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# Transparency in Non-Tariff Measures : An International Comparison

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## Abstract

We construct an index of NTM transparency based on notifications to the WTO under the SPS and TBT agreements, the existence of a trade portal giving ready access to trade-relevant regulations, the existence of NTM data collected under the MAST classification, and the results of an experiment conducted between 2015 and 2016 where we asked for specific regulations concerning the import of a particular product on behalf of a private company. The resulting country ranking shows that OECD countries are, by and large, the most transparent, but also shows that ASEAN countries score well compared to other developing countries.

**Keywords:** International trade, Non-tariff measures, transparency, governance, index, ranking

**JEL Classification:** F12, F13, F14, F15, F6

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## 1. Introduction

Transparency is fundamental to modern administrative law in many industrial countries and is key to prevent arbitrariness and capture by special interests. Transparency in administrative rules and processes is also crucial for transactions that involve lengthy and complex procedures like international shipments, and is thus particularly relevant as a trade facilitator; as non-tariff measures (NTMs) are often complex legal instruments, transparency is particularly important in their case.

Indeed, a growing literature has shown that improved transparency can generate substantial gains in trade and investment flows (see e.g. Francois, 2001; Wolfe, 2003; Kerr, 2008; Helble et al., 2009; or Lejarraga and Shepherd, 2013). In these papers, the determinants of trade volumes typically follow the gravity equation, while the causal effects of transparency on trade are identified using variation either in perception-based transparency indices across countries or in transparency provisions across regional trade agreements (RTAs).

In spite of growing interest in measuring transparency in trade policy, most of the proxies used in the literature are broad in scope, relating to general perceptions of government transparency or to “WTO+” provisions in RTAs. We propose in this paper a more direct approach drawing on what governments actually do in the area of NTM transparency. We draw on various sources, including “off-the-shelf” data, on country-level compliance with WTO requirements, such as the notification of potentially trade-restricting measures (a general requirement for all WTO members), the creation of a trade portal (a requirement under the recent Trade Facilitation Agreement), or the availability of NTM inventories under the MAST classification in the new UNCTAD database. In order to get closer to what really happens on the ground, we combine those with the results of an original experiment, in which a Swiss producer of food containers and logistics solutions sent a standardized request on relevant import regulations to trade agencies and SPSTBT enquiry points to 182 countries in the world. The information requests were in French to French-speaking countries, in Spanish to Spanish-speaking countries, and in English to all other ones. They were sent in repeated waves in order to smooth out cases of non-response due to temporary unavailability of particular staff members or other non-persistent factors. When responses were received, we rated them by their quality; for instance, some agencies simply acknowledged reception, while, at the other extreme, Slovenia sent a highly detailed technical explanation that was translated into German (the Swiss company's home language) by the Slovenian embassy in Switzerland. We then aggregated the experimental scores with those under the other criteria, using as weights the variable loadings from principal factor analysis, and then ranked countries by decreasing order of the index value. As our scores have a limited range of integer values, the resulting index has many ties. Within those ties, rankings are arbitrary; in order to lift the indeterminacy, based on the observation that transparency, by and large, correlates with income levels, we rank countries by decreasing order of GDP per capita.

By and large, our index correlates with the Government transparency score of the World Economic Forum's Global Competitiveness Index. It also reveals plausible but nevertheless interesting variation across income and regional groups. Unsurprisingly, OECD countries typically have the highest scores; non-OECD high-income countries—which include a number of oil producers—have low ones. The lowest scores are observed in low-income and lower-middle-income countries. Among developing countries, ASEAN has the highest average scores, followed (albeit with much more heterogeneity) by European and Central Asian countries. The lowest scores are observed in MENA and Sub-Saharan African countries.

The rest of the paper is organized as follows. Section 2 briefly reviews the literature on transparency and trade. Section 3 details the construction of the index. Section 4 analyzes the properties of the resulting ranking. Section 5 concludes.

## **2. Transparency as a trade facilitator: What do we know?**

Be it because of the delays involved in the transactions, different jurisdictions involved, or lack of familiarity between sellers and buyers, international trade is particularly vulnerable to business risk. A number of papers (e.g. Anderson and Marcouiller, 2002, de Groot et al., 2004, Levchenko, 2007, Nunn, 2007, or Francois and Manchin, 2013) have shown that institutional-quality improvements reducing the uncertainty faced by traders have substantial trade-enhancing effects. Typically, the literature focuses on variables that correlate with contract enforcement, such as the protection of property rights or the “rule of law”, political stability, lack of corruption, or government effectiveness components of the World Bank's Governance Indicators. The mechanism, implicit or explicit depending on the modeling approaches, that translates institutional improvements into higher trade volumes is essentially the reduction of sunk and fixed costs (see e.g. van Tongeren 2009; Handley and Limao 2015).

Beyond general institutional quality, a number of papers have shown that transparency has positive effects on trade and investment (Francois, 2001; Wolfe, 2003; Kerr, 2008, or Helble et al., 2009). Helble et al., for instance, use perception-based indicators from the World Economic Forum's Global Competitiveness Report and from the World Bank's Logistics Performance Index, which provide indicators of customs efficiency, corruption, favoritism, policy uncertainty, and the prevalence of NTBs. Using factor analysis to aggregate these components into a comprehensive index of transparency in import regulations,<sup>1</sup> they find the five highest scores among APEC countries for Singapore, New Zealand, Australia, Hong Kong and the U.S., and the five lowest scores for Peru, Thailand, the Philippines, Vietnam and Russia.

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<sup>1</sup> They also derive an index of transparency in export regulation.



Including their transparency index as one of the determinants of trade volumes in a gravity equation,<sup>2</sup> they find substantial and statistically significant effects on trade between APEC countries, in particular for heterogeneous products. Simulating the effect of transparency improvements on trade, they estimate that if all the APEC countries with below-average transparency scores were to improve to the region's average, intra-APEC trade, excluding commodities, would rise by \$148 billion, or 7.5 percent of its current value. Interestingly, the induced trade increase is eight times larger than if all APEC countries with above-average tariffs were to reduce their tariffs to the region's average, highlighting the importance of transparency (see also APEC and World Bank, 2007).

Transparency has been promoted in various ways in the multilateral trading system, encouraging smaller countries, which are rarely if ever challenged under the WTO's dispute-resolution system, to live up to their commitments (Bown and Hoekman, 2007). In a thorough analysis, Wolfe (2013) distinguishes between three generations of transparency requirements: basic "right-to-know" requirements, monitoring & surveillance mechanisms; and accessibility (reporting and engagement).

Right-to know requirements for trade in goods are included in GATT Article II and Article X, which states that

Laws, regulations, judicial decisions and administrative rulings of general application, made effective by any contracting party, pertaining to the classification or the valuation of products for customs purposes, or to rates of duty, taxes or other charges, or to requirements, restrictions or prohibitions on imports or exports or on the transfer of payments therefor, or affecting their sale, distribution, transportation, insurance, warehousing inspection, exhibition, processing, mixing or other use, shall be published promptly in such a manner as to enable governments and traders to become acquainted with them. (GATT Article X, para. 1)

The right-to-know principle is also enshrined in the WTO's notification system. However, in the absence of an enforcement mechanism, the system has only had limited success (see Bacchetta, Richter and Santana, 2012).

The WTO's primary monitoring & surveillance mechanism is based on periodic Trade Policy Reviews, which provide detailed assessments of Member countries' trade policies over a wide range of issues. For regulatory issues, another important monitoring & surveillance mechanism is provided by the "specific trade concerns" (STC) clauses of the SPS and TBT agreements,

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<sup>2</sup> As transparency in trade regulation can be endogenous to trade volumes (either through reverse causation or through omitted variables), the authors use colonial history as an instrumental variable for the transparency index in order to identify a one-way causal mechanism from transparency to trade volumes

which are based on a “reverse” notification procedure (the notification is made not by the country issuing the regulation, but by partners aggrieved by it).<sup>3</sup>

Reporting & engagement requirements have developed over time, starting with the obligation to create enquiry points for SPS and TBT measures, the development of databases (the WTO’s I-TIP portal and the recent development of a universal NTM database by UNCTAD), and the obligation to set up trade portals in the WTO’s Trade Facilitation Agreement.

Transparency provisions are also prevalent in regional trade agreements (see Lejarraga, 2013 for an overview), where they have the appealing feature that they are “non-excludable” and therefore have only trade-creation effects, without any potential for trade diversion (see Chauffour and Maur, 2011, or Lejarraga and Shepherd, 2013). Using an OECD database of FTAs with WTO+ provisions, Lejarraga and Shepherd (2013) find that countries with high democracy and governance indices are more likely to include transparency provisions in bilateral FTAs, which are also more prevalent in FTAs between countries at different levels of income. Based on a raw count of transparency provisions in agreements, they also find that each provision correlates with a one-percent rise in bilateral trade.

We now turn to the construction of an index of transparency in NTMs, using a combination of off-the-shelf data such as WTO notifications with the results of an original experiment.

### **3. A synthetic measure of NTM transparency**

Our index combines two broad sources of information: Publicly-available data, and the results of an experiment consisting of addressing a specific request for regulatory information, on behalf of a private company, to various national agencies including SPS/TBT enquiry points, and rating the quality of the response, when a response was received (more details below).

