

# QUANTITATIVE AND QUALITATIVE METHODS FOR ASSESSING TRADE FACILITATION

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**Abstract.** *The assessment of trade facilitation requires both quantitative and qualitative research methods. This paper explores these methodologies and their contributions. Quantitative methods focus on measuring trade costs, time, and efficiency, utilizing models and indices like the Logistics Performance Index. Qualitative approaches examine stakeholder experiences and institutional contexts through interviews, case studies, and analysis. Integrating both methods provide insights for policymakers and researchers, showing the positive correlation between trade facilitation and economic growth, competitiveness, SME participation, and sustainable development. This highlights the importance of effective trade facilitation measures for fostering economic growth and promoting sustainability.*

**Keywords:** *trade facilitation, theoretical framework, international trade, quantitative and qualitative methods, trade competitiveness, soft infrastructure.*

## 1. Literature review

The theoretical framework underpinning the investigation of trade facilitation measures within the context of a PhD project is rooted in various seminal academic papers authored by prominent scholars in the field. A foundational work in this area is the paper by Anderson and van Wincoop (2003), which introduced the gravity model of trade. This model, initially developed by Tinbergen (1962) and further elaborated upon by Eaton and Kortum (2002), underscores the importance of factors such as distance, economic size, and trade costs in determining international trade patterns. Building upon this framework, the work of Djankov et al. (2010) highlights the significance of regulatory quality and institutional factors in shaping the effectiveness of trade facilitation measures. Moreover, Baldwin (2011) provides insights into the evolution of global value chains and the role of trade facilitation in enhancing supply chain efficiency. By synthesizing the contributions of these scholars, this PhD project aims to develop a comprehensive theoretical foundation for the analysis of trade facilitation measures, incorporating key elements from neoclassical trade theory, New Institutional Economics, and the gravity model of trade, among others, to elucidate the multifaceted dynamics of international trade facilitation.

The conceptual understanding and definition of trade facilitation draw upon key academic papers authored by prominent scholars in the field. One pivotal work in this domain is the paper by World Trade Organization (WTO) economists, Wilson and Mann (2003), which offers a comprehensive conceptual framework for trade facilitation. Their definition posits that trade facilitation encompasses measures and policies aimed at simplifying, harmonizing, and expediting cross-border trade procedures and transactions. This foundational perspective aligns with the work of Limão and Venables (2001), who emphasize the reduction of both tariff and non-tariff barriers as essential components of trade facilitation efforts. Additionally, the contributions of Djankov et al. (2002) and Shepherd (2007) underscore the significance of customs procedures, administrative processes, and infrastructure development in enhancing trade facilitation. By synthesizing insights from these seminal papers, this PhD project aims to develop a nuanced and comprehensive

understanding of trade facilitation, encompassing not only the removal of explicit trade barriers but also the broader spectrum of initiatives aimed at promoting efficiency, transparency, and predictability in international trade processes.

First-time trade facilitation as a matter of theory has been discussed by Anderson and van Wincoop in 2004, according to these scholars' trade facilitation aims to reduce trade costs, which in their broadest definition include all costs, apart from the cost of production, incurred in getting a good from a producer to a final consumer.

Many scholars (Helble, Shepherd & Wilson, 2007) state that trade facilitation does not have a universally agreed definition and there is no standard definition of trade facilitation (McLinden, Fanta, Widdowson & Doyle, 2011).

According to Wilson in a narrow sense, trade facilitation simply addresses the logistics of moving goods through ports or customs at the border. A broader definition includes the environment in which trade transactions take place, including the transparency of regulatory environments, harmonization of standards, and conformance to international or regional regulations. (Wilson, J. S., Mann, C. L., & Otsuki, T., 2003)

The commonly accepted aim of trade facilitation is to "simplify and streamline international trade procedures to allow the easier flow of trade across borders and thereby reduce the costs of trade." (Congressional Research Service, 2017) WTO 2015. Countries introduce trade facilitation reforms to achieve various policy goals. These include attracting investment and manufacturing to create jobs; reducing trade costs for importers, exporters, and consumers of goods; and participating in global value chains. According to the WTO, full implementation of the TFA will reduce global trade costs by an average of 14.3 percent and will result in export gains of between US\$750 billion and US\$1 trillion per annum, depending on a number of factors.

