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TRADE FACILITATION

RAPID EVIDENCE ASSESSMENT, MAY 2015

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EXECUTIVE SUMMARY

The objective of this Rapid Evidence Assessment (REA) is to review the evidence on the impact of trade facilitation on trade performance. In particular, the assessment focused on the following questions:

> *What has been the impact (on trade costs, volumes and values) of different types of trade facilitation interventions in developing countries and which factors lead to positive and negative impacts?*

A Rapid Evidence Assessment follows a particular methodology which consists of a structured literature search and selection process. Subsequently, a quality assessment of the studies that met pre-set inclusion criteria is carried out according to the guidance provided in DFID's *How to Note: Assessing the Strength of Evidence*.[1] This quality assessment forms the basis for a synthesis of the selected evidence.

The key findings of this Rapid Evidence Assessment on trade facilitation are:

- Trade facilitation reduces trade costs and increases trade flows.
- Improvements in infrastructure, customs efficiency and regulatory environment have the greatest impact on trade.
- The effectiveness of trade facilitation interventions is context specific.
- Impact evaluations and case studies help to highlight what works best, where and why, and can contribute to better design of trade facilitation interventions.

1 See https://www.gov.uk/government/publications/how-to-note-assessing-the-strength-of-evidence

CONTENTS

TABLES

1.0 INTRODUCTION

The global trade landscape has evolved in two important ways, which in turn are influencing the challenges and opportunities for developing countries to leverage trade for sustainable development. The first of these is that until recently developing countries traded predominantly with advanced economies such the United States, Canada, Europe, Australia, New Zealand and Japan, where they benefited from preferential market access. Now, however, while trade with such economies continues, developing country trade with other developing countries – referred to as South–South trade – is on the rise. Second, trade in intermediate goods and services, or trade in tasks, accounts for the majority of global trade. This type of trade is organised along global and regional value chains, with goods and services crossing borders multiple times before the final product reaches its destination market. Hence the new reality of global trade is fragmented production dispersed across countries and coordinated by lead firms in the production networks and value chains.

This reorientation of global trade necessitates a re-examination of trade and development strategy. Preferential market access, though still important, carries less weight in participating in regional and global trade, shaped by cross-border production networks and value chains, than do cost and capacity factors. There is increasing evidence that developing countries' trade costs are too high, and their productive capacity too low, for them to be able to participate fully in the new global trade.

The constraints placed on developing countries by high trade costs and low productive capacity have been acknowledged in global trade and development forums such as at the Global Aid for Trade Review and the World Trade Organization (WTO) Bali Ministerial Conference in 2013. The emergent issue, then, is what can and should be done to improve trade facilitation?

This report reviews the available published evidence on the impact of trade facilitation interventions on trade, and seeks to identify factors that lead to positive or negative impacts. In reflecting on the findings of the review, it also highlights gaps in evidence and information that need to be filled in order to design effective trade facilitation interventions and reforms.

Trade facilitation reforms are generally broad in nature and entail a number of interventions. For instance, these include:

- infrastructure reforms to improve the quality and quantity of physical infrastructure such as ports, airports, road and rail networks, and also information and communication technology (ICT) infrastructure;
- customs efficiency interventions aimed at streamlining customs procedures through the harmonisation and simplification of formalities, procedures, documents, and the exchange of information between the various partners in the supply chain; and
- regulatory and business environment interventions comprising mechanisms intended to develop a clear and transparent legal framework as well as to improve the business environment and enhance business competitiveness.

The paper finds that:

1) Interventions improving infrastructure are the most effective in increasing trade volumes and reducing trade costs, followed by reforms improving customs efficiency and then reforms improving the regulatory and business environment.
2) Broader policy reforms are important in increasing the impact of improvements in trade infrastructure.
3) For lower-middle-income countries the strongest impact on trade flows comes from improvements in logistics efficiency.
4) As the nature of trade costs varies across geographical areas and income levels, the effectiveness of trade facilitation interventions is likely to be determined by the degree and intensity of the factors that contribute to high trade costs.
5) A lack of published impact evaluations on aid for trade facilitation limits the ability to determine which types of intervention work best, where and why.
6) The gap in the evidence will be best addressed through impact evaluations, and case studies, so that aid for trade facilitation interventions can be designed to take into account context-specific factors.

The rest of the report is structured as follows. Section 2 discusses the evidence assessment methodology and its limitations. Sections 3 to 5 present the findings on the evaluation of the evidence, the quality of the body of evidence and what the evidence suggests. Section 6 concludes the assessment. Annex 1 discusses in detail the methodology used in reviewing the evidence. Annex 2 provides a full list of the quality assessments made. Annex 3 contains an annotated bibliography of the literature on trade facilitation.

2.0 METHODOLOGY

2.1 METHOD

The objective of this Rapid Evidence Assessment is to review the evidence on the impact of trade facilitation on trade performance. In particular, the assessment focused on the following questions:

> *What has been the impact (on trade costs, volumes and values) of different types of trade facilitation interventions in developing countries and which factors lead to positive and negative impacts?*

The report adapted and used DFID's methodology for *Assessing the Strength of Evidence*.[2] As the purpose of this paper is to provide rapid assessment of the evidence as well as to contribute to policy work, we selected the key elements of DFID's methodology. The main considerations for the selection were: applicability to the literature and the topic, efficient use of time and resources, effective search and assessment criteria, and ensuring high assessment quality.

The first step of the assessment of evidence was to identify relevant literature. Over 60 studies were searched, and 54 of these were identified as potentially relevant to the focus of the assessment. Of these 54 studies, 43 were found through online searches, and include both peer reviewed journal articles and reports by development agencies, research institutes and think tanks (see Annex 1). The remaining 11 studies and reports were identified by contacting experts in ODI's research network, and include some which may not yet have been published and/or may not have appeared through online search. Of the 54 studies identified as potentially relevant, 34 were assessed. The difference between these two numbers is accounted for by the fact that several were duplications (i.e. publication in different forms – working paper, journal article, book chapter, etc. – of the same study) and some, although discussing trade facilitation issues generally, were found not to contain any impact assessment element.

We then identified whether each study used primary or secondary research, and grouped it in one of the following three categories:

1) studies that look at different types of trade facilitation reform;
2) studies that adopt a geographic focus; and,
3) studies that focus on income level.

We used the following criteria to assess the quality of each study (see Annex 1 for further discussion): conceptual framing, transparency, appropriateness, cultural sensitivity, validity, reliability and cogency of research findings. Studies that comprehensively address all the criteria were assessed as of 'high' quality and indicated by a '↑'. Studies that address two or more of the criteria were assessed as of 'moderate' quality and indicated by a '→'. Studies that address fewer than two criteria were assessed as of 'low' quality and indicated by a '↓'.

[2] See: https://www.gov.uk/government/publications/how-to-note-assessing-the-strength-of-evidence

We then assessed the quality and amount of evidence, and the consistency of the research findings, for the overall body of studies, undertaking multiple cross-checks to detect assessment coding errors and improve consistency. Notwithstanding the limitations of the methodology, discussed below, the results of the assessment are robust.

2.2 LIMITATIONS

The principles used in assessing the quality of single studies are a truncated version of the full range of principles recommended in DFID's *How to Note: Assessing the Strength of Evidence*. This means that the assessment of the single studies in this report is limited to the seven principles of quality used in this report (see Annex 1).

The bar for assessment of single studies as of high quality is set very high: a study must 'comprehensively address' all seven principles of quality. The criterion used to qualify single studies as of medium quality is that they address two or more principles of quality. Recalibrating the criteria and/or including another category (e.g. 'very high quality' for those studies addressing all seven principles and 'high' for studies addressing five) would produce a different result that reflects a broader range of qualities.

Time constraints limited the extent of the search. The use of limited search key words may have led us to miss relevant studies. We have tried to address this by contacting trade facilitation experts. For instance, the studies identified focus largely on 'Customs' efficiency, which is only one, albeit important, element of trade facilitation. Trade facilitation is likely to be most effective when addressing constraints as part of improving 'border management' (an approach that embraces a much wider 'whole of the government' perspective[3]). Implications for policy drawn from an assessment skewed by the direction and focus of the existing literature on trade facilitation should be avoided. It is therefore important that use of this assessment of the evidence be accompanied by an equal focus on the evidence *gaps* (discussed throughout the paper and in Section 6 – Conclusion – in particular). Put differently, what works best might not always be what we already know, but rather what we are yet to find.

[3] See: https://openknowledge.worldbank.org/bitstream/handle/10986/2544/588450PUB0Bord101public10BOX353816B.pdf?sequence=1

3.0 EVIDENCE BY TYPE OF TRADE FACILITATION REFORM

3.1 ASSESSING SINGLE STUDIES

This section assesses the quality of relevant studies as well as the body of evidence on the impact of trade facilitation reforms on trade performance. The studies are classified by three categories of trade facilitation reform: infrastructure reforms, customs efficiency reforms, and regulatory and business environment reforms. Tables 1–3 group the relevant studies by quality assessment and analytical focus.

Table 1. Evidence by type of trade facilitation reform: Primary; observational; high-quality studies [P; OBS; ↑]

Author(s)/date	Infrastructure reforms	Customs efficiency reforms	Regulatory and business environment reforms
Asian Development Bank (ADB), 2009	x	x	
Calí and te Velde, 2010		x	
Dennis and Shepherd, 2011		x	
Felipe and Kumar, 2010	x	x	
Hoffman and Wilmsmeier, 2008	x		
Moïsé et al., 2011		x	x
Moïsé and Sorescu, 2013		x	x
Portugal-Perez and Wilson, 2009	x	x	x
Portugal-Perez and Wilson, 2012	x	x	x
Shepherd and Wilson, 2008	x		
Spence and Karingi, 2011	x	x	x
Wilmsmeier et al., 2006	x		
Wilson et al., 2003	x	x	x
Wilson et al., 2004	x	x	x

Table 2. Evidence by type of trade facilitation reform: Primary; observational; moderate-quality studies [P; OBS; →]

Author(s)/date	Infrastructure reforms	Customs efficiency reforms	Regulatory and business environment reforms
Helble, et al., 2009	x	x	x
Njinkeu et al., 2008	x	x	x
Otsuki, 2011	x	x	x
Rippel, 2011	x	x	x
Sánchez et al., 2003	x		
Taneja et al., 2013	x	x	
Uzzaman and Yusuf, 2011		x	
Vijil and Wagner, 2012	x	x	
Weerahewa, 2009	x	x	
Wilson and Otsuki, 2007	x	x	x
Zaki, 2011	x	x	x

Table 3. Evidence by type of trade facilitation reform: Secondary; other review; moderate-quality studies [S; OR; →]

Author(s)/data	Infrastructure reforms	Customs efficiency reforms	Regulatory and business environment reforms
Milner et al., 2008	X	x	x

3.2 ASSESSING AND DESCRIBING THE BODY OF EVIDENCE

- The **quality** of the studies constituting the body of evidence is **moderate**.
- The **size** of the body of evidence is **medium** (26 studies).
- The **findings** of the body of evidence are **consistent**.

Details of the definitions and thresholds for these classifications are included in Annex 1.

3.2.1 DESCRIPTION

There is a medium-sized (26 studies) body of moderate-quality evidence on the impact of different types of trade facilitation reforms on trade volumes and trade costs. The studies are almost entirely primary research studies that employ observational research designs and use quantitative methods for data collection and analysis. The majority of studies use gravity models estimated using cross-sectional or panel data designs, but there are also a few studies that utilise ordinary least-squares (OLS) regressions using factors generated by principal component analysis.

