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The future of international trade and development

Volume 3

INCREASING INTRA-AFRICAN TRADE

CAN THE AFRICAN CONTINENTAL FREE TRADE AREA BE THE GAME CHANGER?

EDITED BY
Wilma Viviers, Martin Cameron & Leila Baghdadi

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The publisher (AOSIS) endorses the South African 'National Scholarly Book Publishers Forum Best Practice for Peer-Review of Scholarly Books'. The book proposal form was evaluated by our Social Sciences, Humanities, Education and Business Management editorial board. The manuscript underwent an iThenticate similarity evaluation to compare the level of originality with other published works and confirmed originality and appropriate acknowledgements to other published works. The manuscript was subjected to a rigorous two-step single-blind peer review assessment before publication by three technical expert reviewers in the field, who did not include the volume editors and were independent of the volume editors, with the identities of the reviewers not revealed to the authors. The reviewers were independent of the publisher, volume editors and authors. The publisher shared feedback on the similarity reports and the reviewers' assessments with the manuscript's volume editors and authors to improve the manuscript. Where the reviewers recommended revisions and improvements, the volume editors and authors responded adequately to such recommendations. The reviewers commented positively on the scholarly merits of the manuscript and recommended that the book be published.

Research justification

The main focus of this book is to understand the complexities and challenges of intra-Africa trade and economic development within the context of the African Continental Free Trade Area (AfCFTA). Given the pressing need for more robust economies and sustainable development amid evolving global trade dynamics, this book explores how to identify export opportunities in Africa and outlines strategies that contribute to increased intra-Africa trade through export diversification and industrialisation. In addition, by addressing the challenges faced by African countries, this book provides strategic insights that will inform evidence-based policy interventions within the AfCFTA context.

This book makes a significant contribution to the existing body of knowledge about trade dynamics and relationships and the potential of the AfCFTA to strengthen regional economic integration across the African continent. Through its application of the refined TRADE-DSM (Decision Support Model) methodology, combined with the product space approach, the book identifies untapped opportunities in a selection of countries and regions in Africa. By illustrating the transformative potential of the AfCFTA, the book highlights the importance of export diversification, industrialisation and sustainable development as essential pillars in building economic resilience and driving export growth. The book further identifies significant barriers that hinder progress in this regard, including resource constraints and logistical challenges.

This book further contributes to new knowledge creation by framing the AfCFTA not merely as a trade agreement but as a catalyst for comprehensive economic transformation in Africa. The identification of realistic export opportunities, coupled with practical solutions to challenges, adds depth to the existing literature on trade policy. By articulating actionable recommendations that align with the AfCFTA's overarching goals, the book serves as a critical resource for policymakers and other stakeholders seeking to realise the full potential of Africa's trade landscape. Furthermore, these strategic recommendations address current gaps in the literature, positioning this research as a vital reference point for future studies and policymaking efforts in the context of Africa's economic and trade agendas within a rapidly changing world.

The TRADE-DSM and product space methodologies stand out for their tailored demand and supply approaches, which not only accommodate the specific contexts of landlocked and developing countries but also integrate both intensive and extensive margin strategies to support export promotion. This dual focus equips stakeholders with a nuanced understanding of export potential and market dynamics, ultimately facilitating more informed

approaches to trade policy formulation and economic development in Africa. Moreover, the synthesis of practical case studies for Rwanda, South Africa, Tunisia and the Economic Community of Central African States (ECCAS) as a regional economic community enriches the scholarship by grounding theoretical frameworks in real-world applications.

The target audience of this book is fellow scholars and researchers in the international trade and development economics disciplines as well as policymakers and other stakeholders who are interested in gaining insights into the potential of the AfCFTA to drive trade and sustainable development across Africa.

The authors confirm that no part of the work has been plagiarised.

Contents

Abbreviations and acronyms, figures and tables appearing in the text and notes

List of acronyms and abbreviations

AfCFTA	African Continental Free Trade Area
AfDB	African Development Bank
AI-ECTA	Australia–India Economic Cooperation and Free Trade Agreement
AMU	Arab Maghreb Union
ARP	Assembly of the Representatives of the People
ASYCUDA	Automated System for Customs Data
ATAF	African Tax Administration Forum
ATO	African Trade Observatory
ATRN	African Tax Research Network
AU	African Union
AUC	African Union Commission
AUDA-NEPAD	African Union Development Agency/New Partnership for Africa's Development
A-UKFTA	Australia–UK Free Trade Agreement
AVE	ad valorem-equivalent
BACI	Base pour l'Analyse du Commerce International
BCG	Boston Consulting Group
BEd	Bachelor of Education
CCTTFA	Central Corridor Transit Transport Facilitation Agency
CEN-SAD	Community of Sahel-Saharan States
CEPII	Centre d'Études Prospectives et d'Informations Internationales
CGE	computable general equilibrium
CID	Center for International Development
CIF	Cost, Insurance and Freight
CIREM	Centre for International Research and Economic Modelling
COMESA	Common Market for Eastern and Southern Africa
COSCO	China Ocean Shipping (Group) Company
COVID-19	coronavirus disease 2019

DCom	Doctor of Commerce
DOTS	Direction of Trade Statistics
DPPA	United Nations Department of Political and Peacebuilding Affairs
DRC	Democratic Republic of the Congo
DSM	Decision Support Model
DTIC	Department of Trade, Industry and Competition
DTP	Digital Trade Protocol
EAC	East African Community
ECCAS	Economic Community of Central African States
ECI	Economic Complexity Index
ECOWAS	Economic Community of West African States
ELG	export-led growth
EPA	export promotion agency
ESSAIT	Higher School for Statistics and Information Analysis of Tunis
ESSECT	Higher School of Economic and Commercial Sciences of Tunis
EU	European Union
FAO	Food and Agriculture Organization
FDI	foreign direct investment
FGI	Fung Global Institute
FMOA	foreign market opportunity analysis
FOB	Free on Board
FTA	free trade area
GDP	gross domestic product
GNP	gross national product
GTAP	Global Trade Analysis Project
GVC	global value chain
HHI	Herfindahl-Hirschman Index
HS	Harmonized System
IATA	International Air Transport Association
IBRD	International Bank for Reconstruction and Development
ICAO	International Civil Aviation Organization
ICBT	informal cross-border trade
IFA	Investment Facilitation Agreement
IGAD	Intergovernmental Authority on Development
IGC	International Growth Centre
IHEC	Institut des Hautes Études Commerciale de Carthage
IMF	International Monetary Fund

IMS	international market selection
INS	National Institute of Statistics
IORA	Indian Ocean Rim Association
ISIC	International Standard Industrial Classification
IT	information technology
ITC	International Trade Centre
ITRISA	International Trade Institute of Southern Africa
JSI	Joint Statement Initiative
JVL	Jewish Virtual Library
LCPS	Lebanese Center for Policy Studies
LDCs	least-developed countries
LPI	Logistics Performance Index
LSCI	Liner Shipping Connectivity Index
LSE	London School of Economics and Political Science
MA	Master of Arts
MacMap	Market Access Map
MAI	Market Access Index
MCom	Master of Commerce
MENAAP	Middle East, North Africa, Afghanistan and Pakistan
MFN	most-favoured-nation
MIS	Market Institutions Section
MSc	Master of Science
MSC	Mediterranean Shipping Company
NBER	National Bureau of Economic Research
NCTTCA	Northern Corridor Transit and Transport Coordination Authority
NIEs	newly industrialised economies
NRF	National Research Foundation
NTBs	non-tariff barriers
NTMs	non-tariff measures
NWU	North-West University
OECD	Organisation for Economic Co-operation and Development
OEMs	original equipment manufacturers
ONDD	Office National du Ducroire
OSBP	one-stop border post
PACCI	Pan African Chamber of Commerce and Industry
PAPSS	Pan-African Payment and Settlement System
PCI	Product Complexity Index
PDI	Plan Directeur d'Industrialisation

PGM	platinum group metals
PhD	Doctor of Philosophy
PIDA	Programme for Infrastructure Development in Africa
PPP	purchasing power parity
PwC	PricewaterhouseCoopers
RATB	revealed absence of trade barriers
RCA	revealed comparative advantage
RECs	regional economic communities
REOs	realistic export opportunities
RITD	Regional Integration and Trade Division
RoO	rules of origin
RSF	SACU Revenue-Sharing Formula
RTA	revealed trade advantage
RVC	regional value chain
SAATM	Single African Air Transport Market
SACU	Southern African Customs Union
SADC	Southern African Development Community
SADR	Sahrawi Arab Democratic Republic
Safto	South African Foreign Trade Organisation
SAIIA	South African Institute of International Affairs
SAP	structural adjustment programme
SARB	South African Reserve Bank
SARS	South African Revenue Service
SDGs	Sustainable Development Goals
SITC	Standard International Trade Classification
SME	small and medium-sized enterprise
SNA	System of National Accounts
SoP	stages of processing
SRO-AC	Subregional Office for Central Africa
StatCan	Statistics Canada
TCI	Trade Complementarity Index
TFA	Trade Facilitation Agreement
TFTA	Tripartite Free Trade Area
TIPA	trade and investment promotion agency
TIPS	Trade and Industrial Development Strategies
TLC	transport and logistics costs
TRADE-DSM	TRADE-Decision Support Model
UAE	United Arab Emirates

UK	United Kingdom
UN	United Nations
UN Comtrade	United Nations Commodity Trade
UNCTAD	United Nations Conference on Trade and Development
UNCTADSTAT	United Nations Conference on Trade and Development Statistics
UNDESA	United Nations Department of Economic and Social Affairs
UNECA	United Nations Economic Commission for Africa
UNIDO	United Nations Industrial Development Organization
UNStat	United Nations Statistics Division
US	United States
USA	United States of America
USITC	United States International Trade Commission
VAT	value-added tax
WBDB	World Bank Doing Business
WBG	World Bank Group
WCO	World Customs Organization
WCP	World Trade Organization Chairs Programme
WDI	World Development Indicators
WEF	World Economic Forum
WEO	World Economic Outlook
WITS	World Integrated Trade Statistics
WTA	World Trade Analyzer
WTO	World Trade Organization
WTP	World Tariff Profile

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Viviers has received many research grants and several prizes, including a fellowship from the International Trade Institute of Southern Africa (ITRISA) for her role in extending the scope of international trade-focused education and research in South Africa; the Women in Research Award from the South African Association of Women Graduates; five university teaching excellence awards; and the Department of Science and Technology's Distinguished Women in Science Award first runner-up in the Humanities and Social Sciences category. Over the years, she has successfully supervised more than 35 MA and PhD students.

Viviers has also been actively involved in initiatives aimed at enhancing South Africa's trade competitiveness and performance. Viviers was instrumental in introducing the TRADE-DSM® (Decision Support Model), a market selection tool and an efficient approach to identifying high-potential export opportunities (or product–country combinations) for individual exporters and countries. The TRADE-DSM® and its applications are extensively covered in numerous academic publications, and Viviers has also overseen its roll-out in several other countries. More recently, she and her research team have been focusing on the digital economy and big data analytics and how these can be leveraged to improve countries' growth prospects and export decision-making.

Preface

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In an era defined by increasing geopolitical uncertainty, shifting trade alliances and rising competition, Africa faces considerable challenges in the years ahead. Yet new opportunities are opening up for African countries to do things differently and better, which could pave the way for a brighter, more economically sustainable future for the continent. Long known for lagging behind other regions in its economic development efforts, Africa is nevertheless rich in natural resources, youthful energy and entrepreneurial talent – all of which have the potential to reshape Africa's trade and economic landscapes if effectively leveraged.

One of the most important levers in this regard is the African Continental Free Trade Area (AfCFTA), an extremely ambitious but potentially game-changing initiative launched by the African Union (AU) some years ago under the auspices of Agenda 2063, the AU's developmental blueprint for the continent. The AfCFTA is being operationalised in stages in line with

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the achievement of various milestones in the negotiations between member states. The AfCFTA aims to greatly expand intra-continental trade in Africa (which currently stands at only about 15%), boost productivity and competitiveness, attract higher levels of investment, harmonise regulatory regimes and trade facilitation measures, and create more sustainable employment. This trade expansion process is heavily geared towards reducing African countries' heavy reliance on primary commodity exports and stimulating more value-added trade across the continent, supported by strong regional value chains.

While a larger, more inclusive continental market sounds good in principle, Africa faces many challenges in bringing the AfCFTA to fruition and ensuring that it serves the purpose for which it was intended. The progressive removal of tariff barriers under the AfCFTA is one of the keys to unlocking the continent's trade potential, but there are many non-tariff barriers that will continue to stand in the way of progress if not seriously addressed. These include undeveloped transport corridors, poor physical infrastructure, regulatory and administrative hurdles (red tape), limited technological adoption and corruption.

To a greater or lesser extent, these impediments have put a damper on trade between members of regional economic communities (RECs) in Africa, such as the Economic Community of West African States (ECOWAS), the Arab Maghreb Union (AMU), the Common Market for Eastern and Southern Africa (COMESA) and the Southern African Development Community (SADC). Many African countries trade more with countries in other parts of the world, such as Europe and Asia, than with their regional neighbours because of the high cost and the practical difficulty of doing so. Moreover, the parlous state of overland transport and logistics facilities in many African countries is felt particularly acutely by landlocked countries in Africa.

