

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

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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.

* 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.

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 access² 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.

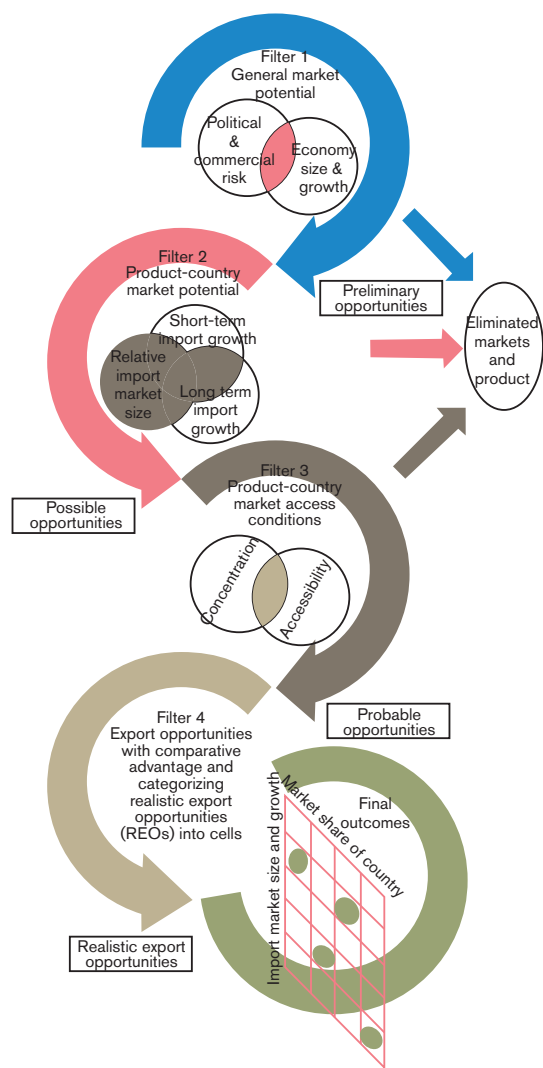
In filter 3, the products and services that are clearly losing ground due to high market access barriers were identified. It was therefore possible to make a distinction between those sub-Saharan African markets in which the identified export opportunities have better prospects of success (due to relatively 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 ($RCA \geq 1$), 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 ($RCA \geq 1$), 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 <i>n</i> 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:

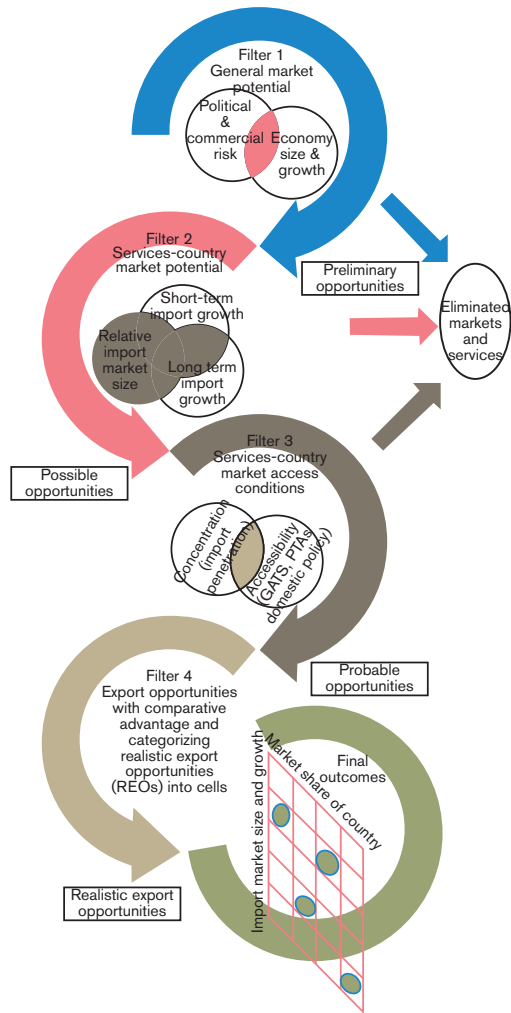
M represents imports, i is a country, j is a product, t is a year and n represents all countries. Such a measure implies a relative import advantage (RMA).