3.2.2 FINDINGS

Trade facilitation reforms relate not only to the simplification and standardisation of customs formalities and administrative procedures related to international trade, but also to the improvement of the business environment, quality of infrastructure, transparency and domestic regulations. Several different trade facilitation reforms have been implemented in developing countries over time. To provide just a few examples:

- In 2009 the first African one-stop border post was established between Zambia and Zimbabwe – Rippel (2011 [P; OBS – policy note; →]).
- Single-window systems were created in Senegal, Ghana, Tunisia, Cameroon, and Mauritius, and are under construction in several other countries including Kenya, Burkina Faso, Libya, Morocco and the Republic of Congo – UNECA (2013 [S; other review; →]);
- A number of reforms aimed at improving infrastructure for cross-border movement of persons, vehicles and goods have also been planned or launched in a number of South Asian countries –Taneja et al. (2013 [P; OBS – case study; →]). For example, in 2005 sea transport reforms were introduced between India and Pakistan, while in 2010 improved rail connectivity between India and Bangladesh was agreed. A series of integrated check posts (ICPs) have also been created in India at identified entry

points on the international land borders (e.g. the ICP on the India–Pakistan border which became operational in 2012). Furthermore, in the 1990s customs reform projects were launched in several developing countries, including Bolivia, Peru, Jamaica, Bangladesh, Angola, Ghana, Mozambique, and Uganda – Milner et al. (2008 [S; OR; →]).

In the literature, different approaches have been used to identify and measure the various types of trade facilitation reform that have been implemented. These are likely to have been constrained to some extent by data availability. Some papers focus on a broad number of indicators of trade facilitation, while others take into account only a restricted number, or even a single indicator. Moïsé et al. (2011 [P; OBS – quantitative data collection and analysis; ↑]), for example, created twelve trade facilitation indicators (TFIs) corresponding to the main policy areas under negotiation at the WTO (i.e. *information availability, involvement of the trade community, advance rulings, appeal procedures, fees and charges, formalities – documents, formalities – automation, formalities – procedures, internal cooperation, external cooperation, consularisation, governance and impartiality*). These indicators are also used by Moïsé and Sorescu (2013 [P; OBS – quantitative data collection and analysis; ↑]) in addition to *transit fees and charges, transit formalities, transit guarantees*, and *transit agreements and cooperation* – giving a total of sixteen TFIs.

On the other hand, Wilson et al. (2003 [P; OBS – quantitative data collection and analysis; ↑]) and Wilson et al. (2004 [P; OBS – quantitative data collection and analysis; ↑]) refer to four categories of trade facilitation reform (i.e. to *port efficiency*, *customs environment*, *regulatory environment*, and *e-business usage*). In a similar way, Portugal-Perez and Wilson (2012 [P; OBS – quantitative data collection and analysis; ↑]) and Spence and Karingi (2011 [P; OBS – quantitative data collection and analysis; ↑]) distinguish between 'hard' trade facilitation reforms (those directed at improving *physical infrastructure*, and *ICT*) and 'soft' trade facilitation reforms (those directed at enhancing *border and transport efficiency*, and *the business and regulatory environment*). There are also a number of authors, such as Dennis and Shepherd (2011 [P; OBS – quantitative data collection and analysis; ↑]), Felipe and Kumar (2010 [P; OBS – quantitative data collection and analysis; ↑]), Portugal-Perez and Wilson (2009 [P; OBS – quantitative data collection and analysis; ↑]), and ADB (2009 [P; OBS – quantitative data collection and analysis; ↑]), who rely on the World Bank's *Doing Business* trading-across-the-border indicators, and/or *Logistics Performance Index* (LPI), as well as on *trade restrictiveness indices* (TRI) to measure trade facilitation reforms. Finally, Wilmsmeier et al. (2006 [P; OBS – quantitative data collection and analysis; ↑]) and Hoffman and Wilmsmeier (2008 [P; OBS – quantitative data collection and analysis; ↑]) focus on just one specific category of trade facilitation reform, those aimed at improving *port efficiency*.

The empirical evidence consistently suggests that trade facilitation is important in enhancing trade volumes and reducing trade costs. Moïsé and Sorescu (2013 [P; OBS – quantitative data collection and analysis; ↑]), for example, show that the cost reduction potential of trade facilitation to be almost 12% of trade costs for low-income countries over the period 2002–10. Nevertheless, the impact of trade facilitation on trade volumes and trade costs varies across the above-mentioned different types of trade facilitation reform.

In light of the different measures of trade facilitation used in the reviewed studies, in what follows we divide trade facilitation reforms into three categories: (i) infrastructure reforms; (ii) customs efficiency reforms; and (iii) regulatory and business environment reforms.

INFRASTRUCTURE REFORMS

The existing literature suggests that **reforms which improve infrastructure have the greatest impact on trade volumes and trade costs**. Indeed, ADB (2009 [P; OBS – quantitative data collection and analysis; ↑]) finds that in South Asia reforms on physical and electronic infrastructure (i.e. reforms improving the quality of transport and IT infrastructure) have the strongest impact on trade flows. In particular, the elasticity of an exporter's (importer's) infrastructure to trade flows is such that a 1% amelioration in infrastructure leads to a 5.02% (4.00%) increase in trade flows. Portugal-Perez and Wilson (2012 [P; OBS – quantitative data collection and analysis; ↑]) also highlight the importance of investment in physical infrastructure (i.e. ports, airports, roads, and rail infrastructure) in improving export performance in developing countries. Their simulation exercise shows that improvements in infrastructure in sub-Saharan Africa would generate an important increase in trade flows. For example, an improvement in Chad's infrastructure quality to a level half that in South Africa would lead to an increase of 79.3% in Chad's exports. In Latin America, Bolivia appears to be the country that would benefit most from an improvement in infrastructure quality. If Bolivia's infrastructure quality were to improve to half the Chilean level, exports would increase by 49.1%.

The studies by Felipe and Kumar (2010 [P; OBS – quantitative data collection and analysis; ↑]) and Wilson et al. (2004 [P; OBS – quantitative data collection and analysis; ↑]) agree that trade facilitation reforms improving infrastructure lead to the biggest gains in trade flows on the exporter side, while Spence and Karingi (2011 [P; OBS – quantitative data collection and analysis; ↑]) highlight that trade facilitation reforms aimed at improving the quality and quantity of infrastructure are robust contributors to export competitiveness.[4] Felipe and Kumar (2010 [P; OBS – quantitative data collection and analysis; ↑]), in particular, show that infrastructure improvements in Tajikistan would lead to an increase of about 18% in total trade. Moreover, there are a number of studies that shed light on the relevance of trade facilitation reforms on port infrastructure in enhancing trade performance. Shepherd and Wilson (2008 [P; OBS – quantitative data collection and analysis; ↑]), for example, suggest that improving port facilities in the Southeast Asia region could expand trade by up to 7.5% (US$22 billion). In a similar way, Wilson et al. (2003 [P; OBS – quantitative data collection and analysis; ↑]) find that improvements in port efficiency have the largest effect on trade. According to their results, indeed, half of the 21% (US$254 billion) increase in intra-Asia–Pacific Economic Cooperation (APEC) trade resulting from trade facilitation reforms comes from improved port efficiency in the region.

[4] Felipe and Kumar (2010 [P; OBS – quantitative data collection and analysis; ↑]) refer to transport and information technology infrastructure. Wilson et al. (2004 [P; OBS – quantitative data collection and analysis; ↑]) take into account both port efficiency and service sector infrastructure. Spence and Karingi (2011 [P; OBS – quantitative data collection and analysis; ↑]) refer to physical infrastructure (ports, airports, roads, and rail infrastructure) as well as to ICT infrastructure.

Furthermore, in their focus specifically on trade facilitation reforms aimed at improving port infrastructure, Hoffman and Wilmsmeier (2008 [P; OBS – quantitative data collection and analysis; ↑]) find that improvements in berth length, storage capacities, as well as maximum draft and port areas have a significant reducing impact on freight rates. Wilmsmeier et al. (2006 [P; OBS – quantitative data collection and analysis; ↑]) also note that it is through improvements in the ports that cost savings and increased trade competitiveness can be achieved. Their analysis suggests that doubling port efficiency in a pair of ports has the same impact on international transport costs as halving the distance between them.

CUSTOMS EFFICIENCY REFORMS

Next to those improving infrastructure, **reforms enhancing customs efficiency appear to play the second-biggest role in boosting trade performance**. Moïsé et al. (2011 [P; OBS – quantitative data collection and analysis; ↑]) find that trade facilitation measures which aim to streamline customs procedures (single windows, pre-arrival processing, physical inspections, post-clearance audits, separation of release from clearance, and authorised traders) have the potential to reduce trade costs by 5.4%. Felipe and Kumar (2010 [P; OBS – quantitative data collection and analysis; ↑]) show that an improvement in customs efficiency in the importing country by 1% would improve trade flows by 1.04%. ADB (2009 [P; OBS – quantitative data collection and analysis; ↑]) also highlights the relevance of reforms to the quality of customs for boosting trade flows, and finds that the elasticity of an exporter's (importer's) customs procedures to trade flows is such that 1% amelioration in customs procedures leads to a 4.02% (3.43 %) increase in trade flows. Moreover, Moïsé and Sorescu (2013 [P; OBS – quantitative data collection and analysis; ↑]) find that trade facilitation measures enhancing customs efficiency through, for example, improved harmonisation and simplification of documents, automated processes, and streamlined border procedures have the highest impact on trade volumes. According to Dennis and Shepherd (2011 [P; OBS – quantitative data collection and analysis; ↑]), reforms to improve customs procedures have a positive effect on export diversification which is even greater than that of reforms to improve inland transport and ports.

REGULATORY AND BUSINESS ENVIRONMENT REFORMS

Finally, trade facilitation reforms improving the regulatory and business environment are also found to play an important role in increasing trade flows and reducing trade costs. Among the studies reviewed, that by Moïsé et al. (2011 [P; OBS – quantitative data collection and analysis; ↑]) finds that trade facilitation measures to advance rulings on customs clearance have the potential to reduce trade costs by 3.7% in the sample of Organisation for Economic Cooperation and Development (OECD) countries considered. Note that the advance ruling mechanisms considered in this paper refer to those concerning tariff classification and origin but do not cover other tools included in the advance ruling scheme proposed in the WTO negotiations, such as methods used for customs valuation, requirements for duty drawback, use of quotas and the fees and charges applying to a specific good. Wilson et al. (2003 [P; OBS – quantitative data collection and analysis; ↑]) also argue that improvements in the regulatory environment have a large effect on trade.

Indeed, according to their results 7.3% (US$88 billion) of the 21% (US$254 billion) increase in intra-APEC trade resulting from trade facilitation reforms comes from an improved regulatory environment in the region. Portugal-Perez and Wilson (2012 [P; OBS – quantitative data collection and analysis; ↑]), too, stress the importance of reforms to the business environment, in particular in some South Asian countries. Indeed, the results of their simulation exercise show a 38.4% increase in Bangladesh's trade due to improvements in the business environment.

SUMMARY

The empirical evidence gathered suggests that of the different types of trade facilitation reform, interventions to improve infrastructure are the most effective in increasing trade volumes and reducing trade costs, followed by reforms to improve customs efficiency and then reforms to improve the regulatory and business environment. The finding that 'soft' trade facilitation reforms (i.e. interventions enhancing transparency, customs management, and the business environment) are less effective than infrastructure reforms is rather surprising, especially when looking at developing countries. Indeed, 'soft' trade facilitation interventions are less costly than investment in infrastructure and may provide significant impacts on trade expansion in poor countries with tight budgets. In order to check the robustness of this finding, it would be interesting to compare the impact of the different types of trade facilitation reform with the cost of implementation. Moreover, it would also be desirable to conduct more studies on the impact of regulatory and business environment reforms on trade performance, since the existing evidence on this specific type of intervention is rather scant compared with that on infrastructure and customs efficiency reforms.