The question should be posed: What are the prospects of the AfCFTA succeeding if the RECs have not (it can be argued) performed optimally as trade and development catalysts? It is this question that provided the inspiration for this book and is reflected in its title: *Increasing intra-African trade: Can the African Continental Free Trade Area be the game changer?*

An initial observation that can be made is that the AfCFTA is not a replacement for existing RECs; the latter will continue to have an important role to play in leveraging regional competitive advantages, which mainly benefit the regions in question. The AfCFTA is designed to *complement* the RECs, offering a continent-wide platform for exploring and pursuing trade and investment opportunities on a grander scale, often in non-traditional markets, and projecting a more holistic African identity to the rest of the world. This is very important, given the high levels of economic

and geopolitical volatility that we are seeing these days. More than ever before, Africa needs to adopt a more integrated approach, which takes advantage of economies of scale, and communicate in a stronger, more unified voice. The AfCFTA can be a valuable vehicle in this regard. However, given the scale of its goals and undertakings, it will take time to gain traction.

Another important observation is that the success of the AfCFTA will be heavily dependent on the ability and willingness of countries (working independently or in tandem with regional trading partners) to overcome the many obstacles that impede cost-efficient trade on the continent – from severe infrastructural shortcomings to institutional weaknesses and corruption. The AfCFTA, in many ways, provides a comprehensive framework for enhancing trade and economic wellbeing in Africa, but the practicalities of production and trade are the responsibility of countries, industries and businesses.

It should be noted that several World Trade Organization (WTO) and AfCFTA agreements, which also aim to enhance trade within the African continent, hold particular significance in the context of the AfCFTA. The WTO's Trade Facilitation Agreement (TFA) plays a central role in enhancing cross-border trade within the AfCFTA framework by expediting customs procedures and the clearance of goods. Similarly, the WTO's Agreement on Investment Facilitation for Development or Investment Facilitation Agreement (IFA), which is a plurilateral agreement, seeks to attract higher-quality, long-term investment through greater transparency and predictability for investors. To this end, it will facilitate more development and trade. In addition, the AfCFTA's Protocol on Investment has been developed in collaboration with the WTO and aims to promote greater intra-African investment flows.

Another WTO initiative is the Joint Statement Initiative (JSI) on E-commerce, which largely centres on trade facilitation measures. Together with the AfCFTA's Digital Trade Protocol (DTP), the JSI establishes comprehensive digital trade rules. Designed to harmonise regulatory frameworks across the continent, the DTP promotes coherence and efficiency within Africa with a view to boosting intra-African trade by creating a unified digital market economy.

From an academic perspective, this book contributes to the growing body of knowledge on trade and economic development in Africa and the potential of the AfCFTA to inject more dynamism into African countries' trade efforts. However, it does not delve into the intricacies of the AfCFTA or the modalities shaping the underlying agreement. Instead, it uses the AfCFTA as the backdrop to an analysis of the factors that will ensure that this ambitious trade pact bears fruit. To this end, the book gives specific

attention to trade enablers or building blocks such as export opportunity identification, export diversification and industrialisation.

From a broad stakeholder (including policymaker) perspective, the book acts as a valuable information source and provides recommendations grounded in empirical research into a selection of African countries. These case studies can help to inform decisions aimed at enhancing trade performance, diversifying exports, facilitating investment and driving more sustainable economic growth and development. An important theme in several of the chapters is the application of the refined TRADE-DSM (Decision Support Model) methodology, which is used to reveal high-potential export opportunities for goods.

The content of the book's nine chapters can be summarised as:

- *Chapter 1:* 'Harnessing the African Continental Free Trade Area: Identifying export opportunities to boost intra-Africa trade'. This chapter lays the foundation for the book, highlighting the AfCFTA's potential to act as an inducement to more diverse and robust trade on the continent. It also highlights the importance of African countries producing a wider range of value-added products to drive export-led growth and industrialisation.
- *Chapter 2:* 'TRADE-DSM refinements for landlocked countries'. This chapter delves into the TRADE-DSM methodology, providing a comprehensive overview of the pre-2021 iteration and the subsequent refinements that have enhanced the methodology's applicability, particularly for landlocked countries. The chapter also emphasises the need for stakeholders to navigate the complexities of export diversification, using tailored approaches that address both product and market diversification options.
- *Chapter 3:* 'Export diversification: The case of a landlocked country in Africa, Rwanda'. This chapter demonstrates the application of the TRADE-DSM methodology, using Rwanda as a case study, and the need for careful consideration to be given to logistical flows for efficient export planning. The chapter advocates the adoption of a dual export diversification strategy, incorporating both intensive margin opportunities (increasing existing products in existing markets) and extensive margin opportunities (diversifying into either new products or markets, or both).
- *Chapter 4:* 'Export diversification: The case of Tunisia, with a focus on the African Continental Free Trade Area'. This chapter focuses on new export opportunities for Tunisia in African markets, using the TRADE-DSM methodology. It reveals a significant number of untapped opportunities in a range of sectors and highlights the need for targeted investment strategies to capture these opportunities, particularly in the electrical machinery and wearing apparel sectors in which Tunisia has a limited market share.

- *Chapter 5:* 'Export diversification: The case of South Africa, with a focus on the African Continental Free Trade Area'. This chapter discusses the centrality of export diversification within the AfCFTA framework and the crucial role it plays in driving export growth and industrialisation. It also emphasises the importance of accessing robust market intelligence to reveal promising markets in North and West Africa, which are less traditional markets for South African exporters.
- *Chapter 6:* 'Export diversification: The case of north and south – bilateral opportunities for South Africa and Tunisia'. This chapter shows the bilateral application of the TRADE-DSM methodology while addressing the needs of various stakeholders, ranging from government policymakers to private exporting firms. The chapter also reinforces the need to align high-level strategic considerations with firm-level export initiatives so as to leverage trade agreements.
- *Chapter 7:* 'Industrialisation of regional economic communities: Applying the TRADE-DSM approach to Economic Community of Central African States'. This chapter challenges conventional beliefs about the production capabilities of ECCAS member states when considering intra-regional trade potential. The chapter advocates the adoption of innovative thinking that takes into account the specific characteristics of target markets and challenges outdated assumptions about Africa's economic development.
- *Chapter 8:* 'Expanding Tunisia's export horizons: Leveraging the TRADE-DSM and product space approaches'. This chapter consolidates insights from preceding chapters, reiterating the prevalence of export opportunities for Tunisia in Western and Eastern Africa. It also argues for a more thorough investigation to be conducted into each opportunity to more effectively leverage the potential of the AfCFTA.
- *Chapter 9:* 'Strategic considerations for the success of the African Continental Free Trade Area'. This chapter draws a number of overarching conclusions and emphasises that the AfCFTA represents a unique opportunity for African countries to achieve sustainable economic development through enhanced trade and industrialisation. The chapter also poses critical questions about how the AfCFTA is different from other, more longstanding trade groupings, while advocating the adoption of an evidence-based approach that uses past experiences to understand and realise the AfCFTA's potential going forward.

We hope you will find this book both interesting and enlightening, and that it will give you a new appreciation of Africa's trade and development potential and how the AfCFTA could, given the right circumstances, become the positive catalyst that it was always envisaged to be.

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Four chapters in this book – Chapters 4, 5, 6 and 8 – were specifically informed by the findings from the bilateral research project. Also deserving of special mention is the valuable contribution made by Dr Martin Cameron, one of the project participants, who obtained his Doctor of Philosophy (PhD) from the North-West University (NWU). His thesis, titled 'Extending the TRADE-DSM (Decision Support Model) approach for landlocked countries: A case study of Rwanda', informed the development of two chapters (Chapters 2 and 3) in this book. The revised TRADE-DSM methodology, as described in his thesis, was employed in those chapters that included country case studies.

To broaden the scope of this book, a further chapter was added, based on a research project conducted in 2022 by Dr Cameron in collaboration with the United Nations Economic Commission for Africa's (UNECA) Subregional Office for Central Africa (SRO-AC), titled 'A micro-level approach to export diversification in Central Africa (ECCAS) considering supply, demand, and logistics'. Chapter 7 contains a refined version of the findings from the 2022 UNECA research project.

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Chapter 1

Harnessing the African Continental Free Trade Area: Identifying export opportunities to boost intra-Africa trade

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Introduction

Following intensive negotiations, the African Continental Free Trade Area (AfCFTA) agreement was signed in Kigali, Rwanda, on 21 March 2018, thereby creating the world's largest free trade area (FTA). The AfCFTA covers 54 of the 55 countries in Africa, with a total population of approximately 1.3 billion people and a combined gross domestic product (GDP) of US$3 trillion in 2022 (tralac 2023a).[1] Furthermore, according to the World Economic Forum (WEF 2021), the AfCFTA could potentially lift 30 million people out of extreme poverty, representing a significant step forward in Africa's developmental journey. However, signing the agreement is only the first step. Countries also need to have their commitment to the AfCFTA accepted through their domestic political processes and to submit instruments of ratification that make them legal parties to the agreement.[2]

The AfCFTA is significant for various reasons. The main reason, though, is its potential to contribute to increased economic growth by stimulating intra-African trade, which to date has been comparatively low relative to other world regions, based on formally reported goods trade (Cameron 2020; Hummels 2007; Mold 2022). More details on this characteristic of African trade are provided in the section 'Characteristics of African trade' in this chapter. According to Karingi and Aidi (2022), the AfCFTA has the potential to boost intra-Africa trade by 15–25% or by US$50 billion to US$70 billion (the realisation period not having been specified by the authors), while the World Bank estimates that it could increase intra-Africa trade by as much as 110% and Africa's exports to the rest of the world by up to 46% by 2035 (World Bank 2020). Furthermore, the AfCFTA is an essential building block for realising the African Union's (AU) Agenda 2063, which aims to drive the continent's socio-economic transformation and create 'an integrated, prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in the international arena' (Luke 2023b; WEF 2017).

The scope of the AfCFTA is extensive, covering trade in goods and services, investment, intellectual property rights, competition policy and e-commerce, thus exceeding the requirements of a traditional FTA. The AfCFTA is one of several continent-wide initiatives, including the Single African Air Transport Market (SAATM) and the African Passport and Free Movement of People. These initiatives are or will be underpinned by various protocols, including the protocol relating to the Free Movement of Persons, Right of Residence and the Right of Establishment (AU 2022a).

1. Only one country, i.e. Eritrea, had not indicated its commitment (tralac 2024b).

2. At the time of writing, six countries had yet to deposit their instruments of ratification, with 48 of the 54 signatories having done so by August 2024 (tralac 2024b).

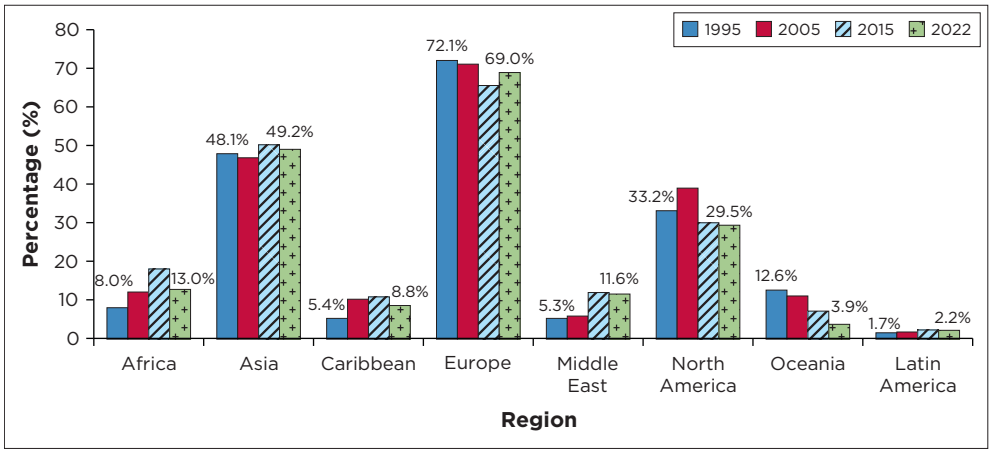
The coronavirus disease 2019 (COVID-19) pandemic delayed the AfCFTA's enactment, but an important date in the AfCFTA calendar was 01 January 2021. On that date, trade under the AfCFTA officially commenced. An earlier significant milestone was the launch of the AfCFTA Operational Phase in July 2019. At the launch, five instruments were noted (AU 2022b):

- The rules of origin (RoO), a regime governing the conditions under which a product or service can be traded duty-free across the region.
- The tariff concessions, that is, a reflection of tariff liberalisation.
- An online mechanism for monitoring, reporting and eliminating non-tariff barriers (NTBs).
- The Pan-African Payment and Settlement System (PAPSS), designed to facilitate payments on time and in full by ensuring that payments are made in local currency and that, at the end of every year, there will be net settlements in foreign exchange.
- The African Trade Observatory (ATO),[3] a trade information portal aimed at addressing hindrances to trade in Africa because of a lack of information about trade opportunities, trade statistics and information about exporters and importers in the different countries.

