | (-11.6249) | -15.7905 | (-25.9152) | (-22.8113) | (-21.4012) | (-16.2065) | (-21.3955) | | |
| reg4p | -0.6092*** | -0.1217*** | -0.3630*** | -0.0458*** | -0.1607*** | 0.2085*** | -0.2359*** | -0.7695*** | -0.1741*** | -0.1139*** | -0.2282*** | | 1.80E+04 |
| | (-33.2938) | (-13.9699) | (-27.5993) | (-4.9698) | (-12.0468) | -16.1102 | (-27.2604) | (-26.3263) | (-23.1051) | (-17.6300) | (-23.4515) | | |
| reg5_cp | 0.6051 | -0.1807 | -0.6811 | 0.5471** | -0.6664 | -0.5347** | -0.2108 | -1.1288* | 0.1364 | -0.2863 | 0.4196*** | 0.6432 | 1.80E+04 |
| | -1.5131 | (-0.9745) | (-1.2448) | -2.3533 | (-1.5730) | (-2.4695) | (-0.9745) | (-1.8523) | -0.6129 | (-1.1649) | -6.3938 | | |
| | -0.2123 | 0.0903*** | 0.04 | -0.0062 | -0.6934*** | -0.5518** | 0.0909*** | -1.1674*** | 0.1136 | -0.3139* | -0.2963 | | |
| | (-0.5550) | -10.161 | -0.0954 | (-0.0378) | (-3.2061) | (-2.0348) | -1.00E+04 | (-3.8962) | -0.5704 | (-1.9474) | . | | |

The sample period is [2000-2008] and Fixed Effects are included but not reported. OLS and Robust Standard errors and P for Poisson
(a) for Information availability, (b) for Involvement of trade community, (c) for Advance rulings, (d) for Appeal procedures, (e) for Fees and charges, (h) for Formalities - documents, (g) for Formalities - automation, (h) for Formalities - procedures/process, (i) for Border agency Cooperation - internal, (j) for Border agency Co-operation - External, and (l) for Governance and Impartiality. Significance levels are *** = 1%, ** = 5%, * = 10%.