3.3 EXAMPLES FROM RELEVANT STUDIES

- ADB (2009 [P; OBS – quantitative data collection and analysis; ↑]) highlights that of the different trade facilitation reforms, those affecting the quality of customs and infrastructure have the most significant impact on trade flows.
- Calí and te Velde (2010 [P; OBS – quantitative data collection and analysis; ↑]) use a large subset of developing country data to examine which type of aid for trade (AfT) measures help to improve recipient countries' trade performance and find that aid to economic infrastructure has the greatest effect on export improvement in developing countries (with other AfT measures having almost no effect on exports).
- Dennis and Shepherd (2011 [P; OBS – quantitative data collection and analysis; ↑]) find that reforms to improve customs procedures have a greater positive effect on export diversification than those to improve documentation, inland transport and ports.
- Felipe and Kumar (2010 [P; OBS – quantitative data collection and analysis; ↑]) find that infrastructure has the greatest impact on trade flows from an exporter perspective, and customs efficiency the greatest impact from an importer perspective (with an improvement in importing country customs efficiency of 1% increasing trade flows by 1.04%). Their simulations indicate that the greatest benefit to total trade derives from trade facilitation reforms aimed at improving infrastructure, followed by logistics and efficiency of customs and other border agencies.
- Hoffman and Wilmsmeier (2008 [P; OBS – quantitative data collection and analysis; ↑]) find that port infrastructure, such as berth length, storage capacities, maximum draft and port areas, is significant in reducing freight rates.
- Moïsé et al. (2011 [P; OBS – quantitative data collection and analysis; ↑]) build twelve TFIs, corresponding to the main policy areas under negotiation in the WTO. According to their findings, for OECD countries the policy areas that seem to have the greatest impact on trade volumes and costs are advance rulings, information availability, formalities and procedures and inter-agency cooperation. If all TFIs are added, their cost reduction potential reaches almost 10% of trade costs.
- Moïsé and Sorescu (2013 [P; OBS – quantitative data collection and analysis; ↑]) create sixteen TFIs to estimate the impact of different types of trade facilitation reform on trade volumes and costs in all WTO member countries and observers. They find that the trade facilitation measures that have the highest impact on trade volumes are information availability, harmonisation and simplification of documents, automated processes and risk management, streamlining of border procedures and good governance and impartiality. Sector-specific analysis shows that these measures are particularly significant for manufactured goods but less so for agricultural goods.
- Portugal-Perez and Wilson (2009 [P; OBS – quantitative data collection and analysis; ↑]) find that important gains can be achieved in Africa through trade facilitation reforms. In particular, improvements in trade logistics to cut trade costs for the less advanced African countries to levels comparable to those in more

advanced countries in the region could be more important in terms of trade expansion than a reduction in tariffs.

- Portugal-Perez and Wilson (2012 [P; OBS – quantitative data collection and analysis; ↑]) distinguish between 'hard' trade facilitation (physical infrastructure and ICT) and 'soft' trade facilitation (border and transport efficiency and the business and regulatory environment) They find that trade facilitation reforms improve export performance in developing countries, with the greatest impact achieved by investment in physical infrastructure and regulatory reform to improve the business environment.
- Shepherd and Wilson (2008 [P; OBS – quantitative data collection and analysis; ↑]) suggest that the Southeast Asia region can gain significantly from trade facilitation reforms, particularly those directed towards improving transport infrastructure and ICT. They find that improving port facilities could expand trade by up to 7.5% or US$22 billion.
- Spence and Karingi (2011 [P; OBS – quantitative data collection and analysis; ↑]) consider four different TFIs and find that trade facilitation reforms aimed at improving the quality and quantity of infrastructure are a robust contributor to export competitiveness.
- Wilmsmeier et al. (2006 [P; OBS – quantitative data collection and analysis; ↑]) note that it is through improvements in ports that the greatest cost savings and most significant increases in trade competitiveness can be achieved. Their analysis suggests that doubling port efficiency in a pair of ports has the same impact on international transport costs as halving the distance between them.
- Wilson et al. (2003 [P; OBS – quantitative data collection and analysis; ↑]) distinguish between four measures of trade facilitation: port efficiency, customs environment, regulatory environment, and e-business usage. Their results suggest that improvements in port efficiency and the regulatory environment have the greatest effect on trade. They also find that improvements in trade facilitation have boosted intra-APEC trade by US$254 billion (21%), and that half of this increase is the result of improved port efficiency in the region.
- Wilson et al. (2004 [P; OBS – quantitative data collection and analysis; ↑]) consider four measures of trade facilitation (port efficiency, customs environment, regulatory environment and service sector infrastructure). They find that all these measures have a positive impact on trade and that the impact is higher for exporters than for importers. Moreover, the coefficient of the exporters' service sector infrastructure is found to be the highest among all trade facilitation measures.

4.0 EVIDENCE BY GEOGRAPHICAL FOCUS

4.1 ASSESSING SINGLE STUDIES

Table 4. Evidence by geographical focus: Primary; observational; high-quality studies [P; OBS; ↑]

Author(s)/date	Africa	ASEAN	Latin America	Regional comparison
Balistreri et al., 2014	x			
Cirera and Winters, 2014	x			
Hoffman and Wilmsmeier, 2008			x	
Moïsé et al., 2011				X
Portugal-Perez and Wilson, 2009	x			
Shepherd and Wilson, 2008		x		
Spence and Karingi, 2011	x			
Wilmsmeier et al., 2006			x	
Wilson et al., 2003				X

Table 5. Evidence by geographical focus: Primary; observational; moderate-quality studies [P; OBS; →]

Author(s)/date	Africa	South Asia	Latin America	Regional comparison
Iwanow and Kirkpatrick, 2007	x			
Otsuki, 2011				X
Rippel, 2011	x			
Sánchez et al., 2003			x	
Taneja et al., 2013		X		
Weerahewa, 2009		X		
Wilson and Otsuki, 2007		X		

Table 6. Evidence by geographical focus: Secondary; other review; moderate-quality studies [S; OR; →]

Author(s)/date	Africa	South Asia	Latin America	Regional comparison
UNECA, 2013	x			
World Economic Forum, 2013				X

4.2 ASSESSING AND DESCRIBING THE BODY OF EVIDENCE

- The **quality** of the studies constituting the body of evidence is **moderate**.
- The **size** of the body of evidence is **medium** (18 studies).
- The **findings** of the body of evidence are **mixed**.

Details of the definitions and thresholds for these classifications are included in Annex 1.

4.2.1 DESCRIPTION

There is a medium-sized (18 studies) body of moderate-quality evidence on the impact of trade facilitation reforms on trade volumes and trade costs across different geographical areas. The studies are mostly primary research, employing observational research designs and using both quantitative and qualitative methods for data collection and analysis. The evidence is mixed, but points to the positive impact of aid for trade facilitation on trade flows and costs across geographical regions. The impact depends on context-specific factors as well as the type and magnitude of trade barriers.

4.2.2 FINDINGS

AFRICA

A number of studies examine the impact of trade facilitation in Africa. Balistreri et al. (2014 [P; OBS – quantitative data collection and analysis; ↑]) provide the most recent and comprehensive analysis. They build a ten-region, 19-sector global trade model with a focus on the members of the East African Customs Union. They find that trade facilitation impacts on sector outputs vary with *ad valorem* equivalents at the sector level as well as partner country. In other words, trade facilitation in a specific sector of the economy leads to trade expansion in that sector. For example, reducing trade barriers in agricultural products in Uganda leads to expansion in Uganda's agricultural sector relative to other sectors. They also find that trade facilitation and liberalisation at the multilateral level produce higher gains for East African economies, but that the political economy of the distributional impact suggests that liberalisation at the regional level is likely to face less resistance.

Evidence suggests that improving trade facilitation in African countries can help expand trade. Iwanow and Kirkpatrick (2007 [P; OBS – quantitative analysis; →]) find that while trade facilitation reforms contribute to improved export performance , other reforms – including to the quality of the regulatory environment and the quality of basic transport and communications infrastructure – are also needed and are often more important than on-the-border trade facilitation reforms in facilitating export growth. Similarly, Portugal-Perez and Wilson (2009 [P; OBS – quantitative data collection and analysis; ↑]) find that the gains for African exporters from cutting trade costs (i.e. the costs of transporting goods and moving them across borders) half-way to the level of those in Mauritius has a greater effect on trade flows than a substantial cut in tariff barriers.

Improving supply-chains across Africa will be particularly important for increasing value-adding activities. A World Economic Forum report (2013 [S; OR; →]), which includes interesting case studies of industry leaders, points out that supply-chain barriers – shipping services and border administration – in Madagascar threaten to erode the country's labour-cost-competitive advantage in the apparel industry. The report suggests that reducing supply chain barriers to trade could increase global gross domestic product (GDP) by nearly 5%, and trade by 15%.

Rippel (2011 [P; OBS – policy note; →]) discusses why trade facilitation is important for Africa. She argues that measures that reduce the time needed for travel, border crossings

and administrative procedures, and that improve border management – such as the introduction of automated customs systems and streamlining of border procedures – can help expand trade in Africa. Moreover, she finds that trade facilitation can provide opportunities for African exporters only if hard infrastructure and technical advice are backed by equally ambitious policy reforms.

A report by UNECA (2013 [S; OR; →]) discusses trade facilitation issues, in particular the WTO trade facilitation agreement, from an African perspective. The paper compares red tape and transaction costs in African countries with those in the rest of the world. The paper finds transaction costs in Africa to be disproportionately high by international standards. The paper also finds differences in the incidence of transaction costs between exports and imports, as well as at the sub-regional level (including landlocked countries). High transaction costs for intermediate goods are found to undermine Africa's ability to engage competitively in value-adding activities. The paper looks at the cost of implementing the WTO provisions on trade facilitation. It suggests that the costs of single-window projects, for example, can vary from €8 million to €40 million, depending on the size of the country and the complexity of the system.

The evidence on the whole suggests that infrastructure, transport and administrative improvements are critical for African countries, particularly those that are landlocked.

ASEAN

We found two relevant papers that examined trade facilitation issues in the ASEAN region. Otsuki (2011 [P; OBS – quantitative data collection and analysis; →]) analyses TFIs that include port efficiency, regulatory environment, customs environment, and service sector infrastructure. ASEAN performance on these indicators is quite similar to the world average, but this masks differences in individual-country performance. Using a gravity model, the paper finds that a 5% improvement in the TFIs analysed leads to trade gains of US$1,148 billion to exporters and US$ 487 billion to importers. The paper finds that the gain in ASEAN's trade with the rest of the world from its own improvements is three times greater than its gains in intra-regional trade. Similarly, Shepherd and Wilson (2008 [P; OBS – quantitative data collection and analysis; ↑]) find that improving port facilities in the ASEAN region could expand trade by up to 7.5% or US$22 billion.

LATIN AMERICA

Hoffman and Wilmsmeier (2008 [P; OBS – quantitative data collection and analysis; ↑]), Wilmsmeier et al. (2006 [P; OBS – quantitative data collection and analysis; ↑]) and Sánchez et al. (2003 [P; OBS – quantitative data collection and analysis; →]) find that increases in port efficiency in Latin America lead to improvements in trade performance. The cost of shipping is an important determinant of trade competitiveness. For instance, Sánchez et al. (2003 [P; OBS – quantitative data collection and analysis; →]) argue that the doubling of a country's trade costs can lead to a reduction of 80% in that country's trade.