## **2. Measurement Method of Trade Facilitation**

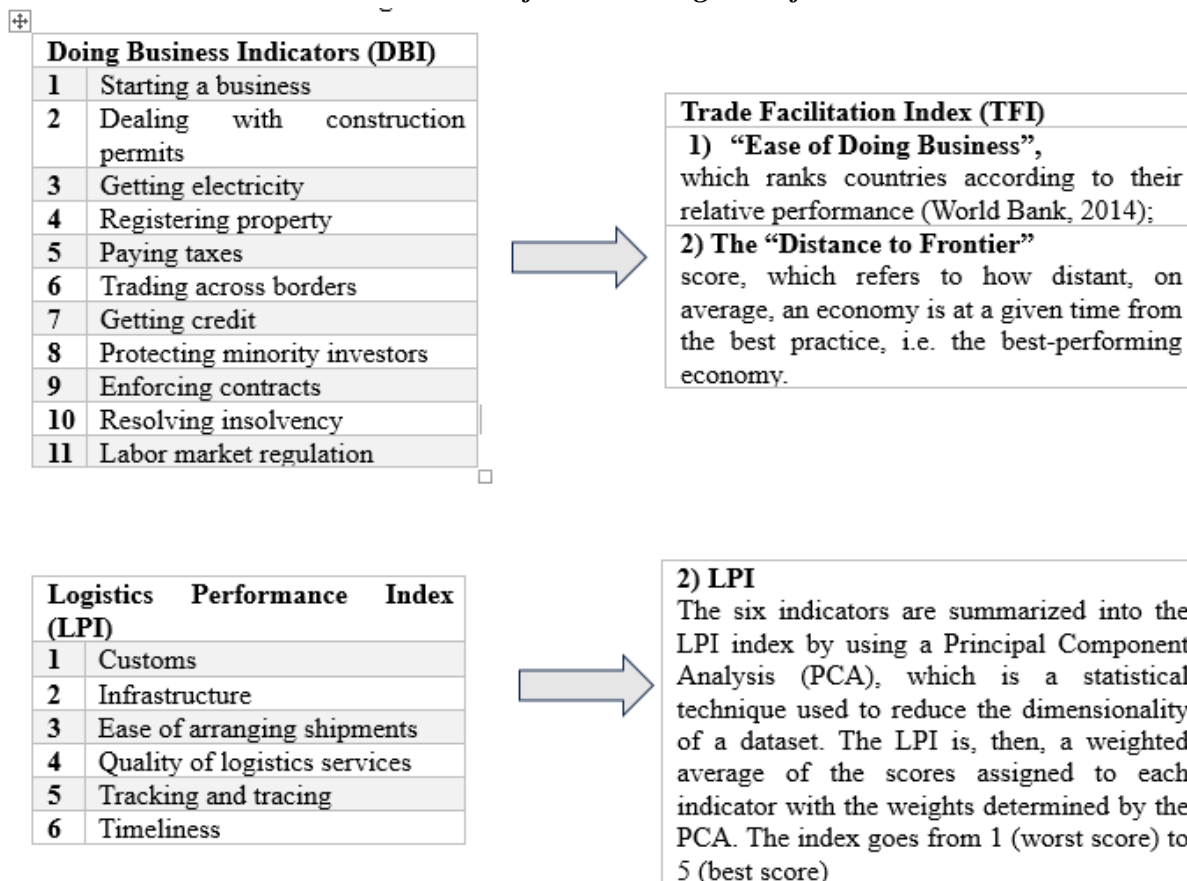
According to Orliac (2012), 12 trade facilitation indicators underscore the significance of trade facilitation. These encompass the "Doing Business" (DB) indicators provided by the World Bank Group, particularly those about cross-border trade; the Logistics Performance Index (LPI) by the World Bank; the Trade Facilitation Indicators (TFIs) by the Organisation for Economic Co-operation and Development (OECD); and the Enabling Trade Index (ETI) by the World Economic Forum.

