

Chapter 2

Key performance indicators of trade facilitation

The definition of trade facilitation varies over time and across Institutions. That is why, researches in this area encompass various scopes, relying on a broad or narrow definition of trade facilitation. Traditional indicators on trade facilitation usually refer on a set of proxies measuring Customs clearance procedures, governance, ICT and transport infrastructures issues. They aim to evaluate the effectiveness of border management, but also infrastructure and logistic operators. The performance of border operators, both public and private, is a very sensitive issue. That is why, hard data are rarely publicly available, even if they exist. In consequence, indicators are often based on perception data. Moreover, they encompass various *-different-* assumptions. Other issues about trade facilitation indicators rely on their coverage (years and countries) and their scope. Narrow indicators remain scarce and generally, the more an indicator becomes narrow, the more the country coverage is limited.

In this chapter, I review the “traditional” indicators used in most of trade facilitation studies and then, some specific *-narrow-* indicators. I show that there are many disparities and inconsistencies across each traditional source, but also between broad and narrow indicators²³. Moreover, I also stress that there are some disparities across sectors, transport modes and even between border offices of the same country. Some of these indicators are used in the following study about the construction of a composite indicator of trade facilitation, as inputs or controls (chapter 4).

2.1 The usual indicators of trade facilitation

Past reviews of empirical studies related to trade facilitation (Staples, 1998; OECD, 2003a; Walkenhorst and Yasui, 2004) have shown that the majority of them were based on a series of business surveys. Since a decade, numerous indicators have been developed on various topics based on such regular surveys. They became a useful toolbox used by researchers to estimate the impact of several

²³A global picture of the main indicators is drawn in chapter 5.

trade facilitation dimensions. In a seminal work, Wilson et al. (2002) built seven indicators of trade facilitation based on a set of variables provided by the Global Competitiveness Report (WEF), the World Competitiveness Yearbook (IMD), the Economist Intelligence Unit and Transparency International²⁴. They used them in a gravity regression to estimate their impacts on trade, which were significant. Then, following the same methodology on a smaller set of indicators, Wilson et al. (2003, 2004) and Mann (2004) reported also significant impacts. In 2005, a new source -*Doing Business*- became available to measure some key elements of trading across the border. Finally, in 2007, the World Bank provided a measure of the performance of border operators, both Customs administrations and logistics operators. As stressed by Findlay (2009), these sources are still popular in many trade facilitation researches²⁵. Studies also refer to other traditional sources according to their scope, such as the Enterprise Surveys database²⁶.

With the growing need of data in the field of trade facilitation, Bagai and Wilson (2006) provided a first attempt to summarize main data and relevant indicators. Since, additional sources and indicators have appeared. These new sources mainly rely on existing data, but also include new ones. They are often a compilation of existing datasets on a specific topic. It is part of the new strategy of traditional providers who offer now a free access to their datasets²⁷. Recent studies rely increasingly on some of these new indicators, such as the UNCTAD connectivity and transshipment Indexes. This section reviews the current traditional databases and indicators used in trade facilitation studies.

2.1.1 A review of traditional indicators

World Governance Indicator The World Governance Indicator (WGI) is composed by six aggregate governance indicators, covering over 200 countries since 1996. These indicators of governance are based on different sources and reflect the perception of a diverse group of respondents. The six components as well as the individual indicators, are highly correlated and should be used carefully in a regression²⁸. Among the six broad dimensions of governance, the indicator measuring the control of corruption is particularly relevant. It captures the “*perceptions of the extent to which public power is exercised for private gain, including both petty and grand form of corruption as well as capture of the state by elites and private interests*”, Kaufmann et al. (2010). The methodology used to build these composite indicators is an Unobserved Components Model (UCM). The interpretation of the percentile ranks should be controlled by the confidence intervals. Finally, there is still some compar-

²⁴The indicators measured port logistics, Customs procedures, regulatory environment, standards harmonization, business mobility, e-business, and transparency issues.

²⁵Such as Helble et al. (2007), Wilson (2007a,b), Wilson and Otsuki (2007), Dennis and Shepherd (2007), Iwanow and Kirkpatrick (2007), Hoekman and Nicita (2008), Zaki (2009), Shepherd and Wilson (2009), Kharel and Belbase (2010), Portugal-Perez and Wilson (2010), Persson (2010) or Duval and Utoktham (2011), to quote some recent studies.

²⁶Such as Li and Wilson (2009b) who focus on firms data.

²⁷The World Bank and recently the OECD have opened most of their database to the public, without any fees requirements.

²⁸Individual indicators come from a wide variety of sources, such as the Global Competitiveness Report, the World Competitiveness Yearbook or the World Bank surveys.

isons issues over time and across countries since datasets are potentially unbalanced. The highest percentile indicates the highest performance.