Numerous promises have been made about positive outcomes and improved intra-continental trade, including expanded trade, enhanced capacity of companies to access and supply more markets, increased employment, stronger economic growth rates, lower poverty levels and increased production through the development of regional value chains (RVCs). Regional value chains stimulate economic activity and ensure supply to new markets by boosting export diversification opportunities. Enhanced intra-Africa trade could also drive industrialisation efforts (Apiko, Woolfrey & Byiers 2020).

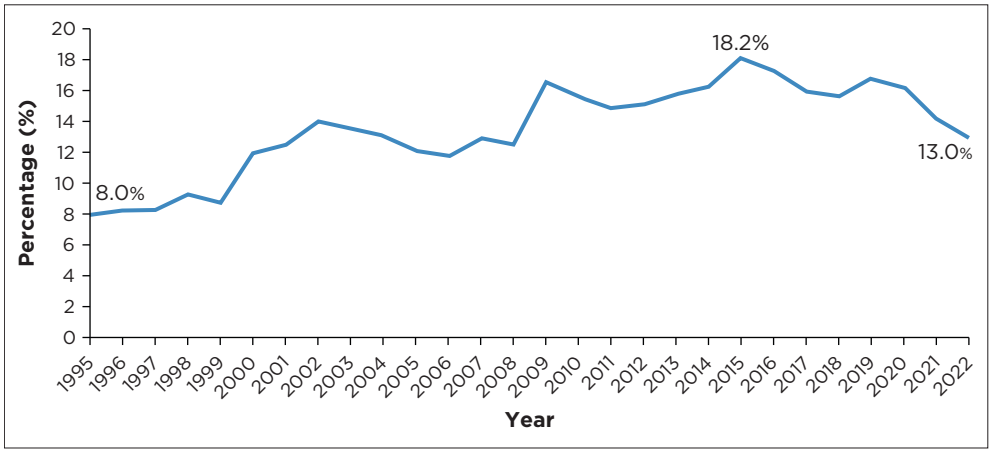
According to the Organisation for Economic Co-operation and Development (OECD), while intra-African exports as a percentage of total African exports increased from approximately 10% in 1995 to just under 19% in 2019 (pre-COVID-19) (OECD 2019), they declined to 16% in 2020 (tralac 2021a). A recent update of this calculation based on the latest available Centre d'Études Prospectives et d'Information Internationales (CEPII) Base pour l'Analyse du Commerce International (BACI) database (Figure 1.1) shows that intra-Africa exports remain significantly below the levels in Europe, the Asia-Pacific region and North America, where intra-regional trade accounts for over 30% of total export trade. From Figure 1.2, it is evident that although intra-Africa trade increased steadily from 1995 to 2015, a reversal of this trend has since been seen – even before the global COVID-19 pandemic affected global trade.

3. See African Trade Observatory dashboard: https://ato.africa/en.



Source: Authors' calculations from data available in the CEPII BACI Database (January 2024 version).
Key: BACI, Base pour l'Analyse du Commerce International; CEPII, Centre d'Études Prospectives et d'Information Internationales.

FIGURE 1.1: Intra-Africa export shares, 1995, 2005, 2015 and 2022, compared to intra-export shares of other regions.



Source: Authors' calculations from data available in the CEPII BACI Database (January 2024 version).
Key: BACI, Base pour l'Analyse du Commerce International; CEPII, Centre d'Études Prospectives et d'Information Internationales.

FIGURE 1.2: Intra-Africa export shares, 1995–2022.

From Figure 1.2 it is clear that the share of intra-Africa exports steadily increased from 8% in 1995 to 18.2% in 2015, after which it declined to 13% in 2022. The reasons for these low levels of trade are discussed in the section 'Characteristics of African trade' in this chapter.

Some key questions can be posed at this point. Will the AfCFTA agreement be a game changer for Africa, serving as the engine of economic growth, industrialisation and increased bilateral and intra-Africa trade? Will African countries be willing and able to steadfastly address the obstacles that they face to boost intra-African trade? It is important to note that the

AfCFTA needs to co-exist with eight regional economic communities (RECs) in Africa. The RECs also aim to enhance intra-regional trade, strengthen regional economies and reduce poverty (World Bank 2020). Before the advent of the AfCFTA, 80% of all intra-African traded volumes flowed through RECs (tralac 2019). Some RECs contribute significantly to regional integration by simplifying trade regimes for small-scale (including informal) traders and enabling cross-border mobile payments.

Will similar efforts under the auspices of the AfCFTA yield new trade opportunities in RECs and encourage wider intra-African trade? After all, much of Africa's trade is still with markets outside Africa (Kuwonu 2021; OECD 2020; Spak et al. 2021). The AfCFTA agreement accommodates this possibility by stating that the RECs' FTAs also form the building blocks of the AfCFTA (tralac 2024a). However, the specific role to be played by the RECs and how they will fit into the AfCFTA's institutional architecture and into continental integration schemes and action plans still need to be addressed.

The rest of this chapter provides the background to, and aims of, the AfCFTA and why increased intra-African trade is important. This is followed by a discussion of the characteristics of Africa's trade in generalised terms with reference to challenges and obstacles that the continent faces in creating more trade opportunities and bringing about more substantial intra-Africa trade, and how the dynamics surrounding the AfCFTA will impact Africa in the short and long term. The chapter concludes by focusing on the need to inform the identification of realistic export opportunities (REOs) for both policymakers and companies, thereby contributing to better decision-making related to a fundamental building block for the success of the AfCFTA – namely, improved regional integration through increased intra-Africa trade.

Background to the African Continental Free Trade Area

Regarding its scope and overall potential, the AfCFTA is both aspirational and expansive. The underlying agreement is designed to reduce tariffs among member countries and to support and enhance sub-RECs and trade agreements in Africa by offering a continent-wide regulatory framework that allows for greater harmony and policy coherence in areas such as trade facilitation, services, and technical norms and standards. The regulatory framework could include investment and intellectual property rights protection, which, to date, have not been provided for in most sub-regional agreements in Africa (World Bank 2020).

African countries that ratify the AfCFTA agreement automatically commit to removing tariffs on 90% of over 5,000 tariff lines and to

liberalising their services sectors. The ultimate objective is to create a single continental market for African goods and services, while also allowing the free movement of (business) people and investments (World Bank 2020). The following three phases characterise the AfCFTA negotiation process (AU 2020a; tralac 2021a):

- *Phase 1* covers protocols for the trade in goods, services and dispute settlement procedures, the negotiations for which are still incomplete. Once the RoO schedules of tariff concessions and the schedules of services commitments have officially been finalised, the parties will effectively be able to trade under the agreed preferential terms. As the AfCFTA will co-exist with other pre-existing FTAs in specific RECs, trade in goods will be possible. Still, different preferential tariff regimes will have their own RoO on the continent. Under an 'interim arrangement', RoO are in place for the goods in question (tralac 2021a). Furthermore, the tariff offer by each partner country must comply with the tariff negotiating modalities (which distinguish between non-sensitive, sensitive and excluded products).

The tariff and RoO[4] negotiations are not yet complete (tralac 2023b). Agreed RoO cover approximately 87.7% of tariff lines. An interim arrangement for trade has been in place since 01 January 2021, which means that trade in those goods for which RoO have been finalised can take place under the tabled tariff offers. These offers must comply with the agreed modalities for tariff negotiations, which are:

- Tariffs on 90% of tariff lines (on non-sensitive goods) are to be eliminated. Countries that are not in the least-developed country (LDC) category must liberalise tariffs on non-sensitive goods over five years and LDCs over 10 years.
- Of the total tariff lines, 7% can be classified as sensitive goods. Non-LDCs must liberalise tariffs on sensitive goods over 10 years and LDCs over 13 years.
- Of the total tariff lines, 3% can be excluded from liberalisation. The value of these imports may not exceed 10% of total intra-Africa imports (tralac 2021b).
- *Phase 2* covers investment, competition policy and intellectual property rights.
- *Phase 3* covers digital trade (e-commerce) and women and youth.

The United Nations Economic Commission for Africa (UNECA) estimates that eliminating import tariffs through the AfCFTA could increase

4. The rules of origin covering 87.7% of tariff lines were agreed during the 8th meeting of the AfCFTA Council of Ministers Responsible for Trade in Accra, Ghana on 28–29 January 2022. An agreement was reached that trading under the AfCFTA regime could proceed for these products (AU 2022a).

intra-Africa trade by 52.3% (UNECA 2019). Eliminating tariffs, however, is not the only requirement for increasing intra-Africa trade. Significant policy reforms and trade facilitation measures, such as enhanced infrastructure and transport logistics, are needed to ensure that the envisaged vast African market comes into being. Moreover, measures should ensure that African countries are given greater scope to diversify their exports, accelerate growth and attract foreign direct investment (FDI).

Aims of the African Continental Free Trade Area

With the AfCFTA being Africa's most ambitious integration effort to date, its main aim is to liberalise trade in goods and (selected) services among those member states of the AU that have joined this arrangement. However, the longer-term aims of deepening the economic integration of the African continent and facilitating the free movement of (business) people and investments will take time. These intended outcomes will require further negotiations and agreements by the parties (tralac 2021a).

The general aims of the AfCFTA can be summarised as (AU 2018):

1. Establish a single market for goods and services, facilitated by the movement of persons. The intention is to strengthen and deepen the economic integration and prosperity of the African continent, underpinned by the vision of 'an integrated, prosperous and peaceful Africa', as stated in Agenda 2063.
2. Expand intra-Africa trade through improved harmonisation and coordination of trade liberalisation and facilitation regimes as well as instruments for goods and services across RECs on the continent – to be achieved through successive rounds of negotiations.
3. Contribute to the movement of people and capital and the mobilisation of investments, while building on the initiatives of the various role players, that is, government and RECs.
4. Lay the foundations for the establishment of a continental customs union.
5. Promote, achieve and sustain inclusive socio-economic development and structural transformation among the parties.
6. Enhance competitiveness at the industry and enterprise level through the leveraging of opportunities for scale production, continental market access and better allocation of resources.
7. Promote industrial development through economic diversification and RVC development, agricultural development and food security.
8. Act to resolve the challenges of multiple and overlapping memberships and expedite regional and continental integration processes.

The specific aims of the AfCFTA can be summarised as (AU 2018):

1. Progressively eliminate tariffs and NTBs to trade in goods.
2. Gradually liberalise trade in services.
3. Support and encourage cooperation in investment, intellectual property rights protection and competition policy.
4. Cooperate, expand and integrate all trade-related policy areas.
5. Set up and sustain an institutional framework for the implementation and administration of the AfCFTA agreement.
6. Cooperate in customs matters.
7. Cooperate in the implementation of trade facilitation measures.
8. Establish a sustainable mechanism for conflict and dispute resolution in relation to members' rights and obligations.

Of particular interest and importance to analysts and direct stakeholders in the short to medium terms are the enhanced trading opportunities that are likely to emerge from the AfCFTA as a result of trade liberalisation, diversification and policy coordination. The latter is anticipated in the wake of a single, continent-wide market for goods and services, which will create a more solid foundation for industrialisation. To this end, African countries have been developing national strategies to complement their broader trade and industrialisation policy frameworks. African countries are also exploring key (unique) opportunities and current constraints as well as the steps required to take full advantage of national, regional and global markets in the AfCFTA context (UNECA 2019).

The first specific aim of the AfCFTA, therefore, is for all countries to make a concerted effort to lower tariffs on goods. According to the International Monetary Fund (IMF), dismantling tariffs on 90% of traded goods and reducing NTBs, such as customs bottlenecks and delays, will increase intra-Africa trade by around 53% and the continent's trade with the rest of the world by about 15% (IMF 2023). Another benefit of the AfCFTA will be increased value addition, more employment opportunities and higher incomes (AU n.d.[a]; Spak et al. 2021).

Although average tariffs on traded goods have been progressively declining on the African continent, mainly because of stronger integration efforts and more effective RECs, tariffs remain significant between RECs. Therefore, the establishment of the AfCFTA, which will result in the reduction or elimination of tariffs on the continent (as well as between RECs), is expected to generate new trade opportunities for African countries (World Bank 2022).

Why is increasing intra-Africa trade important?

Over the past three decades, most African countries have been searching for ways to improve and accelerate their participation in the global economy.

While the developing world has become more integrated through globalisation-induced technology transfer and resulting efficiencies in production, Africa lags other regions in its integration attempts. This has prompted some to question the benefits of globalisation (L'Huillier 2016; Nissanke & Thorbecke 2010; Okonjo-Iweala & Coulibaly 2019).

Africa's share (in value terms) of global trade in goods and services fluctuated over the 2005–2019 period, although on average it showed a gradual rise. Despite this upward trajectory, Africa's respective shares of global exports and global imports have remained relatively constant at about 3% (World Trade Organization [WTO] 2021). Many African countries have intensified their efforts to attract FDI using various fiscal measures and other incentives. Yet FDI inflows have so far largely centred on the extraction of oil and other natural resources. Tellingly, Africa attracted only about 3.5% of global FDI in 2022 (United Nations Conference on Trade and Development [UNCTAD] 2023).

A great deal of literature has been devoted to empirically testing the validity of the export-led growth (ELG) hypothesis. Examples of such studies include those of Hagemeijer and Mućk (2019) who, having briefly reviewed the literature, concluded that the weight of evidence appears to support the ELG hypothesis, particularly when the endogeneity of exports is taken into account. The literature also tends to support bi-directional causality, that is, economic growth and development can prompt countries to export more by, for instance, enabling them to produce a greater variety and a better quality of products (Baldwin & Harrigan 2011; Hummels & Klenow 2005).