SOUTH ASIA

The transaction costs of trading across borders in South Asia are extremely high, which has hindered regional trade. These high trade costs are because of high transport costs, lack of automation and archaic customs protocols, as well as the prevalence of non-tariff barriers (Taneja et al., 2013 [P; OBS – case study; →]). Weerahewa (2009 [P; OBS – quantitative data collection and analysis; →]) finds that improving logistics performance indicators to the value of the best performer in South Asia could increase the value of agricultural trade by 27%.

REGIONAL COMPARISONS

Otsuki (2011 [P; OBS – quantitative data collection and analysis; →]) looks at performance indicators (port efficiency, regulatory environment, custom environment, and service sector infrastructure) across regions. On most of the these indicators ASEAN performs better than sub-Saharan Africa, the Middle East and North Africa and Latin American countries. Moïsé et al. (2011 [P; OBS – quantitative data collection and analysis; ↑]) look at the impact of trade facilitation in different developing regions. In the sub-Saharan African group of countries the trade facilitation improvement that leads to the most significant increases in trade flows is the harmonisation and simplification of documents. In Asia, Latin America and the Caribbean, Eastern Europe, and Central Asia, the streamlining of procedures has the strongest impact on trade performance.

SUMMARY

The literature focusing on different geographical areas finds that high trade costs negatively impact trade performance. The main factors contributing to these high trade costs are found to be inadequate trade infrastructure, inefficient regulations and weak logistics. As the nature of trade costs varies across geographical areas, effective trade facilitation interventions are likely to be determined by the degree and intensity of the factors underlying the high costs.

4.3 EXAMPLES FROM RELEVANT STUDIES

- Balistreri et al (2014 [P; OBS – quantitative data collection and analysis; ↑]) find that while trade facilitation and liberalisation at the multilateral level produce higher gains for East African economies than liberalisation at regional level, the political economy of the distributional impact suggests that liberalisation at a regional level is likely to face less resistance.
- Cirera and Winters (2014 [P; OBS – quantitative analysis; ↑]), focusing on sub-Saharan African countries, find a lack of impact of AfT flows on trade costs and trade flows, with the exception of AfT programmes on trade policy and regulations that help reduce the time to export and import.

- Iwanow and Kirkpatrick (2007 [P; OBS – quantitative analysis; →]) find that trade facilitation reforms can indeed contribute to improved export performance in Africa. But other reforms, including the quality of the regulatory environment and the quality of basic transport and communications infrastructure, are also needed and are often more important in promoting export growth than on-the-border trade facilitation reforms.
- Moïsé et al. (2011 [P; OBS – quantitative data collection and analysis; ↑]) find that in sub-Saharan African groups of countries the form of trade facilitation that leads to the most significant increases in trade flows is the harmonisation and simplification of documents. In Asian, Latin American and Caribbean, Eastern European and Central Asian groups of countries it is the streamlining of procedures that has the strongest impact on trade performance.
- Otsuki (2011 [P; OBS – quantitative data collection and analysis; →]) finds that in the ASEAN region trade gains accrue when trade facilitation improvements affect both exports and imports.
- Portugal-Perez and Wilson (2009 [P; OBS – quantitative data collection and analysis; ↑]) find that the gains for African exporters of cutting trade costs half-way to the level of those in Mauritius has a greater effect on trade flows than a substantive cut in tariff barriers.
- Rippel (2011 [P; OBS – policy note; →]), looking at experience in Africa, finds that measures that reduce the time needed for travel, border-crossings and administrative procedures, and better border management, such as the introduction of automated customs systems and streamlining of border procedures, can help expand trade in Africa.
- Shepherd and Wilson (2008 [P; OBS – quantitative data collection and analysis; ↑]) find that improving port facilities in the ASEAN region could expand trade by up to 7.5% or US$22 billion. The importance of improving port efficiency is also highlighted in Hoffman and Wilmsmeier (2008 [P; OBS – quantitative data collection and analysis; ↑]), Wilmsmeier et al. (2006 [P; OBS – quantitative data collection and analysis; ↑]) and Sánchez et al. (2003 [P; OBS – quantitative data collection and analysis; →]).
- UNECA (2013 [S; OR; →]) finds that the benefits of trade facilitation are likely to exceed the costs. Some African countries have demonstrated the ability to design and implement trade facilitation measures by themselves and even to provide technical support to others on the continent. The costs of implementing trade facilitation measures depend on factors such as size of the economy, extent of existing systems, use of public–private partnerships, sophistication of design in terms of technology and equipment, and existing customs automation.
- World Economic Forum (2013 [S; OR; →]) finds that supply-chain barriers – shipping services and border administration – in Madagascar threaten to erode the country's labour-cost-competitive advantage.

5.0 EVIDENCE BY INCOME LEVEL

5.1 ASSESSING SINGLE STUDIES

This section assesses the quality of relevant studies as well as the body of evidence on the impact of trade facilitation on countries of different income levels. Tables 7 and 8 group the relevant studies by quality assessment and analytical focus.

Table 7. Evidence by income level: Primary; observational; high-quality studies [P; OBS, ↑]

Author(s)/date	Low-income	Middle-income
Lee and Kim, 2012	x	x
Massa, 2013	x	
Moïsé and Sorescu, 2013	x	

Table 8. Evidence by income level: Primary; observational; moderate-quality studies [P; OBS, →]

Author(s)/date	Low-income	Middle-income
Ijjo and Shinyekwa, 2014	x	
Taneja et al., 2013	x	x
Uzzaman and Yusuf, 2011	x	

5.2 ASSESSING AND DESCRIBING THE BODY OF EVIDENCE

- The **quality** of the studies constituting the body of evidence is **moderate**.
- The **size** of the body of evidence (6 studies) is **small**.
- The **findings** of the body of evidence are **mixed**.

Details of the definitions and thresholds for these classifications are included in Annex 1.

5.2.1 DESCRIPTION

There is a small body (6 studies) of moderate-quality evidence on the impact of trade facilitation reforms on trade volumes and trade costs by level of income. The reviewed studies use primary research methods, employing observational research designs, and using both quantitative and qualitative methods for data collection and analysis. The evidence is mixed, but overall points to the positive impact of aid for trade facilitation in increasing trade flows and reducing trade costs in low-income countries.

5.2.2 FINDINGS

There is evidence that **trade facilitation has a positive impact on trade performance in low-income countries.** Massa (2013 [P; OBS – quantitative data collection and analysis; ↑]) finds a significant impact of aid for trade facilitation on export flows in a sample of lower-income countries. Importantly, she finds this positive impact to be strongly affected by the quality of institutions in recipient countries. Moreover, Moïsé and Sorescu (2013 [P; OBS – quantitative

data collection and analysis; ↑]) find that for low-income countries the form of trade facilitation that leads to the most significant increases in trade flows is the harmonisation and simplification of documents.

In examining AfT flows to Uganda from 2002 to 2011, Ijjo and Shinyekwa (2014 [P; OBS – quantitative data analysis; →]) find that AfT largely went to areas identified in national development priorities. These include transport infrastructure, energy and agriculture. They find that aid appears to have had a relatively stronger effect on the growth of imports than of exports. The effect of aid on exports, especially through the AfT initiative, is still insignificant. However, there are micro-level analyses of AfT programmes showing significant outputs that are likely to impact trade in the long run. The authors conclude that this might be because the overall effect at the micro level is yet to be observed at the macro level.

Taneja et al. (2013 [P; OBS – case study; →]) look at trade between India and its regional neighbours. They find that the transaction costs of trading across borders continue to be high because of poor infrastructure, lack of automation and archaic transport protocols. Weak institutions restrict seamless transportation across land borders. As a result the level of intra-regional trade is one of the lowest in the world, and accounts for only about 5% of the region's trade with the rest of the world.

Broader policy reforms are important in increasing the impact of improvements in trade infrastructure. Uzzaman and Yusuf (2012 [P; OBS – case study; →]) look at trade facilitation more closely in the context of Bangladesh, a low-income, least developed country. They point to the need to modernise the customs system in order to increase trade flows, and find that customs procedures in Bangladesh also suffer from manual operations, arbitrary decisions, corruption and delays in clearance. Despite simplification in recent times, customs formalities in Bangladesh are still lengthy and less than efficient, leading to delays in the release of goods. Drawing on their research, they argue that upgrading of the infrastructure must be accompanied by improvements in policies that directly or indirectly affect the flow of trade.

For lower-middle-income countries the strongest impact on trade flows comes from improved logistics efficiency. Lee and Kim (2012 [P; OBS – quantitative data collection and analysis; ↑]) find that in the primary sector low- and lower-middle-income countries with better logistics efficiency trade a greater variety of products, while in the manufacturing sector better logistics capability has a significant impact in terms of both product variety and market share. An improvement in logistics allows for better use of existing resources, especially in primary goods. The impact of better logistics efficiency in exporting primary goods for lower-middle-income countries is found to be about 1.5%.

5.3 EXAMPLES FROM RELEVANT STUDIES

- Ijjo and Shinyekwa (2014 [P; OBS – quantitative data analysis; →]), in examining Uganda's case, find that aid appears to have had a relatively stronger effect on the growth of imports than of exports.

- Lee and Kim (2012 [P; OBS – quantitative data collection and analysis; ↑]) find that trade facilitation-related policy reforms enable developing countries to benefit from increased trade in manufactured goods at the extensive margin.
- Massa (2013 [P; OBS – quantitative data collection and analysis; ↑]) finds a strong relationship between exports and institutional quality, as well as a significant impact of aid for trade facilitation on export flows in a sample of lower-income countries.
- Moïsé and Sorescu (2013 [P; OBS – quantitative data collection and analysis; ↑]) find that harmonisation and simplification of documents leads to the most significant increases in trade flows.
- Uzzaman and Yusuf (2012 [P; OBS – case study; →]) highlight the fact that not only customs but also other agencies and parties involved in trade have important roles to play in relation to cross-border trade facilitation.

6.0 CONCLUSION

This paper has assessed evidence on the impact of trade facilitation on trade performance. The studies reviewed suggest that improvements in trade facilitation across types of reform, geographic focus, and income level can lead to a reduction in trade costs and a growth in trade (increasing both exports and imports), and that weak trade facilitation inhibits value-adding activities. Context is crucial to the type of impact (positive or negative), as constraints, capacity and resources differ. The type of trade facilitation reform, together with institutional quality and capacity are important determinants of the effectiveness of trade facilitation interventions.

Our assessment of the empirical evidence on the effects of different types of trade facilitation reform on trade volumes and trade costs suggests that trade facilitation interventions which are aimed at improving the quality and quantity of infrastructure lead to the greatest impacts on trade performance. The magnitude of the effects of these reforms in developing countries and regions can be very significant.

- In Tajikistan, for example, it is estimated that trade facilitation reforms improving infrastructure could lead to an increase of about 18% in total trade, while improving port facilities in the Southeast Asia region could expand trade by up to 7.5%.
- Trade facilitation interventions which enhance customs efficiency are found to play the second-biggest role in boosting trade performance. The impact on trade flows in South Asia and Central Asia is found to be of about 4% and 1% respectively.
- Trade facilitation reforms which improve the regulatory and business environment follow, with the potential to increase trade flows substantially in countries such as Bangladesh.