World Competitiveness Yearbook Since 1989, the IMD World Competitiveness Yearbook (WCY) measures the competitiveness of several economies (57 in 2009), covering over 300 competitiveness criteria²⁹. Indicators are aggregated around four factors (economic performance, government efficiency, business efficiency and infrastructure) based on data provided by international, national and regional organizations and a network of 54 partner Institutes. Each of these four factors has been divided into five sub-factors which do not necessarily include the same number of criteria. Each sub-factor is equally weighted (5%) and composed by different types of data, from hard data to opinion surveys. Two-thirds of data used in the overall ranking are hard data. The sample of respondents to the Executive Opinion Surveys are proportional to the GDP of each economy³⁰. As most of the criteria are scaled differently, a comparable standard scale is used to compute the overall, factor and sub-factor results. Thus, every economy's performance is assessed for each criterion using the Standard Deviation Method (SDM). The standardized values for each criteria is then calculated by subtracting the average value of the 57 economies from the economy's original value and then dividing the result by the standard deviation. The sub-factor rankings are then determined by calculating the weighted average of the criteria standardized values that make up the sub-factor, excluding the background criteria. Hard data have a weight of 1 and the survey data are weighted so that the survey accounts for one-third in the determination of the overall ranking³¹. When data is unavailable for particular economies, the missing values are replaced by a standardized value equal to 0. The highest standardized values are usually attributed to the most competitive economies, but with some criteria the inverse may be true.

The WCY provides several potential proxies of different trade facilitation dimensions. There is a wide set of indicators. Main candidates are related to border policies, transparency and infrastructure:

- Protectionism does not impair the conduct of your business
- Customs authorities do facilitate the efficient transit of goods
- International transactions can be freely negotiated with foreign partners
- Justice is fairly administered
- Transparency of government policy is satisfactory
- Bureaucracy does not hinder business activity

²⁹Only two thirds of individual indicators are used to calculate the Overall Competitiveness rankings.

³⁰They assess the competitiveness issues by answering the questions on a scale of 1 to 6. Then, the average value for each economy is converted into a 0 to 10 scale. Finally, the survey responses are transformed into their standard deviation values, from which the rankings are calculated.

³¹Thus, each survey criterion has a weight of 0.55 in 2009.

- Bribing and corruption do not exist
- The distribution infrastructure of goods and services is generally efficient
- Water transportation (harbors, canals, etc.) meets business requirements

Logistic Performance Index The Logistics Performance Index (LPI) assesses different dimensions of the logistic performance, building profiles of logistics friendliness for 155 countries in its last release, at the international and domestic level. The LPI and its indicators are based on surveys conducted every two years³² from freight forwarders and express carriers, rating eight overseas markets. The LPI is mainly a perception index, rated on a scale from 1 (worst) to 5 (best). The LPI reports six sub-indexes and an overall index calculated by using principal components analysis. The sub-indexes are the following:

- Efficiency of the clearance process by border control agencies (*i.e. speed, simplicity and predictability of formalities*)
- Quality of trade and transport related infrastructure
- Ease of arranging competitively priced shipments
- Competence and quality of logistics services
- Ability to track and trace consignments
- Timeliness of shipments in reaching destination within the scheduled and expected delivery time

The World Bank provides the replies from logistics professionals to the domestic survey in a series of country reports available on its website. Among the detailed qualitative information on the logistics environment of each country, some variables are highly related to “public” trade facilitation issues, such as the perception of the competence and quality of service delivered by Customs, standards or health agencies, but also the evaluation of the clearance and delivery of imports and exports, the transparency of Customs clearance, the provision of adequate and timely information on regulatory changes or the expedited Customs clearance for traders with high compliance levels. The surveys also measure the sources of major delays and changes in the Customs clearance procedures since 2005. Finally, the LPI provides also a series of hard data about the clearance time with/without physical inspection (days), the percent of physical inspection and multiple inspection, the lead time to export/import for port/airport (days), the number of agencies, and the typical charge for a 40-foot export/import container or a semi-trailer (US\$). The LPI survey has been refined and the new release includes some changes. Arvis et al. (2010) provide additional information on the methodology used and the composition of respondents.

³²To date, there are two releases of the LPI (Arvis et al., 2007, 2010).

World Economic Forum The World Economic Forum (WEF) provides a series of indicators on the determinants driving productivity and competitiveness of different areas, particularly in its Global Competitiveness Report (GCR) since more than a decade and more recently with the Global Enabling Trade Reports (GETR). The GCR components are grouped into 12 pillars including numerous variables which could be useful in a trade facilitation analysis³³, even if time series are not always available³⁴. Variables are mainly based on the replies to the Executive Opinion Surveys, rated using a 1 to 7 scale. However, various external sources are also used³⁵. In general, the better the score is, the better the competitiveness is. The aggregate scheme of the composite sub-index and additional information are detailed in the last release of the GCR (Schwab, 2010). The WEF's Enabling Trade Index measures "*the extent to which individual economies have developed institutions, policies, and services facilitating the free flow of goods over borders and to destination*", Lawrence et al. (2010). It is a composite indicator built around four sub-indexes:

- The market access sub-index,
- The border administration sub-index³⁶,
- The transport and communications infrastructure sub-index
- The business environment sub-index

These areas are composed of nine pillars, the domestic and foreign market access, the efficiency of Customs administration, the efficiency of import-export procedures, the transparency of border administration, the availability and quality of transport infrastructure, the availability and quality of transport services, the availability and use of ICTs, the regulatory environment and the Physical security. It appears that several pillars are related to trade facilitation issues as well as individual variables³⁷. Data come from the Executive Opinion Surveys, but mainly from external sources such as the Global Express Association (GEA), the International Air Transport Association (IATA), the International Trade Center (ITC), the United Nations Conference on Trade and Development (UNCTAD), the World Bank and the WTO. Each variable is normalizing to a 1 to 7 scale and each sub-index (and pillar) is calculated as an unweighted average of its individual components.