#### **3.1 Data sources**

Cross-country variation in the availability of publicly-available statistical data on NTMs is a source of difficulties for the statistical analysis of their trade effects. Missing data makes estimates vulnerable to selection effects, as countries that do not report many measures may do so because they do not want to publicize highly restrictive or arbitrarily administered regulations. By contrast, if one is interested in measuring transparency, cross-country variation in the level or quality of the information provided is itself the focus of analysis. In this section, we describe the data we have used to construct our index.

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<sup>3</sup> Article 2.5 of the TBT Agreement states that “[a] Member preparing, adopting or applying a technical regulation which may have a significant effect on trade of other Members shall, upon the request of another Member, explain the justification of that technical regulation. The TBT committee is the place where such justification shall be provided.” See Fontagné and Orefice (2016). Many WTO agreements have independent reverse-notification procedures, but those have progressively lost importance (see Wolfe, 2013)

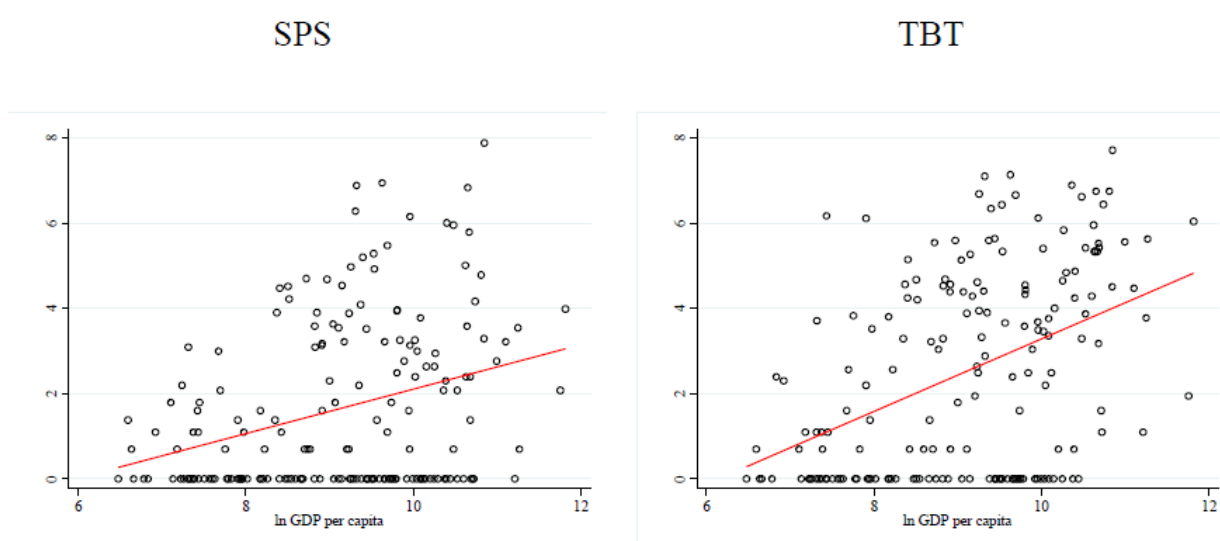
## Compliance with WTO transparency requirements

We collected data on three dimensions of compliance with WTO transparency requirements: TBT notifications, SPS notifications, and the creation of a functional trade portal mandated by the WTO's Trade Facilitation Agreement (TFA).

WTO members are under as many as 157 different notification obligations. A notification is “a transparency obligation requiring member governments to report trade measures to the relevant WTO body if the measures might have an effect on other Members.” Thus, trade restrictiveness is at the heart of the notification process. Under the WTO's TBT and SPS Agreements, member States must notify to the WTO all new regulations with potentially trade-restrictive effects, except those based on international standards. Thus, a sanitary regulation based on the Codex Alimentarius needs not be notified. Similarly, a regulation that liberalizes trade, such as Myanmar's recent elimination of import licenses for a wide range of products, needs not be notified. By contrast, a technical regulation based on a regional or national standard must be notified. While these criteria seem relatively straightforward, in practice, whether a measure is likely to restrict trade or not is a judgment call on which the country imposing the measure and its trade partners may disagree.

Even though notifications are mandatory, in practice few countries other than the United States duly report all regulations. Most low-income countries notify very few measures, and even among high-income countries, there is considerable variation in the number of notifications (Figure 1).

**Figure 1: Notification count and income**



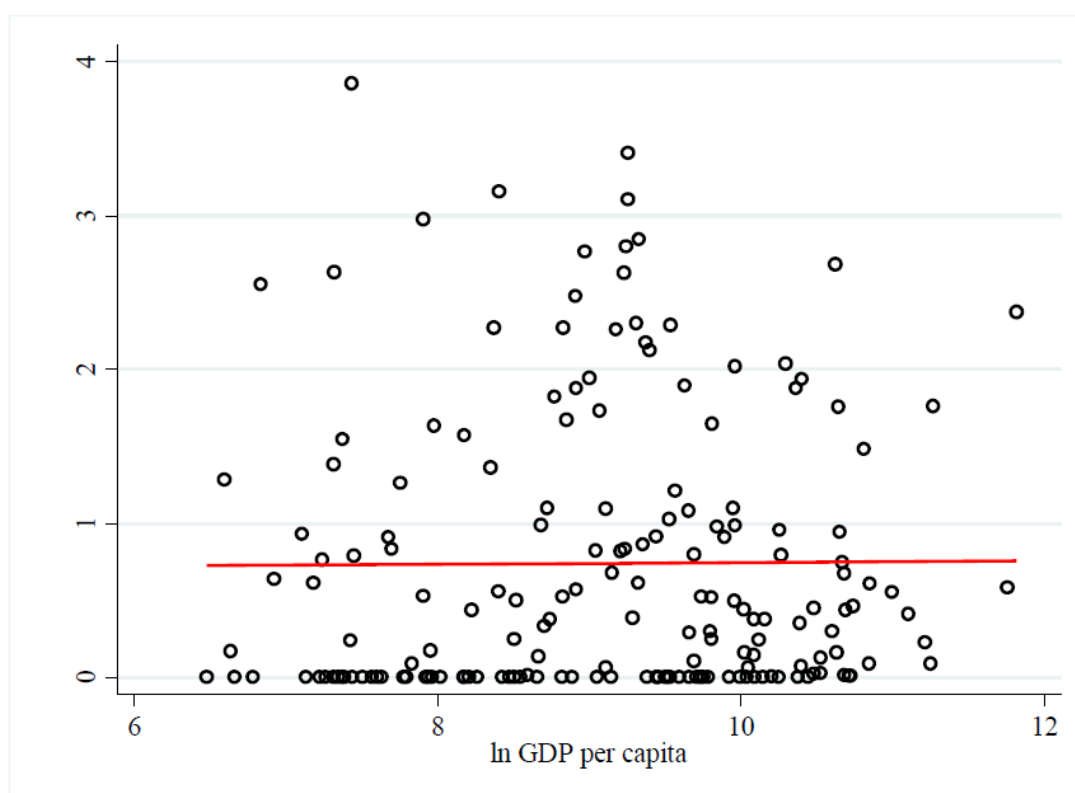
**Note:** Both the number of notifications (on the vertical axis) and the value of GDP per capita (on the horizontal axis) are in logs. Notifications are cumulated over 1995–2013.

**Source:** Authors calculations using WTO ITIP database for notifications and WDI for GDP per capita (2013)

The quality of notifications also varies, some notifications being vague and uninformative. WTO staff filter out obvious errors, such as regulations on car seats notified under the SPS Agreement, but many of them nevertheless remain approximate. We will not attempt here to assess the quality of country notifications but only their cumulative count since 1995.

In order to make the count of notifications comparable across countries in spite of differences in economic size, we adopt two alternative approaches. In one (our preferred specification), we take advantage of the pattern shown in Figure 1 and divide countries into two groups: Those that never notify (clustered along the horizontal axis) and those that notify at least sometimes. In this form, our notification data becomes binary and thus scale-independent. In another specification, we scale the total number of notifications since 1995 by the average value of imports over 1995-2013 as a proxy for the complexity of the notifying country's economy. This eliminates the heavy dependence on income levels appearing in Figure 1, with the resulting number bearing no clear relationship with the country's level of income (Figure 2).

**Figure 2: Normalized notification count (TBT and SPS combined) and income**



**Source:** Authors calculations using WTO ITIP database for notifications and WDI for GDP per capita (2013).

As an alternative measure of transparency in NTMs, we score countries on whether they set up a “trade portal” (i.e. a web site) to provide information on regulations applicable to imported products. The WTO’s TFA, adopted at the Bali Ministerial in December 2013, mandates that countries set up trade portals aimed at facilitating trader access to relevant information. Such web sites, which for some countries like E.U. members existed prior to the Bali agreement, can take different names (trade portal, trade repository, etc.); we searched them using a number of keywords. In addition to coding the existence of a portal in binary form, we also rated its quality on a 1-3 scale, with a score of 3 for the highest quality. Our criterion was for the site to give either direct access to regulations (in the form of pdf documents or summary tables) or to email/telephone/names of contact persons. Empty shells and sites giving merely tariff rates were

not considered as containing “meaningful information” on NTMs and were given a score of one. Sites giving limited information, e.g. notifications to the WTO in vague form, were given a score of 2. Although both notifications and the creation of trade portals are WTO obligations, the groups of non-compliers under both agreements are only weakly correlated, as shown in Table 1.