| **Manufacturing** | TFI (a) | TFI (b) | TFI (c) | TFI (d) | TFI (e) | TFI (f) | TFI (g) | TFI (h) | TFI (i) | TFI (j) | TFI (l) | Adj-R² | Obs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| reg1 | 1.3274*** | 0.2986*** | 1.0560*** | 0.1487** | 0.1860** | -0.3904*** | 0.6731*** | 1.3397*** | 0.4472*** | 0.3031*** | 0.6518*** | 0.5809 | 2.60E+03 |
| | -9.4081 | -5.3417 | -12.7885 | -2.2621 | -2.4316 | (-5.7524) | -11.4519 | -10.7218 | -10.195 | -7.8007 | -9.1481 | | |
| reg1p | 0.2060*** | 0.0415*** | 0.1588*** | 0.0212** | 0.0245** | -0.0534*** | 0.1025*** | 0.2093*** | 0.0656*** | 0.0427*** | 0.0954*** | | 2.60E+03 |
| | -9.3543 | -4.6078 | -12.7949 | -2.1296 | -2.0933 | (-5.3046) | -10.6277 | -9.5919 | -9.6674 | -7.2528 | -8.5793 | | |
| reg1bis | 1.5674*** | 0.2865*** | 1.1903*** | 0.1557** | 0.3030*** | -0.6021*** | 0.9084*** | 3.8747*** | 0.7123*** | 0.5816*** | 0.6882*** | 0.589 | 2.60E+03 |
| | -11.7828 | -5.8149 | -14.7724 | -2.5437 | -4.0103 | (-7.0380) | -17.0938 | -22.3378 | -14.9295 | -12.7346 | -10.7069 | | |
| reg1bisp | 0.2347*** | 0.0367*** | 0.1715*** | 0.0209** | 0.0417*** | -0.0772*** | 0.1329*** | 0.6025*** | 0.1005*** | 0.0796*** | 0.0976*** | | 2.60E+03 |
| | -11.4855 | -4.6783 | -14.808 | -2.2517 | -3.5857 | (-5.9599) | -15.7778 | -20.0036 | -13.8211 | -11.6792 | -10.0811 | | |
| reg2_cp | 2.4254*** | -0.9635 | -1.9606*** | 1.7433*** | 0.311 | 2.1402*** | 2.8924 | -2.1000*** | -0.0783 | -0.3619*** | -1.8721*** | 0.9843 | 2.60E+03 |
| | -138.7951 | . | (-1.3e+02) | -2.10E+06 | . | -2.70E+06 | . | (-9.0e+05) | . | (-50.1267) | (-1.3e+06) | | |
| | 7.7429*** | -0.825 | 4.4646*** | -0.4687 | -0.5555 | 0.8285 | 2.7868 | -3.4368 | -0.6164*** | -1.2290*** | 2.6876 | | |
| | -3.50E+03 | . | -2.30E+07 | . | . | . | . | . | (-78.6811) | (-1.2e+02) | . | | |
| reg3 | 1.2569*** | 0.2962*** | 1.0460*** | 0.1247* | 0.1328* | -0.3740*** | 0.6563*** | 1.2775*** | 0.4245*** | 0.2906*** | 0.5968*** | 0.5853 | 2.50E+03 |
| | -8.6266 | -5.2794 | -12.4716 | -1.897 | -1.7146 | (-5.4012) | -11.1213 | -10.201 | -9.5545 | -7.4045 | -8.1767 | | |
| reg3p | 0.1932*** | 0.0419*** | 0.1568*** | 0.0170* | 0.0171 | -0.0509*** | 0.0990*** | 0.1970*** | 0.0622*** | 0.0412*** | 0.0870*** | | 2.50E+03 |
| | -8.5719 | -4.6187 | -12.4331 | -1.7178 | -1.452 | (-4.9786) | -10.3107 | -9.1669 | -9.1481 | -6.9626 | -7.7573 | | |
| reg4 | -0.2520*** | -0.0414*** | -0.1730*** | -0.0346*** | -0.0692*** | 0.0701*** | -0.1285*** | -0.5538*** | -0.1072*** | -0.0792*** | -0.1128*** | 0.6874 | 2.60E+03 |
| | (-14.2672) | (-6.8872) | (-14.8417) | (-3.4277) | (-6.5905) | -6.4285 | (-17.9620) | (-27.0374) | (-16.5469) | (-13.7812) | (-12.0057) | | |
| reg4p | -0.3763*** | -0.0714*** | -0.2611*** | -0.0533*** | -0.1076*** | 0.1135*** | -0.2015*** | -0.8393*** | -0.1731*** | -0.1368*** | -0.1860*** | | 2.60E+03 |
| | (-13.9893) | (-7.7178) | (-14.8158) | (-3.4086) | (-6.7370) | -6.8322 | (-18.4962) | (-27.9820) | (-17.4223) | (-15.2840) | (-12.4926) | | |
| reg5_cp | -0.0514*** | 0.0863 | 0.3028*** | -0.2287*** | 0.1523*** | -0.2446 | -0.2628*** | 0.2105*** | -0.1198*** | 0.0781*** | 0.0696*** | 0.8702 | 2.60E+03 |
| | (-7.5994) | . | -52.6986 | (-1.3e+06) | -2.00E+05 | . | (-2.3e+06) | -1.90E+05 | (-9.9e+05) | -29.2887 | -2.30E+05 | | |
| | -0.6677*** | 0.0863 | -0.4258*** | 0.0669 | 0.1523*** | -0.2814 | -0.2628 | 0.2105*** | 0.0759*** | 0.2236*** | -0.2709*** | | |
| | (-7.7e+02) | . | (-1.1e+06) | . | -2.60E+05 | . | . | -5.30E+05 | -24.5418 | -63.5605 | (-3.1e+05) | | |

The sample period is [2000-2008] and Fixed Effects are included but not reported. OLS and Robust Standard errors and P for Poisson.
(a) for Information availability, (b) for Involvement of trade community, (c) for Advance rulings, (d) for Appeal procedures, (e) for Fees and charges, (h) for Formalities - documents, (g) for Formalities - automation, (h) for Formalities - procedures/process, (i) for Border agency Cooperation - internal, (j) for Border agency Co-operation - External, and (l) for Governance and Impartiality. Significance levels are *** = 1%, ** = 5%, * = 10%.