³³The most trade facilitation related variables are: Burden of Customs procedures, Burden of Government regulation, Extent of Bureaucratic Red Tape, Irregular payments in export and imports, Judicial Independence, Prevalence of trade barriers, the control of international distribution and several infrastructure indicators such as the quality of port infrastructure. The GCR provides also a wide set of ICT indicators, mainly based on the International Telecommunication Union data.

³⁴Thus, the 2004-2005 Report which focused on Customs issues, provided a series of additional and specific indicators related to customs efficiency such as the Business impact of foreign trade barriers, the Business impact of Customs procedures, the Efficiency of Customs procedures and the level of hidden trade barriers. Unfortunately, these indicators are not available in the next releases.

³⁵Particularly, numerous data are provided by the World Bank (Doing Business and the World Development Indicators), the International Monetary Fund, the International Telecommunication Union or the UNESCO.

³⁶The border administration sub-index assesses the extent to which the administration at the border facilitates the entry and exit of goods.

³⁷Note that the Transshipment Connectivity Index and the Liner Shipping Connectivity Index, both provided by the UNCTAD, are available in the GETR.

Additional information on the methodology and the variable definitions are available in Lawrence et al. (2010).

Corruption Perception Index Transparency International’s Corruptions Perceptions Index (CPI) is a composite indicator ranking countries “*in terms of the degree to which corruption is perceived to exist among public officials and politicians*”, Lambsdorff (2010). This index is based on corruption-related surveys provided by several sources such as the Freedom House, the Economist Intelligence Unit, the Global Insights, the Institute for Management Development or the World Economic Forum. Data are rescaled, standardizing the scores using “matching percentiles” between 0 and 10, and then applying a beta-transformation to the matched scores. The final CPI score for a country is the average of these transformed values (only if, at least three sources are available).

Doing Business Since 2004, Doing Business measures “*the obstacles faced by an entrepreneur performing standardized tasks*”, WB (2004). The reports measure the degree of regulation and gauge regulatory outcomes, covering 183 countries in 2011³⁸. Data are collected from surveys of a variety of respondents following several rounds of interactions. Doing Business ranks the countries along various dimensions and the ease of doing business index is a composite ranking of each dimension, weighted equally. As pointed out by the WB (2010), the Doing Business methodology has various limitations³⁹. Moreover, as stressed by the IEG (2008), surveys collect information “*about a particular subset of a country’s private sector activity, the regulatory environment facing domestically owned firms operating in the formal sector*”. The indicators themselves cannot capture country context, precisely because they are designed to allow cross-country comparisons on the basis of uniform criteria. One of the core dimension measured by Doing Business since 2006, *trading across borders*, is highly related to trade facilitation issues. This component of Doing Business reports hard data on the time and cost to import (export) a standardized cargo by sea, excluding tariffs and ocean transport. It also measures the number of documents required for importing (exporting) a good. However, these specific indicators are not restricted to the role of Customs agencies, but also cover other regulatory agencies and, most importantly, the logistic chain. As explained previously, each indicator of the “trading across borders” category faces to a series of limited assumptions about business, traded goods, documents, but also the measure of cost and time. That is why, such indicators should be carefully chosen according to the scope of the study⁴⁰.

³⁸At the beginning, Doing Business covered 145 countries (in 2004). Note that data for all sets of indicators are lagging by one year, *i.e.* the 2011 report provides data for 2010, and so included with a lag of one year into stata databases.

³⁹First, the collected data refer to businesses in the country’s most populous city. Second, the data often focus on a specific business size. Third, transactions described in a standardized case study refer to a specific set of issues and may not represent the full set of issues a business encounters. Fourth, the measures of time involve an element of judgment by the expert respondents. Finally, the methodology assumes that a business has full information on what is required and does not waste time when completing procedures. The IEG (2008) also pointed out that “*changes in a country’s ranking depend importantly on where it sits on the distribution: small changes can produce large ratings jumps, and vice versa*”.

⁴⁰In a study focusing on a narrow trade facilitation definition, *e.g.* on public issues, such indicators could bias an estimation.

The assumptions used by Doing Business are the followings:

1. **ASSUMPTIONS ABOUT THE BUSINESS:** Has 60 or more employees; is located in the country's most populous city; is a private, limited liability company. It does not operate within an export processing zone or an industrial estate with special export or import privileges; is domestically owned with no foreign ownership; exports more than 10% of its sales.
2. **ASSUMPTIONS ABOUT THE TRADED GOODS:** The traded product travels in a dry-cargo, 20-foot, full container load. The product: is not hazardous nor does it include military items; does not require refrigeration or any other special environment; does not require any special phytosanitary or environmental safety standards other than accepted international standards.
3. **ASSUMPTIONS ABOUT DOCUMENTS:** all bank documents, Customs clearance documents, port and terminal handling documents, transport documents.
4. **ASSUMPTIONS ABOUT COST MEASURES:** Cost measures the fees levied on a 20-foot container in U.S. dollars. All the fees associated with completing the procedures to export or import the goods are included. These include costs for documents, administrative fees for Customs clearance and technical control, terminal handling charges and inland transport. The cost measure does not include tariffs or trade taxes. Only official costs are recorded.
5. **ASSUMPTIONS ABOUT TIME MEASURES:** Time is recorded in calendar days. The time calculation for a procedure starts from the moment it is initiated and runs until it is completed. If a procedure can be accelerated for an additional cost, the fastest legal procedure is chosen. It is assumed that neither the exporter nor the importer wastes time and that each commits to completing each remaining procedure without delay. Procedures that can be completed in parallel are measured as simultaneous. The waiting time between procedures - for example, during unloading of the cargo - is included in the measure.