These findings provide a useful guide to policymakers as to the area or areas in which resource allocation might be expected to yield the greatest benefits. Nevertheless, in order to design effective strategies to improve trade performance policymakers should not only look at the benefits of specific trade facilitation reforms but should also take into account the costs and the possible positive and/or negative spill-overs associated with such interventions (e.g. impacts on growth, productivity, and development). For example, when considering trade facilitation reforms promoting physical infrastructure, it is important to balance the substantial benefits in terms of increased trade volumes and reduced trade costs against the high costs of investment.

It is also important to take into account the large spill-overs that might follow from investment in physical infrastructure. In a similar way, when taking into account trade facilitation interventions improving the regulatory and business environment, it is necessary to recognise that while these measures are associated with lower benefits in terms of trade performance, they also involve considerably lower costs than investment in physical infrastructure. The effectiveness of a certain type of trade facilitation reform cannot, therefore, be predicted with certainty *a priori*, but should be assessed on a case-by-case basis through a careful cost–benefit analysis. Such analysis should take into account both the

static/direct and the dynamic/indirect effects. Country-specific characteristics should also be taken into consideration.

The paper has also identified some important gaps in the available evidence.

- **First, there is lack of published systematic evaluations of the impact of aid for trade facilitation interventions.** This limits the evidence available to assist in designing effective trade facilitation interventions on what has worked best, where and why.
- **Second, the bulk of the literature on trade facilitation focuses narrowly on customs reform**, which in turn can skew policy conclusions. While customs reforms are important, improving trade facilitation will also involve efficient and effective border management, as well as adequate trade infrastructure, efficient trade transit arrangements for landlocked countries and institutional capacity to implement and manage reforms.
- **Finally, the literature analyses trade facilitation constraints from the perspective of trade in final goods** – in other words, trade facilitation issues in connection with country/region A's exports/imports to/from country/region B. Such a perspective might not be the most helpful in a world where trade is increasingly being shaped by global and regional value chains, with intermediate goods and services crossing borders multiple times. The emergence of these global and regional value chains serves to highlight further the importance of efficient and effective trade facilitation.

Further work on impact evaluations, as well as case studies, would add to the body of evidence and provide valuable information for the design of effective trade facilitation interventions and policy reforms.

ANNEX 1: ANNOTATED BIBLIOGRAPHY AND QUALITY ASSESSMENTS

1. ADB (2009) 'The Role of Trade Facilitation in South Asian Economic Integration', Chapter 2 in *Study on Intraregional Trade and Investment in South Asia*. Manila: Asian Development Bank (http://www.adb.org/sites/default/files/publication/28658/intraregional-trade-investment.pdf).
   A gravity model and Global Trade Analysis Project-based CGE model was used to determine the effects of enhancing trade facilitation in South Asia on trade flows (by industry), regional integration, and macroeconomic performance, as well as the relative impacts of the various components of trade facilitation.
   ADB (2009 [P; OBS – quantitative data collection and analysis; ↑]):
   a primary research paper of high quality that uses an observational design (computable general equilibrium (CGE) and gravity model estimated using cross-sectional design).

2. Balistreri, E., Tarr, D.G. and Yonezawa, H. (2014) 'Reducing trade costs in East Africa: Deep Regional Integration and Multilateral Action', *Policy Research Working Paper* 7049. Washington, DC: The World Bank (http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2014/09/29/000158349_20140929153817/Rendered/PDF/WPS7049.pdf).
   The paper decomposes trade costs into three categories: costs that can be lowered by trade facilitation, non-tariff barriers, and the costs of business services. The paper develops a 10-region, 18-sector, global trade model that includes Kenya, Tanzania, Uganda, and Rwanda of the East African Customs Union. The analysis finds that deep integration in the East African Customs Union that lowers these trade costs has resulted in significant gains for the four countries, especially from improved trade facilitation.
   Balistreri et al. (2014 [P; OBS – quantitative data collection and analysis; ↑]):
   a primary research paper of high quality that uses an observational design (CGE model to estimate the impact of trade facilitation).

3. Calí, M. and te Velde, D.W. (2010) 'Does Aid for Trade Really Improve Trade Performance?', *World Development* 39(5): 725–40 (http://econpapers.repec.org/article/eeewdevel/v_3a39_3ay_3a2011_3ai_3a5_3ap_3a725-740.htm).
   Although the concept of AfT has quickly gained prominence among aid donors as well as aid recipients, relatively little is known about its impact on trade-related performance. The paper uses data on a large subset of developing countries for recent years to examine the extent to which various types of AfT have helped recipient countries' trade performance. The paper finds that aid for trade facilitation reduces the costs of trading. Moreover AfT has an overall positive and significant impact on exports. This effect is entirely driven by aid to economic infrastructure, with the other main category of AfT – aid to productive capacity – having no discernible effect on exports. Its strong positive association with exports at the sectoral level is due to an allocation skewed toward already well performing sectors.
   Calí and te Velde (2010)[P; OBS – quantitative data collection and analysis; ↑]):
   a primary research paper of high quality that uses a large subset of developing country data to examine which type of AfT measures help to improve recipient countries' trade performance.

4. Cirera, X. and Winters, L.A. (2015) 'Aid for trade and structural transformation in Sub-Saharan Africa', Commonwealth *Trade Policy Discussion Paper* 2015/01. London: Commonwealth Secretariat (http://www.oecd-ilibrary.org/docserver/download/5js6b1lp69ms.pdf?expires=1429630239&id=id&accname=guest&checksum=137F1127391BE8671B61FB8F89F3E02F).
   African economies have experienced an increasing inflow of AfT targeting trade-related constraints such as infrastructure, policy frameworks or supply-side constraints. AfT from OECD countries tripled between 2002 and 2010, from US$10 billion to US$33 billion. Given the nature and size of these flows, and the challenge of structural transformation for African economies, one important question that needs to be investigated is what role AfT programmes are playing in structural change. This paper analyses this question empirically, employing a rich trade and aid flows dataset for sub-Saharan African countries during the period 1995–2010.
   Cirera and Winters (2014 [P; OBS – quantitative analysis; ↑]):
   a primary research paper of high quality that examines the impact of AfT on structural change, trade flows and trade costs in sub-Saharan Africa.

5. Dennis, A. and Shepherd, B. (2011) 'Trade Facilitation and Export Diversification*', The World Economy* 34(1): 101–22 (http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9701.2010.01303.x/abstract?deniedAccessCustomisedMessage=&userIsAuthenticated=false)
   .
   This paper shows that improved trade facilitation can help promote export diversification in developing countries. The paper finds that, in a sample of 118 developing countries, 10% reductions in the costs of international transport and domestic exporting costs (documentation, inland transport, port and customs charges) are associated with export diversification gains of 4% and 3% respectively. Customs costs play a particularly important role in these results. Lower market entry costs can also promote diversification, but the effect is weaker (1%). The paper also finds evidence that trade facilitation has stronger effects on diversification in poorer countries.
   Dennis and Shepherd (2011 [P; OBS – quantitative data collection and analysis; ↑]):
   a primary research paper of high quality that uses an observational design (Poisson model supplemented by quantitative data analysis).

6. Felipe, J. and Kumar, U. (2010) 'The Role of Trade Facilitation in Central Asia: A Gravity Model', *Working Paper* 628. Annandale-on-Hudson, NY: Levy Economics Institute of Bard College (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1702367).
   By using a gravity model the paper examines the relationship between bilateral trade flows and trade facilitation. It also estimates the gains in Central Asian countries' trade derived from improvements in trade facilitation. Trade facilitation is measured through the World Bank's Logistic Performance Index (LPI). The results show that there are significant gains in trade as a result of improving trade facilitation in these countries. These gains vary from 28% in the case of Azerbaijan to as much as 63% in the case of Tajikistan. Furthermore, intra-regional trade increases by 100%. Among the different components of LPI, the paper finds that the greatest increase in total trade comes from improvement in infrastructure, followed by logistics and efficiency of customs and other border agencies. The results also show that the increase in bilateral trade in highly sophisticated, more differentiated, and high-technology products because of an improvement in the exporting country's LPI is greater than the increase in trade in less sophisticated, less differentiated, and low-technology products.

Felipe and Kumar (2010 [P; OBS – quantitative data collection and analysis; ↑]):
a primary research paper of high quality that uses an observational design (gravity model estimated using cross-sectional design supplemented by quantitative data analysis).

7. Helble, M., Mann, C. and Wilson, J. (2009) 'Aid for Trade Facilitation', *Policy Research Working Paper* 5064. Washington, DC: The World Bank (https://openknowledge.worldbank.org/bitstream/handle/10986/4255/WPS5064.pdf).
Does foreign aid spent on trade facilitation increase trade flows of developing countries? The analysis in this paper explicitly considers how to target aid most effectively to increase trade – a fundamental question related to the crisis and policy debate over restarting the world trading system. Using detailed data on aid flows from the OECD, the analysis estimates the responsiveness of trade flows to specific types of foreign aid. The findings indicate that aid directed toward promoting trade enhances the trade performance of recipient countries: a 1% increase in aid directed toward trade policy and regulatory reform (amounting to about US$11.7 million more such aid) could generate an increase in global trade of about US$818 million. This yields a 'rate of return' on every dollar of this type of aid of about US$697 in additional trade. As the dollar aid flow is relatively small, such targeted aid mitigates concerns about absorptive capacity and real exchange rate appreciation, which may accompany larger disbursements.
Helble et al. (2009 [P; OBS – quantitative data collection and analysis; →]):
a primary research paper of moderate quality that uses an observational design (gravity model estimated using panel data design).

8. Hoffmann, J. and Wilmsmeier, G. (2008) 'Liner shipping connectivity and port infrastructure as determinants of freight rates in the Caribbean', *Maritime Economics & Logistics* 10(1): 130–51 (http://www.palgrave-journals.com/mel/journal/v10/n1/full/9100195a.html).
A number of Caribbean ports have been able to take advantage of their geographical position at the cross roads of major east–west and north–south liner shipping routes. The paper analyses the impacts of port infrastructure and liner shipping connectivity on intra-Caribbean freight rates. The results show that trade routes with only indirect services (i.e. including trans-shipments) induce higher transport costs. The analysis suggests that trans-shipment has an impact on freight rates equivalent to an increase in distance between two countries of 2,612 km. The implication of this for the Caribbean is that in many cases intra-regional trade between small islands is not competitive as compared to trade with, for example, the United States, because of the lack of direct services.
Hoffman and Wilmsmeier (2008 [P; OBS – quantitative data collection and analysis; ↑]):
a primary research paper of high quality that uses an observational design (principal component analysis and OLS regressions).

9. Ijjo, A. and Shinyekwa, I. (2014) 'Leveraging Aid for Trade in Uganda', AidData *Working Paper* 1 (http://aiddata.org/sites/default/files/wps1_leveraging_aid_for_trade_capacity_in_uganda.pdf).
The hindrances to the gainful participation of least developed countries in international trade relate predominantly to domestic supply rather than foreign market access. These constraints include variable productive capacity, economic infrastructure bottlenecks, and inability to meet international quality standards. Looking at the case of Uganda, the paper examines the role of overall official development assistance in driving Uganda's external trade and then specifically that of AfT in strengthening national trade capacity. The paper

finds reasonable alignment between aid and national development priorities, but very little evidence of a robust aid impact, especially on export *vis-à-vis* import capability. The paper underscores persisting deficiency in Uganda's capacity to meet internationally accepted standards and to ensure stability and consistency in export supplies, and recommends that future aid support be directed to unlocking the constraints in Uganda's productive capacity, standards development, economic infrastructure and sound trade policy analysis and formulation.
Ijjo and Shinyekwa (2014 [P; OBS – quantitative data analysis; →]):
a primary research paper of moderate quality that uses quantitative methods to assess the impact of AfT programmes in Uganda.