| **Agriculture** | TFI (a) | TFI (b) | TFI (c) | TFI (d) | TFI (e) | TFI (f) | TFI (g) | TFI (h) | TFI (i) | TFI (j) | TFI (l) | Adj-R² | Obs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| reg1 | -0.2135 | 0.0269 | -0.2114 | -0.2101*** | -0.1287 | -0.2865*** | 0.0985 | 0.1488 | 0.0932 | 0.0617 | -0.2123* | 0.3357 | 2.00E+03 |
| | (-1.1003) | -0.4028 | (-1.5885) | (-2.6917) | (-1.1657) | (-2.8750) | -1.2858 | -0.9252 | -1.4699 | -1.1775 | (-1.9507) | | |
| reg1p | -0.0799 | 0.0019 | -0.0744* | -0.0698*** | -0.0308 | -0.0991*** | 0.0285 | 0.0449 | 0.0255 | 0.0203 | -0.0655* | | 2.00E+03 |
| | (-1.3003) | -0.0816 | (-1.8822) | (-2.8618) | (-0.8343) | (-3.1088) | -1.1211 | -0.7769 | -1.2653 | -1.2179 | (-1.8347) | | |
| reg1bis | 0.6843*** | 0.4237*** | 0.0653 | 0.2085*** | 0.0728 | -0.177 | 0.6059*** | 1.4486*** | 0.3073*** | 0.0888 | -0.123 | 0.3407 | 2.00E+03 |
| | -4.1089 | -7.4445 | -0.5383 | -2.9383 | -0.7935 | (-1.3873) | -9.0583 | -6.143 | -4.4455 | -1.45 | (-1.4816) | | |
| reg1bisp | 0.1899*** | 0.1494*** | 0.0098 | 0.0549** | 0.0353 | -0.059 | 0.1888*** | 0.4929*** | 0.0866*** | 0.0252 | -0.0429 | | 2.00E+03 |
| | -3.5708 | -7.0041 | -0.2754 | -2.4582 | -1.1009 | (-1.3311) | -9.0005 | -5.6401 | -4.0983 | -1.354 | (-1.5825) | | |
| reg2_cp | 5.2252*** | -1.3909*** | 5.4174 | -2.7752*** | -0.7450*** | -1.2406 | 5.4936*** | -4.0159*** | -1.4669*** | -1.8772*** | -1.9057*** | 0.9645 | 2.00E+03 |
| | -681.943 | (-1.1e+02) | . | (-86.1826) | (-6.9e+05) | . | -177.428 | (-1.5e+06) | (-87.1295) | (-1.3e+02) | (-66.0672) | | |
| | -7.4949*** | -0.6747*** | 5.3052 | -2.7280*** | -0.1592*** | 0.6195 | 4.1283*** | -3.1120*** | -0.8646*** | 1.1335*** | -2.3794*** | | |
| | (-1.5e+02) | (-53.4759) | . | (-84.7156) | (-1.1e+05) | . | -210.911 | (-2.1e+06) | (-5.3e+06) | -5.70E+06 | (-82.4908) | | |
| reg3 | -0.1893 | -0.0016 | -0.3123** | -0.1920** | -0.1099 | -0.2779*** | 0.1042 | 0.1466 | 0.0906 | 0.0606 | -0.2382** | 0.3604 | 1.90E+03 |
| | (-0.9773) | (-0.0233) | (-2.3389) | (-2.4455) | (-0.9716) | (-2.8044) | -1.362 | -0.883 | -1.4317 | -1.1642 | (-2.1626) | | |
| reg3p | -0.0797 | -0.0049 | -0.1065*** | -0.0653*** | -0.0253 | -0.0992*** | 0.0263 | 0.0237 | 0.0167 | 0.015 | -0.0833** | | 1.90E+03 |
| | (-1.3002) | (-0.2047) | (-2.6923) | (-2.6637) | (-0.6592) | (-3.1037) | -1.0347 | -0.3947 | -0.8225 | -0.9002 | (-2.2923) | | |
| reg4 | -0.3847*** | -0.0660*** | -0.1319*** | -0.0471** | -0.1276*** | 0.1492*** | -0.1698*** | -0.4901*** | -0.0485*** | 0.0008 | -0.0504*** | 0.3531 | 2.00E+03 |
| | (-11.3046) | (-5.2564) | (-5.5431) | (-2.4725) | (-5.6971) | -7.965 | (-10.3889) | (-6.3561) | (-4.0981) | -0.0842 | (-2.9883) | | |
| reg4p | -0.3592*** | -0.0641*** | -0.1226*** | -0.0465*** | -0.1162*** | 0.1378*** | -0.1600*** | -0.4454*** | -0.0455*** | 0.0001 | -0.0475*** | | 2.00E+03 |
| | (-12.1467) | (-5.9226) | (-5.9734) | (-2.8290) | (-6.0251) | -8.5092 | (-11.4914) | (-7.0275) | (-4.4699) | -0.0096 | (-3.1976) | | |
| reg5_cp | -0.7325*** | 0.2197*** | -0.5944*** | 0.3528*** | 0.4315*** | -0.2706*** | -0.5522*** | 0.5549*** | -0.0169*** | 0.017 | 1.0849*** | 0.9522 | 2.00E+03 |
| | (-5.3e+02) | -74.6024 | (-2.1e+06) | -53.8633 | -1.10E+06 | (-3.1e+06) | (-99.3198) | -1.50E+06 | (-2.4e+05) | . | -225.975 | | |
| | 0.6863*** | 0.1259*** | 0.0937*** | -0.3836*** | 0.4315*** | -0.2706*** | -0.1771*** | 0.5549 | -0.0169*** | -0.0466 | 1.0849*** | | |
| | -74.2975 | -56.0878 | -17.6729 | (-88.5008) | -1.00E+06 | (-1.8e+06) | (-37.6276) | | (-2.9e+05) | . | -225.975 | | |