Among the insights emerging from studies on economic development are that development entails structural change and that those countries that manage to extricate themselves from poverty and become richer are able to diversify away from agriculture and other traditional industries (McMillan & Rodrik 2011). However, the *manner* in which such structural change affects overall labour productivity is one of the key factors contributing to overall economic growth. According to McMillan and Rodrik (2011), since the 1990s, structural change has been accompanied by a decrease rather than an increase in economic growth in many Latin American and sub-Saharan African countries.

An early proponent of structural change was Nobel laureate Sir Arthur Lewis.[5] His widely cited model on the desirability of moving workers from low-productivity to higher-productivity jobs has featured in recent discussions on the paradox of 'growth-retarding' structural change, notably

5. Sir Arthur Lewis received the joint Nobel Prize in Economic Sciences in 1979 for his pioneering research on economic development, particularly in relation to the problems of developing countries. Sir Lewis was a student at the London School of Economics and Political Science (LSE) from 1934 to 1937 and a member of staff from 1938 to 1948 (LSE n.d.).

in economies where manufacturing's contribution to GDP is low or declining, such as in Africa (McMillan & Rodrik 2011; Weiss 2018). In this regard, many policymakers have looked to the newly industrialised economies (NIEs),[6] and their 'alternative' experience of achieving economic growth and development through export-led manufacturing for guidance. According to a study by the Asian Development Bank Institute (Weiss 2005), a key lesson to be learnt from the NIEs is that manufacturing-focused export growth, in combination with macro-economic balances, can produce positive cumulative and reinforcing effects.

While Africa has managed to bring about structural change since the 1950s and 1960s, its labour force has moved in the wrong direction compared with, for example, Asia. In other words, Africa's labour force has regressed from being more productive to being less productive, while also engaging in increasingly informal economic activity (McMillan & Rodrik 2011).

While the concept of the AfCFTA has been long in the making, the renewed impetus given to its realisation comes at a time when the dynamics in the global economic and geopolitical arenas pose ever-increasing risks (but also opportunities) for Africa. To bring about more integrated trade on the continent, various trade-enabling measures, both within and between countries, need to be given serious attention. Stronger trade integration can help countries in Africa to take advantage of technological and demographic shifts, which will help to build greater continent-wide resilience to shocks, such as the recent COVID-19 pandemic, escalating climate change, intensifying geopolitical strife and accelerating trade fragmentation.

Greater trade openness, for example, would help countries to adapt more readily to climate change and to enhance food security through improved availability and affordability of food. More diversified and broad-based trade, in turn, would help to reduce the impact of disruptions to specific markets and to the supply of particular products. The importance of more liberalised and efficient trade cannot be stressed enough, as it is the principal means through which new (including digital) technologies, expanded and more accessible markets, and a more productive labour force can be combined to create new and higher-paying jobs.

Characteristics of African trade

In its quest to deliver on its mandate, the AfCFTA is facing many hurdles, ranging from geographical challenges, such as a high prevalence of

6. The first tier of NIEs is generally considered to be the Republic of Korea (South Korea), Taiwan, Hong Kong, Singapore and the People's Republic of China, while the second tier comprises Malaysia, Thailand, Indonesia and the Philippines (Weiss 2005).

landlocked countries and shortcomings in logistics capabilities, to low levels of commodity-based industrialisation, with relatively low levels of export diversification and low intra-African trade complementarity. These factors contribute to relatively low levels of intra-African trade and partly account for Africa's lacklustre participation in global trade and economic growth over the past three decades, as discussed in the preceding section. Some of the current realities and challenges that Africa faces and how they can be mitigated are discussed in the subsequent sections.

High prevalence of landlocked countries

A landlocked country is distinctive in that it has no direct access to the sea and is bordered by one, two or more neighbouring countries that also lack such direct access (United Nations [UN] 1982; World Bank 2017). When surrounded by other landlocked countries, it is essentially 'double landlocked'. More than 20% of countries in the world are landlocked. Examples of double-landlocked countries are Liechtenstein (which is immediately surrounded by the landlocked countries of Austria and Switzerland) and Uzbekistan (which is immediately surrounded by the landlocked countries of Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan). On the African continent, there are 16 landlocked countries (30% of African countries), with Rwanda, for example, being landlocked from both the east and the west coasts.

Three other concepts are important in the case of landlocked countries. Firstly, a transit country or a 'transit state' is defined as 'a State, with or without a seacoast, situated between a landlocked State and the sea, through whose territory traffic in transit passes' (UN 1982). Secondly, 'traffic in transit' is defined as the:

> [*T*]ransit of persons, baggage, goods and means of transport across the territory of one or more transit States, 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 which begins or terminates within the territory of the landlocked State. (p. 67)

Thirdly, 'means of transport' is defined as '(1) railway rolling stock, sea, lake and river craft and road vehicles; (2) where local conditions so require, porters and pack animals' (UN 1982, p. 68) where 'landlocked States and transit States may, by agreement between them, include as means of transport pipelines and gas lines' (UN 1982, p. 67).

According to UNCTAD (2017), distance and connectivity are significant factors for landlocked developing countries and small island developing states, as they could contribute to their marginalisation in global and regional transport and trading networks. Landlocked countries' transport costs tend to be higher than those of countries with direct maritime access.

Estimates of transport costs range from 50–100% higher, while export volumes can be up to 60% lower, given landlocked countries' lack of direct access to the sea or maritime transport (Faye et al. 2004; Limão & Venables 2001; Rodrigue, Comtois & Slack 2006).

Over and above the issue of longer overland distances, traffic to and from landlocked countries often attracts higher transaction costs owing to the complexities of coordinating multi-modal transport journeys and crossing multiple borders (World Bank 2002). Raballand (2003), using gravity modelling to study Central Asian economies, found an 80% reduction in trade among Central Asian landlocked countries,[7] while Limão and Venables (2001) found that it is more than seven times more expensive to transport goods by land than by sea. Not only is a reduction in trade the result of high transport and infrastructure costs in neighbouring countries, but political relations between landlocked countries and neighbouring transit economies also play a role (Faye et al. 2004).

It should be noted that the geographical definition of landlocked is much simpler than the corresponding economic definition. Being economically landlocked means that a country's economic development is constrained by a combination of factors, such as remoteness from major markets, infrastructure shortcomings and cross-border challenges (Raballand 2003). According to Raballand (2003), these factors are also in evidence in small island developing states. Paudel (2014), Moore (2017) and Rivero et al. (2019) emphasise that landlocked countries experience lower economic growth rates than countries with a sovereign exit to the sea. These studies confirm that landlocked countries are negatively impacted both in their international trade and in the quality of their institutions, which tend to be less effective because of more administrative bureaucracy and corruption.

However, Paudel (2014) and Moore (2017) found that being economically and geographically landlocked impacts developed and developing countries in different ways. Furthermore, access to the sea does not guarantee growth and development in the long term, as demonstrated by, for example, Madagascar, Mozambique and Congo. Moore (2017) also found that in the period of the study (2005–2014), the so-called landlocked 'penalty' appeared to be increasing over time and was over 40% for developing countries. The authors postulated that part of the reason for this observed increase in the landlocked penalty was the cost of sea transport relative to land transport, which was gradually declining.

In view of the aforementioned, UNCTAD acknowledges that the special needs of developing states, particularly small island developing states and landlocked developing countries, should be considered by the maritime

7. These include the Kyrgyz Republic, Kazakhstan, Tajikistan, Turkmenistan and Uzbekistan.

industry and relevant policymakers (UNCTAD 2019a). As such, any methodology informing export opportunity identification and strategy formulation cannot ignore the explicit treatment of this challenge in the context of both geographically and economically landlocked countries. Chapter 3, therefore, provides a more detailed discussion on incorporating the aspect of landlocked countries into the process of identifying REOs. Rwanda, a landlocked country in Africa, is used as a case study in this regard.

Low level of commodity-based industrialisation

Africa has not benefited from the industrialisation opportunities presented by globalisation, as other continents have, and has largely been unsuccessful in boosting its manufacturing activities, despite manufacturing being a policy priority. On the contrary, Africa has largely been deindustrialising since the 2000s (United Nations Industrial Development Organization [UNIDO] 2022). As a result, the continent's share of manufacturing to GDP has declined. For example, between 1980 and 2009, the share of manufacturing to GDP contracted by about 60% in Chad, the Democratic Republic of the Congo (DRC) and Rwanda; by about 50% in Zambia; and by about 30% in Kenya, Malawi and South Africa. Some 60% of Africa's total imports from the rest of the world are industrial goods (UNECA n.d.).

The deindustrialisation trend in Africa since the beginning of the 2000s has been particularly pronounced in sub-Saharan African countries. According to UNIDO, the share of manufacturing employment to total employment in these countries remained stagnant at 7.2% between 1990 and 2010 but had increased to 8.3% by 2018. However, various sub-Saharan African countries have lagged in this trend reversal, namely Burkina Faso, Cameroon, Kenya, Lesotho, Mozambique and Senegal (UNIDO 2022). Productive capacity in these laggard countries is a significant challenge and is lower than that in emerging regions, such as Asia and Latin America. Compounding the problem is Africa's limited internal and external trade linkages (Zeng 2020).

For policymakers, the persistent challenge is how to expand manufacturing production beyond local market requirements while overcoming existing constraints. Even instruments such as preferential trade agreements have not yet resulted in broad and sustainable manufacturing capabilities. Regional economic communities have developed and implemented regional industrial policies, such as the Southern African Development Community's (SADC) Industrial Strategy and Road Map 2015–2063 (SADC 2017). However, success has sometimes been elusive because of a lack of country-specific industrial policies, policy harmonisation and coordination within and across the RECs. As a result, economies in Africa largely remain undiversified, characterised by the export of unprocessed commodities and a stagnant or weak industrial sector (Kaplinsky & Morris 2008; Staritz 2011).

The structural adjustment programmes (SAPs) implemented mainly in the 1980s and 1990s, although intended to foster macro-economic stability, did not lead to the adoption of export-oriented policies aimed at enhancing firms' productive capabilities. Instead, Africa started lagging economies in Asia and Latin America, partly because its particular circumstances and challenges did not mirror those of other regions where SAPs had been successfully rolled out. Emerging markets that made progress in their SAPs, most notably China, did so through export promotion combined with protectionism. They succeeded in integrating their manufacturers within global value chains (GVCs), leading to diversification into technology-intensive sectors and structural transformation. Because of the continent's developmental lag, African economies have found it challenging to compete effectively against Asian emerging markets, despite having grown specific industries, such as the clothing export industry (Kaplinsky & Morris 2008; Staritz 2011).

It is therefore crucial that African countries industrialise and trade more, with the AfCFTA being an important catalyst in this regard. International trade will spur productivity growth through increased economies of scale. Participating in GVCs and taking advantage of FTAs will promote knowledge transfer, technology adoption, and greater production and trade efficiency. Building such productive capacity is vital for Africa's structural transformation and economic development.

Industrialisation plays a vital role in a country's economic development for several reasons. It boosts economic activity and productivity through the use of new equipment and techniques. It also develops the skills and capabilities of the workforce and effects a positive spillover from these improvements into the broader economy (African Development Bank [AfDB] 2019). In addition, industrialisation helps to boost formal employment and skills development, thereby building a firmer market (expanding buying power), creating wealth in countries' economies and improving the trade balance (AfDB 2019). Moreover, industrialisation is a valuable conduit for structural transformation, as reflected in the continent's development aspirations and expressed in the AU's Agenda 2063, and its global ambitions as set out in the UN's 2030 Agenda for Sustainable Development.

The importance of industrialisation is also recognised in various continental initiatives, such as the Action Plan for Accelerated Industrial Development of Africa and the Programme for Infrastructure Development in Africa (PIDA) (UNECA 2020). According to AfDB estimates, infrastructure-related services in Africa are much more expensive than in other developing regions. For example, transport costs in Africa are nearly 70% higher than in East Asia and 50% higher than in Latin America and South Asia (AfDB 2019).

A successful industrialisation drive under the AfCFTA will hinge on the development and implementation of well-coordinated industrial policies. This is to ensure that African countries first have goods and services to trade. The constraints to industrialisation across the continent should be acknowledged and addressed, and implementation should align with existing policies. Evidence suggests that more significant industrial trade on the continent could attract more investment. This will create opportunities for vertical integration and value addition, which, in turn, may address the binding supply-side constraints that are preventing Africa from better integrating into RVCs and GVCs. Therefore, unleashing the power of the AfCFTA is a vital step in facilitating Africa's integration into the global economy so that it can enjoy the expected gains from its active participation therein.

The ability of the AfCFTA to deliver on its promises depends mainly on whether African countries industrialise and (especially) grow their share of manufacturing to GDP through the production and export of value-added products. Morris and Fessehaie (2014) describe several alternative industrialisation roadmaps (depending on countries' particular circumstances), including a focus on services, low- and medium-technology manufacturing, and resource-based industrialisation in countries rich in natural resources. It follows then that African countries should support their industrial sectors as this will help to boost intra-Africa investment and RVC activity (Mkhabele 2021b). African Continental Free Trade Area secretary-general, H.E. Wamkele Mene, emphasised that African countries' economic and trade policies and strategies need to be underpinned by a shared focus on expanding industrial development across the continent (Mkhabele 2021b).

