WORLD TRADE
ORGANIZATION

Trade costs and inclusive growth

Case studies presented by WTO chair-holders

Edited by

Robert Teh
Maarten Smeets
Mustapha Sadni Jallab
Fatima Chaudhri

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World Trade Organization
Organisation Mondiale du Commerce
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Foreword by the WTO Director-General

Imagine if a government proposed that its poor citizens pay more than its rich citizens for food, clothing and other essentials. Such a proposal would be met with universal outrage. But the fact is that poor countries are in effect paying nearly twice as much as rich countries to bring goods to their markets.

Trade costs in developing countries are, on average, the equivalent of a 219 per cent import tariff. In other words, for each dollar it costs to make a product, it costs a further US$ 2.19 to bring it to consumers in developing countries. For high-income countries, this cost is more like US$ 1.34 – much lower than in developing countries but a substantial surcharge nevertheless. Cutting trade costs would therefore have a dramatic effect.

In late 2013, the world came together to take action on this issue by securing a landmark accord: the WTO's Trade Facilitation Agreement (TFA). The TFA aims to standardize and streamline customs processes and, by doing so, to reduce trade costs dramatically. This could boost global merchandise exports by up to US$ 1 trillion per year, with developing countries receiving the lion's share of these benefits, thereby supporting more inclusive trade growth around the world. This is a vital step, and it must be complemented by policies which help to spread the benefits of trade as widely as possible across different parts of the economy and society.

This publication compiles insightful research on the avenues that open up for developing countries when they reduce trade costs, including by ratifying and implementing the TFA. The contributions have been authored by academics affiliated with the WTO Chairs Programme (WCP). The programme was launched in 2010 to enhance knowledge and understanding of the trading system among academics and policy-makers in developing countries. Now in its second phase, the WCP has helped to promote teaching, research and public debate on trade issues.

In 2015, the Fifth Global Review of Aid for Trade was held in Geneva on the theme of "Reducing trade costs for inclusive sustainable growth". WTO Chairs were invited to provide contributions on the topic, and this book brings together the results of that initiative. Many interesting issues are discussed in these pages, such as the interaction between the TFA and regional integration schemes, and the role of the Aid for Trade initiative in helping developing countries reduce trade costs and achieve greater trade integration. The contributions also highlight a number of case studies that illustrate how trade facilitation policies have helped to attract more inward foreign direct investment flows, enhance export diversification, and complement other trade policy reforms.

The publication is therefore a valuable contribution to the literature on trade costs. Moreover, it underscores the success achieved by the WCP in enriching the trade debate by strengthening the relationship between academics and policy-makers. This is important not only to spark further interest in trade and WTO issues, but also so that we can continue to make trade work better, and for the benefit of all.

Roberto Azevêdo
Director-General

Note on the WTO Chairs Programme

The WTO Chairs Programme (WCP) was launched in 2010 as a capacity-building project. It aims to enhance knowledge and understanding of the trading system among academics and policy makers in developing countries through curriculum development, research and outreach activities by universities and research institutions. Information on the WCP is available at www.wto.org/wcp.

Following the conclusion of the first phase of the WCP (2010-2013), it was extended for a second period of four years in 2014. The chairs are selected through a competitive process. There are 19 active chairs in the WCP.

The programme provides financial support of up to CHF 50,000 per annum per institution for a period of up to four years to each newly selected chair. The WCP is funded by the Netherlands.

The current chair-holders are:

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Acknowledgements

Introduction

Robert Teh, Maarten Smeets, Mustapha Sadni Jallab and Fatima Chaudhri

1. Rationale and theme of this publication

The Fifth Global Review of Aid for Trade, conducted at the WTO headquarters in July 2015, focused on the theme "Reducing Trade Costs for Inclusive Sustainable Growth". The discussions confirmed that high trade costs act as a barrier to the integration of developing countries into the global economy. This is especially true for LDCs, landlocked developing countries and geographically remote, small economies. It is against this backdrop of the challenges and opportunities arising from the reduction of trade costs generally and implementation of the TFA in particular that this volume of contributions from WTO Chairs was prepared. The WTO Chairs programme (WCP) supports trade-related academic activities by universities and research institutions in developing and least-developed countries. Ten contributions from WTO Chairs were accepted for this volume.

There is a general consensus in the economic literature that trade and openness could be a powerful engine for economic growth (Busse and Koniger, 2012). International trade integration could also promote inclusive growth, but this link is more complex (World Bank, 2011). Increasing poor countries' integration into global markets is essential to their economic development and poverty reduction strategy. It gives them an opportunity to benefit from greater specialization, access to new technologies and economies of scale. Yet, one important obstacle to realizing this objective is high trade costs, which isolate poor economies from international markets. Current estimates suggest that trade costs are as high as 200 per cent in *ad valorem* tariff equivalent terms for lower-middle-income countries and more than 250 per cent for low-income countries (Arvis et al, 2013). While there are many policy sources of trade costs, including tariffs, technical barriers to trade, etc., inefficient trade procedures constitute a significant part of the trade costs.

The World Trade Organization (WTO), and the General Agreement on Tariffs and Trade (GATT) before it, have provided an invaluable forum for their members to negotiate changes in policies that reduce trade costs. WTO members have been able to cut applied most-favoured-nation tariffs to an average of 9 per cent, which

is nearly a third lower than what it was two decades ago. During the WTO's Ninth Ministerial Conference in Bali in 2013, WTO members were able to conclude a Trade Facilitation Agreement (TFA), which aims to expedite the movement, release and clearance of goods thereby further reducing the costs of trading across borders. Given the broad consensus on the benefits that can be derived from reducing trade costs and implementing the TFA, the authors in this volume analyse how this would affect countries in various regions. Particular attention is given to Africa and to Arab countries, and, not surprisingly, the studies find that the gains that can be obtained are large. Based on the conclusions reached in the contributions to this volume, it is essential to assist developing countries, and particularly the least developed amongst them, to lower trade costs through trade policy reforms and implementation of the TFA.

Trade capacity building is a key element of the WTO's mission and is of critical importance to achieve the main objectives of the Agreement. As is pointed out in some of the studies in this book, many WTO members, and particularly developing-country members, have long recognized the importance of cutting red tape at customs, improving efficiency and reducing unnecessary delays affecting cross-border commerce. However, they do not have the infrastructure or capacity to undertake these changes and need technical support and assistance.

This volume is structured as follows. Section I of the book discusses a number of countries' experiences with policy reforms and reduction of trade costs. Section II focuses on the role of the Aid for Trade initiative in helping developing countries implement trade facilitation reforms. Finally, the contributions in Section III analyse in depth the sectoral and macroeconomic impacts on a number of developing regions of implementing the TFA.

2. Impact of trade facilitation: review of the literature

Definitions of trade facilitation used in the academic literature vary and can be differentiated along at least two dimensions. Narrow definitions of trade facilitation only include improvements in administrative procedures at the border, while broader definitions embrace changes to behind-the-border measures as well. Some definitions of trade facilitation do not go beyond investments in soft infrastructure (i.e. intangible institutional aspects, such as transparency, customs management and the business environment), while other definitions encompass investments in hard infrastructure (i.e. tangible infrastructure, such as roads, ports, highways and telecommunications) as well (Portugal-Perez and Wilson, 2012).

In the WTO, according to the negotiating mandate adopted in August 2004, trade facilitation improves and clarifies GATT Articles V ("Freedom of Transit"), VIII ("Fees and Formalities connected with Importation and Exportation") and X ("Publication and Administration of Trade Regulations"), and introduces provisions on customs cooperation, aimed at "further expediting the movement, release and clearance of goods, including goods in transit".

As a consequence of the different definitions of trade facilitation, a wide range of trade facilitation indicators has also been developed. They include, among others, the World Bank's Ease of Doing Business indicators and Logistics Performance Index (LPI), the World Economic Forum's Enabling Trade Index (ETI) and the OECD's Trade Facilitation Indicators (TFIs). The Ease of Doing Business measures the effects of business regulation and the protection of property rights on businesses, especially on small and medium-sized domestic firms, including the costs related to standardized import and export activities (through the indicator "trading across borders"). The LPI measures the logistic friendliness of countries, ranking them according to customs, infrastructure, ease of arranging shipments, quality of logistics services, tracking, tracing and timeliness. The ETI assesses the extent to which economies have in place institutions, policies, infrastructure and services facilitating the flow of goods over borders and their destinations. The OECD's TFIs are constructed on the basis of the WTO TFA and enable almost every TFI to be mapped to a corresponding provision of the TFA.

Despite these differences, the various indicators are closely correlated with one another (WTO, 2015a). The contributors to this volume have mostly used the LPI and Ease of Doing Business as their preferred indicators of trade facilitation.

Methods used to analyse effect of trade facilitation

The economic literature on trade facilitation has employed two principal methods to estimate or simulate its economic impact: gravity and computable general equilibrium (CGE) models. Gravity models are econometric models of trade that use historical data to determine the effect of past policy on trade flows. However, they can be used after estimation to simulate the effect of policies "ex-ante" (or prospective analysis of policy changes before they occur), provided that these policies are implemented in comparable circumstances. Following Novy (2012), gravity equations can also be "inverted" to estimate trade costs as a function of policy and natural impediments to international trade. CGE models simulate or mimic the behaviour of actual economies in response to changes in relative prices, such that in equilibrium, consumers maximize their welfare and firms their profits, under the constraints imposed by the available resources and policies. They are also designed to provide "ex-ante" analysis of policy changes.

Each approach has its advantages and disadvantages and both have been used, sometimes in combination, in the economic literature on trade costs and trade facilitation. Both gravity and CGE models, and a mixture of both, have been employed by the contributors to this volume, although we also see the use of a dynamic vector autoregressive (VAR)[1] model in one of the chapters, which is yet another interesting way to assess the economic implication of trade policy reforms.

Reducing trade costs

The WTO estimates that the full implementation of TFA could reduce global trade costs by an average of 14.3 per cent (WTO, 2015). Trade costs in developing countries would fall by between 13-15 per cent, while trade costs in least-developed countries (LDCs) would be reduced by 17 per cent. Other studies produce similar estimates. Moise and Sorescu (2013) estimate that the reduction of trade costs could be in the range of 9.6 to 23.1 per cent and could average 14.5 per cent.[2] Using the latest data on the OECD TFIs, the OECD projects that the implementation of the TFA could reduce worldwide trade costs by between 12.5 per cent and 17.5 per cent (OECD, 2015). Countries which implement the TFA in full will reduce their trade costs by between 1.4 and 3.9 percentage points more than those that do only the minimum that the TFA requires. Low and lower-middle-income countries are likely to see the biggest reductions in trade costs.

Increasing trade and GDP

The bulk of the economic literature on the impact of trade facilitation and implementation of the TFA in particular has focused on its impact on trade and GDP. Table 1, reproduced from the WTO's 2015 World Trade Report (WTO, 2015a), provides a comprehensive listing of those studies. The range of trade and GDP gains produced by these studies is relatively wide — from less than US$ 100 billion (Hufbauer et al., 2010) to over a trillion dollars (Hufbauer and Schott, 2013; WTO, 2015a) — largely arising from the nature of the implementation scenarios being contemplated.

The more recent studies, particularly WTO (2015a), pay greater attention to the construction of implementation scenarios and give a better sense of the likely impacts. A study prepared by the Peterson Institute (Hufbauer and Schott, 2013) projects that implementation of the TFA could result in an increase of over US$ 1 trillion in world trade and GDP. According to the authors, the increase in total merchandise exports will mostly benefit developing countries, with a 9.9 per cent increase in their trade and a 4.5 per cent increase for developed countries. The findings by Hufbauer and Schott (2013) are in line with the WTO estimates, which are based on dynamic computable general equilibrium (CGE) simulations, showing

Table 1 Selected studies on the effect of trade facilitation on trade flows

Study	Model	Assumption	Variable	Developed	Developing	World
Decreux and Fontagné (2009)	CGE	50% reduction in AVE cost of time at the border, soft and hard infrastructure.	Export	n.a.	n.a.	+bUS$ 383
Iwanow and Kirkpatrick (2009)	Gravity	10% improvement in trade facilitation index.	Export (manufacturing)	n.a.	Africa: +6%	+2.1%
Hufbauer et al. (2010)	Other	Improve measures of customs and regulatory environment halfway to global average.	Export	+bUS$ 39.5	+bUS$ 47.3	+bUS$ 86.8
Decreux and Fontagné (2011)	CGE	50% reduction in AVE cost of time at the border, soft infrastructure.	Export	n.a.	n.a.	+bUS$ 359 (1.9%)
Dennis and Shepherd (2011)	Gravity	10% reduction in costs of (1) exporting (2) international transport and (3) market entry.	Export variety	n.a.	n.a.	(1) +3% (2) +4% (3) +1%
Hoekman and Nicita (2011)	Gravity	Improve trade facilitation to middle-income countries average.	Export / Import	n.a.	+17% / +13.5%	n.a. / n.a.
Portugal-Perez and Wilson (2012)	Gravity	Improve border and transport efficiency halfway to top performer in the region.	Export	Positive effect decreasing with income.	Chad: +17% Mongolia: +3% Kazakhstan: +23% Venezuela: +4%	Positive and significant
World Economic Forum (2013)	Gravity and CGE	Countries improve trade facilitation halfway to global best practice. Countries improve trade facilitation halfway to regional best practice.	Export	n.a.	n.a.	bUS$ 1,584 (14.5%) bUS$ 1,030 (9.4%)
Hufbauer and Schott (2013)	Gravity	Improve trade facilitation halfway to the region top performer in each category.	Export	+bUS$ 475 (4.5%)	+bUS$ 569 (+9.9%)	+bUS$ 1,043
Persson (2013)	Gravity	1% reduction in number of days needed to export.	Export variety	n.a.	n.a.	HG: +0.3% DG: +0.6%
Feenstra and Ma (2014)	Gravity	10% improvement in bilateral port efficiency.	Export variety	n.a.	n.a.	+1.5% to +3.4%
Zaki (2014)	Gravity and CGE (two steps)	50% reduction in AVE cost of time to import and export.	Export	EU: +10.6% US: +3.9% Japan: +2.1%	SSA: +22.3% Asia: +16.2% LAC: +16.2%	n.a.
Mevel et al. (2015)	CGE	25% reduction in AVE cost of time to import and export. Effect of trade facilitation post-CFTA implementation.	Export	EU: +bUS$ 164.5 US: +bUS$ 121.8	NA: +bUS$ 11.5 MENA: +bUS$36.4 RoA: +bUS$ 38.4	+bUS$ 1,224

Notes: AVE = *ad valorem* equivalent; CFTA = Continental Free Trade Area in Africa; DG = Differentiated good; HG = Homogeneous goods; LAC = Latin America and the Caribbean; NA = North Africa; RoA = Rest of Africa; MENA = Middle East and North African countries; SSA = Sub-Saharan Africa.

Source: WTO (2015a).

that export gains from the TFA could amount to US$ 750 billion, and perhaps even to well over US$ 1 trillion per annum, depending on the implementation time-frame and coverage. Developing countries' exports are expected to increase by US$ 730 billion per annum, so more than 70 per cent of the project expansion is expected to accrue to developing countries.

The WTO study also employs a gravity model to estimate the trade gains of TFA implementation which suggests that the benefits could even be far higher — up to US$ 3.6 trillion — depending on the extent to which the provision of the TFA are implemented. It also again confirms that the developing countries have the most to gain, as both exports and GDP will increase more than in developed countries.

Export diversification

Significant export diversification gains would result from reducing trade costs for developing countries, an important policy goal for many developing countries. Diversification helps to insulate them from adverse trade shocks in specific sectors or destination markets. Indeed, as shown by Ben Hammouda and Ali (2009), as well as by Dennis and Shepherd (2011), developing countries, and in particular African countries, can scale up their economies' growth by raising their total factor productivity through pursuing policies, such as trade facilitation reforms, that enhance diversification. Beverelli, Neumueller and Teh (2015) estimate that, with trade facilitation reform, sub-Saharan African countries could see an increase of up to 15.7 per cent in the number of products exported by destination and up to 34.9 per cent in the number of new markets by product. Countries in Latin America and the Caribbean could see an increase of up to 12.2 per cent in the number of products exported by destination and up to 26.9 per cent in the number of export destinations by product.

Increased participation in GVCs

Timeliness and predictability of delivery times are critical to the successful management of global value chains (GVCs). It will appear then that trade facilitation is particularly important for countries which wish to participate in GVCs. Using a gravity model with trade in machinery parts and components as a proxy for goods traded within GVCs, and using the World Bank's Logistics Performance Indicators, Saslavsky and Shepherd (2014) find that intra-GVC trade is about 50 per cent more sensitive to improvements in logistics performance than trade in other types of goods. Lanz and Piermartini (2016) find that countries with trade facilitation measures (better infrastructure, reduced time to export and timely delivery) and better institutions tend to specialize in value chains.

Greater involvement of SMEs in trade

There is growing evidence that improvements in trade and customs procedures – such as reducing delays and improving transparency – boost the participation of small and medium-sized enterprises (SMEs) in trade. Using the World Bank Enterprise Surveys database, Han and Piermartini (2016) find that micro, small and medium firms benefit more than large firms from reducing delays in exporting. They estimate that reducing export time for all firms to the median regional level can boost the share of SME exports by nearly 20 per cent, compared to 15 per cent for large firms. Fontagné, Orefice and Piermartini (2016) also find that improving information availability and introducing advance ruling and appeal procedures benefit small exporting firms relatively more than large exporting firms.

Attracting more foreign direct investment

Countries that reform their trade regimes to make them more open also tend to attract more foreign direct investment (FDI) (Edwards, 1990; Gastanaga, Nugent and Pahamova, 1998; Hausman and Fernández-Arias, 2000). By the same token, reforms that reduce trade costs, such as trade facilitation, should lead to greater FDI inflows to the reforming economy, although there is little empirical research on this so far. Engman (2005) uses case studies from several multinational companies to show how the facilitated cross-border movement of goods may have a positive effect on the ability of a country to attract foreign direct investment. Going beyond case studies, WTO (2015a) establishes a positive and statistically significant link between trade facilitation and inward FDI flows using data covering 141 countries over the period from 2004 to 2013.

Improving the collection of customs revenues and reducing corruption

Finally, trade facilitation can improve the collection of customs revenue. This is an important consideration for LDCs since customs collections make up a significant part of government revenues. This revenue enhancement effect can occur in at least three different ways: by increasing trade flows, improving traders' compliance, and helping to recover revenue losses from customs fraud. Engman (2005) documents twelve case studies of customs reform across the developing world which led to greater customs collections. Lesser and Moisé-Leeman (2009) show that simplifying customs procedures encourages compliance and increases the likelihood of duties being paid. The incentives to engage in fraudulent practices at the border are greater the longer the time needed to complete trade procedures. Since trade facilitation is expected to shorten the duration of these procedures, it creates an important avenue for reducing the incidence of trade-related corruption.

Cadot, Anson and Olarreaga (2006) show that the adoption of the Automated System for Customs Data (ASYCUDA) in a number of developing countries has generated a substantial reduction in tariff evasion.

Gaps in the literature and the contribution of this publication

Despite the growing literature on the trade facilitation, there are still notable gaps. They include:

- The methodological approaches, which have been confined to gravity and CGE models, or a mixture of the two; while there may be scope to employ other quantitative methods, access to reliable data could be a challenge.
- Many of the studies found in the literature have avoided detailed country-level analysis of the impact of trade facilitation in favour of an analysis of the global or regional impacts.
- Most of the attention has focused on the overall trade and GDP impacts of trade facilitation reforms, and far too little attention has been paid to what we believe are other positive benefits of trade facilitation, including export diversification, greater GVC participation, the possibility of moving from the informal to the formal sector, combined with taxation reforms, the insertion of SMEs into international trade, the attraction of more FDI, and better governance.
- Information on the cost of implementing trade facilitation reforms is limited because trade facilitation reforms are rarely carried out independently of other broader policy objectives and costs may vary depending on the type of trade facilitation measures considered. However, information on the amount and type of capacity building that implementing countries will need is crucial for donors.

The studies included in this publication go some way to filling these gaps; for example, on the methodological front, one of the studies uses a dynamic VAR approach to quantify the impact of trade facilitation reform rather than the conventional gravity and CGE frameworks. The volume includes national-level studies that examine the impact of trade facilitation reform on specific countries, thereby providing much more granular detail of the measures being put in place and the challenges encountered. One study examines how trade facilitation reforms can attract more FDI. There are also a number of contributions in this volume that look at how Aid for Trade can be utilized effectively to promote trade facilitation.

3. Policy reforms and the reduction of trade costs

As indicated earlier, trade liberalization and policy reforms fostering trade openness have long been linked to reduced trade costs, which, in turn, have resulted in higher

trade volumes. Many studies have demonstrated evidence of trade-related growth and its impact on poverty reduction. International mobility and division of labour have the power to alter the distribution of resources in domestic economies which could potentially have an impact on trade costs.

Trade openness has the potential to boost growth rates, increase consumer benefits, and increase and diversify exports, which are crucial for developing countries and which often suffer from being dependent on agricultural goods. Chapter 1 illustrates how improvements in trade facilitation measures have positive spillover effects on Kenya's FDI flows. The results of the study on the sample period between 2001 and 2012 suggest that the improvement in trade facilitation indicators have a positive effect on FDI flows. The chapter presents the relationship between the FDI and trade costs as well as of FDI in Kenya and neighbouring countries. Similarly, Edwards and Lawrence (2006) analysed the implications of trade liberalization on exports and their differentiation in South Africa. They stated that, when trade policies are reformed by eliminating the tariffs, import and export levels increase and the latter are diversified. The findings in Chapter 1 confirm the analysis conducted by Edwards and Lawrence (2006), using a gravity model to indicate that trade facilitation reforms have the potential to boost inward FDI and generate more growth.

In order to further decrease trade costs and improve the exporters' efficiency and welfare, Chapter 2 presents a Decision Support Model, which would enable South African exporters to choose from a pool of product-country combinations within the sub-Saharan region in order to diversify the exports and provide a much-needed boost for the sub-Saharan region as a whole. The model, aimed at policy-makers, could be a robust tool for reforming and enhancing the country's trade facilitation efforts. The Decision Support Model holds in developed economies as well, as shown in the case study by Cuyvers, Steenkamp and Viviers (2012). This contribution reinforces the view that export diversification is crucial in efficient resource allocation and consequently reducing trade costs and that the Decision Support Model is a helpful tool to do so. From a policy perspective, the authors indicate that the Decision Support Model stands out as a straightforward and relatively simple tool for governments to navigate their trade policy in accordance with other trade facilitation measures.

As for the consumers, the transmission channel of trade policy reforms that would be the most visible is the price channel. Trade policy reforms affect prices of all goods produced and consumed and domestically they act as a buffer between the international market and the domestic market. Giordiani, Rocha and Ruta (2014) investigate a link between trade policies and food prices. This study could be of particular interest to developing countries with lower incomes, as the percentage

of expenditure spent on food is generally higher than those of middle- or high-income households in developed countries, which can be explained by Engel's Law of a decrease in food expenditure as a household's income increases. Giordiani, Rocha and Ruta (2014) find that the government may use trade policy reforms in order to mitigate the effects of an exogenous food price shock, causing a multiplier effect that would spark off another round of trade policy interventions that distort the global food market.

Chapter 3 tackles the extent of a transmission of changes in tariffs and international prices to consumer prices in Tunisia from 2000 until 2008. Gouel and Jean (2013) argue that consumers' tendency to be risk-averse is to be blamed for the volatility in the food market, due to numerous trade-distorting measures. Such measures, elaborated in Chapter 3, lead to a low pass-through effect of changes in tariffs and international prices to consumer prices in the case of Tunisia. The authors of Chapter 3 conclude that, in order for Tunisia to reap the benefits of liberalized trade policy reforms, they need to be conducted in a stable macroeconomic environment with trade-supporting institutions. A similar conclusion was reached by Chang, Kaltani and Loayza (2008), who add a labour market flexibility factor in a Harris-Todaro model, the basic premise of which is the complementarity of economic reforms as the key to their effectiveness. Using the model, Chang, Kaltani and Loayza (2008) demonstrate how different fluctuations in the labour market interact with trade distortions, such as imposed tariffs. They conclude that the effect of trade liberalization on welfare and productive efficiency depends on the condition of the labour market. Nevertheless, Chang, Kaltani and Loayza (2008) agree with the premise that trade openness promotes efficient resource allocation. There is a plethora of evidence that suggests the link between trade, growth and poverty. The extent of the effect of trade policies is case-specific, due to a number of differences between developed and developing countries, resource endowment, population structure, capital or labour-intensive focus, export orientation, protectionist tendencies or income inequality within a country. A unified trade facilitation effort is one of the key elements in achieving a balanced multilateral trading system that has the power to increase a country's capacity to trade.

Chapter 4 indicates that, while the removal of the obstacles related to road transport quotas and transit permits is a pre-requirement to reducing trade costs, the core issues in this field rely more on how this removal can effectively take place. As per the World Bank (2014), the road transport quotas and transit permits impede the free circulation of goods covered by this custom union. From that perspective, Chapter 4 illustrates, by means of a case study, that multilateral commitments and disciplines are important because most transit operations require the involvement of various countries and thus necessitate a series of agreements on both bilateral and transit traffic rights. The author also discusses

the relation of the WTO's legal instruments to transit traffic and the freedom of transit. She shows how, in particular, Article V ("Freedom of Transit") of the GATT 1994 and the more recent Article 11 ("Freedom of Transit") of the TFA can come into play to liberalize trade in a more systemic and inclusive way. Furthermore, Magee (2016) proposes an industry-level analysis of trade flows to estimate the trade effects of Turkey's customs union with the European Community, and provide empirical evidence that this customs union has created more trade than it has diverted. One important element of his results is that, while the net effect is positive, the global impact of the customs union has been relatively modest compared to its potential. Therefore, reducing trade costs may have some important dynamic effects on both parties.

4. Aid for Trade as a catalyst for trade facilitation measures

At the WTO's Tenth Ministerial Conference, held in December 2015 in Nairobi, the WTO membership, represented by its ministers, "recognised the importance of the Aid for Trade initiative in supporting developing country members to build supply-side capacity and trade-related infrastructure and to give priority to LDCs needs" (WTO, 2015b). Since its inception in 2005, the Aid for Trade (AfT) Initiative has contributed to collect more resources, increasing AfT from around US$ 25 billion in the period 2002-05 to over US$ 54.8 billion in 2014.[3] AfT has contributed to reinforce trade policy into national development strategy, but results depend on national capacities to implement such trade policy reforms (Newfarmer, 2014).

Section II of this book illustrates how AfT measures could effectively support developing countries in reducing trade costs and ensuring better international trade integration. The various Global Reviews of Aid for Trade organized by the WTO[4] have shown that trade costs still matter and that many developing countries continue to face difficulties in connecting to global markets, either through supply-side constraints or market access challenges (WTO, 2015a). The AfT Work Programme for 2016-2017 underlines the necessity to further deepen the analysis of the supply-side capacity and trade-related infrastructure constraints faced by developing countries, with specific attention to be given to services and upgrading infrastructure. It also emphasizes the need to identify the positive implications that reducing trade costs could have for poverty reduction.

Chapter 5 provides an illustration of specific AfT measures taken when upgrading port infrastructures in Cotonou, Benin. The chapter illustrates the importance of identifying specific measures which may facilitate trade due to cost reduction and efficiency gains. This is particularly important because in 2014 the increase in trade in services represented 50.2 per cent of Benin's GDP (ADB, OECD, UNDP,

2015). Benin benefited in 2006 from the Millennium Challenge Account (MCA), a US Government initiative which, as indicated by the authors, is a series of strategic investments aimed at developing the country's physical and institutional infrastructure and increasing investment and private sector activity.

The main component of the MCA is the "Markets Project", which represents 61 per cent of the grants under the initiative. Basically, the function of this component is to promote markets access and to improve port operations. It also seeks to increase competitiveness, performance and port security through infrastructure modernization, management and institutional reforms of the systems in order to develop capacity through access to new technologies and to reduce transaction costs. The final objective is to reduce costs as well as times, but also to improve the quality of port operations.

Cadot et al. (2014) indicate that there is "a missing link" in the literature on AfT, as it does not analyse empirically the impact of AfT on trade performance. Chapter 5 contributes to filling this gap by providing a quantitative assessment of specific AfT measures on trade performance in Benin. The authors analyse the impact of MCA AfT support on efficiency gains in ports, as well as on trade volume. Empirical evidence confirms the positive effect of the AfT package of measures (with or without MCA support) on imports in Benin on the one hand, and the positive effect of the time and cost of import container treatment on the other. Empirical analysis also confirms an increase of import flows when MCA support is included in the estimation. In addition, the results confirm that MCA support contributes to lowering transaction costs due to better performances in the treatment of import containers characterized by fewer hours on the roads and days in dock for container vessels. The authors recommend a continuation of the port trade facilitation reforms of Cotonou, which guarantee its competitiveness and the positive implications for the region. The results obtained are in line with others findings, especially those of Königer, Busse and Hoekstra (2011), who show that AfT, and more specifically AfT facilitation measures, may lower trade costs and play an important role in helping developing countries to benefit from trading opportunities.

The case of Morocco, in Chapter 6, provides another convincing example of the potential role of AfT in trade facilitation, and more specifically in the reduction of trade costs and in improving trade performance. While there is still ongoing discussion regarding the importance of "hard" versus "soft" infrastructure (Cadot et al., 2014), the research from Morocco shows that both are important. In line with a previous study produced by the Moroccan WTO chair-holder in 2014,[5] the authors indicate that a rigorous needs assessment coupled with tailor-made AfT measures have positive implications on boosting trade flows, but also are a key

driver of regional integration and of the effective insertion of Morocco into regional and global value chains. More importantly, after presenting all reforms implemented by Morocco to reduce trading costs, the authors show that the implementation of such measures contributes not only to improving the macroeconomic environment, but also to the attractiveness of the country for private investment.

5. Sectoral and macroeconomic impacts of the Trade Facilitation Agreement on various regions

Section III outlines the various sectoral and macroeconomic impacts of the TFA on selected regions. There is evidence in the literature that the implementation of the TFA will have significant beneficial effects on the three regions analysed in Chapters 7-10 (i.e. Africa, the Arab region and Brazil), both at country and regional levels, thus offering important new economic opportunities for both trade and investment. In order to unlock the economic potential, the authors of the four chapters suggest that it is urgent that WTO members make the ratification of the TFA a priority and that they undertake the necessary legislative adjustments. The authors' findings closely match the evidence presented in the economic literature, which shows that not only will the TFA lead to a reduction in transaction costs, it is likely to generate new trade and investment flows, lead to upscaled production in terms of value addition, and facilitate developing countries' efforts to link to GVCs.

Chapter 7 investigates the impact of trade facilitation on trade flows for the case of a sample of 20 African economies over the time period 2007-2014. Importers and exporters in the African continent face more difficulties than anywhere else in the world. Based on a panel vector autoregressive framework, the authors find that trade facilitation enhances trade flows for the given sample of African countries. Empirical evidence indicates that a 1 per cent increase in trade facilitation contributes to 0.77 per cent increase in the trade flow. Such a finding tends to support the existing literature, which argues that improving trade facilitation measures in a country generates significant trade benefits to that economy (WTO, 2015a). Nonetheless, they point out that non-tariff barriers remain a major concern and have had a very significant negative impact on trade flows in the African region.

Economic growth, investment and regional trade agreements were also found to be ingredients of trade. The analysis within Chapter 7 supports a bi-causal and reinforcing relationship between trade facilitation and trade flows, and the level of development. A number of regional trade agreements in place are found to be factors that enhance trade facilitation. Interestingly, trade facilitation is also reported to have some positive effects on economic growth and the level of investment. The findings clearly highlight the fundamental importance of trade

facilitation in fostering trade. From a policy perspective, Chapter 7 concludes that it is crucial for African countries to prolong their endeavours to implement reforms geared towards reducing tariffs and, more importantly, geared towards the reduction and/or elimination of non-tariff measures which substantially add to trade costs.

Chapter 8 argues that over the last 20 years, the countries of the Arab region have liberalized trade through unilateral reform, multilateral negotiations and regional integration. The latter has involved the creation of a number of regional trade arrangements (RTAs), of which the most comprehensive in terms of product and country coverage has been the Greater Arab Free Trade Area (GAFTA). Unlike most recent RTAs, GAFTA has limited itself to goods liberalization and does not include trade facilitation provisions. A rigorous assessment of the trade facilitation performance of the Middle East and North African (MENA) countries is provided. Specifically, the welfare and sectoral effects of trade facilitation improvements within the context of regional trade integration are presented.

The main contribution is that the introduction of a trade facilitation provision in the GAFTA will lead to a significant welfare increase for all MENA sub-regions, compared to a scenario of further trade liberalization without trade facilitation. Trade facilitation in the GAFTA has the potential to enhance export competitiveness and lead to a significant increase in overall and intra-trade export value for all countries, particularly for the Mashreq and Maghreb countries.[6] All sub-regions would witness an export boost in the agro-food industries, particularly for those products in which the Mashreq and the Maghreb countries have a comparative advantage. The welfare-enhancing results indicate that the stakes for the MENA region in implementing the WTO TFA are high. However, many countries in the MENA region may face challenges in making trade facilitation reforms due to a lack of human and financial resources. As experience has shown that sequencing and prioritizing the areas of reforms can be a cost-effective way to implement trade facilitation projects, the MENA region could start reforms in areas which contribute most to trade cost reduction, such as automation, involvement of trade community and streamlining of trade procedures.

In the same vein, Chapter 9 tests the effects of trade facilitation on bilateral trade flows within the Arab region. The findings suggest that the performance of logistics systems in the Arab economies in general is still weak and needs to be improved, as indicated by the World Bank's LPI. Vast divergence and discrepancies among Arab countries, due to differences in income levels and geopolitical conditions, can be observed. Hence, while some Arab countries try to develop logistics activities to take advantage of opportunities and seek to establish regional logistics platforms,

others are not only ranked among the lowest in terms of the overall index, but are also at the bottom of the list for the different components of the LPI.

The estimations suggest that trade facilitation has positive impacts on intra-regional trade, but the scope is rather limited. An improvement in trade facilitation of the exporting country by 1 per cent increases trade flow by 0.70 per cent. This impact could be higher and reach more than 2 per cent when sensitivity analysis is included. An improvement in trade facilitation of the importing country of 1 per cent boosts imports by 0.66 per cent, suggesting that there are slight gains in trade from improving trade facilitation in Arab countries. Despite the fact that the overall impact is significant for both the exporting and the importing countries, its amount is relatively small compared with what previous research found regarding the same measures in other regions (WTO, 2015a). However, the study suggests that trade facilitation could potentially have a higher trade impact among Arab countries and other regions and underlines the importance of developing transport and physical infrastructure to enhancing regional integration and trade cooperation. Arab countries should benefit from their geography and stimulate investment in infrastructure, as well as encourage public-private partnerships. Efforts should be made to encourage member countries to fulfil commitments into which they have entered, and to also encourage other non-members to do so.

In fact, there is great potential for expanding trade with other regions, such as Europe, Asia and Africa. Thus, developing transport and physical infrastructure are fundamental prerequisites to enhancing regional integration and trade cooperation. Additionally, improving intra-Arab trade requires addressing the various structural issues impeding trade development, such as removing the remaining tariff barriers and full implementation of the commitments under the GAFTA. Finally, it is vital to enhance productive capacities in the region and to develop the financial sector in order to boost investment in the Arab region and to improve intra-Arab trade.

Chapter 10 confirms that the TFA is expected to have a significant impact on the Brazilian economy and more specifically on its transformation industry (parts and components trade). The study suggests that Brazil could reverse the ongoing deindustrialization process by reducing the share of primary products in its total exports. The results also suggest that this movement should be tied to the rise of imports of intermediates as a consequence of rising investment levels. More imports of parts and components may lead to an increase in the foreign content embedded in Brazil's exports, contributing to connecting its manufacturing sector to relevant GVCs. In order for the benefits to occur and to fully take advantage of the TFA provisions, the adoption of a single window system (a single entry point for traders to submit documentation and data required for imports, exports or transit of goods – the Brazilian system is called *Portal Único*) for exporters and importers is

of critical importance. The simulations conducted show that time is a relevant trade barrier; time costs are particularly damaging to trade in higher value-added goods. The reduction of delays at customs in Brazil thanks to the *Portal Único* is likely to unlock Brazilian economic potential because it would benefit primarily capital-intensive industries. Brazil would benefit from increased competitiveness in its exporting sector throughout the years. The authors calculate that once the *Portal Único* is fully implemented, in the longer term it could add nearly US$ 70 billion per year to Brazil's GDP; the implementation of the *Portal Único* would require significant changes to be made to Brazil's legislation, which are under consideration by the law-makers. The authors confirm the findings of empirical analyses, which are that reduction of transaction costs may have positive effects not only for Brazil, but for many other WTO members. This makes it even more urgent for all members to ratify the TFA and work towards its implementation.

6. The WTO Trade Facilitation Agreement and its implementation

A survey of WTO members conducted by the WTO Secretariat on the occasion of the Fifth Global Review of Aid for Trade in July 2015 showed that trade facilitation is a high priority for many developing countries and LDCs. At the same time, the survey showed that some developing countries and LDCs were uncertain about the benefits of implementing the TFA.

Our review of the economic literature on trade facilitation and the studies collected in this volume should lay to rest this uncertainty. The studies reveal that implementation of the TFA, and a reduction of trade costs in general, would provide a huge boost to trade, FDI, export diversification, participation in GVCs, and other important indicators of economic performance. Developing and least-developed WTO members should find plenty of useful lessons in these studies, authored by WTO chair-holders, as the research and conclusions drawn are firmly rooted in circumstances and challenges frequently encountered in the developing world.

An observation that arises in a number of these studies is that the principle of special and differential treatment (i.e. special treatment given to developing countries in WTO agreements) in the TFA goes beyond the granting of transition periods for implementing commitments. Instead, the extent and the timing of commitments by developing and least-developed members are tied to their implementation capacities. This means the readiness of the international community to provide capacity building to developing and least-developed members is key in determining how speedily and fully the provisions of the TFA are realized. This point is reinforced by the studies in this book that have shown how

AfT can and have played a catalytic role in making possible trade facilitation reforms.

As of the date of publication of this book, we are still short of the ratification threshold needed – two-thirds of the WTO membership – for the TFA to come into force, although the number of countries that have ratified has increased significantly in recent months. The studies in this book show how urgent it is for those members who have not yet done so to complete their ratification process as soon as possible so that the TFA may be implemented and the benefits harvested.

Finally, the work of academics on trade facilitation will not end with the implementation of the TFA. One of the core functions of the WTO is to monitor the implementation of WTO agreements. Under the provisions of the TFA, a Committee on Trade Facilitation will be established to review the operation and implementation of the TFA four years from its entry into force and periodically thereafter. Academics, and WTO chair-holders in particular, can assist and complement WTO members' monitoring efforts through their analysis and evaluation of the economic impact of the TFA. Among other things, the WTO chair-holders can contribute to the development of better indicators and analytical tools, as well as the collection of more data, so as to monitor and evaluate the TFA effectively. Given the quality of the contributions collected in this volume, we look forward to seeing them contribute in this fashion to the WTO's work in the future.

Endnotes

1.   The VAR is an econometric model generally used for the analysis of multivariate time series. It captures linear interdependencies among multiple time series. This methodology is frequently used to measure dynamic behaviour and to generate forecasts.

2.   See also OECD (2015).

3.   The global figure is extracted from the OECD aid for trade database, http://www.oecd.org/dac/aft/aid-for-tradestatisticalqueries.htm

4.   In 2007, 2009, 2011, 2013 and 2015 – see https://www.wto.org/english/tratop_e/devel_e/a4t_e/aid4trade_e.htm.

5.   Jansen, Sadni Jallab and Smeets (2014), Chapter 12.

6.   The Maghreb countries include Algeria, Libya, Morocco and Tunisia; the Mashreq countries include Egypt, Iraq, Jordan, the Lebanese Republic and the Syrian Arab Republic.

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I

Policy reforms and the reduction of trade costs

1 Trade facilitation and foreign direct investment flows in Kenya

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Tabitha Kiriti-Nganga**

Abstract

This chapter examines the effects of trade facilitation on foreign direct investment (FDI) in Kenya. Using bilateral FDI data for the period 2001–2012, a fixed effects Poisson pseudo maximum likelihood estimation of the gravity model was used in the analysis. The results indicate that improvements of indicators related to the business environment, the quality of port infrastructure, the number of days required for enforcement of contracts and the activities that improve logistics performance, are essential drivers of FDI flows in Kenya. Kenya should therefore enhance efforts to implement trade facilitation measures with a view to deepening integration in global trade and production networks, in order to increase FDI.

1.1 Introduction

Trade facilitation refers to the simplification, harmonization, standardization and modernization of trade procedures in terms of import and export processes (WTO, 2015a). It encompasses a wide range of activities involving the interface between business and government and which influence transaction costs. The definition is further extended to mean the improvement of transport infrastructure (i.e. transport facilitation), eradication of government corruption, reduction of customs tariffs and resolution of non-tariff trade barriers, and export marketing and promotion.

It is widely argued that countries that implement trade facilitation reforms and enhance trade efficiency and connectivity are generally expected to attract more foreign direct investment (FDI). This is an important source of financing development in host countries and positively contributes to generation of employment, tax revenues, exports and capital formation (UNCTAD, 2012). On the other hand, Zaki (2014) contends that trade facilitation includes five main elements: simplification of trade procedures and documentation; harmonization of trade practices and rules; more transparent information and procedures for international trade flows; recourse to new technologies to promote international trade; and more secured means of payment for international commerce.

According to the WTO (2013), trade facilitation involves trade procedures encompassing practices and formalities involved in collecting, presenting, communicating and processing data required for the movement of goods in international trade. In that regard, it is frequently referred to in supply chain security initiatives as Aid for Trade (AfT) and capacity-building initiatives (Grainger, 2008).

Trade across boundaries involves transaction costs. OECD (2001) classifies transaction costs into two forms: (i) direct costs or costs of compliance associated with collection and processing of information and charges for trade-related services, e.g. for freight, insurance and handling; and (ii) indirect costs or time-sensitive costs brought about by administrative processes and inventory charges. Other costs can be brought about by a lack of transparency or of uniformity in the interpretation of regulations and contracts, which increases the effective costs of producing the necessary trade and procedural information.

Kenya has been implementing a number of trade facilitation activities under various regional and international initiatives. This chapter attempts to quantify the potential impact of trade facilitation programmes on FDI flows into Kenya. Using a bilateral dataset on FDI flows, the gravity models of FDI featuring relevant trade costs and trade facilitation indicators are estimated.

Despite the increasing trend in FDI flows into Kenya in the recent past, the FDI stock remains very low. For instance, the FDI stock in 2014 was 7.2 per cent of GDP, whereas Tanzania's was 35.5 per cent and that of the East Africa Community (EAC) 24.7 per cent during the same year, despite the various incentives, including tax holidays, instituted by the Kenyan Government. In addition, the role of trade-related procedures, infrastructure and services needs to be investigated to gain a better understanding of the policy implications of trade facilitation measures being undertaken. This chapter attempts to fill this gap by running an empirical investigation on the effects of trade facilitation on FDI flows.

The main objective of the chapter is to investigate the effects of trade facilitation measures on FDI flows into Kenya by reviewing the implementation of trade facilitation measures and FDI flows into Kenya, evaluating the effects of trade costs and trade facilitation indicators on FDI flows into Kenya, and thereafter suggesting appropriate policy implications.

1.2 Perspectives on trade facilitation and FDI

Portugal-Perez and Wilson (2010) define trade facilitation as measures that can be undertaken along two dimensions: a "hard" dimension related to tangible infrastructure, such as roads, ports, highways and telecommunications, and a "soft" dimension related to transparency, customs management, the business environment, and other institutional aspects that are intangible. Persson (2013) argues that trade facilitation refers to making it easier for traders to move goods across borders by making cumbersome cross-border trade procedures more efficient.

According to the WTO (2015a), trade facilitation can be viewed in two other dimensions: the broad or narrow, and soft or hard infrastructure. With regard to the former, the narrow definition focuses on improving administrative procedures at the border while the broad definition focuses on behind-the-border measures such as technical barriers to trade. Some definitions of trade facilitation concentrate on improvements in trade procedures that do not require investment in physical infrastructure, although investment in better information technology for customs is included in this definition. However, other definitions of trade facilitation include investment in hard infrastructure, such as ports, railways and roads, as well as in information and communications technology (ICT).

As mentioned earlier, trade involves transaction costs. WTO members negotiated the WTO Agreement on Trade Facilitation (TFA), which is expected to ease trade costs globally, and the TFA was adopted in 2014. It includes a set of measures for

expeditiously moving goods across international borders using best practices from around the world. The TFA states that assistance and support should be provided to help countries achieve that capacity. It is expected to reduce total trade costs by more than 14 per cent for low-income countries, more than 15 per cent for lower-middle-income countries, and more than 13 per cent for upper-middle-income countries.

The Trade Facilitation Agreement Facility (TFAF) was created to help developing countries and least-developed countries (LDCs) implement the TFA (WTO, 2015a). The Facility acts as a focal point for implementation and aims to support developing countries and LDCs by:

- Helping them to assess their capacity to implement the TFA and their needs for assistance to implement particular provisions of the Agreement;
- Maintaining an information-sharing platform to assist with the identification of possible donors;
- Providing guidance on the implementation of the TFA through the development or collection of case studies and training materials;
- Undertaking donor and recipient match-making activities;
- Providing project preparation grants in cases where a member has identified a potential donor but has been unable to develop a project for their consideration, and is unable to find funding from other sources to support the preparation of a project proposal;
- Providing project implementation grants (limited to soft infrastructure projects, such as modernization of customs laws through consulting services, in-country workshops or training of officials) related to the implementation of TFA provisions in cases where efforts to attract funding from other sources have failed;
- Complementing efforts by regional and multilateral agencies, bilateral donors and other stakeholders to provide trade-facilitation-related technical assistance and capacity-building support.

Overall, trade facilitation seeks to remedy trade transaction costs. It recognizes that transaction costs are wasteful and undesirable for both business and government. Proponents of trade facilitation argue that its principles can increase business competitiveness, improve efficiency and control and promote investments, both foreign and domestic.

FDI is the process whereby residents of one country acquire ownership of assets for the purpose of controlling the production, distribution and other activities of a firm in another country (UNCTAD , 2013). Investments are made to acquire lasting interest in enterprises operating outside the economy of the investor. There are at

least three major types of FDI: horizontal, vertical and conglomerate. The mode of entry can be through greenfield investment or through mergers and acquisitions. Horizontal FDI occurs when a company investment is made for the purpose of conducting similar business operations in another country. It usually serves the local and regional market and involves the replication of production facilities in the host country in order to avoid trade costs associated with entering new markets. Horizontal FDI is also referred to as "tariff-jumping" or "export-substitution" FDI. The latter is mainly driven by market size and market growth of the host economy. Due to market and income considerations, FDI in small and poor countries is unlikely to be of the horizontal type (Lim, 2001).

Vertical FDI is the expansion of a firm into a stage of the production process other than that of the original business. It is usually undertaken by firms looking for cheaper factor prices in other countries and usually flows from rich to poor countries and sometimes between developed countries.

Conglomerate FDI is where an unrelated business is added abroad. This is the most unusual form of FDI as it involves attempting to overcome two barriers simultaneously – entering both a foreign country and a new industry.

Greenfield FDI entry implies assembling all the elements from scratch. They are the primary targets of a host nation's promotional efforts. On the other hand, mergers and acquisitions occur when the control of assets and operations is transferred from a local to a foreign company, with that local company becoming an affiliate of the foreign company.

According to Franco, Rentocchini and Marzetti (2008), there are four types of motivation attributed to FDI:

▪ Resource-seeking, where the main aim is to acquire certain types of resources that are not available at home (e.g. natural resources, such as oil and gas or raw materials) or are available at a lower cost (such as unskilled labour that is offered at a cheaper price than in the home country). This would lead a firm to relocate parts of the production chain to the host country and it is often export-oriented;
▪ Market-seeking, where an FDI investor invests in a foreign country to exploit the possibilities granted by markets of greater dimensions;
▪ Efficiency-seeking, where a firm wants to take advantage of differences in the availability and costs of traditional factor endowments in different countries, or to take advantage of economies of scale and scope and of differences in consumer tastes and supply capabilities. Investing firms gain from common governance of geographically dispersed activities in the presence of

economies of scale and scope. The idea here is to take advantage of special features such as labour costs, skills of the labour force and quality of infrastructure (Abala, 2014);

▪ Strategic asset-seeking, where the purpose of the investment is to acquire and complement a new technological base rather than exploit the existing assets.

Duval and Utoktham (2014) argue that countries that implement the TFA are expected to attract more FDI. Trade facilitation is one way of attracting more FDI, especially FDI related to international production networks and which requires low transaction costs between members of the network. Hence, trade facilitation is quite often promoted to reduce transaction costs and attract FDI, especially that connected with international and/or regional production networks.

1.3 Relationship between FDI and trade facilitation

Firms pursuing international business opportunities consider several factors regarding investment decisions, including but not limited to exchange rates, domestic taxes, quality of institutions and trade protectionism. It is notable that most previous studies do not include trade costs and trade facilitation indicators, particularly those on developing countries, due to measurement problems. However, recent empirical studies, e.g. Duval and Utoktham (2014) support the notion that trade facilitation is a core component of any FDI development strategy and provides further evidence of the benefits associated with enhancing trade efficiency. In fact, Carr, Markusen and Maskus (2001) clearly suggest the need to capture links between FDI and trade-related procedures, infrastructure and services.

For practical purposes, in this chapter, FDI is defined as when an investor from one country obtains a controlling interest in a (new or existing) firm in another country, and then operates that firm as a part of its multinational business. FDI may be financed through a parent company transfer of funds to the new affiliate, borrowing from home-country lenders, borrowing in the host country by the parent company, or any combination of these strategies. A foreign investor is considered to have control over a firm when they have 10 per cent of shares or voting power in the enterprise (or the equivalent in an unincorporated firm). FDI also pertains to investments in infrastructure, equipment and/or organizations that allow the foreign investor to influence the management of the firm.

The relationship between trade facilitation and FDI is complex (OECD, 2005). A country's FDI flows may change through its own trade facilitation reforms and also due to its multi-dimensionality. A growing number of studies have emphasized the

complementary relationship between trade and investment, suggesting that reductions in inefficient trade procedures may also be an effective policy for attracting FDI. Inefficient import and export procedures give rise to direct costs to trading firms because such firms will have to devote resources to complying with the procedures rather than to directly productive activities.

However, there are also large indirect costs involved because of the delays that are the result of unnecessarily complex procedures. These costs may arise in several ways. The most straightforward reason is that there may be depreciation costs, either because products quickly lose their market value (e.g. as a consequence of fashion or advances in technology) or in terms of physical depreciation. Delays also increase costs for international traders because companies have to keep goods in store instead of quickly shipping them out. Long delays are also associated with increased uncertainty about delivery times, which means that companies are unable to take advantage of business and export opportunities and unable to use modern just-in-time production techniques.

According to WTO (2015a), the effect of trade facilitation on FDI is ambiguous on a theoretical basis. This follows the motivations for FDI and the relationships between horizontal and vertical FDI and trade. Horizontal FDI is designed to serve foreign customers and can be viewed as a substitute for exports. This type of FDI is affected by factors such as market size and trade costs, whereby higher transport costs or trade barriers increase the incentives for the multinational firm to choose FDI over export as a mode to reach foreign markets. Thus, in such a case, inefficient trade procedures would increase the probability of the firm choosing FDI over exports, while trade facilitation would have the opposite effect.

On the other hand, vertical FDI stems from reasons of comparative advantage, where stages of production are located in different countries based on where they can be performed at lowest cost. This will probably be accompanied by trade in both intermediate and final goods between the parent company and its foreign affiliates. Thus, trade and FDI can, in this case, be seen as complementary activities. Similarly, export-platform FDIs are also expected to be positively associated with trade. In these cases, the existence of efficient and predictable procedures at the border should have a positive effect on FDI.

1.4 Literature review

The literature on trade and FDI is vast, ranging from studies about the relationship between FDI and trade as complements or substitutes (Swenson, 2004) to studies examining the factors affecting a firm's decision to engage in FDI rather than export

(Helpman, Melitz and Yeaple, 2004; Markusen and Venables, 2005). However, the empirical literature on FDI and trade facilitation is rather scarce, especially for developing countries such as Kenya.

The link between FDI and trade is firmly established in economic literature. Casson (1990), for example, has suggested that FDI is a "logical intersection" of the theory of international capital markets, the theory of the firm and trade theory. Singh and Jun (1995) and Tanaka (2006) suggest that firms might conduct FDI for the specific purpose of "tariff-hopping" and avoiding trade costs, suggesting that trade issues have significant sway when firms make investment decisions. From a policy-making perspective, however, the identification of factors attracting FDI is particularly relevant.

Nyamwange (2009) studied the key factors that influence FDI decisions in Kenya and explored the empirical relationship between FDI and economic growth in Kenya. This study reveals that the main determinants of FDI in Kenya are market size, taxation, stable macroeconomic policies and a level of human capital that is tolerable for investors. On the other hand, Kinaro (2006) found that FDI in Kenya is determined by economic openness, taxation, human capital, real exchange, inflation and FDI in previous periods. The author also found that variables such as government consumption, financial development, natural resources, wages and political rights were insignificant in explaining FDI.

Dollar, Hallward-Driemeier and Mengistae (2004) investigated the relationship between investment climate and international integration using a probit model.[1] Based on survey results from 7,302 companies in eight developing economies (Bangladesh, Brazil, China, Honduras, India, Nicaragua, Pakistan, and Peru), the authors conclude that efficiency of customs administration is a key determinant of foreign investment.

Eifert and Ramachandran (2004) estimated that if the number of days required to clear customs were halved in Ethiopia, average firm-level productivity would increase by 18 per cent. Moreover, the authors argue that the returns to effective customs reform in more inefficient countries are substantial and have significant potential to raise investment attractiveness.

Engman (2005) examined the economic impact of trade facilitation on trade flows, government revenue and FDI and reviewed recent quantitative work on border-related trade transaction costs over a 15-year period. The study established that inefficient border procedures negatively affect a country's ability to attract FDI because of the resulting costs and risks of doing business.

Chimilila, Sabuni and Benjamin (2014) looked into the impacts of trade facilitation in the EAC. Using descriptive research methods, the study found that implementation of trade facilitation initiatives has improved trade performance, FDI inflows and trade taxes collection in all EAC countries. However, Tanzania performed better than other EAC countries in terms of FDI inflows and contribution of exports to GDP. Besides, whereas the study found a significant positive relationship between countries' trade facilitation and export performance, trade facilitation was found to have no significant relationship with FDI flows.

The internationalization of production through global value chains (GVCs), which allows firms to join international production networks rather than having to build their own from scratch, highlights the need for countries to have an open, predictable and transparent trade and investment regime, in terms of tariffs, non-tariff barriers and other restrictive measures that affect not only foreign suppliers but also domestic producers. Many of the costs that affect the smooth connection of various parts of the chain most often transcend national borders. Trade facilitation is an important determinant of GVC participation. With goods crossing borders multiple times as a result of enhanced GVC activity, trade facilitation has become central to the smooth functioning of GVCs (OECD, 2015).

Time is a critical factor in the operation of GVCs. In 2013, the Fourth Global Review of Aid for Trade pointed to customs procedures, transportation costs and delays as the biggest factors blocking developing countries from integrating value chains (OECD and WTO, 2013). In sub-Saharan Africa, too, remoteness is a critical factor that impedes further GVC participation (OECD, 2015). Furthermore, the cost of trading across borders in Africa is substantially higher than in other regions: according to the World Bank's Doing Business indicators, in sub-Saharan Africa it takes an average of 159.6 hours to import and 108.3 hours to export goods across borders compared to 15.2 and 59.3 hours, respectively in OECD high income countries (World Bank, 2016).

In Kenya, several studies on the determinants of FDI have been carried out. Njoroge and Okech (2011) assessed the factors that affect FDI inflow in Kenya's horticultural industry. The study attributed low foreign investments in the horticultural sub-sector to poor infrastructure, especially the road network and telecommunications. In addition, a cumbersome regulatory framework, subject to a bureaucratic screening and approval system, erratic weather conditions, unfair investment policy requirements for foreign investors, unfavourable labour laws and trade union activities, an inadequate policy framework for fair competition, and stringent import requirements in the EU market, constrained increased FDI flows into Kenya.

Using the Johansen co-integration technique, Kinaro (2006) established that economic openness and human capital affect FDI positively in the short run. Likewise, inflation and real exchange rates have a negative influence on FDI inflows in the short and long run, respectively. Looking at the drivers of economic growth and FDI in Kenya, Abala (2014) indicates that FDI in Kenya is mainly market-seeking and that investments require a growing GDP, political stability, good infrastructure and a sizeable market, as well as a reduction in corruption levels.

1.5 Overview of trade facilitation and FDI in Kenya

Kenya has been undertaking an integrated and comprehensive approach aimed at improving its trade facilitation systems. The priority programmes of trade facilitation focus on addressing transport logistics and improving regional transit procedures; improving information technology in customs, Kenya Ports Authority (KPA), Kenya Bureau of Standards (KEBS), Kenya Plant Health Inspectorate Service (KEPHIS) and among exporters and importers; improving the institutional and human capacity of all relevant public and private agencies; and the introduction of a data interchange information system linking all parties involved in trade facilitation.

The implementation of trade facilitation is carried out within national programmes under the Vision 2030 framework, as well as regional integration frameworks, i.e. under the EAC and Common Market for Eastern and Southern Africa (COMESA) integration initiatives. Kenya ratified the TFA in 2015 as evidence of its commitment to reducing trade costs both internally and in regional and external markets. The TFA contains provisions that aim to expedite the movement, release and clearance of goods, including goods in transit. It also sets out measures for effective cooperation between customs and other appropriate authorities on trade facilitation and customs compliance issues. Further, it contains provisions for technical assistance and capacity-building in this area.

According to the OECD (2013), Kenya performs better than most sub-Saharan African and low-income countries in the areas of harmonization and simplification of documents, automation, streamlining of procedures and external border agency co-operation. However, Kenya's performance in involvement of the trade community, fees and charges, and internal border agency cooperation is below that of sub-Saharan African and lower-income countries. In World Bank (2015), Kenya is ranked 136th of 189 economies in the aggregate ease of doing business, and third in the EAC region (after Rwanda, ranked 46 and Tanzania, ranked 131). However, it is the best regional performer in terms of the number of procedures involved in dealing with construction permits, getting electricity connected and protection of minority investors.

A key trade project with a regional dimension is the Improvement of the Port of Mombasa under the regional framework of the Northern Corridor Transit and Transport Coordination Authority (NCTTCA). The Northern Corridor is the transport corridor linking the landlocked countries of Burundi, Rwanda and Uganda with Kenya's maritime port of Mombasa. Similarly, the Northern Corridor serves the eastern part of the Democratic Republic of Congo, southern Sudan and northern Tanzania. In addition, the establishment of the Single Customs Territory (SCT), which encompasses three pillars (free circulation of goods, a revenue management system and legal and institutional framework), has significantly reduced the duration and cost of clearance of cargo. For instance, the time for clearance of cargo destined for Kigali has dropped from 21 to six days since the launch of the SCT in 2014, according to the Rwanda Revenue Authority. In addition, the average dwell time for cargo inside the port has been substantially reduced over the past five years. For instance, transit time between the port gate and Malaba stands at 3.4 days, compared with 12 days in 2008 for most transit traffic (CPCS Transcom International Limited, 2015). Transportation logistics costs have also been reduced, as shown in Table 1.1.

Whereas investments in trade facilitation are largely driven by the need to enhance trade flows, its impacts on FDI flows are equally being recognized, given the complementarity between trade and investments. Indeed, since independence, Kenya has undertaken important reforms to promote domestic and foreign investments through various policies, strategies and regulations. These include liberalization measures such as the removal of controls on prices and foreign exchange rates in the 1980s, the elimination of unnecessary licences and simplification of existing ones, and the provision of incentive schemes, including manufacturing under bond, export processing zones, the duty remission scheme, zero-rating of capital goods and raw materials and repatriation of profits, etc. The

Table 1.1 Trends in transport costs of TEU* along the Northern Corridor from Mombasa

	Destination					
	Bujumbura (US$ million)	Goma (US$ million)	Juba (US$ million)	Kampala (US$ million)	Kigali (US$ million)	Nairobi (US$ million)
2011	8,000	9,500	9,800	3,400	6,500	1,300
2014	6,500	7,000	4,700	2,900	4,800	1,045
% change	-19	-26	-23	-9	-26	-20

Note: * TEU (twenty-foot-equivalent unit) refers to a unit of cargo capacity.
Source: CPCS Transcom International Limited (2015).

pinnacle of the government's efforts was the establishment of the Kenya Investment Authority (KIA) as the statutory body charged with the responsibility of promoting and facilitating investment. The Authority provides a "one-stop-shop" to help investors acquire the requisite licenses, permits, incentives and other available services.

Despite these efforts, FDI flows into Kenya have remained stagnant for a long time. The trend of FDI stock and flows in Kenya is presented in Figure 1.1. The data show that, historically, FDI flows into Kenya have been stagnant and only began rising in the recent past. FDI remained stagnant between 2000 and 2006 and increased in 2007, partly due to improvements in governance following changes in political regimes.

However, growth was short-lived until a gradual increase after 2012. Previous studies attribute the inability of Kenya to attract FDI to macroeconomic instability, corruption, inconsistencies in economic policies and regulations, deteriorating public service and infrastructure (Abala, 2014). Other studies, including Kinaro (2006) and Opolot, Mutenyo and Kalio (2008), indicate that the relatively small market size, low economic growth, lack of policy transparency and rising costs of electricity and labour are the root causes of low investments. In summary, some of the reasons why Kenya's FDI has been lower than that in other EAC members in the past could be due to perceived political instability, high levels of insecurity, the high cost of doing business and bureaucratic red tape, the high cost of electricity and other utilities, high corruption levels, and so on.