The sample period is [2000-2008] and Fixed Effects are included but not reported. OLS and Robust Standard errors and P for Poisson.
(a) for Information availability, (b) for Involvement of trade community, (c) for Advance rulings, (d) for Appeal procedures, (e) for Fees and charges, (h) for Formalities.
- documents, (g) for Formalities - automation, (h) for Formalities - procedures/process, (i) for Border agency Cooperation - internal, (j) for Border agency
Co-operation - External, and (l) for Governance and Impartiality. Significance levels are *** = 1%, ** = 5%, * = 10%.

### *Cross-section*

The following table provides the results under each specification, in cross-sections (2005), for all sectors.

| **All Sectors** | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (l) | Adj-R² | Obs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| creg1 | 0.1005 | 0.1291*** | 0.1615*** | -0.0107 | 0.0103 | -0.0731 | 0.2216*** | -0.014 | 0.0296* | 0.0530** | 0.1502*** | 0.7741 | 10000 |
| | -1.5573 | -4.2975 | -5.039 | (-0.3860) | -0.2664 | (-0.8595) | -5.0651 | (-0.2719) | -1.6574 | -2.5745 | -4.8056 | | |
| creg1bis | 0.4133*** | 0.3187*** | 0.3800*** | 0.1131*** | 0.1286* | -0.0396 | 0.5809*** | 0.7496*** | 0.1184*** | 0.2476*** | 0.2442*** | 0.7751 | 10000 |
| | -6.6259 | -10.5748 | -10.1824 | -2.9393 | -1.7347 | (-0.3674) | -11.9447 | -6.0474 | -5.1768 | -11.1332 | -8.5846 | | |
| creg3 | 0.1035 | 0.1306*** | 0.1663*** | -0.009 | 0.0091 | -0.0726 | 0.2230*** | -0.0111 | 0.0298* | 0.0554*** | 0.1512*** | 0.7741 | 10000 |
| | -1.6005 | -4.3311 | -5.1667 | (-0.3237) | -0.2365 | (-0.8536) | -5.0877 | (-0.2141) | -1.6662 | -2.6688 | -4.8271 | | |
| creg4 | -0.2755*** | -0.0654*** | -0.1677*** | 0.1056*** | -0.1729*** | -0.1660*** | 0.0463*** | 0.0308 | -0.0546*** | -0.0256*** | -0.0635*** | 0.6669 | 11000 |
| | (-12.2695) | (-5.5028) | (-13.5058) | -7.3612 | (-6.6042) | (-3.7178) | -2.637 | -0.6456 | (-7.2435) | (-3.1725) | (-6.2910) | | |

The sample period is [2005] and Fixed Effects are included but not reported. OLS and Robust Standard errors .
(a) for Information availability, (b) for Involvement of trade community, (c) for Advance rulings, (d) for Appeal procedures, (e) for Fees and charges, (h) for Formalities - documents, (g) for Formalities - automation, (h) for Formalities - procedures, (i) for Border agency Cooperation - internal, (j) for Border agency Co-operation - External, and (l) for Governance and Impartiality. Significance levels are *** = 1%, ** = 5%, * = 10%.