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 $RCA \geq 1$ 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.

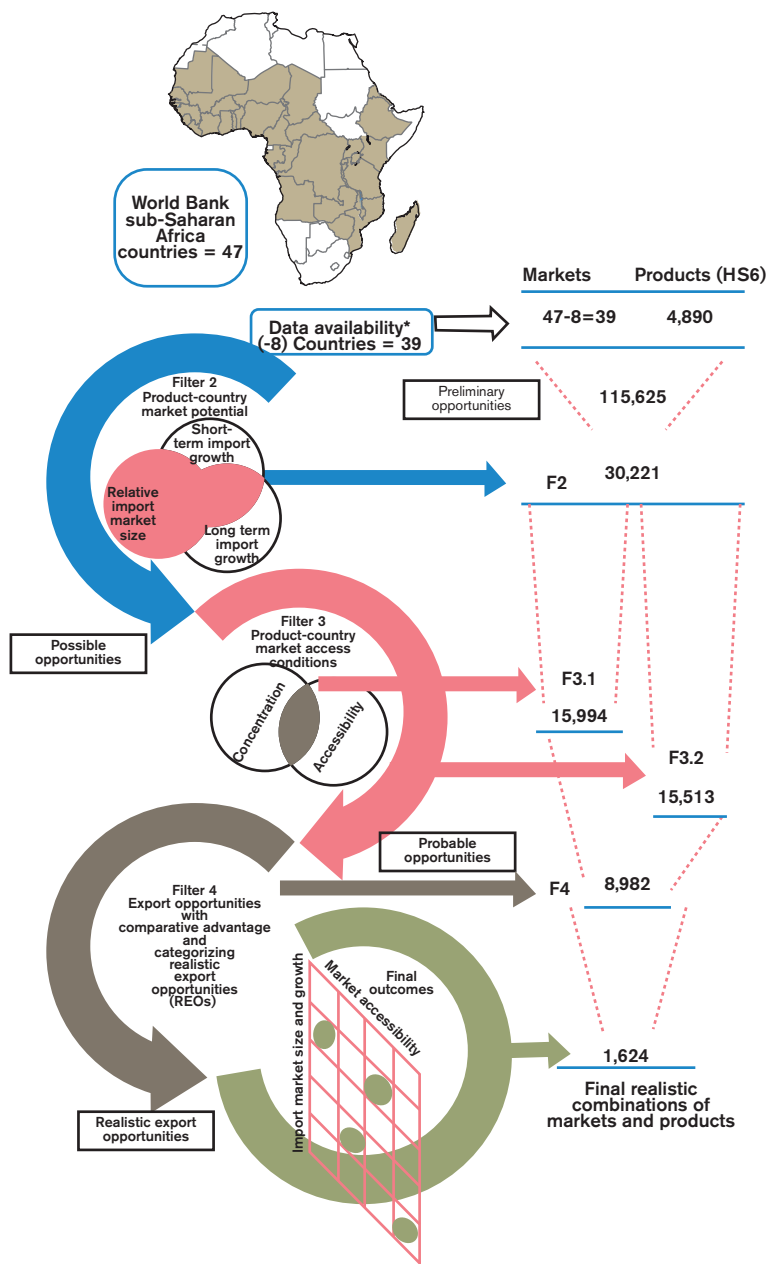
2.5 Results

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).