According to World Trade Report (2015), the theory and measurement of trade facilitation the "iceberg" model of trade cost draws an analogy between the way trade costs reduce the value of goods to both exporters and importers and the way an iceberg melts as it moves through the ocean. The "iceberg" model, introduced by Samuelson in 1954, serves as a valuable analytical framework for examining the impact of trade costs, originally focusing on transportation costs.

However, its applicability extends to assessing the consequences of inefficient trade procedures. Inefficient trade procedures give rise to escalated trade costs, resulting in a divergence between the price received by producers and the price paid by consumers. This discrepancy represents a pure loss, often referred to as a "deadweight loss," akin to the gradual melting of the mass of an iceberg as it navigates through the ocean.

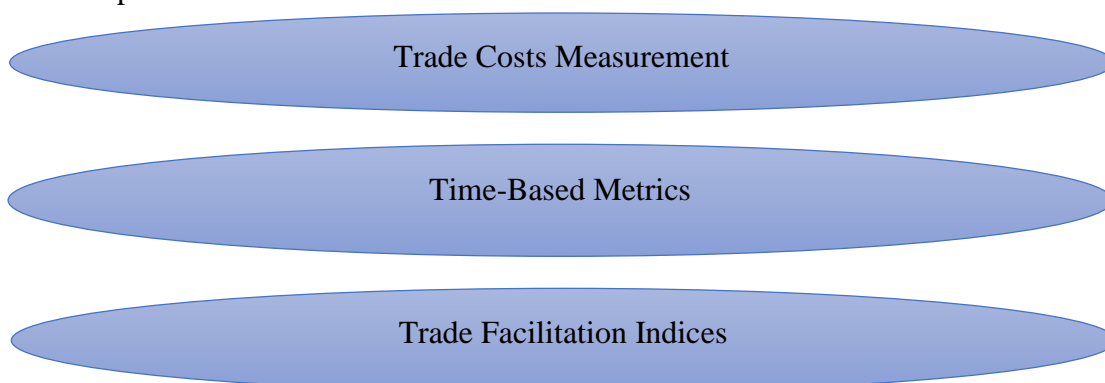
While the iceberg model typically assumes that trade costs are proportional to the value of goods shipped, the core insights and conclusions of the model remain valid even in cases where trade costs are additive.

*Table 1. Methods for estimating trade facilitation*



**Methods for assessing trade facilitation**

The assessment of trade facilitation measures is a multifaceted endeavor that requires a comprehensive approach, integrating both quantitative and qualitative research methods. Academic literature offers a rich repository of scholarly works by esteemed authors, providing insights into these methodological dimensions. In the realm of quantitative assessment, methodologies often center around the measurement of trade costs, time, and efficiency, while qualitative approaches delve into understanding the qualitative aspects of trade facilitation, such as the experiences of traders and the institutional context. *Quantitative methods* can be divided into 3 main parts:



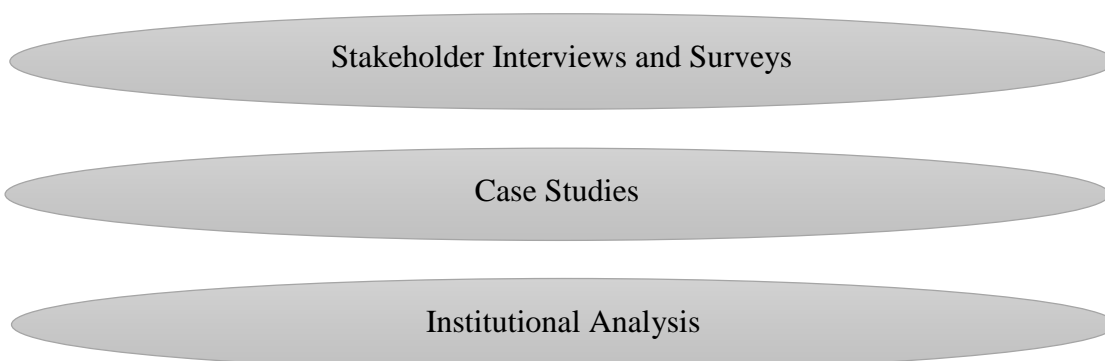
Trade Costs Measurement includes trade facilitation measures are frequently evaluated quantitatively through the estimation of trade costs. Anderson and van Wincoop (2003) pioneered the application of gravity models to measure trade costs, wherein variables such as transportation

costs, tariffs, and logistics expenses are quantified. Their approach has been refined and expanded upon in subsequent works by Behar and Venables (2011) and Novy (2013), offering nuanced insights into the quantitative assessment of trade facilitation.