# Appendix 4.
# Regressions with all the TFIs

The following tables provide the coefficients of the TFIs taken together, depending on the specifications and the sectors. ALL TFIs are included (except for K).

| All sectors | Reg 1 | Reg 1bis | Reg 2 | Reg 3all | Reg 4all | Reg 5 |
|---|---|---|---|---|---|---|
| **TFI (a)** | 0.2509** | -0.1802* | na. | 0.2548** | -0.4631*** | na. |
| | -2.0488 | (-1.6611) | | -2.0617 | (-8.7238) | |
| **TFI (b)** | -0.3718*** | -0.0487 | | -0.3843*** | 0.0121 | |
| | (-10.4833) | (-1.4629) | | (-10.6643) | -0.8187 | |
| **TFI (c)** | 2.2569*** | 2.1874*** | | 2.2555*** | -0.4756*** | |
| | -29.1314 | -30.0679 | | -28.8155 | (-17.0796) | |
| **TFI (d)** | 0.0322 | 0.1727*** | | 0.0518 | 0.0585*** | |
| | -0.7421 | -4.7011 | | -1.1819 | -3.4815 | |
| **TFI (e)** | -0.2188*** | 0.037 | | -0.2242*** | -0.1977*** | |
| | (-3.8041) | -0.6712 | | (-3.8526) | (-8.0912) | |
| **TFI (f)** | -0.2949*** | -0.1174** | | -0.3089*** | -0.014 | |
| | (-6.8445) | (-2.0298) | | (-7.1043) | (-0.6172) | |
| **TFI (g)** | 1.9734*** | 1.5371*** | | 1.9961*** | -0.3769*** | |
| | -31.7193 | -28.418 | | -31.539 | (-21.4181) | |
| **TFI (h)** | 1.7384*** | 2.2870*** | | 1.7229*** | -0.6831*** | |
| | -16.5382 | -16.4627 | | -16.171 | (-9.9431) | |
| **TFI (i)** | -5.0480*** | -3.5301*** | | -5.0960*** | 0.7674*** | |
| | (-25.8113) | (-20.8143) | | (-25.6824) | -12.4926 | |
| **TFI (j)** | 4.0778*** | 3.0688*** | | 4.1207*** | -0.6461*** | |
| | -25.2515 | -20.7729 | | -25.1542 | (-11.3665) | |
| **TFI (l)** | 1.1903*** | 0.6864*** | | 1.2155*** | -0.1869*** | |
| | -14.0746 | -10.1019 | | -14.2131 | (-6.4845) | |
| **Adj-R²** | 0.68 | 0.69 | | 0.68 | 0.58 | |
| **Manufacturing** | Reg 1 | Reg 1bis | Reg 2 | Reg 3all | Reg 4all | Reg 5 |
| **TFI (a)** | 0.2784 | 0.6505*** | na. | 0.2548** | -0.4118*** | na. |
| | -1.2536 | -3.7898 | | -2.0617 | (-7.4447) | |
| **TFI (b)** | -0.5931*** | -0.9345*** | | -0.3843*** | 0.0420*** | |
| | (-8.9646) | (-17.1993) | | (-10.6643) | -2.7648 | |
| **TFI (c)** | 2.5722*** | 2.6687*** | | 2.2555*** | -0.5022*** | |
| | -20.6392 | -25.6448 | | -28.8155 | (-18.4136) | |
| **TFI (d)** | -0.0254 | -0.0548 | | 0.0518 | -0.0127 | |
| | (-0.3173) | (-0.9416) | | -1.1819 | (-0.7343) | |
| **TFI (e)** | -0.4954*** | -0.0908 | | -0.2242*** | -0.1445*** | |
| | (-4.7205) | (-1.0946) | | (-3.8526) | (-5.1336) | |
| **TFI (f)** | -0.3894*** | -0.6163*** | | -0.3089*** | 0.0636** | |
| | (-4.6465) | (-7.7097) | | (-7.1043) | -2.5191 | |
| **TFI (g)** | 2.1940*** | 2.3914*** | | 1.9961*** | -0.5031*** | |
| | -22.7766 | -30.2596 | | -31.539 | (-25.2778) | |
| **TFI (h)** | 2.0381*** | 5.3316*** | | 1.7229*** | -0.5328*** | |
| | -11.5371 | -25.2354 | | -16.171 | (-7.7136) | |
| **TFI (i)** | -5.6963*** | -6.1935*** | | -5.0960*** | 1.0418*** | |
| | (-18.3952) | (-25.2597) | | (-25.6824) | -16.0154 | |
| **TFI (j)** | 4.5341*** | 5.4529*** | | 4.1207*** | -0.8538*** | |
| | -17.2322 | -24.3526 | | -25.1542 | (-14.3212) | |
| **TFI (l)** | 1.6435*** | 1.1904*** | | 1.2155*** | -0.2947*** | |
| | -11.2802 | -11.8814 | | -14.2131 | (-9.7246) | |
| **Adj-R²** | 0.69 | 0.81 | | 0.68 | 0.58 | |