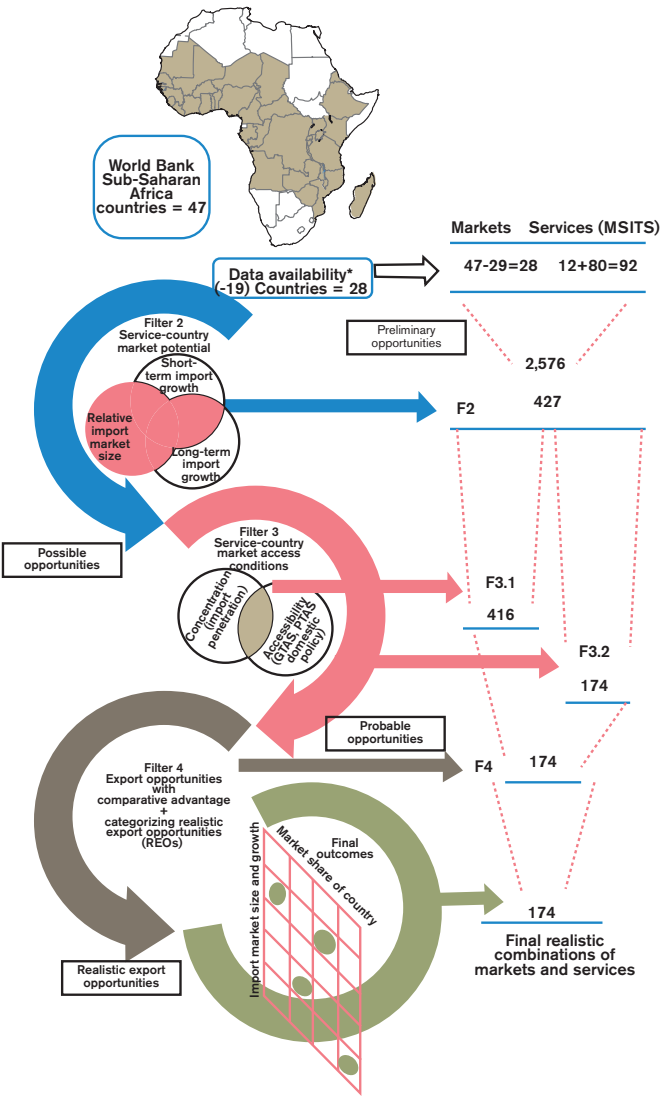
To further illustrate the outcomes derived from the application of the DSM methodology, an example product is used:

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).

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

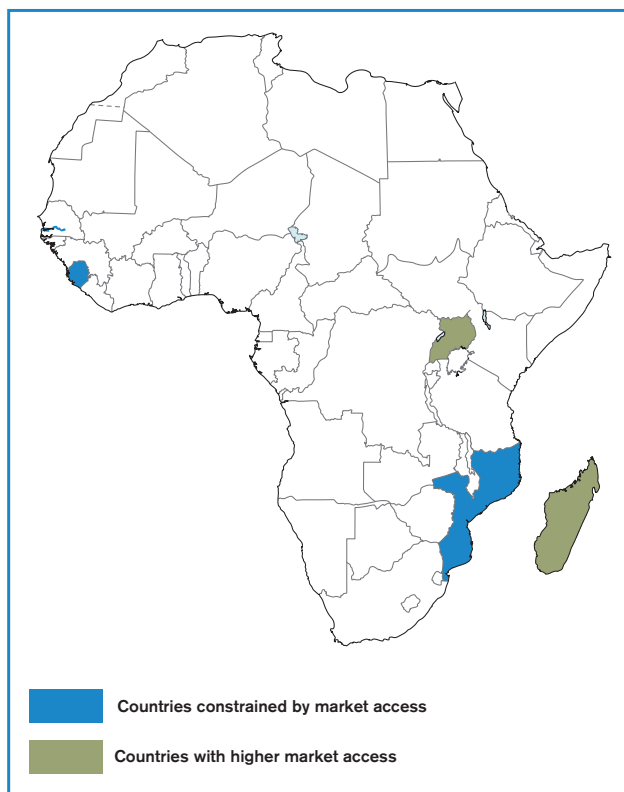
protecting local industry against foreign competition. Added to this is the fact that domestic policy and regulations can be changed or adapted much more easily than can a commitment at a multilateral level.

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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