10. Iwanow, T and Kirkpatrick, C. (2007) 'Trade facilitation, regulatory quality and export performance', *Journal of International Development*, 19(6): 735–53 (https://ideas.repec.org/a/wly/jintdv/v19y2007i6p735-753.html).
The paper quantifies the potential gains in trade performance from the implementation of trade facilitation reform. It applies a gravity model augmented with trade facilitation, regulatory quality and infrastructure indicators to assess the impact of trade facilitation on export performance. The results suggest that a 10% improvement in trade facilitation would yield an increase in exports of about 5%. The same percentage improvement in the regulatory environment and in the quality of infrastructure provision would result in increases of 9–11% and 8% respectively. The results confirm that while trade facilitation can contribute to improved export performance, improvements in the quality of the regulatory environment and basic transport and communications infrastructure are equally, if not more, important in facilitating export growth. The conclusion is that trade facilitation alone is unlikely to result in a significant improvement in export performance.
Iwanow and Kirkpatrick (2007 [P; OBS – quantitative analysis; →]):
a primary research paper of moderate quality that uses a panel dataset for 124 developed and developing countries to assess the impact of trade facilitation and other trade-related institutional constraints on export performance with particular reference to Africa.

11. Lee, H.-Y. and Kim, C.-S. (2012) 'The Impact of Trade Facilitation on the Extensive and Intensive Margins of Trade: An Application for Developing Countries'*, Journal of East Asian Economic Integration,* 16(1): 67–96 (http://www10.iadb.org/intal/intalcdi/PE/2012/10438.pdf).
Previous literature has looked merely into the effect of trade facilitation on aggregate trade, or analysed trade growth using the extensive and intensive margins. This paper blends these two lines of research for a detailed analysis of the impact of trade facilitation on trade by using highly disaggregated trade data and a more composite index for measuring trade facilitation, also taking into account the export sectors and income levels of countries. The paper finds that developing countries with higher trade facilitation levels export a wider range of products, especially primary goods. While trade facilitation levels do not have a statistically significant association with trade at the intensive margin in general, further analysis shows that the impact of advanced trade facilitation for lower-middle-income countries is greatest in primary goods trade at the intensive margin, and for upper-middle-income countries in manufactured goods trade at the intensive margin. The results suggest that trade facilitation-related policy reforms enable developing countries to benefit from increased trade in manufactured goods at the extensive margin.

Lee and Kim (2012 [P; OBS – quantitative data collection and analysis; ↑]):
a primary research paper of high quality that uses an observational design (gravity model estimated using panel data design supplemented by quantitative data analysis).

12. Massa, I. (2013) 'Aid for Trade Facilitation in lower-income countries: the role of institutional quality', *ODI Report.* London: Overseas Development Institute (http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8672.pdf).
This study used a sample of 58 low- and lower-middle-income countries over the period 1996–2011 to examine the impact of aid for trade facilitation on export performance. Country case studies suggest that the quality of local institutions determines the impact of AfT; this study is the first to examine this empirically in a panel of countries. The results point to a strong relationship between exports and institutional quality, as well as to a significant impact of aid for trade facilitation on export flows. Importantly, the positive and significant effect of aid for trade facilitation on export flows is found to be affected strongly by the quality of institutions in recipient countries. On average, good-quality institutions are found to be associated with as much as a 22% increase in export flows. Aid for trade facilitation is found to be associated with a 0.02% increase in export flows. This has implications for the wider literature on how resource flows (e.g. AfT) and policies and institutions interact to achieve better development outcomes.
Massa (2013 [P; OBS – quantitative data collection and analysis; ↑]):a primary research paper of high quality that investigates the impact of aid for trade facilitation on export performance in a sample of 58 low- and lower-middle-income countries over the period 1996–2011.

13. Milner, C., Morrissey, O. and Zgovu, E. (2008) 'Trade facilitation in developing countries ', *CREDIT Research Paper* 08/05. Nottingham: University of Nottingham, Centre for Research in Economic Development and International Trade (http://www.nottingham.ac.uk/credit/documents/papers/08-05.pdf).
Measures to actively facilitate trade are increasingly seen as essential to assist developing countries in expanding trade and benefiting from globalisation. Although often viewed as narrowly concerned with the ease and speed of customs procedures, even greater trade cost reductions and trade and welfare benefits may be reaped from a broader view of trade facilitation that incorporates transportation, distribution and communication issues. A number of trade facilitation reforms are particularly beneficial: improving procedures, especially customs clearance; introducing automation and use of information technology; reducing excessive documentation requirements; addressing lack of transparency in import and export requirements; addressing lack of modernisation of and cooperation between Customs and other government agencies. The review identifies the types of trade facilitation reform that could address these problems and deliver a return in terms of increased revenue collection efficiency, reductions in trade costs and promotion of greater regional cooperation (at least in customs and transport, especially as many trade facilitation measures are appropriate for inclusion in regional integration agreements).
Milner et al. (2008 [S; OR; →]): a secondary paper of moderate quality that uses a non-systematic review design.

14. Moïsé, E., Orliac, T. and Minor, P. (2011) 'Trade Facilitation Indicators: The Impact on Trade Costs', *OECD Trade Policy Papers* 118. Paris: OECD Publishing (https://www.wto.org/english/tratop_e/tradfa_e/case_studies_e/oecd_paper_e.pdf).

This report presents the findings of the OECD indicators for assessing the economic and trade impact of specific trade facilitation measures in OECD countries. Twelve trade facilitation indicators have been constructed, corresponding to the main policy areas under negotiation in the WTO, with the aim of estimating the impact of addressing specific facilitation hurdles in the trade procedures of a given country.
Moïsé et al. (2011 [P; OBS – quantitative data collection and analysis; ↑]): a primary research paper of high quality that uses an observational design (gravity model estimated using panel data design supplemented by quantitative data analysis).

15. Moïsé, E. and Sorescu, S. (2013) 'Trade Facilitation Indicators: The Potential Impact of Trade Facilitation on Developing Countries' Trade', *OECD Trade Policy Papers* 144. Paris: OECD Publishing (http://www.oecd-ilibrary.org/docserver/download/5k4bw6kg6ws2.pdf?expires=1429693574&id=id&accname=guest&checksum=CBC94EFDD0C6133AB71C20953FFE1C98).
This report presents the findings of the OECD indicators for assessing the impact of specific trade facilitation measures on developing countries' trade. The combined effect of improvements in these areas is greater than the simple sum of the impact of individual measures, reaching an almost 14.5% reduction in total trade costs for low-income countries, 15.5% for lower-middle-income countries and 13.2% for upper-middle-income countries.
Moïsé and Sorescu (2013 [P; OBS – quantitative data collection and analysis; ↑]): a primary research paper of high quality that uses an observational design (gravity model estimated using panel data design supplemented by quantitative data analysis).

16. Njinkeu, D., Wilson, J. and Fosso, B. (2008) 'Expanding Trade within Africa: The Impact of Trade Facilitation', *Policy Research Working Paper* 4790. Washington, DC: The World Bank (http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-4790).
This paper examines the impact of trade facilitation on intra-African trade. The authors examine the role of trade facilitation reforms, such as increased port efficiency, improved customs and regulatory environments, and upgrading services infrastructure on trade between African countries. They also consider how regional trade agreements relate to intra-African trade flows. Using trade data from 2003 to 2004, it finds that improvement in ports and services infrastructure promise relatively more expansion in intra-African trade than other measures. They also show that almost all regional trade agreements have a positive effect on trade flows.
Njinkeu et al. (2008 [P; OBS – quantitative data collection and analysis; →]): a primary research paper of moderate quality that uses an observational design (gravity model estimated using panel data design and Tobit model).

17. Otsuki, T. (2011) 'Quantifying the Benefits of Trade Facilitation in ASEAN', *OSIPP Discussion Paper* DP-2011-E-006. Osaka: Osaka School of International Public Policy (http://www.osipp.osaka-u.ac.jp/archives/DP/2011/DP2011E006.pdf).

This paper assesses the performance and progress of the ASEAN economies in trade facilitation, and the effect of improved trade facilitation on the region's manufacturing trade, with a focus on port efficiency, customs environment, regulatory environment and service sector infrastructure. Under a scenario of raising the below-average countries half-way to the global average, ASEAN's trade is estimated to increase by US$99 billion, three-quarters of which comes from the region's own improvements. Also, regulatory reforms, for example,

enhancing transparency of trade-related regulations and ensuring law-abiding operations of the regulatory authorities, are found to be most effective.

Otsuki (2011 [P; OBS – quantitative data collection and analysis; →]): a primary research paper of moderate quality that uses an observational design (gravity model estimated using panel data design supplemented by quantitative data analysis).

18. Portugal-Perez, A. and Wilson, J. (2009) 'Why trade facilitation matters to Africa', *World Trade Review* 8(3): 379–416 (https://ideas.repec.org/p/wbk/wbrwps/4719.html).
Mitigating the impact of the economic crisis will require using all the tools necessary to regain a sustainable path to growth. This includes measures to support trade expansion, including in developing countries such as those in Africa. This paper provides context for understanding why trade facilitation and lowering trade costs matter to Africa both today and over the long term. Trade costs are higher in Africa than in other regions. Using gravity-model estimates, the paper computes *ad-valorem* equivalents of improvements in trade indicators for a sample of African countries. The evidence suggests that the gains for African exporters from cutting trade costs half-way to the level of those in Mauritius has a greater effect on trade flows than a substantial cut in tariff barriers. As an example, improving logistics so that Ethiopia cuts its costs of trading a standardised container of goods half-way to the cost in Mauritius would be roughly equivalent to a 7.6% cut in tariffs faced by Ethiopian exporters across all importers.
Portugal-Perez and Wilson (2009 [P; OBS – quantitative data collection and analysis; ↑]): a primary research paper of high quality that uses an observational design (gravity model estimated using cross-sectional design supplemented by quantitative data analysis).

19. Portugal-Perez, A. Wilson, J. (2012) 'Export Performance and Trade Facilitation Reform: Hard and Soft Infrastructure', *World Development* 40(7): 1295–1307 (http://www.sciencedirect.com/science/article/pii/S0305750X11003056).
The paper estimates the impact of aggregate indicators of 'soft' and 'hard' infrastructure on the export performance of developing countries. It derives four new indicators for more than 100 countries over the period 2004–7. Estimates show that trade facilitation reforms do improve the export performance of developing countries. This is particularly true with investment in physical infrastructure and regulatory reform to improve the business environment. The findings provide evidence that the marginal effect of the transport efficiency and business environment improvement on exports appears to be decreasing in *per capita* income. In contrast, the impact of physical infrastructure and ICT on exports appears increasingly important the richer a country becomes. The paper finds statistical evidence on the complementarity between hard infrastructure and soft infrastructure, as captured by the indicators used.
Portugal-Perez and Wilson (2012 [P; OBS – quantitative data collection and analysis; ↑]): a primary research paper of high quality that uses an observational design (gravity model estimated using panel data design supplemented by quantitative data analysis).

20. Rippel, B. (2011) 'Why Trade Facilitation is Important for Africa', *Africa Trade Policy Notes* 27. Washington, DC: The World Bank (http://siteresources.worldbank.org/INTAFRREGTOPTRADE/Resources/trade_facilitation_note_nov11.pdf).
The paper highlights the need for cross-sector analysis, for example along the value chain of products, to address trade bottlenecks. The biggest obstacle to greater trade integration in

Africa is the lack of accompanying policy and regulatory reforms. Trade facilitation can provide opportunities for African exporters if hard infrastructure and technical advice are backed by equally ambitious policy reforms.
Rippel (2011 [P; OBS – policy note; →]): a primary research paper of moderate quality that uses an observational design (policy note).