# Appendix 5.
# Correlation Between the TFIs and Alternative Sources

## *Following the equal weights scheme*

| | | TFI_a | TFI_b | TFI_c | TFI_d | TFI_e | TFI_f | TFI_g | TFI_h | TFI_i | TFI_j | TFI_l |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Do you receive adequate and timely information when regulations change? | LPI | 0.154 | **0.545** | 0.333 | -0.18 | 0.423 | 0.067 | 0.403 | 0.27 | 0.194 | 0.138 | -0.04 |
| Government Effectiveness | WGI | **0.543** | **0.668** | 0.374 | 0.187 | 0.491 | 0.298 | 0.491 | 0.481 | 0.286 | 0.37 | 0.287 |
| Regulatory quality | WGI | **0.669** | **0.539** | 0.424 | 0.286 | 0.393 | 0.178 | 0.346 | 0.419 | 0.278 | 0.372 | 0.442 |
| Rule of Law | WGI | **0.545** | **0.561** | 0.368 | 0.16 | 0.414 | 0.219 | 0.373 | 0.441 | 0.252 | 0.401 | 0.348 |
| Favouritism in decisions of government official | GCR | 0.281 | 0.436 | 0.046 | 0.179 | **0.503** | 0.207 | 0.286 | **0.592** | 0.49 | 0.447 | 0.088 |
| Transparency of government policy is satisfactory | WCY | 0.169 | **0.531** | 0.154 | 0.023 | 0.385 | 0.06 | 0.404 | 0.446 | 0.356 | 0.397 | 0.025 |
| Evaluate the level of competence of customs agencies | LPI | **0.518** | 0.287 | 0.36 | 0.201 | 0.415 | 0.446 | 0.109 | 0.37 | 0.097 | 0.339 | 0.265 |
| Can customs declarations be submitted and processed electronically? | LPI | 0.358 | **0.625** | 0.495 | 0.116 | 0.269 | 0.309 | 0.499 | 0.349 | 0.31 | 0.267 | 0.361 |
| Are export shipments cleared and shipped as scheduled? | LPI | **0.6** | 0.356 | -0.06 | 0.494 | 0.434 | 0.49 | 0.158 | 0.44 | 0.338 | 0.29 | 0.306 |
| Are import shipments cleared and shipped as scheduled? | LPI | **0.536** | **0.589** | 0.23 | 0.469 | 0.32 | 0.374 | 0.309 | 0.272 | 0.317 | 0.439 | 0.406 |
| Burden of customs procedures | GCR | 0.416 | 0.457 | 0.059 | 0.258 | 0.358 | 0.374 | **0.531** | **0.58** | 0.345 | 0.294 | 0.166 |
| Do traders demonstrating high levels of compliance receive expedited customs clearance? | LPI | 0.348 | 0.35 | **0.522** | 0.049 | 0.182 | 0.358 | 0.403 | 0.122 | -0.14 | 0.265 | 0.366 |
| Can customs declarations be submitted and processed electronically? | LPI | 0.358 | **0.625** | 0.495 | 0.116 | 0.269 | 0.309 | 0.499 | 0.349 | 0.31 | 0.267 | 0.361 |
| Control of corruption | WGI | 0.434 | **0.587** | 0.314 | 0.17 | 0.399 | 0.142 | 0.387 | 0.47 | 0.271 | 0.438 | 0.274 |
| Corruption perception index | CPI | 0.466 | **0.572** | 0.315 | 0.167 | 0.412 | 0.14 | 0.386 | 0.479 | 0.284 | 0.379 | 0.262 |
| Efficiency of legal framework | GCR | 0.385 | 0.444 | 0.238 | 0.123 | 0.441 | 0.224 | 0.307 | 0.461 | 0.414 | 0.313 | 0.152 |
| The public service is independent from political interference | WCY | 0.252 | **0.523** | 0.066 | 0.149 | 0.475 | 0.172 | 0.365 | 0.345 | 0.479 | 0.244 | 0.028 |