**Table 1: Compliance with TFA and notification requirements (percent)**

	No portal	Portal	Total
Never notified	32.5	4.5	37.0
Notified	44.5	18.5	63.0
Total	77.0	23.0	100.0

**Source:** WTO ITIP, web search for portals.

While 63 percent of all countries have notified SPS or TBT measures at least once and have created a meaningful trade portal, only 23 percent have a working portal, possibly reflecting the fact that the TFA is a recent agreement.

## NTM data

Over the last two decades, data has been collected on NTMs in various waves and forms. One of the earliest datasets was published on UNCTAD’s TRAINS database, accessible from the World Bank’s WITS portal. The first wave of data was collected in the early 2000s and was used in the paper by Kee, Nicita and Olarreaga (2009) to calculate trade restrictiveness indices. Since then, the TRAINS database has been replenished as part of a joint effort by UNCTAD and the World Bank, while regional entities such as the ALADI Secretariat for Latin American countries, the African Development Bank for the African continent and ERIA for ASEAN countries have contributed regional data-collection efforts. The new data is classified in a consistent way by type of measure using MAST, a common classification proposed by UNCTAD in collaboration (in its 2012 version) with the WTO. Data collection is, in most cases, carried out by outside consultants and financed by development partners rather than by countries themselves, so its availability does not necessarily reflect a proactive transparency effort by government. However, data collection requires the collaboration of various government agencies and cannot proceed without, at the minimum, tacit government approval. In that sense, it is also a sign of transparency, albeit a weak one. Accordingly, we grade countries in binary form (zero/one) on whether NTM data was collected as part of this multilateral/regional effort. Table 2 illustrates the correlation between the two waves of data collection. The coefficient of correlation is 0.41; however, differences in coverage between the two waves are not random. As the 2001 wave did not cover a number of industrial countries (particularly E.U. ones), we did not use it in the index construction.<sup>4</sup>

<sup>4</sup> Kee et al. (2009) completed the TRAINS NTM data with data compiled by Shepherd (2004) and from WTO Trade Policy Reviews.

**Table 2: Correlation in the availability of TRAINS data between the two waves (percent)**

TRAINS	TRAINS data, MAST classif		
2001	No data	Data	Total
No data	51.9	22.8	74.6
Data	5.8	19.6	25.4
Total	57.7	42.3	100.0

**Source:** WITS

## Experimental data

Finally, we completed “off-the-shelf” data with a simple experiment consisting of emailing a request for information about regulations applicable to the import of a certain product to relevant agencies including ministries of trade, health, or agriculture and SPS inquiry points in 182 countries, and scoring the information received in return (if any). For this, we secured the collaboration of a Swiss company, MCC TEC AG, producing and exporting containers and integrated logistics solutions for food and pharmaceutical products. The information requests were sent from a company email account and answers were received on that account. The text of the information request was as follows:

“Dear Sir or Madam,

I am writing you regarding import procedures and requirements in [country name]. MCC-TEC AG is a company based in Bätterkinden, Switzerland. Our core product is

MCC-BOX, a container for the transportation of pharmaceutical and food products ([www.mcc-tec.ch/anwendungen/pharmalogistik](http://www.mcc-tec.ch/anwendungen/pharmalogistik) and [www.mcc-tec.ch/anwendungen/foodlogistik](http://www.mcc-tec.ch/anwendungen/foodlogistik)). We are establishing business contacts with potential clients in [country capital’s name] but are currently in exploratory mode.

In order to enable us to proceed with the planning of our export strategy and be able to respond to customer queries, could you please send us useful documentation or weblinks regarding technical regulations as they apply to pharmaceutical and food logistics as well as any import license procedures and required documentation for the import of Swiss-made products in [country name]?

We thank you in advance for your help.

With best regards,”

For Latin American countries, it was sent in Spanish, and for francophone countries, it was sent in French. In all other countries, it was sent in English. For E.U. member states, queries went to national authorities and not to the E.U. Commission. For federal countries, they went to federal

authorities and not to sub-national entities. The first wave of emails was sent on July 1<sup>st</sup>, 2015; when no response was received (107 cases), a second mail was sent a month later in order to ensure that nonresponse was not due to temporary factors like unavailability of the contact person or IT failure. In some cases, we got personalized answers; for instance, Slovenia responded with a letter detailing all relevant regulations that was translated into German (which they guessed was the company's operating language, even though the letter was in English) by the Slovenian embassy in Switzerland. In a number of cases, our information requests were redirected to specific government agencies; we then followed up until we got a final answer (informative or not). An additional wave of emails was sent to SPS and TBT inquiry points in the Fall of 2015.

Table 3 shows that the various pieces of our transparency data have weak correlation coefficients with each other, suggesting that they are not collinear. The lowest correlation coefficients are for the availability of NTM data in the 2001 TRAINS database, reflecting the fact that industrial countries were not in that database.

**Table 3: Correlation between NTM transparency variables**

	TRAINS 2001	TRAINS MAST	Normalized notifications	Portal quality	Experiment score
TRAINS 2001	1.00				
TRAINS data, MAST class.	0.41	1.00			
Normalized notifications	-0.01	-0.13	1.00		
Portal quality	-0.17	0.42	-0.06	1.00	
Experiment score*	-0.08	0.26	0.03	0.31	1.00

**Note:** \* Best score of the two survey waves.

**Source:** Authors calculations

Transparency data vary substantially across regions, as shown in Table 4, although the extent of variation differs between variables. For instance, while the proportion of countries notifying anything to the WTO varies from a low of 50% (East Asia & the Pacific and South Asia) to a high of 71% (Latin America & the Caribbean), the number of notifications, when normalized by import value, varies more, with Sub-Saharan Africa having a high score not so much because it notifies a lot but because of its low average import values. The proportion of trade portals already set up also varies substantially, from a low of 7% in Latin America to a high of 47% in Europe and Central Asia (the E.U. has had a working trade portal since before the TFA).

**Table 4: Average NTM transparency across regions**

	EAP	ECA	LAC	MENA	SA	SSA
<b>WTO SPS/TBT notifications</b>						
Proportion of notifiers	0.64	0.72	0.85	0.55	0.50	0.57
Average normalized notifications*	1.01	1.41	8.21	4.23	1.12	4.44
<b>Trade Facilitation trade portal</b>						
Proportion of existing portals	0.11	0.55	0.06	0.10	0.25	0.19
Average portal quality	2.33	3.00	2.00	3.00	1.00	2.22
<b>Trade Facilitation NTM data</b>						
2001 version	0.14	0.04	0.41	0.20	0.63	0.40
MAST version	0.54	0.64	0.44	0.20	0.63	0.21
<b>Experiment</b>						
Average score (0-3)	0.57	1.17	0.88	0.25	0.13	0.28
Observations	28	47	34	20	8	47

**Note:** EAP stands for East Asia & the Pacific, ECA for Europe & Central Asia, LAC for Latin America & the Caribbean, MENA for Middle East & North Africa, SA for South Asia, an SSA for Sub-Saharan Africa. Regions are defined according to World Bank classification except that ECA includes high-income, non-World Bank client European countries.

\* Number of notifications per million dollar of imports, on average over 1995-2013

**Source:** Authors calculations

Scores vary also substantially across income groups, as shown in Table 5, with typically higher scores at higher income levels (except for high-income, non OECD countries), likely reflecting stronger administrative capabilities. This effect is probably subdued in the data due to donor assistance in the case of low-income countries. For instance, a number of low-income countries in Sub-Saharan Africa have trade portals set up and financed by donors but no regulatory data uploaded, sometimes possibly reflecting low appropriation of the initiatives as much as low capabilities. The results of our experiment also vary substantially, with the highest score going to the ECA region because it includes E.U. countries many of which provided very precise responses.