Figure 1.1 Kenya's FDI inflow and stock, 2000–2014
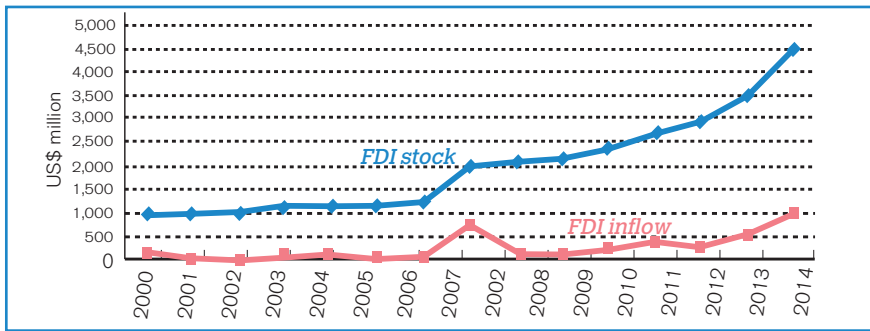
Source: UNCTAD FDI/TNC database (http://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=96740), accessed on 20 February 2016.

The latest rise in investments is largely attributed to large infrastructure projects being undertaken by the government within the aspirations of the Vision 2030 framework. The trend is expected to continue, especially following the recent discovery of oil, gas, rare earth minerals and coal in various parts of the country.

A comparison of FDI flows in the EAC (Figure 1.2) indicates that Kenya's FDI remains behind that of neighbouring Tanzania and Uganda, although investment levels have increased in recent years, from US$ 339 million in 2009 to an estimated US$ 989 million in 2014 (UNCTAD, 2015a). FDI in the rest of the EAC countries has also boosted FDI flows from Kenya, yet the reverse does not occur. According to the UNCTAD FDI/TNC (i.e. transnational corporations) database, FDI outflows from Kenya in 2011 to Uganda, Tanzania and Rwanda were US$ 173 million, US$ 98 million and US$ 67 million, respectively. In Tanzania, the top FDI sources were the United Kingdom (23 per cent), India and Kenya (15 per cent each), the Netherlands, China and the United States (10 per cent each), South Africa (7 per cent), Canada (5 per cent) and Germany (3 per cent). Uganda's FDI inflows are largely driven by investor interests in mining exploration and manufacturing. In Rwanda, the financial services, mining and telecom sectors attracted the highest amount of FDI in the recent past. Besides, Kenya topped the list of the countries of origin of Rwanda's foreign capital inflows, at US$ 66.7 million in 2012, followed by Switzerland (US$ 47.1 million) and South Africa (US$ 46.4 million).

Figure 1.2 FDI inflows in the EAC region, 2000–2014

Table 1.2 Types of investment flows into Kenya

	2005–2007 (US$ million)	2012 (US$ million)	2013 (US$ million)	2014 (US$ million)
Cross-border mergers and acquisitions	146	86	103	1
Greenfield investments	250	1,017	3,635	2,305

Source: UNCTAD (2015a).

The types of investment inflows into Kenya are presented in Table 1.2. It is notable that greenfield investments constitute the bulk of FDI flows into Kenya, rather than cross-border mergers and acquisitions. Key investments in Kenya are mainly in oil and gas exploration, industrial production and transport. Greater focus is also being given to expansion of power generation, to serve as a platform of economic growth and firmly set up the country as a favoured regional hub for energy, services and manufacturing over the next decade.

1.6 Conceptual framework and methodology

Conceptual framework

The link between trade and investment is illustrated by the complementarities and interdependence between them. According to UNCTAD (2015b), trade facilitation measures positively affect export-oriented investment and investments that benefit from facilitated imports. Equally, investment facilitation measures such as creating a conducive business environment will have positive effects on exports by attracting export-oriented investment that results in the build-up of critical productive capacities. This circle is presented in Figure 1.3, which shows how targeted interventions in trade and investment can help build productive capacities.

Trade facilitation enhances domestic and external trade flows, leading to greater integration into wider productive networks and value chains. Value chains trigger development in productive capacities, depending on the nature and availability of markets. The changes in investment flows in turn increase or otherwise affect production capacities. Productive capacities for trade constitute three pillars: (i) productive resources (infrastructure and productive assets); (ii) linkages with markets; and (iii) capabilities, i.e. skills, entrepreneurship and technology. Changes in productive capacities for trade influence the nature and intensity of trade and the cycle of trade facilitation and investment.

Figure 1.3 Linking trade facilitation and investment
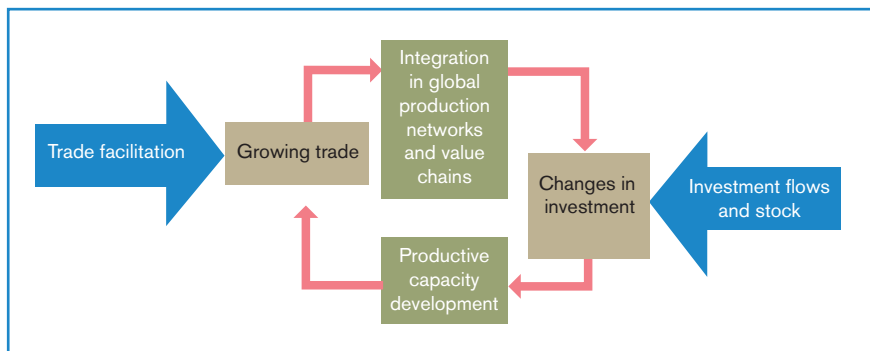
Source: Adapted from UNCTAD (2015b).

Empirical model

A macroeconomic approach to FDI is used as the empirical framework for this study. Specifically, the gravity model is used to evaluate the significance of trade facilitation factors on FDI and to examine the importance of these factors. The core idea behind the gravity model of trade is the notion that trade is determined by the economic size of the countries involved as well as the physical distance between them. Pioneered by Tinbergen (1962), the gravity equation for trade states that the trade flow from country *i* to country *j*, denoted by T_{ij}, is proportional to the product of the two countries' GDP, denoted by Y_i and Y_j and inversely proportional to their distance, D_{ij}, and *Fij,* broadly construed to include all factors that might create trade resistance, as indicated in equation (1). In its simplest form, the model is specified as:

$$T_{ij} = \alpha_0 Y_i^{\alpha_1} Y_j^{\alpha_2} D_{ij}^{\alpha_3} F_{ij}^{\alpha_4} \qquad (1)$$

where α_0, α_1, α_2, α_3 and α_4 are unknown parameters.

We follow the previous studies and employ the gravity framework. The baseline model to be estimated is as presented in equation (2):

$$FDI_{ijt} = \beta_1(GDPC_{it}) + \beta_2 \ln(GDPC_{jt}) + \beta_3 \ln(Dist_{ij}) + \beta_4 \ln(Comlang_{ij}) + \beta_5(Border_{ij}) + \varepsilon_{ijt} \qquad (2)$$

where:

FDI_{ijt} is the flow of FDI from the investing country *i* to the hosting country *j* in year *t*;

$GDPC_{it}$ is the GDP per capita of country *i* at time *t*;

$GDPC_{jt}$ is the GDP per capita of country j at time t;

$Dist_{ij}$ is the distance in kilometres between the two countries;

$Comlang_{ij}$ represents the presence of a common language between the source and host country. It takes a value of 1 if they share a common language and 0 if they do not;

$Border_{ij}$ takes the value of 1 if the two countries share a common border and 0 if they do not;

ε_{ijt} is the error term.

FDI depends on the extent to which cheaper factors of production can be accessed overseas and also the relative ease with which intermediate goods can be moved in and out of the countries where they are being processed before being assembled into final goods. Thus, transaction costs across borders can be expected to be crucial determinants of FDI in this context. The empirical model specified in equation (2) is modified by incorporating various trade cost components, including tariff and trade facilitation related indicators:

$$FDI_{ijt} = \beta_1 (GDPC_{it}) + \beta_2 \ln(GDPC_{jt}) + \beta_3 \ln(Dist_{ij}) + \beta_4 \ln(Comlang_{ij}) +$$
$$\beta_5 \ln(Border_{ij}) + \beta_6 \ln(Tcost_{ijt}) + \beta_7 \ln(Dtax_{jt}) + \beta_8 \ln(Contract_{jt}) + \beta_9 \ln(ICT_{jt}) +$$
$$\beta_{10} \ln(Port_{jt}) + \varepsilon_{ijt} \qquad (3)$$

where:

$Tcost_{ij}$ measures the maritime transport cost per container from the investing country's major port (i) to the host country's major entry port (j);

$Dtax_{jt}$ refers to domestic taxes on profits or capital gains;

$Contract_{jt}$ refers to the number of days required to enforce a contract;
ICT_{jt} measures the cost of internet use per 100 population in the host country.

The additional variables should, to a large degree, capture the costs inflicted on traders, which is the main interest of this study.

$Port_{jt}$ refers to the quality of port infrastructure, ranging from 1 (extremely under-developed) to 7 (well developed and efficient by international standards).

Following Santos Silva and Terenyo (2006), a fixed effects Poisson pseudo maximum likelihood (Poisson PML)[2] estimation of the equation in its original multiplicative form is used. The estimator has three advantages over the traditional approach of making the model linear by taking logarithms and then estimating the equation by an ordinary least squares (OLS) estimator.[3] The first is that the Poisson PML estimator can be used on the model in its original multiplicative form, implying that the observations with zero FDI flows do not have to be dropped. Given that the value of FDI is zero for a lot of the observations in the dataset of the study presented here, this is particularly relevant. Second, the Poisson PML estimator is consistent, even in the presence of heteroskedasticity. This is not true for the OLS estimator. Third, interpretation of the coefficients from the Poisson model is straightforward, and follows exactly the same pattern as under OLS.

Data sources

The bilateral FDI data from 19 source countries for the period 2001–2012 is obtained from UNCTAD. The study treats missing values as missing and zero and negative FDI data as zero. Indeed, while there is a possibility that missing value is either unreported FDI (non-zero values) or zero value, assuming that unreported FDI is zero might lead to biases in the estimation of the model.

The GDP data and Internet users per 100 population are obtained from the World Bank's World Development Indicators. Geographical distance between most populated cities (in kilometres), contiguity and bilateral common language dummy variables are obtained from the Centre d'Études Prospectives et d'Informations Internationales (CEPII). The trade facilitation indicators, including transport costs and number of days for clearance, are obtained from NTCCA (CPCS Transcom International Limited, 2015) and the World Bank's World Development Indicators.

1.7 Findings

The results for the regression analysis are presented in Table 1.3. They show that GDP per capita of the source country and commonality of language have significant positive effects on FDI in Kenya both with and without inclusion of trade costs. In the classical gravity model (1), all the variables have expected signs, i.e. GDP per capita for the source and host countries and language have positive effects on FDI flows, while distance has negative effects. It is notable that the statistical significance of distance and common language increases when the model is expanded to include trade costs.

Table 1.3 Regression results

	Classical gravity model (1)	Adjusted gravity model (2)	Adjusted gravity model (3)
Dependent variable: FDI			
Constant	10.561 (3.30)	1.246 (0.07)	10.741 (0.32)
GDP per capita (source country)	0.819 (3.13***)	1.632 (3.24***)	1.460 (3.50***)
GDP per capita (host country)	0.695 (1.52**)	-2.621 (-1.20*)	-3.630 (-0.88*)
Distance	-0.908 (-1.82**)	-2.416 (-2.01**)	-2.838 (-3.68***)
Common language	1.359 (2.09***)	3.148 (5.96***)	3.118 (6.05***)
Domestic taxes on profits		19.076 (1.48**)	19.976 (1.56**)
Port quality		0.661 (1.24**)	0.742 (1.17**)
Enforcement of contracts		-16.499 (-2.82***)	-2.899 (-0.18*)
Business costs		-5.160 (-1.21**)	-6.291 (-0.56*)
Maritime transport cost			-0.599 (-1.15**)
ICT			-4.288 (-1.53**)
Average import tariffs			-24.593 (-1.21**)
No. of observations	144	144	144
R-squared	0.03857	0.17869	0.1886

Notes: t-values in parenthesis.*** significant at 1 per cent level; ** significant at 5 per cent level; * significant at 10 per cent level.

In the adjusted model (2), the variables related to underlying trade costs in the domestic economy exhibit expected signs, except the coefficients of GDP per capita and taxes on capital gains, which are positive but insignificant. The coefficient of GDP per capita is negative, implying that a 1 per cent increase in

GDP per capita reduces FDI inflow by 2.6 per cent. Ideally, an increase in GDP per capita raises the cost of labour within the host country and therefore exporting sectors become uncompetitive in external markets. In regional markets such as the EAC, investors would shift to less costly markets. Such a scenario reflects the effects of resource- or asset-seeking FDI driven by low-cost labour and oriented towards exports. This perhaps explains the flow of FDI from the Kenyan economy to the other EAC countries, as evident in available statistics. The negative relationship between FDI and GDP is consistent with the findings of other studies such as Boyd and Smith (1992), Brecher (1983) and Brecher and Diaz Alejandro (1977).

In addition, the coefficient of domestic taxes on profits is positive. This could be attributed to improvements in the investment climate, in which firms are able to make profits and are therefore willing to comply as long as they remain profitable.

As expected, the quality of port infrastructure is positive and significant. This is due to the fact that global sourcing, which is affected by the quality and efficiency of the port infrastructure, represents a significant share of investment flows (Engman, 2005). The results indicate that a 1 per cent improvement in port facilities increases FDI flows by 0.7 per cent. This implies that improvements in the entry port positively affect FDI flows through increased efficiency in clearance and improved quality of logistics performance. The indicators related to improvement of the business environment, i.e. the number of days required for enforcement of contracts and the costs of starting a new business, are inversely related to FDI flows, as expected. For instance, a 1 per cent increase in the number of days required for enforcement of contracts reduces FDI inflows by 16.5 per cent. On the other hand, a 1 per cent increase in the number of days required to start a new business leads to a 5.2 per cent reduction in FDI flows. This is supported by the relatively high number of days and cost of claims, as indicated in a number of the World Bank's ease of doing business reports. The results indicate the essentiality of a conducive business environment in Kenya in attracting FDI.

The adjusted model (3) incorporates trade costs associated with international and domestic transactions. Generally, the indicators exhibit expected results, i.e. that trade costs negatively affect FDI flows (Engman, 2005). This is a common phenomenon for efficiency-seeking and market-seeking FDI targeting regional markets. Transportation costs, Internet use and average tariffs all have negative effects on FDI inflows in Kenya. The transportation costs reflect the poor state of physical infrastructure, i.e. roads and railway networks, which increases the time and direct cost of deliveries of capital and intermediate goods as well as exports. Greater internet use and technological advances reduce the cost of trade-related transactions and enhance firms' abilities to coordinate international production networks.

1.8 Conclusions

This chapter has investigated the effects of trade facilitation measures in the context of trade costs on FDI in Kenya. Generally, FDI flows into Kenya have stagnated over long periods of time despite reforms and investment packages issued by the government. This could be attributed to high trade costs and high levels of corruption, among other reasons. The results of the investigation indicate that improvements in indicators related to the business climate, including the quality of port infrastructure, the number of days required for enforcement of contracts, and activities that improve logistics performance, are essential drivers of FDI. The latter are mainly trade-related costs within the domestic economy.

In addition, reducing international trade costs, including transport costs, along with greater Internet use and reducing average import tariffs, are equally important. Thus, Kenya should enhance efforts to implement trade facilitation measures with a view to deepening its integration into global trade and production networks, and thereby increase FDI.

In light of its findings, this study recommends that a distinction be made between market- and efficiency-seeking FDI, and that targeted improvements be made to the business climate and the activities that reduce trade costs at domestic and international levels.

Endnotes

1. A probit model is a type of regression where the dependent variable can take two values only. It is said to have a dichotomous or binary outcome.

2. The model assumes that the response variable has a Poisson distribution modelled by a linear combination of the logarithm of its expected value.

3. Ordinary least squares (OLS) is a method used to estimate the unknown parameters in a linear regression model, with the goal of minimizing the squared differences between the observed and predicted responses by the linear approximation of the data.

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2 Streamlining South Africa's export development efforts in sub-Saharan Africa: A Decision Support Model approach

Ermie Steenkamp, Sonja Grater and Wilma Viviers*

Abstract

Given its abundant natural resources and accelerating consumer-driven growth, sub-Saharan Africa has much to offer investors and traders. Yet the region remains weakly integrated into global and regional value chains, due to, among other things, geographical disadvantages, infrastructural shortcomings, high transport costs and difficult-to-access market intelligence – all of which add to the cost of trade. While not an insignificant player in international business and trade circles, South Africa is facing shrinking demand in its traditional export markets and has to plot a new economic course after decades of overreliance on commodity exports and value-added imports. This chapter looks at how a market selection tool, the Decision Support Model (DSM), can streamline the process of identifying export opportunities, particularly at an intra-regional level. Covering both products and services, and adaptable to different countries' circumstances, the DSM simplifies market selection decisions by pinpointing both short- and longer-term business opportunities in high-potential sectors, while also exposing market access barriers that could become the focus of specific efficiency-enhancing interventions. In this way, the DSM can be a valuable aid to trade facilitation.

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2.1 Introduction

Recent years have seen the global trading environment undergo very pronounced and rapid change. The growing importance of value chains and the complex production networks that invariably support them are having a profound influence on countries' growth and development prospects and, consequently, their trade and investment priorities.

With the shift in emphasis away from running a full production process towards specializing in a narrower range of intermediate goods and services, traditional economic thinking and relationships are being tested. For some countries, the evolution in production and trade patterns is creating pathways to new forms of competitive advantage and export opportunity. Yet for other countries (typically in the developing world), the transition is proving to be difficult, particularly where producers are technically ill-equipped to participate in global or regional value chains and/or the local policy and institutional environment is not conducive to value-added, specialized production (OECD and WTO, 2013).

Africa is a case in point. The continent has made strides in recent years in opening up its markets and improving its rankings on the World Bank's Ease of Doing Business Index. Given their expanding economies and increasingly consumption-driven populations, many African countries hold rich potential for international traders and investors. Yet making inroads into Africa can still be fraught with difficulty, largely due to market access problems, which often highlights the need for various forms of trade facilitation. These problems include high and/or changeable tariffs, infrastructural and logistical hurdles that lead to delays in the clearing and delivery of goods, excessive bureaucracy and widespread bribery and corruption. Such factors also constrain Africa's export performance, at both global and regional levels.

The complexity of trading in and with many African countries and the attendant high costs of doing so have suppressed Africa's potential to play a truly meaningful role in global and regional value chains. Sub-Saharan Africa, in particular, suffers from the triple disadvantage of low density (i.e. low agglomeration of economic activity, with skilled labour migrating to other continents), long distances (i.e. being thousands of miles from key world markets, with few navigable rivers or natural harbours, the lowest road densities in the world and a large proportion of the population living in landlocked countries) and deep division (i.e. high transport costs, especially when moving goods overland in landlocked countries, and long processing/transit times). This puts the region at a clear disadvantage from a development perspective (World Bank, 2009).

Purfield, Farole and Im (2014) and the World Bank (2009) assert that greater regional integration in sub-Saharan Africa could go a long way towards alleviating the many obstacles encountered by the region's traders, a large proportion of whom point to the need for intervention at the trade facilitation level. Furthermore, Shayanowako (2014) emphasizes that sub-Saharan Africa will need external aid for capacity-building to assist with the implementation of the WTO Agreement on Trade Facilitation (TFA). Even with the necessary show of political will from the governments concerned and support from multilateral and regional entities, such as the WTO and the African Union, as well as the donor community, the practical reality is that overcoming barriers to trade is likely to remain a protracted and uneven process.

2.2 Export development as a necessary companion to trade facilitation in sub-Saharan Africa

Despite their many challenges on the development front, if all the sub-Saharan African countries were to ratify the TFA and (with the necessary political will and support) implement its various provisions, the region would see more streamlined trade flows, which in turn would induce much-needed cost savings and other economic benefits. Yet trading successfully involves far more than having sound and efficient rules and procedures in place for moving goods internationally. In a wider perspective, trade also entails identifying the right export product–market combinations in the light of exporting countries' comparative advantages, production capabilities and tolerance levels for competition and other potential barriers to market access. The issue of how countries should arrive at a sustainable export mix and support export culture is beyond the scope of the TFA's text, yet it is crucial if sub-Saharan African countries, in particular, are to take advantage of what trade facilitation has to offer.

The developed countries and many emerging economies are already operating from a diversified export base and are well integrated into regional and global value chains. Many sub-Saharan African countries, though, still rely heavily on raw materials exports and intra-regional trade is low. A common view is that the TFA will expose sub-Saharan African markets to greater foreign competition, which will make it increasingly difficult for them to build local capacity in a more diverse range of economic sectors. Therefore, from a sub-Saharan African standpoint, export development and trade facilitation should, ideally, work in tandem.

South Africa is not immune to the challenges faced by other sub-Saharan African countries in repositioning themselves in a fast-changing world. Although once hailed as a rising star in the constellation of emerging economies, South Africa has

experienced much economic upheaval in recent years in the aftermath of the global financial crisis of 2008–2009. Faced with waning demand in many of its traditional markets, South Africa has seen its share of global trade decline, creating uncertainty among its exporters and dampening its economic growth prospects, with adverse implications for the ongoing fight against poverty and unemployment.

While South Africa is better resourced than several other countries in sub-Saharan Africa when it comes to trade infrastructure, institutions and logistics capabilities, it is nevertheless facing significant challenges as it stands at the confluence of the many new forces and developments shaping today's global economy. The World Bank's 2014 economic update on South Africa, which focused heavily on how the country was faring on the export competitiveness front, raised the concern that exports (minerals, non-minerals and services) were underperforming. Compared with its peers,[1] South Africa under-exported non-mineral goods by about 9 per cent of GDP (US$ 34 billion) in 2011–2012, while its mineral export volumes had been practically flat since 2001, showing only slight improvement due to global commodity prices. South Africa's services exports were also showing slow growth compared with those of its peers, even though the services sector (today) contributes 66 per cent of South Africa's GDP and 75 per cent of its GDP growth, and is the main source of employment in the country (Purfield, Farole and Im, 2014).

In an attempt to give rein to a more vigorous and focused export drive, the South African Government has launched several wide-ranging economic initiatives at national, provincial and local levels. The overarching goals of increased industrialization, higher export revenues and a more diversified export mix (in line with the current focus on new market development) are highlighted in a collection of national strategy documents, including the National Development Plan 2030 (Republic of South Africa NPC, 2012), National Industrial Policy Framework (Republic of South Africa DTI, 2007), South African Trade Policy and Strategy Framework (Republic of South Africa DTI, 2010) and Industrial Policy Action Plan (Republic of South Africa DTI, 2011). While these strategies tend to look at the same problems in different ways, there is a general consensus that South Africa needs to develop a stronger export culture, with more attention being paid to producing value-added goods and services (as opposed to commodities) and to increasing the country's share of high-growth markets.

Of course, broad strategies of this nature need to be turned into practical and realizable programmes that resonate with, and provide clear direction to, the South African business community that is operating at the coalface. The import climate should also be given strong consideration – something that is often neglected at the policy level yet is ultimately critical for successful integration into global or

regional value chains. Even the most proficient exporters have often, when contemplating expansion options, found themselves wondering how to accurately compare one market with another and how to ensure that product choices and production volumes are in line with evident demand. In a sub-Saharan African context, acquiring market insights is often complicated by the variable quality of market data and the time it takes to arrive at reliable conclusions about a market's potential.

This chapter explains how an export market selection tool, the Decision Support Model (DSM), which has been adapted for South African circumstances by the North-West University, in collaboration with esteemed academics in Belgium, can streamline the process of identifying export opportunities in a range of markets. The DSM has also been applied to Belgium, Mozambique, the Netherlands, Tanzania and Thailand.

The DSM uses a sophisticated filtering process to sift through an extensive range of product/service and country data to reveal those product–country and service–country combinations that are the most realistic and likely to generate the best returns. While lending scientific weight to the process of identifying export opportunities in new and/or existing markets, it also helps to minimize the cost of sourcing, assembling and intelligently analysing market data. The DSM is fast gaining traction with government departments, industry associations and private businesses in South Africa, which are recognizing its value as a trade facilitation aid – in its ability to cut the costs of conventional market research and selection, and to ensure that the right exports are going to the right markets. This helps government trade promotion officials to prioritize and efficiently allocate their financial and other resources, including determining where trade facilitation interventions may be needed.

This chapter goes on to show how, through a recent application of the model, the DSM has revealed those South African products and services with the highest export potential in sub-Saharan Africa, while also differentiating among the various markets in terms of whether they present relatively high or relatively low barriers to market access – with a specific focus on logistical barriers (in the case of tangible goods) and market regulations (in the case of services). The practical application of the DSM outlined in this chapter serves as a case study to illustrate how the model could be applied in other countries in sub-Saharan Africa to reveal high-potential (including new) export opportunities that are not too encumbered by logistical and other market access problems. Where the latter are evident, compliance with the provisions of the TFA could encourage more streamlined regulations and procedures.

At time this chapter was written, 10 of the 47 sub-Saharan African countries had ratified the TFA: Botswana, Côte d'Ivoire, Kenya, Lesotho, Mali, Mauritius, Niger, Seychelles, Togo and Zambia. Considering the difficulty of trading in and with the sub-Saharan Africa region – which would surely point to the need for trade facilitation – this number is surprisingly low. One of the contributing factors could be that countries need to amend their existing customs legislation and institutional frameworks in order to bring the TFA into effect. This can be a time-consuming and costly exercise.

Of the sub-Saharan African countries that have ratified the TFA:

- Botswana, Côte d'Ivoire, Kenya and Seychelles have notified that they will implement the TFA according to Category A (i.e. when the Agreement comes into force);
- Mauritius and Zambia have notified that they will implement the TFA according to Categories A, B (i.e. after a transitional period following the Agreement coming into force) and C (i.e. after a transitional period following the Agreement coming into force and the necessary capacity-building taking place); and
- Lesotho, Mali, Niger and Togo have not notified any categories.

The following seven sub-Saharan African countries have not yet ratified the TFA, but have notified that they will implement the TFA according to Category A: Gabon, Namibia, Nigeria, Rwanda, Senegal, Tanzania and Uganda. Therefore, there are 30 sub-Saharan African countries that have not given any indication of ratifying, or notification that they will implement, the TFA.

Where South Africa stands vis-à-vis the TFA is subject to speculation, but it is anticipated that the country will ratify the Agreement during 2016.

With a clearer understanding (using the DSM) of where the export opportunities lie, but also where the barriers are that could benefit from focused trade facilitation initiatives, sub-Saharan African governments should be able to formulate and implement more realistic trade strategies. This, in turn, should pave the way for more intra-regional trade and sustainable economic development.

The rest of this chapter is structured as follows. Section 3 provides an overview (gleaned from the literature) of issues surrounding market access in the sub-Saharan Africa region. Because of the fundamental differences between the trade in products and the trade in services, these topics are dealt with separately. Section 4 explains the methodology of the DSM for products and services, respectively, while section 5 presents the key findings from the practical application

of the models. Section 6 draws broad conclusions from the main themes and results discussed.

2.3 The market access climate in sub-Saharan Africa

The South African Government regards export expansion into Africa as a key strategy for achieving the economic development goals set out in the National Development Plan, which provides an economic blueprint for the country up to the year 2030. While South Africa has a geographical advantage over many other countries when trading with the sub-Saharan Africa region, making sustainable export inroads into African markets is difficult, largely due to market access problems.

Market access in relation to products

There is a vast swathe of literature on the negative impact of high trade costs on trade volumes and development (see, among others, Anderson and Van Wincoop, 2004; Arvis et al., 2013; Hoekman and Nicita, 2008; Limão and Venables, 2001; Radelet and Sachs, 1998).

Trade costs broadly include exogenous separation factors (i.e. geographical distance, transportation costs and commonalities between trading partners, such as language, history or sharing a border) and endogenous separation factors (i.e. tariffs, non-tariff barriers, logistics performance and trade facilitation status) between exporters and importers (Arvis et al., 2013). The present study focuses specifically on tariffs, transportation costs and costs associated with logistics, customs and border administration in sub-Saharan Africa.

Sub-Saharan Africa is home to the world's poorest countries (Bosker and Garretsen, 2012), with geographical disadvantages, among other things, being regarded as one of the root causes of the region's poor economic performance. According to the World Bank's *World Development Report 2009,* sub-Saharan Africa's most pressing problems include the low agglomeration of economic activity to incubate entrepreneurship, skills and innovation, and the long distances to world markets. Sub-Saharan Africa is the least urbanized region in the world (only one-third of its population live in urban areas) and it has one of the lowest road densities in the world. Not surprisingly, these and other factors – including the poor quality of its infrastructure – give rise to high trade costs (World Bank, 2009).

Bosker and Garretsen (2012) assessed how market access[2] affects sub-Saharan African countries' economic development status. Even after controlling for other

possible explanations for poor economic performance, such as education levels and institutional quality, they found that market access for manufactured products has a significant, positive effect on economic development in the region. This effect has also become more pronounced over time. Access by sub-Saharan African traders into other sub-Saharan African countries is particularly significant and positively associated with income levels. This highlights the importance of improved intra-regional market access and lower trade costs for the region's economic development. Bosker and Garretsen (2012) concluded that, despite room for (policy-induced) improvements in market access, the (economic) remoteness of many sub-Saharan African countries remains a formidable barrier to economic development. However, Bosker and Garretsen (2012) estimated that, if sub-Saharan Africa's infrastructure could be improved and regional integration could be deepened, market access would be positively affected, producing important benefits for the uplifting of the region.

Apart from their remoteness from world markets and their infrastructural shortcomings, sub-Saharan African countries – along with Central Asian countries – are known for having the slowest border crossings in the world (World Bank, 2009). Cumbersome customs and border administration procedures delay trade and add to the cost of doing business in the region. The OECD (2005) identified customs and administrative procedures as one of the most problematic non-tariff impediments that developing countries face. It has also been determined that these procedures can widen borders and limit trade flows and factors of production (World Bank, 2009). The cost of trading across borders in Africa is more than double that of trading in East Asia and the OECD countries (Dihel, Fernandez and Mattoo, 2011; Purfield, Farole and Im, 2014). Furthermore, it takes, on average, 85 per cent longer to import and 60 per cent longer to export goods across borders in sub-Saharan Africa compared with the world average (World Bank, 2013), which is attributable to the poor quality and density of domestic infrastructure, inefficient border management, cumbersome fiscal arrangements and poorly-crafted technical regulations and standards, permit requirements and licensing protocols (World Bank, 2011).

Despite these challenges, sub-Saharan Africa has become the dominant market for South Africa's non-mineral exports (Purfield, Farole and Im, 2014). Interestingly, since 2000, all-Africa's share in South Africa's non-mineral exports (excluding mineral ores, metals and fuels) has grown from 19 per cent to 29 per cent, overtaking the European Union's, which has fallen from 41 per cent to 28 per cent. Africa is a natural entry point for new South African exporters, who are three times more likely to start exporting to Africa than to Europe. In this regard, the rate of South African firms entering the European market for the first time has declined by

40 per cent since the period 2004–2006 (three-year average) (Purfield, Farole and Im, 2014).

This diversification towards Africa has been beneficial for South Africa as it has reduced the risk of adverse demand shocks and cushioned the impact of the decline in demand in Europe in the wake of the global financial crisis. It needs to be borne in mind, however, that the European market is 30 times larger than the African market, and South Africa's already high market share in many African countries limits the growth potential relative to traditional markets (Purfield, Farole and Im, 2014).

Notwithstanding the many barriers to trade, South Africa's proximity to, and local knowledge of, African markets has given South Africa an advantage over many of its competitors. Yet a reduction in trade costs in sub-Saharan Africa could expand the range of promising business opportunities and help to lessen the fallout from South Africa's underperformance in its non-minerals and services exports (Purfield, Farole and Im, 2014).

Market access in relation to services

For many countries (especially in the developing world), the services trade has in recent years become a significant source of growth and export diversification potential. In addition, a reduction in the cost of travel, communications and information technology, and easier access to the Internet, have paved the way for more developing countries to play an active role in the services trade and bolster their competitiveness (Francois and Hoekman, 2010).

Trade liberalization efforts in the services sector – notably those directed by the WTO under the General Agreement on Trade in Services (GATS) – have boosted market access for services and reduced many of the traditional barriers to trade. However, barriers to services trade still exist and are mainly of a policy and regulatory nature. At an international level, these barriers largely manifest as multilateral and bilateral trade agreements, which tend to be formulated for the services sector in general and are not very sector specific. However, recent studies by Borchert, Gootiiz and Mattoo (2012) and van der Marel and Shepherd (2013) point to the fact that restrictions in services trade are very sector-specific and relate more to domestic policies, such as labour laws, business ownership requirements and other commercial regulations, than to the external environment.

Africa has made some progress in terms of regional cooperation through the mechanism of regional trade agreements (RTAs) over the past decade, and

attempts have been made to open regional markets for services and to allow more unrestricted movement of workers across borders. However, intra-regional trade in services, specifically, has grown very slowly due to persistent policy-related barriers (Brenton, Dihel, Gillson and Hoppe, 2011). Exports in the sub-Saharan Africa region, for example, still mainly comprise minerals and primary products. In keeping with this trend, South Africa's exports are heavily resource-dependent, while its services exports constitute only about 18 per cent of the country's total exports.[3]

Purfield, Farole and Im (2014) indicate that almost 60 per cent of South Africa's current services exports are destined for other African markets, but export growth is weak, despite the potential of the region to absorb professional service offerings. For example, while South Africa has roughly 48 accountants and 43 lawyers per 100,000 people, the corresponding figures in countries such as Mozambique and Rwanda are less than one and five, respectively. This reveals the enormous scale of opportunity for services exporters to and within the region.

Scholvin and Draper (2012) highlight the potential of South Africa to act as an economic gateway to Africa, emphasizing the country's advantages as a logistics and distribution hub and conduit for transportation, logistics, and financial and telecommunications services to the region. The progressive rollout of these services could do much to enhance the competitiveness of countries' manufacturing sectors. Yet such an outcome is being hampered by a persistently restrictive environment when it comes to foreign ownership, the take-up of employment by foreign workers, and education and professional qualification requirements for non-citizens.

Under the auspices of the Southern African Development Community (SADC)'s Protocol on Trade in Services (SADC, 2012), negotiations have been initiated among SADC members in respect of six priority services sectors: communications, construction, energy, financial, tourism and transport. The negotiations span a three-year period and are expected to result in greater commitment from SADC members to open their markets to services trade. Complementing other regional agreements, the SADC Protocol on Trade in Services has the potential to bring about greater integration in services markets in sub-Saharan Africa, encourage competition and attract more foreign direct investment to the region.

2.4 Research method

The Decision Support Model (DSM) of Cuyvers, Steenkamp and Viviers (2012) is applied in this study. The DSM is designed to identify potential export opportunities,

using a filtering process that sifts through an extensive range of product/service and country data to reveal those product–country and service–country combinations (or "export opportunities") that are the most realistic and most likely to generate sustainable business opportunities.

This chapter shows how the DSM has been specifically used to identify those South African products and services with the highest export potential in sub-Saharan Africa, while also differentiating among the various markets in terms of whether they present relatively high, or relatively low, barriers to market access. Specific attention has been given to tariffs and trade costs (in the case of tangible products) and market regulations (in the case of services). The original DSM was developed for tangible products only but a DSM for services was developed by Grater and Viviers (2012), thereby enhancing the model's versatility and value, particularly considering the symbiotic relationship that exists between products and services in today's global and regional value chains.

Filter 1 of the DSM typically evaluates the commercial and political risk associated with exporting to countries as well as those countries' overall demand potential (macroeconomic size and growth). The aim of filter 1 is primarily to limit the number of countries that warrant detailed analysis in subsequent filters. Since the focus of this study was already confined to sub-Saharan African countries, filter 1 was not applied.

Filter 2 of the DSM assesses the import demand potential at a product–country and service–country level, while filter 3 evaluates the market accessibility of the remaining product–country and service–country combinations. Thus, filter 2 was used in this study to identify which products and services have high export potential (in other words, high and/or growing import demand) in sub-Saharan African markets.

In filter 3, the products and services that are clearly losing ground due to high market access barriers were identified. It was therefore possible to make a distinction between those sub-Saharan African markets in which the identified export opportunities have better prospects of success (due to relatively low market access barriers) and those in which the identified export opportunities have less chance of success (due to relatively high market access barriers) but whose potential could possibly be enhanced through a concentrated trade facilitation programme.

The next two sub-sections offer a more detailed discussion on the methodology of the DSM for products and for services, respectively.

The DSM methodology for products

For the purposes of this study, the analysis commenced with filter 2, where the import demand in each sub-Saharan African country for all HS 6-digit product categories was assessed with a view to identifying product–country combinations (markets) with adequate import size and growth (Figure 2.1).

Figure 2.1 Illustrative overview of the DSM methodology for products (see Figure 2.2 for services)
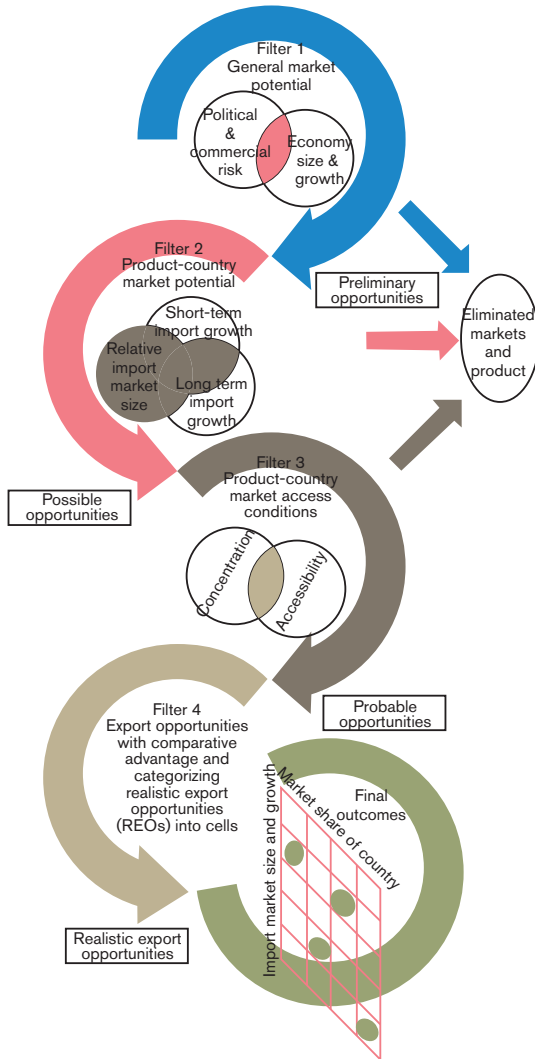
Three criteria were used in filter 2: short-term import growth, long-term import growth and import market size (Cuyvers, Steenkamp and Viviers, 2012). Import data were gathered from the CEPII (i.e. Centre d'Études Prospectives et d'Informations Internationales) BACI (Base pour l'Analyse du Commerce International) world trade database, which is constructed from the United Nations Statistics Division's Comtrade database and reconciles the trade data reported by almost 150 countries. The CIF import values and FOB export values reported are reconciled to provide one trade figure for each bilateral trade flow, which excludes CIF costs. Furthermore, the CEPII team assesses the reliability of country reporting and takes these reporting quality weights into consideration when reconciling the bilateral trade flows.[4]

The cut-off value for the relative import market size of country i for product category j are defined in such a way that, if South Africa is not specialized in exporting product j (RCA < 1), the importing country's (country i) imports of product j must be above 2 per cent and up to 3 per cent (if RCA = 0) of total world imports of product j. If, however, South Africa specializes in exporting the product (RCA ≥ 1), the importing country i's imports of product j are allowed to be 2 per cent of total world imports of the product.

$$RCA = \left(\frac{X_{i,j}}{X_{W,j}} \right) / \left(\frac{X_{i,tot}}{X_{W,tot}} \right)$$

with $X_{i,j}$ denoting country i's exports of product j; $X_{i,tot}$ denoting country i's total exports; $X_{W,j}$ denoting the world's (all countries') exports of product j; and $X_{W,tot}$ denoting total exports in the world (Balassa, 1964).

The cut-off values for short- and long-term import growth are defined in such a way that if South Africa is not specialized in exporting product j (RCA < 1), the importing country's (country i) short- or long-term import growth rate of the product must be higher than − by up to two times − the world import growth rate for product j. If, however, South Africa specializes in exporting the product (RCA ≥ 1), the importing country i's import growth rate of product j is allowed to be a bit lower than the world import growth rate of product j (Cuyvers, Steenkamp and Viviers, 2012).

Only those markets considered to be relatively large, growing in both the short and long term, or large and growing in the short and/or long term, are selected to enter filter 3.

In filter 3, two categories of market accessibility are considered, namely, the degree of market concentration (filter 3.1) and trade restrictions (filter 3.2).

In filter 3.1, the Herfindahl-Hirschmann index (HHI) (Hirschmann, 1964) is used to measure the market concentration in each country that entered filter 3:

$$HHI_{ij} = \sum \left(\frac{X_{k,ij}}{M_{tot,ij}} \right)^2$$

where:

$X_{k,ij}$ denotes exports of a competitor country k to importing country i for product category j. HHI values closer to 0 indicate less concentrated markets where the market share is more evenly distributed among the different suppliers. On the other hand, HHI values closer to 1 indicate that the market share is dominated by only a few suppliers/competitors, and an HHI value equal to 1 denotes that there is a single competitor country supplying the entire market.

According to Cuyvers, Steenkamp and Viviers (2012), concentration poses a bigger problem in markets that are not growing, because in order to gain market share, an exporting country has to prise away the market share of competitors that are already established in the market. Concentration is therefore considered less of a problem in growing markets. The cut-off values of filter 3.1 therefore depend on the import size and growth that were analysed in filter 2. The cut-off points for filter 3.1 are set at no more than 0.4 for large import markets; no more than 0.5 for markets growing in the short and long term, as well as markets that are large and growing in the short or long term; and 0.6 for markets that are large and growing in both the short and long term. It is therefore clear that, for larger, growing markets, a higher degree of concentration is allowed (Cuyvers, Steenkamp and Viviers, 2012).

In filter 3.2, the barriers to trade in each market that entered filter 3 are determined. Barriers to trade typically include tariffs, non-tariff barriers, transport cost, trade time, distance, infrastructural weaknesses, and inefficiencies in customs and border administration.

For the purposes of this study, it is argued that the total cost of shipment (including the costs associated with international transportation, all documentation, inland transport and handling, customs clearance and inspections, port and terminal handling and official costs) encapsulates the restrictive impact that distance, infrastructural weaknesses and time to trade would have on trade. Tariffs are also included in the total trade cost used to measure trade barriers in this study. However, non-tariff barriers could not be included because data on non-tariff barriers are very outdated and the data recently updated by the International Trade Centre (ITC) are still too limited for this study's objectives (WEF, 2014).[5]

The trade costs included in the filter 3.2 analysis therefore include:

- The *ad valorem* equivalent tariff charged to South Africa for each product–country combination. The information was gathered from the ITC's MacMap database.[6] This database has a unique approach to measuring the tariff levels faced by individual country exports in that it accounts for bilateral, regional and preferential tariff systems (IMF, 2005);
- The international shipping cost per country. This was obtained from World Freight Rates' Freight Calculator.[7] It includes the cost of shipping a standard consignment (specified in World Bank (2013) as a 20-foot FCL of general cargo valued at US$ 20,000) from the port of Durban to the port in each importing country featured in the *Doing Business* report's "Trading across Borders" section;
- The domestic cost to import per country. This was obtained from the "Trading across Borders" section of World Bank (2013). It includes all costs incurred from the time a 20-foot FCL of general cargo valued at US$ 20,000 arrives at the port in the importing country until the time it is delivered to the warehouse. This includes all costs associated with documentation requirements, inland customs clearance and inspections, port and terminal handling, and inland transportation and handling (World Bank, 2013).

To arrive at an *ad valorem* equivalent international and domestic shipping cost, these costs are divided by the US$ 20,000 value of the cargo.

The total *ad valorem* equivalent (per cent) trade cost to transport goods from the port in the exporting country to the final destination in the importing country, which is used in filter 3.2, is calculated by adding the *ad valorem* equivalent tariff per product–country combination to the *ad valorem* equivalent international shipping cost and domestic cost to import.

The cut-off point for filter 3.2 is set at the 80th percentile of the total *ad valorem* equivalent trade cost for all product–country combinations that entered filter 3. All product–country combinations with costs lower than this 80th percentile cost value are selected to enter filter 4. Here the DSM distinguishes between easier-to-access and harder-to-access markets, acting as an information tool that pinpoints markets where trade facilitation is crucial for unlocking the evident trade potential. In this way, the DSM can act as a companion to other trade facilitation initiatives aimed at improving the environment for trade.

In the last stage of the analysis (filter 4), the export opportunities (product–country combinations) that were identified in filters 1 to 3 are categorized according to their import market size and growth (determined in filter 2) and their relative market importance (the exporting country's current market share compared with that of the top six competitors) (Cuyvers, Steenkamp and Viviers, 2012). This categorization in filter 4 is illustrated in Table 2.1.

In order to prioritize among the export opportunities identified, the potential export value of each of the selected export opportunities is estimated from the average market value of the top six competitors in each market (excluding the exporting country for which the model is being applied). This gives an indication of the size of the export opportunities relative to one another and is in line with filter 4, in which the exporting country's market share in each market is compared with that of the top six competitors. The potential value will therefore be much higher than the exporting country's actual export value if the export opportunity is allocated to cells 1 to 10, while it will be much closer to the exporting country's actual export value if the export opportunity is allocated to cells 11 to 20. It is possible for the actual export value to be higher than this potential export value, which means that the exporting country is one of the main exporters to a particular market and exceeds the average market value of its top six competitors.

Table 2.1 Final categorization of realistic export opportunities for products

Size and growth of importing market	Market share of country n compared with the top six competitors			
	Relatively small	Intermediately small	Intermediately high	Relatively high
Large product market	Cell 1	Cell 6	Cell 11	Cell 16
Growing (short- and long-term) product market	Cell 2	Cell 7	Cell 12	Cell 17
Large product market with short-term growth	Cell 3	Cell 8	Cell 13	Cell 18
Large product market with long-term growth	Cell 4	Cell 9	Cell 14	Cell 19
Large product market with short- and long-term growth	Cell 5	Cell 10	Cell 15	Cell 20

Source: Cuyvers, Steenkamp and Viviers, (2012).

The DSM mainly focuses on the demand potential (size, growth, competitors and market access) for products in different countries and does not take into consideration the production capacity of the exporting country. It could happen, though, that export opportunities for a specific product are identified in many different countries, but the exporting country does not have the capacity to produce the product. An additional criterion/filter was therefore introduced at this stage using South Africa's revealed comparative advantage (RCA) for each product selected. If South Africa has an RCA greater than or equal to 1 for a particular product, it means that the country is relatively specialized in the production and export of that product (Balassa, 1964).

Furthermore, to limit the results to products that South Africa produces locally and does not merely re-export, the Revealed Trade Advantage (RTA) index of Vollrath (1991) is used.

The RCA index is often used as an indicator of relative export advantage or competitiveness, but it only accounts for exports. Hence, the RTA index accounts for exports and imports simultaneously and is used as an indicator of product-level competitiveness. An RTA > 0 reveals positive comparative trade advantage or trade competitiveness. It can be assumed that an RTA > 0 implies that the majority of the products exported are locally produced as it corrects for re-exports:

$$RTA_{ij} = RCA_{ij} - RMA_{ij}$$

$$RMA_{ij} = \left[\left(M_{ij} / \sum_{t, t \neq j} M_{it} \right) / \left(\sum_{n, n \neq i} M_{nj} / \sum_{n, n \neq i} \sum_{t, t \neq j} M_{nt} \right) \right]$$

where:

M represents imports, i is a country, j is a product, t is a year and n represents all countries. Such a measure implies a relative import advantage (RMA).

As international trade data can potentially contain spurious transactions or shocks, the RCA and RTA values are in this instance calculated over a five-year period. Hence, only export opportunities for products in which South Africa has an RCA ≥ 1 and an RTA > 0 are included in the final list of results.

The DSM methodology for services

The DSM for services (Figure 2.2) was adapted to allow for differences in data availability for the services sector, notably in the lack of specific bilateral trade data for South Africa. The model uses trade data based on the MSITS 2010 classification list (UN et al., 2012) and works on the lowest sub-sector level, which

Figure 2.2 Illustrative overview of the DSM methodology for services
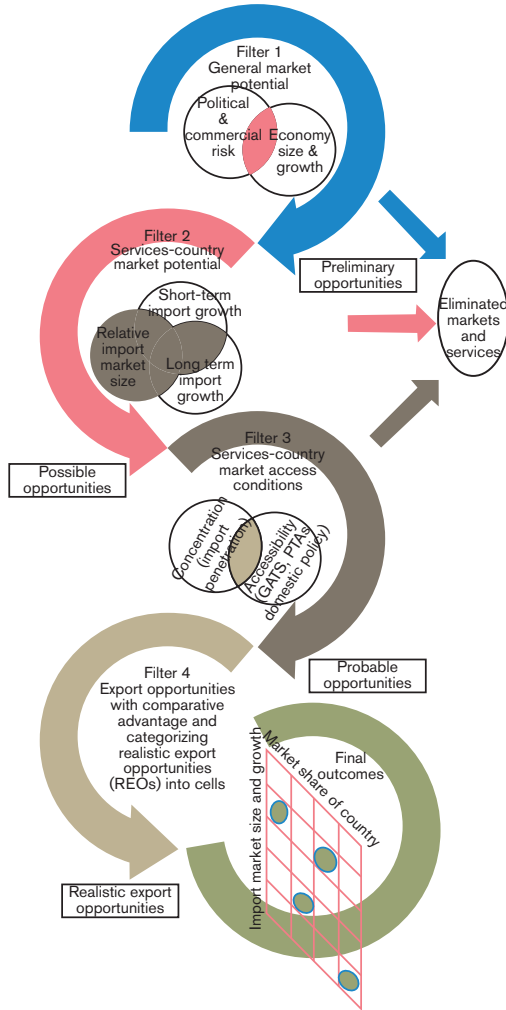
allows for an analysis of 12 main sectors of services and 80 sub-sectors. For this study, import and export data for services were obtained from the ITC's TradeMap database for the period 2009−2013 for all countries with sufficient data in all the years.[8]

Filter 2 of the DSM for services follows the same methodology as that of the DSM for products, analysing trade data based on size and growth for the import market over a five-year period. The results from filter 2 then enter filter 3, which is divided

into two sections: filter 3.1 and 3.2. Filter 3.1 uses the import penetration index (IPI), which is a measure of market openness (Mikic and Gilbert, 2009). This method measures the ratio between the imports of a specific service in a specific country and the total demand for that service in the domestic market (calculated by using domestic services produced, plus all imports of the specific service, minus all exports of that service). The formula is as follows:

$$\frac{\sum_s M_{sd}}{GDP_d - \sum_s X_{sd} + \sum_s M_{sd}} \times 100$$

where:

d is the country being studied, *s* is the set of all other countries, *X* is the total bilateral exports, *M* is the total bilateral imports and *GDP* is the gross domestic product.

This method is used in filter 3.1 as a measure of market concentration or the relative openness of the market to imports. The assumption is made that, if a country imports a lot of a specific service, then the market is very open to imports and should be easy to penetrate (Grater and Viviers, 2012). A cut-off value is determined by calculating the 20th percentile, and those service–country combinations that are not sufficiently penetrable will not proceed to the final results of the DSM for services.

The results from filter 2 are also further analysed in filter 3.2, where the DSM for services calculates market accessibility for each service in each country. As the model evaluates all service sectors across all countries, it is still difficult to obtain very sector-specific data that are available for all countries. Therefore, for this filter, two available data sets on service restrictiveness are combined.

The first dataset is published by the WTO and shows the level of market access committed by WTO members in both the GATS and preferential trade agreements (PTAs) (WTO, 2015). The dataset works on a similar methodology to that developed by Hoekman (1996) by giving a score to each member's commitment in both the GATS and its best preferential trade agreement (PTA). The result is a score between 0 and 100 for each country's GATS commitments, as well as the highest level of market access commitments across all its PTAs. A score of 0 indicates a closed economy or very low market access, while a score of 100 indicates high market access.

The second dataset is published by the World Bank and covers 103 countries across five major services sectors and 19 sub-sectors.[9] Each sub-sector is

evaluated on the basis of applied domestic trade policy, and data were collected using surveys on local investment laws, regulations and legislative information. Again, a similar methodology to that used by Hoekman (1996) is used to allocate a score to each policy regime and the database then also calculates a score between 0 and 100.

For filter 3.2 of this model, both databases were combined and the average market access score was calculated across all three sub-indices: the GATS, PTAs and domestic policy. For some countries, no data were available and the authors manually calculated a score for their GATS commitments using the same methodology as in the above databases. The combination of the databases provides a percentage of market access for each service–country combination in the DSM.

The results are then also classified according to the size and growth of the import market (calculated in filter 2) and the level of market openness as per the import penetration index (IPI) (according to filter 3.1) and market access (according to filter 3.2). The cell structure is shown in Table 2.2.

A cut-off value is again determined by calculating the 20th percentile, and those service–country combinations that show market access to be too low are given no further consideration in the model.

Table 2.2 Final categorization of realistic export opportunities for services

Market size	Low IPI and low market access	Low IPI and high market access	High IPI and low market access	High IPI and high market access
Large services market	Cell 1	Cell 6	Cell 11	Cell 16
Short-term and long-term growth	Cell 2	Cell 7	Cell 12	Cell 17
Large services market with short-term growth	Cell 3	Cell 8	Cell 13	Cell 18
Large services market with long-term growth	Cell 4	Cell 9	Cell 14	Cell 19
Large services market with short- and long-term growth	Cell 5	Cell 10	Cell 15	Cell 20

Source: Grater and Viviers (2012).

All service–country combinations that are not eliminated in filters 3.1 or 3.2 are viewed as the most realistic export opportunities for services.

For a more detailed description of the methodology used for the products and services models, respectively, see Cuyvers, Steenkamp and Viviers (2012) and Grater and Viviers (2012).

The results of the DSM for services, therefore, highlight the potential of services in the region, and can be used as a basis for trade facilitation initiatives aimed at clearing obstacles to services trade. Such initiatives would largely take their direction from the policy and regulatory environment, which should encourage the take-up of a wide range of business (including investment) opportunities at a regional level.

2.5 Results

Results for products

The application of the DSM to identify export opportunities for South African products in sub-Saharan Africa started with a list of 39 countries for which data were available and 115,625 product–country combinations for which there were trade flows during the period of analysis (Figure 2.3). Once the filtering process was complete, a list of 1,624 product–country export opportunities for South Africa into the sub-Saharan Africa region remained. The filtering process up until filter 3.1 highlighted markets in which the import demand is large and/or growing, and which will not be too difficult to penetrate given the level of market concentration (see section 4.1). There are 15,994 such export opportunities in sub-Saharan Africa, with South Africa having a comparative trade advantage in 3,088 of these.

When filter 3.2 was applied, six sub-Saharan African countries were eliminated due to the high trade cost in these countries. This can largely be attributed to the high cost of border formalities, customs administration and inland transportation in the countries concerned, which, on average, amounts to almost 30 per cent of the value of the goods imported into these countries. In addition, for the sub-Saharan African countries that remained in filter 3.2, there were products that were eliminated due to a combination of high tariffs (on average, 23.5 per cent) and high trade costs (which are already approximately 42 per cent higher in sub-Saharan Africa than in the rest of the world). For example, the highest tariffs were observed in the textiles, foodstuffs, transportation, animal and animal products, and vegetable product sectors.

Figure 2.3 Step-by-step outcomes of the DSM methodology applied for South African products
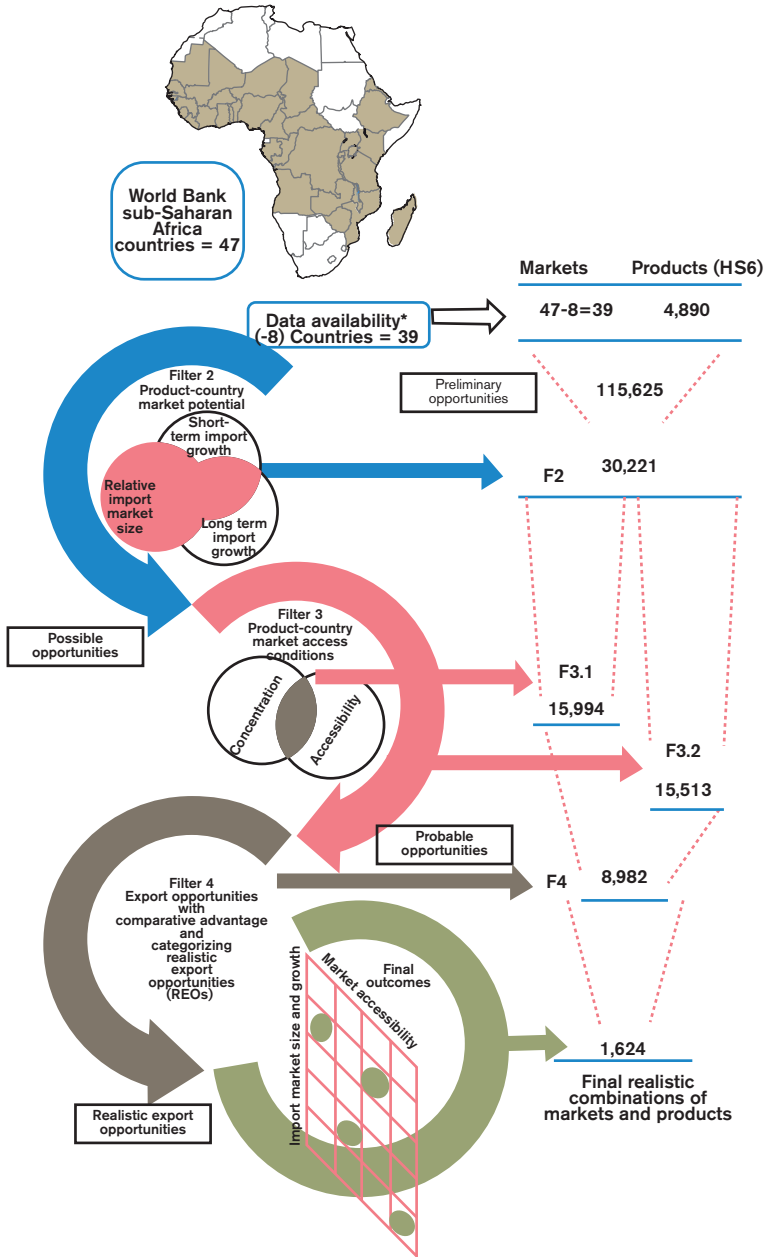
It is important to keep in mind that the markets that were eliminated in filter 3.2 can be regarded as having relatively high export potential – showing large and/or growing import demand and low levels of concentration – but they were eliminated because of high trade costs.

This makes the DSM unique, since it can be used to identify market access barriers in the markets with high export potential. As a result, a much more focused approach to addressing such market access barriers can be taken. The TFA could offer valuable guidance in this regard.

In total, the export potential that will be difficult to unlock due to market access problems amounts to 42.25 per cent of the total potential export value of the product–country combinations identified in filters 2 and 3.1. The six countries in which all products were eliminated because of the high cost of border control, customs administration and inland transportation account for 10.98 per cent of this potential. The products that were eliminated because of a combination of high tariffs and trade costs in countries that remained in filter 3.2 account for 31.27 per cent of the total export potential that will be difficult to unlock due to market access barriers.

On the other hand, 57.75 per cent of the total export potential of the markets in sub-Saharan Africa with large and/or growing import demand (determined in filter 2) and low levels of concentration (determined in filter 3.1) have relatively higher market access (filter 3.2) and have been selected in the DSM as realistic export opportunities. These markets are categorized in the DSM according to the cells in Table 2.1, and export promotion organizations could formulate focused offensive and defensive promotion strategies to tap into this potential (Cuyvers, Viviers, Sithole-Pisa and Kühn, 2012).

To further illustrate the outcomes derived from the application of the DSM methodology, an example product is used:

Harmonized System code HS 200919: Orange juice, (other than 2009.11 and 2009.12), unfermented and not containing added spirit, whether or not containing added sugar/other sweetening matter.

The results show that there are four countries that exhibit realistic export potential, while another seven countries exhibit potential but are eliminated in the final stage (filter 3.2) due to a combination of high tariffs and trade costs (on average, 53.7 per cent) (Figure 2.4).

Figure 2.4 Example results (HS 200919: Orange juice) of the DSM methodology for products applied for South Africa
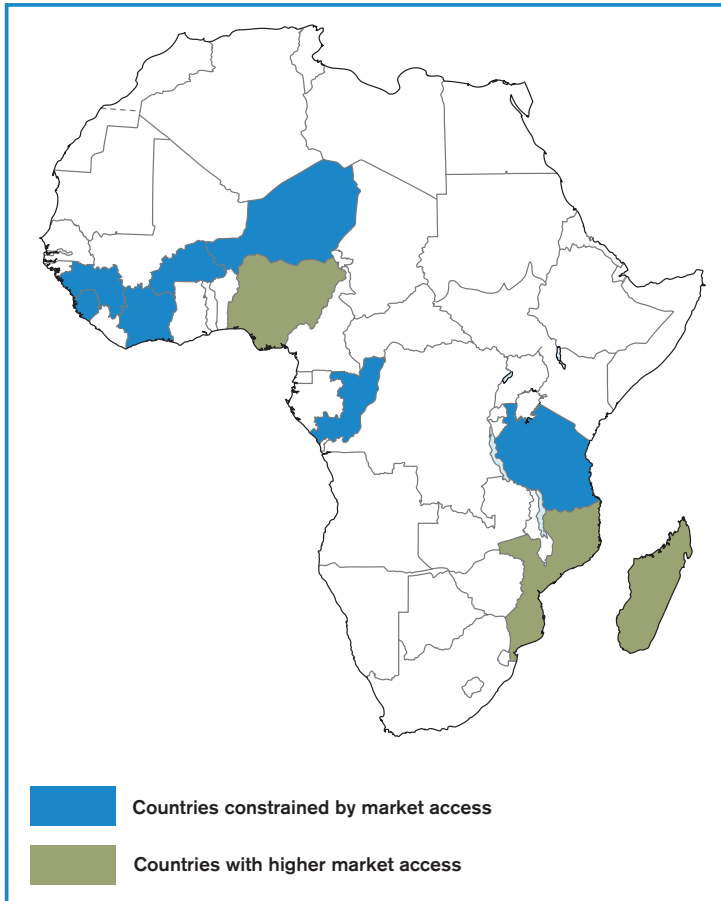
By exposing these high trade costs that are blocking certain high-potential trade opportunities, the donor community and other organizations can operate from a more informed base when designing their Aid for Trade (AfT) assistance and other trade facilitation packages.