Economic Freedom Index The 2010 Index of Economic Freedom covers 183 countries around the world, ranking 179 of them with an economic freedom score based on 10 different aspects: business freedom, Trade freedom, fiscal freedom, government spending, monetary freedom, investment freedom, financial freedom, property rights, freedom from corruption and labor freedom. As states by Miller (2010), "*trade freedom reflects the openness of an economy to imports of goods and services from around the world and the ability of citizens to interact freely as buyers and sellers in the international marketplace*". Trade freedom is a composite measure of the absence of tariff and non-tariff barriers that affect imports and exports of goods and services, based on the trade-weighted average tariff rate and Non-tariff barriers (NTBs).

The score is calculated according to the following formula:

$$TFreeom = \left(100 \times \frac{Tariff_{Max} - Tariff_i}{Tariff_{Max} - Tariff_{Min}} \right) - NTB_i$$

A Non-tariff barriers (NTB) penalty, assigned according to a specific scale, is subtracted from the base score. The extent of NTBs in a country's trade policy regime is evaluated using both qualitative and quantitative information. One of the six categories of NTBs refers to *Customs restrictions*, such as advance deposit requirements, Customs valuation procedures, Customs classification procedures or Customs clearance procedures⁴¹. Primary sources come from the World Bank (World Development Indicators, Doing Business), the World Trade Organization, the Economist Intelligence Unit, and official government publications of each country.

⁴¹Additional details are available in Miller (2010).

The World Trade Indicators The World Trade Indicators (WTI) is a compilation of the World Bank from various sources, measuring trade performance over more than 200 countries. The database is divided in 5 pillars: (i) Trade Policy, (ii) External Environment, (iii) Institutional Environment, (iv) Trade Facilitation, and (v) Trade Outcome. Obviously, the fourth pillar provides several individual indicators related to trade facilitation. This pillar is built around the LPI and its indicators, the DB Trading Across Borders indicators, some transportation related indicators⁴², ICT indicators, Trade Finance and other variables. The WTI is based on equal weights and the user can apply its own weight scheme.

The Enterprise Survey The World Bank Enterprise Survey (ES) is a firm-level survey of a representative sample of an economy's private sector, covering a broad range of business environment topics across 125 developing countries to date⁴³. Time series analysis are not easy to implement as the database is not updated on a regular basis, but every three years -in average- since 2002. Moreover many survey questions change between two reviews. However, the scope of respondents is higher than traditional indicators such as Doing Business⁴⁴. Some variables are relevant in the area of trade facilitation, such as (i) Average time to clear direct exports through Customs, (ii) Average time to clear imports from Customs⁴⁵, (iii) Firms expected to give gifts to get an import license, (iv) Firms identifying corruption as a major constraint, (v) Firms identifying transportation as a major constraint, and (vi) Firms identifying Customs and trade regulation as a major constraint⁴⁶. Unfortunately these data are not available for OECD countries and the majority of EU Members. Recently, Li and Wilson (2009b) investigate trade facilitation issues on SMEs using these surveys for a set of Asian countries.

The Customs reports of the Global Express Association The Global Express Association (GEA) is the global trade association of the express delivery industry. The GEA provides reports on standard trade facilitation measures for numerous countries, capturing different aspect of the services offered by Customs and related agencies. The framework of the survey is quite close to the WTO (2010) negotiations on trade facilitation, which made it a good candidate to fill the gap of the OECD Trade Facilitation Index project (Moisé and Orliac, 2010). The GEA collects information from their members who have local knowledge of the Customs services available in each country reviewed. Data was first collected in 2005 and are regularly updated as information becomes available. At the 31 January 2011, the Customs reports cover 139 countries. These surveys are highly relevant in Trade

⁴²This dimension is particularly interesting, as other areas provide data already available in other reports.

⁴³The Enterprise Survey is also known as the Business Environment and Enterprise Performance Surveys (BEEPS).

⁴⁴There is no restriction about the type and size of enterprises included in the surveys. Since 2002, the statistics on the number of firms surveyed show that the surveys have covered 43114 small enterprise (<20 employees), 30666 medium enterprise and 20551 large enterprise (over 100 employees). Moreover, 17.62% of these enterprises are exporters.

⁴⁵The question is “*in the [current] fiscal year, when [this] establishment imported material inputs or supplies, how many days did it take on average from the time these goods arrived to their point of entry (e.g. port, airport) until the time these goods could be claimed from Customs?*”

⁴⁶It is the “*percentage of firms identifying Customs and trade regulations as a major or very severe obstacle*”.

Facilitation analysis. The Global Enabling Trade Report already uses some of these questions (15) to build its “*Customs services index*”. The GETR aggregates each variable to obtain a maximum score of 12 in its last release⁴⁷. I have extracted the whole database from each Customs report. An overview of the database and an Extended version of the Customs Services Index are available in section 5.2. However, it remains a snapshot without time series⁴⁸.