At present, the AfCFTA lacks a directive to govern industrial policy or a mechanism to deal with the likely absence of industrial policy coordination at the continental level (Mkhabele 2021a). A typical trend is that trade policy has preceded industrial policy. In addition, industrial capacity and capabilities vary across countries and regions, potentially exposing countries to unequal trade dynamics. The smaller and poorer African countries must therefore be afforded equal opportunities to implement the AfCFTA so that they can enjoy the benefits of full and meaningful participation – but not to the extent that their national industries and vulnerable manufacturing sectors are put at risk.

The AfCFTA creates the policy space that can potentially empower these countries to develop new and innovative ways to build competitiveness by expanding their value-added sectors and technological capabilities and moving away from reliance on a few commodities (Mkhabele 2021a).

For more details on the role of export promotion and the identification of export opportunities in assisting individual countries and RECs to

industrialise, see the case study on the Economic Community of Central African States (ECCAS) in Chapter 7.

Low export diversification

Export diversification is a critical driver of more inclusive growth and the type of structural transformation that leads to higher productivity and economic resilience (Caselli et al. 2020). However, poor diversification in trade patterns is the main reason for Africa's limited role in global trade. Export diversification in Africa is low at both a sectoral and a product level and has decreased since 1995 (Morris & Fessehaie 2014), severely undermining Africa's development potential. Africa's average share of total global exports and imports, albeit stable since 1998, is a mere 2.7% (UNCTAD 2019b). Meanwhile, manufactured goods constitute more than 40% of regional exports, with only about 15% leaving the continent (Songwe 2019).

Upon closer inspection of the product groups making up Africa's exports to the world between 1998 and 2018, it is evident that more than 70% comprised minerals and oil. In that period, manufactured goods dominated intra-African trade, at about 45%. Commodity exports barely amounted to one-third of intra-Africa trade (UNCTAD 2022c). Despite efforts to diversify, 45 of the continent's 55 countries remain dependent on exports of primary products from the agricultural, mining and extractive industries (AU n.d.[b]). The high levels of export concentration in primary commodities reflect the heavy dependence of African economies on natural resources and the corresponding weakness of Africa's industrial sector (UNCTAD 2022a).

Admittedly, the degree of diversification differs across regions in Africa (Fosu & Abass 2019). A lack of diversification might intensify as certain countries or regions that are more attractive to investors or more open to change will exacerbate the regional differences. In the face of limited export and development-geared activities, various countries or regions will remain on the periphery. Therefore, structural adjustment mechanisms and policy measures that support economic transformation are vital for countries' equal and sustainable participation in the AfCFTA (Songwe 2019). This is because African countries that trade with one another exchange more manufactured and processed goods, engage in more knowledge transfer and create more value.

The periodic fluctuations in international commodity prices lend weight to the urgent need for both vertical and horizontal export diversification. Vertical and horizontal export diversification involves changing a country's export structure by changing its existing basket of commodities and/or increasing the share of export products by renewing the basket of

commodities through innovation and the use of technology to enhance efficiency and production (Dennis & Shepherd 2007). A country's primary export basket changes with horizontal diversification, which makes trade less vulnerable to fluctuating global commodity prices. As more export sectors are added, there is a reduced dependency on a few sectors to lead export-oriented growth (Naudé & Rossouw 2008).

Vertical diversification, in turn, means that the export mix moves from primary to manufactured products. It could also involve finding new uses for existing and new products through value-added activities, including processing and packaging. In addition, vertical diversification creates more opportunities for spillovers by creating knowledge and enhancing innovation. In this way, more sectors benefit, which improves the international competitiveness of all industries (Matthee & Naudé 2007). Moreover, vertical export diversification helps to stabilise export earnings because prices of manufactured exports do not fluctuate as much as those of primary exports. As a result, countries that produce higher-productivity goods deliver better export performance and benefit more from the gains from globalisation (Hausmann, Hwang & Rodrik 2007).

In addition to vertical and horizontal diversification, backward and forward linkages in the commodity sector could enhance direct and indirect employment opportunities. An industry's backward and forward linkages measure the industry's economic interdependence with other industries (Statistics Singapore n.d.). Upstream linkages relate to the material inputs needed for production, while downstream linkages relate to the products that are produced and distributed. The backward and forward linkages in the manufacturing and service sectors offer market opportunities to both small and large businesses and mainly skilled and semi-skilled labour. Moreover, resource-processing industries can stimulate raw material supply in the soft commodity sectors (i.e. grown rather than extracted commodities that have a growth period ending in harvesting and processing, thereby creating employment) (Morris & Fessehaie 2014). As a result, African countries could expect to accrue higher export revenues and foreign exchange earnings by pursuing forward linkages (Morris & Fessehaie 2014).

Diversification of exports away from resources towards manufacturing and the agro-industry would reduce African countries' total or main dependence on primary commodities, which makes them economically vulnerable (Songwe & Winkler 2012) – particularly as global trade patterns are dominated by industrial products and manufactured goods with increasing technological content (Afreximbank 2019). Export diversification would help to build African countries' resilience to fluctuations in demand because of economic downturns in importing countries and associated price dips, and it could also help to fuel more new jobs. However, it would not automatically lead to more trade.

Every policy and related strategy and plan must consider the highly competitive global environment, which is increasingly dominated by GVCs and RVCs (Brenton & Maliszewska 2022; Huria & Brenton 2015).

Given most African countries' low levels of export diversification and the important role that greater diversification could play in structural transformation, industrialisation and job creation on the continent, it is one of the main aims of the AfCFTA to encourage increased export diversification of products and markets (see the section 'Aims of the African Continental Free Trade Area' in this chapter) (Luke 2023a).

For more details on the importance of identifying REOs to assist African countries' export diversification efforts, see the case studies on Tunisia in Chapter 4 and South Africa in Chapter 5.

Low intra-Africa trade complementarity

As was evident from the preceding sections, Africa's economic landscape is characterised by a diversity of resources, industries and developmental trajectories across the continent, all of which help to explain why intra-Africa trade remains relatively low.

A quick summary of the implications of the effects of these factors can be obtained by considering the intra-Africa international (merchandise) products Trade Complementarity Index (TCI) for African countries. The TCI, by quantifying the complementarity between the export structures of different countries, determines how well 'matched' the trade profiles of two economies are (Michaely 1996). In this way, the TCI can provide insights into the potential synergies and trade opportunities to be harnessed within the AfCFTA. In this context, the TCI[8] stands as a valuable tool for evaluating the potential success of intra-Africa trade within the framework of the AfCFTA.

As the largest FTA in the world by number of participating countries, the AfCFTA aims to enhance economic integration across the African continent. The implementation of such a vast trade agreement requires a nuanced understanding of the complementary nature of member countries' economies. The TCI offers a strategic lens through which to assess this, deploying the 'natural trading partner hypothesis' to identify pairs of countries with diverse comparative advantage structures that are complementary (Khadan & Hosein 2013). The intra-Africa international (merchandise) products TCIs for African countries are shown in the tables

8. The TCI measures the extent to which the export profile of country (or country group) *j* matches the import profile of country (or country group) *k*, the trade partner of country *j*. Outcomes range from 0 to 100, with 0 indicating that there is no correspondence between country *j*'s export structure and country *k*'s import structure, while at the other end of the scale, 100 indicates a perfect match in the two partners' export/import patterns. Therefore, the thinking is that two countries with a relatively high index may gain from trade expansion following the signing of a preferential trade agreement.

in Appendix A1. Exporters are shown on the vertical (rows), while importers (partners) are shown on the horizontal (columns). The table shows the average of the World Integrated Trade Solutions (WITS 2021). Trade complementarity indexes were calculated for each country in the period 2015–2019. For the sake of completeness, all African countries are shown in the table, but countries with blank rows and columns do not have sufficient information, according to WITS (2021), to calculate the required TCIs.

To facilitate the discussion, we consider the potential of South Africa and Tunisia to further develop trade opportunities based on the TCI measure. Evident from the tables in Appendix A1 is that Tunisia as an exporter to South Africa has a TCI of 50.79 (Table A1.3), implying that the South African import demand pattern is potentially an average match for exports from Tunisia. On the opposite side of the relationship, South Africa has a slightly higher average TCI (51.45) for exports to Tunisia (Table A1.3), implying that Tunisia's potential import demand also provides an 'average' match for South Africa's export profile. Contrary to this example, the TCIs for South Africa to Botswana and Namibia are relatively higher at 65.4 and 63.4, respectively (Table A1.1 and Table A1.3), implying that Botswana's and Namibia's import patterns match the export profile of South Africa much more closely. This is also borne out by the fact that South Africa is both Botswana's and Namibia's largest import partner (CEPII 2021).

Therefore, from these indicators, we would expect to find that Tunisia's exports to South Africa provide some opportunities to expand, while exports from South Africa to Tunisia should do the same (all else remaining constant).

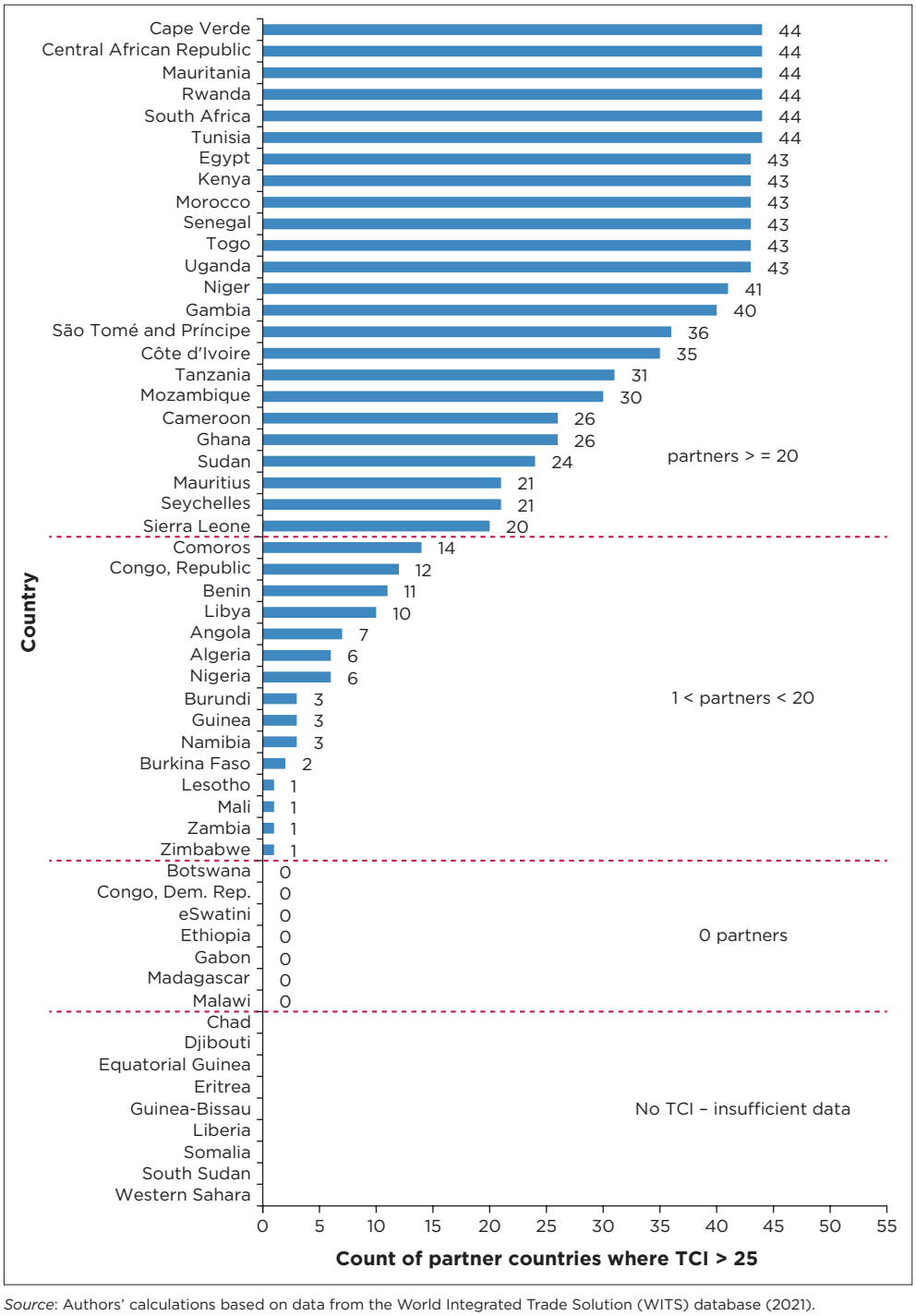
In summary, the overall number of bilateral country pairs that exhibit TCIs greater than 60 is only three,[9] and for TCIs greater than 50 it is only 51, out of the theoretical 3,025 (55 × 55) country pairs possible.

According to Khandelwal (2004), regional trade arrangements where countries have TCIs of less than 25 have all failed. For this reason, we use 25 as the lower limit and calculate the total number of countries that have partner countries with TCIs of 25 or more in Figure 1.3. There are nine countries for which WITS (2021) does not report TCIs.