Time-Based Metrics is a type of quantitative methods, which encompass the measurement of time-related trade facilitation indicators. Djankov et al. (2002) introduced the World Bank's "Doing Business" report, which includes metrics like the time required for customs clearance and port handling. This framework has been further developed and refined over time, providing a standardized quantitative basis for comparing trade facilitation across countries (Pauwels et al., 2017).

Another quantitative method is Trade Facilitation Indices, such as the World Bank's Logistics Performance Index (LPI), which offer a systematic assessment of trade facilitation conditions. Arvis et al. (2016) have notably contributed to the development and refinement of the LPI, which incorporates a variety of quantitative indicators related to infrastructure, customs, and logistics services.

Assessing trade facilitation measures requires a comprehensive approach that integrates quantitative and qualitative research methods. In the quantitative realm, methodologies focus on measuring trade costs, time, and efficiency. Trade costs measurement, pioneered by Anderson and van Wincoop (2003) using gravity models, quantifies variables like transportation costs and tariffs. Time-based metrics, introduced by Djankov et al. (2002) through the World Bank's "Doing Business" report, include indicators such as customs clearance and port handling times. Another quantitative method involves trade facilitation indices like the World Bank's Logistics Performance Index (LPI), refined by Arvis et al. (2016), which systematically assess conditions through various indicators related to infrastructure, customs, and logistics services. *Qualitative methods* can be studied in 3 dimensions:



**Stakeholder Interviews and Surveys:** Qualitative methods for assessing trade facilitation often involve stakeholder interviews and surveys to capture the experiences and perspectives of traders and other relevant actors. Shepherd (2007) employed qualitative research to investigate the impact of trade facilitation reforms on small and medium-sized enterprises (SMEs) in Southeast Asia, shedding light on the challenges and opportunities faced by these businesses.

**Case Studies:**

Qualitative approaches frequently employ case studies to delve deeper into specific trade facilitation initiatives and their outcomes. As a great example on how to measure effect of implementing the TF can be studying Single Window system. Key features of a Single Window According to the UN/CEFACT Recommendation, a Single Window facility should allow:

- Parties involved in trade and transport to lodge standardized information and documents with a single-entry point to fulfil all import, export, and transit-related regulatory requirements. If information is electronic, then individual data elements should only be submitted once.
  - The sharing of all information in respect of international trade transactions, which is supported by a legal framework that provides privacy and security in the exchange of information.
  - The addition of facilities to provide trade related government information and receive payment of duties and other charges.
  - Such a single-entry point to disseminate, or provide access to, the relevant information to participating governmental authorities or authorized agencies
  - Co-ordination of the controls and inspections of the various governmental authorities.
- A Single Window brings meaningful gains to all parties engaged in cross-border trade.

**Table 2. Benefits from TF for government and trade**

<i>Benefits for government</i>
<b>Correct revenue yields</b>
<b>Improved trader compliance</b>
<b>Enable the use of sophisticated “risk management” techniques for control and enforcement purposes</b>
<b>More effective and efficient deployment of resources</b>

<i>Benefits for trade</i>
<b>Cutting costs by reducing delays</b>
<b>Faster clearance and release</b>
<b>Predictable application and explanation of rules</b>
<b>More effective and efficient deployment of resources</b>

Source: United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT)

**Institutional Analysis:**

Qualitative research also encompasses institutional analysis to understand the contextual factors influencing trade facilitation. Melo et al. (2003) conducted a qualitative institutional analysis of customs administrations in Latin America, exploring the governance structures and administrative capacities that affect trade facilitation outcomes.