Results for services

The application of the DSM to identify export opportunities for South African services in sub-Saharan Africa started with all sub-Saharan African countries for which there were sufficient services trade data.Therefore, 28 countries across 80

sub-sectors entered the model as potential export opportunities. Once the filtering process was complete, a list of 174 service–country combinations or export opportunities for South Africa in the sub-Saharan Africa region remained (Figure 2.5).

Figure 2.5 Step-by-step outcomes of the DSM methodology applied for South African services
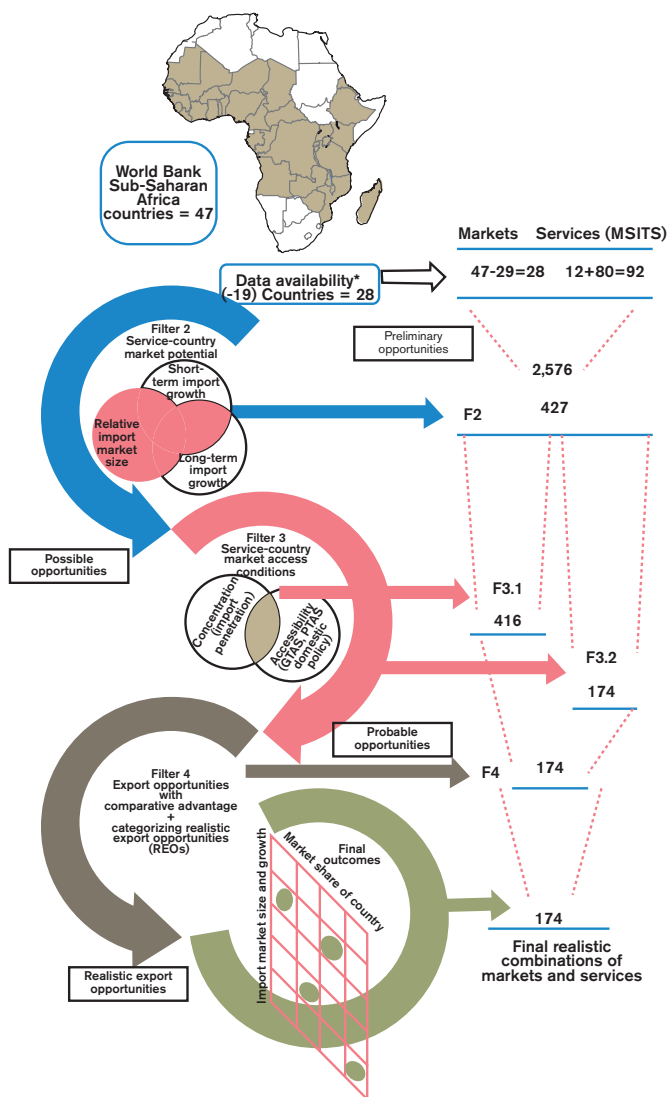
Interestingly, more than half the opportunities that were identified as potential services export opportunities in sub-Saharan Africa have been allocated to cells 11 to 20 (Table 2.2). This indicates that most of the export opportunities that the model has identified for South Africa's services in the sub-Saharan Africa region are in markets that are growing in the short term and long term. These opportunities present high levels of market openness or import penetration as per filter 3.1, as well as high levels of market access as per filter 3.2. Therefore, more than 100 export opportunities that were identified should be easy to act upon. The remaining 70 have been allocated to cells with lower import penetration and market access potential, and these will need more intervention and assistance from export promotion agencies and other government entities if firms are to enter these markets.

Of the 28 sub-Saharan African countries for which sufficient data were available, eight countries were eliminated completely when filter 3.2 was applied.

This filter evaluates market access on the basis of countries' GATS commitments, PTA commitments and domestic policy regulations. Even though the eight countries signalled high levels of demand in filter 2 and showed sufficient openness to import penetration, the policy and regulations surrounding services in these markets pose too great a barrier for entry or market access.

Of the remaining 20 countries, some services sectors were selected to continue into filter 3.2 as possible export opportunities, but other sectors in the same countries were eliminated due to low market access levels. Interestingly, the total number of export opportunities for services in the sub-Saharan Africa region that were eliminated in filter 3.2 amounts to almost 33 per cent of the total imported value of all services in the region in 2013. This can be viewed as 33 per cent of potential services trade that was eliminated on the basis of market access alone. The market access for the eliminated service–country opportunities was, on average, only 23 per cent, while those opportunities that did get selected in filter 3.2 had a market access average of 58 per cent.

Furthermore, it is very interesting to note that, in all the sub-Saharan African countries, the average GATS commitment level was, on average, only 33 per cent, whereas their market access commitment under domestic regulations and domestic policies were, on average, 63 per cent. This points to the possibility that, even though many sub-Saharan African countries are willing to extend market access to the majority of services sectors from a domestic policy standpoint, most of these countries are not willing to commit to long-term market access under multilateral trade agreements, such as the GATS. This is very likely due to the small size of most of these economies, suggesting that they are concerned about

protecting local industry against foreign competition. Added to this is the fact that domestic policy and regulations can be changed or adapted much more easily than can a commitment at a multilateral level.

Similarly to the approach used earlier to illustrate the outcomes of the application of the DSM for products, a services sector is used as an example:

SI1: Telecommunications services.

The results obtained show that five countries show export potential in this sector, namely Gambia, Madagascar, Mozambique, Sierra Leone and Uganda. However only two of these countries are selected on filter 3.2, showing high enough market access. These are Madagascar and Uganda. The other three are eliminated due to market access constraints (Figure 2.6).

Figure 2.6 Example results (SI1:Telecommunications) of the DSM methodology for services applied for South Africa
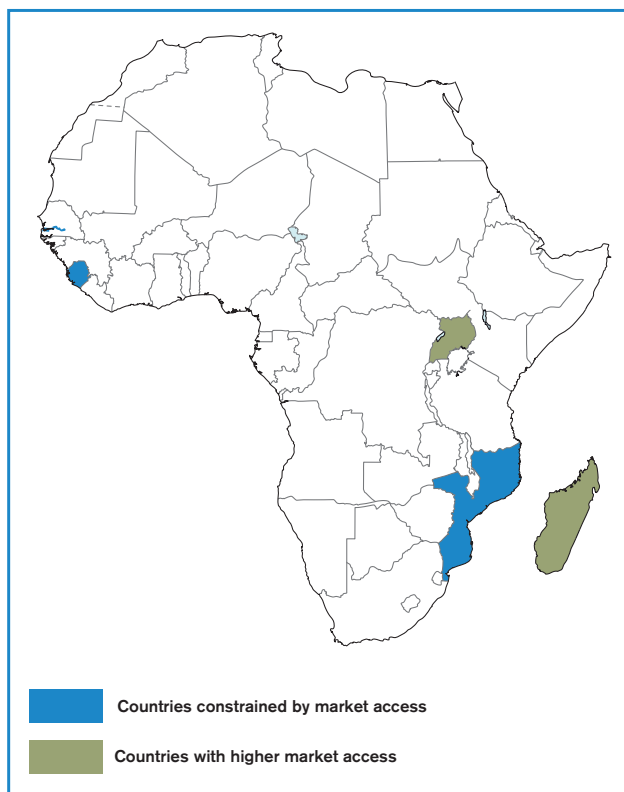
The results of the DSM for services bring into sharp focus the importance of greater regional cooperation aimed at enhancing trade between neighbouring countries.

The new SADC Protocol on Trade in Services has an extremely important role to play in helping to unlock those reservoirs of potential that are currently cut off due to high levels of protection imposed by regional governments. However, the DSM also clearly shows that there is certainly still sufficient potential in the region to augment services trade flows between South Africa and other sub-Saharan African countries on the basis of high levels of market access in a number of sectors. A well-planned programme of trade facilitation is crucial to removing obstacles that are preventing those markets with high, untapped potential from being successfully accessed.

2.6 Conclusions

Barriers to trade in both products and services have the power to add to trade costs, erode competitiveness and retard growth and development in affected countries. Being aware of trade weaknesses and blockages and implementing workable trade facilitation strategies to tackle problems head on are important steps towards becoming fully engaged and successful players in the global and regional trade arenas. Practical interventions from the donor community and other global and regional powers in the form of AfT packages can advance this process.

Much of the global debate about trade costs and trade facilitation efforts is centred on structural and procedural problems. Yet, in an African context, the dearth of accessible and reliable information about countries' market potential also contributes to the continent's underperformance on the trade front, particularly when it comes to intra-regional trade, which should be one of the cornerstones of the continent's quest to build stronger regional value chains.

Export market development finds a natural ally in trade facilitation. Trade facilitation measures should not, however, be introduced on the basis that one size fits all. The need for and intensity of such measures should, ideally, be informed by a careful export product–market selection process in respect of individual countries.

This chapter has introduced the DSM as a strategic and practical tool designed to unveil and prioritize realistic export opportunities in a range of markets for both products and services.

In the illustrative application of the model to identify South Africa's most promising export opportunities in sub-Saharan Africa, it emerged that South Africa has more than 1,600 possible country–product opportunities to explore in more depth within the region. However, from a longer term perspective, the approach revealed that additional export potential in excess of 40 per cent of the total potential export value into sub-Saharan Africa is locked up, due to market access problems. Six countries (accounting for 11 per cent of the potential) were eliminated completely because of the high cost of their border control, customs administration and inland transportation.

In a similar approach adopted for services, it was revealed that approximately 33 per cent of potential services trade was eliminated on the basis of constrained market access alone. The results obtained seem to suggest that, even though many sub-Saharan African countries are willing to extend market access to the majority of services sectors from a domestic policy standpoint, most of these countries are not willing to commit to long-term market access under multilateral trade agreements, such as the GATS.

A key conclusion that can be drawn from the study is that the DSM is able to deliver both short- and longer-term benefits to a range of stakeholders, from government trade promotion entities to industry associations and commercial enterprises. In the short term, the DSM permits the relatively straightforward identification of "easier-to-access" markets that have fairly low barriers to entry and can be acted upon immediately. The DSM also reveals longer-term trade diversification opportunities for less accessible markets, which call for a different kind of policy response and set of interventions. Beverelli, Neumueller and Teh (2015) confirm that there are substantial export diversification gains to be made from trade facilitation policy reform in sub-Saharan Africa. According to Fontagné, Fouré and Keck (2014), in turn, reduced trade costs could assist developing countries to diversify into more dynamic sectors.

Whereas South Africa's export opportunities in the rest of sub-Saharan Africa were used as a basis for illustration, the DSM could also be applied to other sub-Saharan African countries, highlighting these countries' most promising export opportunities – both the "low-hanging fruit" (short-term prospects) and the "harder-to-reach" fruit (longer-term prospects, which are likely to depend on strategic, multi-disciplinary negotiations to clear some of the more endemic barriers to trade, such as a difficult tariff environment, infrastructural hurdles, and so on). Therefore, the DSM has the potential to act as a pivot for decision-making at both a strategic and more operational level, and to be a companion to other trade facilitation initiatives aimed at improving the environment for trade and enlarging

the scope for export growth and diversification in both the product and services arenas.

Despite its clear intentions and benefits, trade facilitation has its detractors. In sub-Saharan Africa, streamlining trade and making markets more accessible inevitably raises fears that local producers will not be able to compete against foreign suppliers – particularly from wealthier, better resourced nations. South Africa, for example, has wrestled with these concerns for many years. However, if trade facilitation and cost reduction strategies (helped by more countries showing support for the TFA) can help to unlock sub-Saharan Africa's economic potential and stimulate more intra-regional trade of goods and services produced by African countries themselves – with better market intelligence at the centre of the process – the continent should begin to see a positive upturn in its development trajectory.

Endnotes

1.   South Africa's emerging-market peers include its BRICS partners and countries with similar population and income levels and export baskets, namely Chile, Colombia, Thailand and Turkey.

2.   Market access can be defined as the export demand a country faces, given its geographical position relative to its trading partners. Market access is a function of the market capacity of the partner country (e.g. GDP per capita) and the bilateral trade costs (e.g. distance, borders, landlocked/coastal, transport cost).

3.   ITC "Trade Map: Existing and Potential Trade": http://www.trademap.org/ (accessed 22 May 2015)

4.   CEPII BACI Database: www.cepii.fr/CEPII/en/bdd_modele/download.asp?id=1#sthash.jCRBRqXk.dpuf (accessed 12 February 2015).

5.   The ITC is engaged in an initiative to collect data on non-tariff barriers affecting international trade. This process is very costly and slow because the organization has to rely on surveys by experts in the field. Although data are available for some countries, no updated data set with global coverage is yet available.

6.   ITC "Market Access Map: Improving Transparency in International Trade and Market Access": http://www.macmap.org (accessed 9 September 2014).

7.   www.worldfreightrates.com/en/freight (accessed 15 September 2014).

8.   ITC "Trade Map: Existing and Potential Trade": http://www.trademap.org/ (accessed 22 May 2015).

9.   World Bank Services Trade Restrictions Database: http://iresearch.worldbank.org/servicetrade/aboutData.htm (accessed 15 May 2015).

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3 Trade policy without trade facilitation: Lessons from tariff pass-through in Tunisia

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Abstract

This chapter evaluates the extent to which changes in tariffs and in international prices were transmitted into consumer prices in Tunisia over the period 2000–2008. A pass-through equation is estimated using sectoral panel data at the retail product level and controlling for unobserved sectoral heterogeneity. The main results show that, on average, tariff pass-through (TPT) is 10 per cent and it varies across sectors. In particular, agricultural products seem to be driving the results. In summary, the change in Tunisian tariffs has affected local prices, but the effect is lower in magnitude than that found for other developing countries. This is in part due to imperfect competition and state interventions by means of subsidies and price controls that prevent the full transmission of changes in international prices. This research suggests that, for Tunisia, trade facilitation measures and sectoral actions to facilitate the business environment could positively impact on the pass-through effect and that reductions in border prices could have higher effects on retail prices, which, in turn, contribute to increase domestic welfare and generate inclusive development.

3.1 Introduction

In the past two decades, an increasing number of developing countries have started unilateral or regional trade liberalization processes in most regions of the world. In particular, many countries in the North African region have intensified their participation in regional trade agreements, such as the pan-Arab Greater Arab Free Trade Area (GAFTA) and the Euro-Mediterranean Agreements (EUROMED), and have also engaged in unilateral trade liberalization policies. Recently, Tunisia adopted the Agreement on Trade Facilitation (TFA) at the 2013 WTO Bali Ministerial Conference. The main aim of the TFA is to reduce trade costs in general and to tackle "red tape" that is hampering trade across borders in particular. As underlined in the World Trade Report 2015 (WTO, 2015), full implementation of the TFA will decrease trade costs by 14.3 per cent and developing countries will benefit the most. To date, Tunisia has notified provisions under Category A of the TFA.

The main underlying goal of these trade policies is improving market access and paving the way towards increasing trade, as well as entering into or increasing WTO members' participation in global production networks. An important question for economic development is whether these policies help to reduce poverty and to increase the welfare of citizens. It could be that, in reducing trade costs, national producers would be displaced by more productive foreign firms that are able to export to the region and this could eventually translate into losses for domestic producers and overall welfare losses. It could also be possible that increasing international competition would reduce domestic prices and this could translate into increasing consumption and welfare for most consumers. For this reason, it is important to evaluate the net welfare effects of such policies in specific countries. A first step to accomplish this task is to analyse the extent to which changes in international prices and in trade and non-trade barriers are transmitted to changes in domestic prices.

This chapter focuses on the Tunisian case for two reasons. First, this is the first attempt to evaluate the pass-through of international prices into domestic prices in this country using data from the 2000s, a period in which Tunisia witnessed important economic and institutional changes. Second, Tunisia still has relatively high tariffs and a large number of non-tariff barriers,[1] despite the fact that the average tariff rate has been reduced in recent years. For instance, the average MFN tariff for manufactured products was reduced from 19 per cent in 2006 to 12 per cent in 2013 (the corresponding tariffs for agricultural goods were 54 per cent and 19 per cent respectively).

The main results of the present study show that, on average, tariff pass-through (TPT) is 10 per cent, which is lower than the impact found for other developing countries. TPT varies across sectors and agricultural products in particular seem to be driving the results. The study finds that the low pass-through is largely due to market concentration. Moreover, without market concentration,[2] the pass-through would more than double. To investigate the effect of other non-tariff measures (NTMs), *ad valorem* equivalents are estimated and their effect on retail prices is also presented. The study finds that only pre-shipment inspection and other formalities have a negative impact on import values and that, conversely, other NTMs have a positive effect. The effect of NTMs on retail prices is found to be positive and significant, but small in magnitude.

The chapter is structured as follows. Section 2 outlines the trade and exchange rate policies in Tunisia in recent years and presents some stylized facts. Section 3 reviews the related literature. Section 4 presents the methodology, describes the main data and variables and presents the results, and Section 5 concludes.

3.2 Tunisian economic policy

Trade policy

In the last two decades, Tunisia has increasingly diversified its economy, focusing on specific agricultural products – olive oil, dates and several organic fruits and vegetables – as well as on manufacturing industries, tourism and the mining and energy sector. Table 3.1 reports import shares over time for different product categories. Note that only the product categories for which domestic price data were available are covered. Transport – which comprises cars, premium gasoline and gasoil – together with housing play the largest roles. The importance of clothing and footwear has constantly declined since 2002. On the other hand, the housing, water, gas, electricity category has gained importance.

Despite Tunisia's maintenance of relatively high tariff barriers, some trade liberalization has taken place in the last three decades, with average tariffs decreasing from about 24 per cent in 2006 to 13 per cent in 2013 (Table 3.2).

Table 3.1 Import shares by category of goods, 2002–2008

	Year						
Category of goods	2002 (%)	2003 (%)	2004 (%)	2005 (%)	2006 (%)	2007 (%)	2008 (%)
Bread and cereals	4.87	3.14	2.77	2.9	2.77	4.97	4.97
Clothing and footwear	14.53	14.67	12.35	11.29	9.55	9.2	7.29
Fish and seafood	0.19	0.28	0.22	0.28	0.3	0.26	0.27
Fresh and dried fruits	0.11	0.08	0.17	0.08	0.07	0.07	0.05
Furniture, household articles	3.99	3.81	3.78	4.17	4.18	3.76	3.57
Housing, water, gas, electricity	9.49	10.55	9.92	13.14	14.08	12.32	16.06
Meat and poultry	0	0.04	0.22	0.21	0.14	0.11	0.1
Milk, cheese and eggs	0.28	0.32	0.36	0.28	0.2	0.22	0.27
Oil and fats	1.12	1.47	1.37	1.48	1.57	1.24	1.91
Salt and condiments	0.03	0.03	0.03	0.04	0.03	0.02	0.03
Sugar, jam, tea, coffee and chocolate	1.33	1.05	1.08	1.12	1.46	1.09	0.99
Tobacco	0.45	0.47	0.47	0.52	0.47	0.43	0.34
Vegetables	0.29	0.25	0.26	0.25	0.19	0.39	0.13
Drinks	0.12	0.13	0.09	0.1	0.08	0.09	0.07
Health	2.03	1.96	1.97	2.01	1.78	1.69	1.54
Transport	12.29	13.13	13.67	14.79	15.2	13.58	15.22

Source: Authors' calculations using data from the United Nations Commodity Trade Statistics (UN-Comtrade) database

Table 3.2 Average applied tariffs by sector and tariff type, 2006 and 2013

Sector	Tariff type	2006 (%)	2013 (%)
All products	Average of MFN tariffs	23.87	12.80
	Average of preferential tariffs	22.19	10.62
Agricultural	Average of MFN tariffs	58.32	21.23
	Average of preferential tariffs	54.24	19.45
Non-agricultural	Average of MFN tariffs	18.93	11.68
	Average of preferential tariffs	17.60	9.36

Source: International Trade Centre (ITC) Market Access Map: http://www.macmap.org/.

Figure 3.1 Weighted average applied tariffs by category of goods, 2002–2013
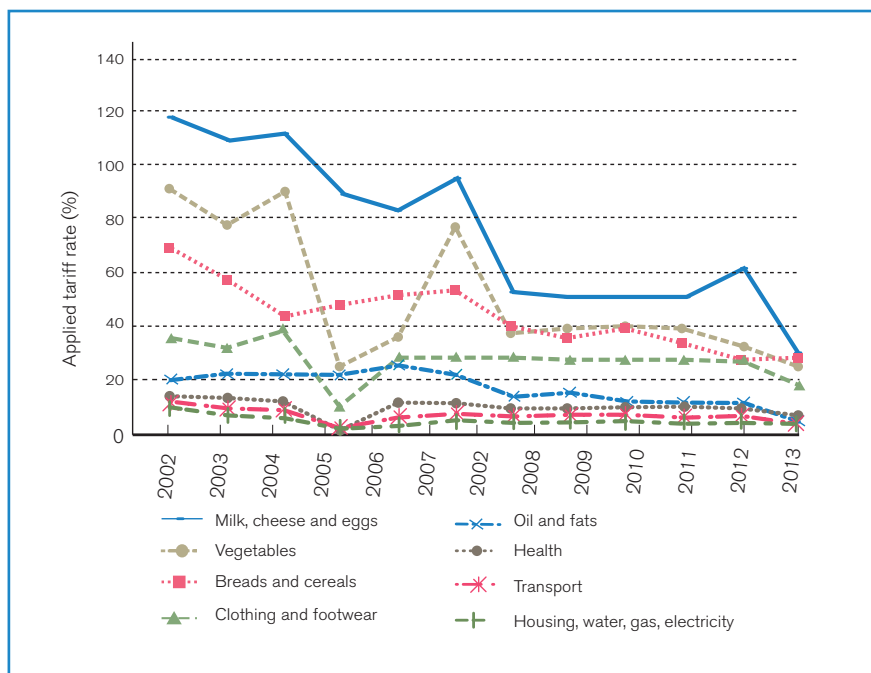
Figure 3.1 illustrates some of those developments. There were exceptionally low tariffs in 2005, coinciding with the complete phasing out of the tariffs remaining in the GAFTA and the entry into force of Tunisia's free trade agreement (FTA) with Turkey. However, a temporary increase in the tariff burden, especially in vegetables, and clothing and footwear, is observed in 2006 and 2007, perhaps as a reaction to increasing competition from abroad. Note that, in many cases, applied tariffs had been lower than bound tariffs, so that these changes were possible in accordance with WTO provisions.

Table 3.3 presents the evolution of simple average tariffs for different categories of goods. The categorization is the same as is used for Tunisian retail price data. Evidently, average tariffs are higher for food products. The highest tariffs were imposed on fresh and dried fruits, and milk, cheese and eggs. While tariffs have declined for most food products (with the exception of drinks), tariffs on clothing and footwear; housing, water, gas and electricity; health; and meat and poultry have largely been retained.

Table 3.3 Simple average effectively applied tariff rate by category of goods, 2002–2008

Category of goods	Year						
	2002 (%)	2003 (%)	2004 (%)	2005 (%)	2006 (%)	2007 (%)	2008 (%)
Bread and cereals	19.37	18.8	18.4	17.03	16.99	16.99	15.63
Clothing and footwear	15.78	15.67	16.06	12.35	14.42	14.42	15.39
Fish and seafood	7.88	7.88	7.85	6.7	6.69	6.69	7.95
Fresh and dried fruits	23.4	22.92	22.55	19.84	19.78	19.78	18.22
Furniture, household articles	13.15	12.92	12.83	8.86	11.42	11.42	12.53
Housing, water, gas, electricity	7.89	7.4	7.28	4.63	6.68	6.68	6.94
Meat and poultry	5.17	5.13	5.07	4.96	4.96	4.96	4.77
Milk, cheese and eggs	16.12	15.48	15.68	15.92	15.96	15.96	13.83
Oil and fats	8.24	8.15	7.97	6.82	7.53	7.53	6.8
Salt and condiments	15.87	15.75	15.66	11.71	12.11	12.11	13.43
Sugar, jam, tea, coffee and chocolate	12.84	12.38	12.28	10.64	11.23	11.23	11.56
Tobacco	9.2	9.07	8.73	7.43	7.57	7.57	7.45
Vegetables	19.35	18.97	18.63	13.61	13.61	13.61	13.62
Drinks	17.01	16.97	16.93	15.44	17.37	17.37	16.87
Health	6.77	5.57	5.41	3.16	4.73	4.73	4.98
Transport	11.08	11.14	10.98	7.95	10.02	10.02	10.57

Source: Authors' calculations using trade statistics from the UN-Comtrade database.

Weighted averages, reported in Table 3.4, show an average decrease, from about 52 per cent in 2000 to 31 per cent in 2008. The values are, in many cases, considerably higher than those in Table 3.3, indicating that tariffs on goods in categories with a high import share are relatively large. For many products, the evolution of weighted averages over time is more pronounced, which indicates that higher tariffs have been subject to greater reductions.

Table 3.4 Weighted average effectively applied tariff rate by category of goods, 2002–2008

Category of goods	Year						
	2002 (%)	2003 (%)	2004 (%)	2005 (%)	2006 (%)	2007 (%)	2008 (%)
Bread and cereals	68.51	56.57	43.23	47.1	50.88	53.71	40.37
Clothing and footwear	35.68	32.15	38.87	10.44	29.21	28.5	28.26
Fish and seafood	36.17	37.34	36.39	24.55	24.43	25.98	38.01
Fresh and dried fruits	110.88	103.83	91.27	89.06	84.82	69.58	51.02
Furniture, household articles	33.73	32.47	31.74	9.62	29.85	29.62	29.93
Housing, water, gas, electricity	9.64	5.92	6.56	1.25	3.52	3.64	4.36
Meat and poultry	104.28	94.98	81.45	79.57	83.75	88.5	59.7
Milk, cheese and eggs	117.91	108.93	111.47	89.07	82.42	94.78	52.51
Oil and fats	20.15	21.93	22.21	22.21	25.61	21.9	14.32
Salt and condiments	72.84	51.95	46.92	18.14	15.82	12.68	36.99
Sugar, jam, tea, coffee and chocolate	19.49	19.59	18.91	17.22	16.95	16.9	15.17
Tobacco	30.77	26.93	22.32	10.36	24.14	23.97	17.97
Vegetables	90.87	77.34	89.49	24.71	36.09	76.47	37.41
Drinks	49.58	49.4	50.89	39.73	58.2	50.29	46.59
Health	13.72	13.01	11.69	0.54	11.21	11.11	9.26
Transport	11.72	9.05	9.38	3.15	7.11	7.54	6.93

Source: Authors' calculations using trade statistics from UN-Comtrade database.

Turning to NTMs, as reported by Tunisia as an importer, Figures 3.2 and 3.3 show the products which incur the highest number of NTMs. Figure 3.2 shows products affected by more than 50 different NTMs – most are agricultural goods. Figure 3.3 shows products for which, in 2002, the number of NTMs was higher than 20 and lower than 50; these comprise food and vegetable products and energy goods (gasoil and gasoline). Both figures compare the number of NTMs in the two years for which the data are available. For most products, an increase can be observed in 2005 relative to 2002.[3]

Figure 3.2   Products affected by more than 50 NTMs, 2002 and 2005 (number)
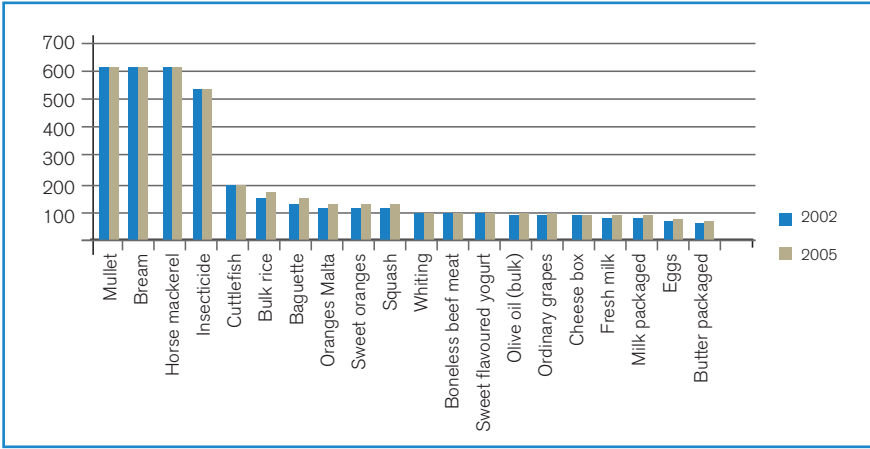
Source: Authors' calculations using WITS Database, World Bank.

Figure 3.3   Products affected by more than 20 NTMs, 2002 and 2005 (number)
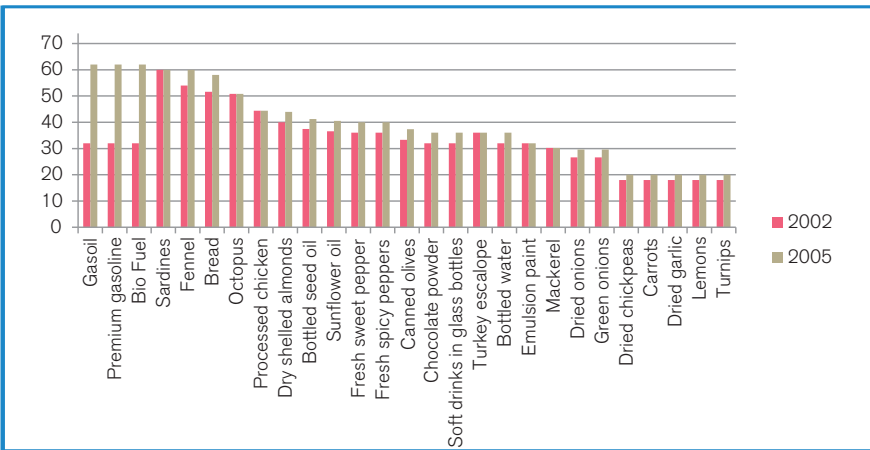
Source: Authors' calculations using WITS Database, World Bank.

Most of these NTMs correspond to sanitary and phytosanitary (SPS) regulations (Type A – 54 per cent) followed by technical barriers to trade (TBT) (Type B – 16 per cent) and pre-shipment inspections and other formalities (Type C – 14 per cent), as reported in Ghali et al. (2013).

Other measures used by Tunisian authorities include: Type D, contingent trade-protective measures; Type E, non-automatic licensing, quotas, prohibitions and quantity-control measures other than for SPS or TBT reasons; Type F, price-control measures, including additional taxes and charges; and Type H, measures affecting competition (UNCTAD, 2013).

In many sectors, NTM coverage ratios[4] amount to 100 per cent (Table 3.5). They are, however, quite low for clothing and footwear, and furniture and household articles. In general, there is no clear inter-temporal pattern. For some products (housing; salt and condiments; drinks), the coverage ratios are significantly reduced over time, whereas others (clothing and footwear; furniture and household articles) show increasing coverage ratios over time.

Table 3.5 NTM coverage ratios, 2002–2008

Category of goods	Year						
	2002 (%)	2003 (%)	2004 (%)	2005 (%)	2006 (%)	2007 (%)	2008 (%)
Bread and cereals	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Clothing and footwear	0.11	0.12	0.09	3.15	2.14	2.85	2.04
Fish and seafood	90.20	95.15	97.10	98.03	97.93	98.57	98.45
Fresh and dried fruits	100.00	100.00	100.00	99.96	99.86	100.00	100.00
Furniture, household articles	22.38	27.02	28.05	32.61	33.93	33.45	34.84
Housing, water, gas, electricity	54.69	57.22	62.88	58.87	57.05	52.25	50.45
Meat and poultry	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Milk, cheese and eggs	100.00	99.63	100.00	100.00	100.00	100.00	100.00
Oil and fats	92.80	93.40	93.97	94.83	93.79	89.98	92.49
Salt and condiments	78.37	81.87	70.04	69.30	69.39	67.66	61.75
Sugar, jam, tea, coffee and chocolate	97.79	97.09	97.21	98.25	97.88	97.59	97.80
Tobacco	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Vegetables	99.94	99.95	99.35	99.82	99.70	99.93	99.76
Drinks	73.18	73.99	65.37	69.72	71.41	67.42	72.34
Health	99.05	99.13	99.31	98.99	98.99	98.89	99.03
Transport	61.15	65.21	62.62	93.55	94.40	92.78	94.43

Source: Authors' calculations using trade statistics from UN-Comtrade database and World Bank.

Table 3.6 presents pairwise correlation coefficients of the variables in natural logs. Most of the crude correlations are significant at the 1 per cent level. In relation to consumer prices, the coefficients bear almost always the expected sign, with the exception of weighted average tariffs, which are insignificant. Note that there is a significant positive relationship between tariffs and NTMs, indicating that tariffs and NTMs could be used as complements. This appears to be the case, especially when importing products have a relatively low unit value.

Tunisia entered the GATT in 1990 and has therefore been a member of the WTO since its formation in 1995. Tunisia's commitments under the WTO included the reduction of tariffs in the agricultural sector by 24 per cent over 10 years (1995–2004), as well as the opening up of quotas for the importation of agricultural and food processing products (World Bank, 2014a). The country also participates in a number of FTAs. In particular, Tunisia entered both the GAFTA and the FTA with the European Union in 1998, and signed an FTA with certain states of the European Free Trade Association (EFTA) and another with Turkey in 2005. It is worth noting that tariffs on industrial imports from the European Union dropped from about 100 per cent in the 1990s to zero by 2008. In contrast, agricultural imports continued to be subject to high levels of tariffs and NTMs.

According to the World Bank (2010), Tunisia's tariff policy is still very distortive and has become even more so with the EU liberalization process, with imports from third countries entering at duties of more than 40 per cent while the same product

Table 3.6 Pairwise correlations of variables in natural logs

	Consumer prices	Weighted average tariff	NTM coverage ratio	Weighted unit values	Industrial prices
	1.	2.	3.	4.	5.	6.
Consumer prices	1				
Weighted average tariffs	-0.0141	1			
NTM coverage ratio	0.1007*	0.2859*	1		
Weighted unit values	-0.0929*	-0.4733*	-0.3341*	1	
Industrial prices	0.0608*	-0.1476*	0.0264	0.2897*	1
Exchange rate	0.0572*	-0.1586*	0.0202	0.0805*	0.4731*

Note: * indicates significance at 1 per cent level.

Table 3.7 Trading across borders in Tunisia, 2015

Indicator	Tunisia	Middle East and North Africa	OECD
Documents to export (number)	4	6	4
Time to export (days)	16.0	19.4	10.5
Cost to export (deflated US$ per container)	805.0	1,166.3	1,080.3
Documents to import (number)	6	8	4
Time to import (days)	20.0	23.8	9.6
Cost to import (deflated US$ per container)	910.0	1,307.0	1,100.4

Source: World Bank (2016)

http://www.doingbusiness.org/data/exploreeconomies/tunisia/#trading-across-borders.

enters duty free from the EU. Consequently, it was of crucial importance to use weighted tariffs in the following analysis.

Despite the important reductions in tariffs observed in the data, however, there has been little progress in reducing NTMs. Tunisia uses NTMs, such as technical norms and costly rule-of-origin requirements, to restrict trade with GAFTA members. Indeed, importers often select to pay the MFN tariff instead of incurring the cost of obtaining preferential treatment (World Bank, 2009).

It is also worth noting that the investment climate improved in the 2000s, mainly due to the economic reforms and the reduction of behind-the-border trade costs (World Bank, 2009). In particular, according to the World Bank (2016) the number of documents needed to export from Tunisia was lower than the average in the Middle East and North Africa (MENA) region and the same as the OECD high-income average. However, in 2015, the time needed to export was still six days higher than the OECD high-income average but four days less than in the MENA region (Table 3.7). There is scope for improvements in the time needed to export and import, which could be achieved by reducing the time needed to prepare the necessary documents, which still exceed average OECD levels quite substantially.

Monetary policy

During the 1990s, in order to maintain a fairly constant real effective exchange rate (REER), Tunisia adopted an REER targeting policy, which helped preserve the country's competitiveness. However, since 2000, a more flexible exchange rate policy has been adopted, and from 2000 until 2008 the REER shows substantial

Figure 3.4 Evolution of Tunisian monthly effective exchange rate, 2000–2013
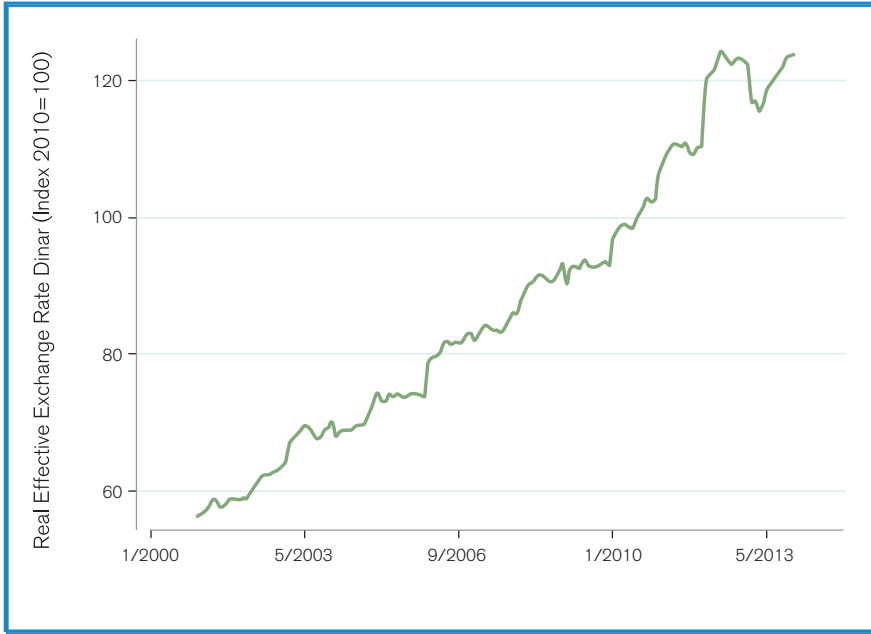
Source: Central Bank of Tunisia (exchange rate); International Monetary Fund (IMF) (CPI); UNCTAD (import share).

depreciation (Figure 3.4).[5] The depreciation was the consequence of a number of shocks affecting the country, namely, the events of September 2001 and several severe droughts that affected agriculture production.

With respect to other policies that also influence consumer prices, the use of administered prices and consumer food subsidies must be mentioned. There are fixed producer buying prices for wheat and other domestic support for barley, milk, olive oil and sugar beet. Tunisia had used price controls since 1986 on agricultural inputs and producer prices, although the former have since been completely removed; there are still guaranteed public prices for grain and milk. With respect to consumer subsidies, since 2000, grain, vegetable oil and milk are covered by subsidies (Minot et al., 2010).

3.3 Literature review

The standard model used to estimate the effect of trade policies or exchange rate movements on retail prices is a pass-through model that distinguishes between domestic and imported varieties (Goldberg and Knetter, 1997).

There is a rich literature estimating the exchange rate pass-through (ERPT), as surveyed by Menon (1995). Those empirical studies mainly find evidence of incomplete pass-through, especially in countries with low inflation. For the Tunisian case, the authors are only aware of one study (Senhadji, Sedik and Kpodar, 2007), which evaluates the degree of ERPT to consumer prices in Tunisia[6] using quarterly data for 43 consumption products (goods and services) over the period 1995–2006. The main results of that study indicate that a 10 per cent nominal depreciation of the dinar increases inflation in the range of 0.7–0.9 percentage points. Some studies extended the pass-through model with trade policy variables to separately estimate ERPT and TPT. To the authors' knowledge, there are only three papers that have estimated ERPT and TPT simultaneously (Feenstra, 1989; Mallick and Marques, 2008; Menon, 1996). However, these studies are (mostly) concerned with the import price at the border of the importing country.

More recently, based on Nicita (2009), a bulk of literature has emerged studying the effect of trade policy on local consumer prices. Since the present study is interested in the distributional effects of trade policy, this is the approach it follows. Recent studies following this approach are Nicita (2009) for the Mexican case, Ural Marchand (2012) for India, and Borraz, Ferrés and Rossi (2013) for Brazil. To the authors' knowledge, the Tunisian case has not been studied separately.

Nicita (2009) evaluates the effect of the formation of Mercosur on household income and expenditure over the period 1990–2000. He assumes that consumer goods cannot be differentiated by origin and that the price of these goods can be expressed as an average price of importer and local substitutes. The estimated TPT differs for agricultural products and manufacturing and is estimated at around 33 per cent and 27 per cent, respectively. The study does not find regional differences in the TPT on agricultural prices, but finds that those differences are significant for manufacturing activities, with regions closer to the United States having a TPT of about 70 per cent, which declines to 40 per cent at 1,000 kilometres' distance from the United States.

For the case of India, Ural Marchand (2012) estimates how price changes are transmitted from the border to the consumers, using a slightly different model to that of Nicita (2009). She is able to estimate different TPT for rural and urban areas and finds that it is significantly lower in rural areas (around 44 per cent) than in

urban areas (64 per cent). Borraz, Ferrés and Rossi (2013) estimate a similar model to that of Nicita (2009) for the Brazilian case over the period 1990–1999. They find that the TPT is around 44 per cent and that trade costs do not have differential effect across geographical areas; hence, the interaction term between transport costs and tariffs is excluded from the estimation results. The present study follows a similar approach to that of Nicita (2009) and Borraz Ferrés and Rossi (2013) and, since Tunisia is a small country in terms of area, does not differentiate between geographical regions.

3.4 Methodology

To evaluate the impact of trade liberalization in Tunisia on domestic prices, retail price data of domestic goods are used in combination with producer price data and international prices to estimate a pass-through equation.

Retail prices can react only partially to changes in international prices, and the extent to which the transmission is complete depends not only on the changes in trade policies, such as tariff reductions or NTMs, or on given domestic policies, such as price support and exchange rate policies, but also on exchange rate policies and on the specific institutional and economic environment and competition policies. It could happen that retail prices do not fully incorporate changes in border prices if the circumstances in the given country impede or complicate the transmission of the changes. In particular, the lack of substitutes, impact of transport costs, influence of competitor prices and rigid margins of intermediaries could affect the extent to which reductions in border prices are passed to retail prices.

Prices are also affected by competitive conditions in the country. If there are barriers to entry into a market, trade liberalization will only benefit those who are already operating within it. Such enterprises, benefiting from having significant market power, are in a position to set high prices while enjoying import tariff cuts. Thus, tariff reform will not impact upon consumer prices. Evidence of barriers to entry is given by Rijkers, Freund and Nucifora (2014). They show a correlation between connected firms, entry restrictions and protectionism in the original code, which was enacted in 1993. These connected firms outperform their competitors on all levels. In addition, they are active in sectors disproportionately subject to authorization requirements and foreign direct investment restrictions, giving them greater market power. These firms are sole players in several sectors.

It is also important to note that price transmission also depends on the market shares of production and consumption of the goods. For example, if a country is a

large producer or consumer of a given product, this could impact upon the product's international price. In the case of Tunisia, which could be considered a small country in economic terms, this should not be an issue for the majority of goods.

The empirical strategy of the present study consists of adapting the framework developed by Goldberg and Knetter (1997) and Campa and Goldberg (2008) and used by Nicita (2009)[7] and Borraz, Ferrés and Rossi (2013) to the Tunisian case. Prices are expressed as follows:

$$P_{kt} = PP^{\alpha}_{kt} \, (PI_{kt} \, (1+\tau_{kt}))^{1-\alpha} \qquad (1)$$

where:

P_{kt} is the local price faced by households for good k at time t; PI_{kt} denotes the international price in local currency; τkt denotes the tariff of good k at period t; PP_{kt} is the production price; α indicates the domination of local varieties over imported varieties; $(1-\alpha)$ indicates the importance of international prices, trade policies and trade costs on local prices. The degree of pass-through is given by $(1-\alpha)$. The pass-through is complete when α takes the value of zero and changes in border prices are 100 per cent passed to retail prices, whereas if $\alpha=1$ the pass-through changes in border prices do not affect retail prices. Note that, while the exposition here is in terms of tariffs, the same line of reasoning applies to other trade costs.

Taking logs of equation (1) obtains:

$$\ln P_{kt} = \alpha \ln PP_{kt} + (1-\alpha) \, \ln PI_{kt} + (1-\alpha) \, \ln(1+\tau_{kt}) \qquad (2)$$

Loosening the restrictions imposed on coefficients in (2) and adding sectoral λ_k and time π_t, dummies, the following model is estimated in accordance with Nicita (2009):

$$\ln P_{kt} = \beta_0 + \beta_1 \ln PP_{kt} + \beta_2 \ln PI_{kt} + \beta_3 \ln(1+\tau_{kt}) + \lambda_k + \pi_t + \varepsilon_{kt} \qquad (3)$$

where ε_{kt} denotes the error term that is assumed to be independent and identically distributed variables and the rest of variables are the same as in equation (1).

In some regressions, the *ad valorem* tariff equivalents (AVEs) of NTMs are included in the regression. They are obtained estimating a gravity model of Tunisian imports:

$$\ln imp_{jpt} = \gamma_0 + \gamma_1 \ln GDPjt + \gamma_2 \ln(1+\tau_{jpt}) + \gamma^h_{NTM} NTM^h_{jpt} + \varphi_j + \delta_t + \in_{jpt} \qquad (4)$$

where:

imp_{jpt} are Tunisian import values of product p (combined harmonized system HS-6 digit disaggregation level) from exporter j at time t; GDP_{jt} is exporter GDP; τ_{jpt} are bilateral weighted tariff rates; NTM^h_{jpt} is a vector of NTM dummies; γ^h_{NTM} is the corresponding vector of coefficients, both of 7 dimensions – one for each type of NTM (Types A to F);[8] φ_j are exporter fixed effects that capture all the other trade cost and gravity variables, such as distance and all other time-invariant bilateral dummies; δt are year fixed effects that proxy for all time-varying factors common for all exporters and products (Tunisian GDP, business cycle); and $\in_{jpt}$ is an *iid* error term.

Note that γ_2 is interpreted as $(1-\sigma)$, where σ is the elasticity of substitution (Anderson and van Wincoop, 2004). In accordance with Bacchetta et al. (2012), the tariff equivalent by type of NTM can be calculated as follows:

$$\widetilde{\tau}^h_{NTM}=\exp(\gamma^h_{NTM}/\gamma_2)\text{-}1 \qquad (5)$$

Similarly, the compound AVE for all types of NTMs is calculated for each product k and year t:

$$\widetilde{\tau}_{kt}=\sum_{p\in k}s_{pkt} \sum_j s_{jpt} [\exp(\gamma^h_{NTM} NTM^h_{jpt} /\gamma_2)\text{-}1] \qquad (6)$$

where:

s_{jpt} is the share of imports of HS-6 product p imported from country j, and s_{pkt} is the share of imports of good k due to import of HS-6 product p. Note that $\gamma^h_{NTM} NTM^h_{jp}$ is a scalar product.

Including NTMs, equation (3) becomes:

$$\ln P_{kt}=\beta_0+\beta_1 \ln PP_{kt}+ \beta_2 \ln PI_{kt}+\beta_3 \ln(1+\tau_{kt})+\beta_4 NTM_{kt}+\varphi_j+\delta_t+\varepsilon_{kt} \quad (7)$$

where NTM_{kt} is either the coverage ratio or $\ln(1+\widetilde{\tau}_{kt})$, i.e. the log-transformed *ad valorem* tariff factor equivalent (AVE) of the NTMs.

3.5 Data, variables and empirical model

Data and variables

Bilateral tariff data are taken from the World Bank's TRAINS database, which covers the period 2002–2008.[9] Because tariff data for 2007 are missing, it is

assumed that 2006 tariffs were retained in 2007. Additionally, for tariffs missing at the beginning of the period, it is assumed that they are at least as high as the earliest available tariff, and therefore a conservative estimate is applied. Effectively applied tariffs (AHS) are used in the analyses. Additionally, in some regressions there is control for the coverage ratio of NTMs, and the corresponding data are from the World Bank.[10]

The study uses unilateral NTMs applied by Tunisia on its imports from the world and from the European Union. Coverage ratios are calculated as the share of import of the HS-6 products that are subject to NTMs with respect to total imports in each price category, to reflect the incidence of this factor on imports at the more aggregated level. It is important to note that it is a crude proxy, given the wide variety of measures (import quotas, security standards, phytosanitary standards, etc.) that exist. For that reason, as an alternative, the study also considered AVEs, which were also constructed using the supplied World Bank data. Weighted average tariffs were constructed using import shares from the UN-Comtrade database, considering only those products with positive imports.[11]

International prices are approximated using import unit values, i.e. expenditure per unit, based on UN-Comtrade. Unit values were calculated in United States dollars per kilogram. Note that, since import values are collected, including cost, insurance and freight (CIF), trade cost does not need to be controlled for in the regression analysis. As in the case of tariffs, weighted unit values were calculated based on the respective commodity's import share. Unit values were converted to Tunisian dinars using exchange rates obtained from the Central Bank of Tunisia.

Retail prices and industrial price indices were kindly provided by the Tunisian National Statistics Institute. Retail prices are available for more than 140 products or product groups. Unfortunately, for lack of recording in the years for which tariff data are available, and lack of concordance in the trade data, only 75 items could be used. Industrial prices are available for 70 product groups. Those that could be linked to retail price categories are employed.

Since no official conversion table was available that allowed the merging of industrial prices, trade and tariff data, and retail prices, the authors manually constructed such tables as can be found in the working paper for this chapter (Baghdadi, Ben Kheder and Arouri, 2016). Note that tariff data were retrieved in HS nomenclature and converted to HS 1996 before they could be merged with the trade and NTMs data.

Main results

The gravity model in equation (4) is estimated using simple ordinary least squares (OLS). Results are presented in the first two columns of Table 3.8.

The coefficient in row 5 (type C NTM) shows that only type C measures (pre-shipment inspections and other formalities) inhibit trade for Tunisia. Therefore, the AVEs – the respective elements of $\tilde{\tau}^h_{NTM}$ calculated according to equation (5) – are negative in the other categories, as can be seen in column 3. By and large, these results are in accordance with Ghali et al. (2013) and Baghdadi, Ben Kheder and Arouri (2016), even though, curiously, they find a negative coefficient for type B measures but a positive coefficient for type C measures. This gives rise to a pattern of compound AVEs ($\tilde{\tau}_{kt}$) per product category, which is reported in Appendix Table 3.1. Note that the reported figures are negative for all product groups, indicating that, on average, the presence of NTMs actually increases trade. While this is quite surprising, a potential explanation could be that NTMs effectively apply standards, thereby improving transparency and credibility. In that respect, they would foster trade, and are equivalent to a negative tariff.

Table 3.8 Gravity estimation and *ad valorem* equivalents

Variable	OLS	Standard Error	AVE (%)
Exporter GDP	0.0788	[0.0547]	
Weighted tariff	-1.493***	[0.0405]	
Type A NTM	1.065***	[0.0778]	-50.9952
Type B NTM	0.526***	[0.0239]	-29.6867
Type C NTM	-0.448***	[0.0825]	34.96706
Type D NTM	0.382***	[0.107]	-22.5908
Type E NTM	3.008***	[0.308]	-86.6599
Type F NTM	0.118***	[0.0406]	-7.60489
Type H NTM	1.256***	[0.0405]	-56.8838
Constant	6.014***	[1.219]	
Observations	261,245		
R-squared	0.122		
Year FE	Yes		
Exporter FE	Yes		

Note: Standard errors in brackets; *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors' calculations using data from UN-Comtrade database and World Bank.

That means that, below the point at which there is a negative coefficient for the AVE, this measures the effect of an increase in NTMs.

Equations (3) and (7) are estimated for all goods and for broad categories for the period 2002–2008 using monthly data for industrial prices and international prices (proxy with weighted import unit values) and for yearly weighted tariffs. The main results for all goods are presented in Table 3.9.

The model is estimated by generalized least squares (GLS).[12] Column 1 in Table 3.9 presents the results for a model with time dummies and column 2 also includes product dummies.

Table 3.9 Tariff pass-through for all goods

Variable	(1) All goods	(2) All goods	(3) All goods	(4) All goods	(5) All goods	(6) All goods
Industrial price	0.259**	0.163**	0.254**	0.165**	0.256**	0.160**
	[0.109]	[0.0727]	[0.109]	[0.0729]	[0.109]	[0.0726]
Weighted unit value per kg	-0.00590	0.00297	-0.00539	0.00296	-0.00482	0.00308
	[0.00444]	[0.00414]	[0.00444]	[0.00414]	[0.00443]	[0.00410]
Weighted tariff	0.0941**	0.0642*	0.0921**	0.0634*	0.0984**	0.0620*
	[0.0443]	[0.0350]	[0.0441]	[0.0351]	[0.0442]	[0.0352]
Coverage ratio			4.82e-05	0.000168		
			[0.000631]	[0.000513]		
AVE of NTM					0.212**	-0.0453
					[0.0890]	[0.0931]
Constant	-1.256**	-2.198***	-1.245**	-2.223***	-1.152**	-2.237***
	[0.525]	[0.389]	[0.531]	[0.397]	[0.525]	[0.395]
Product dummies	No	Yes	No	Yes	No	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,656	4,656	4,656	4,656	4,656	4,656
Number of products	74	74	74	74	74	74

Note: Standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Industrial price, weighted unit value per kg, weight tariff, AVE of NTM in logs

The TPT is 9 per cent in column 1 (without product dummies) and 6.4 per cent with both sets of dummies; the international and production prices coefficients present the expected positive sign and are statistically significant, whereas import unit values are not statistically significant. The degree of TPT is considerably lower in comparison with that found in studies for other developing countries. Including the coverage ratio in columns 3 and 4 leaves results practically unchanged. Unlike the coverage ratio, the inclusion of AVE shows a significant positive impact on prices, but only in column 5. However, including product dummies in column 6, the coefficient becomes less significant. The inclusion of AVE induces only minor changes in the other coefficients.[13] The TPT is now 6.2 per cent.

The model was also estimated including a dummy that takes the value of 1 for the goods subject to subsides and price controls. The results concerning the TPT remain the same and the dummy coefficient is negative and significant, indicating that retail prices are, in general, lower for these products.

In Table 3.10, the model is augmented with a proxy for market power. In particular, use is made of the Herfindahl Index of concentration, which measures the average market shares that firms have in a given industry.

The new variable is also interacted with the weighted tariff to see whether the TPT varies with market power. Indeed, the results show that the tariff elasticity is statistically significant and of higher magnitude in Table 3.10 than in Table 3.9. Calculation of the marginal effects of the combined effect of the level and the interaction factors indicates that the average effects are similar to those in Table 3.9.

Table 3.10 shows that imperfections in the market mechanism reduce TPT substantially. Indeed, the interaction between tariffs and weighted Herfindahl Index shows that, for industries in which firms have sizeable market power, prices are not decreasing in response to tariff cuts: quite the contrary, in some cases – in high concentration sectors – where the effect goes in the opposite direction. Thus, one potential reason for the low TPT in Tunisia is low competition: firms with strong market power are capturing a part of the tariff. Therefore, tariff changes could not possibly translate into price reductions and improvement in consumer welfare.

GLS estimations with product dummies and with time dummies are also presented for broad categories (Table 3.11) and for more disaggregated categories (Table 3.12).

Table 3.10 Tariff pass-through interacted with market power

	(1)	(2)	(3)	(4)
Variable	All goods	All goods	All goods	All goods
Industrial price	0.207*	0.161**	0.211*	0.157**
	[0.107]	[0.0724]	[0.108]	[0.0722]
Weighted unit value per kg	-0.00341	0.00365	-0.00290	0.00341
	[0.00492]	[0.00470]	[0.00495]	[0.00470]
Weighted tariff	0.248***	0.195***	0.265***	0.192***
	[0.0669]	[0.0535]	[0.0680]	[0.0536]
Weighted Herfindahl Index*Weighted tariff	-0.400***	-0.342***	-0.413***	-0.349***
	[0.117]	[0.0963]	[0.118]	[0.0964]
Weighted Herfindahl Index	0.271***	0.189***	0.292***	0.190***
	[0.0704]	[0.0586]	[0.0713]	[0.0585]
AVE of NTM			0.217**	-0.0812
			[0.0906]	[0.0931]
Constant	-1.190**	-2.345***	-1.119**	-2.407***
	[0.517]	[0.397]	[0.523]	[0.402]
Observations	4,522	4,522	4,522	4,522
Number of price_code	73	73	73	73
Product dummies	No	Yes	No	Yes
Year dummies	Yes	Yes	Yes	Yes

Note: Standard errors in brackets.*** p<0.01, ** p<0.05, * p<0.1.
Industrial price; weighted unit value per kg, weighted tariff, AVE of NTM in logs

According to the results in Table 3.11, the coefficient of weighted tariffs is positive for agricultural products and statistically significant in columns 1 to 4, and its interaction with the Herfindahl Index is negative and significant, as in Table 3.10. For manufactured goods, the pass-through coefficient is not significantly different from zero in any of the specifications (with and without NTMs).

Table 3.11 Tariff pass-through for broad categories (addition of Herfindahl Index)

	(1)	(2)	(3)	(4)	(5)	(6)
Variable		Agriculture			Manufactures	
Industrial price	0.179	-0.0996	0.166	0.245***	0.627***	0.238***
	[0.143]	[0.166]	[0.142]	[0.0577]	[0.194]	[0.0573]
Weighted unit value per kg	0.00250	0.00794	0.00167	0.00546	-0.00369	0.00523
	[0.00700]	[0.00725]	[0.00696]	[0.00401]	[0.0120]	[0.00398]
Weighted tariff	0.253***	0.155*	0.221***	0.0218	0.0990	0.0272
	[0.0688]	[0.0832]	[0.0692]	[0.0822]	[0.269]	[0.0813]
Weighted Herfindahl Index*Weighted tariff	-0.473***	-0.263*	-0.466***	0.0228	0.276	0.0622
	[0.132]	[0.156]	[0.131]	[0.143]	[0.467]	[0.142]
Weighted Herfindahl Index	0.293***	0.184*	0.265***	-0.0328	0.0166	-0.0330
	[0.0873]	[0.103]	[0.0872]	[0.0492]	[0.159]	[0.0486]
AVE of NTM			-0.649***			0.122***
			[0.193]			[0.0454]
Observations	2,760	2,760	2,760	822	822	822
Number of price_code	49	49	49	12	12	12
Product dummies	Yes	No	Yes	Yes	No	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes

Note: Standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.
Industrial price, weighted unit value per kg, weighted tariff, AVE of NTM in logs.

Table 3.12 presents the results for broad consumption categories, which show positive and significant tariff effects (reductions in tariffs are associated to reductions in domestic prices) for three items: bread and cereals; milk, cheese and eggs; and tobacco. The AVEs[14] present mostly non-significant coefficients and, in a few cases, are negative. Finally, results for single products are presented in Appendix Table 3.2. Positive and significant TPT is found for 16 of 67 products. In particular, full pass-through is found for chocolate powder, seed oil, and bottled and fresh milk, and partial pass-through for the other 13 products. The coverage ratio presents positive and significant estimates for fresh milk in bulk, synthetic carpet mats, cement and bio fuel. However, the information is missing for many products.

Table 3.12 Tariff pass-through for specific categories

Category of goods	Unit values	Industrial prices	Weighted tariffs	Constant	Observations Observations	Products
Bread and cereals	-0.0229	0.487	0.472***	-113.9***	456	6
Clothing and footwear	0.122	2.127***	-12.44	-235.2***	44	2
Fish and seafood	0.0126	-0.156	0.126	-9.595	574	8
Fresh and dried fruits	-0.0126	3.865***	-0.0507	66.16	290	7
Furniture, household articles	0.00320	0.184***	0.0123	-40.38***	526	7
Housing, water, gas, electricity	0.00395	0.355***	0.0615	-48.65***	520	7
Meat and poultry	0.0194	0.531**	0.346	-48.59	119	2
Milk, cheese and eggs	-0.0175**	0.391**	0.242***	-219.4***	324	5
Oil and fats	-0.00328	-0.0594	-0.0176	-77.01***	168	2
Salt and condiments	0.000150	0.00742	0.00148	-5.695**	252	3
Sugar, jam, tea, coffee and chocolate	-0.00850	-0.133	0.0830	0	181	3
Tobacco	-0.00456	0.487***	0.134***	-96.13***	252	3
Vegetables	-0.00430	-0.753	0.0226	-115.8***	530	14
Health	0.231**	-0.0855	-1.912***	234.8***	168	2
Transport	0.00523	0.0363**	-0.0555	-5.468	252	3

Note: All models estimated with robust standard error (SE) with a time trend and product fixed effects. All models include a constant and were estimated in logs. Tariffs and unit values are weighted by import shares.

Robustness

This section presents the results of a number of robustness tests done to validate the results obtained and reported above. First, a variable used as a proxy of other trade costs, including those different from tariffs, was included. Trade cost data were sourced from the United Nations Economic Commission for Asia and the Pacific (ESCAP) database, and used based on an inverse gravity model of trade. ESCAP provides data on (symmetric) bilateral trade cost for the agricultural and manufacturing sectors across time.

Table 3.13 present the results, without interaction in columns 1 and 2, and with interaction with the Herfindahl Index in columns 3 and 4. Column 1 shows that reductions in trade costs decrease local prices substantially. However, the effect is lower in industries in which firms enjoy important market power (column 3). In any case, the pass-through is much higher than for tariffs, indicating that other trade costs translate more directly into local prices.

Table 3.14 adds the real effective exchange rate (the simple mean _t and the geometric mean _tg) to the model. Addition of the exchange rate does not change the results.

Table 3.13 Trade costs pass-through

Variable	(1) All goods	(2) All goods	(3) All goods	(4) All goods
Industrial price	0.364***	0.168**	0.314***	0.161**
	[0.111]	[0.0729]	[0.108]	[0.0734]
Weighted unit value per kg	0.0113**	0.00426	0.0132**	0.00189
	[0.00478]	[0.00405]	[0.00532]	[0.00468]
Weighted trade costs	1.057***	0.182	1.487***	0.157
	[0.108]	[0.255]	[0.136]	[0.258]
Weighted Herfindahl Index*Weighted trade costs			-0.643***	-0.0207
			[0.117]	[0.0960]
Weighted Herfindahl Index			0.730***	0.0355
			[0.116]	[0.0958]
Constant	-2.902***	-2.262***	-3.176***	-2.190***
	[0.556]	[0.389]	[0.554]	[0.408]
Observations	4,656	4,656	4,522	4,522
Number of price_code	74	74	73	73
Product dummies	No	Yes	No	Yes
Year dummies	Yes	Yes	Yes	Yes

Note: Standard errors in brackets. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
Industrial price, weighted unit value per kg, weighted trade costs in logs.