21. Sánchez, R.J., Hoffmann, J., Micco, A., Pizzolitto, G., Sgut, M., Wilmsmeier, G. (2003) 'Port efficiency and International Trade: Port Efficiency as a Determinant of Maritime Transport Costs', *Maritime Economics & Logistics* 5: 199–218 (http://www.palgrave-journals.com/mel/journal/v5/n2/pdf/9100073a.pdf).
The paper examines the determinants of waterborne transport costs, with particular emphasis on the efficiency at port level. Port efficiency is found to be a relevant determinant of a country's competitiveness – and in this respect there still exist big differences among Latin American countries. The paper finds that port efficiency, unlike most other relevant variables, can be influenced by public policies.
Sánchez et al. (2003 [P; OBS – quantitative data collection and analysis; →]): a primary research paper of moderate quality that uses an observational design (OLS regression using factors generated by principal component analysis).

22. Shepherd, B. and Wilson, J. (2008) 'Trade Facilitation in ASEAN Member Countries: Measuring Progress and Assessing Priorities', *Policy Research Working Paper* 4615. Washington, DC: The World Bank (http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-4615).
By applying the gravity model to trade data for Southeast Asia over the period 2000–5, the paper examines the relationship between trade flows and different trade facilitation indicators (i.e. efficiency of maritime and airports, the extent of irregular payments in relation to export/import licences, and the level of competition between internet service providers). The results show that improvements in trade facilitation have a positive impact on trade. Interestingly, trade in Southeast Asia appears to be particularly sensitive to the quality of air transport infrastructure and the level of competition in the internet services sector: a 1% improvement in the former boosts trade by nearly 5%, while a similar change in the latter leads to a trade increase of just over 1%.
Shepherd and Wilson (2008 [P; OBS – quantitative data collection and analysis; ↑]): a primary research paper of high quality that uses an observational design (gravity model estimated using panel data design supplemented by quantitative data analysis).

23. Spence, M. and Karingi, S. (2011) 'Impact of Trade Facilitation Mechanisms on Export Competitiveness in Africa', *ATPC Work in Progress* 85. Addis Ababa: United Nations Economic Commission for Africa, African Trade Policy Centre (http://www.uneca.org/publications/no-85-impact-trade-facilitation-mechanisms-export-competitiveness-africa).
The paper analyses the impact of trade facilitation on export competitiveness. It shows that trade facilitation, captured by the four indicators created by Portugal-Perez and Wilson,[5] significantly bolsters a key source of competitiveness, total-factor productivity, through a transaction effect, but that the production effect, in which trade facilitation reallocates resources to more productive sectors, proxied by the impact on the income level of exports, is less sensitive. While the quality and quantity of physical infrastructure is robust across specifications, the results suggest that trade facilitation measures are best adopted as part of

[5] https://openknowledge.worldbank.org/bitstream/handle/10986/3748/WPS5261.pdf?sequence=1

a holistic trade policy aimed at creating an environment conducive to the diversification of African exports to ensure long-run export competitiveness.
Spence and Karingi (2011 [P; OBS – quantitative data collection and analysis; ↑]): a primary research paper of high quality that uses an observational design (gravity model estimated using panel data design and Granger causality analysis supplemented by quantitative data analysis).

24. Taneja, N., Prakash, S. and Kalita, P. (2013) 'India's Role in Facilitating Trade under SAFTA', *Working Paper* 263. New Delhi: Indian Council for Research on International Economic Relations (http://icrier.org/pdf/working_paper_263.pdf).
Economic integration in South Asia is governed by India's relations with the other economies of the region, and India is also at the helm of all trade facilitation and transit issues of the region. The paper examines the ground covered so far by India and the challenges that remain for it to realise the benefits under the South Asian FTA. The paper highlights a number of issues that have already been addressed to some extent but need to be dealt with further. These include liberalisation of tariffs (including trimming sensitive lists), removal of non-tariff barriers, reduction in transport and transit barriers and customs reforms.
Taneja et al. (2013 [P; OBS – case study; →]): a primary research paper of moderate quality that uses an observational design (case study).

25. UNECA (2013) *Trade facilitation from an African perspective*. Addis Ababa: United Nations Economic Commission for Africa (http://www.uneca.org/sites/default/files/publications/trade_facilitation_eng.pdf).
The paper compares red tape and transaction costs relating to Africa's international trade within Africa and with the rest of the world. In light of Africa's disproportionately high transaction costs relative to the rest of the world, the analysis confirms how critical trade facilitation is for Africa. In addition, the reviewed evidence highlights the different incidence of transaction costs, distinguishing between export and import flows, and underscores sub-regional and cross-country variability (with special reference to landlocked countries). The paper investigates African countries' import patterns, focusing in particular on intermediate inputs. This analysis reveals the extent to which trade facilitation could boost exports not only directly, by cutting transaction costs, but also indirectly, through providing cheaper access to production inputs to be transformed domestically and then possibly re-exported.
UNECA (2013 [S; OR; →]): a secondary research paper that uses descriptive statistics and review of evidence. The paper is of moderate quality but presents interesting insights.

26. Uzzaman, Md A. and Yusuf, M.A. (2011) 'The role of Customs and other agencies in trade facilitation in Bangladesh: hindrances and ways forward ', *World Customs Journal* 5(1): 29–42 (http://www.worldcustomsjournal.org/media/wcj/-2011/1/Uzzaman_and_Yusuf.pdf).
This paper examines the role of the customs service and other government agencies in trade facilitation in Bangladesh, with the aim of suggesting some ways forward. A combination of primary and secondary data sources are used in the study, which finds that traders in Bangladesh face delays in conducting their trade owing to too many official formalities and inefficiencies and too much arbitrary discretion. Other factors such as inaccurate certificates issued by pre-shipment inspection agencies, lack of testing facilities and false declarations by the trading community are also found to be a cause of delays in import and export clearance. The study suggests that the efforts of a single customs or port administration are not sufficient to facilitate trade; rather an integrated approach is imperative.

Uzzaman and Yusuf (2011 [P; OBS – case study; →]): a primary research paper of moderate quality that uses an observational design (case study).

27. Vijil, M. and Wagner, L. (2012) 'Does Aid for Trade Enhance Export Performance? Investigating the Infrastructure Channel', *The World Economy* 35(7): 838–68 (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2111862).
    There are few empirical studies assessing the effectiveness of AfT as regards trade performance. Furthermore, existing work does not test which are the channels through which AfT has an impact on trade performance. The paper addresses this question using a two-step empirical analysis. Relying on an export performance model, it first tests whether institutions and infrastructure, two potential channels of transmission, are significant determinants of export performance. The paper tests the impact of AfT sectoral flows on the previously detected determinants of export performance. The paper shows, as part of the first step, that the infrastructure channel is a highly significant determinant, whereas the institutional channel turns out to have a limited positive impact on developing countries' export performance. Furthermore, the paper shows, from the second step, that aid for infrastructure has a strong and positive impact. As a result, the paper finds that a 10% increase in aid for infrastructure commitments *per capita* in developing countries leads to an average 2.34% increase in the exports over GDP ratio. It is also equivalent to a 2.71% reduction in tariff and non-tariff barriers. These results highlight the high potential impact of AfT through the infrastructure channel on developing countries' export performance.
    Vijil and Wagner (2012 [P; OBS – quantitative data collection and analysis; →]): a primary research paper of moderate quality that uses an observational design (two-step analysis).

28. Weerahewa, J. (2009) 'Impact of Trade Facilitation Measures and Regional Trade Agreements on Food And Agricultural Trade in South Asia', *Working Paper* 69. Asia-Pacific Research and Training Network on Trade (http://www.unescap.org/sites/default/files/AWP%20No.%2069.pdf).
    Sectoral gravity models of exports of five product categories – all food and agriculture; live animals; vegetables; processed food; and manufactured products – were estimated using conventional explanatory variables (GDP of trading partners and distance) and selected cultural variables, augmented by trade restrictiveness indices and presence of trade agreements, as well as trade facilitation variables. The South Asian Preferential Trade Agreement (SAPTA) has improved agricultural exports. Trade facilitation variables have significant effects on exports of different products in varying degrees, depending upon the proxy used. The Logistic Performance Index (LPI) has large positive effects on value of exports of all the product categories. The estimates for trade costs are negative and significant as expected. Improving trade costs and time delays in South Asian countries up to the average values of the best performer in South Asia (least cost is recorded by Pakistan and best LPI by India) would bring down trade costs by over 17% and improve LPIs by 0.72, resulting in an increase in the value of agricultural trade of 18% and 27% respectively. These results indicate that, by reducing inefficiencies at the borders in South Asia, significant trade gains can be achieved.
    Weerahewa (2009 [P; OBS – quantitative data collection and analysis; →]): a primary research paper of moderate quality that uses an observational design (gravity model estimated using cross-sectional design supplemented by quantitative data analysis).

29. Wilmsmeier, G., Hoffmann, J. and Sánchez, R. (2006) 'The impact of port characteristics on international maritime transport costs', in Cullinane, K. and Talley, W. *Research in*

Transportation Economics, Volume 16: Port Economics: 117–140 (http://www.sciencedirect.com/science/journal/07398859/16).
The paper reports on the empirical results from maritime trade between seven importing and 16 exporting Latin American countries. The database used includes practically all maritime trade-in-containerisable-goods transactions on 105 intra-Latin American trade routes in the year 2002. It includes the main classical explanatory variables of maritime transport costs which previous research has shown to be relevant, such as unit cargo value, volume per transaction, geographical distance, bilateral trade volume, and trade balances. It further looks at six different port characteristics as possible additional determinants of international transport costs. The paper finds that port efficiency, port infrastructure, private sector participation and inter-port connectivity have significant impacts on international maritime transport costs.
Wilmsmeier et al. (2006 [P; OBS – quantitative data collection and analysis; ↑]): a primary research paper of high quality that uses an observational design (OLS regression estimated using cross-sectional design supplemented by quantitative data analysis).

30. Wilson, J., Mann, C. and Otsuki, T. (2003) 'Trade Facilitation and Economic Development: Measuring the Impact', *Policy Research Working Paper* 2988. Washington, DC: The World Bank (https://www.openknowledge.worldbank.org/bitstream/handle/10986/19158/multi0page.pdf?sequence=1).
Based on a gravity model exercise for Asia–Pacific Economic Cooperation (APEC) economies, the paper finds that enhanced port efficiency has a large and positive effect on trade. Improvements in customs significantly expand trade, but to a lesser degree than port improvements. If port efficiency and the customs environment in below-average APEC members were brought half-way to the initial APEC average, intra-APEC trade is estimated to increase by 11.5%. A 9.7% gain (US$117 billion) is expected from increased port efficiency and 1.8% (US$22 billion) from an improved customs environment.
Wilson et al. (2003 [P; OBS – quantitative data collection and analysis; ↑]): a primary research paper of high quality that uses an observational design (gravity model estimated using panel data design supplemented by quantitative data analysis).

31. Wilson, J., Mann, C. and Otsuki, T. (2004) 'Assessing the Potential Benefit of Trade Facilitation: A Global Perspective', *Policy Research Working Paper* 3224. Washington, DC: The World Bank (https://openknowledge.worldbank.org/bitstream/handle/10986/14733/wps3224TRADE.pdf?sequence=1).
This paper measures and estimates the relationship between trade facilitation and trade flows in manufactured goods in global trade in 2000–1, considering four categories: port efficiency, customs environment, regulatory environment, and service sector infrastructure. A gravity model is employed to estimate this relationship across 75 countries (30 developed and 45 developing). The results suggest that both imports and exports for a country and for the world will increase with improvements in these trade facilitation measures. The total gain in trade flow in manufacturing goods from trade facilitation improvements in all the four areas is estimated to be US$377 billion; all regions gain in imports and exports. Most regions gain more in terms of exports than imports, in large part through increasing exports to the OECD market. The most important ingredient in getting these gains, particularly to the OECD market, is the country's own trade facilitation efforts.