Other Indicators Secondary sources are also used in trade facilitation studies, such as the United Nations E-Government Surveys, the Global E-Government Reports, the International Telecommunication Union indicators or the World Bank’s Word Development Indicators. Additional information on tariffs, NTBs, RTAs and gravity variables are provided by the World Trade Organization, COMTRADE, the CEPII or the UNESCAP (ARTNeT). The research Community also provides some specific databases⁴⁹. Another set of data is related to transport issues. The main sources on transport flows, performances and costs are provided by Containerization International (CI), the Baltic Exchange, the UNCTAD⁵⁰ and the OECD who recently provided a database on maritime transport costs⁵¹. Finally, Djankov et al. (2010) provide insights on the classification of goods according to their time sensitivity.

An overview of the scope, the coverage and the type of the traditional indicators listed previously is available in the Appendix (section A.1). As explained in the introduction, these indicators are relatively common in the field of trade facilitation and usual candidates regressors in gravity models⁵². However, they suffer from several issues and should be used carefully.

2.1.2 Limits of these databases

Firstly, indicators measuring the same characteristics do not follow the same definitions, assumptions or methodology. Recently Ramasamy (2010), Behar (2010) or De (2011) pointed out such divergences and lack of correlation between similar indicators from different sources, as earlier Bagai and Wilson (2006) when measuring the clearance at the border. Interviews with Customs officers as well as Customs reports or specific studies also indicate different measures⁵³. I provide a comparison

⁴⁷The aggregation scheme is not well documented. Additional information is available in the section *technical notes and sources* of the WEF, 2010.

⁴⁸Note that the GETR Customs services index could be used in time series studies.

⁴⁹Mayer et al. (2008) provide a useful gravity database including RTAs compiled by Baier and Bergstrand (2007), while Duval and Utoktham (2011) provide a database on gravity variables including trade costs evaluations.

⁵⁰The UNCTAD provides the *Liner Shipping Connectivity Index* which measures a series of quantitative services available, and the *Transshipment Connectivity Index* which measures the degree of connection between countries (direct connection, or higher order connection).

⁵¹Korinek and Sourdin (2009) have compiled a database on transport costs for 43 importing countries (including EU15 countries as a custom union) from 218 countries of origin, at the detailed commodity (6 digit) level. However, in reality data availability and accuracy are limited to a smaller set of importers.

⁵²I built a database including all these indicators related to trade facilitation, available on a STATA format on my website.

⁵³In its first Time Release Study (TRS) in 2007, Australia has tested *the time for import* provided by Doing Business. The TRS results were supplemented with data from a selection of importers meeting the World Bank’s criteria and the finding indicated that these importers received containers fewer than six days after arrival, which was

of the “*time to import*” from different sources in table 2.1, which confirms such divergences between indicators encompassing different assumptions and scopes. As explained by Behar (2010) “*the different data sources are drawing from different distributions or (...) different parts of the distribution*”. The values of the dispersion between each source (see table A.1 in the appendix) show the need to choose carefully an indicator according to its assumptions and its related “trade facilitation policy” coverage, particularly for low economies where the dispersion is higher.

Secondly, these indicators often rely on a mix of variables coming from various sources to build their own variables. It raises the question of the value added of each database. Moreover, such a “spaghetti bowl” raises also some questions about the validity of robustness analysis using alternative -but related by construction- proxies⁵⁴.

less than half the World Bank’s figure. Australia has also compared its intervals with the Logistic Performance Index which evaluates *the efficiency of the clearance process by Customs and other border agencies*, and found a difference of 0.4 days. In this case the measure seems more accurate.

⁵⁴Traditional sources encompass numerous cross-references. Thus, the CPI is based on several traditional sources such as the GCR or the WCY; the Economic Freedom Index uses DB, WDI, WTO, CPI; the Global E-Government Report follows DB, ITU or the IMF; the Global Enable Trade Report compile a wide set of indicators coming from DB, LPI, GCR, GEA, CPI, WDI, ITU or the UNEG, among other third sources; the UN E-Government Report uses the ITU; the WCY is based on surveys but also data from the WTO, DB, WDI, ITU or the OECD; the WDI and the WGI compile data provided by DB, LPI, IMF, WCY, GCR or the ES; and finally the World Trade Indicators also uses DB, LPI, ITU or the UNCTAD.

Table 2.1: Time to import/export by category, a comparison between different sources

	DB, Time (days)		BEEPS, Time (days)		Clearance time		Lead Time (Sea and Air)		Lead Time (Land)	
	Export	Import	Export (1)	Import (2)	LPI (3)	LPI (4)	LPI (import)	LPI (export)	LPI (import)	LPI (5)
High income: OECD	11,09	11,82	4,12	6,16	0,60	1,52	2,46	3,16	2,42	2,67
High income: non-OECD	15,14	16,22	1,65	3,21	1,34	2,50	2,97	3,12	1,91	2,49
Low income	40,46	46,11	7,31	11,64	2,74	4,36	6,92	10,25	5,24	10,51
Lower middle income	27,21	31,16	6,73	14,02	1,78	3,17	4,59	4,94	4,72	7,25
Upper middle income	21,93	24,27	5,42	8,14	1,75	3,17	3,50	5,08	3,53	4,29
Africa	32,83	39,40	6,64	12,07	2,63	4,66	7,33	9,22	4,64	7,19
Americas	18,95	21,78	7,06	13,74	1,50	3,27	3,87	4,96	4,18	3,88
Asia	28,88	30,84	6,95	12,35	1,75	2,71	3,08	4,35	3,71	7,10
Europe	14,58	15,41	2,82	4,76	0,71	1,53	2,37	3,00	2,65	3,14
Oceania	22,13	24,52	9,64	10,66	0,49	1,51	4,55	5,34	1,72	2,97
Total	24,70	27,91	6,16	10,95	1,64	2,94	4,21	5,47	3,59	5,41

Source: own calculation based on available sources. Mean of time (days) since 2005, by income and region.
 DB stands for Doing Business, LPI for Logistic Performance Index and BEEPS for the Enterprise Surveys.