Source: Data derived from ESCAP: http://www.unescap.org/stat/data/statdb/DataExplorer.aspx

Table 3.14 Addition of the real effective exchange rate (REER)

	(1)	(2)	(3)	(4)
Variable	All goods	All goods	All goods	All goods
Weighted unit value per kg	-0.00557	-0.00554	-0.00488	-0.00488
	[0.00442]	[0.00443]	[0.00443]	[0.00443]
Weighted tariff	0.0940**	0.0946**	0.0989**	0.0995**
	[0.0443]	[0.0443]	[0.0443]	[0.0444]
Industrial price	0.254**	0.247**	0.254**	0.247**
	[0.110]	[0.110]	[0.110]	[0.110]
REER_t	0.000746		0.000643	
	[0.00240]		[0.00240]	
REER_tg		0.00179		0.00169
		[0.00203]		[0.00203]
AVE of NTM			0.213**	0.214**
			[0.0889]	[0.0887]
Constant	-1.300**	-1.349**	-1.193**	-1.244**
	[0.542]	[0.535]	[0.544]	[0.536]
Observations	4,656	4,656	4,656	4,656
Number of price_code	74	74	74	74
Product dummies	No	No	No	No
Year dummies	Yes	Yes	Yes	Yes

Note: Standard errors in brackets. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
Industrial price, weighted unit value per kg, weighted tariff, AVE of NTM in logs.

Using instrumental variables for production prices, the results on TPT remain the same (Table 3.15).

Table 3.15 Without industrial prices/instruments for industrial prices

Variable	(1) No production price	(2) No production price	(3) IV 1 lag	(4) IV 1 lag	(5) IV 2 lags	(6) IV 2 lags
Weighted unit value per kg	-0.00467	-0.00417	-0.00314	-0.00273	-0.00314	-0.00273
	[0.00441]	[0.00442]	[0.00327]	[0.00327]	[0.00327]	[0.00327]
Weighted tariff	0.0870**	0.0926**	0.0670***	0.0533**	0.0670***	0.0533**
	[0.0442]	[0.0444]	[0.0255]	[0.0258]	[0.0255]	[0.0258]
AVE of NTM		0.217**		-0.185***		-0.185***
		[0.0886]		[0.0544]		[0.0544]
Industrial price			0.114***	0.0800*	0.114***	0.0800*
			[0.0412]	[0.0424]	[0.0412]	[0.0424]
Constant	-0.0360	0.0645	-0.640***	-0.578***	-0.640***	-0.579***
	[0.0949]	[0.103]	[0.203]	[0.203]	[0.203]	[0.203]
Observations	4,656	4,656	4,656	4,656	4,656	4,656
Number of price_code	74	74	74	74	74	74
Product dummies	No	No	No	No	No	No
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes

Note: Standard errors in brackets. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
Industrial price, weighted unit value per kg, weighted tariff, AVE of NTM in logs.

Table 3.16 demonstrates inclusion of an interaction between tariffs and NTMs. It does not affect the results, and is usually insignificant. The only exception is shown in column 5, where there is positive effect of the interaction. As mentioned above, higher AVE is equivalent to lower NTM. The positive interaction could thus mean that, while NTMs foster trade, they still entail a cost, and thereby limit pass-through. The effect, again, is lower in sectors with high market power.

Table 3.16 Interaction of tariffs and NTMs

	(1)	(2)	(3)	(4)	(5)	(6)
Variable	All goods	All goods	All goods	All goods	All goods	All goods
Weighted unit value per kg	-0.00275	0.00285	-0.00140	0.00341	-0.00151	0.00329
	[0.00439]	[0.00410]	[0.00492]	[0.00470]	[0.00495]	[0.00471]
Weighted tariff	0.0769	0.152*	0.210	0.353***	0.650***	0.293
	[0.108]	[0.0875]	[0.142]	[0.119]	[0.232]	[0.182]
Industrial price	0.229**	0.163**	0.206*	0.155**	0.236**	0.152**
	[0.105]	[0.0725]	[0.105]	[0.0720]	[0.107]	[0.0722]
AVE of NTM	0.187*	-0.0949	-0.0237	-0.139	-0.304*	-0.105
	[0.105]	[0.103]	[0.132]	[0.117]	[0.176]	[0.141]
Weighted Herfindahl Index			0.412***	0.183**	0.702***	0.148
			[0.0869]	[0.0723]	[0.132]	[0.109]
AVE*Weighted tariff	-0.0300	0.204	-0.0674	0.347	0.838*	0.222
	[0.224]	[0.181]	[0.275]	[0.231]	[0.476]	[0.369]
Weighted Herfindahl Index*AVE			0.344***	-0.0340	0.919***	-0.109
			[0.119]	[0.0908]	[0.241]	[0.195]
Weighted Herfindahl Index*Weighted tariff			-0.372***	-0.363***	-1.263***	-0.244
			[0.115]	[0.0967]	[0.352]	[0.287]
Weighted Herfindahl Index*Weighted tariff*AVE					-1.867***	0.253
					[0.710]	[0.579]
Constant	-1.069**	-2.290***	-1.202**	-2.467***	-1.486***	-2.446***
	[0.512]	[0.397]	[0.516]	[0.403]	[0.530]	[0.407]
Observations	4,656	4,656	4,522	4,522	4,522	4,522
Number of price_code	74	74	73	73	73	73
Product dummies	No	Yes	No	Yes	No	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes

Note: Standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Industrial price, weighted unit value per kg, weighted tariff, AVE of NTM in logs.

3.6 Conclusions

This study estimated the TPT for the Tunisian economy using data from 2000 to 2008. The main results indicate that changes in tariffs are only partially transmitted to changes in retail prices, with an average pass-through of 10 per cent. This partial pass-through effect is lower in magnitude than that found in other developing-country studies. The model was also estimated for specific sectors, with results indicating that the TPT for agricultural products is around 22 per cent, whereas for the manufacturing sector the pass-through coefficient is not statistically significant. This result confirms that a trade liberalization scenario that is not strengthened by trade-related institutions and policies, such as a stable macroeconomic environment, a competitive exchange rate and competitive policies, fails to contribute to an efficient allocation of resources. As a consequence, consumer prices will not decrease as expected following tariff reduction. Consumers will not profit from trade liberalization. As the markets are distorted by government interventions via price controls, subsidies, taxes and barriers to entry, tariff cuts will benefit the few firms operating in liberalized markets.

Finally, this research suggests that addressing the distortions discussed above along with trade facilitation measures and sectoral actions to facilitate the business environment could positively impact upon the pass-through effect, so that reductions in border prices could affect retail prices more significantly, which, in turn, could contribute to increased domestic welfare and generate inclusive development.

The results concerning the transmission of NTMs to domestic prices are not very informative. This could be due to errors in the data and to the lack of a sufficiently accurate measure of NTMs for Tunisian imports. More work is needed to refine the measure used and to obtain more clear-cut results. An important aspect that should be mentioned is that a high share of the imported goods (around 40–50 per cent of imports) corresponds to intermediate goods and parts and components, which are also subject to protection but which cannot be directly linked to retail prices. An interesting aspect to be investigated is how changes in protection concerning these products will affect the prices of the final goods produced in Tunisia using these imported inputs. This enquiry remains for further research.

Endnotes

1. Henceforth, this chapter uses the term "non-tariff measures" (NTMs) instead of "non-tariff barriers", since some of them are not necessarily barriers to trade.

2.   In addition, there are a number of subsidies on consumer goods and fixed producer prices for products such as grain, milk, meat, oil and some vegetables.

3.   This could be due to the data construction, since the information available indicates the number of NTMs in the year in which the corresponding regulation applied but the duration of the measures is not provided. Note that some NTMs deal with product standards and do not necessarily have a protectionist effect.

4.   Coverage ratios are calculated as the percentage of imported sub-products subject to NTMs in a given price category.

5.   The nominal effective exchange rate is calculated as the trade weighted arithmetic mean of exchange rates with the most important partner currencies – insofar as data were available from the Central Bank of Tunisia.

6.   See Fanizza et al. (2002) for a description of Tunisia's monetary policy in the 1990s.

7.   The present study does not differentiate by regions due to a lack of data on regional retail prices.

8.   Types are defined as (A) phytosanitary regulations, (B) technical barriers to trade, (C) pre-shipment inspections and other formalities, (D) contingent trade-protective measures, (E) non-automatic licensing, quotas, prohibitions and quantity-control measures other than in A and B, (F) price-control measures, including additional taxes and charges, and (H) Measures affecting competition.

9.   While tariff data for 2013 were available from the ITC's Investment map, these data were not bilateral, which made the calculation of weighted average difficult. Also, since data from 2009 to 2012 was missing, it was not possible to exploit these data without strong assumptions.

10.   Compiled and kindly shared by Mariem Malouche, Trade and Competitiveness Global Practice, World Bank.

11.   Note that UN-COMTRADE does not report data for Taiwan. It was assumed that the COMTRADE partner designated "Other Asia, nes" largely coincides with Taiwan, in accordance with the UN International Trade Statistics knowledge base: http://unstats.un.org/unsd/tradekb/ Knowledgebase/Taiwan-Province-of-China-Trade-data.

12.   Models (3) and (7) were also estimated in first differences to control for unobserved heterogeneity. However, due to missing values, the number of observations was considerably reduced and the estimated effects lost statistical significance. For this reason, the preferred estimation is GLS applied to the equations in levels and with different fixed effects.

13.   Note that, similarly to Ghali et al. (2013), this study finds that most of the NTMs actually increase trade in the case of Tunisia. In some cases, the effect was so strong that the AVE was smaller than -1. Due to the logarithmic structure of the model, those observations had to be dropped in columns 5 and 6.

14.   Results are not reported here, in order to save space. They are available upon request from the authors.

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4 Road transport restrictions, freedom of transit and the Trade Facilitation Agreement: The case of Turkey

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Abstract

This chapter argues that restrictions, including quotas and stringent permit systems, employed by some EU member states on road transport and transit run by Turkish road operators, are important barriers to Turkish exporters. Mindful of the parties' failure to overcome this major obstacle despite the customs union which has existed between them since 1995, this chapter seeks to shed light on how trade can be significantly hampered by such restrictions, and explores the ways in which WTO legal instruments, in particular Article V ("Freedom of Transit") of the General Agreement on Tariffs and Trade (GATT) and recently Article 11 ("Freedom of Transit") of the Trade Facilitation Agreement can come into play to liberalize trade.

4.1 Introduction

The European Union remains Turkey's most important trading partner, with 44 per cent of Turkish exports in 2014 destined for EU markets, even though the European Union's share of Turkey's exports has fallen in recent years, and now accounts for 37 per cent of Turkish imports.[1] The trade that is carried by road transport between Turkey and the European Union is governed mainly by a set of bilateral and multilateral agreements that restrict quantity and capacity by limiting the number of permits available for a truck to make a journey. Turkish exports in manufactured products towards the European Union are subject to technical barriers (Pastori et al., 2014).

Turkey is the biggest economy to be in a customs union (CU) arrangement with the European Union compared to the European Union's other CU partners, i.e. Andorra, Monaco and San Marino. Under normal circumstances, Article XXIV ("Territorial Application – Frontier Traffic – Customs Unions and Free-trade Areas") of the General Agreement on Tariffs and Trade (GATT) requires that internal trade should be liberalized within a CU, which would imply that neither EU countries nor Turkey should impose trade quotas on each other's exports. EU member states, which are all party to the CU that is the European Union, do not impose any such quotas on each other, since these would be in breach of the Treaty on the Functioning of the European Union (TFEU).[2] Bilateral road transport agreements, including quota negotiation, remain within the exclusive competence of individual EU member states, and several EU member states apply road transport quotas to Turkish truck operators.[3] As such, Turkey is the only customs union member country on which a road transport quota is applied.

"Decision No 1/95 of the EC-Turkey Association Council of 22 December 1995 on implementing the final phase of the Customs Union", which is based on EU customs union norms and principles, provides that the parties cannot transpose and implement regulations and practices that lead to additional and avoidable costs for the import or export operations as they can be considered to be charges having equivalent effects to customs duties.[4] According to World Bank (2014),[5] restrictive road transport permits, especially for transit, that create obstacles to the free movement of goods hinder the full operation of the CU. Arguably, to the extent that the amount of trade volume that is being operated through road transport falls within the scope of the "substantially all trade" requirement as stipulated in Article XXIV:8 of the GATT 1994, the restrictions and quotas imposed on that volume could lead to a breach of internal trade liberalization requirement to be met by customs unions under that Article.

On the other hand, it might be argued that the issue lies within the sovereign decision-making mechanism of the European Union's member states and thus a union-wide application cannot be secured. In the absence of a concrete solution toward settling the conflict between parties, this chapter explores the ways in which the existing WTO rules, in particular Article V ("Freedom of Transit") of the GATT and Article 11 ("Freedom of Transit") of the WTO's Trade Facilitation Agreement (TFA) could serve as tools to reduce trade costs and boost trade for WTO members.

In this context, the objectives of this chapter are twofold. First, the obstacles to trade liberalization within the CU of Turkey and the European Union under Article XXIV of the GATT 1994, consisting of road transport quotas and transit permits, are outlined. Second, the chapter discusses how other existing WTO legal texts could be instrumental to overcome such obstacles.

The first section examines the bilateral trade framework between Turkey and the European Union. It highlights the road transport regime that is in force within the European Union and its implications for Turkish road transport operators, who are subject to quotas and transit permits in their exports to EU countries. Data from several studies are used, including a thorough study by the World Bank that was completed in 2014.

With a view to demonstrating the inconsistency of the existing restrictions with other WTO rules and disciplines, the second section turns to the assessment of the WTO legal texts related to transit traffic and freedom of transit, in particular Article V of the GATT 1994 and Article 11 of the TFA.

The third section suggests that Article V of the GATT 1994 and Article 11 of the TFA could serve as useful tools, provided that they are empowered with effective interpretation through Dispute Settlement organs when tested in a case.

4.2 Turkey-EU customs union and restrictions on road transportation

Turkey's preferential trading relationship with the European Union dates from 1963, when the parties agreed to establish a framework for the free movement of goods, services, labour and capital. The relationship was deepened in 1973 with the Additional Protocol and in 1995 with the conclusion of "Decision No 1/95 of the EC-Turkey Association Council of 22 December 1995 on implementing the final phase of the Customs Union", which provided mainly for the free movement of

goods and related issues and did not foresee the free movement of persons or of services, freedom of establishment, or capital movements.

By concluding Decision 1/95 with the European Economic Community, Turkey agreed to adopt legislation, to conclude agreements, and to apply treaty articles equivalent to provisions adopted by the European Economic Community. To ensure the free movement of goods, both parties had to abolish tariffs, quotas and equivalent measures,[6] and also to adopt subsidiary provisions on discriminatory taxation and intellectual property law – all of which mirror primary or secondary EC law. To implement the CU, the parties undertook the commitment to implement identical customs legislation and commercial policy. In order to avoid market distortions, they agreed on common competition and state aid disciplines and related functioning mechanisms. Finally, to avoid distortions resulting from divergent amendments to legislation or from divergent judicial interpretation, they had to develop an institutional structure to monitor continued legal integration.

Despite this advanced level of market integration between the parties, there was a substantial problem related to the restrictions applied by several EU member states in the field of road transportation, including quotas and transit permits. The EU-Turkey CU is now 20 years old and has become outdated in view of the more ambitious free trade agreements that the EU has concluded or is negotiating with other key economic partners. Consequently, the parties have undertaken to modernize the existing trade framework and improve the deficient parts.

Several studies on this modernization process have been and are currently being undertaken by various institutions, including a landmark report entitled "Evaluation of the EU-Turkey Customs Union Report",[7] which was drafted by the World Bank at the request of the European Commission. Among the key findings of the report are the positive economic and trade benefits that both parties derive from the partnership.[8] The changing dynamics of the world economy, the shortcomings of the existing CU to deal with those changes, and the ongoing negotiations between the European Union and the United States in the context of the Transatlantic Trade and Investment Partnership (TTIP), are cited among the factors that might necessitate a revision of the arrangement. It suggests that "Increased trade necessitates the movement of increasing volumes and values of goods. Road transport permits, especially for transit, that limit the free circulation of those goods covered by the CU are therefore a key source of concern. Within the context of the CU, road transport quotas and transit permits should be liberalized – at least on consignments of those products covered by the CU - as they hinder the free circulation of goods."[9]

European attempts to liberalize the road transport market started already with the Treaty of Rome in 1957. Despites several amendments to it, some restrictions still remain. The freedom to supply international inland transport services was provided for in Title IV of Article 79 of the Treaty of Rome, even though full liberalization was not achieved until the establishment of the Single European Market.[10]

It should be noted that the liberalization that was reached, was conceived within the framework of the free movement of services through the acquis communautaire (i.e. the accumulated legislation, legal acts, and court decisions of EU law) related to Transport Policy and was not really regulated through the principle of free movement of goods.[11] Moreover, although significant progress has been achieved, cabotage (which allows for the national carriage of goods by transport operators based in the other country)[12] is still solely enjoyed by EU road transport operators, where operators from non-EU countries can have market access only if they have bilateral agreements with the EU member states. In this context, Switzerland remains the sole exception where there is a comprehensive Land Transport Agreement in force between the European Union and Switzerland. Since the bilateral agreements concluded between the EU member states and Turkey regulate road transportation, the imposition of quota and permit arrangements on hauliers from both sides, in particular from the European Union's side, create impediments to intra-CU trade. Although there is certainly room for the parties to improve their respective overall customs operations, practices and procedures towards trade facilitation, road quota and transit permit issues still stand out as significant trade barriers, to the extent that they appear as quasi customs control issues.

As for Turkey and its road transportation capacity, World Bank (2014) shows that almost 40 per cent of Turkish foreign trade is run by its international road transport sector operators.[13] Mindful of its capacity and global competitiveness, Turkey has undertaken a major reform of its road transport sector in the last decade by introducing criteria for access to the profession, roadworthiness tests for vehicles, social legislation, professional training requirements for drivers and a licensing system. One of the principal reasons for Turkey's reform of the road transport industry was its participation in the TIR[14] System, to which only professional and trustworthy transport operators have access, as well as in the ECMT (European Conference of Ministers of Transport) Multilateral Quota, which introduces qualitative criteria for vehicles and professionals. As a natural outcome of these efforts, Turkey has become the largest user of TIR carnets[15] in the world in the last 15 years. Some of the reforms have also been the result of Turkey's efforts to accede to the European Union and its alignment with the European Union's acquis communautaire. Consequently, road transport has become one of Turkey's most competitive and successful sectors, especially for international operations.

According to the World Bank study, almost 40 per cent of Turkish foreign trade is carried by its international road transport sector of around 1,300 firms and fleet of 45,000 vehicles.[16] Although Turkey's share in external trade capacity is substantial, its share has actually shrunk, as it was at 64 per cent in 1995, even though Turkish operators have increased export operations towards their customs union partners, i.e. EU countries.[17] Within the EU, Turkey's main competitors in the road transport industry are Bulgaria, Poland and Romania, along with Moldova – a non-EU country which has been expanding its capacity towards the EU in recent years.

In order for the EU Commission to negotiate transport agreements with third-party countries, a mandate provided by the member states is needed, regardless of the agreement being air or road transport-related. As a matter of fact, any agreement to be concluded between the European Union and non-EU states is subject to the exclusive competence of the member states and thus must be handled through bilateral negotiations. Therefore, road transport services operating between the European Union and Turkey are regulated by bilateral agreements with individual EU members. Turkey currently has a bilateral road transport agreement with all the EU members except Cyprus, Ireland and Malta (see Table 4.1). These bilateral agreements set the number and nature of the permits that are required to perform a transport operation between an EU member and Turkey.[18]

However, significant differences and variations exist between the agreements signed by the EU member states with Turkey, and present a number of complications for both operators and regulators. Some of the agreements may regulate and render different classes of permit towards transit trade and bilateral trade, whereas other agreements do otherwise. Permits may also be specific to a certain vehicle type and are thus not valid for other vehicles. In some instances, Turkish operators are obliged to buy a special permit for a haulier in transit, whereas other third-country operators are not subject to the same requirement. Specifically, there are four types of permissions that the countries grant to each other's operators:

> "Bilateral transport, or direct traffic, allows transport operators of the two parties to carry goods in trade between them. Transit transport rights allow trade to be transported through countries (without any loading/unloading) while triangular, or third-country traffic, allows goods to be loaded on a truck registered in one country from the other country and carried to a third country. Cabotage allows the national carriage of goods by transport operators based in the other country."[19]

Although the share of road and rail transportation in relation to freight traded internationally remains small and limited in comparison with maritime shipping,

Table 4.1 EU member states with which Turkey has concluded bilateral road transport agreements

EU member state	Agreement concluded	Date of conclusion	Post-accession modifications
Austria	√	21 January 1971	21 February 1978
Belgium	√	10 January 1970	26 October 1977
Bulgaria	√	16 April 1977	29 July 1979 and 27 January 2007
Croatia	√	9 January 1998	-
Cyprus		No agreement concluded	
Czech Republic	√	30 June 1981	-
Denmark	√	14 July 1977	22 February 2007
Estonia	√	9 October1995	-
Finland	√	3 August 1977	-
France	√	14 November 1969	10 November 1976
Germany	√	21 December 1977	-
Greece	√	4 April 1970	-
Hungary	√	14 September 1969	21 August 1978
Ireland		No agreement concluded	
Italy	√	30 June 1971	21 February 1978
Latvia	√	21 January 1996	-
Lithuania	√	10 February 1994	-
Luxembourg	√	25 May 1988	-
Malta		No agreement concluded	
Netherlands	√	6 December 1971	21 February 1978 and 24 April 2003
Poland	√	14 May 1978	15 April 2003
Portugal	√	9 May 2005	-
Romania	√	30 April 1977	-
Slovakia	√	14 March 1982	-
Slovenia	√	20 October 2001	-
Spain	√	3 March 1998	-
Sweden	√	14 May 1978	-
United Kingdom	√	14 May 1978	20 May 2009

Source: Pastori et al. (2014).

because road transportation has advantages related to cost per transit time as opposed to water and air transport, the demand for road transportation remains stable and is subject to increase.[20]

One of the significant impediments for the efficiency of the road transportation for countries and their operators are quotas and transit permits. Various studies undertaken on the implications of the road transport quotas for Turkish foreign

trade performance towards the European Union show that Turkey's road transportation is significantly and negatively affected by the quotas applied by EU member states.[21] Under normal circumstances, Turkish operators have transit through Greece or Bulgaria to carry goods in Europe by road. Bilateral quota arrangements are in place between Turkey and several EU member states, which occasionally give rise to problems.[22] In the case of Greece, no major hurdles are reported with regard to transit quotas, but the number of exports made through road transportation is limited in a number of countries due to the imposition of road transport quotas.[23,24] In this context, the findings in World Bank (2014) show that, since road transport quotas hinder free circulation, impose burdens on Turkish trade and prevent Turkish carriers from efficiently using their trucks, they should be eliminated both on bilateral and transit transportation, at least for those goods covered by the CU.[25]

Similarly, road transport quotas impose additional costs, both financial and administrative, on Turkey's trade since when permits are exhausted in several EU member states, trade undertaken by Turkish road transport operators is effectively closed.[26] Apart from the economic consequences, the existing arrangements also have social implications for the operators, since the extended times that the truck drivers are asked to wait at the borders before they are eventually given right to access or transit may cause stress and fatigue and thus negatively affect road safety. Research undertaken by several national and international organizations[27] estimates that the EU quota system has deprived Turkey of export opportunities to the EU of 1.66 billion tons of goods worth US$ 5.56 billion.

Studying the precise effect of road quotas on Turkey's export performance through the analysis of textile sector, the findings of Kabak et al. (2014) show that:

> "One of the important industries suffering from road transport quotas is the textile sector. As road transportation is faster than rail and sea as well as cheaper than air, trucking is the most preferred means of transport for goods in which customer demand can be fickle and efficient response time required. Turkey is chosen as one of the largest suppliers of the European apparel companies particularly for its ability to provide short response time and low costs. The country's competitive advantage in the textile sector lies in the use of trucks, for short transportation time. Therefore, quotas on road transportation are expected to primarily affect Turkish textile exports to European countries." [28]

It should be noted that more or less all candidate countries to the European Union were presented with road quota limitations.[29] As a matter of fact, similar situations faced by other candidate countries (some of them now are full members) serve as precedents that can be effectively used as benchmarks in identifying a possible solution to ease access of Turkish road transport operators to EU markets. Part of the solution is, without doubt, increased coherence among EU countries regarding their quota systems as this would ease some of the problems faced by Turkish hauliers and move towards compliance of EU-Turkey CU obligations. Moreover, deviations of direct transport to the destination may also be qualified as not in keeping with WTO members' obligations under GATT Article V and Article 11 of the WTO's TFA.

In a scenario where Turkey and the European Union would try to overcome the trade restrictive effect of road transport quotas and transit permit requirements, hence easing the market access conditions in their existing preferential trade agreement, the following actions could be considered: a) goods currently entering the European Union under an EU Free Trade Agreement would be liable for duty in Turkey, b) goods currently entering the CU in the European Union and paying tariffs to EU customs, but which are insufficiently transformed within the European Union to qualify as EU originating goods, would be required to pay an external tariff upon entering Turkey as well as rules-of-origin compliance costs to be paid in Turkey. The latter would include the cost of adapting the production process and sourcing in order to fulfil rules of origin requirements and the cost of demonstrating compliance, including the administrative procedures to obtain a certificate or an approved exporter status from customs.

Road transport operators argue that if an agreement abolishing trade restrictions could be reached with the European Union, this would have an extremely positive impact on trade, output and employment for both parties.[30] The main benefit would essentially derive from removal of transit permits as opposed to the removal of bilateral transit permit arrangements having a smaller effect. The studies undertaken in the field[31] suggest that in case of full liberalization, trade between the parties could be enhanced by more than €3 billion per year. The benefits that would accrue to Turkey in case of liberalization of road-freighted exports are clearly more consequential than those from which the European Union would be likely to benefit.[32] Although Turkish hauliers might benefit from bilateral arrangements, the positive impact of those arrangements would be limited and only secondary when compared with the advantages of an overall liberalization that would be achieved at an EU-wide scale. As such, the total removal of time and resource consuming quotas and transit permitting arrangements, including the transit permits required from Turkish hauliers when passing through several EU member states, would liberalize and boost trade.

Once the obstacles are removed, the benefits of trade liberalization will be shared by both parties to the CU. In case the quota system is withdrawn, completely or partly, both parties' exports to each other's markets will increase substantially compared to a business-as-usual scenario. Turkey's exports towards the European Union are expected to increase more quickly than imports from the European Union, while EU consumers are likely benefit from lower prices for Turkish goods due to regulatory costs being removed from the supply chain.[33] Full liberalization for both parties can be realized in a scenario where transport quotas are removed and adjustment of bilateral permits is regulated with a view to trade liberalization. If the currently cumbersome procedures related to the issuance of transit permits could be improved by way of identifying the amount of permits that would be needed for the corresponding number of estimated trips, it would greatly ease transport operators' tasks. However even in this scenario, since they will still need to get hold of a transit permits and to actually have them on board trucks, the time savings can effectively take place only if full and complete liberalization is achieved.

Having dealt with the problems arising out of the limitations that bilateral and regional arrangements may and do have in relation to the liberalization of trade effectuated through road transportation, we will now turn to the analysis of the relevance and advantages of solutions offered by multilateral rules, such as GATT and the Trade Facilitation Agreement.

4.3 Assessment of the road transport quotas and transit permits in view of the "freedom of transit"

In principle, freedom of transit is regulated by international agreements, be they bilateral, regional or multilateral. The concept of transit, as distinct from transit procedure, may be roughly defined as the action of one country's goods passing through or across another country. Freedom of transit, i.e., right of transit, is a right adopted under international law.

The liberalization and facilitation of transit passes via the territory of each contracting party and the routes conducive to international transit, were stipulated by the League of Nations Agreement and the Barcelona Convention and Statute on Freedom of Transit Law of 20 April 1921, as well as by the other agreements adopted in the international arena. Article V of GATT is the most detailed legal piece among these documents. Article V:2 of the GATT stipulates that international trade should transit via the most convenient route in the contracting countries in international trade and legitimizes freedom of transit for vehicles moving on this route, notwithstanding the departure and arrival points, mode of transport, origin

and flag of vessels. Freedom of transit is also governed in detail in Article 11 of the TFA.

Article V of the GATT determines the concept of traffic in transit and lays down the conditions a member may impose on goods transported through its territory by another party to a foreign destination. Accordingly, the main purpose of the provision is to provide for the freedom of transit through the territory of each member for transport to or from the territory of other members. In order to ensure that this freedom is effectively present and enjoyed, Article V stipulates two essential requirements, i.e. not to hinder traffic in transit by imposing unnecessary delays or restrictions or by imposing unreasonable charges (Article V:3) and to accord most-favoured-nation (MFN) treatment to transiting goods of all members (Article V:5).

Although Article V is entitled "Freedom of Transit", Article V:1 clarifies the term "transit" and the "traffic in transit", whereas Article V:2 lays down the principle of the "freedom of transit". In negotiating Article V, the contracting parties considered the Barcelona Convention and Statute on Freedom of Transit of 20 April 1921, regulating the conditions a member could apply to goods of another member passing through its territory to a third destination. Parts of Article V (i.e. Article V:1 and the last sentence of ArticleV:2) were drawn from corresponding provisions of the Barcelona Convention. An even higher degree of correspondence can be found with respect to the draft Havana Charter for an International Trade Organization, Article 33 of which is a nearly verbatim copy of GATT Article V.[34]

GATT Article V has been subject to interpretation in some disputes, notably in Colombia – Ports of Entry. As a matter of fact, the Colombia – Ports of Entry case is the first WTO case where GATT Article V on the freedom of transit was tested. The Panel dealt first with Article V:2:

> *"There shall be freedom of transit through the territory of each contracting party, via the routes most convenient for international transit, for traffic in transit to or from the territory of other contracting parties. No distinction shall be made which is based on the flag of vessels, the place of origin, departure, entry, exit or destination, or on any circumstances relating to the ownership of goods, of vessels or of other means of transport."*

According to the Panel in this case,

> "Article V:2, first sentence, provides that there shall be freedom of transit through the territory of each Member, via the routes most convenient for international transit, for traffic in transit to or from the territory of other

Members. In turn 'traffic in transit' is defined as the transit across the territory of a Member when the passage across such territory, with or without trans-shipment, warehousing, breaking bulk, or change in the mode of transport, is only a portion of a complete journey beginning and terminating beyond the frontier of the Member across whose territory the traffic passes. […] Article V:2, second sentence provides that no distinction shall be made based on, inter alia, the place of origin, departure, entry, exit or destination, or on any circumstances relating to the ownership of goods, of vessels or of other means of transport. [...] Article V:6 of GATT 1994 provides that products which have been in transit through the territory of any other Member shall be accorded treatment no less favourable than that which would have been accorded to such products had they been transported from their place of origin to their destination without going through the territory of such other Member." [35]

In other words, the Panel in this case clarified whether freedom of transit applies to all goods in transit or only those that are transhipped.

The Panel opined that freedom of transit, as a concept, extends to all traffic in transit in accordance with the definition given in Article V:1. Consequently, this freedom ought to be guaranteed without conditions linked to trans-shipment, warehousing, breaking bulk or changes in the mode of transport.[36] Moreover, and again in accordance with Article V, the panel stated that transit should be permitted and provided via the most convenient route for the passage through its territory for specified routes. Accordingly, the fact that the goods had to be transhipped in order to be recognized and proceed as traffic in transit was found in the *Colombia – Ports of Entry* case to be a breach of Article V.2.

Article V of the GATT 1994 also establishes rules concerning transit. Although this Article has sometimes been invoked during consultations, in particular in connection with pipelines, it had never been subject to a detailed interpretation by a panel until the *Colombia – Ports of Entry* case.[37] Road freight transport lies at the heart of the trade facilitation work that was undertaken as part of the Doha Development Agenda. Article V itself has been under review in the negotiations, in line with the mandate contained in Annex D of the "July package", i.e. the text of the WTO General Council's decision on the Doha Agenda work programme, agreed on 1 August 2004. Pursuant to Annex D, the Negotiating Group on Trade Facilitation was tasked to "clarify and improve relevant aspects of Article V". As a result of this mandate, members submitted a number of legal proposals, which were contained within a draft consolidated negotiating text.

However, even though traffic ought to be permitted to transit freely via any available route in accordance with GATT Article V, the reality is different and that many operators do face restrictions in their road transportation.[38]

4.4 The Trade Facilitation Agreement and its Article 11

The Trade Facilitation Agreement was launched during the WTO Trade Facilitation negotiations of the Doha Round and the text was agreed on 7 December 2013 at the Bali Ministerial Conference. It contains provisions for advancing efficiency in customs procedures by way of ensuring effective cooperation between customs and other authorities on trade facilitation and customs compliance issues. The text was adopted by the General Council of the WTO on 27 November 2014. However the Agreement's entry into force is pending, awaiting formal acceptance by two-thirds of the WTO membership.

Several Articles of the TFA are directly relevant for dealing with the issues discussed in this chapter. The TFA calls for improved collaboration between parties; its Article 11, and several other provisions that touch upon transit, are targeted towards facilitating transit trade. In fact, among the benefits expected from the TFA implementation are improved regional transport markets, the mutual recognition of licences and certificates, and larger infrastructure investments. That said, the ways in which the TFA will apply to the sector in practice will need to be further clarified and tested once it enters into force. Even though transportation is typically perceived as a services sector, the relevance and applicability of the TFA and in particular its Article 11 that are naturally intended to regulate trade in goods, will be employed to address the problems emanating from transport measures to the extent they are trade in goods-related and not services.

The TFA provides for the elimination or reduction of regulations or formalities related to traffic in transit, in particular if they are not necessary or if a less trade-restrictive alternative can be employed. As for the fees or charges, WTO members can have recourse to them if they are strictly related to transit for transportation or if they are used to meet administrative expenses generated by transit or the cost of services rendered. The TFA contains various provisions and related measures geared towards facilitating transit procedures, including the pre-arrival declaration, and prohibits restrictive measures and practices related to customs charges, formalities and inspections, apart from those handled at the offices of departure and destination. It also provides for guarantees where applicable.

In accordance with its Preamble, the TFA desires to "clarify and improve relevant aspects of Articles V, VIII and X of the GATT 1994". To that end, the TFA was built

on GATT provisions related to transit, fees and formalities concerning importation and exportation, trade rule publication and administration, among others. The TFA's Article 11 clarifies and improves GATT Article V on freedom of transit. Accordingly, the article associated with the freedom of transit stipulates that WTO members shall not impose non-transport-related fees or seek voluntary restraints on traffic in transit through a binding commitment. It includes various disciplines on inspection and guarantee schemes as mostly binding commitments. The TFA's Article 11 also forbids a disguised restriction on traffic in transit.

Trade facilitation becomes even more important tool as far as developing countries are concerned. In relation to the interaction between trade facilitation and regional integration, it is argued that those countries with more capacities, higher trade volumes and financial resources, are in a better position to invest in reforms that make trade faster, easier and more transparent.[39] Accordingly, provided that developing countries work towards modernizing customs administrations and trade procedures, they will benefit from more trade that will lead to more revenue and economic development. Consequently, it will be easier for these countries that enjoy the opportunity to trade more as well as attract financial resources to invest in trade facilitation, as larger trade volumes help to achieve a higher rate of return on trade-related investments, which will consequently help their trade to grow further.[40]

Other studies (Government of Mongolia et al, 2007)) further point out the importance of trade facilitation, with particular emphasis on the implications of transport quotas for landlocked developing countries: "Freight distribution quotas are applied in certain road transit corridors with a view to ensuring that transporters from both landlocked and transit countries share the gains and benefits. Usually, two thirds of the transit freight at a port is allocated to carriers from a landlocked country and one third to those from a transit country. Although these quotas were established with development objectives in mind, such as to help develop the transport sector of landlocked countries, their strict application can give rise to efficiency issues and may have unintended results. In particular, transport quotas may cause transport capacity bottlenecks and increase transport costs, if the supply, capacity and quality of vehicles are not the same in the landlocked country as they are in a transit country. Therefore, the quota system may economically be disadvantageous to landlocked countries if the effects of the increase in transport costs outweigh the benefits generated in the transport sector."[41] Since the transhipment of cargo at a border and an empty return voyage are costly in cases where market restrictions do not allow transport companies to pick up cargo in both directions, regional collaboration and coordination are needed in order for transit to become more efficient through improved transport infrastructure that will take into account cross-border trade flows and vehicle standards. Consequently,

the mutual recognition of permits, insurances and drivers' licences would be necessary to ensure the efficiency as well as the trade gains that are sought after by the landlocked developing countries.

When compared with the efficiency of a multilateral framework, the trade facilitation related rules and disciplines provided in regional integration arrangements that are essentially geared towards trade liberalization between the parties do not necessarily serve as an essential feature. It has been put forward that those measures can only play an essential role in regional trade agreements (RTAs) provided that:

> "First […] RTA provisions are binding and enforceable via the RTA's dispute settlement mechanism. Secondly, RTAs serve as a training ground: they can provide a head-start for the members to absorb and implement the multilateral customs and trade-facilitation instruments. Thirdly, given that customs procedure and trade-facilitation disciplines are relatively similar across RTAs, RTAs can facilitate and accelerate convergence in these disciplines around the world. Fourthly, to the extent that RTAs streamline customs procedures and facilitate trade, they are inherently good for the multilateral trading system: the resulting lowered trade costs boost trade with all trade partners".[42]

As a matter of fact, it could also be argued that on the basis of the internal trade liberalization requirement that is laid down in Article XXIV of GATT 1994, regulations or formalities in connection with traffic in transit should be eliminated or reduced if they are no longer required, or a less trade restrictive solution becomes available between the RTA parties. In order to meet the conditions laid down for CUs, the RTA parties must internally eliminate duties and other trade restrictions on "substantially all the trade" between their members in originating products under Article XXIV: 8(a)(i).[43] As for the fees or charges related to the transit, arguably they may be imposed on transit only for transportation or if commensurate with administrative expenses entailed by transit or with the cost of services rendered.[44]

The new TFA disciplines and rules relative to transit on the basis of the principles laid down in Article V of the GATT represent a significant improvement. Article V frames a series of fundamental freedom-of-transit principles, such as the definition of goods in transit, non-discrimination and national treatment, freedom from unnecessary delays or restrictions, exemption from customs duties and other duties (except charges for transportation or those commensurate with administrative expenses entailed by transit or with the cost of services rendered) and reasonable transit duties and regulations. Similarly, and in a way that complements Article V of the GATT, Article 11 of the TFA on freedom of transit

embodies some 17 provisions that can be grouped under charges, regulations, and formalities; strengthened non-discrimination; transit procedures and controls; guarantees; and cooperation and coordination on transit issues. The obligations that are spelled out in Article 11 (see Table 4.2) improve upon and go beyond GATT Article V insofar as transit procedures, guarantees and cooperation are concerned, and thus aim to clarify further international legal disciplines applicable to transit operations via operational guidelines that are geared towards securing freedom of transit and that include both mandatory and best-endeavour obligations.

In view of the international agreements, including the TFA, discussed above, where does the problem related to road transport quota and transit permits between Turkey and the European Union stand? Turkey has been active alongside other countries requesting further liberalization of global road transport markets. Within the framework of the UN system, Turkey has actively contributed to the work undertaken by countries towards the liberalization and enforcement of road transportation within the Working Party on Road Transport at the United Nations Economic Commission for Europe (UNECE)[45] by advocating for negotiations to be conducted on a multilateral agreement whereby UNECE member countries would amend their bilateral agreements in order to comply with the provisions of the three major multilateral legal instruments of direct relevance to international road transit.[46]

As for the TFA, Turkey, along with the rest of the WTO membership, actively participated in its negotiation and submitted various proposals and opinions leading up to the Ninth WTO Ministerial Conference of 2013. Turkey's efforts arguably concentrated on transit rules, where it was involved with other WTO members in proposing and drafting paragraph 3 of Article 11 stating: "*Members shall not seek, take or maintain any voluntary restraints or any other similar measures on traffic in transit*". On this point, it should be noted that the second sentence of paragraph 3, which reads: "*This is without prejudice to existing and future national regulations, bilateral or multilateral arrangements related to regulating transport, consistent with WTO rules*" may be interpreted to fall short of expectations, since quota-imposing members arguably remain free to keep their already existing arrangements and regulations that restrict freedom of transit and thus the effectiveness of the provision may be lessened. The only part of the provision that may still be used and invoked by any WTO member which may face road transport quotas is the conditionality expressed by "*consistent with WTO rules*", through which members may attempt to challenge their trading partners' existing arrangements and regulations if and when tested through WTO dispute settlement.

Table 4.2 Obligations under TFA Article 11

Items	Article	Mandatory obligation	Necessity test	Best endeavour
Less restrictive regulations or formalities	11-1		X	
Avoidance of disguised restrictions	11-1	X		
Prohibition of traffic in transit to be conditioned upon the collection of fees except transportation costs, administrative expenses, or cost of services	11-2	X		
Prohibition of voluntary restraints or similar measures	11-3	X		
No less favourable treatment than goods directly transported from origin to destination for goods in transit	11-4	X		
Physically separate infrastructure for traffic in transit	11-5			X
Formalities, documentation requirements, and customs control not more burdensome than necessary	11-6		X	
Prohibition of customs charges and unnecessary delays or restrictions until transit is concluded at exit point	11-7	X		
Prohibition of the application of technical regulations and conformity assessment procedures	11-8	X		
Provision of advance filing and processing of transit documentation and data prior to the arrival of goods	11-9	X		
Prompt termination of transit operations	11-10	X		
Guarantees:				
- Shall be limited to ensuring that transit requirements are fulfilled	11-11.1	X		
- Shall be discharged without delay once transit requirements have been satisfied	11-11.2	X		
- Can be comprehensive in a manner consistent with the Member's laws and regulations	11-11.3			X
Publication of relevant information used to set the guarantee	11-11.4	X		
Prohibition of customs convoy or escorts when circumstances are not high-risk or guarantees ensure compliance	11-11.5	X		
International cooperation and coordination for transit	11-12			X
Appointing a national transit coordinator	11-13			X

Source: Hamanaka (2014).

Similarly to the issue on road transport quotas, Turkey reportedly also took part in drafting paragraph 2 of the TFA's Article 11, which stipulates that "*traffic in transit shall not be conditioned upon collections of any fees or charges imposed in respect of transit, except the charges for transportation or those commensurate with administrative expenses entailed by transit or with the cost of services rendered*". This involvement in the drafting process may well be due to the fees that Turkish road operators have being paying in order to obtain transit permits when operating within Europe, hence the importance of multilateral negotiations to address issues that may not always have been solved on a regional or bilateral level. In terms of adoption of their commitments and the legal texts, Turkey notified the WTO of its Category A commitments under the TFA in July 2014. It has designated all of the provisions contained in Section I of the Agreement under Category A for full implementation upon the TFA's entry into force, except for Article 7.9 relating to perishable goods. It also deposited its instrument of accession and notified its acceptance of the TFA in March 2016. As for the European Union, it completed its ratification procedure in October 2015. Therefore, both Turkey and the European Union remain ready and committed to honour their obligations under the TFA.

Will the TFA solve Turkey's ongoing struggle with the EU member states' road transport quotas and transit permits? While this multilateral agreement is certainly a positive step towards trade liberalization in the long run, more flexible arrangements with the respective EU member states, i.e. bilateral agreements, also remain necessary. Since, as it stands, the authority to conclude road transportation agreements lies with the EU member states, the mandate and empowerment to be given to the European Commission by EU member states in order to conduct the road transport negotiations on their behalf could boost trade liberalization among the CU partners.[47]

4.5 Concluding remarks

The Decision 1/95 establishing a CU between the EU and Turkey provided mainly for the free movement of goods and related issues and did not foresee the free movement of persons or of services, establishment, or capital movements. The principle of liberalization of trade in goods has been in effect since the initiation of the CU in 1995. However, in practice, this principle has had a few exceptions and has also faced some major obstacles. Among them are road quotas, and notably transit permits, which form impediments to the free movement of goods as well as to transit traffic and thus they remain to be a stumbling block on the way to the full operation of the CU. The World Bank's high-level analysis (World Bank, 2014) highlighted the impact of the gradual liberalization of access to the market for road

freight services operated between the European Union and Turkey. This study suggests that the liberalization of the quota system between Turkey and the EU member states would facilitate trade and enable Turkish carriers to effectively use their export capacity through road transport. A careful study of various liberalization scenarios between the European Union and Turkey reveals that major improvement would likely be linked to the removal of transit quotas.

Despite the benefits of the removal of the obstacles related to road transport quotas and transit permits, the essential question is how this removal can effectively take place. Road quotas and transit permits are often subject to bilateral agreements. However, those arrangements fall short of bringing an effective solution to the problem, since most transit operations require the involvement of various countries and thus necessitate a series of bilateral agreements on transit traffic rights. In order to provide for a solution on a larger scale, a number of international agreements have been concluded as to stipulate the principle of the freedom of transit. Article V of the GATT 1994 and the revised Consolidated Resolution on the Facilitation of International Road Transport, which was adopted by UNECE in 2004, were the pioneer legal texts in the field until recently.

To complement and further clarify what was achieved through these texts, the WTO Trade Facilitation Agreement could well serve as an effective tool although the relevant provisions of Article 11 of the TFA contain some limitations. In any event, a multilateral forum to eliminate barriers to the transit as well as the transport of goods by laying down multilateral principles and disciplines is surely the best scenario where the interests and concerns of both developed and developing countries can be addressed.

We argue that the WTO legal texts that are related to the transit traffic and the freedom of transit, in particular Article V of the GATT 1994 and Article 11 of the Trade Facilitation Agreement, could serve as useful tools in particular if they are clarified and tested following an effective interpretation by the WTO adjudicating bodies when invoked in a case. Article V of the GATT 1994 has been interpreted in WTO dispute settlement in essentially one case so far and yet a substantial clarification was brought to the way in which the Article should be understood and operate. By analogy and if the need arises, the mandate that was given to the Trade Negotiations Committee through the Doha Development Agenda towards the clarification and improvement of the disciplines related to the freedom of transit under Article V of the GATT 1994 which led to the enactment of Article 11 of the TFA, could effectively be complemented through a dispute where the WTO adjudicating bodies could pronounce on the interpretation and application of the rules applicable to the freedom of transit and thus make a substantial contribution to legal heritage of the WTO multilateral trading system.

Endnotes

1.   See WTO (2016), paragraph 2.24.

2.   E.g. Article 34 of the TFEU reads: "Quantitative restrictions on imports and all measures having equivalent effect shall be prohibited between Member States."

3.   The Court of Justice of the European Union opined in Case C-265/95 (Commission of the European Communities v. French Republic) that obstacles to road transportation, even in cases not caused by the member state measures, may become obstacles to the free movement of goods and thus be attributed to the state in question.

4.   Article 4 of the Decision 1/95 of the EC-Turkey Association Council of 22 December 1995 on implementing the final phase of the Customs Union (96/142/EC) provides as follows: "Import or export customs duties and charges having equivalent effect shall be wholly abolished between the Community and Turkey on the date of entry into force of this Decision. The Community and Turkey shall refrain from introducing any new customs duties on imports or exports or any charges having equivalent effect from that date. These provisions shall also apply to customs duties of a fiscal nature." Similarly, Article 5 provides that: "Quantitative restrictions on imports and all measures having equivalent effect shall be prohibited between the Parties."

5.   E.g. World Bank Report (2014), paragraph 56.

6.   Article 5 of the Decision 1/95 of The EC-Turkey Association Council of 22 December 1995 on implementing the final phase of the Customs Union (96/142/EC) provides that: "Quantitative restrictions on imports and all measures having equivalent effect shall be prohibited between the Parties."

7.   World Bank (2014) - see its paragraph 20. The report was officially launched in Istanbul on 8 April 2014 and in Brussels on 10 April 2014.

8.   Executive Summary, World Bank Report (2014).

9.   World Bank (2014), paragraph 8.

10.   Article 79.1 of the original version of the Treaty of Rome reads as follows: "1. In the case of transport within the Community, discrimination which takes the form of carriers charging different rates and imposing different conditions for the carriage of the same goods over the same transport links on grounds of the country of origin or of destination of the goods in question, shall be abolished, at the latest, before the end of the second stage."

11.   Article 61 of the original version of the Treaty of Rome reads as follows: "1. Freedom to provide services in the field of transport shall be governed by the provisions of the Title relating to transport." Along the same line, see World Bank (2014), paragraph 102.

12.   World Bank (2014), paragraph 105.

13.   Ibid, paragraph 99.

14.   "TIR" stands for Transports Internationaux Routiers (International Road Transport) and is an international harmonized system of customs control that facilitates trade and transport whilst effectively protecting the revenue of each country through which goods are carried.

15.   An international transport document that allows the transport of goods from the customs

office of departure to the customs office of destination under the TIR procedure, defined by the TIR Convention.

16. World Bank Report (2014), paragraph 99.

17. Ibid.

18. Pastori et al. (2014).

19. World Bank Report (2014), paragraph 105.

20. OECD (2010).

21. Kabak (2014).

22. World Bank (2014), paragraph 102: "By limiting the number of Turkish-registered vehicles that can carry goods in their territory, EU member states set limits on Turkish goods that can be transported to the EU by Turkish road transport operators (although they can still be carried by EU road transport operators). This raises costs if the most efficient transport operator can no longer be used."

23. See, for example, World Bank (2014), Box 14, p. 54 and Pastori et al. (2014), p. 89.

24. Kabak (2014).

25. See World Bank (2014), paragraph 110 and Government of Mongolia et al. (2007), pp. 62-63.

26. See World Bank (2014), Box 14, p. 54.

27. See UNECE (2008); Kabak (2014); World Bank (2014), paragraph 110.

28. Kabak et al. (2014). See along the same lines Pastori et al. (2014), p. 47, table 8.7.

29. World Bank (2014), paragraph 111.

30. See remarks by Çetin Nuhoğlu, President of the Turkish International Transportation Association (UND) Board of Directors on 29 April 2014: http://oldweb.ikv.org.tr/icerik_en.asp?ko nu=haberler&id=682&baslik=UND%20DELEGATION%20VISITED%20IKV

31. See Pastori et al. (2014), Executive Summary, page i.

32. See Pastori et al. (2014).

33. Ibid, p.47.

34. WTO (2005).

35. WTO (2009), paragraphs 4.35, 4.37 and 4.38.

36. See WTO (2009), paragraph 7.396.

37. Ibid.

38. World Bank Report (2014), paragraph 111.

39. See UNCTAD Transport and Trade Facilitation Newsletter N°69, First quarter of 2106, available at: http://unctad.org/en/PublicationsLibrary/webdtltlb2016d1_en.pdf

40. Ibid.

41. "Trade, Trade Facilitation and Transit Transport Issues for Landlocked Developing Countries", Government of Mongolia, United Nations Office of the High Representative for Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS), United Nations Development Programme (UNDP), United Nations Conference on Trade and Development (UNCTAD) and Mission of Paraguay in Geneva (2007). Available at: http://unohrlls.org/UserFiles/File/Elle%20Wang%20Uploads/LLDCs%20Publication.pdf

42. Estevadeordal, Suominen and Teh (2009), page 148.

43. For the legal test to be applied under Article XXIV of the GATT 1994, see WTO (1999a) and WTO (1999b).

44. Cousin and Duval (2014).

45. World Bank Report (2014), paragraph 112.

46. The three major multilateral legal instruments are: "United Nations Convention on the Law of the Sea (Montego Bay Convention) of 10 December 1982 (Articles 3.1b and c to liberalize transit transport); the United Nations Convention on Transit Trade of Landlocked States (New York Convention) of 8 July 1965 (Articles 2.2d and e which foresee the liberalization of transit transport) and the Article V of the General Agreement on Tariffs and Trade (freedom of transit)." World Bank Report (2014), footnote 59.

47. World Bank Report, 2014, p. 55 paragraph 113.

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II

Aid for Trade as a catalyst for trade facilitation measures

5 Millennium Challenge Account support and port reforms in Benin: A trade facilitation effects analysis

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Abstract

Since 2006, Benin has benefited from the United States Government initiative, the Millennium Challenge Account (MCA) programme. In Benin, the main component of this programme is the Access to Markets Project, through which 61 per cent of MCA subsidies are directed towards improving port operations and infrastructures. The aim of this chapter is to assess the potential effects of these trade facilitation reforms over the project period. Based on performance indicators, this chapter shows an increase in goods traffic via the Cotonou Port Authority (CPA) by an average 13.65 per cent annually. The Granger causality test is applied to establish a relationship between aid and the time taken to process import containers, as well as the quantity of imports. The study shows that Aid for Trade (AfT) induces a significant decrease in the time taken for import container processing at CPA, by an average 6.9 per cent annually. An econometric model of importing enables support for these correlations. We estimate the model with and without an MCA grant. Findings highlight an important increase in volume of imports when MCA aid is included in the model. These results show that an MCA grant contributed to improvement in the CPA's performance and we suggest intensification of trade facilitation reforms at the CPA.

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5.1 Introduction

Economic growth plays a central role in poverty reduction and it is recognized that countries that have made the development of trade a determining factor in their strategies experience higher growth rates (Higgins and Prowse, 2010). How to take advantage of trade thus remains the biggest challenge in developing countries: constraints exist not only on participation in world trade (OECD, 2009), but also for access to business opportunities and the sharing of trade gains between countries. Most least-developed countries (LDCs) are more or less open economies whose products and growth remain dependent on international and regional trade (Rippel, 2011). Despite its marginal contribution to regional and global trade, Benin is no exception: the narrowness of the domestic market and limited productive industry mean that the country remains a net importer of goods. Hence, tax on imports and export promotion are important factors in the growth of national income and development. The country's only seaport, the Cotonou Port Authority (CPA), is one of the main ports in the sub-region, because of its role in providing transit for landlocked countries. It also occupies a central place in Benin's economy, accounting for 90 per cent of foreign trade, 45–50 per cent of tax revenues and 80–85 per cent of customs revenues, the largest component of domestic budgetary resources (MCA-Benin, 2012).

Ensuring the economic competitiveness of the port involves reforms to guarantee service quality, reduce operating costs and processing times, and improve port security. It is in this context that trade facilitation is defined. As pointed out in World Trade Report 2015 (WTO, 2015), "trade facilitation" is a polysemous word that broadly refers to reducing trade costs to make it easier for traders to move goods across borders by making cumbersome cross-border trade procedures more efficient (Persson, 2013). According to Portugal-Perez and Wilson (2012), trade facilitation can be measured along two dimensions: a "hard" dimension related to tangible infrastructure, such as roads, ports, highways and telecommunications, and a "soft" dimension related to transparency, customs management, the business environment and other institutional aspects that are intangible.

Trade facilitation policies initiated in Benin in recent years concern the onshore operations in particular, and they are accompanied by modern and adequate infrastructure policies. In general, the importance of investments and equipment needed in this area, combined with tight budget constraints in LDCs, show the usefulness of official development assistance in facilitating reforms. It is in this context that the Aid for Trade (AfT) approach was initiated, to develop supply capacities and trade infrastructure in developing countries to enable these countries to take advantage of trade agreements. In this context, Benin has

benefited since 2006 from the United States Government initiative, the Millennium Challenge Account (MCA) programme.[1]

The MCA is a series of strategic investments meant to improve physical and institutional infrastructure and increase investment and private sector activity. With a value of about US$ 307,298,000 in Benin, the main component of the programme is the Access to Markets Project, which accounts for 61 per cent of the MCA grants (MCA-Benin, 2012). Basically, this component of the MCA-Benin programme aims to promote market access through improved port operations and infrastructure. It also seeks to improve competitiveness, performance and port security through infrastructure modernization, management and institutional and systems reforms in order to increase capacity and reduce transaction costs. With this US bilateral support, research on the effectiveness of the CPA is intended to contribute to more added value to both importers and exporters, through reduced costs and processing duration, but also to improve the quality of port operations. Theoretically, investments in port infrastructure should help energize and substantially increase not only the volume of trade but also the business climate.

This research aims to assess the different effects of the reforms on the CPA and cross-border trade within the MCA programme in Benin. The study is organized in six sections. Following this Introduction, Section 2 provides an overview of the problems arising from stylized facts based on the different axes of reforms as part of the MCA financial support. Section 3 is a review of theoretical and empirical literature on the effects of the aid on trade and growth. In Section 4, the methodology is presented. Section 5 presents the main results with their analyses and implications. Section 6 concludes the study.

5.2 Stylized facts and problems

With the CPA, Benin is a corridor serving the hinterland countries (Burkina Faso, Chad and Niger) and Nigeria, in particular by providing transit. Even though the importance of the CPA in Benin's economy has been rising continuously over several years, the port's competitiveness has been questioned because of the strong regional competition, but also because it is under-equipped with modern infrastructure (MCA-Benin, 2012). Congestion, a multiplicity of procedures involving significant costs of formal or informal transactions, and process complexity with time losses, are characteristic of port operations. The competitive environment in the sub-region, with neighbouring ports, also remains a strong constraint to which Benin must respond with trade facilitation reforms, among others.

Red tape in the CPA significantly weighs on the performance of the handling companies, with procedures taking an average of four times longer than in competitor ports, including Téma and Lomé (N'Guessan N'Guessan, 2003). In terms of transit times for commercial goods destined for landlocked countries, consolidated data produced by Delmas in 2009 indicate a longer transportation corridor in Benin: from Cotonou to Niamey (Niger), total transit time could extend to 23 days, as opposed to 22 days from Tema (Ghana) to Niamey, in spite of the comparative advantage of 280 km less distance in Benin (Hartmann, 2011). The same disadvantages in terms of total transit time are observed whether the Lomé or Ouagadougou ports are used.

Consequently, the decline in traffic and the volume of goods through CPA has led to a dwindling of government revenues in an important sub-sector of the economy of Benin (MCA-Benin, 2012). Therefore, in addition to the obsolescence of road transportation, these differentials sufficiently justified reforms and investments to simplify procedures and processes to reduce overall formal and informal transaction costs. In the five years since 2006, Benin has chosen to focus the MCA grant mainly on the Access to Markets component of the programme, initiating various investments and reforms in the port area. Basically, the programme has helped to overcome the main obstacles to good performance by the CPA through the improvement of physical and institutional infrastructure, including arrest spike extension, the construction of two new berths, reinforcement of the former docks, and the acquisition of trailers. On 3 February 2012, the distribution of funds was as follows (Table 5.1).

Table 5.1 Distribution and execution of resources by project activities

Activity	Budget (US$)	Commitments		Payments	
		Budget (US$)	Share (%)	Budget (US$)	Share (%)
Education	9,881,009	9,848,674	99.67	9,848,674	99.67
Institutional reform	11,033,882	10,967,813	99.40	10,967,813	99.40
Security and access roads	58,432,216	58,390,316	99.93	58,390,316	99.93
Infrastructure expansion	108,739,211	108,697,185	99.96	108,697,185	99.96
Total	188,086,318	187,903,987	99.90	187,903,987	99.90

Source: MCA-Benin, February 2012.

Overall, resources provided under the project were initiated and fully executed. In terms of indicators of activity, 160 port agents have benefited from strengthening technical capacity, two docks were built, 53 items of surveillance equipment were acquired for security purposes, a set of scanners was installed, and a car park and three access roads for large aircraft were built (MCA-Benin, 2012). In addition, the preliminary results of the project estimate the number of beneficiaries to be 5,818,528, including corporate agents (operators and port users) and members of their households, and consumers and companies that participated in the implementation of activities planned under the project and members of their households (MCA-Benin, 2012).

The facilitation of investment also accounts for part of the acquisition and installation of an integrated security system, electronic gates, dry bulk processing equipment, an oceanographic station and pollution control equipment. Modernization of the CPA continued with the reform of the single window, which became operational in 2011 with the automation of procedures for greater efficiency of the port logistics chain, which is a major facilitation measure as part of agreements (World Customs Organization, 2011). Justified by transit time reduction, transparency in the clearance process and secure customs revenue, the single window should allow optimizing, managing and automating port and logistics processes through an integrated database. Moreover, some investments in infrastructure, undertaken with private partners, Bolloré and Maersk Groups in particular, have strengthened the work undertaken and acquisitions made under the MCA programme. The fruit of the partnership between the public and private sectors, the new logistics system "docking window" installed in 2009, has reduced the waiting time at the port by 60 per cent.

Through these extra investments in the CPA, various reforms have been undertaken in the direction of improving the business climate in Benin, within the scope of facilitating border trade. Among those reforms that have strengthened trade facilitation measures at the CPA are the introduction of new technology for managing procedures, including single-charge fees and the control of shipments by electronic monitoring of bordereau[2] information. In the context of transit, traffic was controlled with the establishment of joint checkpoints on the Benin corridor. Finally, the CPA trade facilitation measures also concerned the simplification of export and import procedures (documentation and processes) and the reduction of the time and costs related to foreign trade. According to the Presidential Investment Council (CPI), which administers these reforms, the implementation of single-charge fees has reduced payment processing time from five days to about seven minutes.

Since 2009, following investments and reforms in the port and logistics chain, performance has been recorded (Alix, 2009). Theoretically, investments in port infrastructure are designed to stimulate and substantially increase the volume of trade through the CPA. Given the sector's contribution to public revenues, and especially its diffuse training effects on other sectors, employment and output growth should be affected. It is expected that these reforms, for which the Customs Administration, the National Shippers' Council of Benin (CNCB), La Société d'Exploitation du Guichet Unique de Bénin (SEGUB) – the company operating the single window – and La Société Solutions Technologiques des Transports du Bénin (STTB-SA) are key actors, will have direct and indirect effects on reduced waiting times and operational costs, which will increase the volume of both imports and exports. As indicated by Rippel (2011), trade facilitation policies can reduce trade costs, increase competitiveness and improve the export and import capacity of countries, to create more jobs, generate economic growth and thereby reduce poverty.

Table 5.2 highlights the evolution of the volumes of Benin's imports and exports. On average, they have almost doubled between the two periods considered, that is to say before and after the implementation of the relevant reforms.