**Table 5: Average NTM transparency by income group**

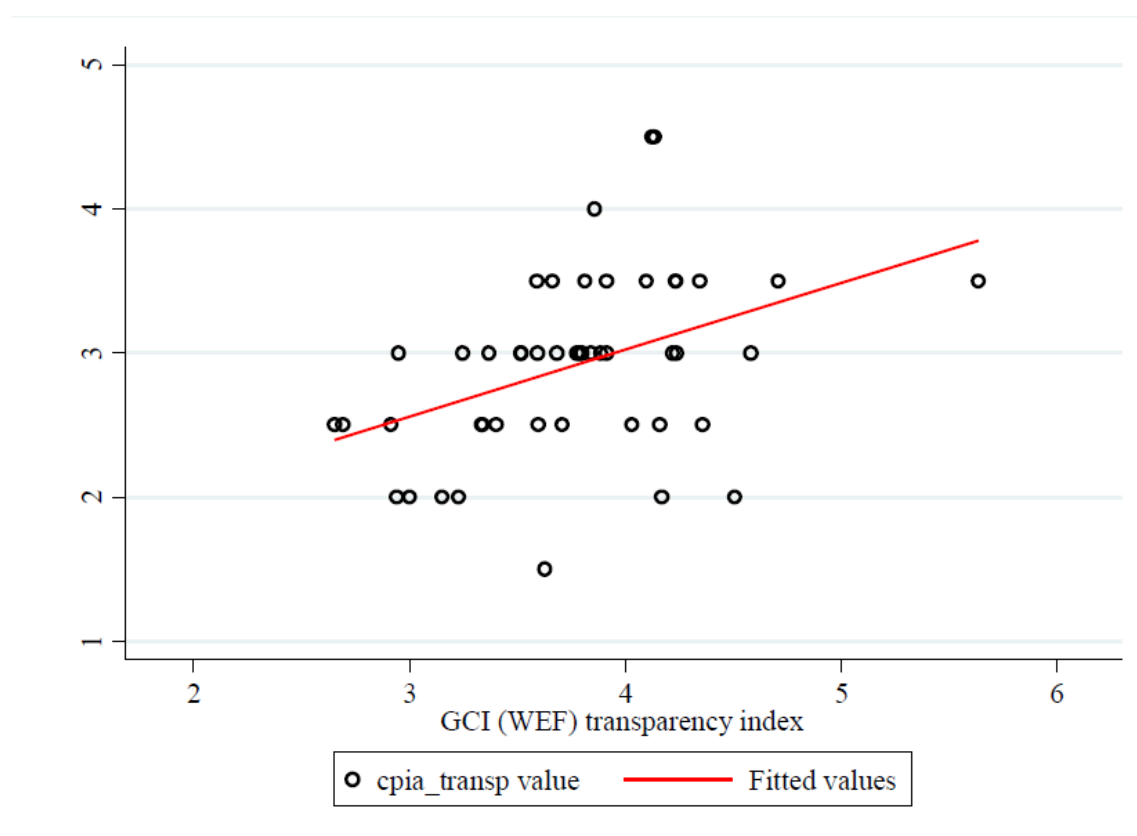
	HI (OECD)	HI (non- OECD)	UMI	LMI	LI
<b>WT O SP S/T BT notifications</b>					
Proportion of notifiers	0.93	0.67	0.69	0.60	0.54
Average normalized notifications	0.89	3.43	5.07	3.57	5.99
<b>TFA trade portal</b>					
Proportion of existing portals	0.81	0.14	0.15	0.15	0.11
Average portal quality	3.00	3.00	2.50	2.38	1.50
<b>TRAINS NTM data</b>					
2001 version	0.04	0.04	0.35	0.27	0.40
MAST version	0.89	0.89	0.52	0.27	0.26
<b>Experiment</b>					
Average 1-3 score	1.81	1.81	0.79	0.37	0.09
Observations	27	38	52	52	35

**Note:** HI stands for high income, UMI for upper middle-income, LMI for lower middle income, and LI for low income. Income groups are defined according to World Bank classification. a/ Number of notifications per million dollar of imports, on average over 1995-2013

**Source:** Authors calculations

Beyond NTMs, government overall transparency is regularly rated through executive surveys by the World Economic Forum (WEF) as part of the Global Competitiveness index (GCI). It is also scored by the World Bank as part of the Country Policy and Institutional Assessment (CPIA). The two measures, which are collected only for a limited number of countries, are only weakly correlated, with a correlation coefficient of 0.41 (Figure 3).

**Figure 3: Correlation between GCI and CPIA government transparency indices**



**Source:** Authors' calculations

Similarly, a simple regression of survey-based indices on our specific NTM transparency measures produces weak correlation (Table 6), with our transparency data explaining, together with income levels, a bit less than a third of the cross-country variation in CPIA and GCI indices. Correlations are stronger with the GCI transparency index (part of the Global Competitiveness Index) than with the CPIA. Variables with statistically significant correlation with the GCI include the binary measure of whether a country notifies anything to the WTO and, interestingly, the score on our experiment.

**Table 6: Regression of overall transparency indices on NTM transparency variables**

Dependent variable	CGI government transparency sub-index		World Bank CPIA transparency score	
Estimator : OLS	(a)	(b)	(c)	(d)
ln GDP per capita	0.248 (3.81)***	0.273 (4.17)***	0.468 (4.80)***	0.462 (5.11)***
<b>WTO SPS/TBT notifications</b>				
At least one notification	0.405 (3.03)***		0.103 (0.68)	
Normalized notifications		0.015 (1.52)		0.014 (1.23)
<b>TFA trade portal</b>				
Country has a trade portal	0.179 (1.24)		-0.207 (1.01)	
Portal quality		0.070 (1.24)		-0.159 (1.24)
<b>TRAINS NTM data</b>				
2001 version	0.072 (0.51)	0.123 (0.85)	0.482 (2.65)**	0.558 (2.88)***
MAST version	-0.131 (0.95)	-0.080 (0.53)	-0.307 (1.67)*	-0.291 (1.63)
Experiment score	0.094 (1.79)*	0.091 (1.67)*	0.012 (0.15)	0.026 (0.35)
Constant	1.392 (2.51)**	1.407 (2.54)**	-0.959 (1.27)	-0.923 (1.29)
$R^2$	0.31	0.28	0.28	0.30
$N$	130	130	75	75

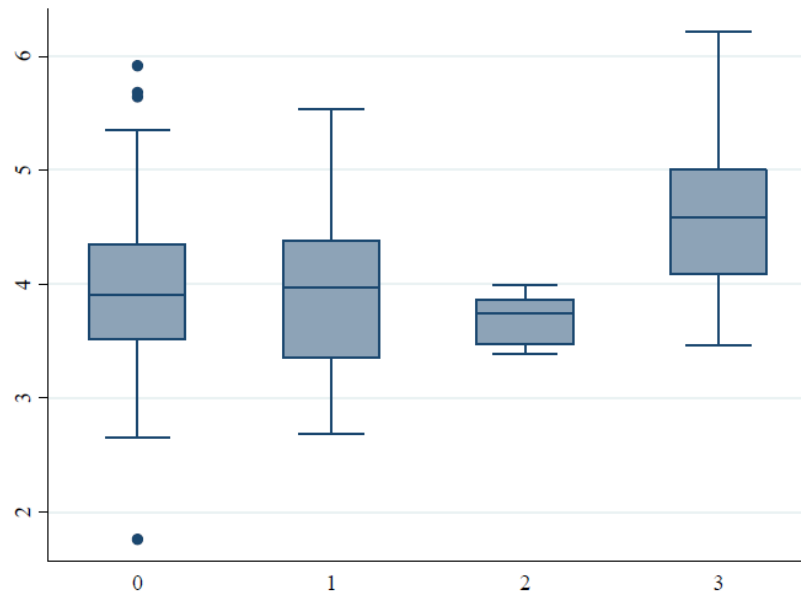
**Source:** Authors calculations

The lack of correlation between objective measures of NTM transparency such as compliance with WTO requirements and survey-based perceptions is noteworthy. Several factors may contribute to this lack of correlation. First, it may be the case that trade-related agencies like SPS enquiry points are “enclaves” of transparency in governments that are otherwise non-transparent. Second, perceptions tend to be self-fueling, circulating among circles of executives and expatriates who mutually reinforce group opinions generated out of a few salient anecdotes. However, the partial correlation between the experiment’s score and survey-based perception indices is statistically significant, albeit at the 10-percent level, suggesting that perceptions are not entirely self-fueling.

Indeed, Figure 4 illustrates this with a “box plot” showing the conditional distribution of GCI scores for each level of the experimental score. A slight upward shift in the conditional distribution is

discernible in the GCI score at a highest level of the experimental score, and conversely at the lowest level.

**Figure 4: Distribution of GCI scores, by experimental score level**



**Note:** Each box marks the interval between the 25<sup>th</sup> and 75<sup>th</sup> percentiles of the conditional distribution of GCI transparency scores for each value of the experiment's score; the "whiskers" mark the upper and lower limit of the conditional distribution without outliers, and the outliers, when there are any, appear as dots above or below the whiskers. The horizontal bar is the median.

**Source:** Authors' calculations using the World Economic Forum's GCI index values for "transparency in government policy".

By and large, our data paints a varied picture of NTM transparency across countries and provides a good basis for building up an overall index, to which we now turn.

### 3.2 Aggregation

After cleaning, we are left with 187 countries with all dimensions of the data. We aggregate our transparency variables using weights derived from factor analysis. Factor analysis, a widely used technique in many disciplines, highlights patterns in data with high dimensionality (many variables) and high degrees of correlation between variables. The objective is to identify a small number of orthogonal factors, not directly observed, that account for most of the variation in the dataset. The contribution of each variable to a given factor's variation is called a "loading". Here, as the data's dimensionality is low and so is the degree of correlation between variables (see Table 3), we use the technique essentially to derive weights to construct an overall NTM transparency index. We used factor analysis on two alternative versions of the notifications and portal data. The first version is in binary form, where the notification variable is one when the country notified at least one measure to the WTO and zero otherwise, and the portal variable is one when the country has a trade portal and zero otherwise. The second, alternative version is

in continuous form, where the notification variable is the cumulated number of notifications since the creation of the WTO, normalized by the value of imports, and the portal variable ranges from one to three based on a subjective assessment of the information displayed on it. Factor analysis using the latter (continuous) version shows negative loadings for normalized notifications, which is not a desirable feature, and performs no better than using the former (binary) version, while the two alternative indices have a correlation coefficient of 0.9325. From now on, we use binary version of the index, for which factor analysis results are shown in Table 7 after standardization of the variables to a common scale.