(1) Average Time to Clear Direct Exports Through Customs (days)

(2) Average Time to Clear Imports from Customs (days)

(3) Clearance time (days), without physical inspection

(4) Clearance time (days), with physical inspection

(5) Lead time import, best case (days)

Thirdly, the country coverage and the scope of these indicators vary across sources, and even within the same source across the successive releases⁵⁵. Fourthly, some of them are based on perceptions (soft data) while other are factual (hard data). The interpretation of soft and hard data is not the same. The latter do not suffer of subjectivity issues but could omit a part of the situation if not correctly put in context. Moreover, these “hard” indicators are more or less accurate. About the former one -the soft data- the question of relativity is still an issue, leading to diverse interpretations. In the one hand, a score can be subject to “a pattern illusion”, *i.e. a long practice in a country modifies the perception of the respondent about the reality by omitting the experience effect*. In the other hand, a score can be subject to an over-estimation of a recent event⁵⁶. The relative stability of many indicators over time tends to confirm the former observation. In addition, the panel of respondents could be not representative and leads to biased replies and so, indicators⁵⁷.

Fifthly, indicators encompass different natures and rely on various methodological backgrounds⁵⁸. The standardized methods and weighting schemes can change significantly an indicator. Moreover, scores and ranks can also lead to misinterpretation. Country rankings retain only information on countries relative rank but not on the size of the gaps between countries. An indicator must be placed within the specific context and the development level of a country. In addition, one should look at its place in the distribution, particularly when using time series. Indeed, a poor score can know a significant jump. Finally, some indicators should be interpreted by using a threshold strategy rather than pure scores or ranks, especially for hard data. Indeed, is there a big difference when the clearance time differs by 10 minutes or should we consider another scale than the minutes? Last but not least, these traditional indicators are not specific to the date of publication of each report and should be lagged in a regression⁵⁹.

The scope -*the deepness*- of traditional indicators is another issue. As stressed by Holloway (2010), indicators of measurement of trade facilitation could be classified according to their scope, which is more or less narrow. Customs is a focal point in the border management, but are only a part of the whole supply chain. Many traditional indicators merge different steps of the clearance process and so different operators within the same variable. There is no clear distinctions between private and public sectors as well as between the different agencies involved. Moreover, traditional indicators do not investigate the impact of the size of each operator or their characteristics (SMEs/MNEs, goods perishable or not), providing a common measure for different operators who do not face the

⁵⁵Some data providers are aware of this kind of issue and try to provide comparable time series by back-calculating the data set to adjust for changes in methodology and revisions in data. It is the methodology followed by Doing Business. That is why, for several indicators and particularly *Time to import*, the current downloadable data set is far away from the original data set published in the *pdf* reports. See the Australian case study in appendix, table A.3.

⁵⁶It is a known issue in quality of life surveys, when the reality of each day differ, following daily events and mood.

⁵⁷Arvis et al. (2010) accounts for the standard errors of the replies to the LPI survey.

⁵⁸See Hoffmann et al. (2008) for a review of methodological issues related to composite indicators.

⁵⁹Data presented are for the immediately preceding year(s)

same issues⁶⁰. In addition, the different areas of trade facilitation are not entirely covered. Narrow indicators are available through specific cases studies, Time Release Studies or Customs reports. These sources are detailed in the following section.

2.2 Some specific measures of trade facilitation

2.2.1 Time Release Studies

By comparison to traditional indicators, Time Release Studies (TRS) provide an effective evaluation of Customs performance at the border, a standardized way to measure the time to release goods, at each step (see figure 2.1). The TRS cover the Customs procedures, related government agencies and the private sector involved in the trade supply chain⁶¹. In addition, TRS provide information for each different mode of transportation, type of goods and even at different Customs offices. As stressed by Zhang (2009), the scope of TRS is a determining factor of the measure of border performance. TRS has been promoted by the World Customs Organization since 1994, following the pilot initiatives of Japan and the United States. In 2002, the WCO has developed a guide (WCO, 2002), followed by a software in 2005, to help its Member to launch such programmes. Even if their number expands, the TRS are not well *-or not enough-* developed around the world to be used as a useful database to evaluate the impact(s) of trade facilitation policies⁶². Such programmes are costly to implement, they require technical capacities and a close cooperation between the different actors involved. Moreover, a TRS project usually requires several months along each stage of the programme⁶³.

Despite these implementation difficulties, TRS are a valuable tool for Customs authorities, particularly to design and measure trade facilitation policies. TRS help to identify bottlenecks in the clearance process and reform opportunities which aim to enhance the efficiency of Customs procedures and the whole trade supply chain, such as the single windows, the pre-arrival declaration or the Authorized Economic Operator. Thus, since its first TRS in 1991, Japan has followed the recommendations of each survey (conducted every two or three years) and implemented a series of modernization initiatives leading to substantial improvements of Customs procedures⁶⁴. Korea has conducted TRS since 1998 and known numerous critical improvements following a series of adopted trade facilitation policies. After a downward trend of clearance times, the Korean TRS have pointed out a new performance issue, focusing on the predictability of clearance services “*which could be*

⁶⁰According to the Enterprise Surveys, SMEs face higher transaction costs such as higher clearance time, than large firms.