There is reason to question whether these dynamics are attributable to the various port reforms since 2006, and to what extent. At the same time, it is necessary to indicate Benin's performance as recorded in Doing Business 2015 (World Bank, 2014), the country having risen from rank 167 in 2014 to 151 in 2015. Is there a causal relationship between various reforms undertaken since 2006 with particular MCA financial support, analysed in terms of AfT in Benin? Besides, the effects on trade remain to be tested – have these reforms, financed by US aid, induced a real and significant impact on Benin's economy in terms of jobs, productivity gains and increased national income? Beyond these reforms and performances recorded in

Table 5.2 Evolution of goods traffic through the CPA, 2002–2012

Component	2002–2006			2007–2012		
	Total volume (metric tons)	Average volume (metric tons)	Rate variation (%)	Total volume (metric tons)	Average volume (metric tons)	Rate variation (%)
Import	19,748,762	3,949,752.40	61.41	35,901,605	7,180,321.00	13.50
Export	2,490,259	498,051.80	11.28	5,150,862	1,030,172.40	86.56
Total	22,240,021	4,448,004.20	54.73	41,052,467	8,210,493,40	20.92

Source: Authors' calculations based on econometric research.

trade and resulting from trade facilitation policies, have they induced real effects in terms of reducing transaction costs and processing time for port operations?

If economic growth remains sluggish in Benin, at an average 4 per cent over the past decade (MCA-Benin, 2012), it is necessary to appreciate its link with trade facilitation policies in order to identify the real potential of reforms. According to Higgins and Prowse (2010), AfT issues, which have emerged since 2005, must be part of general development policies; this has become more important in developing countries, having particular implications in terms of improvement of comparative and competitive advantages. Therefore, beyond the direct effects of reduced time and costs, there may be a link between trade, growth and poverty reduction, and trade openness is crucial in this process. Therefore, with a view to poverty reduction and capacity-building through exchange, this study should allow for extension of the scope of trade-facilitating reforms in Benin in terms not only of productivity but also inclusive growth. Specifically, given the US subsidies considered as AfT, what direct and indirect links are established between the induced reforms on the one hand, and growth and poverty reduction on the other? These results should be a powerful asset that can justify the investment required in the second MCA compact being negotiated.

5.3 Literature review

Inefficient border procedures, due to a lack of staff or unnecessarily burdensome paperwork, is costly for administrations and businesses and it is ultimately the taxpayer or client who supports these costs. For enterprises, there may be direct costs at the border related to the transmission of information and documents as well as indirect costs related to bureaucratic delays, lost business opportunities and unpredictable regulations. Surveys to determine these costs indicate that they can represent between 2 per cent and 15 per cent of the value of traded goods (Sanchez et al., 2003). Similarly, inefficient border procedures have a cost to governments: loss of revenue, smuggling and difficulties in trade policy implementation. Finally, inefficient border procedures hamper competitiveness, making a country less attractive for investment. In developing countries especially, trade costs are particularly high. It is therefore expected that full implementation of trade facilitation will reduce global trade costs by an average of 14.3 per cent, and African countries and LDCs are expected to see the biggest average reduction in trade costs (WTO, 2015).

Therefore, it is recognized that improving the efficiency of border procedures through facilitation policies is beneficial: countries that have carried out reforms in this field have seen significant increases in their customs revenue despite the

reduction of customs tariffs on subsequent trade liberalization (Berrittella and Zhang, 2012; Cadot et al., 2011; OECD, 2009).

Trade facilitation and cost reduction

Trade facilitation is one of the topics that has been discussed since the First WTO Ministerial Conference in Singapore in 1996.[3] With a view to successfully completing the Doha Round, negotiations aimed to clarify and improve relevant aspects of GATT Articles on freedom of transit, fees and formalities related to imports and exports, and the publication and administration of trade regulations. The Ninth WTO Ministerial Conference in Bali in 2013 resulted in an agreement on trade facilitation. This agreement includes measures and obligations on trade facilitation on the one hand and flexibility provisions for developing countries in terms of special and differential treatment on the other.

Regarding facilitation, Portugal-Perez and Wilson (2012) distinguish between the "hard" dimension related to tangible infrastructure such as roads, ports and telecommunications, and the "soft" dimension related to intangible infrastructure, including transparency, customs, the business environment and institutional framework. It is these elements that are followed internationally to facilitate trade and that are reflected in the WTO definition of facilitation, namely, simplification and harmonization of procedures.

Trade facilitation is of particular importance for developing countries: they derive the most advantage from more efficient trade procedures, as even a modest reduction in the cost of trade would have a positive impact on trade for both developed and developing countries (Hoekman and Nicita, 2011; Iwanow, 2009, OECD, 2009). If a country improves its trade procedures so that trade costs are reduced, importers benefit from lower prices, while exporters receive higher prices for the traded goods. Thus, trade facilitation benefits both exporting and importing countries (WTO, 2015). If the welfare of other countries is improved, developing countries will see their trade increase further, current systems being comparatively inefficient and affected sectors (food products, small and medium enterprises) being crucial to their economies.

Given that trade facilitation measures designed to reduce transaction costs affect different sectors of the economy and the different operators of international trade, OECD research (2005) shows that developing countries should collect two-thirds of the benefits of trade facilitation on well-being throughout the world. Among other effects of the training requirements that are generated by trade facilitation, trade-competitive countries more easily attract foreign direct investment, and cover duties and taxes more efficiently and more reliably. The prospect of increasing

revenues is, in fact, one of the main incentives for reform in trade facilitation: the loss of revenue due to inefficient border procedures is estimated at more than 5 per cent of GDP (OECD, 2005).

Starting from a broad definition of trade facilitation, Wilson et al. (2005) consider four indicators to measure its impact: port efficiency, customs procedures, regulations and use of information and communications technology (ICT). Berkowitz et al. (2006) indicate two induced effects of trade facilitation: a transaction effect resulting from reduced costs for exporting and a production effect resulting from the transformation of production systems. Iwanow and Kirkpatrick (2009) show, for a sample of 124 developing countries, that trade facilitation reforms contribute to improving Africa's export performance, in particular for manufactured goods, the rate outstripping the rest of the world. However, in terms of reforms, the quality of regulation, and transport and communications infrastructure, are also needed. Hoekman and Nicita (2011) reach the same conclusion, that facilitation policies affecting non-tariff measures are favourable to the expansion of trade, including exports. Portugal-Perez and Wilson (2009) show that substantial gains can be made with trade facilitation policies in African countries: reduced transaction costs have a greater impact on trade flows than addressing tariff barriers. Moreover, Portugal-Perez and Wilson (2012) indicate that the hard trade facilitation dimension, including physical and ICT infrastructure, induces increasingly important effects as economies develop.

Moïsé and Sorescu (2013) study the possible effects of trade facilitation in developing countries. The areas that seem to have greater effect on trade volumes and trade costs, for both imports and exports, are the availability of information, simplification and harmonization of documents, streamlining of procedures and use of automated processes. They show that the combined effect of improvements in these areas is dominant, with a reduction of 14.5 per cent in the total cost of trade for low-income countries, 15.5 per cent for lower-middle-income countries and 13.2 per cent for upper-middle-income countries. This suggests a comprehensive approach to trade facilitation reforms rather than other policies. Spence and Karingi (2011) appreciate the impact of trade facilitation in the African economies: applying the four indicators of trade facilitation offered by Portugal-Perez and Wilson (2012), they show that facilitation policies reinforce both the competitiveness of exports (transaction effect) and total factor productivity (production effect). From this point of view, trade facilitation reforms, including physical infrastructure, are a component of a holistic approach to trade policy in African countries; they contribute not only to the diversification of exports but also to long-term external competitiveness (Bearce et al., 2012; Brenton and von Uexkull, 2009).

Cost of facilitation reforms and the role of aid

If trade facilitation policies are beneficial in reducing the costs of inefficient procedures, their implementation also involves costs related to new regulations, institutional changes, training, equipment and infrastructure. Regulatory costs arise from new laws or amendments concerned with the facilitation of trade; institutional costs arise from the creation of new services, such as the single window. Training is probably the most important element of trade facilitation, given the new administrative practices. Finally, equipment and infrastructure are often the biggest issue; however, equipment and infrastructure are tools to be combined with reforms relating to regulations, the institutional framework and human resources. In particular, ICT can improve efficiency, but it implies the simplification of formalities upstream to optimize adoption of the automated system. However, these costs are more than offset by lower effective border controls and revenue improvement. Most developing countries that have carried out these reforms have reaped greater benefits than their costs, and often these are very much higher. In the case of a five-year programme of customs modernization that enabled Angola to increase revenues by 150 per cent, the duration of customs procedures was reduced to 24 hours (OECD, 2005).

As indicated by Stiglitz and Charlton (2006), many developing countries have not been able to achieve their Uruguay Round obligations[4] because of the associated costs. Therefore, given the benefits of trade facilitation programmes on the one hand and the necessary resource requirements for their implementation on the other, the orientation of AfT has become a crucial issue in developing countries (Helble et al., 2009; Higgins and Prowse, 2010). As such, support for these countries to overcome barriers to the expansion of trade and to benefit from trade is the principal purpose of AfT (OECD, 2009). Overall, improving access to the market for LDCs' products plays a central role in the trade negotiations of the Doha Round, complemented by the strengthening of supply capacity, tariff policies and substantial investment. These beliefs have guided the involvement of developed countries in aid programmes to support trade development and trade facilitation policies: this is the approach of AfT. Overall, AfT includes: (i) technical assistance related to business strategies and negotiating practices; (ii) infrastructure, including roads, ports and telecommunications; (iii) investment in production capacity with favourable export diversification and exploitation of comparative advantages; and (iv) adjustment assistance, which compensates for tariff losses and deteriorating terms of trade (Higgins and Prowse, 2010; OECD, 2009).

According to Higgins and Prowse (2010), the AfT initiative has become effective in recent years, including by increasing support to LDCs that has resulted in the reduction of constraints that limit their capacity to integrate into the multilateral

trading system. Since 2005, donors have increased their support for the expansion of trade in developing countries. Aid increased by about 10 per cent in real terms between 2006 and 2007, with both bilateral and multilateral commitments reaching US$ 25.4 billion in 2007, along with US$ 27.3 billion worth of commercially driven non-concessional financing (OECD and WTO, 2009). The MCA Access to Markets Project in Benin could be seen as a response to the African Growth and Opportunity Act programme (Zackaria-Touré, 2009), as well as a response to the appeal made at the Sixth WTO Ministerial Conference in December 2005, inviting donors to increase AfT resources.[5]

There is considerable literature on the relationship between trade, growth and poverty. Evidence suggests that more open trade is essential for economic growth (OECD, 2009), but the interactions between these factors are not precise (Basnett et al., 2012; Hallaert, 2010). First, trade openness induces growth and is necessary to reduce poverty. On the other hand, it is possible that economic integration through trade is the result of economic growth. The direction of causality between variables is not, therefore, determined a priori. Thus, an inclusive growth momentum favours open trade but economic integration can also facilitate access to markets.

Furthermore, at the aggregate level, the link between trade openness and growth, and trade liberalization, involves winners and losers, limiting the impact of trade policies in terms of reducing poverty and inequality. There are, however, some certainties about how changes in trade directly or indirectly affect growth and poverty, with some differences depending on the context, incentive policies and reforms (Higgins and Prowse, 2010). More specifically, the challenge for the AfT initiative is that, beyond the direct effects in terms of increased trade volumes, the indirect effects can address long-term issues of inclusive growth and poverty reduction. To this end, both the context and institutional factors are central.

Aid for Trade: Theoretical arguments and real effects

Addressing the negative impact of the financial and economic crisis on the AfT programme, the OECD and WTO (2009) stress the need to maintain commitments: AfT should further support growth policies and reduce poverty in developing countries by removing constraints to trade and diversifying the sources of economic growth. Inspired by McCulloch, Winters and Cirera (2001), Higgins and Prowse (2010) distinguish three transmission channels. The distribution channel derives from the impact of trade facilitation policies on prices of goods and services, given the cost reduction; depending on other factors (world prices, terms of trade, taxes and factor costs), well-being will be affected. The companies channel reflects the reaction of producers through wages, profits and employment;

for example, import facilities may make it less competitive domestic products with negative effects on demand, employment and wages. Finally, the government channel results in changes to taxes and transfer costs: as a consequence of pricing policy, public resources may increase or decrease, with expanding or depressive effects on public spending on infrastructure, education, health and social protection.

Vijil and Wagner (2010) consider two channels: institutions and infrastructure. They show that, whereas infrastructure is a significant factor of export performance, the quality of institutions is found to have a fairly limited impact on the exports of developing countries. Also, AfT-oriented infrastructure has a positive impact on the level and capacity of infrastructure in developing countries: a 10 per cent increase in aid to infrastructure per capita induces an average 2.34 per cent increase in exports relative to GDP. This is also equivalent to a 2.71 per cent reduction in tariff and non-tariff barriers, evidencing a significant economic impact of AfT through the channel infrastructure.

Basnett et al. (2012) come to the same conclusions about the impact of AfT on trade facilitation and of infrastructure on exports. A 10 per cent increase in AfT for infrastructure contributes to an increase in exports relative to GDP of around 2.3 per cent. Furthermore, for developing countries, the significant impact of reforms in reducing trade costs improves economic performance in terms of exports, domestic products or the investment environment. However, these effects can vary widely, depending on the type of intervention, country and sector beneficiaries. Helble, Mann and Wilson (2009) estimated the rate of return from US$ 1 of aid to be in the order of US$ 697 induced by trade in the LDCs. In a sample of 184 countries for the period 1990–2005, Johansson and Pettersson (2009) reach the same results for both the donor and the recipient; the aid being considered was holistically oriented technical assistance and export capacities. The specific effect of the AfT-related exchange infrastructure is less significant.

Having identified the constraints to trade development in developing countries, the OECD (2009) shows that the four objectives of the AfT initiative have great potential to boost economic growth and reduce poverty in countries in development. However, this trade potential will only be realised if the countries concerned transform opportunities for trade and growth in trade. The challenges in this regard include supply capacity constraints and lack of trade-related infrastructure on the one hand, and endogenous constraints that limit the growth effect of trade on the other hand. In terms of the latter, constraints are numerous and it is useful to identify the greatest for each country. For this purpose, the diagnostic analysis of constraints to growth approach proposed by Hausmann, Rodrik and Velasco (2008) is a rather valuable tool. Cali and te Velde (2011)

analyse the effects of AfT on export performance through the reduction of exchange costs and the level of exports. For a sample of developing countries, they conclude that AfT has a reducing effect on exchange costs. Furthermore, economic infrastructure and productivity enhancing assistance significantly improve export volumes.

The empirical literature suggests a strong link between trade expansion and economic growth, and the effect on growth varies by country (Chang, Kaltani and Loayza, 2005; Dufrénot, Mignon and Tsangarides, 2009). For Rodrik (1998), although trade policies in sub-Saharan Africa produced significant effects on export and trade performance, better than elsewhere in the world over the period 1964–1994, the effects of these policies on economic growth remained very modest and indirect. In explaining this, Dufrénot, Mignon and Tsangarides (2009) show that the effect of trade openness on growth is higher in low-growth developing countries than in developing countries with high growth rates; this is explained by the high concentration on exports and relatively small share of manufacturing in the former. However, the sectoral analysis of the effects of AfT made by Cali and te Velde (2011) shows that support for infrastructure is particularly beneficial for the mining and manufacturing sectors, the food sector being less affected. In this area, employing the substitution effect between aid and preference for trade with externalities of learning by doing on exports among partner countries, Adam and O'Connell (2004) show that greater preference for trade at the expense of aid would enhance the welfare of the recipient country.

The effects of AfT on welfare are not as obvious, as highlighted by Mayer and Milberg (2013). In a context of widespread value chains co-existing among small and large companies with different levels of market power, workers and small producers are not able to capture the economic gains to be had. Accordingly, for Mayer and Milberg, the benefit of AfT is captured only by the market players who have strong market power in the value chain, which skews the potential effects of aid on growth, poverty reduction and well-being. Beyond aid flows, Lensink and Morrissey (1999) consider the stability of the aid to explain actual effects. Estimating a growth model in including the level of aid, they show that it is not the level of aid that has the most significant effect; however, taking instability into account, the impact of aid flows on economic growth becomes significant. The stability test also indicates the significant effect that results from the investment channel. Therefore, more stable aid flows would induce significant effects on growth, which means that, for the countries of sub-Saharan Africa, aid has less impact, given the fact that it is characterized by uncertainty.

Differences between countries indicate the existence of constraints limiting the effects of trade on economic growth. It is also recognised that these effects are not

direct but pass through various transmission channels, the most important of which are investment and productivity (OECD, 2009). Among the factors that may affect the transmission mechanism are macroeconomic instability, financial constraints, financial development, the quality of the workforce, and policies targeting the business environment and the allocation of resources. Addressing lessons learned from reforms in the 1990s, the World Bank (2005) evokes the problematic impact of trade on growth in these terms: "Trade is an opportunity, not a guarantee; if it can help speed up integration in international trade and enhance growth strategies, it can ensure the success of other necessary factors including macroeconomic management, infrastructure and institutions favourable to trade". Because the AfT initiative does not include these factors, they should be addressed through complementary policies and reforms (OECD, 2009). This view is consistent with that of Collier and Dollar (2002) in addressing the problem of the inefficiency of overall aid in bringing about poverty reduction: the sources of inefficiency result from poverty levels and especially the quality of policies implemented.

It is also possible that AfT allows for solutions to climate change. This is the case of loans granted in the agricultural sector; the sector will grow, taking into account the problems of adaptation to and mitigation of climate change, in order to gain comparative advantage and improve export potential. Indeed, variations in temperature and precipitation, and extreme weather events, will affect yields and agricultural productivity in developing countries. From this point of view, the new challenges facing AfT include ensuring substantial investment in climate change mitigation and adaptation projects that add value to a country's agricultural and export potential. Finally, the AfT programme will need to invest in activities that enhance adjustment capacity, to reduce the impact of the decline in overall demand on growth and poverty in developing countries.

5.4 Methodology

The methodology for this study includes the literature review, encompassing all reforms aimed at facilitating trade in Benin (as well as the CPA in the field of border trade), and the collection of useful primary and secondary data. The analytical approaches and tools to be mobilized to achieve the objectives of the study are also discussed in this section.

The concept of AfT is broad and difficult to assess, which does not facilitate the assessment of its effects (Basnett et al., 2012). Overall, the literature identifies six categories of variables proposed by the WTO to measure AfT (WTO, 2005): (i) trade-oriented policies and regulations; (ii) development-oriented trade; (iii) aid to the exchange infrastructure; (iv) productive capacity-building, (v) trade-oriented

adjustment measures; and (vi) AfT requirements. It is conventional to consider one or another of these variables in accounting for data availability, but also to include them in research objectives, as have Basnett et al. (2012), Cali and te Velde (2011) and Vijil and Wagner (2010). Given the purpose of this study, the preferred dimensions of AfT will be infrastructure on the one hand and strengthening the productive capacities of the Access to Market component of MCA-Benin grants on the other. For Adhikari (2011), these two categories are used to specifically address the supply constraints of developing countries in general and LDCs in particular, accounting for about 95 per cent of total aid in the context of trade facilitation.

Adhikari (2011) proposes a specific methodology for assessing the effect of AfT in recipient countries, according to data availability. It includes in particular the path of aid flows, leadership, alignment, coordination among donors, South–South cooperation and the limitations of countries' absorptive capacities, consistent with environmental sustainability and macroeconomic and microeconomic impacts through case study. The methodology employed here is based largely on the matrix elements, indicators and sources proposed by Adhikari (2011) to assess the effects of AfT.

Nature and sources of the variables

Specific data on the variables of interest are based on the methodological approach proposed by Adhikari (2011); they are derived from different sources. Aid flows with the support of the MCA in the various sections indicated in Table 5.1 are of great importance in the context of the analysis. The statistics relating to them are provided by MCA-Benin. Data on PCA performance indicators and the cross-border trade are collected from the institutions involved in the design, implementation and monitoring of the reforms: the CPI, SEGUB, Customs Administration and CPA. These data are the volume of goods passing through the port, the length of stay of container ships in the harbour, the length of stay of container ships dockside, the number of flights in the port area as a proxy security operation, the waiting time for trailer trucks at the port, and customs transit time. The related data are from MCA-Benin. Moreover, as for most of the previous studies, the secondary aid data derive from the OECD.[6]

Method, model and analysis tools

The methodology includes two analysis approaches mobilized to address the issue of the effects of US aid on the performance of the CPA. Firstly, for the hard dimension, the dynamics of the development of port performance variables will be demonstrated over time. More specifically, this first analysis approach allows the

assessment of the appropriateness of investment in terms of time savings and reduction of transaction costs in port operations. The data summarized in Table 5.3 provide the basis for this analysis.

Finally, an empirical model that can capture the impact of aid on variables of interest, especially the advent of the first MCA compact and subsequent investment, is considered in order to assess the impact of reforms on the volume of trade in particular. The specification inspired by Cali and te Velde (2011) and Collier and Dollar (2002) takes the form:

$$lnM = f(lnPib, lnCost, lnAid, Mca, lnTime)$$

where, given the natural logarithm operator, variables denote, respectively: value of imports as dependent variable; GDP; import cost per container; AfT; a dummy variable indicating the occurrence of MCA assistance, with the value 0 before 2006 and 1 thereafter; and processing time per container. This simple model is used to assess the impact of reductions in both time and cost on imports, but it also allows for measuring the effect of time reduction due to investment. Also, assistance will be considered both without and with the grant from the MCA to highlight its direct effect. The Granger causality test will introduce this second approach of analysis.

Table 5.3 Port of Cotonou performance, 2006–2011

Year	Volume (metric tons)	Duration of ships in harbour (hours)	Duration of ships at dock (days)	Flights (no.)	Waiting time for trucks at port (hours)	Customs transit time (days)
2006	4.1	16.00	2.00	40	24.00	3.80
2007	6.04	49.00	1.53	57	na	na
2008	6.91	67.60	1.98	25	104.00	na
2009	6.36	39.12	1.60	48	na	na
2010	7.104	34.72	1.10	24	38.26	3.38
2011	6.9	34.60	1.31	32	27.55	2.93

Source: MCA-Benin (2012).
Note: na = data not available.

5.5 Empirical results

In the period 2006–2011, MCA-Benin funding to the CPA under the Access to Markets component amounted to US$ 187,903,987. Referring to the methodology for analysing the effects of AfT proposed by Adhikari (2011), it is important to appreciate the first criterion, the principle of additionality. Indeed, funding under AfT should supplement aid flows to LDCs. Figures 5.1(a) and 5.1(b) provide an illustration of this principle in the context of US aid to Benin.

Figures 5.1(a) and 5.1(b) show the dynamics of AfT within, respectively, economic infrastructure and services (I) and trade policies and regulations (II). After a decline in AfT from 2002 to 2006 in the field of economic infrastructure, there is a steady increase in the variable, peaking precisely in 2011, the year the MCA project ended. The Market Access component helped to substantially raise the level of AfT in the country throughout the period of project implementation, hence the principle of additionality, which allows analysis of this support in terms of AfT. The same dynamic can be seen in aid flows in relation to trade policies and regulations, the peaks being during the implementation period of the CPA project. This is the first evidence-based research of actual impacts of financing commitments on the port's performance by considering several relevant indicators.

Dynamic analysis of performance indicators

As indicated in the methodology, key performance indicators relate to the volume of goods passing through the CPA, the length of stay of container ships in the

Figure 5.1 Evolution of AfT flows
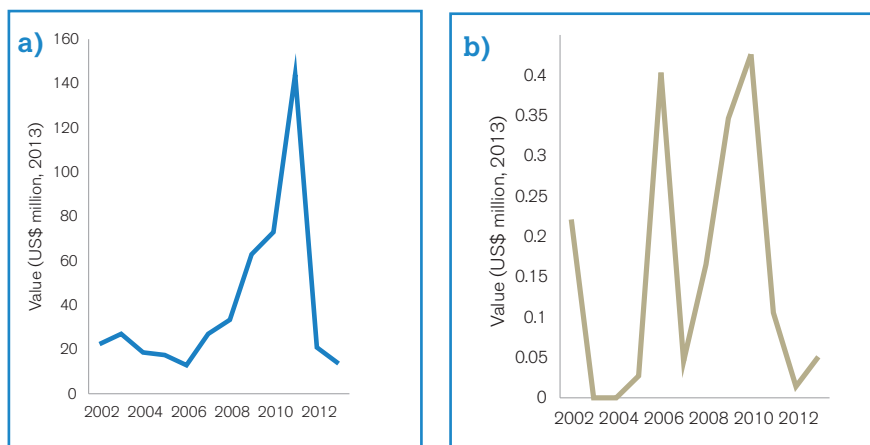
Source: Authors; OECD CRS database, https://stats.oecd.org/Index.aspx?DataSetCode=CRS1.

harbour, the length of stay of container ships dockside, the number of flights in the port area as a proxy for the safety of operations, the waiting time for trailer trucks at the port and customs transit time. Their evolution over time gives an illustration of the effects of various facilitation reforms undertaken at the CPA.

To appreciate freight traffic at the CPA over the recent period, recourse is made to the volume of goods (Figure 5.2(a)) and the value of traded goods as a percentage of GDP (Figure 5.2(b)).

Figure 5.2(a) shows that the traffic of goods through the CPA rose by 2.8 metric tons over the five years of the programme, from 4.1 to 6.9 metric tons, representing an annual average growth rate of 13.65 per cent. In year 5 of the programme, cargo traffic reached 6.9 million metric tons against a final target of 6.3 million metric tons. According to the compact completion report (MCA-Benin, 2012), the upward trend is expected to continue, starting with the exploitation of investments undertaken. This can be observed elsewhere: Figure 5.2(b) shows the change in the value of goods traded through the CPA, with peaks in 2007 and 2008.

The length of stay of container ships in the harbour and dockside (Figure 5.3(a)) is an element of investment-related performance and reforms undertaken as part of AfT. By the same logic, it is customary to study this in relation to both import and export activity (Figure 5.3(b)).

The average waiting time of container ships in the harbour was not significantly reduced during the period of implementation. This would have resulted in congestion due to the massive imports of materials and equipment needed for work in the framework of the 2008 summit of the Community of Sahel-Saharan States (CEN-SAD) in Benin. However, the establishment of the logistical measure "Travel to Fixed Window" in October 2009 helped significantly reduce the average waiting time in the harbour until the end of the programme and beyond (MCA-Benin, 2012). This is apparent in Figure 5.3(b), which shows a dramatic drop in the number of days required for export as well as import, in particular since the realization of investments in 2007. In contrast, the average length of stay of container ships at the dock has decreased over time by 6.9 per cent on average, from two days in 2006 to 1.31 days in 2011.[7] This trend is compatible with the lower average time needed to import (down by an average 3.42 per cent annually) and export (down by an average 2.64 per cent annually (Figure 5.3(b)). This is a particularly important gain in terms of time in trade, which results from corporate policies and reforms.

Figure 5.2(a) Volume of goods at the CPA
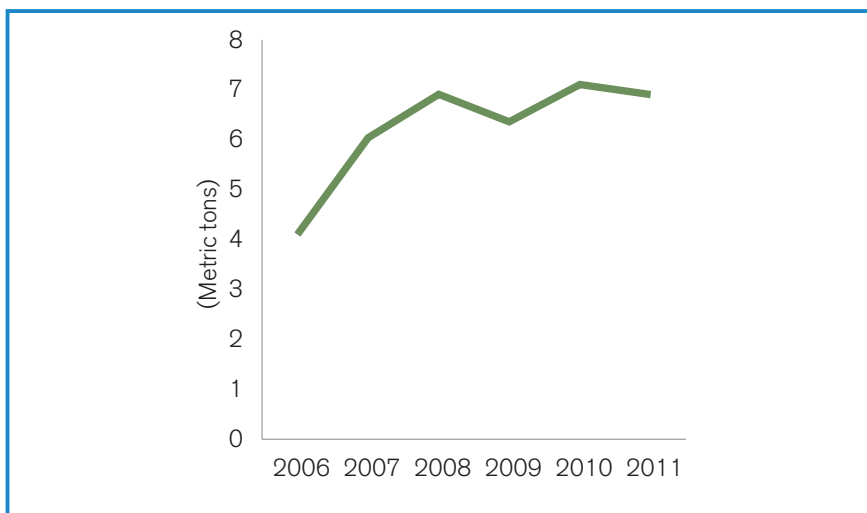
Source: Authors; MCA-Benin (2012).

Figure 5.2(b) Evolution of value of good traded
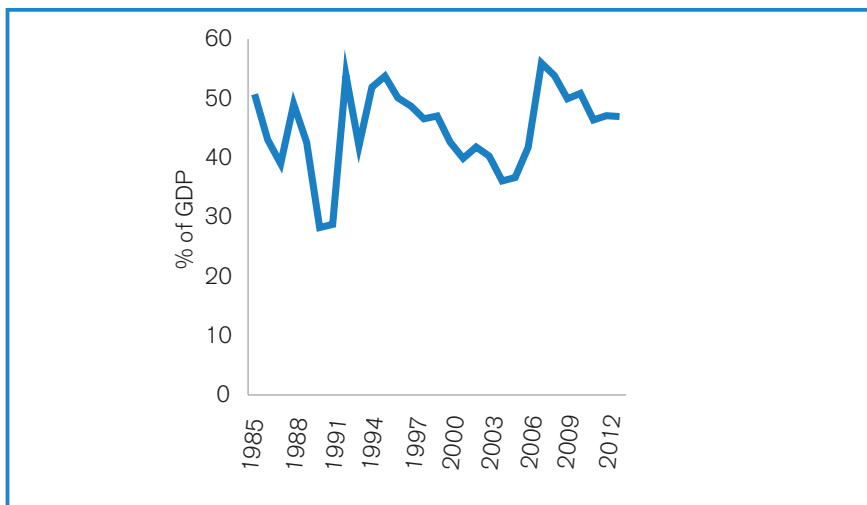
Source: Authors; World Bank (2015).

The compact completion report of the MCA-Benin programme also presents results on other indicators, such as waiting time for trailer trucks, transit time and cases of theft in the port area. While results on the first of these indicators are somewhat erratic, they follow a downward trend that must be credited to the Plan of Actions established to ensure better monitoring and more rational management of living in trailer trucks in the port area[8] (MCA-Benin, 2012).

Figure 5.3(a) Time of ships in the harbour and dockside
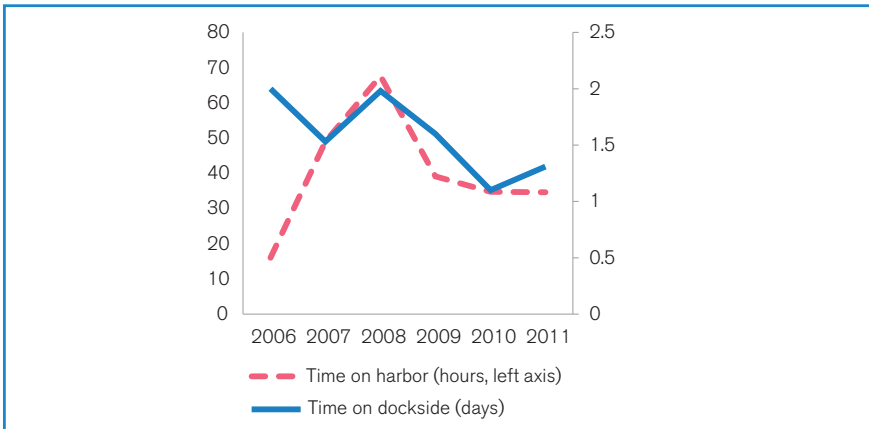
Source: Authors; World Bank (2015).

Figure 5.3(b) Time for import and export
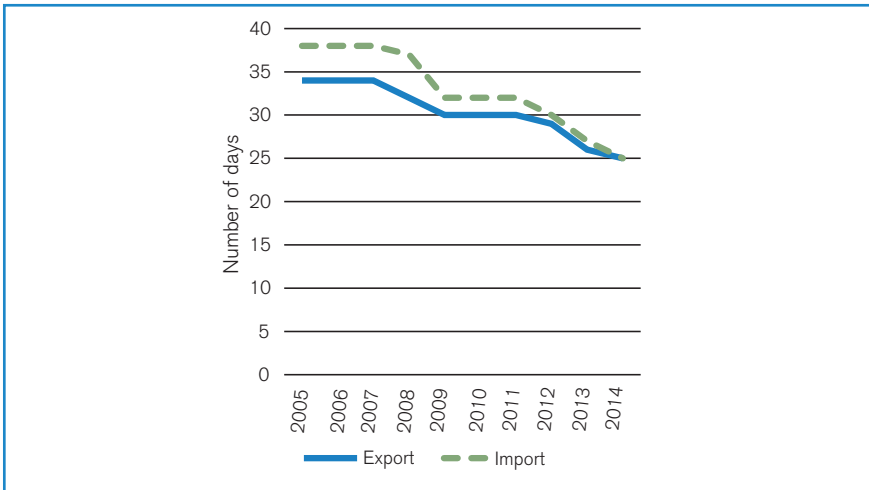
Source: Authors; World Bank (2015).

Customs transit time, which was 3.8 days in 2006, recorded a continuous decline to 2.93 days in 2011.[9] Finally, the number of flights in the port area is considered under the indicator of safety of port operations. The number of recorded flights by the special brigade of the port is erratic.

The intervention logic of the Access to Market component of the MCA programme does not explicitly include reduced processing costs of port operations (MCA-Benin, 2012). Therefore, the cost analysis should be interpreted in terms of the reduction of transaction cost potentially induced by time savings as well by time spent in the harbour, docked in the processing of cases at the level of the single desk. Figure 5.4 indicates the rising cost of processing container-based imports and exports.

Without question, costs related to processing imports appear higher than those related to processing exports. There is a marked upward trend in the costs of processing imports, particularly from 2008. As a result, the implementation of investment reforms and facilitation at the CPA under the MCA programme could be accompanied by an increase in the cost of port operations in the order of 0.66 per cent for imports and 2.17 per cent for exports, on average. Thus, in clear terms, the reductions in waiting time and processing time are set against an increase in processing costs. This could be explained by a new services billing structure based on the principle of quality-price, given the new investment. Therefore, the

Figure 5.4 Cost of container processing
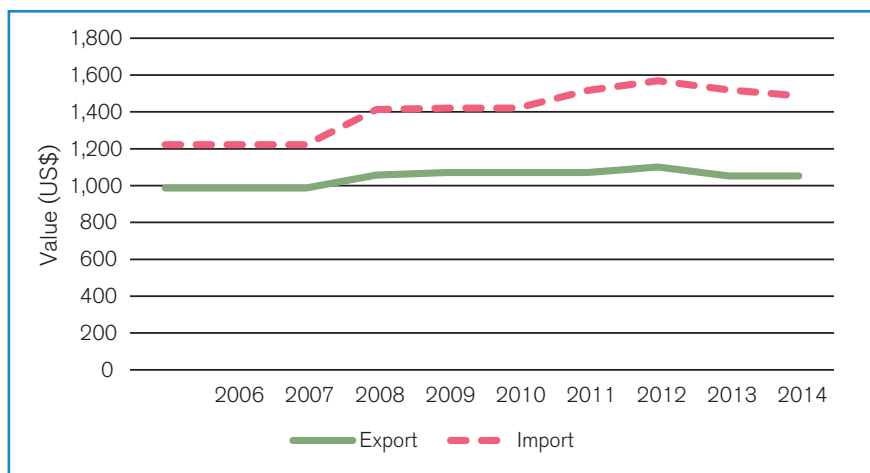
Source: Authors; World Bank (2015).

reduction in transaction costs related to time savings becomes important for overall assessment of the impact of reforms and political facilitation on costs at the CPA.

Before estimating the explanatory model of imports, the causality between the key variables is assessed to support graphics analysis and interpretation. The results of the Granger causality test (1969) are shown in Table 5.4 for relevant variables considered for analysis.

Table 5.4 Results of Granger causality test

Null hypothesis:	Obs	F-Statistic	Probability
Cost_to_M Does not Granger Cause AfT_MCA	27	7.58615	0.00312
AfT_MCA Does not Granger Cause Cost_to_M		2.90376	0.0 4601
Time_to_M Does not Granger Cause AfT_MCA	27	36.4079	1.0E-07
AfT_MCA Does not Granger Cause Time_to_M		3.21118	0.05976
M Does not Granger Cause AfT_MCA	27	0.72432	0.49586
AfT_MCA Does not Granger Cause M		19.5787	1.3E-05
Time_to_M Does not Granger Cause Cost_to_M	27	3.98236	0.03341
Cost_to_M Does not Granger Cause Time_to_M		170091	4.2E-14
M Does not Granger Cause Cost_to_M	27	1.05044	0.36668
Cost_to_M Does not Granger Cause M		4.77996	0.01889
M Does not Granger Cause Time_to_M	27	1.15470	0.33353
Time_to_M Does not Granger Cause M		3.63819	0.04315

Source: Authors.

The variables relate to AfT, including the MCA grant in the five-year period 2006–2011 (*AfT_MCA*), the cost of processing an import container (*Cost_to_M*), the processing time for an import container (*Time_to_M*) and imports (*M*) by value. On the threshold of 5 per cent, it is found that the AfT not only Granger-causes the time and cost of import processing containers to the PAC, but it also causes imports.[10] In the same dynamic and indirectly, it is noteworthy that both time and cost to import Granger-cause imports; this amplifies the causal effect of AfT in Benin on imports during this period. Finally, there is indeed a two-way causal relationship between cost and time, which could justify the hypothesis of a reduction in transaction costs due to the reduction in the average time taken by port operations. On the basis of the causality test, it is concluded that changes in AfT would have directly affected the costs and processing times of

container-based import and, indirectly, the quantity of goods imported into Benin during the period. Referring to Cali and te Velde (2011) and Collier and Dollar (2002), a regression of the variable M on these exogenous factors will support this intuition.

To explain the value of imports, the following are considered: gross domestic product (*lnPib*); AfT without the MCA grant[11] (*lnAfT_NMCA*) and its square[12] (*lnAfT_NMCA²*); the dummy variable indicating the occurrence of MCA assistance, with the value 0 before 2006 and 1 thereafter (*MCA*); AfT with the MCA grant (*lnAfT_MCA*) and its square (*lnAfT_MCA²*); the time taken to import (*Time_to_M*); and the cost to import (*Cost_to_M*). Two scenarios are distinguished: estimating without the grant, and estimating with the grant over the period 1985– 2013. The results are shown in Table 5.5.

Overall, the results confirm the predictions of the trend analysis and causality test: the positive effect of AfT (with or without the MCA grant) on imports in Benin on the one hand, and the negative effect of the time and cost of container import-processing on the other. The coefficient associated with the dummy variable significance testing attests to the importance of the MCA grant in the explanation of the dynamics of imports in Benin since the grant's inception in 2006. More specifically, the elasticity of imports relative to AfT_NMCA and AfT_MCA is estimated to be 0.039 and 1.092 respectively, confirming a greater increase in imports when the MCA grant is considered in the estimation. It is the same square of variables of AfT for which the coefficient is not significant in the first scenario but is significant in the second, with 0.216 as elasticity.

Negative elasticity of imports with respect to time and cost allows corroboration of the early results of the analysis of dynamics: these variables reduced by 1 per cent lead to increased imports of the order of 0.092 per cent and 1.305 per cent respectively in the first scenario, while the elasticity is in the range of 0.216 and 0.463 respectively in the second scenario. These results further justify the finding that, beyond the rising costs of processing containers observed in the trend of the variable, its reducing effect on imports and tested significance could be explained by lower transaction costs due to improved processing time performance, with fewer hours on the roads for trucks and fewer days in dock for container vessels.

Despite methodological limitations to the data (i.e. various sources, the number of observations) and reference to the MCA grants implemented in 2006 alone, these different analytical approaches are used to confirm the positive effect of MCA support analysed under AfT on Beninese imports. This effect comes from the

Table 5.5: Results of the model estimation

Variables	Estimation without MCA grant	Estimation with MCA grant
$lnPib_t$	0.928***	1.002***
	(10.63)	(11.40)
$lnAfT\_NMCA_{t-1}$		
	0.039**	
$lnAfT\_NMCA^2_{t-1}$	(2.06)	
MCA	0.015	0.123***
	(0.09)	(5.03)
$lnAfT\_NMCA_{t-1}$		1.092***
		(4.04)
$lnAfT\_NMCA^2_{t-1}$		0.216*
		(1.75)
$lnTime\_to\_M_t$	-0.092	-0.216**
	(-1.50)	(-2.20)
$lnCost\_to\_M_t$	-1.305*	-0.463**
	(-1.67)	(-2.27)
Constant	13.011*	-3.246***
	(1.66)	(-5.20)
R^2	0.88	0.93
Observations	28	28
Fisher	F(5,22)=43.11	F(5,22)=31.77

Source: Authors.

Note: Values in parentheses represent the t-Student. ***, ** and * indicate the significance of the coefficients at 1 per cent, 5 per cent and 10 per cent, respectively.

reduction in container processing times, but also in the time ships are in the harbour and dockside; it also comes from lower transaction costs associated with these various reforms undertaken on the port onshore. Considering both scenarios – with and without grants – the goal is to isolate the specific effect of this US aid in explaining imports. There are other, more specific analysis approaches that would address this issue carefully and could be implemented to validate the robustness of the results highlighted here.

These results confirm the positive effect of MCA support analysed under AfT on Beninese imports. They call for further reforms in trade facilitation at CPA to ensure its competitiveness over time. At the same time, increased investments are required to optimize the use of structures built at this particular port and also the corridor serving the hinterland countries. These reforms are complementary to those that primarily focus on the business environment in the area of cross-border trade. The results support the second MCA compact programme for which Benin is eligible and any investments will impact on other sectors of the economy.

5.6 Conclusion

Being eligible for the MCA programme, Benin chose, in the five years from 2006, to focus mainly on the Access to Markets component of the MCA grant, instituting various investments and reforms. The MCA is a series of strategic investments to improve the physical and institutional infrastructure base and increase investment and private sector activity. The total programme value is around US$ 307,298,000. The main component of the programme is the Access to Markets Project, which received 61 per cent of the grants (MCA-Benin, 2012). Basically, this component aims to promote access to markets through improved port operations and infrastructure. It also seeks to improve the competitiveness and performance of the port and port security, through infrastructure modernization, management and institutional and systems reforms in order to increase capacity and reduce transaction costs. Given this focus, the US support fits perfectly in the AfT context. The objective of this study is to identify the potential effects of reforms in the CPA and the volume of imports through the port under the MCA programme.

To achieve this, the methodology is largely based on the matrix elements, indicators and sources proposed by Adhikari (2011) to assess the effects of AfT. The methodology includes two approaches: (i) the dynamics of port performance variables are assessed over time in terms of time savings and reduction of transaction costs; and (ii) after a Granger causality test, the effect of reforms on the volume of trade is analysed by an empirical model inspired by Cali and te Velde (2011) and Collier and Dollar (2002). The analysis of the aid dynamics

demonstrates the principle of additionality, according to which, the Access to Markets Project has substantially raised the level of AfT in Benin over the entire period of execution, which justifies the great appreciation of this support in terms of AfT.

Performance indicators were analysed to highlight the potential impact of aid, including goods traffic, and average waiting time of ships in the harbour and dockside. Freight traffic passing through the CPA increased by 2.8 metric tons over the five years of the programme, from 4.1 to 6.9 metric tons, representing an average annual growth rate of 13.65 per cent. This upward trend in traffic will be confirmed in analysing the implications of investments for trade creation and facilitation. If the average waiting time of container ships in the harbour has not been significantly reduced during the implementation period, the average length of stay of container ships dockside has decreased over time by an average 6.9 per cent, from two days in 2006 to 1.31 days in 2011. This trend is consistent with the decrease in the average time required to import. Furthermore, the results show that the implementation of investment reforms and trade facilitation under the MCA programme could be accompanied by an increase in the annual cost of processing port operations, by an average 0.66 per cent for exports and 2.17 per cent for imports. This is based on the supposition that the reduction of import processing time results from an increase in operations processing costs; therefore, the reduction of transaction costs related to time savings becomes important for an overall assessment of the impact of reforms and facilitation policies on costs at the CPA.

The causality test helped consolidate these first results: the AfT not only caused the time and cost of processing of import containers to fall, but also increased the volume of imports. On this basis, it is concluded that variations in AfT would directly affect both costs and time for processing import containers and, indirectly, the quantities of goods imported into Benin during the period under study. Referring to Cali and te Velde (2011) and Collier and Dollar (2002), in regressing import on its exogenous variables, we are able to corroborate this insight, the estimation being done both with and without the grant from the MCA. Overall, the importance of the grant in explaining the dynamics of imports in Benin since 2006 is highlighted. The results confirm the predictions of trend analysis and the Granger causality test, namely, the positive effect of AfT (with or without the MCA grant) on imports in Benin on the one hand, and the negative effect of time and container processing cost on the other hand. These results call for further reforms in trade facilitation at CPA, to ensure its competitiveness over time. This will be a part of the second compact of the MCA programme, which was concluded in September 2015.

Endnotes

1. On 22 February 2006, the Government of the United States, through the Millennium Challenge Corporation (MCC), and the Government of Benin signed a cooperation agreement (the Compact) to provide a solution to economic constraints and provide incentives to the private sector in Benin.

2. An insurance form, similar to a declaration, which provides for insurance coverage of multiple shipments within a prescribed reporting period.

3. Other new topics discussed during the Singapore Ministerial Conference, 9–13 December 1996, concerned: (i) trade and competition, (ii) investment and competition and (iii) investment and transparency. Along with trade facilitation, these are regarded as "the Singapore issues".

4. The Uruguay Round was the eight round of multilateral trade negotiation under the GATT from 1986 to 1994.

5. The Sixth WTO Ministerial Conference, held in Hong Kong 13–18 December 2005, called on donors to increase AfT resources to help countries, especially LDCs, to build supply capacities and infrastructure exchange. They were expected to implement the WTO Agreements but also to reap the benefits they offer and lead to the expansion of trade (WTO, 2005).

6. OECD Creditor Reporting System (CRS) database (https://stats.oecd.org/Index.aspx?DataSetCode=CRS1).

7. The performance recorded in this mode of the operating platform in favour of container shipping led the main owner of the CPA to delete port surcharges related to waiting ships as of March 2010 (MCA-Benin, 2012).

8. Among the actions recommended in this plan is the development of software (Système Intégré de Gestion du Port Autonome de Cotonou, SIGPAC) which, since it was commissioned in March 2011, has resulted in a net decrease in the "residence" time of trucks at the port.

9. Further reforms in the manual customs clearance procedures and finalizing the removal of goods held at the CPA should help to further improve this situation.

10. Rejection of the null hypothesis.

11. AfT without the MCA grant is obtained by deducting the latter from the total AfT, given the amounts disbursed in each project year.

12. The square of aid flows allows variables to take into account the effect of size or performance assistance on imports.

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6 Aid for Trade as a catalyst for trade facilitation: A Moroccan perspective

*Nabil Boubrahimi and Azzedine Ghoufrane**

Abstract

This chapter aims to highlight the potential role of Aid for Trade (AfT) in trade facilitation, reducing the cost of trade and improving the trade performance of Morocco. The chapter finds that AfT is a fundamental lever for facilitating commercial exchanges and a main vehicle for promoting regional integration and effective integration of developing countries into global value chains. AfT helps developing countries to increase exports of goods and services, integrate into the multilateral trading system and take advantage of the progressive liberalization and expansion of market access. If it is rationally oriented, AfT will enhance the competitiveness of exports and enable Moroccan companies to go upmarket; in addition, AfT would consolidate the reforms of trade policy in Morocco to streamline international transactions and increase the attractiveness of the Moroccan economy to investors.

6.1 Introduction

Trade facilitation has been always considered a key factor for regional and international integration and development. It depends on a set of conditions, such as infrastructure quality, transit efficiency, transport systems and the single-window "one-stop-shop" system[1] that could enable a competitive business environment, which, in turn, will trigger the acceleration of trade development.

Trade facilitation is no longer limited simply to the reduction of trade costs, in the context of the globalization of production with a growing complexity of distribution systems supported by supply chains, but also represents a decisive vehicle for improving the attractiveness of foreign direct investment and a decisive tool of development. As noted by UNCTAD (2014) in this regard, "the implementation of trade facilitation measures 'needs' to invest in human and institutional capacities."

Trade facilitation is, moreover, among the priority objectives of the Aid for Trade (AfT) initiative in favour of developing countries, particularly the least-developed countries (LDCs). This initiative aims to contribute to trade-related infrastructure projects through funding and capacity-building in order to increase business opportunities and help countries better integrate into the multilateral trading system and regional trade.

Launched at the WTO Ministerial Conference in Hong Kong, China, in December 2005, the AfT initiative is mainly targeting trade facilitation, either by funding trade-related infrastructure development (roads, highways, railways, ports, logistic platforms, etc.) or by providing assistance to strengthen commercial capacities and the business environment.

According to a World Bank study[2] in this area, the cost of trade transactions in countries not implementing a determined trade facilitation policy can increase total business operations costs by up to 20 per cent. Such extensive cost implications seriously impact on a country's competitiveness, which reduces its integration into its regional and international trade environment.

This explains the prioritization of trade facilitation in the framework of the multilateral trade negotiations under the Doha Round, which led to the adoption of the WTO Agreement on Trade Facilitation (TFA) at the Bali Ministerial Conference in December 2013.

On that occasion, WTO member states reaffirmed their commitments to the AfT initiative and highlighted its strategic role in strengthening the domestic trade capacity of the developing countries and LDCs. Furthermore, the ratification and actual implementation of the TFA will depend on the medium- and long-term integration of trade facilitation into the national development strategies of the ratifying members.

AfT can play an important role in supporting developing countries' efforts in trade facilitation, by targeting projects and programmes financing the infrastructure required for effective trade, transport and capacity-building.

It should be noted that the performance of countries in this field differs according to their degree of development. In fact, each country's performance is measured by its ability to eliminate non-tariff barriers restricting trade and transport (i.e. developing an efficient transit system) through the adoption of national policies and regulations that meet specific needs for trade facilitation. The ultimate goal is to create a suitable and conducive environment for trade and transport at the international and regional levels. Hence, the need to include these projects in regionally coordinated AfT initiatives is essential for the improvement of trade-related infrastructure and to facilitate the establishment of effective business procedures under national policies and regulations.

Analysis of Morocco's national policies and efforts on trade facilitation, as a case study, should help to demonstrate what could be achieved in this area. Certainly, in recent years, countries that have managed to integrate into the global economy have implemented a number of measures to promote trade, particularly at the regional and international levels, by improving the quality of port and airport infrastructure and simplifying and shortening trade procedures.

Before examining the Moroccan experience in the field, it is worth recalling the theoretical framework of the correlation between trade facilitation and trade cost reduction on the one hand and the potential role of the AfT facilitation process on the other.

6.2 Correlation between trade facilitation and trade cost reduction

Trade facilitation and its contribution to the reduction of trade-related costs have been demonstrated in several international studies (OECD, 2015; World Bank, 2012).

"Trade facilitation has become an important subject in the Doha Round negotiations. The saving from streamlining procedures could be 2%–15% of the value of the goods traded, according to estimates by the OECD. The World Bank says that for every dollar of assistance provided to support trade facilitation reform in developing countries, there is a return of up to US$ 70 in economic benefits". [3]

These studies have established that trade facilitation, with regard either to trade- and transport-related infrastructure or import- and export-related procedures, remains a crucial factor that has an impact on the total cost of traded goods.

The "Bali Package" adopted by WTO members in December 2013 represents a remarkable evolution in the process of negotiations and marks the willingness of members to overcome the stalling of the Doha Round. The proposed measures are mainly oriented towards trade facilitation and support for developing economies.

The TFA contains provisions for faster and more efficient customs procedures. The first section of the Agreement clarifies and improves Articles V, VIII and X of the GATT, 1994, and is focused on several issues, focused on the following issues:

- Publication and availability of information;
- Opportunity to comment, information before entry into force and consultation;
- Advance rulings;
- Appeal or review procedures;
- Other measures to enhance impartiality, non-discrimination and transparency;
- Disciplines on fees and charges imposed or in connection with importation and exportation;
- Release and clearance of goods;
- Border agency cooperation;
- Movements of goods under customs control intended for import;
- Formalities connected with importation and exportation and transit;
- Freedom of transit;
- Customs cooperation;
- Institutional arrangements.

The second section includes special and differential treatment (SDT) for developing countries and LDCs to assist them in implementing the Agreement. Consideration of the situation of these countries will focus on national needs assessments to determine assistance needs and costs, and the scheduling of

commitments at individual member level. Developing countries and LDCs will be able to link their commitments to the receipt of technical assistance and support for capacity-building, monitored by the WTO.

Implementation of the provisions of the TFA could generate US$ 1 trillion of GDP gains to the world economy, according to estimations of Hufbauer and Schott (2013).

Based on a computable general equilibrium (CGE) model, Zaki (2014) has highlighted the potential gains arising from the implementation of the TFA in terms of economic growth and export promotion. Table 6.1 shows these estimates for some regions.

The Organisation for Economic Co-operation and Development (OECD)'s 2015 Trade Facilitation Indicators show that implementation of the TFA could reduce trade costs worldwide by between 12.5 per cent and 17.5 per cent. They also demonstrate that the potential impact on trade costs depends on the level of implementation intended by each country (OECD, 2015). The calculation is based on two scenarios: full and limited implementation (see Table 6.2).

Table 6.1 Estimates of the gains by 2020 brought about by improved trade facilitation

Country/region	GDP gains		Export gains	
	%	US$ billion*	%	US$ billion
European Union	2.04	348	10.60	629
Middle East	5.66	30	13.66	22
North Africa	4.44	15	11.21	14
Other Africa	7.28	47	22.28	46
Other Europe and Turkey	3.75	36	15.04	49
United States	0.55	90	3.90	61
China	1.45	124	8.83	187

Source: Zaki (2014).
Note: *All US$ amounts expressed in 2005 prices.

Table 6.2 Impact of implementation of the TFA on costs

Scenario	Implementation level	Potential cost reduction
Full implementation	Countries implement all the options contained in the Agreement, including those formulated on a "best endeavours" basis	Low-income countries: 16.5 per cent; Lower-middle-income countries: 17.4 per cent; Upper-middle-income countries: 14.6 per cent; OECD countries: 11.8 per cent.
Limited implementation	Countries implement only the mandatory provisions contained in the Agreement, but take into account that some of the "best endeavours" measures were already in place	Low-income countries: 12.6 per cent; Lower-middle-income countries: 13.7 per cent; Upper-middle-income countries: 12.8 per cent; OECD countries: 10.4 per cent

Source: OECD (2015).

Both scenarios offer potential reductions in trade costs. The effectiveness of trade facilitation depends strongly on the combination of measures implemented and the deadline for their implementation.

Furthermore, the potential impact of trade facilitation depends on the nature of the measures in place. Countries in each income category would do well to direct their actions to focus on measures that provide a significant effect on the cost of trade (Figure 6.1).

Figure 6.1 Potential trade cost reduction on TFA implementation by measure
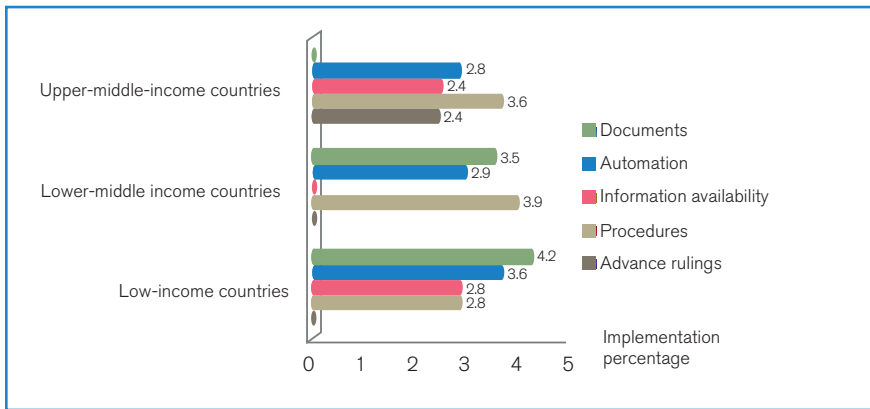
Source: OECD (2015).

Improving the quality and timeliness of formalities (through the simplification of trade documents and the streamlining and automation of border procedures) would have a significant impact on the costs of trade transactions and could generate savings of between 2.8 per cent and 4.2 per cent, depending on a country's income profile (OECD, 2015). Table 6.3 illustrates the potential impact of each measure.

Trade-related infrastructure is considered as a factor in increasing the competitiveness of traded goods and expanding access to the markets of other countries and regions. This is because well-developed and efficient infrastructure results in lower costs, higher trading volume per product and safer delivery of goods, which improve a country's competitiveness (World Bank, 2012).

Table 6.3 Potential impact of trade facilitation measures by country income profile

Country income profile	Measure	Potential impact on trade cost (%)
Low-income countries	Harmonizing and simplifying trade documents	4.2
	Automating trade and customs processes	3.6
	Availability of trade-related information	2.8
	Streamlining border procedures	2.8
Lower-middle-income countries	Streamlining border procedures	3.9
	Harmonizing and simplifying trade documents	3.5
	Automating trade and customs processes	2.9
Upper-middle-income countries	Streamlining border procedures	3.6
	Automating trade and customs processes	2.8
	Availability of trade-related information	2.4
	Providing advance rulings on customs matters	2.4

Source: OECD (2015).

Hoekman and Zarrouk (2009) show that the cost of transport in Africa is higher than elsewhere relative to the value of transported goods and the predictability and reliability of transport according to international standards. More recently, it has been estimated that the costs of transportation and logistics, as well as trade procedures (including those applied to the borders for regional trade), add up to 20 per cent to the cost of the traded product.

Moreover, this analysis supports an earlier empirical study by Limão and Venables (2001) showing that the lack of infrastructure remains a major cause of the weak business outcomes achieved by African countries. By relying on multi-country regressions, the authors conclude that, in Africa, trade is highly dependent on the cost of transport. They determine that a 10 per cent drop in transport costs leads to a 25 per cent increase in trade.

This also converges with the work of Amjadi and Yeats (1999), who state that the cost of transportation is a high trade barrier that is more restrictive than the customs procedures and duties applied to imports. It is also higher than other trade-quantitative restrictions.

Other empirical studies have concluded that transport cost is still very high and trade-related infrastructure is least effective in Africa, relative to other regions, such as Latin America and Asia (AICD, 2008).The price of road transport in Francophone Africa, for example, could be six times higher than that in Pakistan and nearly 40 per cent higher than that in France (AICD, 2008).

Limão and Venables (2001) consider that the main factors behind the rising costs of transportation in Africa are low productivity in the road transport sector, particularly with regard to infrastructure problems, the low level of competition between transport service providers and the lack of infrastructure.

The United Nations Economic Commission for Africa (UNECA) has identified areas in which the exorbitant transaction rates that hinder the development of intra-regional trade can be reduced. These include the development of additional services and related infrastructure (roads, railways, ports, intermodal transport, cross-border trade, logistics platforms, etc.) and national and regional logistics, in particular to ensure infrastructural links between landlocked countries and neighbouring countries that have a coast line (UNECA, 2015).

Further work on road transport has shown that it is the most appropriate means of communication and best trade integrator in Africa (UNECA, 2010).Therefore, it should constitute one of the priorities of the African Union's New Partnership for Africa's Development (NEPAD).

In the past, it was assumed that, by investing significantly to improve road infrastructure, the price of transport would be reduced. Thus, since the 1970s, the World Bank has actively supported efforts to improve transport corridors in Africa, reserving a large part of its financial support to improving infrastructure initiatives.

In recent years, there has been international agreement on the importance of trade facilitation as a means of generating growth and employment opportunities and it has been placed at the centre of trade policy debate. The AfT initiative plays a critical role here as it can contribute to national efforts to address the constraints that limit the ability of particular African countries to benefit from trade expansion, through actions on improving trade-related infrastructure and trade facilitation in terms of capacity-building.

6.3 The role of Aid for Trade facilitation in the process of trade

Trade facilitation has always been a major concern in the formulation of national development policy objectives. Developments in trade facilitation, transport and transit systems confirm their centrality to removing impedimentsthat largely restrict bilateral and regional trade flows between countries, including those in Africa and the Middle East and North Africa (MENA) region. For the most part, these impediments arise from the proliferation of non-tariff barriers, despite the conclusion of many bilateral, sectoral and regional preferential trade agreements.

The lack of comprehensive trade facilitation regulations and the presence of inefficient infrastructures are not the most important constraints; there are also those related to cross-border trade, which mainly arise due to the low levels of integration between countries in these regions.

The ineffectiveness of the regional trade chain generates additional costs that affect traded goods, in particular exorbitant transportation costs and costs due to delays at the land checkpoints and the volume of documents demanded by border authorities. Many of these documents vary across the transit countries and their respective regulations. For import and export formalities, the absence of a regional framework for cooperation on the harmonization, standardization and simplification of cross-border procedures provokes a serious lack of predictability regarding the documents to be provided. Note that the countries that have their procedures loaded on official websites dedicated to international trade procedures are rare. This is a major source of unpredictability and complexity for the delivery of both import and export goods.

In terms of trade-related infrastructure, the unavailability of certain control services at border crossings, especially for sanitary and phytosanitary control, and the absence of common platforms of communication and information exchange among the border agencies, complicates and delays the progress of cross-border trade formalities.

When it comes to trade governed by the provisions of favourable trade agreements, the lack of coordination among services is a source of underperformance and proliferation of non-tariff barriers, which limit preferential market access to countries within a region.

While it is clear that African countries might never be able to cope with these difficulties alone, the urgent need to activate regional initiatives financed by donors in the AfT context becomes inevitable. Only these kinds of initiatives can bring tangible solutions to these problems. For this reason, it is necessary to converge the objectives of regional AfT projects, especially those that have an impact on trade facilitation, if the deficiencies of infrastructure, including those related to trade and trade-related services, are to be overcome. Otherwise, it will be necessary that international trade procedure stake into account regional specificities as to ensure more integration.

Thus, AfT will act as a catalyst for the development and dynamism of trade in goods between the countries of Africa and the MENA region, and this should favour regional integration projects structured through trade.

This is an important move as many African economies have directed the bulk of their investment funds to promoting trade with developed economies, with which they have concluded various free trade agreements. The low level of regional integration in Africa is in part explained by the preference given to North-South partnerships and for other non-African countries (primarily emerging economies).

Today, African countries are facing a lack of the financial, technical and human resources required to tackle regional integration projects, while, in the view of development specialists, only international and regional AfT initiatives could finance such major projects. Therefore, donors are called up onto support projects aimed at stimulating bilateral or regional trade in Africa, the impact of which on the development of trade will be certain.