The assessment of trade facilitation measures necessitates a multifaceted approach that incorporates both quantitative and qualitative research methods. Quantitative methods focus on the measurement of trade costs, time-based metrics, and indices, providing a quantitative basis for cross-country comparisons. Qualitative methods, on the other hand, offer insights into the experiences of stakeholders, the impact of trade facilitation reforms, and the institutional context in which these measures are implemented. By integrating these quantitative and qualitative approaches, researchers and policymakers can gain a holistic understanding of trade facilitation and its implications for international trade. These methodological insights contribute to the advancement of knowledge in this critical area of trade policy and economics.

*Analysis of international trade facilitation indicators and indices*

The evaluation and analysis of international trade facilitation indicators and indices play a pivotal role in assessing the effectiveness of trade facilitation measures, tracking progress, and informing policy decisions. This academic discussion explores the key academic contributions in

this domain, drawing upon influential works by distinguished authors. International trade facilitation indicators and indices are vital tools for quantifying and benchmarking trade facilitation performance across countries.

**Quantitative Indicators:**

**Trade Facilitation Indicators:** The World Bank's Logistics Performance Index (LPI) is a widely recognized quantitative indicator used to assess trade facilitation. Arvis et al. (2016) have contributed significantly to the development and refinement of the LPI, which encompasses various sub-indicators related to infrastructure, customs efficiency, logistics services, and more. This quantitative approach provides a comprehensive view of trade facilitation conditions at the national level.

**Time-Based Metrics:** Time-based metrics, such as those highlighted by Djankov et al. (2002), are essential quantitative indicators for evaluating trade facilitation. The measurement of the time required for customs clearance, port handling, and border compliance procedures offers a tangible assessment of the efficiency and effectiveness of trade facilitation measures, enabling cross-country comparisons.

**Cost-Based Metrics:** Quantitative assessment also extends to the measurement of trade costs, as elucidated by Anderson and van Wincoop (2003). This approach quantifies trade costs, including transportation, tariffs, and logistics expenses, providing insights into the cost-effectiveness of trade facilitation measures.

**Composite Indices:**

**Global Indices:** Numerous composite indices, aggregating various quantitative indicators, have been developed to provide a holistic view of trade facilitation. The Global Enabling Trade Report by the World Economic Forum (WEF), as discussed by Zahoor et al. (2015), compiles a composite index assessing trade facilitation, which incorporates factors such as border administration, transport infrastructure, and regulatory environment. These global indices offer a broader perspective on trade facilitation performance.

**Regional Indices:** Regional trade facilitation indices, such as the Asia-Pacific Trade Facilitation Report discussed by Sarker et al. (2016), offer a nuanced analysis of trade facilitation within specific geographical contexts. These indices adapt global indicators to regional nuances and provide valuable insights for policymakers and stakeholders in those regions.

**Qualitative Dimensions:**

While quantitative indicators and composite indices provide valuable quantitative insights, qualitative dimensions are equally crucial for a comprehensive analysis of trade facilitation.

**Case Studies and Qualitative Research:** Qualitative methods, as exemplified by the work of Osei et al. (2018), employ case studies and qualitative research to delve deeper into the real-world impact of trade facilitation measures. Such studies shed light on the experiences and perspectives of traders, businesses, and government officials affected by trade facilitation reforms.

**Institutional Context:** Qualitative analysis also includes the examination of the institutional context within which trade facilitation measures are implemented, as explored by Melo et al. (2003). This dimension helps us understand the governance structures, administrative capacities, and institutional challenges that influence trade facilitation outcomes.

The analysis of international trade facilitation indicators and indices combines quantitative and qualitative approaches to provide a comprehensive assessment of trade facilitation measures. Quantitative indicators and composite indices offer standardized metrics for cross-country

comparisons, while qualitative dimensions provide a deeper understanding of the real-world impact and contextual factors influencing trade facilitation. By synthesizing these approaches, researchers and policymakers can develop informed strategies to enhance trade facilitation, ultimately fostering economic growth and international trade. These methodological insights contribute significantly to the advancement of knowledge in the field of trade policy and economics.