**Table 7: Factor analysis results**

(a) Unrotated factor analysis				
	Eigen value	Diff.	Prop.	Cumul.
Factor 1	1.079	1.089	1.458	1.458
Factor 2	-0.010	0.075	-0.013	1.444
Factor 3	-0.064	0.160	-0.114	1.330
Factor 4	-0.245		-0.330	1.000
<b>Notes:</b> LR test: independent vs. saturated: $\chi^2(6) = 85.37$ ; $\text{Prob} > \chi^2 = 0.0000$				
(b) Factor loadings, no rotation				
Country has at least one notification			0.479	0.771
Country has a trade portal			0.525	0.725
NTM data available in MAST classification			0.617	0.619
Experiment score			0.441	0.806
<b>Source:</b> Author's calculations				

Part (a) of Table 7 provides the eigenvalue of each of the factors identified and their contribution to the data's overall variance. Part (b) gives the loading of each variable and its uniqueness, which is the proportion of its variance that is not associated with the factors (the residual variance).

Part (a) of Table 7 shows that the first factor alone over-explains the data's overall variation, so in part (b) we discard the other ones. We use the variable loadings in Factor 1 as weights in the aggregate NTM transparency index.

The next issue is what functional form to use to aggregate data into a single index. Usual forms include, inter alia, Cobb-Douglas, Constant-Elasticity of Substitution (CES) or a simple weighted sum. A Cobb-Douglas form would assign an overall index value of zero to all countries with a

zero in one of the index's components; this would create an oversized and uninformative cluster at zero values, which is not desirable. A CES function would be preferable but gives results that are broadly similar to a weighted average while relying on an arbitrary choice of elasticity of substitution. As there is no obvious benchmark to rely on for the elasticity of substitution and substitutability between components does not play a crucial role in our analysis, we go for the simplest solution, i.e. a weighted sum using factor loadings from Table 7 as weights. In the index's construction, experiment scores, which are not binary, are normalized to lie between zero and one using the following formula (letting  $x$  be the index score):

$$x_n = \frac{x - x_{\min}}{x_{\max} - x_{\min}}$$

We now turn to the resulting ranking of countries.

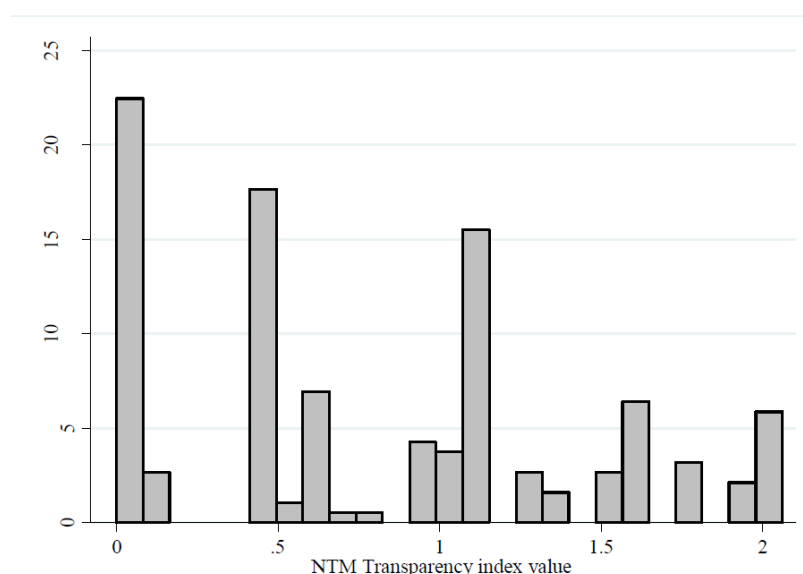
## 4. Results

Two rankings can be constructed, depending on the type of notification data. In the first version, notifications are taken in binary form, distinguishing only between countries that notified and countries that do not. In the second, the notification variable is the normalized count. The second version gives results that are, by and large, close to those of the first, but less plausible, with some low-income countries pushed to high index values by their low import values (which mechanically raise the normalized value). For brevity, we report only results according to version 1; results according to version 2 are available upon request.

### 4.1 Rankings

Country rankings and index values are presented in Appendix Table A1. The index takes on 25 discrete values between zero and 2.061, with a median at 0.62. Within each value of the index, there are several countries whose ranking within that index category is arbitrary. The frequency of index values is shown in Figure 5.

**Figure 5: Distribution of index values**

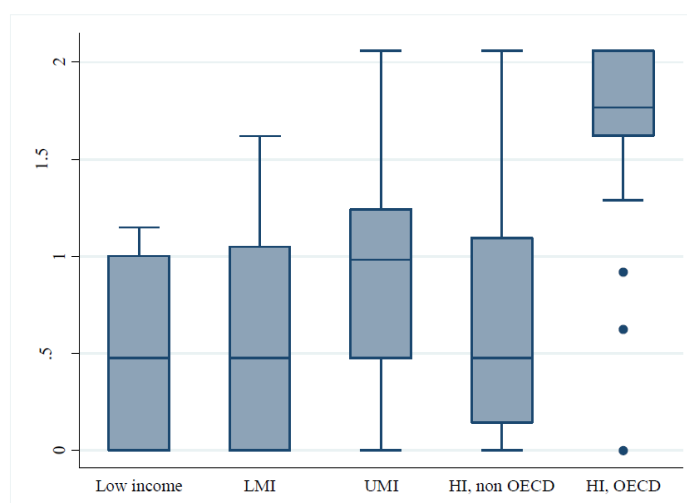


**Source:** Authors' calculations

The front-runners category includes Northern European countries; next come most of the European countries, together with Australia. The first ASEAN country is Singapore, which comes in the second category, together with the United States and New Zealand.

By and large, index values go up with the level of income, except for non-OECD high-income countries (which include, for instance, oil producers) which have low transparency index values (Figure 6).

**Figure 6: Distribution of index values by income category**

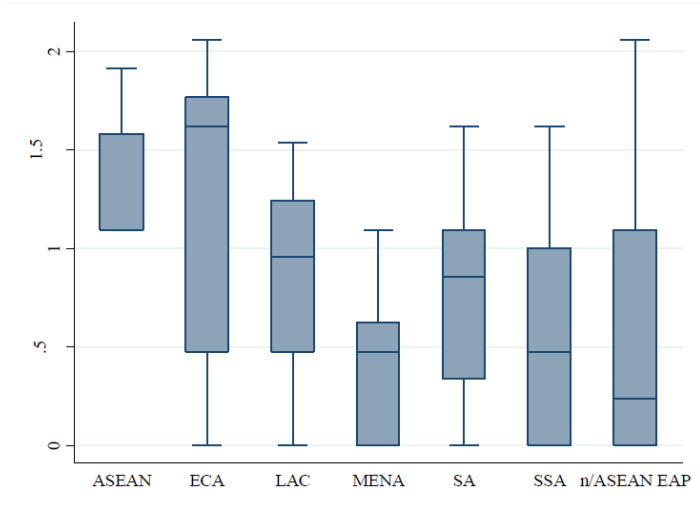


**Note:** HI stands for high income, UMI for upper middle-income, LMI for lower middle income, and LI for low income. Income groups are defined according to World Bank classification. Each box marks the interval between the 25<sup>th</sup> and 75<sup>th</sup> percentiles of the conditional distribution of GCI transparency scores for each value of the experiment's score; the "whiskers" mark the upper and lower limit of the conditional distribution without outliers, and the outliers, when there are any, appear as dots above or below the whiskers. The horizontal bar is the median.

**Source:** Authors calculations.

Index values also vary by region, with high index values for ASEAN countries and low ones for Sub-Saharan Africa and Middle East and North Africa (MENA) countries (Figure 7). ASEAN index values are boosted by the comprehensive data- collection effort undertaken by ERIA in collaboration with UNCTAD in 2015, whose results are taken into account in this paper.

**Figure 7: Distribution of index values by region**



The high performance of ASEAN countries in the NTM transparency index is confirmed by regression analysis which makes it possible to control for different income levels across (Table 8). The approach taken here consists of regressing various transparency indices on income levels, regional dummies, and an additional dummy variable for ASEAN countries. The EAP dummy is then dropped because of collinearity, as it includes too few non-ASEAN countries. Non-ASEAN EAP countries then become the omitted category, and coefficient estimates are to be interpreted as relative to that omitted category.

Interestingly, regression results are sharply different depending on whether one uses as the dependent variable our transparency index or survey-based measures. With our indicator, ASEAN countries fare very well with a positive and significant coefficient. By contrast, with the GCI or the CPIA, the point estimate is either negative or insignificant. This largely reflects the particular effort targeted at NTM transparency through the 2015 data collection. As experimental results were also positive for ASEAN countries, our scores may also reflect a particular attention given to NTMs as part of regional integration efforts which have no counterpart in domestic regulatory environments.