⁶¹The TRS measures the time consumed by Customs but also by shipping company and agent, port Authority, importer, Customs broker, government agencies (health and standard agencies), bank, warehouse operators, forwarder or domestic carriers.

⁶²Matsumoto and Lee (2007) and Zhang (2009) provide a review of Asian TRS. I have also studied a series of publicly available Time Release Studies from Australia (Customs, 2009b,c, 2010a) and New Zealand (Customs, 2010b), Japan (Customs, 2007, 2009d), Jordan (Customs, 2008), Kenya (Oloo et al., 2004) and Tanzania (Customs, 2005). See section A.2 in the appendix.

⁶³See Zhang (2009) for a review of the 5 stages of TRS programmes.

⁶⁴See section A.2.1 in the appendix for additional details.

Figure 2.1: Time Release Study Schedule



expressed as standard deviation of clearance time”, Matsumoto and Lee (2007). TRS also provide insights to reallocate resources, to request other government agencies and private sectors for their re-engineering. Another potential interest of TRS is to evaluate the “real” role and place of Customs in the whole trade supply chain. Indeed, as pointed out by Zhang (2009), a significant finding of TRS is that Customs may not necessarily represent the weakest link of the chain but on the contrary “*Customs is very often found to be one of the more efficient agencies*”. Other government agencies and even the private sector are responsible for some delays. That is why, performance indicators capable to disaggregate the border processes are a useful tool for Customs to underline delays and inefficiencies which are outside their control⁶⁵. TRS could be valuable candidates to build a composite trade facilitation indicator. However, as explained previously, their utility is limited by the geographic scope of the current TRS, but also by the lack of regular surveys and the lack of common measures used in each TRS, despite the WCO initiatives⁶⁶. But, TRS provide insights on the impact of a series of trade facilitation policies according to the type of good, the mode of transport or the Customs regime, and the disparities across border offices of a unique country. Such characteristics are detailed in section A.2 of the appendix and recalled along the paper.

2.2.2 Customs monitoring

In many countries, Customs authorities provide an annual report with a set of key statistics. However, efficiency indicators are not always publicly available or even available -at all- for the authorities. Indeed, such a reporting with various indicators of Customs efficiency is quite new, it implies

⁶⁵This situation has been described by Cantens et al. (2010), the Australian TRS (Customs, 2009c, 2010b) and during some interviews with Customs officers. Firstly, it appears that Customs inherits of some inefficiencies that exist within the delegating agency process. Secondly, private operators often rely to Customs to explain the cause of any delay, instead of their own inefficiencies. Thirdly, logistic operators use the border clearance system to deal with their cargo in a timely manner, but also to play with several delays such as the free stock areas to reduce their costs. Refas and Cantens (2011) explained that “*the container terminal is in fact a warehousing option for cargo owners and is therefore used to meet some of their temporary or long term storage needs*” and define this phenomena as a discretionary dwell time.

⁶⁶Zhang (2009) details additional dilemmas confirming that TRS are not designed for cross-countries comparison.

numerous steps and actors, including the Customs authorities but also other agencies, and could be expensive or require an extensive use of IT. In addition, the picture is not necessarily the same at every border offices of the same country⁶⁷. Definitions also differ between countries. Even within the European Union, there is not a common approach to measure trade facilitation and particularly the Customs efficiency⁶⁸. Moreover, Holloway (2010) underlines the natural tendency for border agencies “*to measure outputs rather than outcomes*”. To quote the example of Holloway, such reports provide “*the amount of drugs seized over a period of time rather than any assessment of whether or not a particular drug strategy has been effective*”. It raises the question of the ambiguity of several indicators⁶⁹. As stressed by the Time Release Studies, even hard data need to be put in the right context. Thus, clearance time varies according to the nature of the good, the transport mode, the Customs regime or the classification to the risk. Most of the time, classical indicators are a simple average of all the states of the nature. For example, clearance time is an average of goods classified according to their potential risk as “green lights” and “red lights”, the latter requiring a longer process with several controls⁷⁰. Merge both categories do not provide a right picture. It is advisable to use two separated indicators of clearance time with and without controls (as provided by the LPI).

Finally, the Customs authorities also provide a series of specific reports on particular issues, such as compliance issues (Customs, 2009a), which are useful to elaborate a clear facilitation strategy and assessing priorities. I made a review of the monitoring approach of the french Customs⁷¹, available in the appendix (section A.3).

2.3 A way towards new indicators

Deeper and disaggregated indicators are essentials to provide an accurate picture of the impacts of trade facilitation policies. Specific reports such as TRS or Customs reports could provide reliable indicators. Unfortunately these reports are not provided on a regular basis and suffer from a lack of

⁶⁷As pointed out by the Australian TRS, there are different patterns at each offices, different infrastructures and even different “perceptions” of Customs officers. These observations have also been confirmed by numerous TRS and several interviews of Customs officers in Europe.

⁶⁸The EU has recently launched (April 2011) a series of working parties on this topic and a wide study of the EU Customs efficiency in each Member States.