For country pairs with lower complementarities, around 604 have TCIs ranging from 25 to below 50. In total, 655 country pairs have some potential based on export–import complementarity (around 22% of the total theoretical combinations).

In total, 24 out of 46 countries in Africa for which TCIs are calculated have 20 or more potential partners in Africa, with TCIs > 25. However, a note of caution is required here. A high TCI does not automatically imply that gains are to be made from increased trade. For example, where the two

9. Mauritania to Central African Republic, South Africa to Botswana, and South Africa to Namibia.



Source: Authors' calculations based on data from the World Integrated Trade Solution (WITS) database (2021).
Key: TCI, Trade Complementarity Index.

FIGURE 1.3: Total Trade Complementarity Index count by African country.

partners are geographically distant from each other or are faced with high transportation and transaction costs or a high concentration of competition, expected gains may not be realised. A high TCI could also be misleading if the difference in the size of the two economies is relatively large (i.e. a match in percentage terms does not imply a match in level terms).

It is evident that at the macro level, these indicators provide an 'overall' fit view (or not). Therefore, the results can potentially look completely different at the lower product level, such as at the Harmonized System (HS) 6-digit detail level.

Overall, the number of potential opportunities for country pairs with 'matching' export–import profiles in Africa is relatively low, based on this measure. This, in turn, helps to explain why intra-regional trade in Africa is relatively low in comparison with other regions. However, this observation also points to significant future potential if African countries can adjust their economies' production structures. This is because, with greater development and higher income levels as well as changes to the imported components used in their production structures, import demand patterns will adjust accordingly.

For more details on the identification of countries' bilateral export opportunities, see the example of Tunisia and South Africa in Chapter 6.

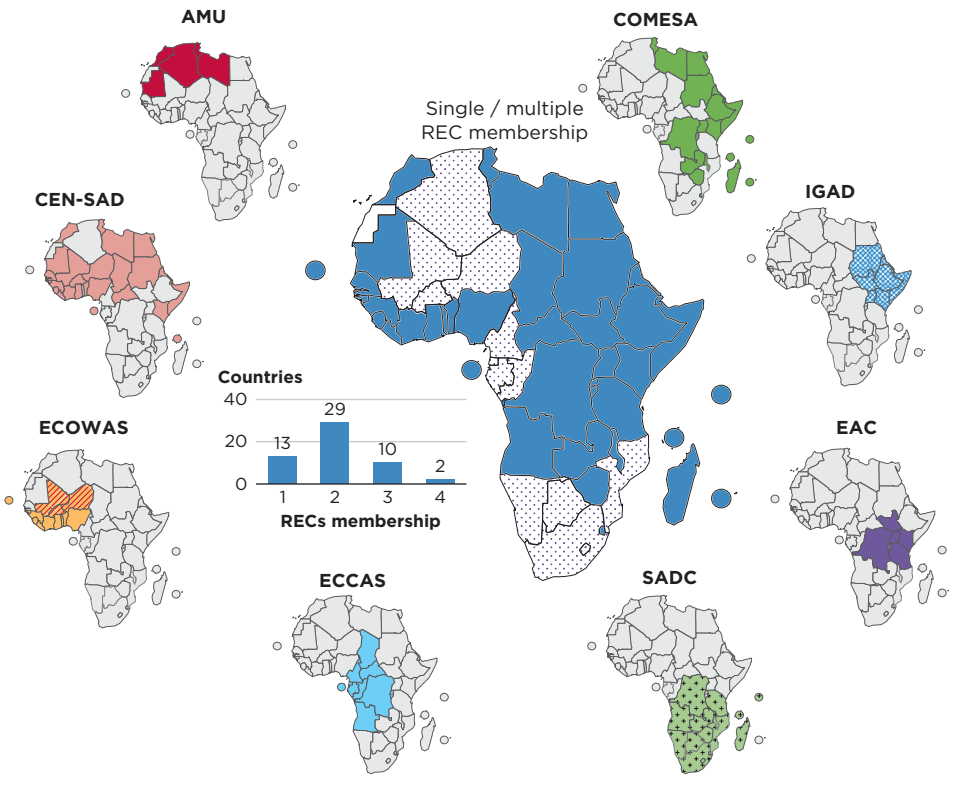
Regional fragmentation and lack of regional integration

A further challenge is that uneven progress has been made in the ratification process, which has created complications for the different RECs in Africa. Most intra-Africa trade takes place between countries that are members of the same REC, especially in the case of an FTA or customs union (tralac 2020), with overlapping memberships being a frequent phenomenon.

The AU recognises eight RECs (AU n.d.[a]). These are the Arab Maghreb Union (AMU), with five member states; the Community of Sahel-Saharan States (CEN-SAD), with 29 member states; the Common Market for Eastern and Southern Africa (COMESA) with 21 member states; the East African Community (EAC), with seven member states; ECCAS, with 11 member states; the Economic Community of West African States (ECOWAS), with 15 member states[10]; the Intergovernmental Authority on Development (IGAD), with eight member states; and SADC, with 16 member states. The complexity created by overlapping memberships is demonstrated in Figure 1.4.

Note that after the recent departure of Burkina Faso, Mali and Niger from ECOWAS, 13 of the countries now belong to only one of the eight

10. Note that ECOWAS members Burkina Faso, Mali and Niger announced (on 28 January 2024) their intention to withdraw from ECOWAS, with the effective date being 29 January 2025 (ECOWAS 2025).



AMU (Arab Maghreb Union)	5 [Algeria, Libya, Mauritania, Morocco and Tunisia]
CEN-SAD (Community of Sahel–Saharan States)	29 [Benin, Burkina Faso, Cape Verde, Central African Republic, Chad, Comoros, Côte d'Ivoire, Djibouti, Egypt, Eritrea, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Libya, Mali, Mauritania, Morocco, Niger, Nigeria, São Tomé and Principe, Senegal, Sierra Leone, Somalia, Sudan, Togo, Tunisia]
COMESA	21 [Burundi, Comoros, Djibouti, Egypt, Eritrea, eSwatini, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Democratic Republic of the Congo (DRC), Seychelles, Somalia, Sudan, Tunisia, Uganda, Zambia, Zimbabwe]
EAC	7 [Burundi, DRC, Kenya, Rwanda, South Sudan, Tanzania, Uganda]
ECCAS	11 [Angola, Burundi, Cameroon, Central African Republic, Chad, Congo, DRC, Equatorial Guinea, Gabon, Rwanda, Sao Tome and Principe]
ECOWAS	15 [Benin, Burkina Faso*, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali*, Niger*, Nigeria, Senegal, Sierra Leone, Togo]
IGAD	8 [Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan, Uganda]
SADC	16 [Angola, Botswana, Comoros, DRC, eSwatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Tanzania, Zambia, Zimbabwe]

Source: Authors' representation of data from the African Union (n.d.)
Key: REC, regional economic community.

FIGURE 1.4: Overlapping memberships of eight recognised regional economic communities in Africa.

recognised RECs, while 29 belong to at least two, 10 belong to three and two belong to four of the RECs. Overlapping memberships, for example, SADC, ECCAS, EAC and COMESA (to name a few), can be problematic. For example, until all the members of an REC have ratified the AfCFTA agreement, no member can take full advantage of AfCFTA-linked trade preferences when exporting to other African countries.[11] For more details on multiple REC memberships, see tralac (2023a).

Another significant hurdle is that many African countries have yet to adjust their customs regulations and procedures. Until they do, the trade-in-goods protocol under the AfCFTA cannot be fully activated. Another challenge is that businesses in RECs like SADC and ECOWAS have limited knowledge of export opportunities in other RECs or other parts of Africa. West Africa, for instance, imports large quantities of wine, mainly from Europe. This is a major 'untapped' export opportunity for South African wine producers. For more details on South Africa's export opportunities in Africa, see Chapter 5.

Low intra-Africa trade

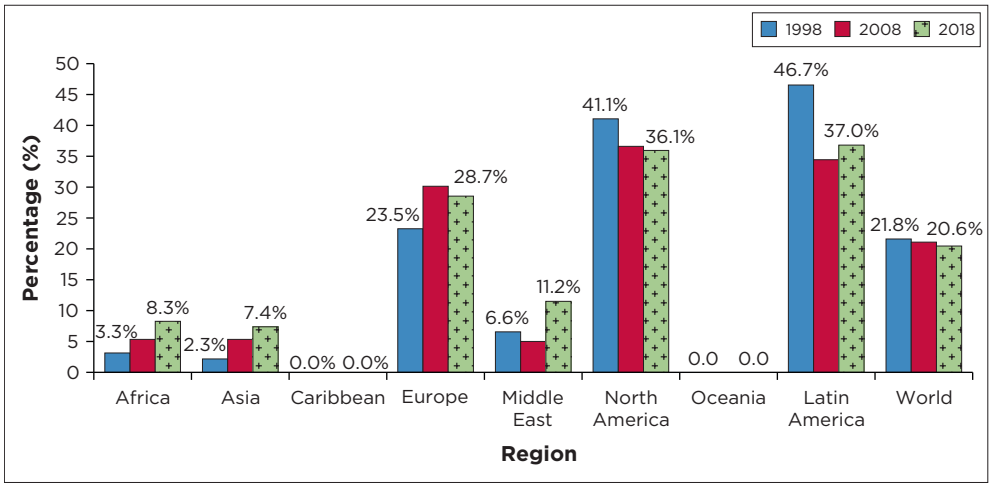
In Africa, the Middle East and Asia, countries' merchandise trade (in value terms) with their immediate neighbours accounts for only around 1–5% of these regions' trade (Hummels 2007).

Recent calculations (based on the same principle) of total trade by region (shown in Figure 1.5) confirm that these relatively low shares persisted for over two decades, from 1998 to 2018 (Cameron 2020).

With reference to the broader concept of intra-Africa trade (i.e. the average of total imports and exports of goods between all countries in Africa, as opposed to imports and exports between immediate neighbouring countries only), Africa's trade-to-total trade ratio was estimated to be between 15% and 17% in 2019 and 2020 (Mold 2022), calculated from IMF Direction of Trade Statistics [DOTS] and UNCTAD Statistics [UNCTADSTAT] data.

The promotion of intra-Africa trade is an essential policy priority aimed at boosting economic growth, export diversification, industrialisation and economic development. Intra-Africa trade reached a high of 21% in 2015 but

11. At the beginning of 2022, the Southern African Customs Union (SACU), EAC and ECOWAS, for example, were still constrained by some members not having ratified the AfCFTA agreement after four years. South Sudan (EAC), Botswana (SACU/SADC), and Benin, Guinea-Bissau and Liberia (ECOWAS) were yet to ratify the agreement (PACCI 2022). Botswana subsequently ratified the agreement (19 February 2023), enabling SACU to officially trade under the AfCFTA. In ECOWAS, Guinea-Bissau (27 September 2022) and Liberia (31 July 2024) also ratified the agreement, but Benin and South Sudan (EAC) had still not ratified at the time of writing.



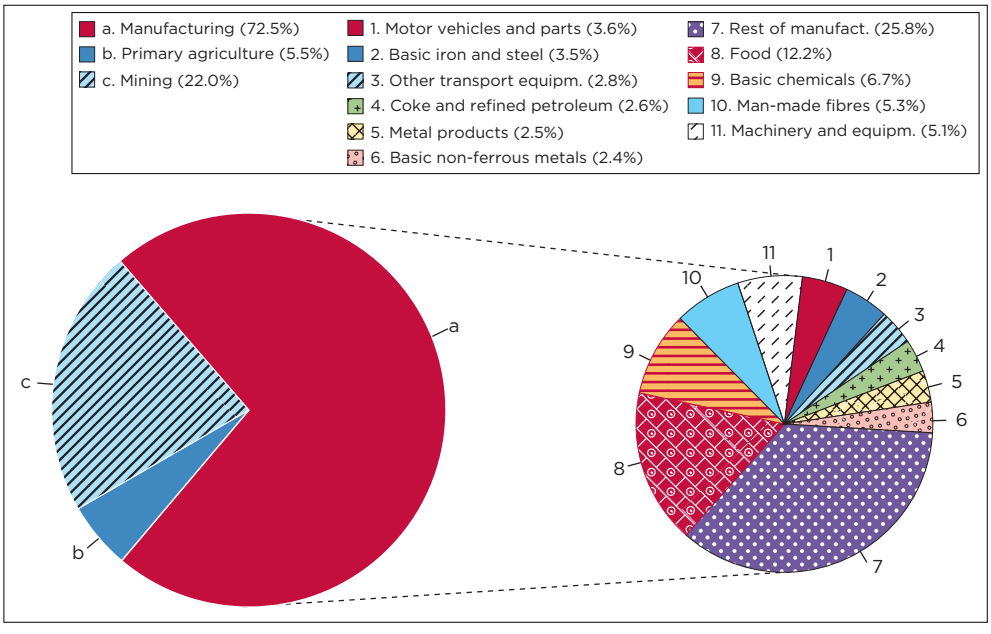
Source: Cameron (2020), calculated from available UN Comtrade 2020 data.