**Table 8: ASEAN's relative performance under various NTM transparency indices**

Dependent variable :	NTM transparency index	GCI transp. sub-index	WB CPIA transp. score
Estimator : OLS	(a)	(b)	(c)
GDP per capita	0.000 (2.77)***	0.000 (5.48)***	0.000 (3.38)***
ASEAN	0.716 (3.48)***	-0.279 (0.70)	-0.830 (3.57)***
ECA	0.632 (3.23)***	-0.384 (1.06)	-0.512 (2.21)**
LAC	0.400 (2.23)**	-0.598 (1.57)	-0.277 (1.20)
MENA	-0.163 (0.80)	-0.756 (1.97)*	-0.986 (3.84)***
SA	0.365 (1.46)	-0.497 (1.32)	-0.494 (1.79)*
SSA	0.158 (0.90)	-0.363 (0.99)	-0.406 (2.10)**
Constant	0.351 (2.16)**	4.140 (11.65)***	2.879 (15.62)***
$R^2$	0.30	0.33	0.30
$N$	175	128	75

**Notes:** Robust t-statistics in parentheses. \*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$

## 4.2 Robustness

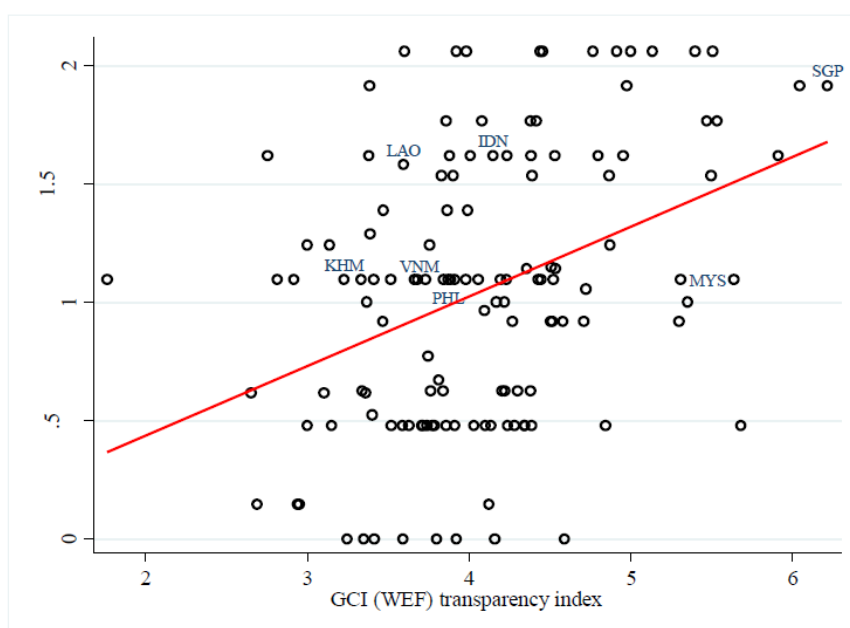
As a first robustness test, we explore whether one single criterion overwhelming drives the rankings. This is unlikely given our reliance on factor analysis, but we nevertheless check explicitly if taking out one of the criteria in the index affects drastically the rankings it generates. We take out each criterion, one by one, recalculate the index values and ranking, and then calculate the correlation between the resulting partial indices. If rankings suddenly became very different when one criterion was taken out, that criterion could be considered as having a disproportionate influence. As Table 9 shows, correlations are very high, suggesting that no single criterion drives the rankings.

**Table 9: Correlation between partial indices**

		(a)	(b)	(c)	(d)	(e)
Complete index	(a)	1.0000				
Without notifications	(b)	0.946	1.000			
Without portal	(c)	0.946	0.847	1.000		
Without TRAINS MAST data	(d)	0.912	0.814	0.812	1.000	
Without experiment	(e)	0.973	0.903	0.909	0.849	1.000

**Notes:** (a)-(e) columns correspond to the same variables as (a)-(e) lines; that is, (a) is the complete index, (b) the index without the experiment etc. Weights are held constant throughout.

Next, we compare our index with the government transparency component of the GCI.<sup>5</sup> There is large overlap between the two databases, with 134 countries common to the two databases. The correlation is clearly positive (Figure 8), and it is significant at the one percent level.

**Figure 8: Correlation between the NTM transparency index and the GCI's government transparency sub-index**

**Source:** Authors' calculations using World Economic Forum database (<http://reports.weforum.org/global-competitiveness-report-2015-2016/>).

<sup>5</sup> The GCI's "Transparency of Government Policy" component scores countries on the basis of the following question: "In your country, how easy is it for businesses to obtain information about changes in government policies and regulations affecting their activities?"

Correlation with the World Bank's CPIA is much weaker, and the data overlap is also substantially smaller, with only 79 data points in common out of 21 countries.

Thus, all in all, our robustness exercise suggests that our NTM transparency index is not overly driven by one single criterion, and that it correlates fairly well with overall government transparency as measured by the Global Competitiveness Index.

## **5. Concluding remarks**

The index of NTM transparency that we propose in this paper is based on a mixture of statistical data availability, compliance with WTO transparency requirements, and the results of an original experiment. The resulting index is robust in the sense that it is not overly sensitive to one single criterion. It is also broadly correlated with the government transparency component of the World Economic Forum's Global Competitiveness Index. Finally, it makes it possible to rank countries by their degree of transparency in NTMs.

Two main results emerge from our country ranking. First, industrial countries generally lead the pack, which is not overly surprising. Second, ASEAN efforts toward NTM transparency seem to have produced results, as ASEAN countries score arguably higher in data collection and experimental results than in compliance with WTO transparency requirements. However, those efforts do not seem to be largely noticed by the business community, as survey-based measures of government transparency still produce poor ratings for ASEAN countries.

Transparency alone may not be enough to encourage the spread of best practices (a similar argument was made about disclosure requirements by Stiglitz, 2010; see the discussion in Wolfe, 2013); coercion mechanisms may be necessary as well. However such coercion mechanisms do not exist currently in ASEAN. The contrasted ratings of ASEAN countries suggest that improved NTM transparency should be better communicated and should be used as an entry door to broader regulatory transparency and simplification. This could be achieved by giving NTM committees (in countries that have set up such committees) a broader mandate for regulatory supervision and simplification, including for domestic regulations.

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## Appendix

### Country ranking

Country	ISO3	ASEAN	Rank	Index value	WTO notifications		TFA trade portal		TRAINS data			GDP per capita 2014	WEF transp. index
					At least one notif.	Normalized notif.	Has a trade portal	Portal quality	2001 version	MAST version	Experim. score		
IRL	Ireland	0	1	2.06	1	0.000	1	3	0	1	3	45,242	5.5
AUT	Austria	0	2	2.06	1	0.000	1	3	0	1	3	44,873	5.0
SWE	Sweden	0	3	2.06	1	0.012	1	3	0	1	3	43,869	5.4
DNK	Denmark	0	4	2.06	1	0.021	1	3	0	1	3	43,560	4.8
DEU	Germany	0	5	2.06	1	0.000	1	3	0	1	3	43,522	5.1
AUS	Australia	0	6	2.06	1	0.024	1	3	0	1	3	43,011	4.9
ESP	Spain	0	7	2.06	1	0.002	1	3	0	1	3	32,770	4.0
CYP	Cyprus	0	8	2.06	1	0.009	1	3	0	1	3	32,554	4.4
SVK	Slovak Republic	0	9	2.06	1	0.010	1	3	0	1	3	25,718	3.9
POL	Poland	0	10	2.06	1	0.001	1	3	0	1	3	23,152	3.6
LVA	Latvia	0	11	2.06	1	0.036	1	3	0	1	3	21,176	4.5
SGP	Singapore	1	12	1.91	1	0.002	1	3	0	1	2	76,988	6.2
USA	United States	0	13	1.91	1	0.018	1	3	0	1	2	51,457	5.0
NZL	New Zealand	0	14	1.91	1	0.128	1	3	0	1	2	32,990	6.0
HUN	Hungary	0	15	1.91	1	0.004	1	3	0	1	2	22,494	3.4
NLD	Netherlands	0	16	1.77	1	0.013	1	3	0	1	1	46,054	5.5
BEL	Belgium	0	17	1.77	1	0.004	1	3	0	1	1	41,397	4.4
GBR	United Kingdom	0	18	1.77	1	0.001	1	3	0	1	1	37,386	5.5