Scholars typically developed a trade facilitation assessment framework, as outlined by Wilson et al. (2003). In light of this framework, the study of Chu Qiao (2023) has opted to incorporate four primary indicators, namely port efficiency, customs environment, institutional environment, and e-commerce. Subsequently, a comprehensive trade facilitation evaluation system for China and its 30 trading partners has been established, encompassing these four primary indicators and an additional ten secondary indicators. See Table 1 for a detailed representation of this evaluation system.

***Table 3. Trade Facilitation Evaluation System***

Primary indicators	Secondary indicators
<b>Infrastructure</b>	Quality of roads
	Quality of railroad infrastructure
	Quality of port infrastructure
	Quality of air transport infrastructure
<b>Customs environment</b>	Burden of customs procedures
	Prevalence of non-tariff barriers
<b>Institutional environment</b>	Regulatory quality
	Corruption perceptions index
	Rule of law
<b>Electronic commerce</b>	Individuals using Internet

### 3. The Trade Facilitation impact.

#### *Trade Facilitation and Economic Growth:*

Numerous studies have established a positive correlation between trade facilitation and economic growth. For instance, Arvis et al. (2016) conducted a comprehensive analysis of trade facilitation measures in 143 countries and found that improvements in trade facilitation led to increased trade flows and ultimately contribute to economic development. Similarly, Djankov et al. (2010) examined the impact of trade facilitation reforms on economic growth in 109 countries and concluded that enhancing trade facilitation has a significant positive effect on GDP growth.

#### *Trade Facilitation and Competitiveness:*

Trade facilitation measures are crucial in enhancing a country's competitiveness in the global marketplace. The efficient movement of goods across borders simplified customs procedures, and improved logistics networks can provide a competitive advantage to firms operating within a country. A study by Wilson and Mann (2017) examined the relationship between trade facilitation and competitiveness in East Asia and found that countries with better trade facilitation infrastructure tend to have higher levels of competitiveness in international trade.

*Trade Facilitation and Small and Medium-sized Enterprises (SMEs):*

SMEs play a vital role in many economies, and trade facilitation measures can significantly impact their ability to participate in international trade. Research by Shepherd and Wilson (2020) explored the specific challenges faced by SMEs in trade facilitation processes and highlighted the importance of tailored measures to address their unique needs. The study emphasized the role of information and communication technologies (ICTs) in improving SMEs' access to trade information and reducing trade costs.

*Trade Facilitation and Sustainable Development:*

The relationship between trade facilitation and sustainable development has also garnered attention. Scholars argue that well-designed trade facilitation measures can contribute to the achievement of sustainable development goals. For instance, Limão and Rocha (2016) examined the impact of trade facilitation on environmental outcomes and found that efficient customs procedures and reduced trade costs can lead to a decrease in carbon emissions associated with trade.

In conclusion, the assessment of trade facilitation measures necessitates a comprehensive approach that integrates both quantitative and qualitative research methods. Quantitative methodologies focus on measuring trade costs, time-based metrics, and indices, providing a standardized basis for cross-country comparisons. Qualitative methods, on the other hand, offer insights into the experiences of stakeholders, the impact of trade facilitation reforms, and the institutional context in which these measures are implemented.

Key quantitative methods include trade costs measurement, time-based metrics such as those found in the World Bank's "Doing Business" report, and trade facilitation indices like the Logistics Performance Index. These approaches offer valuable insights into the efficiency and effectiveness of trade facilitation measures at both national and international levels. Qualitative methods encompass stakeholder interviews, case studies, and institutional analysis, which provide a deeper understanding of the real-world implications and contextual factors influencing trade facilitation outcomes. By synthesizing these quantitative and qualitative approaches, researchers and policymakers can develop informed strategies to enhance trade facilitation, ultimately fostering economic growth, competitiveness, and sustainable development. Moreover, studies consistently demonstrate a positive correlation between trade facilitation and economic growth, competitiveness, and the facilitation of small and medium-sized enterprises (SMEs). Additionally, trade facilitation measures have the potential to contribute to sustainable development goals by promoting efficient customs procedures, reducing trade costs, and mitigating environmental impacts associated with trade. In essence, a holistic understanding of trade facilitation, achieved through the integration of quantitative and qualitative methodologies, is essential for guiding policy decisions and fostering inclusive and sustainable economic development in the global marketplace.



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