This chapter stresses the provision of AfT as a solution to guide aid in order to address existing barriers that disproportionately affect regional cross-border trade. This question deserves particular attention from donors as actors in AfT, in consultation, of course, with national trade policy-makers, especially regarding

actions and funding. Faced with various obstacles, including logistical, procedural and economic, lines of inquiry have been opened to boost cross-border trade between African countries and those of the MENA region.

Optimization of trade-related logistics infrastructure

Trade facilitation cannot develop if not accompanied by structural projects to develop transport infrastructure and logistics (roads and highways, railways, maritime and air links with other countries). In this context, AfT donor initiatives could constitute a means of financing to support these large-scale projects. Experience has shown that, without substantial and sufficient project funding in a regional cooperation framework, it will be difficult to remedy existing deficiencies, and any proposed regional dimension of trade facilitation is likely to have adverse effects on trade development and the integration of economies.

For example, trade-related infrastructure and passage through the borders of African countries should be supported in a rigorous manner within the framework of joint projects. Hence the need for technical assistance to countries to help them implement the simultaneous adoption of transit systems in accordance with relevant international standards, namely, mandatory implementation of the Customs Convention on the International Transport of Goods under Cover of TIR (International Road Transport Convention) Carnets.

Funding under the AfT initiative could strengthen operational cooperation between countries, notably through the upgrading of services associated with border crossings, by not only strengthening controls but also sharing information that could be useful to other administrations or agencies involved in the trade chain.

Improving regulatory and administrative aspects of trade and transport

Through its capacity-building mechanism, AfT could provide technical and financial assistance to improve regulatory and administrative issues, with the goal of reducing non-tariff barriers and building awareness among public authorities about compliance with the principles of facilitation, harmonization and regional cooperation. This should begin with a definition of good practice in terms of laws and regulations governing trade, and by building repositories of standards and international conventions.

Another aspect of AfT capacity-building to be considered concerns assistance to be granted to neighbouring countries to design common border posts as an optimal form of cross-border/operational cooperation on border controls. This

generally allows common and optimal exploitation of the border post by two countries, whereas separately controlled posts may provide space in which smuggling and insecurity can thrive.

Financial and technical assistance should lead to joint border management, based on close bilateral cooperation, harmonization of required documents, sharing of infrastructure maintenance costs, joint or mutually recognized controls and data exchange. Regulation must accompany such development, along with planning for the deployment of border services officials on the territory of the neighbouring country. It will often be necessary to make major investments in infrastructure, for example new buildings, access roads, information and communications technology, common weighbridges, etc., and to enter into agreements for the sharing of information and installation of equipment and infrastructure.

Any AfT initiative may extend to cooperation in customs personnel training and joint programme management. It should be active in strengthening the capacity of customs administrations and non-tariff measures (freight, transportation, sanitary and phytosanitary control, etc.) of trading countries.

Improving regulatory and administrative aspects must necessarily mean greater transparency. Morocco's BADR online customs clearance system, for example, can simulate the customs duties payable and provide information in advance of all commercial documents that are required by law for export or import. This service can be offered to non-neighbouring countries that are linked to Morocco through indirect trade flows. The improvement of Morocco's customs procedures has also necessitated greater use of new information technologies, but it remains dependent on the progress made by other operators of foreign trade (Moroccan importers and exporters and other national stakeholders).

National capacity-building for trade

Strengthening the national transport and trade capacities of African countries is linked in particular to the accession of these countries to the major international conventions governing the transportation, transit and facilitation of international trade.

African countries need technical and financial assistance to facilitate their adherence to such conventions. This assistance will help them align their customs formalities, procedures, operations and documentation within international conventions, standards and practices, and facilitate reform to develop cross-border trade and international and regional transit. In addition, an AfT initiative can

contribute to strengthening public agencies responsible for trade facilitation capabilities.

The involvement of Morocco and Tunisia in almost all of these major international agreements is highly advantageous, and they can support partner countries. Their efforts can be strengthened with the support of the international organizations and private institutions responsible for the implementation and monitoring of these agreements. The goal is for African countries to have in common the legal instruments that are considered an essential basis for trade facilitation, particularly for goods transported by road.

It is therefore highly desirable for African countries to accede to the most important United Nations conventions for the facilitation of international trade such as the International Convention on the Harmonization of Frontier Controls of Goods (1982); the TIR Convention (1975); the International Convention on the Simplification and Harmonization of Customs Procedures (revised Kyoto Convention, 1999) and the European Agreement concerning the International Carriage of Dangerous Goods by Road (revised ADR, 2015).

Countries in Africa that have not yet signed these international conventions can benefit from technical assistance under the AfT initiative and also take advantage of training their officials in the application of these conventions at the national level.

Another aspect that deserves special attention concerns the publication of national trade regulations via a national portal, with a view to effective dissemination of trade information for the benefit of operators (including importers and exporters), in accordance with the rules of transparency. This also concerns traders who use official websites to access information on the rules, procedures and timetable for reforms and regulatory or tax information about a particular product they wish to import.

6.4 Moroccan experience: current situation and prospect

The Moroccan experience in trade facilitation relates to the measures and actions that Morocco has taken in the context of its policy to support its international trade.

Thus, Morocco is engaged in the facilitation of trade at the bilateral, regional and multilateral levels. Morocco also participates in the work of regional and international bodies whose mission is to strengthen and facilitate trade between countries.

At the multilateral level, Morocco participated in the negotiations for the TFA. The country has also pledged to ensure that national and foreign operators have better access to market information, in accordance with the principle of transparency in market access.

Among Morocco's key achievements is the dematerialization of a set of documents and international trade procedures. In that sense, the single window was set up in order to simplify procedures and streamline international trade transactions. It provides more visibility and more certainty for importers and exporters and helps to strengthen their competitiveness and attractiveness of Morocco.

Efforts are now being made to extend the single window - currently limited to the port of Casablanca, which manages 80 per cent of Morocco's trade - to other areas, with a view to expanding the customs information system and streamlining customs control procedures.

The Global Enabling Trade Report 2014 (WEF, 2014) lists Morocco as one of 35 economies that have obtained the maximum score in terms of transparency of customs and one of 54 economies that have no specific tariffs. Morocco's situation is summarized in Table 6.4. These scores show that the country is moderately positioned and that it is performing rather effectively in Pillars 3 and 7 (Efficiency and transparency of border administration; Operating environment).

In terms of customs procedures, the Customs Code of Morocco grants free transit to ensure the fluidity of cross-border movements of goods, and all clearance operations are managed by the BADR online customs clearance system.

In the late 1980s, Morocco's National Commission for Simplification of International Trade Procedures (CNSPCI) initiated a major project that has resulted in significant improvements in the procedural system for international trade. In particular, the inherent costs of international trade procedures and delays in freight parking at ports and other customs clearance areas have been reduced. The project has included computerization of the operations of major stakeholders, standardization of export documents, relaxation and simplification of customs control, improvement of port logistics and the progressive liberalization of international road transport of goods, among other measures.

The conclusion of the TFA in 2013 reactivated the interest of Morocco in this issue. The main measures on national trade facilitation and transport policy undertaken by Morocco since 1990 are:

Table 6.4 Enabling Trade Index 2014: Morocco

	Rank (out of 138)	Score (1–7)
Enabling Trade Index	**43**	**4.4**
Sub-index A: Market access (25%)	**53**	**3.8**
Pillar 1: Domestic market access	100	4.2
Pillar 2: Foreign market access	32	3.5
Sub-index B: Border administration (25%)	**45**	**4.9**
Pillar 3: Efficiency and transparency of border administration	45	4.9
Sub-index C: Infrastructure (25%)	**50**	**4.2**
Pillar 4: Availability and quality of transport infrastructure	36	4.3
Pillar 5: Availability and quality of transport services	53	4.3
Pillar 6: Availability and use of ICT	65	4.1
Sub-index D: Operating environment (25%)	**45**	**4.5**
Pillar 7: Operating environment	45	4.5

Source: WEF (2014).

- Simplification, harmonization and computerization of import and export securities;
- Adoption of the single goods declaration;
- Standardization of business documents for export and import;
- Simplification and computerization of customs clearance procedures;
- Implementation of an automated online customs-based network (BADR), one of the most successful electronic customs platforms.

These trade facilitation measures have enabled Morocco to improve its Logistics Performance Index (LPI) in terms of the number of documents required for export or import, the time taken to fulfil international trade procedures and the cost of cargo container processing (Table 6.5).

Table 6.5 LPI indicators of cross-border trade, selected countries and country groups, 2007, 2012

Indicators	Morocco		OECD members		Middle East and North Africa	
	2007	2012	2007	2012	2007	2012
Logistics performance index: Overall (1=low to 5=high)	2.38	3.03	3.59	3.60	2.69	2.80
Time to export (days)	13	11	11.74	11.06	23.11	18.90
Time to import (days)	18	15	11.38	10.09	26.84	22.90
Cost to export (US$ per container)	477	577	926.74	1,062.38	927.58	1,079.19
Cost to import (US$ per container)	800	950	999.59	1,109.79	1,061	1,235.24
Documents to export (number)	6	5	4.03	3.94	6.21	5.95
Documents to import (number)	7	6	4.68	4.44	7.79	7.62

Source: World Bank, World Development Indicators databank.[4]

The Government of Morocco continues to reflect on trade facilitation, focusing on its primary objective to dematerialize international trade procedures by replacing paper with electronic media, and extension of the principle of one-stop non-customs control procedures.

Table 6.6 below shows the necessary time, in days, to accomplish each type of formality to both the import and export in Morocco:

Table 6.6 Nature of proceedings and time taken for export and import

Nature of proceedings	Export (days)	Import (days)
Preparation of documents	5	9
Customs clearance and technical control	1	2
Port handling (at the terminal)	2	2
Ground handling and transportation	2	1
Total	**10**	**14**

Source: World Bank (2013), Doing Business 2014.

This focus was selected as a priority axis of the emergency plan (2014–2016) recently adopted by the Government of Morocco, which seeks to end the slowness and complexity of trade-related procedures (customs, administrative, technical, legal, etc.) that constitute brakes on the development of export activities and impact on business competitiveness.

The main measure is to accelerate the development and dematerialization of documents for foreign trade and implement the single window for foreign trade formalities. The objective of simplifying trade procedures is to eliminate redundancies and optimize transactions' processing time.

Through the National Foreign Trade Council (CNCE), Morocco has already begun to implement a national plan for simplifying foreign trade procedures and generalizing electronic data interchange (EDI). The National Ports Agency has supported the full implementation of the ports-related part of the plan (PortNet) and revised document workflow aspects of port operations of international trade.

The measures taken by Morocco on the simplification of foreign trade procedures have led to significant improvement in the average time taken for the storage of imported goods in containers at ports and in other clearance areas (Figure 6.2).
In 2014, this period was 14 days, down from 25 days prior to1990. Cargo clearance time has been significantly reduced, from 5 days prior to 1997 to an average of less than two hours in 2014.

Figure 6.2 **Time required for export and import, selected countries and country groups, 2014**
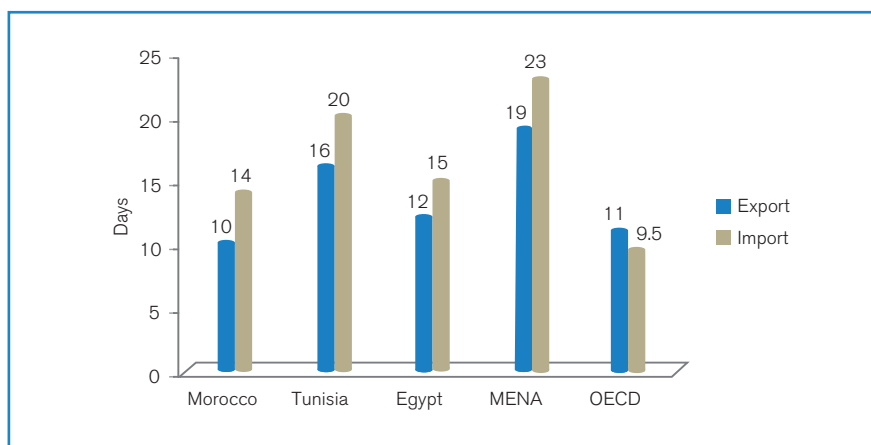
Source: World Bank, World Development Indicators databank.[5]

Furthermore, Morocco made positive progress between 2005 and 2011 to be well positioned in comparison with other lower-middle-income countries regarding the time required for export and import operations (Figure 6.3).

Morocco is also relatively competitive with other lower-middle-income countries regarding the control of import- and export-related costs (Figure 6.4).

Figure 6.3 Time required to export and import, 2005 and 2011
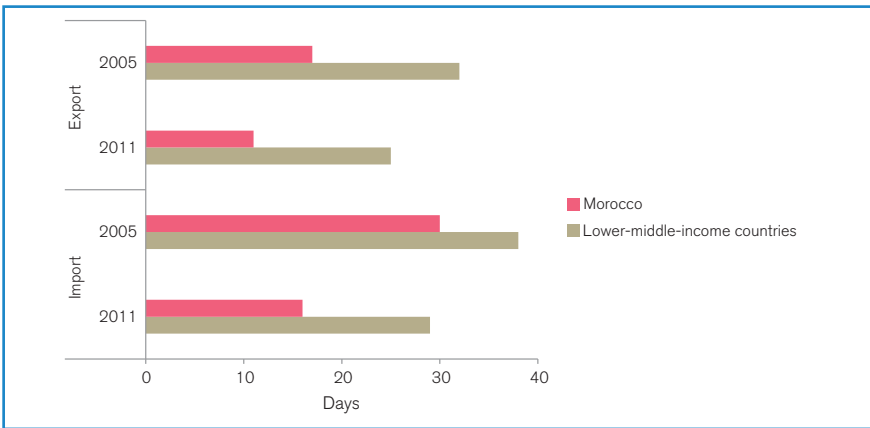
Source: World Bank (2010; 2012).

Figure 6.4 Cost to export and import, 2005 and 2011
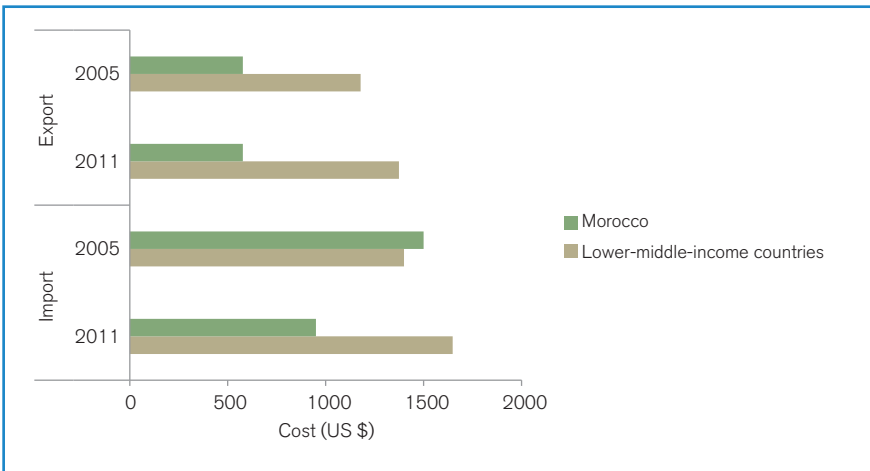
Source: World Bank (2010; 2012).

In terms of trade-related infrastructure, Morocco has embarked on a national policy of strengthening the basic infrastructure and reforms in terms of organization and liberalization of transport modes (maritime, road and air).

The experience of Tangier Med port has placed Morocco in a better position in terms of Mediterranean-based trade, as evidenced by the volume of trade it generates, which continues to trend upward year by year. In 2013, for example, total volume of trade grew by 39 per cent over 2012, to 34.9 million tons. Container traffic increased by 40 per cent in 20-foot-equivalent units (TEUs) and 61 per cent in tonnage compared with 2012.

The success of Tangier Med has inspired the construction of another port infrastructure, Nador West Med, which will become Morocco's largest port and one of the largest Mediterranean ports. Its commissioning is scheduled for 2019.

Development of Morocco's road network is proceeding at a steady pace. According to the Ministry of Equipment and Transport, Morocco currently has a road network of 59,000 km of which 1,416 km highways, 41,500 km of paved roads and a little less than 16,000 km unpaved roads. This road network plays a vital role as it facilitates access to social services, promotes economic exchanges (not least from inaccessible areas) and increases the value of natural resources. In addition, road projects are structuring projects with high added-value to link economic centres of the regions (METL, 2015).

None of these projects could be successful without connection to a faster road network, to facilitate interregional transport. Certainly, global experience has shown that socio-economic development requires infrastructure connecting the areas being developed with each other and with the rest of the territory. Hence the national motorway network development strategy, which helped Morocco achieve a network of 1,800 km of motorways by the end of 2015.

On a global level, while acknowledging achievements made so far, efforts must continue to address the limitations that persist in two areas: (i) trade-related infrastructure, in some isolated regions; and (ii) consolidation and generalization of simplification of the flow of documentation for foreign trade operations other than through maritime ports.

It seems significant that Morocco's efforts remain insufficient in this regard, and there is a need for more investment. Regarding overall performance as measured by the LPI in 2012 Morocco was at the same level as other lower-middle-income countries (Figure 6.5).

Figure 6.5 Logistics Performance Index (1=low to 5=high)
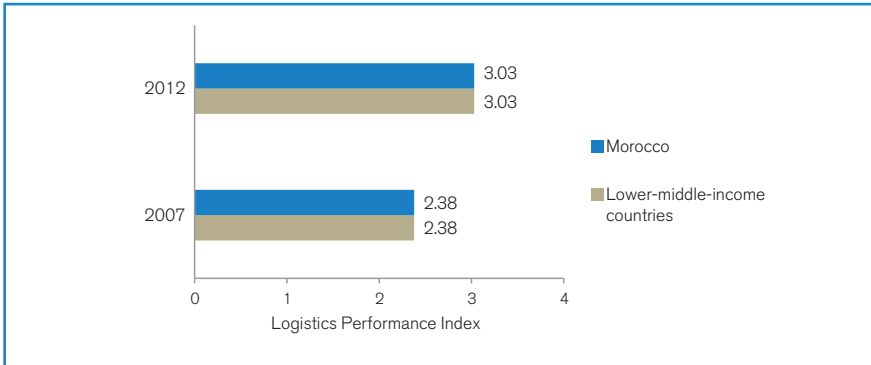
Source: World Bank, World Development Indicators.[6]

Thus, Morocco needs to augment its efforts with external financing, and AfT can play an important role in this. The World Bank and African Development Bank, for example, are currently mobilizing US$ 245 million to finance a reform programme to improve public policy in three key areas of the Moroccan Government's economic strategy: the investment climate, trade policy and trade facilitation, and economic governance.

It would benefit Morocco if such support for trade facilitation were to focus on strengthening the:

- Dematerialization of international trade documents;
- Effectiveness of the non-customs control procedure;
- Quality of infrastructure related to trade and transport in some areas outside the Tangiers–Agadir corridor;
- Ability of SMEs to easily organize export at competitive costs,
- Competence and quality of logistics centres at borders;
- Ability to track and trace the progress of import and export operations electronically;
- Rate at which exports reach the consignee within the scheduled or expected delivery period.

The contribution of AfT in connection with Morocco's efforts in trade facilitation should address the shortcomings related to trade- and transport-related infrastructure (i.e. the lack of the "soft" and "hard" components indispensable for trade facilitation).

It should be noted that Morocco is among the top 10 recipients of AfT (WTO, 2015). The largest share of aid received by Morocco goes towards transport-related improvements - 51 per cent in the period 2002–2013 (Figure 6.6, Table 6.7).

Several empirical studies have identified the main cause of weakness in inter-and intra-country trade as being the inadequate or poor state of infrastructure related to trade and transport (UNECA, 2015). "Soft" support components of the AfT initiative are intended to overcome the inadequacy and lack of harmonization of procedures and simplify border crossings so as to comply with international standards. The international conventions in the field of trade facilitation and transport, mentioned above, have demonstrated their efficiency once they are applied correctly. The lack of harmonization of customs procedures and border formalities between most African countries makes customs control more complex and uncertain.

"Hard" or physical infrastructure components eligible to benefit from the AfT initiative include support services, logistics centres and border crossing points, which are lacking at the main African borders because the countries cannot provide the heavy investments in both physical and human resources required to establish and operate them.

Figure 6.6 Disbursement of Aid for Trade received by Morocco by sector, 2002-13

Source: OECD statistics database (http://www.oecd.org/dac/aft/aid-for-tradestatisticalqueries.htm)
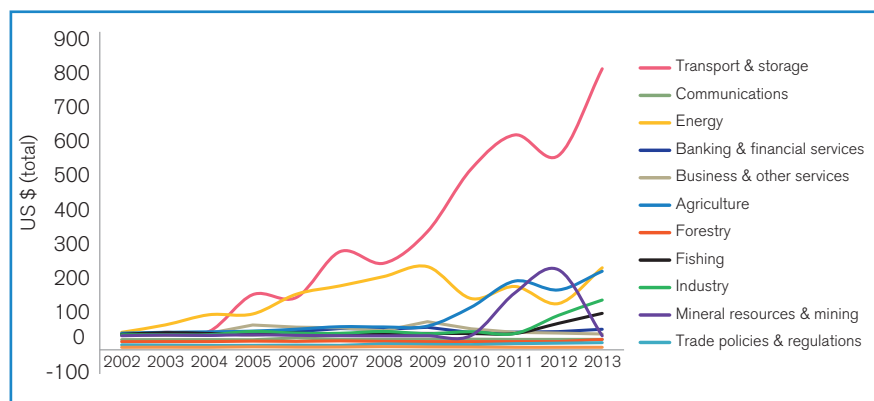
Table 6.7 Disbursement of Aid for Trade received by Morocco by sector, 2002-13

Sector	2002 (US$)	2003 (US$)	2004 (US$)	2005 (US$)	2006 (US$)	2007 (US$)	2008 (US$)	2009 (US$)	2010 (US$)	2011 (US$)	2012 (US$)	2013 (US$)
Transport and storage	2.39	10.28	12.67	120.31	112.25	246.18	212.15	304.71	487.59	587.24	527.01	780.60
Communications	0.32	0.74	0.63	0.12	5.48	1.02	1.28	1.49	2.04	1.28	0.88	1.01
Energy	10.24	31.89	61.62	63.86	121.67	146.04	173.29	202.15	108.91	144.25	94.38	198.95
Banking and financial services	1.80	3.45	1.00	9.10	12.33	21.36	19.41	24.87	9.25	10.65	11.90	19.05
Business and other services	1.31	1.95	7.70	31.60	25.13	23.52	15.14	41.34	20.39	10.32	8.02	5.19
Agriculture	7.88	10.27	11.71	13.82	19.46	26.70	25.95	28.43	83.69	159.97	134.15	188.71
Forestry	0.09	0.34	0.44	1.49	1.27	2.28	1.41	0.73	0.27	0.37	0.29	6.78
Fishing	4.37	9.10	6.92	3.01	7.62	2.33	6.75	7.05	6.71	6.73	36.48	65.73
Industry	3.10	3.20	3.47	12.88	7.90	7.52	12.76	6.38	12.16	6.74	59.89	104.63
Mineral resources and mining	0.29	2.19	1.33	3.06	1.39	0.41	0.00	0.27	0.88	125.38	192.90	0.00
Trade policies and regulations	2.62	1.91	1.02	1.14	2.06	1.25	5.05	4.19	3.51	5.86	7.50	8.93
Tourism	0.16	0.46	0.27	1.51	0.70	0.95	2.05	1.26	0.89	0.15	0.11	0.19
Total	34.57	75.77	108.79	261.92	317.26	479.57	475,23	622.86	736.28	1,058.96	1,073.52	1,379.76

Source: OECD statistics database (http://www.oecd.org/dac/aft/aid-for-tradestatisticalqueries.htm)

The absence of integrated projects that could be financed by the AfT initiative in the context of "regional infrastructure funds" partly explains the unexploited potential of international cooperation in this field.

AfT could contribute to the mobilization of regional infrastructure funds in the context of a dialogue between donors and recipients of official development assistance (ODA). Involving the private sector in project preparation would promote trade facilitation to support the creation of value and development of trade between countries.

The major lesson that emerges from this analysis of the determinants of trade facilitation in Morocco is that efforts should be concentrated on releasing the brakes that prevent better transmission of the benefits of reducing trade transaction processes, and on leveraging AfT. These brakes, or problematic factors, are evident on both exporting (Figure 6.7) and importing (Figure 6.8).

Figure 6.7 Most problematic factors for exporting, Morocco, 2013

Identifying potential markets and buyers — 14.8
Difficulties in meeting quality/quantity requirements of buyers — 11.6
Access to trade finance — 10.9
Technical requirements and standards abroad — 10
High cost or delays caused by international transportation — 9.7
Access to imported inputs at competitive prices — 9.2
Tariff barriers abroad — 8.5
Rules of origin requirements abroad — 8
Burdensome procedures at foreign borders — 6.7
Inappropriate production technology and skills — 5.2
High cost or delays caused by domestic transportation — 3.5
Corruption at foreign borders — 1.8

Factors / Per cent (0 2 4 6 8 10 12 14 16)

Source: WEF (2014).

Figure 6.8 Most problematic factors for importing, Morocco, 2013

Burdensome import procedures — 26.9
Tariffs — 20.4
High cost or delays caused by international transportation — 20.4
Corruption at the border — 10.7
High cost or delays caused by domestic transportation — 9.4
Domestic technical requirements and standards — 8.5
Inappropriate telecommunications infrastructure — 2.9
Crime and theft — 0.8

Factors / Per cent (0 5 10 15 20 25 30)
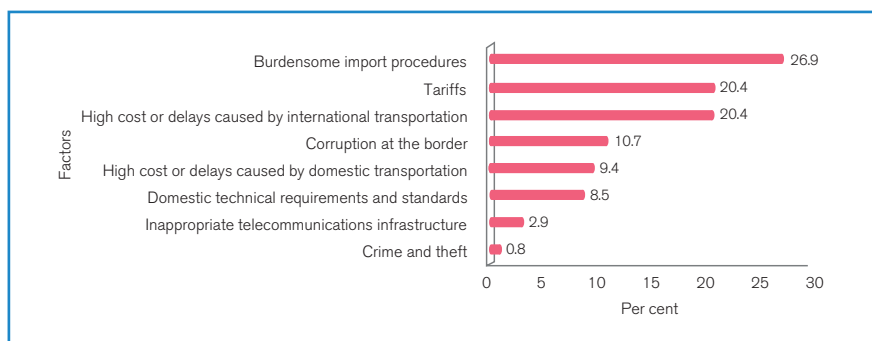
Source: WEF (2014).

6.5 Conclusions

The purpose of this chapter has been to respond to the concern of how AfT can accelerate the process of trade facilitation in promoting regional integration and scale up the development of "intra-North-African trade". The aim was to highlight the role of AfT in increasing trade by bringing about a substantial reduction in the barriers to trade, in terms of both logistics and transport and the commercial procedures governing relations between the countries of the region.

Having good quality trade-related infrastructure and transportation, whether in Morocco or elsewhere, is crucial to ensuring the development and flow of trade between countries and regions. The economic impact of such infrastructure, as an important lever for growth, job creation and the development of trade, has been confirmed by several recent studies (OECD, 2015; UNCTAD, 2014; World Bank, 2012). Furthermore, export- and import-related procedures are of great significance to economic operators as they contribute to the speed of business transactions and therefore to reducing the costs and increasing the volume of traded products.

Trade facilitation measures can bring very significant benefits to the Moroccan economy but they require considerable effort in terms of increasing human, logistical, procedural and technological capacities. The AFT initiative is crucial in this context.

Effective trade facilitation supported by AFT targeted to identified needs, can help lower trade costs and reduce the gap between domestic and international prices. Furthermore, trade facilitation measures offer very interesting economic growth opportunities and lead to the expansion of trade –and they seem to be more effective than simple tariff elimination in achieving this.

Several empirical studies (World Bank, 2012; UNCTAD, 2014; WTO, 2015) have shown that weakness in international trade, especially between the countries of Africa, is primarily due to the lack of basic trade-related infrastructure and the complexity of procedures for transit and transportation, and for import and export.

Endnotes

1. The one-stop shop would optimize resources and shorten the time of completion of formalities related to foreign trade transactions. The multiplicity of stakeholders and partners increases the procedures and uncertainty. It is for this reason that Morocco has implemented the PortNet, that is, a unique platform connecting many entities: the National Ports Authority (ANP), Shipping Agents, the customs administration and other control bodies, private operators, banks, insurance brokers, freight forwarders, etc.

2. OECD, WTO (2015), Chapter 2: "How are trade costs evolving and why?", contributed by the World Bank.

3. World Trade Organization, Information Centre, Trade facilitation website https://www.wto.org/english/news_e/brief_tradefa_e.htm

4. http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators

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III

Sectoral and macroeconomic impacts of the Trade Facilitation Agreement on various regions

7 Trade facilitation and trade flows: Evidence from Africa

Boopen Seetanah, Rajah Vinesh Sannassee, Sheereen Fauzel*

Abstract

This chapter investigates the impact of trade facilitation on trade flows for a sample of 20 African economies over the period 2007–2014. Using a panel vector autoregressive framework, it finds that trade facilitation enhances trade flows in those African countries. Economic growth, investment and the presence of regional trade agreements were also found to be ingredients of trade. Further analysis supports a bi-causal and reinforcing relationship between trade facilitation and trade flows, and the level of country development and presence of regional trade agreements were found to be factors that enhance trade facilitation. Interestingly, trade facilitation is also reported to have some positive effects on economic growth and level of investment.

7.1 Introduction

The prevalence of trade facilitation in the face of increasing trade costs as a result of inefficiencies at various levels during the movement of goods was duly recognized during the 1996 WTO Ministerial Conference in Singapore. The simplification of trade procedures and coordination of trade processes has been part of the WTO's framework and negotiations agenda since August 2004.

In December 2013, the WTO achieved another landmark when members concluded negotiations on the WTO Agreement on Trade Facilitation (TFA) at the Bali Ministerial Conference. The TFA essentially contained provisions for release and clearance of goods and ensured effective cooperation between customs and other authorities on trade facilitation and customs compliance. A Trade Facilitation Agreement Facility (TFAF) was created to provide technical assistance and capacity-building to developing and least-developed countries (LDCs), to support them in the full implementation of the new Agreement. According to the World Trade Report 2015 (WTO, 2015), the TFA has the potential to increase world trade by up to US$ 1 trillion per annum. Near the end of 2015, 63 WTO members had ratified the TFA.

Broadly, trade facilitation is defined by the WTR (2015) as the "simplification and harmonization of international trade procedures" or, more specifically, the "activities, practices and formalities involved in collecting, presenting, communicating and processing data required for the movement of goods in international trade". More generally, trade facilitation relates to the ease of moving goods across borders, and this relates most notably to the efficiency of customs administration and other agencies, the quality of physical infrastructure and having a competent logistics sector.

As such, trade facilitation essentially aims at harmonizing certain rules between countries to promote greater efficiency, transparency and predictability, based on norms, standards and internationally accepted practices, and may constitute a very important source of increased competitiveness for any given country, given its potential to reduce trade barriers and costs (Scorza, 2007; Sá Porto and Macedo, 2011). In addition, any improvement in processes and procedures translating into greater trade facilitation may be beneficial to a country by way of: (i) increased total factor productivity as a result of reduced levels of human and material input (Canuto, 2012); (ii) gains in trade, which can serve to increase income, which in turn may foster human development (Wilson, Mann and Otsuki, 2003); and (iii) greater offerings and choices to the public and to consumers as a consequence of

the increase in trade. All these benefits taken together can only serve to enhance living standards (Rippel, 2011).

Unfortunately, the benefits to be had from trade facilitation are yet to materialize for most African countries, despite the implementation of major trade reforms across the continent by way of trade liberalization, regional initiatives and other multilateral agreements. Although tariff levels are at an all-time low, the multitude of non-tariff measures is negatively impacting on the cost and ease of doing business on the continent (Arvis et al., 2013). In this regard, Moïsé and Sorescu (2013) argue that inefficient border procedures have caused a large reduction in revenues – up to 5 per cent of GDP – in African countries, which has led to the argument that Africa is still widely recognized as the place where importers and exporters face far greater obstacles in trade than in any other region in the world (Seck, 2014). Consequently, there is the distinct belief that the implementation of measures aimed at eliminating such non-tariff measures, and hence at facilitating trade, should help reduce the transaction costs associated with trade, which could result in significant economic gains.

Indeed, trade facilitation can avail African exporters of numerous opportunities if hard infrastructure and technical advice are backed by equally ambitious policy reforms. For instance, the trade facilitation aspect of the WTO negotiations that focuses on transactions at the border, such as documentary requirements, transparency of customs clearance and transit procedures, and disciplines on fees and taxes, can only serve to improve border and transit management procedures and their implementation and thereby remove obstacles to trade in goods. Interestingly, reporting in 2013 on trade facilitation from an African perspective, the United Nations Economic Commission for Africa (UNECA, 2013) observed that African countries and regional economic communities were already active in aligning their trade measures with the TFA. The Chirundu one-stop-border post between Zambia and Zimbabwe is one such case, and has resulted in annual savings of US$ 486 million (UNECA, 2013). Some African countries have already ratified the TFA, including Botswana, Côte d'Ivoire, Kenya, Mauritius, Niger and Zambia. The World Trade Report 2015 (WTO, 2015) also found that full implementation of the TFA is bound to reduce global trade costs by an average of 14.3 per cent, and that African countries and LDCs are expected to benefit significantly from the TFA, by capturing more than half of the available gains. Such measures will contribute to the expansion of world trade, further helping developing countries and LDCs to integrate into the global economy. This is why it is crucial for governments to embark on a major overhaul of their myriad existing policies with the aim of positively impacting on the ease and costs of doing business in their respective countries.

Given the above, the present study attempts to measure the impact of trade facilitation on trade flows, focusing on Africa. The World Bank's Logistics Performance Index (LPI) data is used as a proxy for trade facilitation in a trade model for 20 countries over the period 2007–2014,[1] Given the dynamic nature of trade, and in the presence of endogeneity, this study is based on a panel vector autoregressive (PVAR)[2] framework, which removes specification restrictions a priori. The LPI also allows for identification of the effect of different components of trade facilitation on trade. The results stemming from this study should provide important insights for policy-makers and other stakeholders involved in the formulation of policies aimed at fostering the ease and costs of doing business.

The rest of this chapter is organized as follows: section 2 reviews the related literature; section 3 discusses the estimation strategy and the key estimation issues and provides an overview of the data; section 4 discusses the results; and section 5 concludes and attempts to provide the overarching policy implications and resulting recommendations.

7.2 Related literature

One of the pioneering works on trade facilitation[3] was that of Wilson, Mann and Otsuki (2003). They analysed the relationship between trade facilitation and trade flows in the Asia-Pacific region using four indicators for measuring trade facilitation: port efficiency, customs environment, regulatory environment and e-business use. Their results demonstrate that regulatory barriers and port inefficiency have had a negative effect on trade, while improvements in customs and e-business use positively impacted on trade. Similarly, Clark, Dollar and Micco (2004), in their study of the determinants of shipping costs to the United States, using a large database on shipments of products from different ports around the world, showed that an increase in port efficiency would reduce shipping costs substantially.

In addition, in their follow-up paper, Wilson, Mann and Otsuki (2005) considerably expanded their sample of countries and found that trade facilitation improvements were associated with enhanced exports and imports. In this regard, the authors showed that improvements in the different components of trade facilitation would be associated with a US$ 377 billion increase in trade flows.[4] Fink, Mattoo and Neagu (2005) also confirmed that international variations in bilateral communications costs had a significant influence on bilateral trade flows. In their study, they found that a 10 per cent decrease in the bilateral calling price was associated with an 8 per cent increase in bilateral trade. Djankov, Freund and Pham (2006), using 2005 data from the World Bank's Doing Business survey on time taken to export and import, estimated that, on average, each additional day a

product is delayed prior to being shipped would reduce trade by at least 1 per cent. Using various indices of trade restrictiveness and trade facilitation developed at the World Bank in a gravity model, Hoekman and Nicita (2008) observed that, despite preferential access programmes, tariffs and non-tariff barriers were significant sources of trade restrictiveness for low-income countries.

Furthermore, several studies have also proceeded to estimate the potential effects of trade facilitation on the well-being of countries using alternatively computable general equilibrium (CGE) models. CGE models involve modelling trade facilitation as a reduction in the costs of international trade or as an improvement in the productivity of the international transportation sector (Wilson, Mann and Otsuki, 2003). One such example is the APEC (1999) study that estimated the impact of trade liberalization and trade facilitation measures. The results indicated that trade facilitation measures could expand trade by 1.3 per cent within APEC countries. Similarly, Abe and Wilson (2008), who explored the impact of institutional trade facilitation indicators, found that reducing corruption and improving transparency in APEC countries to the average level of the region would have increased regional trade by 11 per cent.

Global patterns of trade costs and trade flows also reveal significant cross-country differences. Arvis et al. (2013) provide evidence that trade costs are declining with income per capita. As a result, developed countries are experiencing a faster decrease in trade costs than developing countries. Furthermore, studies focusing on sub-Saharan Africa have uncovered evidence that maritime transport connectivity and logistics performance are very important determinants of bilateral trade costs. Therefore, facilitation reforms in these areas would bring Africa closer to its trading partners and could reap significant economic gains. Zaki (2014) first used a gravity model to calculate the *ad valorem* tariff equivalent[5] of the time to export and import. He next assumed that trade facilitation reform will lead to a 50 per cent reduction in these *ad valorem* trade costs, and, finally, used the MIRAGE CGE model to measure the trade impact. The results showed that developing countries tend to see the largest increases in both exports and imports. Following the trade facilitation reforms, sub-Saharan African, Asian, Latin American and Middle Eastern countries saw their exports increase, by 22.3 per cent, 16.2 per cent, 16.2 per cent, and 13.8 per cent, respectively. Similarly, imports increased by almost the same magnitude.

In one of the very few studies focusing on the African experience, Portugal-Perez and Wilson (2010) provide evidence that trade facilitation is significant for Africa in both the short and the long run. The gravity-model results clearly indicate that trade facilitation measures could yield increased trade flows, as compared with reduction

in tariffs. Improvements in logistics in Ethiopia are one example, representing the equivalent of a 7.6 per cent decrease in the *ad valorem* tariff.

Using detailed data on transit, documentation and ports and customs delays on Africa's exports, Freund and Rocha (2010) reported that transit delays had the most economically and statistically significant effect on African exports. They found that a one-day reduction in inland travel times led to a 7 per cent increase in exports. Similarly, Hummels and Schaur (2013) suggested that reducing transit time by one day could drive trade at a magnitude equivalent to a reduction in the *ad valorem* tariff by 0.6 to 2.1 per cent. These results were consistent with many findings in the literature that view time as a trade barrier (Djankov, Freund and Pham, 2006; Nordås, Pinali and Grosso, 2006).

Furthermore, studies have also shown that the quality of trade infrastructure, reducing export and import processes, implementation of new technologies and improving the regulatory environment were crucial elements contributing to reduced transit time. Earlier work by Limão and Venables (2001) showed that deterioration in the infrastructure from the median to the 75th percentile would reduce trade volumes by approximately 28 per cent. Similarly, Iwanow and Kirkpatrick (2009) suggested that the low performance of the African manufacturing sector in export markets could largely be attributed to poor infrastructure and the institutional environment. The study employed a gravity model and the results indicated that trade facilitation could be the key to increasing Africa's trade potential in manufactured goods.

More specifically, Njinkeu, Wilson and Fosso (2008), analysing the impact of reforms on port efficiency, the customs environment, the regulatory environment and service infrastructure, found that improvements in port efficiency and service infrastructure were the primary factors driving intra-African trade expansion. Disdier et al. (2010), who included infrastructure variables in his study, found that gains from trade facilitation would almost only arise for developing countries, in particular in sub-Saharan Africa.

Finally, there is also strong empirical evidence that trade facilitation can have a positive impact on firms' performance. For instance, as trade costs decline, productivity increases (Bernard, Jensen and Schott, 2006). Clarke (2005), for instance, argued that the main reasons why African manufacturers did not witness significant increases in their exports were restrictive trade, customs regulation and poor customs administration. All of these suggest that African firms could greatly benefit from trade facilitation, provided they could identify the obstacles in trade and accordingly implement appropriate reforms to ease trade and accumulate the benefits of international trade.

7.3 Methodology

The present study aims to analyse the impact of trade facilitation on trade performance in 20 selected African countries over the period 2007–2014. To construct the econometric model, reference is made to various previous studies, including Wilson (2011) and Felipe and Kumar (2010) proposed model is essentially a trade model augmented with a trade facilitation proxy:

$$TRADE = f(LPI, GDP, POPULATION, INVT, RTA) \quad (1)$$

However, because of the variance-stabilizing properties of log transformation, the log values of the variables are used and such log values yield a more clear-cut interpretation of the coefficients in terms of percentage change.

Hence, converting all the variables in logarithmic terms yields:

$$LTRADE = \alpha_0 + \beta_1 LLPIxt + \beta_2 LGDPxt + \beta_3 LPOPxt + \beta_4 LINVTxt + \beta_5 RTAxt + \mu_{xt} (2)$$

where:

LTradeLLPI, LGDP, LPOP, LINVT, RTA are the logs of trade openness, trade facilitation, GDP per capita, population, investment and regional trade agreement (RTA), respectively;

$\beta_1 \dots \beta_5$ represent the parameter estimates;

μ is the random disturbance term.

Variables definition

Dependent variable: Trade openness

Edwards (1992), among others, has argued that trade openness implicitly refers to the trade policy orientation of specific nations (for a similar analogy, see Krueger (1997) and Wacziarg and Horn Welch (2008)). However, other authors, including Rodriguez and Rodrik (2001), viewed the notion of trade openness as being more complex, covering not only the trade policy orientation of countries but also a set of other domestic policies, which together make the country more or less outwardly oriented. Other studies, such as Wilson (2011) have adopted a more global view of trade openness that covers not only the policy dimension but also all other non-policy factors that clearly have an impact on trade and on the outward orientation of countries.

Thus, many different measures of trade openness have been proposed and used in empirical analyses. Measures based on trade flows, which have been commonly used in empirical analyses, mostly relate to the most global definition of trade openness. Trade dependency ratios are the most popular of these measures (Dollar and Kraay, 2004; Squalli and Wilson, 2011). In the present study, the sum of imports and exports as a percentage of GDP is used to measure trade flows.

Independent variables

Trade facilitation and the Logistics Performance Index (LPI)

Hertel and Mirza (2009) and Hoekman and Nicita (2008) used the World Bank's LPI and Doing Business report within a gravity framework to model trade facilitation. Using the indices of trade restrictiveness and trade facilitation developed at the World Bank, these authors suggested that tariffs and non-tariff measures continued to be a significant source of trade restrictiveness for low-income countries despite preferential access programmes. Such a finding could be explained by the fact that the value of trade preferences was quite limited.

For the purpose of the present study, the LPI (2007-2014) is used to measure how well countries connect to international logistics networks. According to the World Bank, the LPI "helps countries identify the challenges and opportunities they face in their trade logistics performance and what they can do to improve. Based on a worldwide survey of operators on the ground – such as global freight forwarders and express carriers – the LPI provides in-depth knowledge and feedback on the logistics 'friendliness' of the countries in which the operators do business and those with which they trade. It provides an informed qualitative assessment of the global logistics environment for the benefit of government and trade practitioners alike."[6] The LPI website features the index as an interactive cross-country benchmarking tool.

The LPI is a multi-dimensional assessment of logistic performance. It summarizes the performance of countries through six dimensions that capture the most important aspects of the logistics environment as quoted by Arvis et al. (2014):

- Customs: efficiency of the customs clearance process;
- Infrastructure: quality of trade and transport-related infrastructure;
- International shipments: ease of arranging competitively priced shipments;
- Logistics quality: competence and quality of logistics services;
- Tracking and tracing: ability to track and trace consignments;
- Timeliness: frequency with which shipments reach the consignee within the scheduled or expected time.

The LPI provides not only a comprehensive assessment of logistics performance worldwide but also an analysis of performance trends, which makes it possible to understand trends over time. It also comprises of a set of domestic performance indicators that is not included in the overall country score. Moreover, it includes quantitative information on particular aspects of international supply chains in respondents' countries of work, including import/export, lead time, supply chain costs, customs clearance and the percentage of shipments subjected to physical inspection).

GDP per capita

An increase in economic growth can serve to boost the level of trade in an economy and a decrease to reduce it. For instance, the more goods and services are being produced by an economy, the greater the propensity to trade in terms of both imports and exports (WTO, 2015). Hence, GDP per capita is added in the model to examine the link between trade and economic growth for the sample of countries included in this study.

Population growth

Following Wilson (2011), population growth is included as another control variable in the study. Indeed, an increase in population will have an impact on trade flows in the countries concerned.

Investment

For the purpose of the present study, the investment variable includes domestic investment as a percentage of GDP to account for the relationship between trade openness and investment for the sample of countries. A positive and statistically significant relationship between investment and trade flows is expected (OECD, 2009).

Regional trade agreement

An increase in trade volumes can be the result of trade creation emanating from a regional trade agreement. In addition, countries having a common official language, and countries having had a common colonizer or a colonial relationship are also likely to trade more intensively. In the present study, a binary dummy variable is included for countries between which trade agreements have been made (Wilson, 2011).

Sources of data

The data were extracted from the World Bank LPI Database (2007-2014).[7]

Estimation issues

Before estimating the equation, it is important to test whether the variables are stationary and thus verify the time series properties of the data. The panel root test, commonly known as IPS (Im, Pesaran, and Shin, 2003), was used to test the stationarity of the variables. The IPS static is based on averaging individual augmented Dickey-Fuller (ADF) unit root tests and has a standard normal distribution once adjusted in a particular manner. The result shows that the series are non-stationary at their level and stationary at their first difference at 5 per cent level of significance. This entails that the series follow an I (1) process.

Endogeneity issues and the panel vector autoregressive (PVAR) model

However, there may still be the possibility of losing dynamic information, even within a panel data framework. In addition, it is likely that there exist dynamic feedbacks and indirect effects among the variables in the above function and the inclusion of such feedbacks is essential to the modelling of the study's hypotheses. Indeed, while it may be argued that trade facilitation can directly affect trade flows, it is also true that the latter may in turn have a bearing on the propensity to augment trade facilitation, thus resulting in reverse causation.

Given the possibility of endogeneity and causality issues, the study used vector auto regression (VAR) on panel data to enable consideration of the complex relationship that might exist between trade flows and trade facilitation. Moreover, panel VARs (PVARs) are particularly suited to addressing the macroeconomic issues that are currently at the centre of academic and policy discussions, as they are able to: (i) capture both static and dynamic interdependencies; (ii) treat the links across units in an unrestricted fashion; (iii) easily incorporate time variations in the coefficients and in the variance of the shocks; and (iv) account for cross-sectional dynamic heterogeneities (Canova and Ciccarelli, 2013).

The present study specifies a first-order VAR model as follows:

$$Z_{it} = \Gamma_0 + \Gamma_1 \ Z_{it-1} + \mu_t + \varepsilon_t$$

$$Z_{it} = \Gamma_0 + \Gamma_1 \ Z_{it-1} + \mu_t + \varepsilon_t \qquad (3)$$

where Z_{it} is a six-variable vector (Trade, LPI, investment, GDP per capita, population, regional trade agreement) and the variables are as defined above. The model uses i to index countries and t to index time; τ is the parameters and ε is the error term. The lower case variables are the natural log of the respective upper case variables.

7.4 Results

Table 7.1 is a composite table. Each column can be viewed and analysed as an independent function, i.e. each column corresponds to an equation in the PVAR. The variable named in the first cell of each column is viewed as the dependent variable. The estimated coefficient of the explanatory variables is reported in the cells.

The results shown in Table 7.1 demonstrate that the coefficient of trade facilitation is positive and significant. The results tend to suggest that trade facilitation has had a positive and significant effect on trade flows for the sample of African countries included in the study over the period 2007–2014. Additionally, a 1 per cent increase in the index of trade facilitation contributed to a 0.77 per cent increase in trade flows. Such a finding is unsurprising given the expectation that an improvement in trade facilitation measures in relation to a country does generate significant trade benefits to its economy. For instance, the results of this study support the empirical findings of Wilson, Mann, and Otsuki (2005) and Djankov, Freund and Pham (2006), which reveal positive and significant benefits from trade facilitation and trade flows, respectively. Arvis et al. (2013) suggest that the joint effect of maritime transport connectivity and logistics can even be as high as that of geographical distance.

Table 7.1 Results from the PVAR model

Variable	LN_TRADE	LN_LPI	LN_GDP	LN_INVT	LN_POP	RTA
LN_TRADE(-1)	0.898828**	0.11320**	0.18646**	0.068656**	-0.007892***	-7.40E-15
LN_LPI(-1)	0.77321*	0.763475**	0.101736*	0.221450*	-5.64E-05**	-8.21E-15
LN_GDP(-1)	0.09135***	0.10980***	0.995617**	0.001414**	-0.004470***	-5.89E-16
LN_INVT(-1)	0.41420**	-0.000959	0.11337**	0.789414**	0.000845***	-1.97E-14
LN_POP(-1)	0.23378	0.009966***	0.017124**	-0.011664**	1.000346***	-3.01E-15
RTA(-1)	0.68632**	0.47635**	0.10912**	-0.048083**	-0.018158***	1.000000
C	0.997085	-0.105805	-0.073324	1.391000	0.098682*	1.68E-13
R-squared	0.810920	0.785345	0.980164	0.699892	0.999967	0.999999

*significant at 10 per cent; ** significant at 5 per cent; ***significant at 1 per cent.

The results of the present study also confirm the importance of trade facilitation in Africa and supplement the work of Njinkeu, Wilson and Fosso (2008), who found that improvements in port efficiency and service infrastructures were the primary factors driving intra-African trade expansion. Freund and Rocha (2010) reported that transit delays were significant deterrents to African exports. In this regard, Lesser and Moisé-Leeman (2009) have also argued that trade facilitation measures aiming at overcoming border bottlenecks could significantly reduce informal cross-border trade in sub-Saharan Africa.

The above findings provide support for the major trade reforms that have been implemented with success in Africa over the last few years. For instance, trade liberalization has been implemented, as well as regional integration initiatives, including bilateral and multilateral trade agreements, which have together led to substantial decreases in the level of tariffs for the African region. Nonetheless, non-tariff barriers remain a major concern and they have had a very significant negative impact on trade flows in the African region. Indeed, it is well documented that Africa is the continent where importers and exporters face the most difficulties in comparison with the rest of the world. On average, it can take up to 31 days to ship a container from Africa to elsewhere in the world.

Also, in terms of documentation requirements, the evidence suggests that operating in Africa entails a greater volume of paperwork. As regards the LPI (2007-2014), African countries had an average score of 2.47 out of 5, below the world average (excluding Africa) of 3.07. Such an environment can only mean higher trade costs for firms operating in Africa (Arvis et al., 2013). Consequently, such a situation unequivocally leads to higher prices and thus discourages both imports and exports. Therefore, the implementation of measures geared towards improving trade facilitation can only bode well for striving African nations.

Economic growth is also seen to be an important determinant of trade flows – the higher the level of growth, the higher the level of international trade. In addition, on analysis of Table 7.1 (GDP column), it can also be argued that an increase in trade does lead to an increase in economic growth. Empirically, there is evidence that international trade affects economic growth positively by facilitating capital accumulation, industrial structure upgrading, technological progress and institutional advancement. More precisely, an increase in imports of capital and intermediate products that are not available in the domestic market may result in a rise in the productivity of the manufacturing sector (Lee, 1995). Similarly, more active participation in the international market by promoting exports may lead to more intense competition and to improvement in the terms of productivity (Wagner, 2007).

As regards the investment element, the results demonstrate that an increase in investment in the countries under consideration has had a positive impact on trade flows. For instance, a 1 per cent increase in investment has led to a 0.41 per cent increase in trade flows over the period 2007–2014. Such a finding may be due to the positive influence that investment may have on both imports and exports. Also, the results demonstrate the existence of a bi-directional relationship between investment and trade flows. Thus, an increase in investment also leads to an increase in trade flows and vice versa. Moreover, a positive and significant relationship was found for the regional trade agreement element, which may be due to trade creation as a result of countries joining a regional initiative. Finally, no significant relationship was found between population and trade although, intuitively, a positive and significant relationship was expected.

Furthermore, the VAR framework enabled more interesting insights on endogeneity issues, as well as on indirect effects, to be gauged. For instance, in relation to the LPI equation, it can be argued that a reverse causation exists, which indicates that trade flows was also an element that impacted on trade facilitation. The results show that a 1 per cent increase in trade has resulted in a 0.11 per cent increase in trade facilitation over the period under investigation. Such a result highlights the prevalence of the role played by the level of trade in reducing trade barriers, thus supporting a bi-causal relationship and reinforcing the relationship between trade facilitation and trade flows. It also supports the findings of the study by Wilson (2011). Additionally, the level of development and presence of regional trade agreements were deemed to be significant determinants of trade facilitation (as recorded in the LPI). Finally, trade facilitation is also reported to positively impact on economic growth (Table 7.1 GDP column) and the level of investment (Table 7.1 investment column).

The impulse response function

Generally, the impulse response analysis tends to confirm the above results. The impulse response analysis quantifies the reaction of every single variable in the model on an exogenous shock to the model. The main interest of the study was to investigate the impact of trade facilitation on trade flows. The results from the impulse response function shows that a 1 standard deviation shock to trade facilitation has led to an immediate positive response in trade flows (Figure 7.1).

Figure 7.1 Response of ln_trade to Generalized One standard deviation ln_LPI innovation
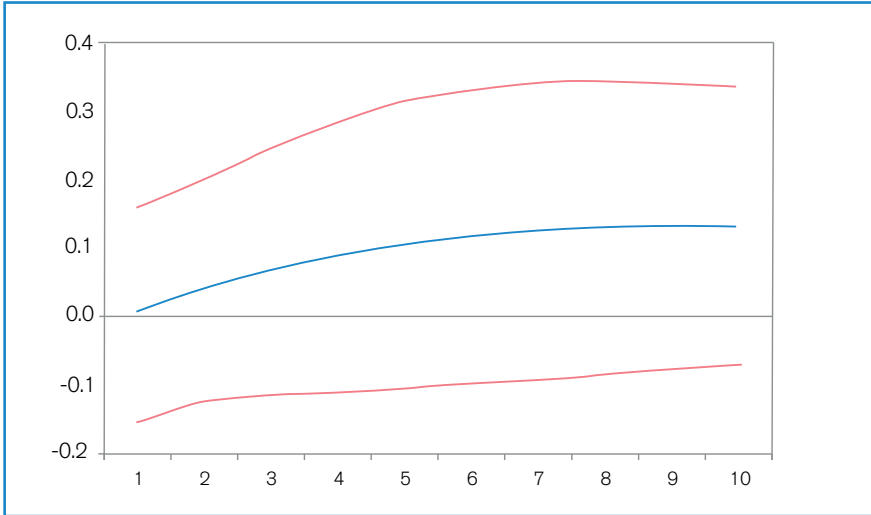
The X axis shows the periods and the y axis shows the response of ln_trade to Generalized One standard deviation in ln_LPI innovation. The blue line represents the response of ln_trade to Generalized One standard deviation in ln_LPI innovation, and the red lines represent the 95 per cent confidence interval.

7.5 Conclusions

The present study aimed to measure the impact of trade facilitation on trade flows for a sample of 20 African economies over the period 2007–2014 within a panel vector autoregressive (PVAR) framework. Using the World Bank's LPI as the main proxy for trade facilitation, the study found that trade facilitation has had a positive and significant effect on trade flows for the sample countries. The research also reported that a 1 per cent increase in trade facilitation contributed to a 0.77 per cent increase in trade flow. Such a finding lends support to the existing literature, which has overwhelmingly argued that an improvement in trade facilitation measures in a country generates significant trade benefits to that economy. Economic growth, investment and regional trade agreements were also found to be significant ingredients fostering trade flows.

Additionally, the results delineated through the VAR framework highlighted the presence of a reverse causation between trade levels and trade facilitation, supporting a bi-causal relationship and thereby reinforcing the interplay between

trade facilitation and trade flows. Interestingly, the study also reported that country development levels and the existence of regional trade agreements were crucial ingredients that served to enhance trade facilitation as measured by the LPI. Last, but not least, trade facilitation was also reported to have some positive effects on economic growth and the level of investment.

These findings have far-reaching implications, particularly as they clearly highlight the fundamental importance of trade facilitation in fostering trade. In this regard, one can argue that it is crucial for these African countries to prolong their endeavours to implement reforms geared towards reducing tariffs, mostly through regional initiatives, but also, and more importantly, geared towards the reduction and/or elimination of non-tariff measures, which substantially add to trade costs. In this regard, for there to be effective reforms, a clear understanding is required of the various elements that make up the trade cost landscape and the way they interact to generate low performance in the first instance. In addition, there needs to be the requisite political will to embark on such reforms; such reforms should not only happen in the host country, but also in its trading partners. An understanding of the mechanisms that underlie special interest at both ends of the bilateral trade relationship is as crucial as knowledge of the extent of the trade gains associated with reducing trade costs.

However, current figures with respect to the prevailing transaction costs in Africa do not bode well. Figures from the UNECA study of trade facilitation from an African perspective (UNECA, 2013) reveal that Africa remains by far one of the regions where international trade is most expensive. In addition, documentation requirements in Africa appear to be extremely cumbersome by international standards and African LDCs have more expensive customs and terminal handling costs than do other countries. Conversely, African small island developing states, similarly to those elsewhere, appear to face significantly lower costs for exports, in terms of both overall costs and costs for customs and terminal-based handling.

Given the various challenges these countries face, there is an undeniable need for the adoption of measures and policies geared towards reducing trade costs. The elimination and/or reduction of non-tariff barriers, such as numerous border controls and frequent goods inspection, and the elimination of a number of licences, related to both the import and export of goods and raw materials, will significantly reduce the costs of operations and also increase the speed at which trading operations are carried out.

Appendix Table 7.1: Descriptive statistics

	LPI	GDP per capita	Investment	Population	Trade flows
Mean	2.447838	2606.176	24.35870	21614599	76.17391
Median	2.441341	1055.500	24.00000	14243703	74.00000
Maximum	3.260000	15253.00	43.00000	1.77E+08	138.0000
Minimum	1.770000	243.0000	5.000000	649404.0	31.00000
Standard Deviation	0.264072	3343.442	7.435819	34812565	24.25693
Skewness	0.460597	1.859502	0.312092	3.168627	0.412073
Kurtosis	4.231168	5.699992	3.090582	12.60944	2.597301

Endnotes

1.   Angola, Burkina Faso, Cameroon, Chad, Comoros, Côte d'Ivoire, Djibouti, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Madagascar, Mali, Mauritius, Namibia, Niger, Nigeria, Rwanda, Senegal.

2.   In VAR models all variables are treated as endogenous and interdependent, both in a dynamic and in a static sense.

3.   For an extensive review of the literature, see Maur and Wilson (2010).

4.   For studies with similar outcomes, see Hertel and Mirza (2009) and Portugal-Perez and Wilson (2010) for South Asia; Souza and Burnquist (2011) and Sá Porto et al. (2013) for Latin America; Hummels and Schaur (2013) for the US; and Sá Porto, Canuto and Morini (2015) for a pool of 72 countries.

5.   This is a calculation of the cost of the time taken to complete export or import procedures expressed as a tariff computed as a percentage of the price of the good.

6.   http://lpi.worldbank.org/

7.   See Appendix Table 7.1.

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8 Regional integration in the MENA region: Deepening the Greater Arab Free Trade Area through trade facilitation

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Abstract

This chapter assesses the trade facilitation performance of the countries of the Middle East and North Africa (MENA) region and determines the welfare and sectoral effects of trade facilitation improvements within the context of regional trade integration. It shows that introducing a trade facilitation provision in the Greater Arab Free Trade Area (GAFTA) will lead to a significant welfare increase for all MENA sub-regions compared with a scenario of further trade liberalization without trade facilitation. Trade facilitation in the GAFTA would enhance export competitiveness and lead to a significant increase in overall and intra-trade export value for all countries, but particularly for the Mashreq and Maghreb countries. In the analysis, all sub-regions witnessed an export boost in agro-food product exports, particularly those products in which the Mashreq and Maghreb countries have a comparative advantage. The welfare-enhancing results of this analysis indicate that the MENA region has a high stake in implementing the WTO Agreement on Trade Facilitation (TFA), and should begin with areas that contribute the most to trade cost reduction, such as automation and streamlining of trade procedures.

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* The contents of this chapter are the sole responsibility of the authors and are not meant to represent the position or opinions of the WTO or its members.

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8.1 Introduction

Over the last 20 years, Arab countries have liberalized their trade through unilateral reform, multilateral negotiations and regional integration. The latter has involved the creation of a number of regional trade agreements (RTAs), of which the most comprehensive in terms of product and country coverage is the Greater Arab Free Trade Area (GAFTA).[1] However, and unlike most recent RTAs, the GAFTA has limited itself to goods liberalization and does not include trade facilitation among its provisions. In its existing shallow form, the GAFTA has had little impact on regional trade and has faced substantial challenges because of restrictive non-tariff measures and inefficient cross-border measures (Shui and Walkenhorst, 2010). Some analysts estimate that non-tariff measures, combined with cumbersome border measures, are more restrictive than tariffs in the MENA region and their presence could significantly reduce the expected benefits from regional integration (Dennis, 2006).

Trade facilitation has been a matter of global interest, which culminated in 2013 in the multilateral Agreement on Trade Facilitation (TFA) under the auspices of the WTO. WTO members are currently in the process of adopting measures to bring the Agreement into effect, which will take place once two-thirds of the WTO's members have domestically ratified the Agreement. At time of writing, none of the Arab countries had ratified the Agreement although 10 Arab countries had notified their category A commitments.[2] This relatively slow progress in ratification may reflect a lack of general understanding in the region of the benefits of early implementation of trade facilitation measures, whether under the TFA or within the various regional trade facilitation initiatives and programmes that exist.

The objective of this chapter is to assess the economy-wide as well as the sectoral effects of trade facilitation on the MENA region within the context of the GAFTA. For modelling purposes, the GAFTA is divided into three sub-regions: the Gulf Cooperation Council (GCC) countries,[3] the Maghreb countries and the Mashreq countries. The assessment used a general equilibrium approach (GTAP 8.1) to simulate two scenarios of trade integration. The first assumes that the three sub-regions eliminate the remaining bilateral tariff barriers,[4] and the second assumes that, in addition to eliminating tariffs, the three sub-regions undertake trade facilitation measures.