Country	ISO3	ASEAN	Rank	Index value	WTO notifications		TFA trade portal		TRAINS data			GDP per capita 2014	WEF transp. index
					At least one notif.	Normalized notif.	Has a trade portal	Portal quality	2001 version	MAST version	Experim. score		
FRA	France	0	19	1.77	1	0.003	1	3	0	1	1	37,256	4.4
CZE	Czech Republic	0	20	1.77	1	0.026	1	3	0	1	1	28,674	3.9
SVN	Slovenia	0	21	1.77	1	0.034	1	3	0	1	1	28,450	4.1
FIN	Finland	0	22	1.62	1	0.007	1	3	0	1	0	40,209	5.9
ITA	Italy	0	23	1.62	1	0.000	1	3	0	1	0	35,525	2.8
PRT	Portugal	0	24	1.62	1	0.000	1	3	0	1	0	27,000	4.0
EST	Estonia	0	25	1.62	1	0.006	1	3	0	1	0	24,736	5.0
LTU	Lithuania	0	26	1.62	1	0.010	1	3	0	1	0	24,084	4.5
ROM	Romania	0	27	1.62	1	0.015	1	3	0	1	0	18,137	3.9
MUS	Mauritius	0	28	1.62	1	0.015	1	3	1	1	0	16,950	4.8
BGR	Bulgaria	0	29	1.62	1	0.007	1	3	0	1	0	15,672	3.4
IDN	Indonesia	1	30	1.62	1	0.021	1	1	0	1	0	9,449	4.1
NAM	Namibia	0	31	1.62	1	0.001	1	2	1	1	0	9,028	4.4
IND	India	0	32	1.62	1	0.006	1	1	1	1	0	4,948	4.2
LAO	Lao PDR	1	33	1.58	0	0.000	1	3	1	1	3	4,579	3.6
JPN	Japan	0	34	1.54	1	0.012	0	0	1	1	3	35,598	5.5
CHL	Chile	0	35	1.54	1	0.141	0	0	1	1	3	21,183	4.9
CRI	Costa Rica	0	36	1.54	1	0.191	0	0	1	1	3	13,833	4.4
PER	Peru	0	37	1.54	1	0.193	0	0	1	1	3	11,045	3.9
JAM	Jamaica	0	38	1.54	1	0.100	0	0	0	1	3	8,674	3.8
HRV	Croatia	0	39	1.39	1	0.014	0	0	0	1	2	21,114	3.5
COL	Colombia	0	40	1.39	1	0.158	0	0	1	1	2	12,053	3.9
PRY	Paraguay	0	41	1.39	1	0.119	0	0	1	1	2	7,444	4.0

Country	ISO3	ASEAN	Rank	Index value	WTO notifications		TFA trade portal		TRAINS data			GDP per capita 2014	WEF transp. index
					At least one notif.	Normalized notif.	Has a trade portal	Portal quality	2001 version	MAST version	Experim. score		
GRC	Greece	0	42	1.29	0	0.000	1	3	0	1	1	25,462	3.4
URY	Uruguay	0	43	1.24	1	0.035	0	0	1	1	1	18,770	4.9
BRA	Brazil	0	44	1.24	1	0.121	0	0	1	1	1	15,220	3.1
THA	Thailand	1	45	1.24	1	0.038	0	0	0	1	1	13,752	3.8
ARG	Argentina	0	46	1.24	1	0.106	0	0	1	1	1		3.0
GMB	Gambia, The	0	47	1.15	1	0.079	1	1	1	0	1	1,598	4.5
MLT	Malta	0	48	1.14	0	0.000	1	3	0	1	0	28,276	4.5
CIV	Cote d'Ivoire	0	49	1.14	0	0.000	1	2	1	1	0	2,802	4.4
BRN	Brunei Darussalam	1	50	1.10	1	0.005	0	0	0	1	0	74,161	
HKG	Hong Kong SAR, China	0	51	1.10	1	0.002	0	0	1	1	0	51,250	
RUS	Russian Federation	0	52	1.10	1	0.003	0	0	1	1	0	24,063	4.0
MYS	Malaysia	1	53	1.10	1	0.012	0	0	0	1	0	22,481	5.3
CUB	Cuba	0	54	1.10	1	0.032	0	0	1	1	0	19,812	
TUR	Turkey	0	55	1.10	1	0.006	0	0	0	1	0	18,196	4.4
VEN	Venezuela	0	56	1.10	1	0.007	0	0	1	1	0	18,020	1.8
MEX	Mexico	0	57	1.10	1	0.026	0	0	1	1	0	16,146	4.1
CHN	China	0	58	1.10	1	0.018	0	0	1	1	0	11,215	4.5
TUN	Tunisia	0	59	1.10	1	0.010	0	0	1	1	0	10,800	3.7
ECU	Ecuador	0	60	1.10	1	0.457	0	0	1	1	0	10,466	3.4
LKA	Sri Lanka	0	61	1.10	1	0.043	0	0	1	1	0	9,014	3.9
GTM	Guatemala	0	62	1.10	1	0.093	0	0	1	1	0	6,978	4.2
MAR	Morocco	0	63	1.10	1	0.015	0	0	1	1	0	6,805	4.4



Country	ISO3	ASEAN	Rank	Index value	WTO notifications		TFA trade portal		TRAINS data			GDP per capita 2014	WEF transp. index
					At least one notif.	Normalized notif.	Has a trade portal	Portal quality	2001 version	MAST version	Experim. score		
PHL	Philippines	1	64	1.10	1	0.043	0	0	0	1	0	6,157	3.9
BOL	Bolivia	0	65	1.10	1	0.036	0	0	1	1	0	5,897	3.7
VNM	Vietnam	1	66	1.10	1	0.014	0	0	0	1	0	5,001	3.8
PAK	Pakistan	0	67	1.10	1	0.016	0	0	1	1	0	4,459	3.3
KHM	Cambodia	1	68	1.10	1	0.004	0	0	0	1	0	2,847	3.2
TZA	Tanzania	0	69	1.10	1	0.054	0	0	1	1	0	2,330	3.9
SEN	Senegal	0	70	1.10	1	0.028	0	0	1	1	0	2,204	4.2
NPL	Nepal	0	71	1.10	1	0.032	0	0	1	1	0	2,154	3.5
RWA	Rwanda	0	72	1.10	1	0.277	0	0	1	1	0	1,510	5.6
MDG	Madagascar	0	73	1.10	1	0.025	0	0	1	1	0	1,399	2.9
MWI	Malawi	0	74	1.10	1	0.004	0	0	1	1	0	763	3.7
MMR	Myanmar	1	75	1.10	1	0.003	0	0	0	1	0		2.8
KAZ	Kazakhstan	0	76	1.06	0	0.000	0	0	1	1	3	21,892	4.7
ARE	United Arab Emira	0	77	1.00	1	0.016	1	3	0	0	0	59,693	5.4
GRD	Grenada	0	78	1.00	1	0.348	1	1	0	0	0	11,245	
BLZ	Belize	0	79	1.00	1	0.129	1	3	0	0	0	8,119	
NGA	Nigeria	0	80	1.00	1	0.000	1	3	1	0	0	5,405	3.4
KEN	Kenya	0	81	1.00	1	0.401	1	1	0	0	0	2,718	4.2
UGA	Uganda	0	82	1.00	1	1.000	1	3	0	0	0	1,696	4.2
SYC	Seychelles	0	83	0.97	0	0.000	1	2	0	0	3	24,110	4.1
SAU	Saudi Arabia	0	84	0.92	1	0.073	0	0	0	0	3	49,707	4.5
CAN	Canada	0	85	0.92	1	0.034	0	0	0	0	3	42,281	5.3

Country	ISO3	ASEAN	Rank	Index value	WTO notifications		TFA trade portal		TRAINS data			GDP per capita 2014	WEF transp. index
					At least one notif.	Normalized notif.	Has a trade portal	Portal quality	2001 version	MAST version	Experim. score		
AZE	Azerbaijan	0	86	0.92	1	0.002	0	0	0	0	3	16,173	4.3
ZAF	South Africa	0	87	0.92	1	0.032	0	0	0	0	3	12,597	4.5
SLV	El Salvador	0	88	0.92	1	0.320	0	0	0	0	3	7,856	3.5
GEO	Georgia	0	89	0.92	1	0.187	0	0	0	0	3	6,823	4.7
ZMB	Zambia	0	90	0.92	1	0.082	0	0	0	0	3	3,564	4.6
UKR	Ukraine	0	91	0.77	1	0.027	0	0	0	0	2	8,468	3.7
LSO	Lesotho	0	92	0.67	0	0.000	1	3	0	0	1	2,426	3.8
KWT	Kuwait	0	93	0.63	1	0.104	0	0	0	0	1	78,454	3.8
ISR	Israel	0	94	0.63	1	0.119	0	0	0	0	1	31,628	4.2
TTO	Trinidad and Toba	0	95	0.63	1	0.144	0	0	0	0	1	29,517	3.8
BWA	Botswana	0	96	0.63	1	0.051	0	0	0	0	1	14,255	4.4
DOM	Dominican Republ	0	97	0.63	1	0.168	0	0	0	0	1	11,735	4.2
LCA	St. Lucia	0	98	0.63	1	0.626	0	0	0	0	1	10,458	
ALB	Albania	0	99	0.63	1	0.185	0	0	0	0	1	9,667	4.3
NIC	Nicaragua	0	100	0.63	1	0.484	0	0	0	0	1	4,467	3.3
LBN	Lebanon	0	101	0.62	0	0.000	0	0	1	1	0	16,871	3.1
DZA	Algeria	0	102	0.62	0	0.000	0	0	0	1	0	13,370	3.4
MRT	Mauritania	0	103	0.62	0	0.000	0	0	0	1	0	3,550	2.7
AFG	Afghanistan	0	104	0.62	0	0.000	0	0	1	1	0	1,933	
BFA	Burkina Faso	0	105	0.62	0	0.000	0	0	1	1	0	1,547	
IRQ	Iraq	0	106	0.52	0	0.000	1	3	0	0	0	14,714	
BGD	Bangladesh	0	107	0.52	0	0.000	1	1	0	0	0	2,764	3.4