FIGURE 1.5: Merchandise export shares with immediate neighbouring countries (by border) per region, 1998, 2008 and 2018.

declined to 16% in 2020 because of the COVID pandemic and related supply chain disruptions (tralac 2021b). According to UNCTAD, intra-Africa trade (imports plus exports) in 2020 stood at 14.4% of total African exports with a total value of US$61 billion, which was 5% less than in 2015 (UNCTAD 2021). Clearly, then, intra-Africa trade remains low relative to other large regions (60% in Asia, 67% in Europe and 46% in the Americas), despite attempts having been made over many years to expand trade volumes on the continent through negotiations and agreements within the different sub-regions and RECs (Mold & Chowdhury 2021; tralac 2021a; UNCTAD 2019b).

Products associated with the minerals and mining sector, primarily crude oil, are the top-traded single products by value, although as a sector they account for 22% of intra-Africa exports, with 78% leaving Africa. Another top-traded sector by value is manufactured goods (representing 72.5% of intra-Africa exports). Primary agricultural goods, in turn, account for only 5.5% of intra-Africa exports. The top 10 traded goods by economic sector accounted for nearly 46% of traded goods in Africa on average over the period 2017–2022. The top 10 manufacturing sub-sectors are depicted in Figure 1.6 relative to the three main sectors of primary agriculture (including forestry and fishing-related primary goods), mining and minerals and manufacturing.

Structural realities partially explain the low levels of intra-Africa trade. Contrary to global trade patterns, Africa's primary sources of export revenue are still limited to natural resource extraction and commodities, processed and value-added by trading partners mostly outside the African continent. This stands in contrast to the industrial products and



Source: Authors' calculations from data available in the CEPII BACI Database (January 2024 version).
Key: equipm., equipment; manufact., manufacturing; BACI, Base pour l'Analyse du Commerce International; CEPII, Centre d'Études Prospectives et d'Information Internationales.

FIGURE 1.6: Intra-Africa merchandise trade: Percentage share per economic sector, 2017–2022 (average).

manufactured goods, with increasing technological enhancements, that dominate global trade patterns (Afreximbank 2019). Africa's comparatively limited export basket means that the continent is extremely vulnerable to changes in the external environment. For example, lower oil prices and more subdued demand for mineral products significantly impacted Africa's exports from 2013 to 2019.

However, according to modelling results produced by UNECA and the Centre for International Research and Economic Modelling (CIREM) of the CEPII (UNECA n.d.), the AfCFTA has the potential to turn this situation around and have a positive impact on Africa's trade output, GDP and welfare in the long term. Compared to a baseline without the AfCFTA, the percentage change in intra-Africa trade by main sector projected for 2045 under the AfCFTA is presented in Table 1.1.

The tariff offers and service commitments, when officially finalised, will also be considered in the projections. As a result, the findings presented in Table 1.1 can be expected to evolve (UNECA 2021). The assessment captured in the table also provides for the liberalisation of trade in goods in line with agreed AfCFTA modalities and a 50% reduction in actionable trade restrictions in the five AfCFTA priority service sectors (i.e. tourism, transport, communication, financial and business services), plus health and education services. In addition, it includes a 50% cut in actionable non-tariff

TABLE 1.1: Change in intra-Africa trade by main sector with the African Continental Free Trade Area in 2045.

Aggregation level	Baseline in 2020	% change in 2045 without the AfCFTA	% change in 2045 with the AfCFTA	% change per main sector
Intra-Africa total trade	US$100 billion	+270	+400	
Intra-Africa share of total trade	15%	20 (+37 compared to 2020)	26 (+75 compared to 2020)	
Agrifood	19.6%	16.9	17.8	41.1
Services	2.6%	2.8	2.9	39.2
Industry	44.8%	56.2	58.4	39
Mining and energy	33%	24	20.9	16.1

Source: Authors' calculations based on data from the United Nations Economic Commission for Africa (UNECA n.d.).
Key: AfCFTA, African Continental Free Trade Area.

measures (NTMs). The figures presented in Table 1.1 assume that all 55 African countries have signed and ratified the AfCFTA agreement.

The aforementioned study further highlighted that the AfCFTA would not only boost intra-Africa trade but would also help Africa to industrialise and diversify away from its dependence on energy and mining (UNECA 2021). Moreover, the study indicated that for the AfCFTA to achieve its goal of inclusively transforming African economies, countries will have to develop effective export policies and strategies and identify new opportunities for diversification, industrialisation and value chain development, while also addressing supply-side constraints (UNECA 2021).

African countries mainly trade with non-African partners. Around 85% of Africa's total exports are currently destined for countries outside Africa – the European Union (EU), China, India and the United States (US). Africa's annual exports to and imports from countries outside Africa first decreased between 2013 and 2016 and then increased again. The value of imports exceeded that of exports from 2013 to 2019 (AU 2020b), with the exported-to-imported goods ratio decreasing from 92.5% in 2013 to 83.1% in 2019. As a result, Africa's external trade balance in 2019 was negative, with exports having an average value of US$372 billion and imports having an average value of US$495 billion (AU 2020b).

According to trade figures based on the UN International Trade Centre (ITC) TradeMap (tralac 2021a), these observations can be made:

- The leading intra-Africa exporters in 2020 (in order of ranking) were South Africa, Nigeria, the DRC, Egypt, Zimbabwe, Kenya, Morocco, Namibia, Senegal and Zambia.
- The top 10 exporters accounted for 77% of total intra-Africa exports in 2020. South Africa, Kenya, Nigeria, Namibia, Zambia and Zimbabwe were both top exporters and top importers in the African market.
- The leading intra-Africa importers were South Africa, Botswana, Namibia, Zimbabwe, Uganda, Tanzania, Zambia, Mozambique, Nigeria and Kenya.

The AfCFTA holds the promise of being able to reduce Africa's current trade dependence on its external partners if the AfCFTA market gains traction and formal intra-Africa trade is able to overtake Africa's trade with the rest of the world in the period to 2045 (UNECA 2021).

Status of some key enablers of trade in Africa

There are numerous dimensions to consider when exploring enablers of trade, and more specifically intra-Africa trade, including aspects such as the free movement of people, improved trade facilitation, financial integration, infrastructure development, regulatory harmonisation, capacity building, development of RVCs, digital transformation, green trade and sustainability, inclusive trade policies, political stability, and improved governance and access to trade finance. Each could be a book on its own. However, for the purposes of this discussion, the following four areas are highlighted as fundamental enablers of increased trade in Africa: Logistics infrastructure, FDI, availability of information and economic growth.

Logistics infrastructure – an ongoing bottleneck

One of the current constraints and potential ongoing impediments to the success of the AfCFTA, which, if not addressed, will undermine African countries' ability to implement and make the most of the AfCFTA, is NTBs. Non-tariff barriers include infrastructure and logistics gaps (both soft and hard) faced by businesses, which undermine their production and trade competitiveness and inhibit their ability to tap into priority sectors in regional and continental markets (UNECA 2019). Trade logistics relate to the capacity of countries to move physical goods within and across borders and involve a range of interlinked services that support such movements. Logistics are also critical for ease of doing business and simplifying the movement of goods and services as needed (Tony Elumelu Foundation 2021). Moreover, logistics contribute significantly to reduced costs and increased export competitiveness. They are therefore key to the successful expansion of manufacturing, especially in the case of just-in-time value chains (Huria & Brenton 2015).

Many African countries have low rankings in several logistics-related indicators on the World Bank's Logistics Performance Index (LPI) (World Bank 2018). These indicators include cross-border clearance processes, quality of trade infrastructure, consistency of tax regimes, and consignment tracking and tracing mechanisms (Arvis et al. 2018;

World Bank n.d.). African countries rank between 1.77 and 3.43 out of 5 on the LPI, which measures the ease, speed and simplicity of moving goods and services across Africa. This performance is concerning because logistics infrastructure deficits and the fragmentation of supply chains constrain the effective leveraging of the AfCFTA. Poor logistics may be a more significant barrier to trade than tariffs and NTBs (AfDB 2019). While the AfCFTA provides a vehicle for systematically dismantling trade-distorting tariffs across the continent, NTBs are often considered more harmful than tariffs and the leading contributor to the prohibitive cost of intra-regional trade. Non-tariff barriers typically relate to infrastructure and cross-border processes, for example, the lack of roads, rail and ports; inefficient infrastructure; the lack of automated border systems and procedures; and onerous phytosanitary and other administrative requirements.

African countries' ability to implement effective trade logistics determines the extent and nature of their participation in international markets (World Bank 2018). Strong logistics infrastructure facilitates intra-regional trade, people movement and regional integration. It also drives export diversification as it reduces export concentration (Huria & Brenton 2015; Mukeredzi 2018; tralac 2017). Efficient transit corridors and gateway ports are essential for manufactured exports and rely on the right physical infrastructure; operational efficiency; connectivity; competition and associated regulatory frameworks; and collaborative, efficient and competitive port communities.

It has been estimated that the AfCFTA could boost intra-Africa transport services by nearly 50% (UNECA 2022). However, the impact and viability of the AfCFTA will largely depend on the efficacy of Africa's logistics infrastructure, including cross-border predictability, transparency, reliability and accountability. Improved intermodal transport and new initiatives to overcome trade barriers are critical for inland countries to reduce delays and cut costs. The AfCFTA faces immense logistics challenges. Even current trade agreements in Africa have not succeeded in lowering trade barriers, making it imperative for the AfCFTA to tackle trade logistics challenges head on. However, some positive initiatives provide a foundation for further action.

One example is the One-Stop Border Posts (OSBP) initiative aimed at harmonising the processes involved in people and products crossing borders (Parliament of South Africa 2021). One-stop border posts are central to the implementation of transport projects like the PIDA (tralac 2017). A reduction in infrastructure-related bottlenecks boosts growth in industrialisation and agro-industries specifically. It also improves the competitiveness of both intra-Africa and international trade.

For more details on the challenges emanating from landlocked countries' weak logistics, see the case study on Rwanda in Chapter 3.

Low and heterogeneous foreign direct investment – infrastructure investment versus extractive-based investment

Foreign direct investment has many advantages. For example, it helps to enhance productivity and integrate domestic companies into global markets, and it boosts economic growth (Myles 2021). In the first half of 2020, overall global FDI flows decreased by 49%, a significant drop compared with the first half of 2019. However, FDI flows showed a strong rebound in 2021, growing by 77% to an estimated US$1.65 trillion, and they have since surpassed their pre-COVID-19 levels. The earlier decline was mainly pandemic-related, which resulted in total FDI flows of only US$929 billion in 2020 (UNCTAD 2022b).

Most countries in Africa also saw a moderate rise in FDI post-COVID. Foreign direct investment flows to the continent more than doubled, although the total amount was skewed by the value of a single intra-firm financial transaction[12] in South Africa in 2021 (South African Reserve Bank [SARB] 2021).

Of the total increase in global FDI flows in 2021 (US$718 billion), more than US$500 billion was recorded in developed economies. In contrast, developing economies, notably LDCs, saw a more modest recovery in their growth rates. Africa, however, still lags all regions in terms of FDI (UNCTAD 2022b). The AfCFTA could help to improve Africa's attractiveness to investors, as there are now more markets that companies can potentially tap into (Burger 2021).

Whereas FDI in Africa traditionally originated in developed countries, more recently the origin of FDI has shifted to Asia, and notably China. China's share of FDI in Africa is almost 50% of Asia's share of FDI. Foreign direct investment from China has also helped to stimulate economic growth in the recipient African countries. For example, Ethiopia's manufacturing sector has found that companies supplying Chinese companies in the country have been empowered to diversify their operations and increase the demand for, and the quality of, their products (Crescenzi & Limodio 2021). Other sources of FDI in Africa are (ranked in descending order) the

12. A Naspers Ltd and Prosus N.V. share exchange. The Naspers Ltd and Prosus N.V. share exchange involved the acquisition by Prosus N.V. (a Netherlands-domiciled company) of Naspers Ltd N ordinary shares (a South African-domiciled company), held by resident and non-resident shareholders in exchange for Prosus N.V. ordinary shares N.

US, France, Turkey, the United Kingdom (UK), Japan and the United Arab Emirates (UAE) (Oluwole 2022).