8.2 Trade facilitation in the MENA region

Trade facilitation, in its narrow scope, focuses on improving administrative procedures at the border (simplification, harmonization and transparency), while its broad scope includes changes to behind-the-border measures, such as non-tariff barriers (WTO, 2015).[5] The purpose of trade facilitation is to ease the movement of goods at the border and reduce trade cost. Inefficient and cumbersome trade procedures constitute an indirect cost to trade that is significantly more restrictive than tariffs and other direct border charges, which have been progressively reduced through negotiations over the years (WTO, 2015).[6] Despite tariff reductions, trade costs including inefficient customs procedures and country-specific factors, are still quite high. For example, in a recent study, trade costs were estimated to be equivalent to applying *ad valorem* tariffs on traded goods of 213 per cent for developing countries and 134 per cent for developed countries (WTO, 2015).[7]

The performance of the MENA region in terms of trade facilitation is reflected in the World Bank's Ease of Doing Business Indicators and, in particular, the Trading Across Borders Indicators (World Bank, 2013). These indicators reflect the number of documents, the time and the costs associated with exporting and importing by seaport. By this account, the MENA region in 2013 was the lowest performer in terms of time needed to export and import as well as the number of documents required to export, compared with other regions (Table 8.1). The longer the time to comply with border inspection and documentation requirements, the higher the trading cost faced by MENA exporting and importing firms. Beyond regional comparisons, it takes three times longer for a MENA exporter to comply with customs procedures than an exporter in the world's most efficient trading country (Denmark).

Table 8.1 Trading across borders, by region

Region	Documents to import (number)	Time to export (days)	Time to import (days)	Cost to export (US$/ container)	Cost to import (US$/ container)
MENA	8	20	24	1,304	1,342
East Asia and the Pacific	7	20	22	839	867
Latin America and the Caribbean	7	17	18	1,343	1,722
High-income OECD	4	11	10	1,060	1,085
Denmark*	3	6	7	795	745

Note: *Denmark is the world's best performing country on trading across borders indicators.
Source: World Bank (2013).

Customs transactions vary widely within the MENA region (Figures 8.1, 8.2 and 8.3). The best performer is the United Arab Emirates, where it takes only seven days and three documents to export, followed by Oman (10 days and seven documents); the worst performers are Yemen (29 days and seven documents) and Iraq (80 days and 10 documents).[8]

Indirect costs, such as time delays, have long been recognized by researchers as a major factor limiting international trade volumes (Hummels, 2007; Hummels and Schaur, 2013). For the OECD countries and for exports, Hummels (2007) estimated that one day's clearance is equivalent to a 1 per cent tariff (per day tariff equivalent = 1 per cent) while, for the MENA countries, the per-day tariff equivalent is 0.4. The lower time sensitivity of MENA exports reflects its bulk exports of crude oil compared with the technology-intensive manufacturing exports of the OECD.[9] The tariff equivalents of time vary quite widely within the MENA region, depending on each country's export product characteristics. For example, time tariff equivalents are higher for countries in North Africa and for the Lebanese Republic, as they export time-sensitive products such as fresh fruit and vegetables. Per-day tariff equivalents amount to 0.5 per cent for Morocco and Tunisia, 0.7 per cent for Egypt and 1.4 per cent for the Lebanese Republic (Hummels, 2007).

Figure 8.1 Time to export and import
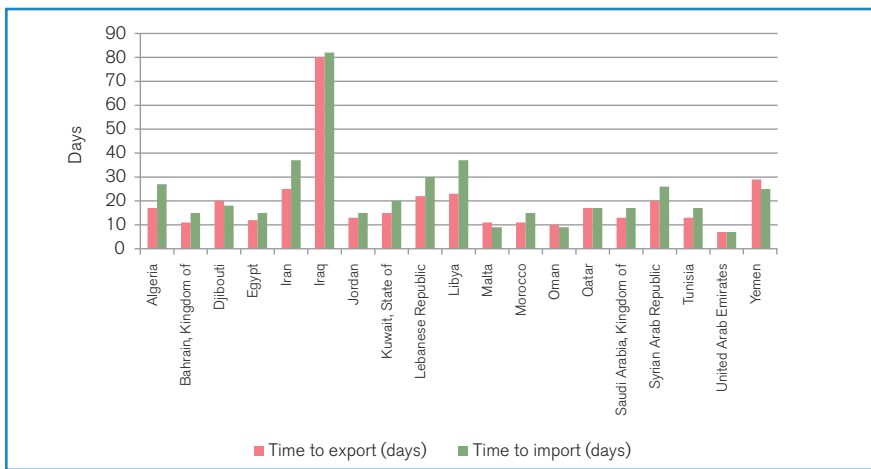
Source: World Bank (2013).

Figure 8.2 Cost to export and import

Figure 8.3 Documents required to export and import
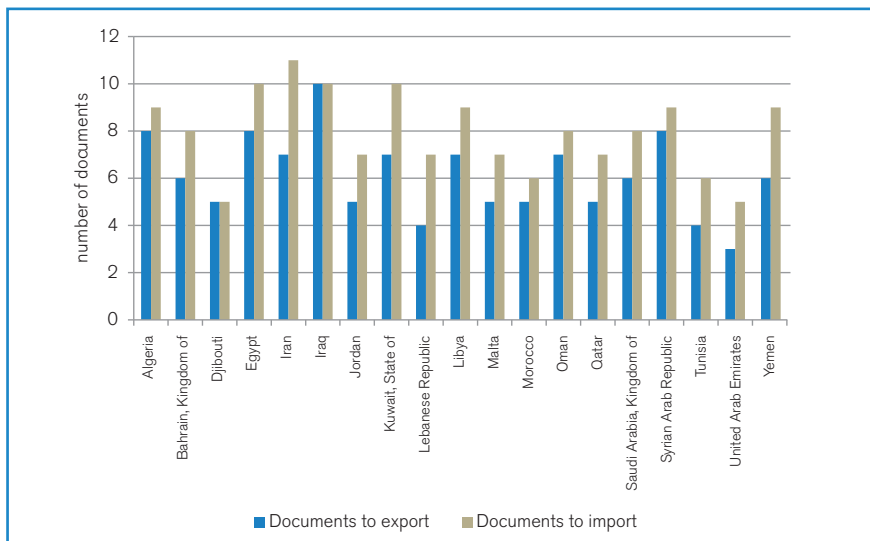
8.3 Economic impact of trade facilitation: literature review

The global discussion on trade facilitation was reinvigorated with an ambitious mandate in the early years of the WTO Doha Round negotiations. At the same time, an abundant literature on the economic impact of trade facilitation emerged to provide the background information to these negotiations and contribute to the discussion. Estimation of the economic impact of trade facilitation mainly used two approaches: the gravity model and the computable general equilibrium (CGE) model. The gravity model investigates econometrically the link between trade flows and trade facilitation indicators while the CGE model simulates the effect of trade facilitation measures on welfare, economic growth, employment and trade, considering sectoral and country linkages.

Most studies, whether using a gravity or CGE model, have found that improved and simplified customs procedures have a positive effect on trade flows. Specifically, the adoption of trade facilitation measures boosts government revenues in developing countries and enhances the ability of a country to attract foreign direct investment (FDI), diversify its exports and integrate into global production supply chains (Decreux and Fontagné, 2011; Engman, 2005; Minor and Tsigas, 2008; Moïsé and Sorescu, 2013; WTO, 2015; Zaki, 2010). Furthermore, trade facilitation enhances the role of small and medium-sized enterprises (SMEs) in trade. By reducing export delays, SMEs are more likely to increase their export share than are large firms (WTO, 2015).

To help countries improve their border procedures and prioritize their TFA implementation actions, the OECD has developed a set of trade facilitation indicators that are consistent with the provisions of the TFA (Moïsé and Sorescu, 2013). These indicators serve as a basis on which to measure performance and make inter-country comparisons in various areas of trade facilitation. OECD analysis shows that the MENA region is performing better than the average of the 107 countries (outside the OECD) studied, in terms of simplification and harmonization of documents and external border agency cooperation. The region performs at the overall average level in the areas of information availability, automation, streamlining of procedures, and governance and impartiality, but performs less well than the overall average in terms of advance rulings[10] and fees and charges (OECD, 2013).

Using a gravity model, the same OECD study indicates that full implementation of the TFA will reduce trade cost in the MENA region by 10.5 per cent. The measures that contribute most to trade cost reduction are automation of formalities (2.6 per cent reduction), involvement of the trade community (1.8 per cent reduction) and streamlining of procedures (1.3 per cent potential reduction).

Similarly to the OECD study, in 2014, the United Nations Economic and Social Commission for West Asia (ESCWA) initiated a comprehensive survey to collect data and information on trade facilitation in the Arab region. The main findings of the ESCWA survey showed that, although many Arab countries are engaged in implementing trade facilitation measures, implementation of a cross-border paperless trading system remains extremely limited (ESCWA, 2015). The analysis clearly showed a negative relationship between trade facilitation implementation and trade costs excluding tariffs.

In the context of regional integration, Dennis (2006) used GTAP to analyse the welfare and GDP growth effects of trade facilitation. He found that incorporating trade facilitation improvements would triple the welfare effect compared with a scenario of a MENA free trade area (FTA) without trade facilitation. He estimated that adding trade facilitation to mere trade liberalization would increase overall welfare from US$ 913 million to some US$ 3 billion, corresponding to a 0.1 per cent increase in GDP, with all MENA sub-groups benefiting from this increase. Bchir et al. (2007) used the MIRAGE model to look into various trade integration schemes of the Maghreb countries (Maghreb free trade area, Maghreb customs union, Maghreb common market). They estimated that liberalizing trade in goods in the Maghreb region would lead to an overall gain of US$ 300 million, with the common market scenario leading to the largest GDP gain. However, Bchir et al. did not explicitly incorporate trade facilitation into their analysis.

In the present study, the approach used in assessing the impact of trade facilitation follows that of Dennis (2006), but with a much richer data set (GTAP 8.1), incorporating most Arab countries, including the GCC, Maghreb and Mashreq countries. [11]

8.3 Modelling trade facilitation

GTAP 8.1 is used to assess the economy-wide as well as the sectoral effects of trade facilitation within the context of MENA regional integration. GTAP 8.1 is ideal to assess such effects as it considers the sectoral as well as the country linkages through trade and factor mobility. It is a standard multi-region, multi-sector CGE model with perfect competition and constant returns to scale. The model is fully documented in Hertel and Tsigas (1997). GTAP 8.1 includes 134 regions and 57 commodities/sectors and contains complete bilateral trade, transport and tariff information. For the present study, the data set was aggregated into 29 regions and 32 sectors reflecting the trade structure of the MENA region and was updated by shocking the initial data set to the year 2015 using World Bank data on population, GDP and labour (Boughanmi, Al Shammakhi and Antimiani, 2016). The

sectoral aggregation includes 15 agricultural and natural resources products, four oil and mineral products, nine manufacturing and industrial products, three transportation service sectors and one aggregate service sector. The regional aggregation, in addition to the GCC, Mashreq and Maghreb countries as defined above, includes most OECD countries, and other countries from Africa, Asia and Latin America (Appendix Table 8.3).

However, as indicated by Dennis (2006), GTAP 8.1 does not include a sector that captures trade facilitation. To capture this, the present study simulates the removal of cross-border inefficiencies as an import-augmenting technical change in the GTAP model (Fox, Francois and Londoño-Kent, 2003). A technological shock is introduced through the AMS variable in GTAP, which represents the change in the price of imports from a particular trading partner due to efficiency changes (Fugazza and Maur, 2008).[12] Hertel et al. (2007) argue that improvements in trade facilitation will help reduce the indirect cost associated with transit time (iceberg cost) and reduce the destination price of traded goods. Dennis (2006) and the OECD (2013) estimated that total trade transaction cost in the MENA region amounts to around 10 per cent. The indirect cost component of the total transaction cost for the MENA countries is estimated to be 3 per cent of the total trade transaction cost (Dennis, 2006). For comparative purposes, the present study used the same figure for both the Maghreb and Mashreq sub-regions but only 1 per cent for the GCC sub-region, as the latter is considered to have more efficient trade logistics (World Bank, 2015). The model is solved using the standard GTAP macroeconomics closure, where global investment is allocated across regions according to the relative rates of return in each region, affecting regional savings and the current accounts (Hertel, 1997).

Simulation results

The GTAP framework was used to assess two scenarios of further trade liberalization within the GAFTA. The first scenario assumes that GAFTA countries complete trade liberalization by eliminating the remaining tariffs on bilateral trade (GAFTA scenario). The second scenario includes the first scenario but assumes, further, that GAFTA countries are implementing cross-border trade facilitation measures (GAFTA+TF scenario).

The GAFTA+TF scenario leads to a significant increase in welfare (equivalent variation, EV) compared with the GAFTA scenario without trade facilitation (Figure 8.4). Among the three GAFTA subgroups, the Mashreq countries gain the most (2.2 per cent), followed by the North African countries (1.5 per cent). This basically reflects the initial high levels of protection as well as initial high levels of cross-border inefficiencies in these two subgroups compared with the GCC subgroup

Figure 8.4 Welfare effect of trade facilitation improvement
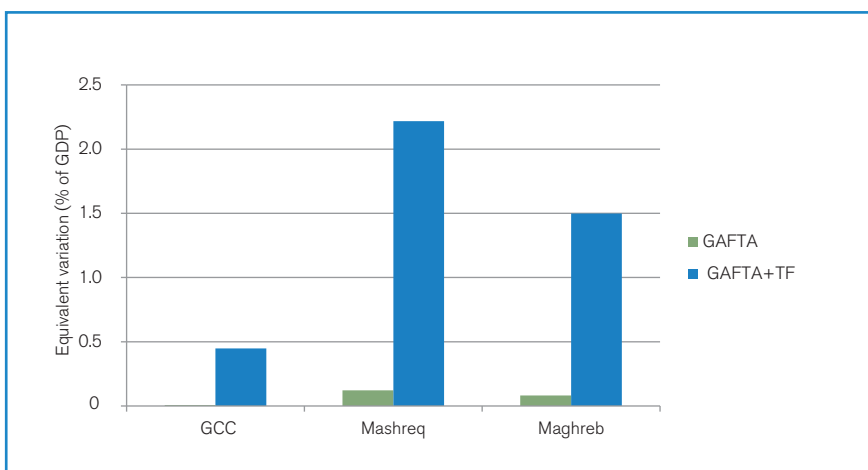
Source: Author's calculations.

(0.5 per cent). Without trade facilitation, completing the GAFTA by the total elimination of tariffs will have almost no effect on welfare.

Likewise, trade facilitation provides a significant boost to real GDP in the GCC (0.45 per cent), Mashreq (2.25 per cent) and Maghreb (1.5 per cent) sub-regions of the GAFTA, while the scenario of complete elimination of tariffs without trade facilitation had a zero to a very minor effect on GDP (Figure 8.5). Therefore, the Mashreq and Maghreb subgroups benefited most from deepening the GAFTA through the elimination of remaining tariffs along with improved trade facilitation. The magnitude of the results of this study is somehow greater than those found in Dennis (2006), who estimated an increase in real GDP for all MENA subgroups in a range of 0.02 to 0.21 per cent, with the highest gain for the North African countries. Refinement of the data and greater country coverage explain these discrepancies.

The trade effects of trade facilitation are captured by the value of exports (Figure 8.6). The GAFTA completion scenario has almost no effect on the value of exports of the GCC countries, while the effect is higher for the Mashreq and Maghreb countries (3.8 per cent and 1.7 per cent, respectively). Introducing trade facilitation into the GAFTA leads to a significant increase in export value for all countries, and particularly for the Mashreq (6.9 per cent) and Maghreb (3 per cent) countries.

Figure 8.5 GDP effect of trade facilitation
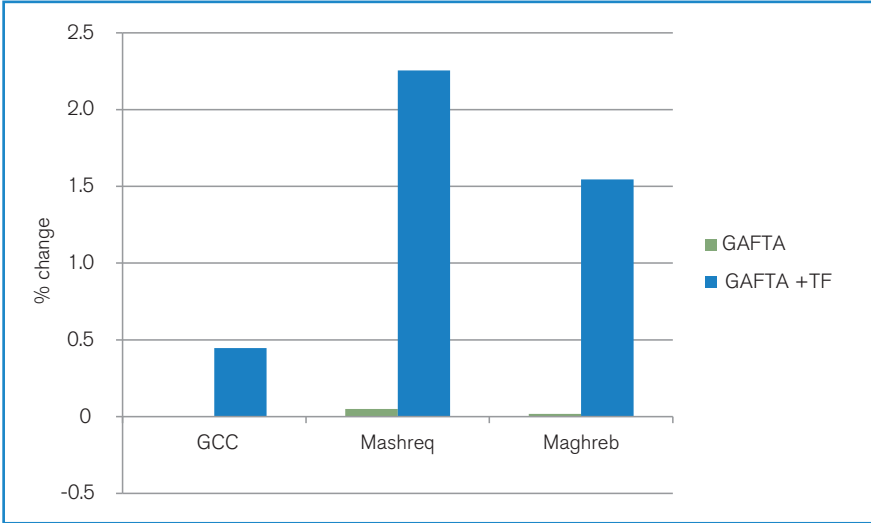
Source: Author's calculations.

Figure 8.6 Effect of trade facilitation on exports
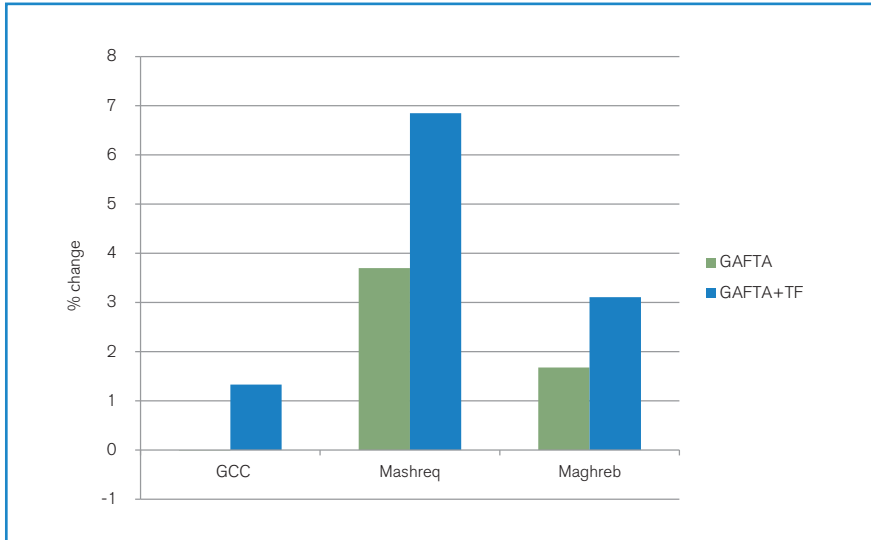
Source: Author's calculations.

Likewise, with trade facilitation, full trade liberalization in the GAFTA leads to a significant increase in intra-regional exports, particularly for the Maghreb sub-region, where export growth reaches around 6 per cent, most of which is destined for the Mashreq sub-region (Figure 8.7). The GCC subgroup also witnesses an important increase in exports towards the GAFTA, with intra-export growth above 2 per cent. The lower level of increase for the Mashreq sub-region's intra-export can be explained by the already quite intensive Mashreq intra-trade compared with the other-sub-regions.

At the sector level, with trade facilitation, an impressive (double-digit) increase is observed in overall exports of the Mashreq sub-region in agricultural and food products (dairy, meat, beverages, other food), minerals (oil, gas) and manufacturing (Appendix Tables 8.1 and 8.2). The Maghreb sub-region witnesses a double-digit increase in overall exports of dairy products and transport equipment. Although export growth is lower in the GCC countries, they nonetheless witness a clear positive increase in exports of all products, in particular, agro-food products (dairy and meat). Although they have limited agricultural resources, through processing imported agricultural raw materials, the GCC countries are able to create value-added products and thereby access international markets.

Figure 8.7 Effect of trade facilitation on GAFTA intra-trade
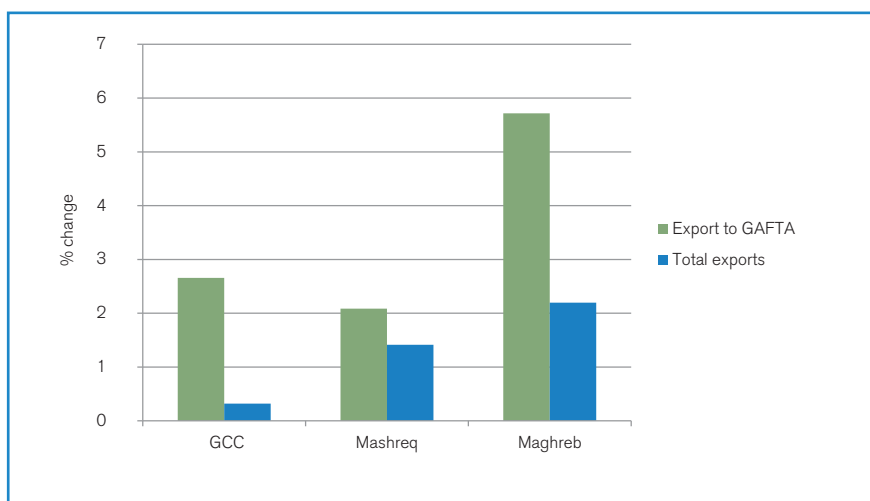
Source: Author's calculations.

8.4 Conclusions

Indirect trade cost in the MENA region, as reflected in the Word Bank's trading across borders indicators, is relatively high compared with regions such as East Asia and the Pacific, and Latin America and the Caribbean. Indirect costs related to inefficient trade procedures are worse than equivalent tariffs as they are "wheels in the sand" causing greater economic losses. Improving trade procedures through trade facilitation measures would reduce trade cost and enhance the international competitiveness of MENA countries.

This chapter analysed the effects of introducing and implementing trade facilitation measures as part of a regional integration agreement to deepen the GAFTA in the MENA region. GTAP 8.1 was used to simulate two scenarios, one involving the elimination of the remaining bilateral tariffs between GAFTA members, and the second assuming that, in addition to tariff elimination, MENA countries undertake trade facilitation measures. Trade facilitation was introduced into the GTAP analysis as an efficiency-enhancing measure affecting import prices.

Results indicate that the full completion of the GAFTA with trade facilitation improvements yields a welfare gain for all GAFTA sub-regions, with the Mashreq and the Maghreb sub-regions gaining the most (an increase in welfare of 2.2 per cent and 1.9 percent, respectively). Trade facilitation in the GAFTA enhances export competitiveness and leads to a significant increase in overall export value for all countries, particularly for the Mashreq (6.9 per cent) and Maghreb (3 per cent) countries. Furthermore, the scenario of trade liberalization within the GAFTA plus trade facilitation leads to a significant increase in intra-regional exports for all countries, reaching 6 per cent for the Maghreb, 2.6 per cent for the GCC and 2 per cent for the Mashreq countries. All sub-regions witness an export boost in agro-food products, particularly those products in which the Mashreq and Maghreb countries have a comparative advantage.

The welfare-enhancing results of this study indicate that the MENA region has a high stake in implementing the TFA. However, many countries in the MENA region may face challenges in making trade facilitation reforms due to a lack of human and financial resources. Experience has shown that sequencing and prioritizing the areas of reforms can be a cost-effective way of implementing trade facilitation projects. For example, the MENA region could begin reforms in the areas reported above as contributing most to trade cost reduction, such as automation, involvement of the trade community and streamlining of trade procedures.

Appendix

Appendix Table 8.1 Value of merchandise regional exports by commodity
FOB (% change)

| | S1:GAFTA | | | S2: GAFTA +TF | | |
	GCC	Mashreq	Maghreb	GCC	Mashreq	Maghreb
Rice	-0.16	1.71	7.39	2.35	6.32	5.94
Wheat	0.12	-0.77	-1.42	3.25	4.33	-1.41
Oilseeds	0.03	0.54	4.47	2.87	2.80	2.59
Sugar	-0.14	-0.89	5.92	0.43	1.21	5.96
Fruit and vegetables	-0.36	7.21	0.49	0.44	7.73	-0.28
Dairy	-0.46	11.41	16.15	3.34	12.51	16.20
Livestock	0.30	-0.11	-0.42	0.95	-0.99	-1.33
Meat	0.15	9.04	0.41	5.07	10.71	-5.18
Beverages and tobacco	-0.30	12.04	3.57	0.15	12.66	3.76
Other food	-0.28	10.85	1.00	0.91	11.63	2.80
Other crops	0.20	-0.81	0.04	1.20	-2.18	-0.58
Vegetable oil	-0.01	0.66	-0.36	1.92	5.79	-0.86
Forestry	0.03	-2.31	1.79	0.58	-5.35	-0.20
Fishing	0.12	-0.01	-0.24	0.88	-0.02	-1.49
Wood products	0.08	11.24	1.27	1.08	13.17	4.67
Oil	0.00	-0.32	0.17	0.25	0.00	8.06
Coal	-0.02	-2.10	-0.09	1.63	0.80	7.93
Gas	0.53	-8.78	-1.04	3.57	24.12	0.03
Other minerals	-0.29	10.80	2.29	0.07	12.60	2.32
Electricity	-0.01	-0.41	-0.32	0.52	5.73	0.85
Oil products	0.02	18.79	0.95	0.22	19.04	4.59
Chemicals	0.01	2.64	0.45	0.43	6.47	3.73
Metals	-0.03	1.18	0.82	1.24	5.47	4.55
Textiles	-0.05	1.90	-0.77	0.88	7.47	0.46
Transport equipment	-0.02	1.00	11.52	1.80	3.70	20.86
Electronic equipment	0.00	17.26	-0.73	1.41	24.53	4.56
Other manufactures (1)	0.02	19.34	1.38	1.53	23.41	7.41
Other manufactures (2)	0.03	-0.09	0.18	1.67	8.10	4.05
Land transport	0.03	-0.59	-0.33	0.45	-0.60	-0.33
Water transport	0.02	-0.27	-0.01	0.32	0.35	0.31
Air transport	0.03	-0.65	-0.09	0.65	0.14	1.30
Services	0.00	-1.02	-0.60	0.47	-2.29	-1.89

Source: Author's calculations.

Appendix Table 8.2: Value of merchandise regional imports by commodity CIF (% change)

	S1:GAFTA			S2: GAFTA +TF		
	GCC	**Mashreq**	**Maghreb**	**GCC**	**Mashreq**	**Maghreb**
Rice	-0.03	0.26	1.29	-0.74	-1.44	8.80
Wheat	-0.04	0.51	0.61	0.20	1.44	5.62
Oilseeds	0.01	0.12	0.49	-0.58	-1.91	2.13
Sugar	-0.02	0.57	0.54	-0.38	-0.43	5.17
Fruit and vegetables	0.05	5.51	0.64	-0.23	7.63	3.37
Dairy	0.00	5.93	0.98	0.29	15.15	10.41
Livestock	0.02	0.48	0.40	-0.40	1.33	2.16
Meat	0.02	2.10	0.83	0.28	10.74	8.79
Beverages and tobacco	0.00	2.58	0.26	-0.36	3.62	0.46
Other food	0.02	2.36	0.46	-0.04	3.79	2.51
Other crops	0.01	0.96	0.43	-0.63	3.86	2.44
Vegetable oil	0.01	0.30	0.23	-0.17	0.02	-0.35
Forestry	0.02	2.15	0.41	-1.11	8.87	3.73
Fishing	0.04	0.40	0.31	0.04	3.10	3.21
Wood products	0.00	1.04	0.38	0.13	0.67	1.82
Oil	0.00	5.16	-0.22	4.02	16.72	4.74
Coal	-0.01	1.54	0.00	-0.74	1.06	-2.61
Gas	0.06	2.58	0.52	9.70	14.57	26.93
Other minerals	0.05	2.76	0.40	0.55	2.14	3.27
Electricity	0.01	0.47	0.36	1.65	3.36	5.85
Oil products	0.11	0.37	1.05	0.97	1.76	0.96
Chemicals	0.02	0.43	0.29	0.76	-0.68	1.37
Metals	0.00	0.47	0.41	0.35	-0.76	2.00
Textiles	0.00	0.82	0.29	0.49	1.42	4.34
Transport equipment	0.01	0.78	0.41	0.07	1.66	-0.32
Electronic equipment	0.04	0.94	0.33	0.85	2.61	3.14
Other manufactures (1)	0.01	1.09	0.30	0.09	1.91	-0.44
Other manufactures (2)	0.03	0.60	0.38	0.96	2.10	4.83
Land transport	0.01	0.39	0.22	0.33	3.38	2.54
Water transport	0.00	0.33	0.07	0.11	0.33	-0.01
Air transport	0.01	0.19	0.09	0.05	0.15	0.28
Services	0.01	0.59	0.40	0.56	3.90	3.53

Source: Author's calculations.

Appendix Table 8.3 Sectoral and regional aggregation

Commodity	Factor	Country/Region
Rice	Land	Oman
Wheat	Labour	Bahrain, Kingdom of
Oilseeds	*skilled*	Saudi Arabia, Kingdom of
Sugar	*unskilled*	United Arab Emirates
Vegetables and fruit	Capital	Kuwait, State of
Dairy	Natural resources	Qatar
Livestock		Rest of MENA countries
Meat		North Africa
Beverages and tobacco		EU28
Other food		EFTA
Other crops		USA
Vegetable oil		Canada
Forestry		Russian Federation
Fishing		Japan
Wood products		China
Oil		Korea, Republic of
Coal		Philippines
Gas		Singapore
Other mineral		Turkey
Electricity		Iran
Oil products		Brazil
Chemicals		India
Metal products		Indonesia
Textile		Australia and New Zealand
Transport equipment		Mexico
Electronic equipment		Africa
Other manufactures (1)		Rest of Asia
Other manufactures (2)		Rest of America
Land transport		Rest of World
Water transport		
Air transport		
Services		

Source: GTAP 8.1 database.

Appendix Table 8.4: Simple average bilateral tariff rates applied in the GAFTA region

Sector	GCC import tariff from		Maghreb import tariff from		Maghreb import tariff from	
	Mashreq	**Maghreb**	**GCC**	**Mashreq**	**GCC**	**Maghreb**
Grains	0.0	0.0	2.1	0.1	0.0	0.0
Fruit and vegetables	0.0	0.0	23.7	2.3	6.1	9.3
Fishing	0.0	0.1	14.7	3.8	0.9	0.0
Dairy products	0.0	0.1	0.3	2.2	7.0	3.9
Sugar	0.0	0.0	4.1	0.6	15.5	0.0
Beverages and tobacco	0.0	6.7	8.1	12.5	1.4	37.5
Other food products	0.0	0.1	5.9	5.1	2.1	1.6
Textiles	0.0	0.2	4.9	15.0	6.1	1.3
Chemicals and plastic products	0.0	0.4	2.4	1.9	1.2	0.3
Petroleum products	0.0	4.5	8.7	12.0	0.7	4.5
Motor vehicles and parts	0.0	1.2	0.4	10.5	2.9	2.5
Other industrial products	0.0	1.2	6.7	5.2	3.3	5.0
Services	0.0	0.0	0.0	0.0	0.0	0.0

Source: GTAP 8.1 database.

Endnotes

1.   The GAFTA has been in force since 1 January 1998 and includes 17 Arab countries: the Kingdom of Bahrain, Egypt, Iraq, Jordan, the State of Kuwait, the Lebanese Republic (Lebanon), Libya, Morocco, Oman, the State of Palestine, Qatar, the Kingdom of Saudi Arabia, Sudan, the Syrian Arab Republic (Syria), Tunisia, the United Arab Emirates and Yemen.

2.   In order to benefit from the special and differential treatment (SDT) provision, the Agreement classifies its provisions under categories A, B and C. Category A provisions will be implemented immediately the Agreement enters into force; category B provisions will be implemented after a transition period determined by each member; category C provisions will be implemented after a transition period, once members have received capacity-building support.

3.   The GCC includes the Kingdom of Bahrain, the State of Kuwait, Oman, Qatar, the Kingdom of Saudi Arabia and the United Arab Emirates; the Maghreb countries include Algeria, Libya,

Morocco and Tunisia; the Mashreq countries include Egypt, Iraq, Jordan, the Lebanese Republic and the Syrian Arab Republic.

4. Tariff data show that, despite the full implementation of the GAFTA, there are still various tariffs and non-tariff barriers on intra-trade (Appendix Table 8.4).

5. The WTO defines trade facilitation in two dimensions: (i) broad or narrow; and (ii) soft or hard infrastructure. The latter dimension differentiates between improvements in trade procedures that do not require heavy investment (soft) and investment in hard infrastructure, such as ports and transportation links within a country (WTO, 2015).

6. This is often referred to in the literature as "iceberg cost", where the tip of the iceberg constitutes the direct cost while the bigger, under-the-water part of the iceberg constitutes the indirect cost in relation to the cost of time, due in particular to inefficient and long customs procedures (Hummels and Skiba, 2004). In the "iceberg model" of trade cost, inefficiencies at the border are pure losses, reducing the value of goods as they cross the border, in similar fashion to the melting tip of the iceberg as its moves through the ocean (WTO, 2015).

7. In these estimates, trade cost is defined broadly, referring to all costs involved in moving a product from the producer to the consumer (cost beyond the cost of production).

8. In addition to the World Bank's trading across border indicators, a number of other trade facilitation indicators have been developed and used in assessing trade facilitation policies. These indicators vary in terms of focus, country coverage and frequency of publication. Examples include the World Bank's Logistics Performance Index (LPI), the OECD's Trade Facilitation Indicators (TFI) and the World Economic Forum's Enabling Trade Index (ETI). While the LPI measures a country's performance along the supply chain, the ETI measures the quality of institutions, policies and services facilitating trade across borders. The TFI covers the full spectrum of border procedures corresponding to the main policy areas under the TFA. For the sake of simplicity, the present study used the World Bank's trading across borders indicators as they are sufficient to serve the purpose of the analysis.

9. Combining the per-day tariff equivalents with the World Bank's trading across borders data gives the tariff equivalents of the total import and export time delays. For the MENA countries, this comes to 5.5 per cent tariff equivalent, which is more than twice the applied tariff (Hummels, 2007).

10. As defined in the TFA, advance rulings means "prior statements by the administration requesting traders concerning the classification, origin, valuation method, etc., applied to specific goods at the time of importation".

11. The country coverage in Dennis (2006) is rather limited, including only Egypt, Jordan, Morocco and Tunisia; all other countries are aggregated into one group, the Rest of MENA.

12. Alternatively, the reduction in time is introduced as an iceberg effect by Hertel, Walmsley and Itakura (2001), which allows for the shifting of the Armington demand function by the *ad valorem* tariff equivalent of the time saving to cross the border.

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9 Trade facilitation in the Arab region

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Abstract

This chapter aims to assess the progress of trade facilitation in the Arab region, and subsequently tests the effect of trade facilitation on bilateral trade flows within this region. The findings support the fact that the performance of Arab countries' logistics systems in general is still weak and needs to be improved, as indicated by the World Bank's Logistics Performance Index (LPI). Vast divergence and discrepancies among Arab countries can be observed because of differences in income levels and geopolitical conditions. Hence, while some Arab countries try to develop logistics activities to take advantage of opportunities, seeking to establish regional logistics platforms, others are not only ranked among the lowest on the overall index, but are also near the bottom of the list for the different components of the LPI.

The estimations presented here suggest that trade facilitation has positive impacts on intra-regional trade but that its scope is rather limited. Indeed, an improvement in trade facilitation (LPI score) of the exporting country by 1 per cent increases trade flows by 0.7 per cent. This impact could be higher and reach more than 2 per cent when sensitivity analysis is included. An improvement in trade facilitation (LPI score) of the importing country by 1 per cent boosts trade flows by 0.66 per cent. The results of this chapter show that there are slight gains in trade to be made from improving trade facilitation in Arab countries. Despite the fact that the overall LPI score is significant for both exporting and importing countries, the magnitude of that significance is relatively small compared with previous research findings regarding the same measures in other regions. However, the study suggests that trade facilitation could have a greater impact on trade among Arab countries and with other regions and underlines the importance of developing transport and physical infrastructure to enhance regional integration and trade cooperation.

9.1 Introduction

Trade facilitation has become a major issue in trade negotiations. The WTO defines trade facilitation as "the simplification, modernization, and harmonization of export and import processes" (WTO, 2015). Research reveals that trade facilitation is likely to have positive effects on trade, particularly in developing countries because they have more room for improvements. Indeed, trade facilitation – encompassing both simplified customs procedures and upgrades to transportation infrastructure – enhances a country's ability to compete in international markets by reducing shipping delays and risk and lowering the cost of trading. Accordingly, improvements in trade facilitation measures are expected to translate into gains in trade, which in turn contribute to income growth that enhances human development.

Liapis (2015) provides evidence that many countries across the geographic and income spectrum improved their performance on several trade facilitation variables. He suggests that further enhancements to trade facilitation in many low- and lower-middle-income countries are required if they are to develop better practices. Cattaneo (2013) gives evidence that the removal of obstacles to trade, reduction of customs delays and border procedures, and reduction of transport costs are key priorities for future Aid for Trade (AfT) initiatives in the agro-food sector.

Arvis et al. (2013) suggest that trade facilitation policy should pay special attention to improving transport and logistics performance, particularly in low-income countries and in sub-Saharan Africa, where these could have highly significant impacts on trade costs.

Felipe and Kumar (2010), Fink, Mattoo and Neagu (2005), Hammar (2008), Moïsé (2013), Otsuki (2011) and Wilson, Mann and Otsuki (2003) examine the relationship between trade facilitation and trade flows in various countries. They provide evidence that applying trade facilitation measures will result in substantial benefits that outweigh their costs. Furthermore, Hertel and Mirza (2009) used the World Bank's Logistics Performance Index (LPI) to apply thorough analysis to various trade facilitation dimensions. Overall, using several trade facilitation measures, previous studies have revealed that trade facilitation is expected to enhance trade flows and result in many benefits.

With respect to the Arab region, several studies have assessed trade performance among Arab countries. Al-Atrash and Yousef (2000) estimate a gravity model to reveal whether there is too little intra-Arab trade. Their findings indicate that intra-Arab trade and Arab trade with the rest of the world are lower than the gravity equation predictions.

By applying a gravity model, Elafif (2008) analyses the determinants of intra-Arab trade throughout the period 1985–2005. He argues that expanding the possibility of intra-Arab trade needs harmonization of economic policies and trade practices between sub-regional unions of Arab countries specifically, or among all Arab countries in general.

In fact, although Arab countries have made numerous attempts to engage in various practices of regional economic integration, trade between them is still extremely inadequate compared with various other developed and developing regional groupings.

This chapter aims to assess the performance and progress of trade facilitation in Arab economies. Additionally, the relationship between bilateral trade flows and trade facilitation in Arab countries will be examined. In that regard, this study uses the latest available LPI, that of 2014, in addition to all available past periods: 2007, 2010 and 2012. It applies pooled data analysis to capture the effect of trade facilitation on trade volume over time and across Arab countries. To the author's knowledge, there are no applied studies concerning trade facilitation in the region.

The rest of this chapter is organized as follows. Section 2 reviews the measurement of trade facilitation and discusses the state of logistics in the Arab countries. Section 3 discusses the estimation strategy and data. Section 4 presents the results. Section 5 concludes and provides policy implications.

9.2 Trade facilitation measurement

The LPI:

> "is an interactive benchmarking tool created to help countries identify the challenges and opportunities they face in their performance on trade logistics and what they can do to improve their performance. The LPI […] allows for comparisons across about 160 countries. The LPI is based on a worldwide survey of operators on the ground (global freight forwarders and express carriers), providing feedback on the logistics 'friendliness' of the countries in which they operate and those with which they trade. They combine in-depth knowledge of the countries in which they operate with informed qualitative assessments of other countries where they trade and experience of [the] global logistics environment. Feedback from operators is supplemented with quantitative data on the performance of key components of the logistics chain in the country of work." [1]

The LPI consists of both qualitative and quantitative measures and helps build profiles of the logistics friendliness of the countries included. It measures performance along the logistics supply chain within a country and offers two different perspectives: international and domestic. So far, it has been calculated for four periods: 2007, 2010, 2012 and 2014.

This chapter uses the International LPI, which provides qualitative evaluations of a country by its trading partners – logistics professionals working outside the country. The latest LPI, for 2014, ranks 160 countries on six dimensions of trade – including customs performance, infrastructure quality and timeliness of shipments – that have increasingly been recognised as being important to development. The data used in the ranking comes from a survey of logistics professionals who were asked questions about the foreign countries in which they operate. The LPI uses standard statistical techniques to aggregate the data into a single indicator that can be used for cross-country comparisons. The score cards demonstrate comparative performance – the dimensions show on a scale from 1 to 5 (lowest score to highest score).

State of logistics in the Arab countries

Table 9.1 provides information on the LPI for the Arab countries. Evidently, trade facilitation performance in the Arab countries is relatively low, according to the latest available LPI (2014). When analysing individual Arab countries, significant differences are observed, with their scores ranging between 3.54 and 2.09, ranking them from 27th to 155th. Obviously, oil-exporting Gulf countries achieve substantially higher scores and the highest rankings among Arab countries, while those countries suffering from wars and unstable political conditions are ranked lowest among Arab countries. Comparing the scores and ranks with previous periods clearly shows that there is deterioration with regard to all trade facilitation measures.

Starting from 2007, the average LPI for all Arab countries was higher than the world average, except for the Logistics Services index, which was a little lower. Considerable improvement was achieved by the year 2010, when the LPI index rose by 2.5 per cent (based on the short-list countries),[2] with all sub-indicators having progressed. Unfortunately, in 2012, the average overall score for all Arab countries was lower than the world average. However, based on the short-list countries, the average LPI score was better than the world average, although registering a 1 per cent decline compared with 2010. This negative trend continued in 2014, when the overall LPI score declined by 3.1 per cent compared with 2010. Clearly, all sub-indicators scored below the world average.

Table 9.1 Logistics Performance Index, 2007, 2010, 2012 and 2014

Country	2007													
	Overall LPI		Customs		Infrastructure		Ease of Shipment		Logistics Services		Ease of Tracking		Timeliness	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Bahrain, Kingdom of	3.15	36	3.40	22	3.40	27	3.33	27	2.75	59	3.00	47	3.00	84
Egypt	2.37	97	2.08	122	2.00	121	2.33	111	2.38	95	2.62	72	2.85	96
Jordan	2.89	52	2.62	54	2.62	56	3.08	39	3.00	41	2.85	57	3.17	68
Kuwait, State of	2.99	44	2.50	59	2.83	46	2.60	76	3.00	47	3.33	32	3.75	32
Lebanese Republic	2.37	98	2.17	107	2.14	102	2.50	88	2.40	93	2.33	101	2.67	115
Morocco	2.38	94	2.20	101	2.33	77	2.75	64	2.13	119	2.00	130	2.86	95
Oman	2.92	48	2.71	46	2.86	43	2.57	79	2.67	67	2.80	63	4.00	24
Qatar	2.98	46	2.44	67	2.63	55	3.00	46	3.00	43	3.17	38	3.67	38
Saudi Arabia, Kingdom of	3.02	41	2.72	45	2.95	38	2.93	50	2.88	51	3.02	43	3.65	39
Sudan	2.71	64	2.36	79	2.36	73	2.67	68	2.83	55	2.92	51	3.17	67
Syrian Arab Republic	2.09	135	2.17	108	1.91	131	2.00	138	1.80	145	2.00	137	2.67	118
Tunisia	2.76	60	2.83	39	2.83	44	2.86	55	2.43	88	2.83	60	2.80	105
United Arab Emirates	3.73	20	3.52	20	3.80	18	3.68	13	3.67	20	3.61	23	4.12	17
Yemen	2.29	112	2.18	105	2.08	111	2.20	123	2.22	111	2.30	104	2.78	108
Total	38.65		35.89		36.74		38.51		37.16		38.77		45.14	
Average 2007 / Arab	2.76		2.564		2.62		2.7504		2.65		2.77		3.22	
Total excluding incomplete data	36.27		33.69		34.41		35.7560		35.03		36.77		42.28	
Average 2007 / Arab*	2.79		2.59		2.65		2.7505		2.69		2.83		3.25	
Average 2007 / World	2.74		2.556		2.58		2.72		2.71		2.73		3.17	

Red denotes a country for which not all data are available.
* Excluding Iraq, Libya and Morocco because their data are incomplete.

Table 9.1 Logistics Performance Index, 2007, 2010, 2012 and 2014 (continued)

Country	2010													
	Overall LPI		Customs		Infrastructure		Ease of Shipment		Logistics Services		Ease of Tracking		Timeliness	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Bahrain, Kingdom of	3.37	32	3.05	37	3.36	30	3.05	54	3.36	30	3.63	26	3.85	39
Egypt	2.61	92	2.11	122	2.22	106	2.56	110	2.87	54	2.56	101	3.31	81
Iraq	2.11	148	2.07	130	1.73	147	2.20	144	2.10	140	1.96	150	2.49	148
Jordan	2.74	81	2.31	93	2.69	55	3.11	49	2.49	90	2.33	133	3.39	78
Kuwait, State of	3.28	36	3.03	38	3.33	32	3.12	47	3.11	43	3.44	34	3.70	52
Lebanese Republic	3.34	33	3.27	29	3.05	41	2.87	69	3.73	19	3.16	49	3.97	29
Libya	2.33	132	2.15	116	2.18	107	2.28	140	2.28	121	2.08	143	2.98	124
Oman	2.84	60	3.38	24	3.06	40	2.31	137	2.37	108	2.04	145	3.94	32
Qatar	2.95	55	2.25	99	2.75	51	2.92	63	2.57	81	3.09	57	4.09	22
Saudi Arabia, Kingdom of	3.22	40	2.91	43	3.27	33	2.80	82	3.33	32	3.32	42	3.78	45
Sudan	2.21	146	2.02	139	1.78	144	2.11	151	2.15	135	2.02	148	3.09	108
Syrian Arab Republic	2.74	80	2.37	83	2.45	75	2.87	68	2.59	75	2.63	95	3.45	74
Tunisia	2.84	61	2.43	73	2.56	65	3.36	22	2.36	109	2.56	102	3.57	58
United Arab Emirates	3.63	24	3.49	21	3.81	17	3.48	14	3.53	27	3.58	28	3.94	33
Yemen	2.58	101	2.46	69	2.35	88	2.24	142	2.35	110	2.63	94	3.48	68
Average 2010 / Arab	2.85		2.62		2.71		2.75		2.75		2.735		3.53	
Average 2010 / Arab*	2.95		2.70		2.82		2.83		2.83		2.85		3.66	
Average 2010 / World	2.74		2.56		2.58		2.72		2.71		2.729		3.17	

Red denotes a country for which not all data are available.
* Excluding Iraq, Libya and Morocco because their data are incomplete.

Table 9.1 Logistics Performance Index, 2007, 2010, 2012 and 2014 (continued)

Country	2012													
	Overall LPI		Customs		Infrastructure		Ease of Shipment		Logistics Services		Ease of Tracking		Timeliness	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Bahrain, Kingdom of	3.05	48	2.67	60	3.08	43	2.83	72	4.10	3	3.97	11	3.79	31
Egypt	2.98	57	2.60	69	3.07	45	3.00	51	3.34	31	3.17	46	3.40	63
Iraq	2.16	145	1.75	152	1.92	146	2.38	126	2.68	84	2.98	62	3.11	87
Jordan	2.56	102	2.27	115	2.48	91	2.88	63	2.80	66	3.07	55	3.14	82
Kuwait, State of	2.83	70	2.73	53	2.82	61	2.68	90	2.65	90	2.58	96	3.42	59
Lebanese Republic	2.58	96	2.21	124	2.41	102	2.71	85	2.73	78	2.69	84	3.36	65
Libya	2.28	137	2.08	135	1.75	152	2.63	99	2.75	74	2.83	70	2.73	132
Morocco	3.03	50	2.64	65	3.14	39	3.01	46	2.50	103	2.77	78	2.95	104
Oman	2.89	62	3.10	36	2.96	49	2.78	77	2.55	99	2.10	145	2.74	130
Qatar	3.32	33	3.12	34	3.23	34	2.88	64	2.46	108	2.42	119	2.84	117
Saudi Arabia, Kingdom of	3.18	37	2.79	51	3.22	35	3.10	42	2.18	136	2.48	112	3.12	85
Sudan	2.10	148	2.14	131	2.01	140	1.93	150	2.16	139	2.10	146	2.80	119
Syrian Arab Republic	2.60	92	2.33	104	2.54	84	2.62	100	2.00	149	2.00	147	2.59	141
Tunisia	3.17	41	3.13	33	2.88	54	2.88	65	2.21	131	2.26	136	2.31	152
United Arab Emirates	3.78	17	3.61	15	3.84	17	3.59	15	2.03	148	1.83	152	2.43	148
Yemen	2.89	63	2.29	110	2.62	74	3.14	38	1.84	153	1.73	153	2.19	154
Average 2012 / Arab	2.84		2.59		2.75		2.816		2.56		2.56		2.931	
Average 2012 / Arab*	2.92		2.69		2.86		2.85		2.54		2.49		2.932	
Average 2012 / World	2.87		2.66		2.76		2.824		2.82		2.88		3.26	

Red denotes a country for which not all data are available.
* Excluding Iraq, Libya and Morocco because their data are incomplete.

Table 9.1 Logistics Performance Index, 2007, 2010, 2012 and 2014 (continued)

Country	2014													
	Overall LPI		Customs		Infrastructure		Ease of Shipment		Logistics Services		Ease of Tracking		Timeliness	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Bahrain, Kingdom of	3.08	52	3.29	30	3.04	49	3.04	58	3.04	51	3.29	42	2.80	119
Egypt	2.97	62	2.85	57	2.86	60	2.87	77	2.99	58	3.23	43	2.99	99
Iraq	2.30	141	1.98	149	2.18	131	2.31	139	2.15	147	2.31	136	2.85	116
Jordan	2.87	68	2.60	78	2.59	76	2.96	65	2.94	60	2.67	96	3.46	58
Kuwait, State of	3.01	56	2.69	68	3.16	43	2.76	89	2.96	59	3.16	50	3.39	60
Lebanese Republic	2.73	85	2.29	124	2.53	89	2.53	118	2.89	67	3.22	44	2.89	108
Libya	2.50	118	2.41	104	2.29	119	2.29	140	2.29	131	2.85	78	2.85	114
Oman	3.00	59	2.63	74	2.88	57	3.41	31	2.84	73	2.84	80	3.29	67
Qatar	3.52	29	3.21	37	3.44	29	3.55	16	3.55	28	3.47	32	3.87	34
Saudi Arabia, Kingdom of	3.15	49	2.86	56	3.34	34	2.93	70	3.11	48	3.15	54	3.55	47
Sudan	2.16	153	1.87	155	1.90	152	2.23	144	2.18	144	2.42	125	2.33	156
Syrian Arab Republic	2.09	155	2.07	142	2.08	144	2.15	150	1.82	159	1.90	158	2.53	145
Tunisia	2.55	110	2.02	146	2.30	118	2.91	73	2.42	120	2.42	124	3.16	80
United Arab Emirates	3.54	27	3.42	25	3.70	21	3.20	43	3.50	31	3.57	24	3.92	32
Yemen	2.18	151	1.63	159	1.87	153	2.35	134	2.21	141	2.21	144	2.78	124
Average 2014 / Arab	2.78		2.52		2.68		2.77		2.73		2.85		3.11	
Average 2014 / Arab*	2.83		2.57		2.75		2.84		2.80		2.89		3.15	
Average 2014 / World	2.89		2.73		2.77		2.86		2.85		2.90		3.25	

Red denotes a country for which not all data are available.
* Excluding Iraq, Libya and Morocco because their data are incomplete.

When looking at individual countries within the Arab region, massive differences can be observed. The United Arab Emirates is ranked first in the region in all four periods, although its score declined from 3.73 in 2007 to 3.54 in 2014. Qatar's score improved significantly, from 2.98 to 3.52 during the same period, to be ranked second in the region by 2014. In the case of Jordan, a slight decline can be observed between 2007 and 2014, from 2.89 to 2.87, with a low of 2.56 in 2012. Yemen, Sudan and the Syrian Arab Republic (Syria) are ranked lowest, between 151st and 155th in 2014, which reflects the current unstable conditions experienced by those countries.

Indeed, the performance of Arab countries' logistics systems in general is still weak and needs to be improved. Vast divergence and discrepancies among Arab countries can be observed, which is attributable to many factors, including differences in income levels and the unstable political and war conditions experienced by some. Accordingly, while some Arab countries try to develop logistics activities to take advantage of opportunities, seeking to establish a regional logistics platform, others are not only ranked among the lowest in terms of the overall index, but are also among the lowest ranked for different components of the LPI.

9.3 The gravity model

The gravity equation is a simple empirical model for analysing bilateral trade flows. The gravity model for trade is analogous to the Newtonian physics function that describes the force of gravity. The model explains the flow of trade between two countries as being proportional to their economic "mass" (national income) and inversely proportional to the distance between them. The model has a lineage that goes back to Tinbergen (1962) and Poyhonen (1963), who specified the gravity model equation as follows:

$$Trade_{ij} = \alpha \frac{GDP_i GDP_j}{Dist_{ij}} \qquad (1)$$

where:

$Trade_{ij}$ is the value of the bilateral trade between countries i and j;

GDP_i and GDP_j are the respective national incomes of countries i and j;

Dist$_{ij}$ is a measure of the distance between the two countries;

α is a constant of proportionality.

Taking logarithms of the gravity model equation as in (1), the linear form of the model and the corresponding estimable equation are:

$$\text{Log (Trade}_{ij}) = \alpha + \beta_1 \log (\text{GDP}_i.\text{GDP}_j) + \beta_2 \log (\text{distance}_{ij}) + u_{ij} \quad (2)$$

where α, β_1 and β_2 are the coefficients to be estimated. The error term (u) captures any other shocks and chance events that may affect trade between the two countries such as weather, tariff shocks, etc. Equation (2) is the core gravity model equation where bilateral trade is predicted to be a positive function of income and negative function of distance.

Methodology

The present study estimates a modified gravity model equation to analyse the effect of trade facilitation measures and other factors on the flow of exports within the Arab region. The modified model includes several variables that account for other factors that may affect trade in addition to (the natural logarithms of) income and distance.

The estimation is performed as follows:

$$\text{Log (X}_{ij}) = \alpha + \beta_1 \log (\text{PCGDP}_i) + \beta_2 \log (\text{PCGDP}_j) + \beta_2 \log (D_{ij}) + \beta_2 \log (\text{POP}_i) + \\ \beta_2 \log (\text{POP}_j) + \beta_4 (\text{Border}_{ij}) + \beta_4 (\text{LPI}_i) + \beta_4 (\text{LPI}_j) + u_{ij} \quad (3)$$

where i is the exporting country and j denotes the importing country. Xij denotes the value of exports from i to j. The explanatory variables in the gravity model are defined as follows:

POP$_i$ or POP$_j$ is the population of the country as a measure for the size of the economy;

PCGDP$_i$ or PCGDP$_j$ is the per capita income based on purchasing power parity;

D$_{ij}$ is the distance between country i and country j measured by the air routes using the straight line or great circle measure of distance. This measure seems to be a reasonable measure of averaging across different modes of transportation and works well in practice;

Border$_{ij}$ is a dummy variable to identify whether a country shares a border with the importing country to account for the possibility that neighbouring countries may engage in large volumes of border trade, which they often do. The dummy variable is unity when countries i and j share a common border and 0 when they do not;

LPI$_i$ or LPI$_j$ is the Logistics Performance Index score for the country;

u$_{ij}$ is a log-normally distributed error term and represents the numerous other influences on bilateral trade.

Additionally, the following variables are used in the following estimation models:

LPI_S1: Overall LPI score for the exporter;

LPI_S2: Overall LPI score for the importer;

CUS_S1: Customs score for the exporter;

CUS_S2: Customs score for the importer;

INFRA_S1: Infrastructure score for the exporter;

INFRA_S2: Infrastructure score for the importer;

LOGSERV_S1: Logistics Services score for the exporter;

LOGSERV_S2: Logistics Services score for the importer;

SHIP_S1: Ease of Shipment score for the exporter;

SHIP_S2: Ease of Shipment score for the importer;

TIME_S1: Timeliness score for the exporter;

TIME_S2: Timeliness score for the importer;

TRACK_S1: Ease of Tracking score for the exporter;

TRACK_S2: Ease of Tracking score for the importer.

Study sample

The dependent variable in the following analysis is the natural logarithm of total exports measured in current international prices (US$ value). The trade data are derived from the United Nations Commodity Trade Statistics Database (UN Comtrade)[3] and cover the Arab countries. Observations for all variables are taken in four periods (2007, 2010, 2012 and 2014), as the LPI is available only for these years.

The data source for POP and PCGDP is the World Economic Outlook published by the International Monetary Fund (IMF).[4] Bilateral distance is measured, in miles, as the great circle distance between the two capital cities of the trading partners. Bilateral distance is sourced from the data set developed by FreeMapTools.[5]

9.4 Estimation results

Estimation technique

The estimation technique derives from Gujarati and Porter (2009). Pooled data can be estimated using fixed effects models (FEM) or random effects models (REM). The choice between them depends upon the likely correlation between the cross-section specific error component e_i and the regressors Xs. If it is assumed that e_i and Xs are uncorrelated, REM may be appropriate, whereas if e_i and Xs are correlated, FEM may be appropriate. Additionally, the choice between FEM or REM depends upon whether there is a short panel or long panel. In the analysis by Gujarati and Porter (2009), it is a short panel, i.e. the number of cross-sectional subjects (185) is greater than the number of time periods (4). Gujarati and Porter (2009) explain that even the Hausman formal test that was developed in 1978 (H-test) to choose between FEM and REM can be applied, but in this case, REM estimators are more efficient than FEM estimators. Therefore, results presented here are based on REM estimation (Table 9.2). Equation (3) is estimated using the generalized least squares technique (GLS) with panel data for the period (2007–2014). GLS is fully efficient and yields consistent estimates of the standard errors, since it eliminates serial correlation and heteroskedasticity.

Stationarity of the variables

Levin and Lin (1992, 1993) and Levin, Lin and Chu (2002) provide results on panel unit root tests. The latter developed a procedure using a pooled t-statistic of the estimator to evaluate the hypothesis that each individual time series contains a unit root against the alternative hypothesis that each time series is stationary.

To conduct the Levin-Lin-Chu (LLC) panel unit root test, panels have to be balanced. All panels in this study are balanced, since each cross-sectional unit has the same number of time series observations, which enable conduct of the LLC test. Table 9.2 reports results of this test for variables' levels. It is clearly shown that the null hypothesis of a unit root is rejected at extremely low probability of obtaining type I error for all cases. Thus, all variables are trend stationary series.

Table 9.2 Results of LLC panel unit root test

Null Hypothesis: Unit root (common unit root process)
Levin, Lin and Chu t*

	Statistic	Prob.**
INFL1	-27.0529	0.0000
INFL2	-40.9404	0.0000
LNINFRA_S1	-8.92671	0.0000
LNINFRA_S2	-17.3463	0.0000
LNCUS_S1	-5.85014	0.0000
LNCUS_S2	-44.386	0.0000
LNEXP1	-48.4313	0.0000
LNLOGSERV_S1	-13.5548	0.0000
LNPCGDP1	-51.7084	0.0000
LNLOGSERV_S2	-16.2406	0.0000
LNPCGDP2	-22.6619	0.0000
LNPOP1	-9.33882	0.0000
LNPOP2	-3.60771	0.0002
LNLPI_S1	-7.9834	0.0000
LNLPI_S2	-31.5491	0.0000
LNSHIP_S1	-9.85054	0.0000
LNSHIP_S2	-11.4627	0.0000
LNTIME_S1	-91.9953	0.0000
LNTIME_S2	-41.2811	0.0000
LNTRACK_S1	-13.8152	0.0000
LNTRACK_S2	-16.968	0.0000

Note: LN signifies the Log of the variables.

Correlation matrix

As can be seen in Table 9.3(a), the basic gravity model variables are not strongly correlated. To ensure that there is no multicollinearity in the model, the variance inflation factor (VIF) test is applied, where its value is found to be less than 4 for all possible scenarios, which provides sufficient evidence that no statistical problem will result from including the variables in the same model.

On the other hand, as Table 9.3(b) shows, the LPI sub-measures are extremely correlated. Therefore, any specification that involves all six components of the LPI will suffer from multicollinearity problems. Essentially, this will result in statistically insignificant estimators or may cause an opposite sign. To prevent this problem, they were applied separately in different regression models, keeping other main and control variables. Table 9.4 presents the results in summary.

Table 9.3(a) Correlation matrix for the basic model

	LNDIST_FLY	LNLPI_S1	LNLPI_S2	LNPCGDP1	LNPCGDP2	LNPOP1	LNPOP2	INFL1	INFL2	BORDER
LNDIST_FLY	1									
LNLPI_S1	0.13	1								
LNLPI_S2	0.19	-0.07	1							
LNPCGDP1	-0.32	-0.61	0.06	1						
LNPCGDP2	-0.29	0.03	-0.68	-0.06	1					
LNPOP1	0.25	0.42	-0.04	-0.70	0.04	1				
LNPOP2	0.19	-0.01	0.41	0.05	-0.65	-0.07	1			
INFL1	-0.01	0.16	-0.03	-0.30	0.01	0.46	-0.06	1		
INFL2	0.09	-0.01	0.32	0.01	-0.36	-0.02	0.32	-0.03	1	
BORDER	-0.35	-0.04	-0.05	0.06	0.08	0.06	0.11	0.00	-0.01	1

Table 9.3(b) Correlation matrix between the LPI sub-measures

	LNCUS_S1	LNCUS_S2	LNINFRA_S1	LNINFRA_S2	LNLOGSERV_S1	LNLOGSERV_S2	LNLPI_S1	LNLPI_S2	LNSHIP_S1	LNSHIP_S2	LNTIME_S1	LNTIME_S2	LNTRACK_S1	LNTRACK_S2
LNCUS_S1	1													
LNCUS_S2	-0.08	1												
LNINFRA_S1	0.85	-0.06	1											
LNINFRA_S2	-0.06	0.91	-0.05	1										
LNLOGSERV_S1	0.43	-0.04	0.56	-0.03	1									
LNLOGSERV_S2	0.00	0.49	-0.03	0.57	-0.04	1								
LNLPI_S1	0.81	-0.06	0.93	-0.05	0.59	-0.02	1							
LNLPI_S2	-0.06	0.89	-0.05	0.96	-0.03	0.63	-0.05	1						
LNSHIP_S1	0.43	-0.06	0.64	-0.05	0.35	-0.04	0.70	-0.06	1					
LNSHIP_S2	-0.05	0.67	-0.05	0.80	-0.03	0.53	-0.06	0.85	-0.07	1				
LNTIME_S1	0.22	0.02	0.39	-0.01	0.66	0.05	0.40	0.01	0.13	-0.02	1			
LNTIME_S2	0.00	0.40	-0.05	0.52	-0.04	0.76	-0.02	0.53	-0.10	0.38	0.17	1		
LNTRACK_S1	0.31	-0.04	0.49	-0.03	0.88	-0.04	0.52	-0.04	0.33	-0.03	0.62	-0.03	1	
LNTRACK_S2	0.02	0.40	-0.02	0.50	-0.02	0.91	0.00	0.55	-0.01	0.47	0.05	0.72	-0.01	1

Results

Table 9.4 shows the results from the estimation. The results are in line with the results found previously in the literature. All estimated coefficients are statistically significant with the expected signs in the economic theory. The size of the trading partners represented by population positively impacts on trade flows. GDP per capita has a positive and a statistically significant impact on trade flows. The estimated coefficients are individually highly significant, as the p-values (which help to determine the significance of the results) are so low. The F statistics are also very high, suggesting that, collectively, all variables are statistically important. R-squared (the number that indicates the proportion of the variance in the dependent variable, that is predictable from the independent variable) is reasonable, providing plausible explanatory power.