Wilson et al. (2004 [P; OBS – quantitative data collection and analysis; ↑]): a primary research paper of high quality that uses an observational design (gravity model estimated using panel data design supplemented by quantitative data analysis).

32. Wilson, J. and Otsuki, T. (2007) 'Regional Integration in South Asia: What Role for Trade Facilitation?', *Policy Research Working Paper* 4423. Washington, DC: The World Bank (https://openknowledge.worldbank.org/bitstream/handle/10986/7608/wps4423.pdf?sequence=1)
    The empirical analysis in this paper demonstrates gains to trade in the South Asia region from reform and capacity building in trade facilitation at the regional level. When considering intra-regional trade, if countries in South Asia raise capacity half-way to East Asia's average, trade is estimated to rise by US$2.6 billion. This is approximately 60% of total intra-regional trade in South Asia. Countries in the region also have a stake in the success of efforts to promote capacity building outside its borders. If South Asia and the rest of the world were to raise their levels of trade facilitation half-way to the East Asian average, the gains to the region would be estimated at US$36 billion. Out of those gains, about 87% would be generated from South Asia's own efforts (leaving the rest of the world unchanged). In summary, the paper finds that the South Asian region's expansion of trade can be substantially advanced with programmes of concrete action to address barriers to trade facilitation to advance regional goals.
    Wilson and Otsuki (2007 [P; OBS – quantitative data collection and analysis; →]): a primary research paper of moderate quality that uses an observational design (gravity model and simulation analysis).

33. World Economic Forum (2013) *Enabling Trade: Valuing Growth Opportunities*. Geneva: World Economic Forum (http://www3.weforum.org/docs/WEF_SCT_EnablingTrade_Report_2013.pdf).
    This report examines supply-chain barriers to international trade and concludes that they are far more significant impediments to trade than are tariffs. The report combines empirical macroeconomic analysis with a series of in-depth case studies on individual companies and industries. The report finds that reducing supply-chain barriers to trade could increase GDP by nearly 5% and trade by 15%. Reducing barriers benefits households by lowering prices and improving employment prospects. The effects of reducing barriers are not gradual; changes occur when tipping points are reached. Barriers are harder to overcome for smaller businesses. One key element of supply-chain barriers is heterogeneity in country policies, and even among agencies within any one country. Governments need to remove the sets of barriers relevant to their industries.
    World Economic Forum (2013 [S; OR; →]): a secondary research paper of moderate quality that uses both quantitative and qualitative (case studies) analysis.

34. Zaki, C. (2011) 'Assessing the global effect of trade facilitation: Evidence from the mirage model', *Working Paper* 659. Giza, Egypt: Economic Research Forum (http://www.erf.org.eg/CMS/uploads/pdf/659.pdf)
    This paper provides an attempt to model trade facilitation in a multi-regional and multi-sectoral CGE model, MIRAGE. Following Decreux and Fontagné (2009) in modelling trade facilitation, administrative barriers are assumed to be the tip of the iceberg in terms of cost. The paper extends their model using more accurate *ad-valorem* equivalents (AVEs) of red-tape costs, computed from a gravity model, and introduced in the CGE model. The novelty of these AVEs is that they take into account the effect of bureaucracy, internet coverage,

corruption and geographical barriers on the time to trade. The results show that, at the regional level, developing countries in Africa and Asia, especially sub-Saharan countries, the Middle East and North Africa, gain much more from trade facilitation than developed ones. They benefit from significant export diversification thanks to such a process. At the sectoral level, vegetables, textiles and electronics experience a more important expansion than other types of product, since they are more time sensitive. Finally, the effects of trade facilitation are much greater in the long-run than in the short run.

Zaki (2011 [P; OBS – quantitative data collection and analysis; →]): a primary research paper of moderate quality that uses an observational design (CGE and gravity model).

ANNEX 2: METHODOLOGY FOR EVIDENCE ASSESSMENT

SEARCH STRATEGY

ACADEMIC PUBLICATION SEARCH

Search conducted using the following key words: trade facilitation, aid for trade facilitation, customs procedures.

The following sites were used for searching for academic and empirical studies:

- Google scholar – http://scholar.google.com/;
- SSRN – http://papers.ssrn.com/sol3/DisplayAbstractSearch.cfm;
- Econbiz – http://www.econbiz.de/;
- EconPapers – http://econpapers.repec.org;
- Voxeu – http://www.voxeu.org/;.

DEVELOPMENT AGENCIES PUBLICATION SEARCH

United Nations Economic Commission for Africa (UNECA):

- Search word: trade facilitation;
- Search sites: http://www.uneca.org/publications.

United Nations Conference on Trade and Development (UNCTAD):

- Web-address: http://unctad.org/en/pages/publications/Trade-Facilitation---Technical-Note.aspx;
- We received relevant studies from trade facilitation experts at UNCTAD.

World Customs Organisation (WCO):

- Web-address: http://www.wcoomd.org/;
- No relevant studies found.

Organisation for Economic Cooperation and Development (OECD):

- Web-address: http://www.oecd.org/trade/facilitation/indicators.htm.

The World Bank:

- Key words: trade facilitation, Aid for Trade, Customs;
- Refined by:
  - Timeframe: 2005–15;
  - Topic: International economics and trade;
  - Theme: Trade and integration;
  - Document type: Working paper, Periodic Report/Review, Report.

Asian Development Bank (ADB):

- Web-address: http://www.adb.org/data/publications/search/topics/international-trade-and-finance?keywords=&page=1;

- Search topic: international trade and finance & evaluation;
- Refined by:
    - Subject: Economics; Industry and trade; Regional cooperation and integration; Customs;
    - Series: Economics Working Paper.

THINK-TANK PUBLICATION SEARCH

- Search site: Google scholar – http://scholar.google.com/; websites of think-tanks, research institutes and consultancies.
- Key words: trade facilitation, simplification of customs procedures.
- Search by reference to relevant publications (e.g. Commonwealth publications – *Assessing Aid for Trade Effectiveness* and *Regional Integration in South Asia*).
- Research networks.

RESEARCH NETWORK

We contacted our global research network to identify further relevant studies. We received feedback and relevant studies from the following:

- Mia Mikic, Chief, Trade Policy and Analysis Section, Trade and Investment Division, United Nations Economic and Social Commission for Asia and the Pacific, Bangkok.
- Miho Shirotori, Senior Economic Affairs Officer, Trade Analysis Branch/Division on International Trade, UNCTAD, Geneva.
- Jan Hoffmann, Chief, Trade Facilitation Section, Trade Logistics Branch, DTL, UNCTAD, Geneva.
- David Luke, Coordinator, African Trade Policy Centre, Regional Integration and Trade Division, UNECA, Addis Ababa.
- Mohammad Razzaque, Adviser and Head, International Trade Policy, Economic Policy Division, Commonwealth Secretariat, London.
- Liz Turner, Principal Consultant, Itad, UK.
- Jakob Engel, DPhil Candidate, Economic Geography, School of Geography and Environment, Wolfson College, University of Oxford.

CATEGORISATION OF STUDIES

We assessed the evidence by looking at the impact of trade facilitation/aid for trade facilitation on trade volumes and trade costs, distinguishing between:

- Type of trade facilitation reform: studies that examined specific trade facilitation reforms (e.g. customs procedures, trade logistics, e-business, port efficiency, etc.).
- Geographical area: studies that included geographic areas of focus (e.g. Africa, ASEAN, or cross-regional).
- Recipient-country income level: studies that examined trade facilitation in different country income groups (e.g. middle-income, low-income, and lower-middle-income countries).

ASSESSING AND DESCRIBING SINGLE STUDIES

This sub-section and the next have been adapted from DFID's *How to Note: Assessing the Strength of Evidence.*[6]

Table A1 describes how the research types and designs have been classified.

Table A1. Research types and designs

Research type	Research design
Primary (P)	Experimental (EXP) + state method used
	Quasi-experimental (QEX) + state method
	Observational (OBS) + state method used
Secondary (S)	Systematic review (SR)
	Other review (OR)

Table A2 describes the principles used to assess the quality of studies.

Table A2. Principles of high-quality studies

Principles of quality	Associated questions
Conceptual framing	Does the study acknowledge existing research?
	Does the study pose a research question or outline a hypothesis?
Transparency	What is the geography/context in which the study was conducted?
Appropriateness	Does the study identify a research design and method?
	Does the study demonstrate why the chosen design and method are well suited to the research question?
Cultural sensitivity	Does the study explicitly consider any context-specific cultural factors that may bias the analysis/findings?
Validity	To what extent is the study internally valid?
Reliability	To what extent are the measures used in the study internally reliable?
Cogency	To what extent does the author consider the study's limitations and/or alternative interpretations of the analysis?
	Are the conclusions clearly based on the study's results?

Table A3 presents the definitions of the different quality levels in the assessment of single studies.

Table A3. Quality descriptors

Study quality	Abbreviation	Definition
High	↑	Comprehensively addresses all principles of quality.
Moderate	→	Two or more principles of quality are met.
Low	↓	Less than two principles of quality are met.

DESCRIBING SINGLE STUDIES: EXAMPLES

- Jones (2005 [P; EXP; →]) means 'a 2005 primary research study by Jones, using an experimental research design, of moderate quality'.
- Smith (2004 [P; OBS, case study; ↑]) means 'a 2004 primary research study by Smith, using an observational design (case study), of high quality'.

[6] See: https://www.gov.uk/government/publications/how-to-note-assessing-the-strength-of-evidence.

ASSESSING AND DESCRIBING THE OVERALL STRENGTH OF THE BODY OF EVIDENCE

We used the following thresholds in describing the quality, size and consistency of the body of evidence.

Table A4. Quality of the body of evidence

Quality of the body of evidence	Definition
High	Many/the large majority of the single studies have been assessed as being of a high quality, demonstrating adherence to the principle of research quality.
Moderate	Of the single studies reviewed, approximately equal numbers are of a high, moderate and low quality, as assessed according to the principle of research quality.
Low	Many/the large majority of single studies reviewed have been assessed as being of low quality, showing significant deficiencies in adherence to the principle of quality.

Table A5. Size of the body of evidence

Size of the body of evidence	Threshold
Large	30 or more
Medium	11 to 29
Small	10 or fewer

Table A6. Consistency of the findings[7]

Consistency	Definition
Consistent	A range of studies point to identical or similar conclusions.
Inconsistent (contested)	One or more study/studies directly refutes or contest the findings of another study or studies carried out in the same context or under the same conditions.
Mixed	Studies based on a variety of different designs or methods, applied in a range of contexts, have produced results that contrast with those of another study.

DESCRIBING BODIES OF EVIDENCE: EXAMPLES

- 'There is a large (35 studies) body of high-quality, methodologically diverse global evidence relating to the efficacy of direct budget support in poverty reduction. The evidence consistently suggests significant positive effects.'
- 'There is a medium-sized (12 studies) body of moderate-quality evidence based on few designs and methods relating to the poverty reduction effects of empowerment and accountability initiatives in a specific context: [country X]. The findings of the evidence are inconsistent.'

[7] i.e. whether multiple studies derive the same or opposing conclusions, or whether multiple studies are not directly comparable.

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