⁶⁹Similar questions exist for the traditional indicators. In addition, as stressed by the Doing Business Evaluation Report (IEG, 2008), the methodology used to construct these indicators often links a higher level of regulation with higher costs, without assess the potential social benefits of regulation. Moreover, “*since regulations generate social benefits as well as private costs, what is good for an individual firm is not necessarily good for the economy or society as a whole*”, IEG (2008). This concept is also discussed by Holloway (2010).

⁷⁰The USYCUDA refers to color channels. To better understand this particular issue, I rely on the french experience where the clearance time of french Customs has dropped from 13 minutes in 2004 to 6 minutes and 19 seconds in 2010 (Douane, 2010a). It is a positive trend showing an improvement of the efficiency of french Customs, according to this criteria which decreases each year. However, it is an average where outliers, *i.e. value higher than a day (shipments which require several checks)*, are dropped. Moreover, as an average, there is no distinction between “normal” shipments (green lights) and shipments requiring additional checks (red lights lower than a day). In reality clearance time is lower for the majority of shipments, only limited to the automatic process time of the Risk Management System.

⁷¹I thank Mr Jean-Michel THILLIER, Deputy Director General of French Customs (International Trade Directorate), for helping me to better understand the french strategy to measure the efficiency of the Customs clearance process, and for giving me all data I need.

geographic coverage to be used as a reference database, at least to date. That is why the literature mainly relies on the traditional indicators detailed previously. However, among them some are most suitable than other to be used as trade facilitation proxies, due to their scope or their construction.

The most important points are to know the dimension really covered (and so omitted) by an indicator and the implications of its construction scheme, particularly in the case of a time series analysis. In general, traditional indicators are broad regarding their trade facilitation dimension⁷² but also regarding their coverage, both geographic and sectoral. As explained previously, the situation could vary at different border office within the same country and indicators rarely take into account potential sectoral variances⁷³. The construction scheme is also relevant in the choice of an indicator. As pointed out by Hoffmann et al. (2008), an indicator is more or less suitable for time series and country comparisons. Thus sample specific indicators are sensible to the addition of new country. Changes in the definitions between two releases⁷⁴ as well as changes in the structure of respondents across countries are other examples of common issues.

The criteria of the WCY are based on opinion surveys (see footnote 30) and their score are not sensitive to the sample. The *Customs authorities* criteria is the most relevant indicator of the WCY as trade facilitation proxy, even if it remains broad in its coverage. The LPI is a recent database project which provides valuable indicators about the import (and export) process. As explained previously several criteria are linked to trade facilitation dimensions, focusing on specific steps of the process. In addition the LPI relies on several hard data and variables split by transport mode. However, the LPI remains difficult to use in time series due to the limited number of releases (two), changing methodologies and indicators. Until now, few criteria such as *the number of agencies* to import/export or *the percent of physical inspection* can be used in 2006 and 2009. The World Economic Forum (WEF) provides a series of indicators related to a broad definition of trade facilitation. However, the methodology adopted must be known before using them in time series and even cross country comparisons. The survey sampling follows a stratification based on the size of the company and the sector of activity, but the share of respondents by categories can vary across releases and countries. Then the sector-weighted country averages for the current year are combined with the previous year average to produce the final score. This moving average technique has been introduced in 2007 and includes a discounted factor of the previous year⁷⁵. In addition, hard data are normalized on a 1 to 7 scale with a min-max formula related to the sample. Among the indicators provided by the WEF, the *burden of Customs procedures* may be a candidate. However it remains

⁷²Firstly, the indicators rely on broad definitions of trade facilitation. Secondly, indicators usually merge various steps and actors. For example *time to import* proxies cover many different steps and actors, but rarely a specific stage of the import/export process. However public authorities cannot act at each stage.

⁷³Differences between perishable and not perishable goods, or between SMEs and large firms for example are rarely reported into specific indicators.

⁷⁴That is why some data provided by Doing Business are back calculated each year, as explained previously. See also table A.3 in the Annex

⁷⁵As explained by Schwab (2010) “*it makes results less sensitive to the specific point in time*” and it increases the sample size.

broad by measuring both import and export procedures, without being disaggregated along the trading process. Doing Business is another traditional source providing numerous data related to broad trade facilitation measures, especially the criteria included in the trading across the border category. As explained previously Doing Business suffers of several limitations, from the definition of its indicators based on standardized case scenarios to their coverage⁷⁶. Finally the Enterprise Surveys provide more specific variables regarding their scope or coverage even if their data are not updated on a regular basis, while the Global Express Association shows the issues faced by express forwarders which may be different than other traders. To conclude I would say that aggregated indicators and ranking are usually difficult to use in time series.

These issues lead to the necessity to develop new indicators in an effort to measure various narrow dimensions of trade facilitation and covering more disaggregated areas. The following chapters are a step toward this objective by focusing on specific measures. The country coverage may be more or less limited and these indicators may suffer of several issues listed previously, but they design a path to follow.

⁷⁶Thus the *time to import* relies on the following specific hypotheses: if a procedure can be accelerated for an additional cost and is available to all trading companies, the fastest legal procedure is chosen; it is assumed that neither the exporter nor the importer wastes time and that each commits to completing each remaining procedure without delay; the waiting time between procedures (for example, during unloading of the cargo) is included in the measure. Finally, there are some gaps between Doing Business and Time Release Studies about Customs delays.