Country	ISO3	ASEAN	Rank	Index value	WTO notifications		TFA trade portal		TRAINS data			GDP per capita 2014	WEF transp. index
					At least one notif.	Normalized notif.	Has a trade portal	Portal quality	2001 version	MAST version	Experim. score		
QAT	Qatar	0	108	0.48	1	0.209	0	0	0	0	0	135,649	5.7
MAC	Macao SAR, China	0	109	0.48	1	0.017	0	0	0	0	0	127,544	
OMN	Oman	0	110	0.48	1	0.103	0	0	0	0	0	41,926	4.3
BHR	Bahrain	0	111	0.48	1	0.293	0	0	0	0	0	40,974	4.8
ATG	Antigua and Barbuda	0	112	0.48	1	0.043	0	0	0	0	0	20,947	
PAN	Panama	0	113	0.48	1	0.090	0	0	0	0	0	18,224	4.4
BRB	Barbados	0	114	0.48	1	0.042	0	0	0	0	0	15,625	
JOR	Jordan	0	115	0.48	1	0.029	0	0	0	0	0	11,544	4.3
DMA	Dominica	0	116	0.48	1	0.331	0	0	0	0	0	10,331	
EGY	Egypt	0	117	0.48	1	0.028	0	0	1	0	0	10,248	3.7
VCT	St. Vincent and the Grenadines	0	118	0.48	1	0.277	0	0	0	0	0	10,180	
MNG	Mongolia	0	119	0.48	1	0.027	0	0	0	0	0	9,985	4.1
FJI	Fiji	0	120	0.48	1	0.017	0	0	0	0	0	7,439	
ARM	Armenia	0	121	0.48	1	0.234	0	0	0	0	0	7,398	4.3
GUY	Guyana	0	122	0.48	1	0.112	0	0	0	0	0	6,463	3.7
CPV	Cape Verde	0	123	0.48	1	0.010	0	0	1	0	0	6,254	4.1
SWZ	Swaziland	0	124	0.48	1	0.008	0	0	0	0	0	6,013	3.7
COG	Congo, Rep.	0	125	0.48	1	0.003	0	0	0	0	0	5,800	
HND	Honduras	0	126	0.48	1	0.187	0	0	0	0	0	4,314	4.2
MDA	Moldova	0	127	0.48	1	0.063	0	0	0	0	0	4,225	3.9
GHA	Ghana	0	128	0.48	1	0.012	0	0	1	0	0	3,725	3.9
KGZ	Kyrgyz Republic	0	129	0.48	1	0.089	0	0	0	0	0	2,921	3.8

Country	ISO3	ASEAN	Rank	Index value	WTO notifications		TFA trade portal		TRAINS data			GDP per capita 2014	WEF transp. index
					At least one notif.	Normalized notif.	Has a trade portal	Portal quality	2001 version	MAST version	Experim. score		
CMR	Cameroon	0	130	0.48	1	0.015	0	0	0	0	0	2,714	4.0
PNG	Papua New Guinea	0	131	0.48	1	0.002	0	0	0	0	0	2,525	
BEN	Benin	0	132	0.48	1	0.026	0	0	1	0	0	1,716	3.6
ZWE	Zimbabwe	0	133	0.48	1	0.006	0	0	0	0	0	1,678	3.6
MLI	Mali	0	134	0.48	1	0.064	0	0	1	0	0	1,504	3.8
TGO	Togo	0	135	0.48	1	0.018	0	0	1	0	0	1,317	
GIN	Guinea	0	136	0.48	1	0.033	0	0	1	0	0	1,219	3.0
MOZ	Mozambique	0	137	0.48	1	0.019	0	0	0	0	0	1,014	3.5
CAF	Central African Re	0	138	0.48	1	0.255	0	0	0	0	0	929	
BDI	Burundi	0	139	0.48	1	0.056	0	0	0	0	0	730	3.2
SUR	Suriname	0	140	0.44	0	0.000	0	0	0	0	3	15,705	
BIH	Bosnia and Herzeg	0	141	0.15	0	0.000	0	0	0	0	1	9,370	2.9
BTN	Bhutan	0	142	0.15	0	0.000	0	0	0	0	1	7,248	4.1
TCD	Chad	0	143	0.15	0	0.000	0	0	0	0	1	1,996	2.9
HTI	Haiti	0	144	0.15	0	0.000	0	0	0	0	1	1,613	2.7
FRO	Faeroe Islands	0	145	0.15	0	0.000	0	0	0	0	1		
GNQ	Equatorial Guinea	0	146	0.00	0	0.000	0	0	0	0	0	34,178	
KOR	Korea, Rep.	0	147	0.00	0	0.000	0	0	0	0	0	32,022	3.3
LBY	Libya	0	148	0.00	0	0.000	0	0	0	0	0	22,965	
KNA	St. Kitts and Nevis	0	149	0.00	0	0.000	0	0	0	0	0	20,433	
GAB	Gabon	0	150	0.00	0	0.000	0	0	0	0	0	17,769	3.9
BLR	Belarus	0	151	0.00	0	0.000	0	0	0	0	0	17,210	

Country	ISO3	ASEAN	Rank	Index value	WTO notifications		TFA trade portal		TRAINS data			GDP per capita 2014	WEF transp. index
					At least one notif.	Normalized notif.	Has a trade portal	Portal quality	2001 version	MAST version	Experim. score		
IRN	Iran, Islamic Rep.	0	152	0.00	0	0.000	0	0	0	0	0	16,414	3.4
PLW	Palau	0	153	0.00	0	0.000	0	0	0	0	0	13,774	
MNE	Montenegro	0	154	0.00	0	0.000	0	0	0	0	0	13,589	
SRB	Serbia	0	155	0.00	0	0.000	0	0	0	0	0	12,806	
TKM	Turkmenistan	0	156	0.00	0	0.000	0	0	0	0	0	12,684	
MDV	Maldives	0	157	0.00	0	0.000	0	0	0	0	0	12,626	4.6
MKD	Macedonia, FYR	0	158	0.00	0	0.000	0	0	0	0	0	11,874	
KSV	Kosovo		159	0.00	0	0.000	0	0	0	0	0	8,537	
AGO	Angola	0	160	0.00	0	0.000	0	0	0	0	0	6,755	
WSM	Samoa	0	161	0.00	0	0.000	0	0	0	0	0	5,755	
TON	Tonga	0	162	0.00	0	0.000	0	0	0	0	0	5,130	
WBG	West Bank and Gaza		163	0.00	0	0.000	0	0	0	0	0	4,929	
UZB	Uzbekistan	0	164	0.00	0	0.000	0	0	0	0	0	4,789	
SDN	Sudan	0	165	0.00	0	0.000	0	0	0	0	0	3,872	
YEM	Yemen, Rep.	0	166	0.00	0	0.000	0	0	0	0	0	3,674	
TUV	Tuvalu	0	167	0.00	0	0.000	0	0	0	0	0	3,551	4.2
STP	São Tomé and Príncipe	0	168	0.00	0	0.000	0	0	0	0	0	3,044	
DJI	Djibouti	0	169	0.00	0	0.000	0	0	0	0	0	2,879	
TJK	Tajikistan	0	170	0.00	0	0.000	0	0	0	0	0	2,385	
SLB	Solomon Islands	0	171	0.00	0	0.000	0	0	0	0	0	2,062	
KIR	Kiribati	0	172	0.00	0	0.000	0	0	0	0	0	1,705	3.6
SLE	Sierra Leone	0	173	0.00	0	0.000	0	0	0	0	0	1,593	

Country	ISO3	ASEAN	Rank	Index value	WTO notifications		TFA trade portal		TRAINS data			GDP per capita 2014	WEF transp. index
					At least one notif.	Normalized notif.	Has a trade portal	Portal quality	2001 version	MAST version	Experim. score		
ERI	Eritrea	0	174	0.00	0	0.000	0	0	0	0	0	1,505	3.2
COM	Comoros	0	175	0.00	0	0.000	0	0	0	0	0	1,428	
GNB	Guinea-Bissau	0	176	0.00	0	0.000	0	0	0	0	0	1,373	
ETH	Ethiopia	0	177	0.00	0	0.000	0	0	0	0	0	1,256	
NER	Niger	0	178	0.00	0	0.000	0	0	1	0	0	883	3.8
LBR	Liberia	0	179	0.00	0	0.000	0	0	1	0	0	784	
ZAR	Congo, Dem. Rep.		180	0.00	0	0.000	0	0	0	0	0	652	
CYM	Cayman Islands	0	181	0.00	0	0.000	0	0	0	0	0		
GUM	Guam		182	0.00	0	0.000	0	0	0	0	0		
ABW	Aruba		183	0.00	0	0.000	0	0	0	0	0		
PRK	Korea, Dem. Rep.	0	184	0.00	0	0.000	0	0	0	0	0		
SYR	Syrian Arab Republ	0	185	0.00	0	0.000	0	0	0	0	0		
SOM	Somalia	0	186	0.00	0	0.000	0	0	0	0	0		
GRL	Greenland	0	187	0.00	0	0.000	0	0	0	0	0		

Note: Country rankings within categories with equal index values are arbitrary; by default, countries are ranked by decreasing order of GDP per capita.

*“Sur quoi la fondera-t-il l’économie du monde qu’il veut gouverner? Sera-ce sur le caprice de chaque particulier? Quelle confusion! Sera-ce sur la justice? Il l’ignore.”*

Pascal



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