*Weighting scheme: Equal weight*

## *Following the expert judgement scheme*

| | | TFI_a | TFI_b | TFI_c | TFI_d | TFI_e | TFI_f | TFI_g | TFI_h | TFI_i | TFI_j | TFI_l |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Do you receive adequate and timely information when regulations change? | LPI | 0.202 | **0.509** | | 0.005 | 0.399 | | | 0.349 | | | |
| Efficiency of Legal framework | GCR | 0.42 | 0.405 | | 0.242 | 0.439 | | | **0.518** | | | |
| Government Effectiveness | WGI | **0.539** | **0.592** | | 0.262 | 0.474 | | | **0.526** | | | |
| Regulatory quality | WGI | **0.662** | 0.478 | | 0.292 | 0.398 | | | 0.469 | | | |
| Rule of Law | WGI | **0.545** | **0.503** | | 0.208 | 0.391 | | | 0.49 | | | |
| Favouritism in decisions of government official | GCR | 0.322 | 0.396 | | 0.314 | **0.501** | | | **0.629** | | | |
| Efficiency of legal framework | GCR | 0.42 | 0.405 | | 0.242 | 0.439 | | | **0.518** | | | |
| Evaluate the level of competence of customs agencies | LPI | **0.55** | 0.302 | | 0.228 | 0.377 | | | 0.402 | | | |
| Judicial Independence | GCR | 0.383 | 0.425 | | 0.278 | 0.424 | | | **0.538** | | | |
| Possibility of a review procedure (%) | LPI | **0.508** | -0.02 | | -0.07 | 0.115 | | | 1E-03 | | | |
| Possibility of a review procedure (%) | LPI | **0.508** | -0.02 | | -0.07 | 0.115 | | | 1E-03 | | | |
| Can customs declarations be submitted and processed electronically? | LPI | 0.371 | **0.595** | | 0.224 | 0.265 | | | 0.408 | | | |
| Are export shipments cleared and shipped as scheduled? | LPI | **0.626** | 0.312 | | 0.463 | 0.433 | | | 0.451 | | | |
| Are import shipments cleared and shipped as scheduled? | LPI | **0.544** | **0.513** | | 0.483 | 0.313 | | | 0.294 | | | |
| Burden of customs procedures | GCR | 0.489 | 0.346 | | 0.36 | 0.348 | | | **0.589** | | | |
| Can customs declarations be submitted and processed electronically? | LPI | 0.371 | **0.595** | | 0.224 | 0.265 | | | 0.408 | | | |
| Control of corruption | WGI | 0.438 | **0.544** | | 0.227 | 0.376 | | | **0.531** | | | |
| Corruption perception index | CPI | 0.474 | **0.53** | | 0.245 | 0.394 | | | **0.544** | | | |
| Efficiency of legal framework | GCR | 0.42 | 0.405 | | 0.242 | 0.439 | | | **0.518** | | | |
| The public service is independent from political interference | WCY | 0.244 | **0.533** | | 0.349 | 0.478 | | | 0.422 | | | |
| Transparency of government policy is satisfactory | WCY | 0.158 | **0.536** | | 0.17 | 0.37 | | | **0.508** | | | |

*Weighting scheme: Expert Judgement*