The key variable of interest is LPI score. It is found that an improvement in trade facilitation (LPI score) of the exporting country by 1 per cent increases trade flows by 0.70 per cent. Trade facilitation of the exporter has a slightly higher impact on trade flows than does trade facilitation of the importer. An improvement in trade facilitation (LPI score) of the importing country by 1 per cent increases trade flows by 0.66 per cent. The results show that there are slight gains in trade to be made from improving trade facilitation in Arab countries.

The impact of the individual components of the LPI are also tested. As mentioned above, due to potential multicollinearity, separate models are used for each of the LPI measures. Estimation results are presented in Table 9.4. Coefficients on other variables are qualitatively similar to the benchmark results reported when applying the overall LPI score.

Customs efficiency of the exporter has an impact on trade flows for both the importer and the exporter. The results show that an improvement in customs efficiency of the exporting country by 1 per cent improves trade flows by 0.69 per cent, and improvement in customs efficiency of the importing country by 1 per cent improves trade flows by 0.56 per cent. Improvement of infrastructure seems to have greater impact for the exporting country too, where improvement in the infrastructure of the exporting country by 1 per cent improves trade flows by 0.82 per cent, and improvement in the infrastructure of the importing country by 1 per cent improves trade flows by 0.60 per cent.

Table 9.4 Regression results for the gravity model (all countries)

Variable	Model 1 Coefficient	Prob.	Model 2 Coefficient	Prob.	Model 3 Coefficient	Prob.	Model 4 Coefficient	Prob.	Model 5 Coefficient	Prob.	Model 6 Coefficient	Prob.	Model 7 Coefficient	Prob.
C	4.645444	0.0263	4.468018	0.0319	5.812289	0.0063	4.390749	0.0268	4.272077	0.0343	3.817062	0.0581	3.615354	0.086
BORDER	0.634198	0.0224	0.600312	0.0311	0.632793	0.0214	0.658686	0.0126	0.631957	0.0191	0.590487	0.0278	0.596431	0.0359
LNDIST_FLY_	-1.152594	0.0000	-1.167179	0.0000	-1.177623	0.0000	-1.112239	0.0000	-1.154871	0.0000	-1.141896	0.0000	-1.133202	0.0000
LNPCGDP1	1.03636	0.0000	1.04636	0.0000	0.981047	0.0000	1.01994	0.0000	1.079752	0.0000	1.09161	0.0000	1.113424	0.0000
LNPCGDP2	0.622341	0.0000	0.652563	0.0000	0.58587	0.0000	0.680158	0.0000	0.639742	0.0000	0.733811	0.0000	0.722837	0.0000
LNPOP1	0.817591	0.0000	0.842987	0.0000	0.800979	0.0000	0.804875	0.0000	0.821744	0.0000	0.847352	0.0000	0.854394	0.0000
LNPOP2	0.710679	0.0000	0.735477	0.0000	0.693227	0.0000	0.721984	0.0000	0.724874	0.0000	0.749501	0.0000	0.752868	0.0000
LNLPI_S1	0.702158	0.0513												
LNLPI_S2	0.662204	0.0686												
LNCUS_S1			0.69421	0.0051										
LNCUS_S2			0.563282	0.0287										
LNINFRA_S1					0.817049	0.0041								
LNINFRA_S2					0.597891	0.0304								
LNLOGSERV_S1							0.683749	0.0061						
LNLOGSERV_S2							0.301173	0.1562						
LNSHIP_S1									0.328233	0.2676				
LNSHIP_S2									0.811476	0.0091				
LNTIME_S1											0.339346	0.1404		
LNTIME_S2											-0.025246	0.9129		
LNTRACK_S1													0.182099	0.4219
LNTRACK_S2													0.199296	0.2877
R-squared	0.473088		0.477013		0.480389		0.481686		0.476069		0.472144		0.463845	
Adjusted R-squared	0.463442		0.467439		0.470877		0.472198		0.466477		0.462481		0.45403	
S.E. of regression	0.580439		0.575792		0.578977		0.593994		0.585293		0.59278		0.577679	
F-statistic	49.04514		49.82313		50.50182		50.76488		49.63487		48.85974		47.2579	
Prob(F-statistic)	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	

Shipment efficiency matters only for the importing country, where enhancement of shipment efficiency of the importing country by 1 per cent improves trade flows by 0.81 per cent, while it is insignificant for the exporting country. In contrast, logistics efficiency matters only for the exporting country, where improvement in logistics efficiency of the exporting country by 1 per cent increases trade flows by 0.68 per cent, while it is insignificant for the importing country. Finally, track and time efficiencies are insignificant for either the exporter or the importer. Clearly, various aspects of trade facilitation impact on trade differently.

The estimation results discussed above suggest that trade facilitation plays a weak role in enhancing trade flows between Arab countries. Even though the overall LPI score is significant for both exporting and importing countries, the magnitude of that significance is relatively small compared with previous research findings regarding the same measures in other regions.

Robustness

To check the robustness of these findings, the estimations for only four countries of the sample - the Kingdom of Bahrain, Egypt, Jordan and Oman – are presented. The choice of countries is based on the availability of consistent data for these countries for all variables and all years (2007, 2010, 2012 and 2014), while all other countries are missing data for certain years and/or some variables.

Table 9.5 shows the results from the estimation. The results are in line with those found in Table 9.4.[6] Not only are all the estimated coefficients statistically significant with the expected signs in the economic theory, but also the estimated models are preferable in terms of their explanatory power and the magnitudes of LPI parameters. The size of the trading partners represented by population positively impacts on trade flows. GDP per capita has a positive and a statistically significant impact on trade flows. The estimated coefficients are individually highly significant, as the p-values are so low. The F statistics are also very high, suggesting that, collectively, all variables are statistically important. R-squared is reasonable, providing plausible explanatory power.

The key variable of interest is LPI score. It is found that an improvement in trade facilitation (LPI score) of the exporting country by 1 per cent increases trade flows by 2.04 per cent. Trade facilitation of the exporter has a much higher impact on trade flows than does trade facilitation of the importer. An improvement in trade facilitation (LPI score) of the importing country by 1 per cent increases trade flows by only 0.78 per cent. These results for the four-country sample show that there are significant gains in trade to be made from improving trade facilitation in the exporting country.

Table 9.5 Regression results for the gravity model (reduced sample)

Variable	Model 1 Coefficient	Model 1 Prob.	Model 2 Coefficient	Model 2 Prob.	Model 3 Coefficient	Model 3 Prob.	Model 4 Coefficient	Model 4 Prob.	Model 5 Coefficient	Model 5 Prob.	Model 6 Coefficient	Model 6 Prob.	Model 7 Coefficient	Model 7 Prob.
C	5.361275	0.0248	6.912691	0.0043	7.550554	0.0019	5.08303	0.0338	5.556232	0.0201	5.102857	0.0373	5.368743	0.0264
BORDER	0.805263	0.0027	0.742916	0.0053	0.778478	0.0035	0.849716	0.0017	0.807857	0.0023	0.757455	0.0046	0.783218	0.0037
LNDIST_FLY_	-0.931617	0.0000	-0.956135	0.0000	-0.955554	0.0000	-0.926959	0.0000	-0.951707	0.0000	-0.956999	0.0000	-0.946651	0.0000
LNPCGDP1	0.508174	0.0065	0.439273	0.0249	0.434678	0.0226	0.663106	0.0003	0.643749	0.0004	0.70285	0.0001	0.687521	0.0002
LNPCGDP2	0.821177	0.0000	0.881219	0.0000	0.778108	0.0000	0.870742	0.0000	0.846603	0.0000	0.93444	0.0000	0.914758	0.0000
LNPOP1	0.698427	0.0000	0.697717	0.0000	0.686813	0.0000	0.703341	0.0000	0.702883	0.0000	0.726334	0.0000	0.715776	0.0000
LNPOP2	0.858098	0.0000	0.901884	0.0000	0.848454	0.0000	0.848451	0.0000	0.864198	0.0000	0.898031	0.0000	0.889287	0.0000
LNLPI_S1	2.039378	0.0004												
LNLPI_S2	0.776393	0.0476												
LNCUS_S1			1.143679	0.0009										
LNCUS_S2			0.470523	0.084										
LNINFRA_S1					1.315562	0.0004								
LNINFRA_S2					0.80302	0.0073								
LNLOGSERV_S1							0.908049	0.0024						
LNLOGSERV_S2							0.206849	0.3984						
LNSHIP_S1									0.528452	0.1351				
LNSHIP_S2									0.700368	0.0454				
LNTIME_S1											0.240964	0.4098		
LNTIME_S2											-0.096521	0.7042		
LNTRACK_S1													0.137949	0.5885
LNTRACK_S2													0.081198	0.7062
R-squared	0.62553		0.618926		0.631795		0.615534		0.614197		0.601294		0.602123	
Adjusted R-squared	0.610476		0.603606		0.616993		0.600078		0.598687		0.585266		0.586128	
S.E. of regression	0.477093		0.480186		0.473625		0.485512		0.493038		0.496001		0.497436	
F-statistic	41.55223		40.40097		42.68255		39.8251		39.60089		37.51434		37.64431	
Prob(F-statistic)	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	

The impacts of the individual components of the LPI are also tested. As mentioned above, due to potential multicollinearity, separate models are used for each of the LPI measures. Estimation results are presented in Table 9.5. Coefficients on other variables are qualitatively similar to the benchmark results reported when applying the overall LPI score.

Customs efficiency of the exporter has a significant impact on trade flows for the exporter, while it is only significant at 8 per cent for the importer. The results show that an improvement in customs efficiency of the exporting country by 1 per cent improves trade flows by 1.14 per cent, while improvement in customs efficiency of the importing country by 1 per cent improves trade flows by only 0.47 per cent. Improvement of infrastructure seems to have a greater impact for the exporting country too, where improvement in infrastructure of the exporting country by 1 per cent improves trade flows by 1.32 per cent, and improvement in infrastructure of the importing country by 1 per cent increases trade flows by 0.80 per cent.

Shipment efficiency matters only for importing country, where enhancement in shipment efficiency of the importing country by 1 per cent improves trade flows by 0.70 per cent, while it is insignificant for the exporting country. In contrast, logistics efficiency matters only for the exporting country, where improvement in logistics efficiency of the exporting country by 1 per cent increases trade flows by 0.91 per cent, while it is insignificant for the importing country. Finally, track and time efficiencies are insignificant for either the exporter or the importer. Clearly, various aspects of trade facilitation impact on trade differently. These impacts are strongly in line with previous findings in the original model but with different magnitudes, confirming the importance of trade facilitation measures for the exporting country.

Indeed, these estimation results suggest that trade facilitation measures in exporting countries play a somewhat stronger role in enhancing their exports than such measures play in importing countries. Even though the overall LPI score is significant for both exporting and importing countries, its magnitude is much smaller for the importer compared with the exporter.

Evidently, in both samples, the estimated coefficients are individually highly significant, for the p-values are so low (except for some LPI sub-measures). The F statistics are also very high, suggesting that, collectively, all variables are statistically important.

9.5 Conclusions

Estimation results discussed above propose that trade facilitation plays a positive but limited role in enhancing trade flows between Arab countries. Even though the overall LPI score is significant for both exporting and importing countries, its magnitude is relatively small compared with previous research findings regarding the same measures in other regions.

For the small sample with a more sophisticated data set, the estimation results suggest that trade facilitation measures in exporting countries play a somewhat stronger role in enhancing their exports than such measures play in importing countries. Even though the overall LPI score is significant for both exporting and importing countries, its magnitude is smaller for the importer than for the exporter.

Indeed, Arab countries should benefit from their geography and stimulate investment in infrastructure, in addition to encouraging public–private partnerships. Efforts should be made to encourage WTO member countries to fulfil the commitments they have entered into, and to encourage other non-members to do so. In fact, there is great potential for expansion of trade with other regions, such as Europe, Asia and Africa. Thus, developing transport and physical infrastructure are fundamental prerequisites to enhancing regional integration and trade cooperation. Additionally, improving intra-Arab trade requires addressing the various structural issues impeding trade development, such as removing the remaining tariff barriers and full implementation of the commitments under the Greater Arab Free Trade Area. Finally, it is vital to enhance productive capacities in the region and to develop the financial sector in order to boost investment in the Arab region and improve intra-Arab trade.

Endnotes

1.   http://lpi.worldbank.org/

2.   The short list excludes Iraq, Libya and Morocco because their data are incomplete (see Table 9.1).

3.   http://comtrade.un.org/

4.   http://www.imf.org/external/pubs/ft/weo/2016/01/weodata/index.aspx

5.   www.freemaptools.com/how-far-is-it-between.htm

6.   It should be mentioned that the results need to be interpreted with some caveats as some countries in the region that are relatively more diversified are not included in the sample.

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10 The Trade Facilitation Agreement and its impacts on the Brazilian transformation industry

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Abstract

The WTO Agreement on Trade Facilitation (TFA) will have a great impact on and could unlock important potential for the Brazilian transformation industry. As a developing country, Brazil would have to make significant changes in its legislation in order to adopt a single window ("Portal Único") for exporters and importers. This chapter concludes that the TFA will have a positive impact on the Brazilian economy in the years to come. Indeed, as Brazil is one of the world's 10 largest economies, its Portal Único Programme has the potential, once fully implemented, to produce significant impacts on the Brazilian economy, increasing GDP by nearly US$ 70 billion per year in the long term. Empirical analyses in this chapter also suggest that the reduction of transaction costs may have positive effects not only for Brazil but also for many other WTO members.

10.1 Introduction

Trade facilitation has been on the WTO agenda since 1996. It was only in 2013 that WTO members were able to conclude an agreement to deal with this important issue to guarantee freer international trade.

From being a marginal topic in the Doha Round negotiations, trade facilitation has become one of the main issues that has helped the WTO gain momentum.[1] On 7 December 2013, WTO members adopted the Bali Ministerial Declaration (WTO, 2013), which includes the WTO Agreement on Trade Facilitation (TFA) under the mandate of the Doha Development Agenda. The TFA reaffirmed the non-discrimination principle enshrined in the General Agreement on Tariffs and Trade (GATT) 1994 Article III and established new provisions to facilitate trade among WTO members.

Despite being the most relevant achievement made by WTO members at the 2013 Bali Ministerial Conference, the topic is not new. WTO members have discussed facilitation of trade since 1996.[2] In 2001, members established the mandate to negotiate provisions on trade facilitation for the purpose of "further expediting the movement, release and clearance of goods, including goods in transit, and the need for enhanced technical assistance and capacity building". The Doha Ministerial Declaration also suggested that "the Council for Trade in Goods should review, clarify and improve relevant aspects" of GATT 1994 Articles V, VIII and X (WTO, 2001, para. 27).

Trade facilitation was a part of Annex D of the Doha Work Programme adopted by the General Council in 2004, and of paragraph 33 and Annex E of the 2005 Hong Kong Ministerial Declaration.

After the approval of the main text of the TFA, WTO members had until 31 July 2014 to notify commitments under one of the three Categories of the Agreement (A, B and C – for developing countries and least-developed countries (LDCs)) and to adopt the Protocol drafted by the Preparatory Committee (WTO, 2014a). However, India tied its consent to the TFA to negotiations on public stockholding for food security,[3] which delayed the process due to the lack of consensus among WTO members (Allen and Monaghan, 2014; Babu, 2014; Bagri, 2014). WTO members found a solution in December 2014 (WTO, 2014c).

The TFA's Protocol allowed the Agreement to come into force and to become a part of Annex 1A of the Multilateral Agreement Establishing the WTO, once two-thirds of WTO members complete the ratification process.[4] Reducing customs delay costs is as relevant as negotiating tariffs, as this chapter suggests. Hummels

and Schaur (2013) have demonstrated that each day merchandise remains at customs represents from 0.6 to 2.1 per cent as equivalent tariff.

For developing countries and LDCs, reducing customs delay costs is an opportunity to enhance their export competitiveness. Furthermore, an intelligent and efficient process at customs can attract more business, more investments and more trade.

This chapter is divided into three sections. The first aims to explain the main topics advanced by the TFA, especially those of concern to the Brazilian Government as it acts to implement Brazil's commitments, whether of Category A, B or C. Therefore, it is necessary to ascertain the extent of the obligations enshrined in the TFA and which topics remain sensitive to the Brazilian economy.

The second section will examine the actions the Brazilian Government is taking in order to fully implement the TFA, and the state of play. Although Brazil has only left a few commitments out of Category A, it does not mean that it will not be a real challenge to get all relevant government agencies to work on a single project to facilitate the analysis of requests for imports and exports in Brazilian customs. It is suggested that Brazil still has some work to do. On the other hand, the *Portal Único* Programme is ambitious and aims to encourage other government agencies to consider harmonizing their practices and optimizing the time of exporters and importers to the benefit of improving Brazil's position in international trade.

The third section will deal with the economic model developed to ascertain the effects of Brazil's *Portal Único* Programme on the efficiency of the Brazilian economy by determining tariff equivalents to applied import tariffs in order to verify the indirect costs of customs delays. The simulations suggest that Brazilian exports, imports, trade balance and GDP growth would all perform more strongly if the programme is carried out by 2017 as planned by the Brazilian Government.

10.2   The Agreement on Trade Facilitation: Brazil's[5] commitments[6]

The TFA has two main sections. Section I has 12 articles dealing with transparency issues (correlation with GATT 1994 Article X) and taxes, documentation and other formalities for import, export and transit of goods operations (correlation with GATT 1994 Articles V and VIII) (ITC, 2013).

The creation of a permanent Committee on Trade Facilitation (TFA Article 13) shows that WTO members are willing to transform this issue into a permanent

topic on the WTO agenda. This Committee could also become a relevant place for discussions on the implementation of the Agreement, and as a forum for WTO developing members to introduce their concerns and constraints, especially given the obligation to review the implementation of TFA every four years (TFA Article 13.1.6).

Section II established three categories[7] of provisions to meet demands for special and differential treatment for LDC and developing country members.[8] Category A includes provisions that a developing country designates for implementation upon entry into force of the TFA. Category B refers to provisions that a developing country designates for implementation on a date after a transitional period of time following the entry into force of the TFA. Category C is similar to Category B but a developing country requires the acquisition of implementation capacity through support for capacity building.

The purpose of this chapter is to address Brazil's initiatives to implement the TFA and its impact on Brazilian industry. Therefore, the analysis will focus on the topics that Brazil did not classify as Category A commitments and the provision enabling country members to adopt a single window for foreign trade activities, as Brazil has been implementing since 2014.[9]

Brazil notified the WTO that all provisions in Section I of the TFA are Category A commitments, except for specific points included in Table 10.1 (WTO, 2014d).

Brazil classified the majority of TFA provisions in Section I as Category A commitments, which might suggest that the country faces fewer challenges than other members in fully implementing the Agreement.[10] It is also important to highlight that TFA provisions have flexible wording, which is not unforeseen considering that the very terms of the mandate to negotiate trade facilitation issues was also marked by ambiguous wording (Neufeld, 2014).

The International Trade Centre (ITC) and World Economic Forum (WEF) have also concluded that developing countries and LDCs have different rates of implementation of TFA – differentiated by topic, priority and implementation of Articles 7 and 10 (including the single window, which means, under TFA Article 10.4, a single entry point for traders to submit documentation and data required for imports, exports or transit of goods). On transparency of rules, the implementation rate is only 40 per cent, on border administration, 49 per cent, and on supporting measures, 45 per cent (ITC and WEF, 2015). When it comes to priorities, developing countries and LDCs more often consider Articles 7, 8 and 10 to be most important (ITC and WEF, 2015).[11] Single window implementation was the third highest priority for the developing countries and LDCs surveyed, and it would

Table 10.1 Commitments of Brazil not falling into Category A

Provision	Content	Why?
Article 3.6.b	Publication of requirements for the application for an advance ruling and respective time period of issuance.	Brazil does not yet have legislation determining rules for advance rulings with the purpose of ascertaining the origin of goods and customs valuation. Moreover, Brazilian law is silent on the time period allowed to respond to written requests.
Article 3.9.a.ii	Definition and scope of advance rulings to include an assessment on the treatment of the good by its origin.	
Article 7.1	Pre-arrival processing of goods.	Brazil has pre-arrival processing only for goods arriving by maritime transportation.
Article 7.7.3	The obligation to include at least three out of seven measures to authorized operators, e.g. low documentation and data requirements, rapid release time, a single customs declaration for all imports and exports, etc.	Brazil's major programmes have preferential procedures for large companies. There is legislation in this area (IN 1073/2010) but Brazil still needs to come up with technological solutions to implement all measures described therein.
Article 10.4	Single window.	Brazil is still implementing its single window programme, which will be concluded in 2017.
Article 11.9	On freedom of transit, providing for advance filing and processing before the arrival of the good.	Brazil does not have an adequate system to receive advance filing to process the transit of goods.

Source: Rios and Panzini 2014; TFA; WTO (2014d).

represent a reduction of about 2.8 per cent in trade costs, according to an OECD study (Moïsé and Sorescu, 2012). That study suggested that only 4 per cent of LDCs and 29 per cent of developing countries have implemented TFA Article 10.4 (single window), while 26 per cent of LDCs and 39 per cent of developing countries have implemented TFA Article 10.1 (simplification of documents) and 25 per cent of LDCs and 57 per cent of developing countries have implemented TFA Article 10.3 (use of international standards) (ITC and WEF, 2015).

Thus, it is interesting that only a few developing countries and LDCs have already started their single window programmes. The top priority for Brazil is to implement TFA Article 10.4. In April 2014, Presidential Decree No. 8,229/2014 was issued to include the initiative under the Foreign Trade System (Sistema integrado de comércio exterior, Siscomex) and 20 public bodies were appointed to be part of it.

It is therefore necessary to examine further Brazil's actions to implement the TFA. The next section will analyse legislative changes in Brazil that are intended to adapt Brazil's legal system to the provisions of the TFA. It will also elaborate on Brazil's single window programme (*Portal Único*), one of the hot topics on the TFA agenda.

10.3 Brazil's actions to implement the TFA

Overview

In January 2015, the Brazilian Governmental Chamber for Foreign Trade (Câmara de Comércio Exterior, Camex) – a ministerial-level body – established the National Committee for Trade Facilitation (Comitê Nacional de Facilitação de Comércio, CNFC), fulfilling the obligations enshrined in Article 23.2 of the TFA.

The CNFC will be assigned to coordinate the implementation work of all other governmental bodies involved in the operation and regulation of Brazilian foreign trade policies. The main objective is to pursue full implementation of the TFA provisions.

The Brazilian Government is working on the possibility of the CNFC being incorporated into Camex. The Brazilian authorities consider that the Brazilian Federal Revenue Authority (RFB) of the Ministry of Finance, and the Secretary of Foreign Trade (SECEX) of the Ministry of Development, Industry and Foreign Trade (MDIC) should co-chair the CNFC, which would comprise 11 agencies in all.[12] Camex has discussed the issue of the competences that should be granted to the CNFC.

Notwithstanding the list of Category A commitments submitted by Brazil to the WTO, there is debate on the inclusion of some Category A commitments for improvement and consolidation, namely: (i) publication and availability of information (Article 1); (ii) opportunity to comment, advance filing and advance information (Article 2); (iii) standardization of tax collection (Article 6.1); (iv) expedited shipment (Article 7.8); and single window (Article 10.4).

The Brazilian Government sees the CNFC as an opportunity to reassess public policies on facilitation, simplification and harmonization in foreign trade. It also provides an opportunity to include more stakeholders. Therefore, Camex seems to be inclined to include the private sector in the CNFC and to act as the highest national committee on all TFA provisions.

As mentioned above, TFA Article 23.2 is being implemented by creation of the CNFC. Moreover, the Brazilian Government is acting to implement other provisions:

- TFA Article 6 on fees and charges imposed on or in connection with imports and exports: Despite this being considered a Category A commitment, some governmental agencies are not in conformity with the provisions of Article 6.

The National Nuclear Energy Commission (CNEN),[13] the National Health Surveillance Agency (ANVISA)[14] and Manaus Free Trade Zone Superintendence (SUFRAMA)[15] charge for imports on the basis of a percentage of the invoice presented or complementary criteria, which is not in conformity with Article 6, which prohibits tax collection without connection to the services provided. Therefore, those agencies will have to review their policies in order to establish a fee or charge a specified amount that is closer to the cost of the service provided.

- TFA Article 7.7 on authorized operations: Brazil did not have legislation on this issue prior to the TFA. Recently, the RFB issued Executive Order RFB No. 1,521/2014 establishing the Brazilian Authorized Economic Operator Programme (OEA). The objective is to certify stakeholders in the logistics chain whose operations represent a low risk (along with objectives related to physical security and customs duties). The programme is voluntary and its goal is to reach 50 per cent of export and import declarations registered by certified OEA companies by 2019. Until July 2015, five companies were certified: Embraer, DHL Global Forwarding, 3M do Brasil, Aeroporto Brasil Viracopos S/A and CNH Industrial.

- TFA Article 10.8 on rejected goods: Brazil did not have appropriate legislation on this topic prior to the TFA. The Brazilian Government recently issued Law No. 13,097/2015 establishing rules for goods that will not be authorized by customs to enter the country, and proceedings for either returning the goods or destroying them. Any importer whose operations are not authorized by the respective governmental agency (e.g. ANVISA) according to the provisions of domestic law on health protection, metrology, public safety, environmental protection, or sanitary, phytosanitary and zoosanitary controls, is compelled to return the goods to the exporter in no more than 30 days after being informed of the rejection. Other governmental agencies shall issue their own regulations explaining the proceedings in each case, even where the Ministry of Agriculture, Livestock and Food Supply (MAPA), Brazilian Institute of Environment and Renewable Natural Resources (IBAMA), RFB and ANVISA are yet to issue their specific proceedings.

Brazil has also issued Presidential Decree No. 8,229/2014 establishing the *Portal Único* Programme in compliance with TFA Article 10.4, which will be examined in the next subsection.

Brazil's single window (Portal Único) programme

The TFA determined that WTO members shall endeavour to implement a single window. Governmental authorities and agencies participating in the programme shall not request traders to submit documentation and data requirements if they have already done so through the single window.

Brazil adopted the definition of a single window provided by the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) in its Recommendation No. 33, namely, "a facility that allows parties involved in trade and transport to lodge standardized information and documents with a single entry point to fulfil all import, export, and transit-related regulatory requirements. If information is electronic, then individual data elements should only be submitted once" (UNECE, 2005).

Brazil's *Portal Único* Programme is not limited by the TFA definition in Article 10.4. It also includes competences regarding availability of information, automation and other aspects that make it a very interesting initiative within the pattern of Brazilian legislation. The ITC and WEF (2015)[16] suggest three levels of complexity for single windows: (i) customs single window, which consists of automating the customs agency and creating automated interfaces with traders, but does not include other government agencies; (ii) national single window, which connects customs agency automation with other government agencies, forming a single platform for exchange of information between government and traders; and (iii) regional or global single window, connecting with systems in other countries. Brazil is on the way to building a national single window connecting the CNFC and other governmental agencies, which will give it more internal coherence in the issuance of new directives and rules on the TFA provisions.

The Brazilian *Portal Único* Programme should be fully implemented by 2017. It has three main pillars: stakeholder integration, redesign of proceedings and information technology:

- Stakeholder integration: This has three levels. The first level is about integrating public and private agents.[17] The second level consists in harmonizing foreign trade proceedings and demands for information and documents within the government. This is supposed to avoid different governmental agencies demanding the same kind of information or document already filed in another governmental agency. The Government believes that this harmonization process will involve five steps: (i) information sharing; (ii) identification of which information can be shared with which governmental agency; (iii) sharing of methodologies of work, which should provide more predictability to operators;

(iv) after adopting compatible methodologies, governmental agencies should adopt the same tools and have similar IT systems; and (v) intelligence integration to avoid tax fraud and to verify compliance with technical and environmental regulations. The third level is the integration of automated systems, concentrating them in the Siscomex mechanism as defined by Presidential Decree No. 660/92.

- Redesign of proceedings: The procedural system is based on the Siscomex mechanism developed in the 1990s. Since then, new governmental controls have emerged, e.g. public policies on environment, human health, food security and consumer protection, among others. The first point is to ascertain all processes and requirements for information and documents in force. The Government then suggests the development of performance indicators to identify where the constraints are, and consequently to remove overlapping and unnecessary stages and requirements.

- Information technology: It is planned to create a modern integrated system to facilitate the sharing of information among governmental agencies and to unify the entrance of external users as defined in the single window clause (Article 10.4).

For exports, the Government aims to reduce the current 13 days it takes for a good to be released and cleared through Brazilian customs to eight days (a reduction of 38 per cent) in 2016. For imports, the Government would like to reduce the current 17 days that it takes for a good to be released and cleared to enter the Brazilian market to 10 days (a reduction of 40 per cent) in 2016. Therefore, the Government has established a target: to have Brazil included in the list of the 70 best countries with which to trade, an improvement of some 50 positions in the World Bank's Doing Business index (World Bank, 2014). Other objectives of the *Portal Único* Programme are to enhance transparent and predictable practices and to simplify the processes and requirements for exports and imports.

The next section will analyse the economic impacts of all Brazilian government measures regarding the *Portal Único* Programme.

10.4 Brazilian transformation industry and the TFA provisions: an economic assessment

The first stage of this economic assessment calculates the tariff equivalent of the costs of delays at Brazilian customs, due to inefficient customs procedures, logistics, transportation and other relevant topics discussed under the TFA.

Automation of customs procedures, rationalization of inspection, security requirements procedures, transparency and facilitated access to information are some of the relevant initiatives envisaged by the TFA to reduce indirect costs in WTO members' customs procedures. The work by Hummels and Schaur (2013) is a reference to the economic assessment hereby proposed. It shows that each day in transit represents an equivalent *ad valorem* tariff of between 0.6 and 2.1 per cent, and that the transformation industry (parts and components trade) would be the most vulnerable.

Comparative analysis of customs barriers in exports and imports

The objective of this comparative analysis is to estimate *ad valorem* tariff equivalents to exports and imports of selected WTO members in relation to the costs of total customs delays (or days in transit). For that, the *ad valorem* tariff[18] equivalent was used for each day in transit (Hummels and Schaur, 2013), estimated for average time periods of exports and imports (World Bank, 2014) and weighted by bilateral trade flows sourced from the World Bank's World Integrated Trade Solution (WITS) database.

Table 10.2 Tariff equivalent to customs delays: Sectoral exports, 2013

WTO member	Agriculture (%)	Extractive industry (%)	Agribusiness (%)	Manufactures (%)	All sectors (%)
Argentina	2.87	0.72	11.57	11.97	11.63
Brazil	4.46	4.42	7.55	13.62	13.04
Chile	5.05	0.53	3.55	16.37	14.78
China	8.21	1.40	13.10	18.60	15.64
Germany	3.47	1.65	7.96	8.27	7.45
India	0.92	2.41	15.61	11.90	10.97
Japan	7.72	0.56	7.19	10.43	9.14
Korea, Republic of	14.59	0.92	7.19	7.49	7.17
Mexico	2.53	2.36	6.29	12.10	11.30
Russian Federation	11.03	0.27	5.89	18.64	17.70
South Africa	8.32	0.61	10.61	14.56	14.29
United States	1.89	0.04	4.66	5.31	5.05

Source: Authors' calculations based on data from Hummels and Schaur (2013), WITS (2013) and World Bank (2014).

Table 10.2 shows the *ad valorem* tariff equivalent of customs delays to macrosectoral exports of a selected group of developed and developing economies using the most recent data available at the date of writing. The last column shows the ad valorem tariff equivalent for all sectors; the cost of customs delays for Brazil's total exports is lower than for the other BRICS (i.e. Brazil, Russia, India, China and South Africa) countries, except for India. Nevertheless, the tariff equivalent for Brazil is almost three times that of exporting companies in the United States.

The results demonstrate that the factor of time is relevant and it can be a tool to enhance Brazil's share in international trade. The methodology applied here shows that the costs of the delays to Brazil are still very high in comparison with other developed economies. On the other hand, the distance between Brazil and other developing economies is relatively short. Although China[19] and Brazil have similar tariff equivalents, it is important to highlight that the Brazilian economy is not as integrated as the Chinese economy in the large trade flows.

Therefore, Brazilian maritime transportation costs, for instance, are higher also because of geographical disadvantages, which make investments in trade facilitation even more important.

Table 10.2 reveals that the manufacturing sector bears the highest costs for customs delays in almost every country analysed. It indicates that time to process and to release goods affects value-added products more. The extractive industry sector seems to be less affected by customs delays.

For imports, the methodology was able to ascertain the tariff equivalents for imports caused by delays at customs, added to the weighted averages of applied tariffs (2013) in order to gauge the tariff equivalents of total costs (effective protection) involved in import procedures of goods in each one of the markets analysed (Figure 10.1).

Figure 10.1 shows how important import tariffs (2013 weighted average) are compared with the tariff equivalents of customs delays for the same group of countries. As can be seen, the costs of customs delays are more significant barriers to trade than actual applied tariffs for the countries analysed and the tariffs currently listed in their respective schedules to the GATT 1994.

Figure 10.1 Delay-cost tariff equivalent and applied tariffs (imports), 2013
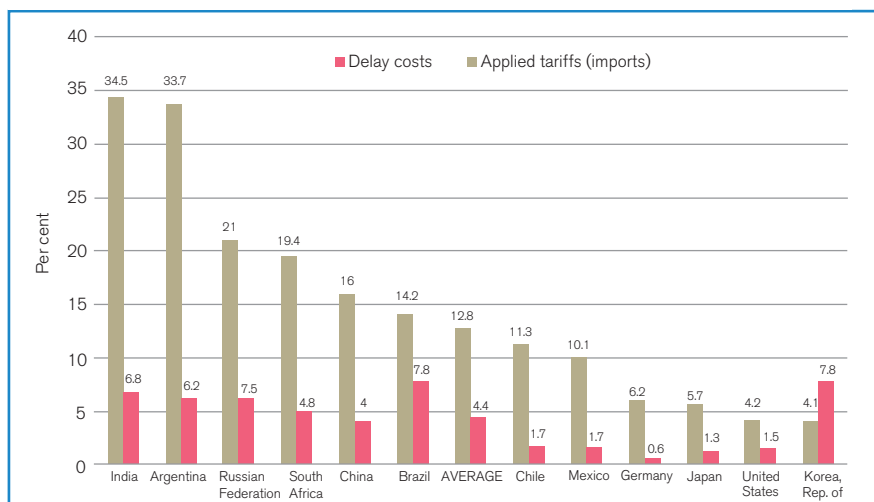
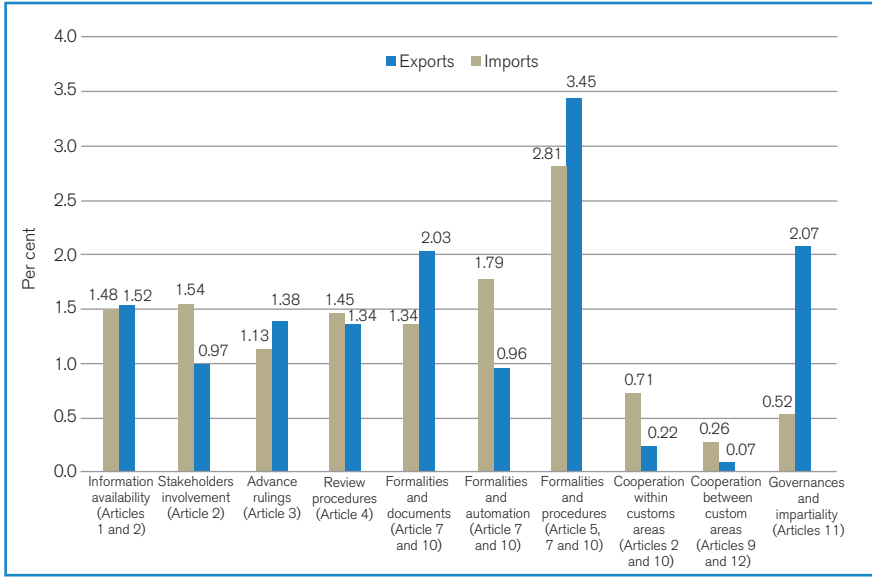*Source:* Authors' calculations based on data from Hummels and Schaur (2013), WITS (2013) and World Bank (2014).

Based on calculations of the tariff equivalents of customs delays on imports, Table 10.3 shows what would be the "effective protection" for the economies analysed, which corresponds to adding the applied tariff to the equivalent tariff for customs delays. In this case, the effective protection of Brazil is about 22 per cent, or almost four times higher than that of the United States (5.7 per cent) and almost half that of Argentina (39.9 per cent). This shows that trade facilitation issues are of relevance for improving the competitiveness of WTO members.

Portal Único for foreign trade: Impact analysis

As established by the Brazilian Government, the *Portal Único* Programme is aimed at reducing from 13 to eight days the time needed for export operations to be released and cleared at Brazilian customs (a reduction of 38 per cent). For imports, the expected reduction is from 17 to 10 days (40 per cent). The Programme should be fully implemented by 2017.

As considered above, it is possible to infer that implementation of the *Portal Único* should result in significant stimulus to improve Brazil's trade flows, especially in its manufacturing sector.

It is also worth bearing in mind that the *Portal Único* Programme is not just a single window programme, but encompasses other tasks, including improving the

Table 10.3 Customs-delay tariff equivalent: effective sectoral protection, 2013

WTO member	Agriculture (%)	Extractive industry (%)	Agribusiness (%)	Manufactures (%)	All sectors (%)
Average	7.8	0.6	18.2	20.0	16.6
Argentina	42.9	0.6	33.3	42.9	39.9
Brazil	4.9	0.3	19.7	25.1	22.0
Chile	6.7	2.0	10.2	14.9	13.0
China	23.8	1.3	21.5	26.4	20.1
Germany	3.8	0.1	5.6	7.6	6.7
India	32.6	2.0	58.9	68.8	41.2
Japan	7.2	0.2	13.7	10.1	6.9
Korea, Republic of	17.14	2.2	32.7	10.2	11.9
Mexico	4.2	0.7	9.4	12.4	11.9
Russian Federation	17.6	7.8	26.5	29.7	28.5
South Africa	8.4	0.2	16.7	29.8	24.2
United States	6.2	0.1	4.9	6.6	5.7

Source: Authors' calculations based on data from Hummels and Schaur (2013), WITS (2013) and World Bank (2014).

availability of information, addressing formalities and automation, and increasing border agency cooperation.

Therefore, it can potentially create positive externalities over several articles included in the Bali Agreement, anticipating reforms in Brazil. Most importantly, it will address the most sensitive TFA provisions for both imports and exports in Brazil.

Figure 10.2 shows the implicit *ad valorem* equivalents of the costs of delays for both exports and imports, broken down by each TFA provision that feeds into the objectives of the *Portal Único*. As shown, most TFA provisions represent significant trade barriers in Brazil, especially those connected with Articles 7 and 10 of the TFA.

Figure 10.2 *Ad valorem* tariff equivalent of each TFA provision related to Brazil's *Portal Único*

Note: Authors' calculations based on data from Hummels and Schaur (2013), WITS (2013) and World Bank (2014).

The *Portal Único* Programme will address some of the tasks represented in Figure 10.2, which have impacts in terms of equivalent *ad valorem* tariff on Brazil's exports and imports. For exports, the *Portal Único* has provisions to review and streamline information availability (with an equivalent *ad valorem* tariff of 1.48 per cent), review procedures (1.45 per cent), and address formalities and documents (1.34 per cent), formalities and automation (1.79 per cent) and formalities and procedures (2.81 per cent).

For imports, the *Portal Único* has provisions to address formalities and documents (with an equivalent *ad valorem* tariff of 2.03 per cent), formalities and automation (0.96 per cent), formalities and procedures (3.45 per cent) and cooperation within each customs jurisdiction (0.22 per cent). Eventually, the economy of Brazil could benefit from the *Portal Único* Programme in more ways than are described in TFA. Article 10.4. It is for the benefit of exporters and importers that the actions taken by the Brazilian Government encompass more elements than the TFA requires.

Methodology[20]

Most of the existing studies on the effects of trade facilitation are based on either gravity equations or computable general equilibrium (CGE) models, or a combination of the two approaches.

Based on a gravity model, Hufbauer and Schott (2013) estimate that gains from trade facilitation may reach as much as US$ 1 trillion in additional global exports per year. Assuming that each country in the sample is able to reduce by half the existing gap in a set of trade facilitation indicators in relation to the most efficient country in the region it belongs to, the authors estimate that developing countries may raise their exports by 9.9 per cent and developed countries by 4.5 per cent. In another study using a gravity model, Dennis and Shepherd (2011) call attention to the potential positive effects of trade facilitation on the extensive margin of trade. According to their estimations, a 10 per cent reduction in the costs to export may increase by 3 per cent the number of products exported by any given country. Other examples of recent empirical works on trade facilitation using gravity models are Djankov, Freund and Pham (2010), Hoekman and Nicita (2011) and Iwanow and Kirkpatrick (2007).

When it comes to estimating the impacts of trade facilitation using CGE models, Decreux and Fontagné (2011) suggest that a 50 per cent reduction in delays at customs may increase global exports by 2 per cent. They use the Mirage (Modelling International Relationships in Applied General Equilibrium) CGE model and the costs of delays are represented by estimated *ad valorem* equivalents based on information sourced from both Doing Business and Minor and Tsigas (2008). In a more recent work, Zaki (2014) estimates the *ad valorem* equivalents of the costs of delays at customs for a set of countries using a gravity model. In a second stage, Zaki uses the Mirage model and simulates a 50 per cent reduction in the costs of delays at customs for the same set of countries. Results from simulations suggest that gains from trade tend to be higher for LDCs and developing countries in comparison with developed ones. Accordingly, exports from Latin American as well as Middle Eastern countries may increase by up to 16.2 per cent and 13.8 per cent respectively, as a consequence of trade facilitation reforms. Other results on the impacts of trade facilitation reforms based on CGE modelling – usually employing "ad hoc" estimations of the costs of delays at customs – can be found in APEC (1999), Francois, Van Meil and Van Tongeren (2003), Hertel, Walmsley and Itakuna (2001) and OECD (2009).

The CGE model employed in the present study is based on the Global Trade Analysis Project's GTAP 8 database for 2007 (Hertel and Tsigas, 1997).[21] The authors updated the original database to 2013, using real data from all economies

involved in the simulations. The approach adopted in this study follows closely that described in OECD (2009). However, in order to trace the dynamic impacts of the TFA on the economy of Brazil, the authors decided to run the simulations using the more sophisticated dynamic version of the GTAP model (GDyn) instead of its static version as employed by OECD (2009).

With the dynamic GTAP model, it is possible to ascertain the convergence path between the initial equilibrium (before the policy is taken into force) and the final equilibrium (with the impacts of the policy fully absorbed by the economy). The impacts of the policy are measured in comparison with a counterfactual scenario (i.e. how the world economy – and the subject economy - would have evolved in the event that the policy analysed had not been implemented).

Data projections for the counterfactual scenario were sourced from the Centre d'Études Prospectives et d'Informations Internationales (CEPII). The counterfactual scenario was projected from 2014 to 2030 based on the following variables: (i) real GDP growth; (ii) labour force growth; and (iii) population growth, for Argentina, Brazil, China, the European Union, the United States and the rest of the world.

The impacts on the economy of Brazil of a reduction in total delays at customs for both exports (38 per cent reduction) and imports (40 per cent reduction) are shown below.

Figure 10.3 *Portal Único* Programme impact: gains in Brazil's GDP compared with the base scenario[22]
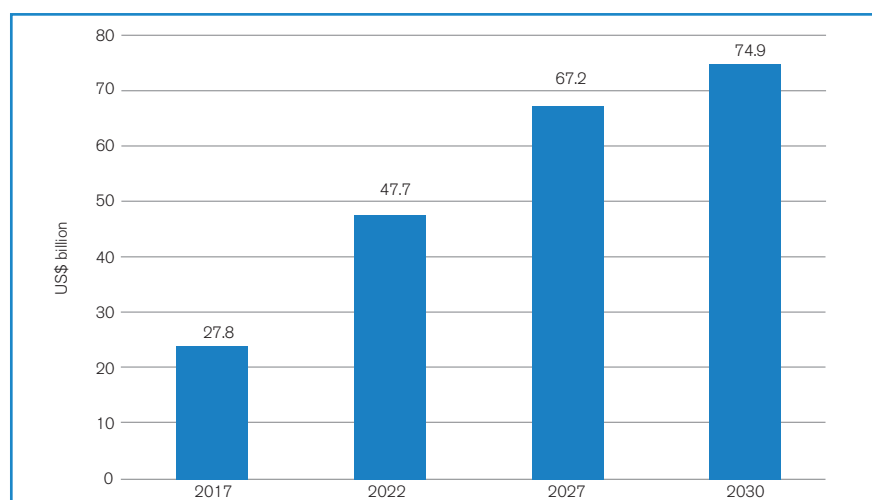
Note: Simulation with GDyn model, GTAP 8 database and long-run projections from CEPII.

Macroeconomic impacts

The *Portal Único* Programme could have a positive impact on the Brazilian GDP growth rate (Figure 10.3). Growth is projected to be 1.19 per cent higher in comparison with the counterfactual scenario (i.e. if the measure had never come into force) by 2017, and 2.53 per cent higher by 2030. Moreover, if Brazil's performance is stronger than projected, Argentina will benefit, as it will stimulate investments and a higher GDP growth rate for Argentina.

Figure 10.4 shows that the reduction of customs delay costs means that Brazilian international traders should benefit from a reduction of their costs, compared with the counterfactual scenario. The simulation suggests that there should be savings of US$ 22.8 billion (at 2013 value) by 2017 and US$ 33.4 billion in 2030.

Figure 10.5 demonstrates that Brazilian trade flow would be US$ 36.18 billion higher (an increase of 7.92 per cent) by 2017, if the *Portal Único* Programme is implemented, and it could reach US$ 68.42 billion (an increase of 10.08 per cent) by 2030. One explanation for this would be that the reduction in customs delay costs affects perceptions of the quality of goods exported and imported by the country, which means a positive shock in the foreign demand for Brazilian products as much as a positive shock in the domestic demand for imported goods.

Figure 10.4 *Portal Único* Programme impacts: costs reduction with reduced customs delays
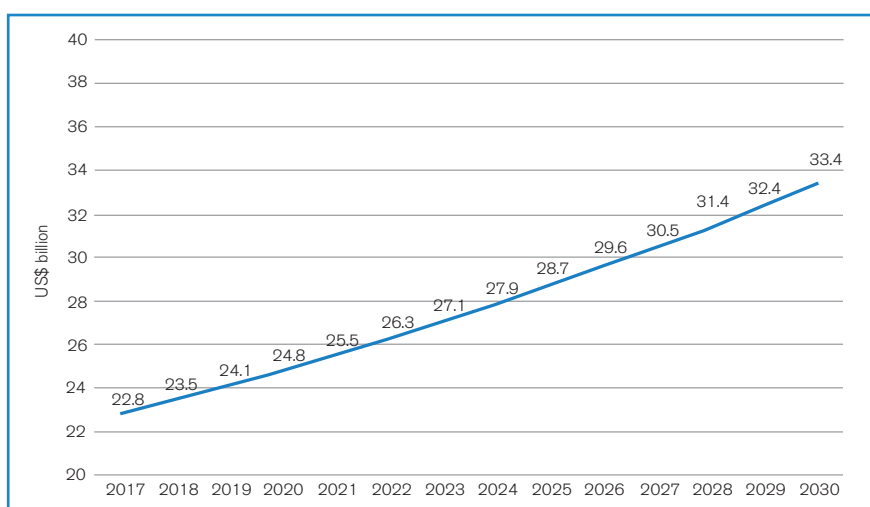
**Figure 10.5** *Portal Único* Programme impacts: gains in Brazil's trade flow
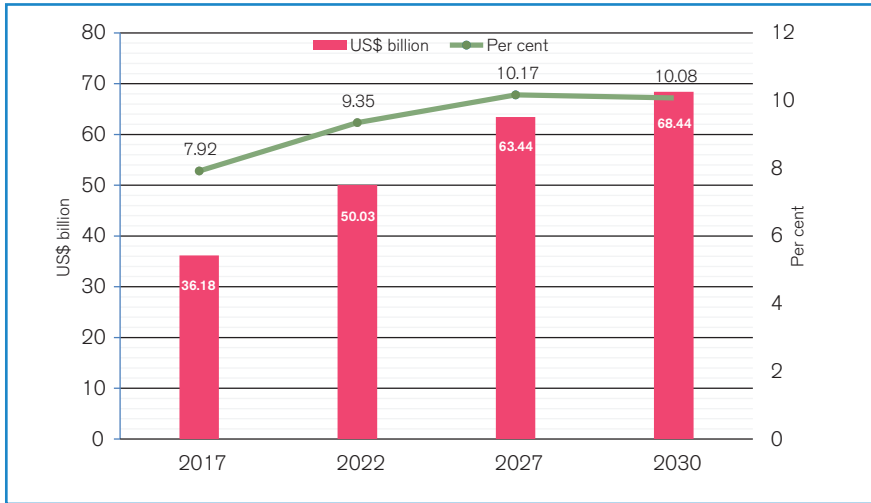
Source: Simulation with GDyn model, GTAP 8 database and long-run projections from CEPII.

In its general aspects, the *Portal Único* Programme is an initiative with potential to create positive economic effects for Brazilian exports and imports. However, the analysis suggests that when sectors are examined separately the transformation industry seems to be more sensitive to changes in customs procedures. The analysis shows that the *Portal Único* Programme stimulates a structural change in the Brazilian economy, with the reallocation of production factors to more capital-intensive industries instead of other sectors of the economy, which have their exports reduced compared with the counterfactual scenario. The reallocation of production factors to more capital-intensive sectors tends to be stronger in the first years of the implementation of the programme. In the long run, a positive reaction is also observed in the exports of the agriculture, extractive and services sectors due to the growth of capital and labour stocks in the economy and the natural trend to constant returns among sectors.

Impacts on the Brazilian transformation industry

As discussed above, trade facilitation could encourage different sectors of the economy in an uneven pattern. The manufacturing industry is the export sector that should benefit most from the reduction of customs delays. The simulation suggests an increase of 10.3 per cent in Brazilian exports by 2017 and, in the long term, continued growth that should reach 26.5 per cent in 2030, both rates compared with the counterfactual scenario.

Figure 10.6 *Portal Único* Programme impacts: gains in Brazil's transformation industry trade flow compared with the counterfactual scenario
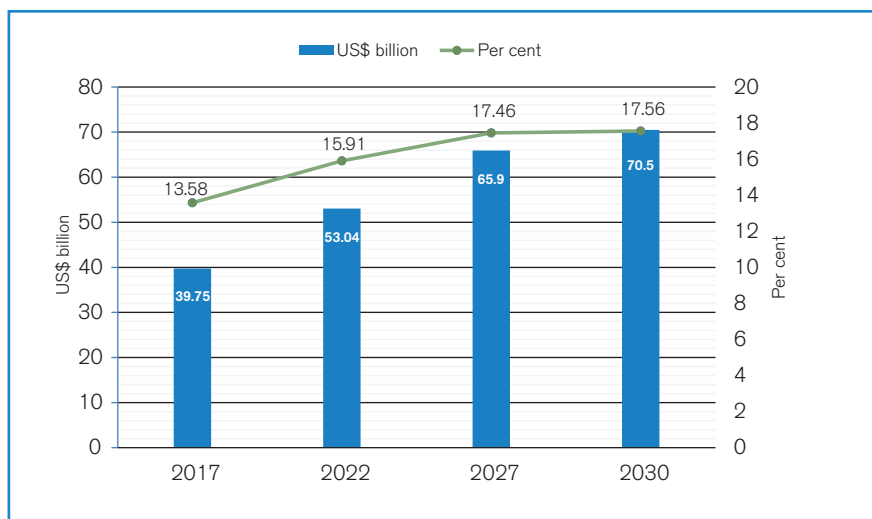
Simulation results for the Brazilian transformation industry are also impressive (Figures 10.6 and 10.7).

Figure 10.6 shows simulated gains in the Brazilian transformation industry's trade flow in US dollars (at 2013 value). In 2017, the year of full implementation of the *Portal Único*, Brazil's exports and imports of industrial goods should benefit from gains of US$ 39.75 billion (or 13.58 per cent) compared with the counterfactual scenario. In 2030, the simulation suggests that industrial gains would be of US$ 70.5 billion (17.56 per cent). It is also worth noting that the trajectory expressed in percentage terms slows with each cycle, from 2.33 per cent (2022 compared with 2017) to only 0.10 per cent (2030 compared with 2027).

Figure 10.7 shows the simulated impacts of the gains in the Brazilian transformation industry's trade balance relative to the counterfactual scenario. Considering that results from the simulation suggest that, for the first years, the impact would be more relevant on investments in industrial goods, it is no surprise that the trade balance gains become more significant and reach US$ 7.14 billion (an increase of 16.40 per cent) by 2020, which is only three years after full implementation of the *Portal Único* Programme. By 2030, the trade balance for Brazilian industrial goods should benefit from a rise of US$ 13.54 billion (or 17.40 per cent).

Figure 10.7 *Portal Único* Programme impacts: gains in Brazil's transformation industry trade balance compared with the counterfactual scenario
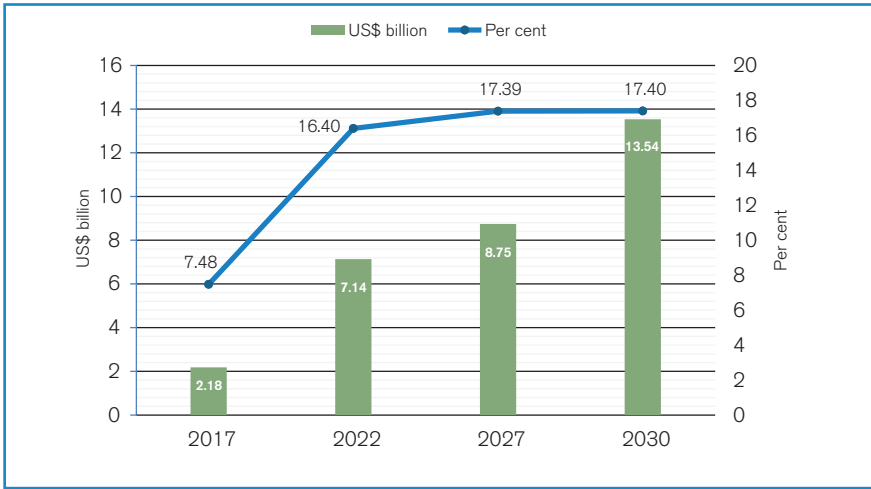
10.5 Conclusions

The Peterson Institute of International Economics (PIIE) has estimated that the TFA could result in gains for world GDP of up to US$ 1 trillion (Hufbauer and Schott, 2013). As Brazil is one of the world's 10 largest economies, its *Portal Único* Programme has the potential, once fully implemented, to produce significant impacts on the Brazilian economy, with nearly US$ 70 billion per year to be added to Brazilian GDP in the long term.

Results of the simulations have also shown that time is a relevant trade barrier. It is of greater importance than other factors in efforts to reduce transaction costs to improve Brazil's trade performance, especially in its transformation industry. Time costs are particularly damaging to trade in higher-value-added goods. Empirical analyses in this study have also suggested that reduction of transaction costs may have positive effects, not only for Brazil but also for many other WTO members.

The reduction of delays at customs in Brazil through the *Portal Único* Programme is likely to unlock Brazil's economic potential because it would primarily benefit capital-intensive industries. To achieve this potential, this study also suggests that Brazil could reverse the ongoing deindustrialization process, through the reduction

in the share of primary products in its total exports. Furthermore, the *Portal Único* could increase Brazil's trade flows, pointing to a more positive trade balance result, especially in the long term.

Brazil would benefit from increased competitiveness in its exporting sector in the future. The results also suggest that this movement should be tied to the rise of imports of intermediates as a consequence of rising investment levels. More imports of parts and components may also lead to an increase in the foreign content embedded in Brazil's exports, contributing to connecting its manufacturing sector to relevant global value chains.

Endnotes

1. The Doha Development Agenda has been under negotiation in the WTO since 2001. The dispute over India's demands on food safety had some impact on the TFA negotiation. With the exception of the TFA, the Doha negotiations have not led to other new agreements. They have led to the updating and extension of the Government Procurement Agreement (GPA), which is a plurilateral agreement. Therefore, the TFA was a significant element in the negotiations of the Doha Development Agenda, as it is the first multilateral Agreement negotiated since the creation of the WTO. See Donnan (2014) and Schwab (2011).

2. The Singapore Ministerial Declaration of 1996 added four topics to the WTO agenda: competition, government procurement, investment and trade facilitation. Trade facilitation provisions are in paragraph 22, and focus on "minimizing the burdens of delegations, especially those with more limited resources, and to coordinating meetings with those relevant UNCTAD bodies" (WTO, 1996).

3. See WTO (2014b).

4. At the time of writing, 70 members had ratified the TFA.

5. Brazil ratified the TFA in March 2016.

6. The International Trade Centre provides a detailed description of the obligations enshrined in the TFA (ITC, 2013). The provisions of most relevance are those that Brazil has considered as not falling into its Category A commitments and the single window (Article 10.4); the focus of this chapter remains on these points.

7. Those categories apply for provisions contained in Articles 1 to 12 or to Section I of the TFA.

8. Although there are fundamental differences between LDC and developing country members, for the purposes of this chapter, "developing countries", "developing members", and "developing economies" refer to both groups.

9. See Presidential Decree No. 8.229/2014 on the creation of the Brazilian Portal Único.

10. When LDCs are compared with developing countries (such as Brazil), in general terms, on average, LDCs have implemented 26 per cent of the Agreement and developing countries, 44 per cent (ITC and WEF, 2015).

11. Surveyed countries considered uniform forms and documentation (Article 10) as the first priority (ranking 4.7 on a scale of 1–5), risk management (Article 7) as second (ranking 4.6), the single window (Article 10) as third (ranking 4.5), pest clearance audit (Article 7) as fourth (ranking 4.3) and border agency cooperation (Article 8) as fifth (ranking 4.3).

12. The Secretary of Foreign Trade (SECEX) of the MDIC (Chair); RFB of the Ministry of Finance (Chair); Executive Director of Camex (Executive Director of CNFC); Civil Office of the Presidency of the Republic; Ministry of Foreign Affairs (MRE); Ministry of Finance; Ministry of Agriculture, Livestock and Food Supply (MAPA); Ministry of Agrarian Development (MDA); Ministry of Planning, Budget and Management; Brazilian Health Surveillance Agency (ANVISA); and National Confederation of Industry (CNI) (private sector).

13. For the taxes charged by CNEN, see: www.cnen.gov.br/seguranca/lfc/listas/lst-valtlc.asp.

14. ANVISA Resolution No. 222/2006 sets different tax rates depending on the size of the company. See: www.emprediarqs.provisorio.ws/arqs_st/1302890986632213/pdf/201502161 24309_1424097785964.

15. See Instruction SUFRAMA No. 192/2000, Annexes II, III, IV and V: www.suframa.gov.br/ download/legislacao/outros_inst_legais/legi_p_192_e_anexos_2000.pdf.

16. This is not considered to be a single window for the purposes of TFA Article 10.4.

17. Presidential Decree No. 8,229/2014 includes 20 participants in the Portal Único Programme, with the possibility of involving more stakeholders if necessary.

18. The WTO Glossary defines an *ad valorem* tariff as "a tariff rate charged as percentage of the price". An *ad valorem* equivalent (AVE) is a "tariff that is not a percentage (e.g., dollars per ton) [that] can be estimated as a percentage of the price".

19. According to the World Bank (2014), Chinese delays are distorted more by the time spent in obtaining export documents than because of shipment activities (movement of cargo, inspections, shipment etc). Those activities bear fewer costs in China than in Brazil. Moreover, it is important to consider that larger manufacture exporters – e.g. China – are more likely to have higher indirect costs for the same time delay than others due to the very nature of the aggregated value in their exports.

20. A detailed explanation on the economy model used in this research is available at <http:// ccgi.fgv.br/sites/ccgi.fgv.br/files/file/Publicacoes/Trade_Facilitation_MPE_fv.pdf>.

21. This is the most recent dataset available to the public at the time of writing this chapter.

22. The base scenario is the counterfactual scenario. It shows how the Brazilian economy would look like in the absence of the trade facilitation reforms, for any given year.

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Trade costs and inclusive growth

Case studies presented by WTO chair-holders

Trade costs and inclusive growth looks at how implementation of the WTO's Trade Facilitation Agreement (TFA) can help to reduce trade costs and promote growth. The publication brings together contributions from ten participants in the WTO Chairs Programme, which supports trade-related activities by academic institutions in developing countries.

The book looks into how the Aid for Trade initiative can assist with implementing the TFA, the importance of mainstreaming trade into national development strategies, and the potential impact of the TFA in various regions.