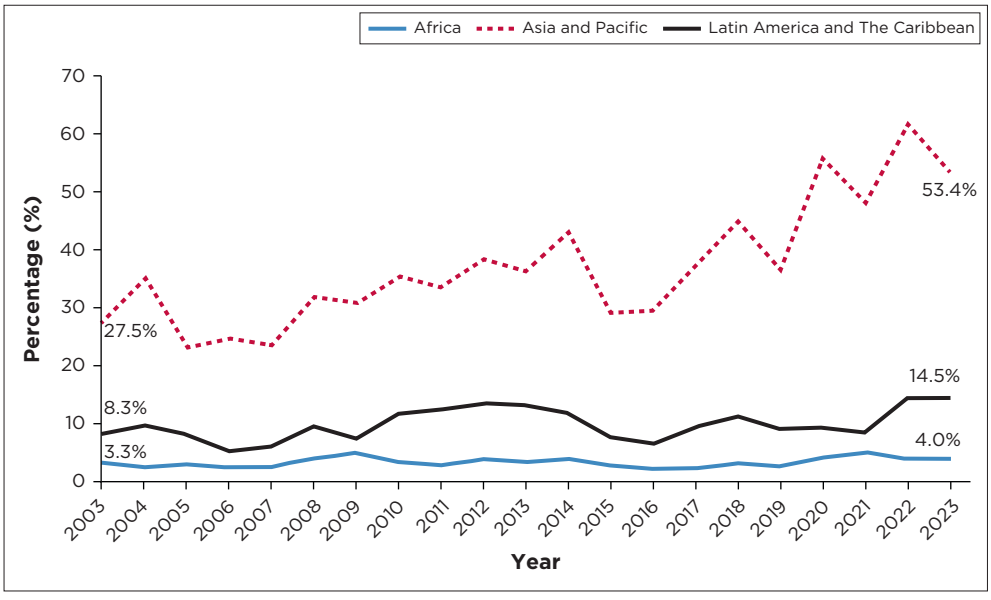
In contrast, companies competing with Chinese newcomers do not flourish, employ fewer staff, invest less and set lower prices. Underlying this trend is the new nature of Chinese investor involvement. Their broader effect and influence have led to knowledge spillovers. Foreign direct investment has a more comprehensive benefit because foreign companies lift local supplier companies' performance (Crescenzi & Limodio 2021). In another positive development, China's investment in Africa has shifted away from natural resources towards higher value-added activities, as seen in the case of Ethiopia. This new trend will assist African countries in their diversification and industrialisation efforts and boost the positive spin-offs from the AfCFTA.

Despite the positive impact of China's FDI strategy, Africa still lags in terms of FDI inflows and the equitable distribution of FDI. Foreign direct investment inflows declined by 18% from US$45.37 billion in 2019 to an estimated US$37.20 billion in 2020 (AfDB 2021). In 2020, credit rating agencies downgraded the creditworthiness of many African economies because of the economic impact of the COVID-19 pandemic. Fitch Ratings (2021) warned that the scale of the positive effects of trade liberalisation under the AfCFTA would be small and would materialise over the long term. However, rating momentum for sub-Saharan African countries has taken a positive turn, with three upgrades and only one downgrade since the beginning of 2021. This was after an unprecedented number of downgrades in 2020 in response to the rise in government debt and liquidity challenges resulting from the COVID-19 pandemic.

The aftermath of the pandemic continues to affect revenue and expenditure in many African countries. Furthermore, longer-term challenges persist, including weak public financial management and a heavy reliance on public investment-driven growth (Fitch Ratings 2021). Improved creditworthiness would be underpinned by prospects of faster and more robust economic recovery as countries moved to contain the COVID-19 pandemic through mass vaccinations (UNECA & AUC 2021).

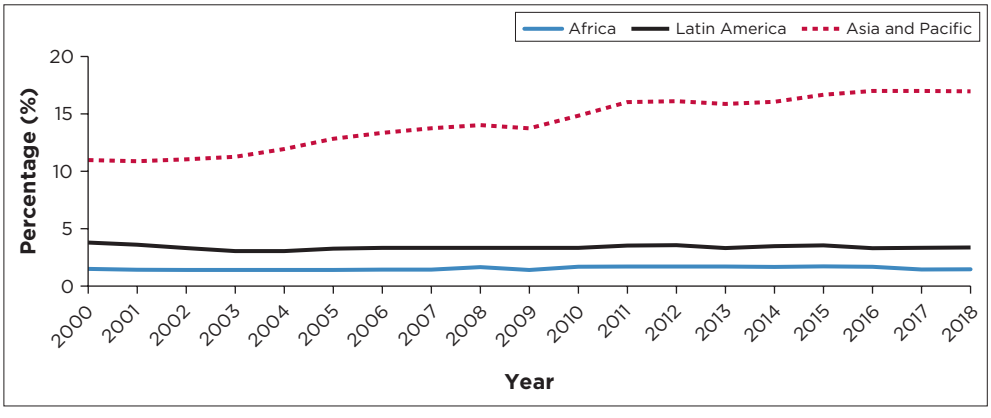
In contrast, sustained low FDI inflows broadly affect Africa's industrialisation prospects, development and participation in GVCs. Although new sources of investment have emerged and new sectors have developed and expanded, both FDI inflows and GVC participation remain limited in Africa (Qiang et al. 2021). For example, FDI flows to Africa constituted only 4.0% of global flows in 2023 (compared to 3.3% in 2003), as depicted in Figure 1.7.

Over the period 2003–2023, no real growth in FDI occurred in Africa, and Africa's share of global GVC participation remained low at 3.4% over the period, as shown in Figure 1.8.



Source: Authors' calculations based on data from the United Nations Conference on Trade and Development (UNCTAD 2024).

FIGURE 1.7: Total share of global foreign direct investment flows to Africa versus selected regions, 2003–2023.



Source: Authors' own representation based on Qiang et al. (2021).

FIGURE 1.8: Total share of Africa's global value chain participation versus selected regions.

Other emerging regions, most notably the Asia-Pacific region, increased their global GVC participation share from 11% in 2000 to 17% in 2018 and their global FDI share from 27.5% in 2003 to 53.4% in 2023. Intra-Africa FDI also rose from 9% in 2002 to 13% in 2017 before declining in 2020 (Myles 2021; WEF 2021) and was mainly focused on resource extraction. There should, however, be a shift towards more FDI in manufacturing to create more employment opportunities.

The main reasons for investors' hesitance about investing in Africa are that markets are too small and the export process is challenging because

of inadequate transportation and communications links, tariff barriers and NTBs, onerous business regulations and the lack of legal rights for investors. Policies that promote and support economic growth, improve the business environment, boost per capita incomes and expand the labour force in African countries will help to facilitate intra-regional FDI (AfDB 2020).

According to UNCTAD's reported statistics on FDI inflows per region, Africa registered incoming FDI valued at US$45 billion in 2022, a decrease of US$1 billion or 2.2% from 2019. The equitable distribution of FDI remains a challenge throughout the continent. Besides investors' own markets, the preferred African destinations for FDI remain Ghana, Nigeria, Mauritius, Zambia and Tanzania (in West and East Africa). Southern, West and East African countries are the preferred destinations for investment in the financial and health care sectors (UNECA 2020). Only five countries (Angola, Egypt, Ethiopia, Ghana and Nigeria) received nearly 57% of the continent's total inflows in 2016. Historically, the leading destination for FDI has been southern Africa (especially South Africa). However, the value of FDI to South Africa declined from about 57% of all FDI in southern Africa in 2003 to 30% in 2018. Although there have also been significant changes in FDI destinations, less attractive destinations remain excluded, thus hampering their full participation in the AfCFTA (UNECA 2020).

In West Africa, FDI stock increased from 15% in 2002 to 36% in 2018, while East Africa also saw increased FDI. The distribution of FDI is also relatively heterogeneous within regions. For example, East Africa registered the best relative improvement among all African regions, with US$7.1 billion in inward FDI, a 13% increase compared with 2015. Foreign direct investment flows to Ethiopia, the fastest-growing country in the region, surged by nearly 46% to US$3.2 billion, with significant infrastructure and manufacturing investments (UNCTAD 2017). In contrast, Tanzania and Kenya registered a 15% and a 36% drop in FDI inflows, respectively, in 2016 (UNECA 2020).

Mining and manufacturing are focus areas in Africa, while economic growth is the primary driver of investor interest on the continent. However, there is also a significant global push to diversify away from low-return markets and commodities towards services and manufacturing (PricewaterhouseCoopers [PwC] n.d.). From 2006 to 2010, the strongest focus was on resource extraction, petroleum and coal-processing projects (more than 50% of the estimated US$236 billion of greenfield FDI projects announced in Africa). Since 2016, however, new projects in these extractive sectors have accounted for less than a quarter of the total in favour of investments in logistics, communications and information technology (IT) services, chemicals and renewable energy (Myles 2021).

The case for Africa being an attractive FDI destination is solid. The COVID-19 pandemic caused a surge in African governments' financing needs. According to AfDB estimates, African countries require significant financial support to respond to the fallout from the COVID-19 pandemic. The Bank estimated the

necessary support to be at least US$154 billion in 2020/21. Fiscal stimulus packages have had immediate and direct implications for budgetary balances, borrowing needs and debt levels (AfDB 2021). In addition, the AfCFTA is likely to boost intra-Africa greenfield investment. The expected adoption of the AfCFTA Investment Protocol could further bolster FDI flows to and within Africa in the long term (tralac 2021a). Indeed, Article 3(2)(c) of the Protocol on Trade in Services contains the specific aim to 'foster domestic and foreign investments' (AU 2018).

Limited information for planning – an ongoing lack of quality information on export and diversification opportunities

Although the AfCFTA agreement was negotiated at a continental level, its implementation and gains will largely be at a country level (Luke 2019). The agreement must be translated and contextualised to align with domestic realities and governments. The public and private sectors need to take deliberate steps to make the AfCFTA work, including creating the necessary enabling environments. The AfCFTA creates opportunities for African companies to enter new markets. This will expand their customer base and lead to the production of new products and services, making investing in innovation more viable (Akeyewale 2018).

Therefore, the importance of quality and detailed information on export and diversification opportunities in Africa should not be underestimated. In this regard, trade and investment promotion agencies have a vital role to play in disseminating such information, as they interact directly with the commercial sector. Exporters will be unable to compete effectively if they do not have a clear view of export opportunities and how to prioritise them according to import demand and ease of market access.

Cognisant of this requirement, the ATO was conceptualised as part of the broader AfCFTA initiative as a key instrument of the AfCFTA.[13] As one of the five operational instruments unveiled, the ATO serves as a critical component in facilitating intra-Africa trade. The primary purpose of the ATO is to address hindrances to trade in Africa caused by a lack of information. The ATO aims to enhance transparency in trade-related information, thereby facilitating informed decision-making for businesses and policymakers across the continent (ATO n.d.).

Four other operational instruments were unveiled alongside the ATO during the launch of the AfCFTA's operational phase: RoO; tariff concessions; an online mechanism for monitoring, reporting and eliminating NTBs; and the PAPSS.

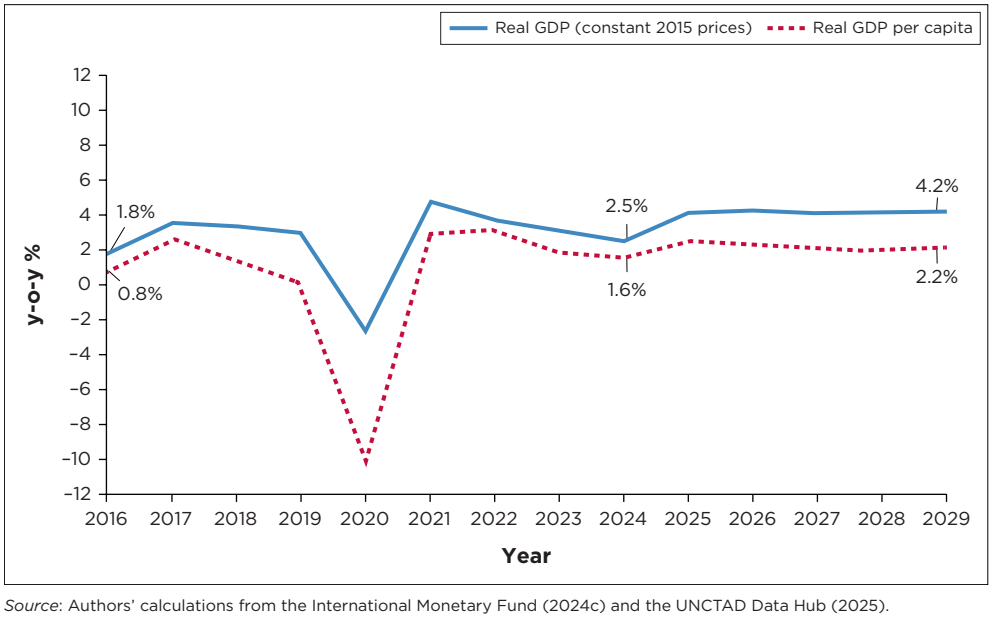
13. The ATO was launched on 07 July 2019 in Niamey, Niger (ATO n.d.).

Low economic growth – insufficient to significantly reduce poverty or address development challenges

Africa's growth performance and recovery prospects vary across regions and economic groupings, depending on prevailing structural characteristics. Contrary to expectations, Africa is the world's second-fastest-growing region, experiencing an average annual GDP growth rate of 4.6% from 2000 to 2016 (United Nations Statistics Division [UNStat] 2025). While this growth declined to around 2.6% from 2016 to 2024 (in part associated with the impact of the COVID pandemic), the IMF's World Economic Outlook (WEO) of October 2024 projects Africa to be growing again at around 4.2% over the period 2025–2029 (IMF 2024c). Tourism, recovering commodity prices and the lifting of pandemic-induced lockdowns are among the factors that boosted the region's economic recovery (World Bank 2021).

The remaining challenge is that real GDP per capita (as a measure of increased economic wellbeing) is projected to grow at only half the pace of GDP (Figure 1.9), implying that Africa's ability to improve the lives of the average citizen will be seriously tested in the foreseeable future.

Several other factors could lead to higher-than-anticipated growth rates in Africa. These include the effective deployment of therapeutics and vaccines for COVID-19 during the pandemic period, the positive impact of

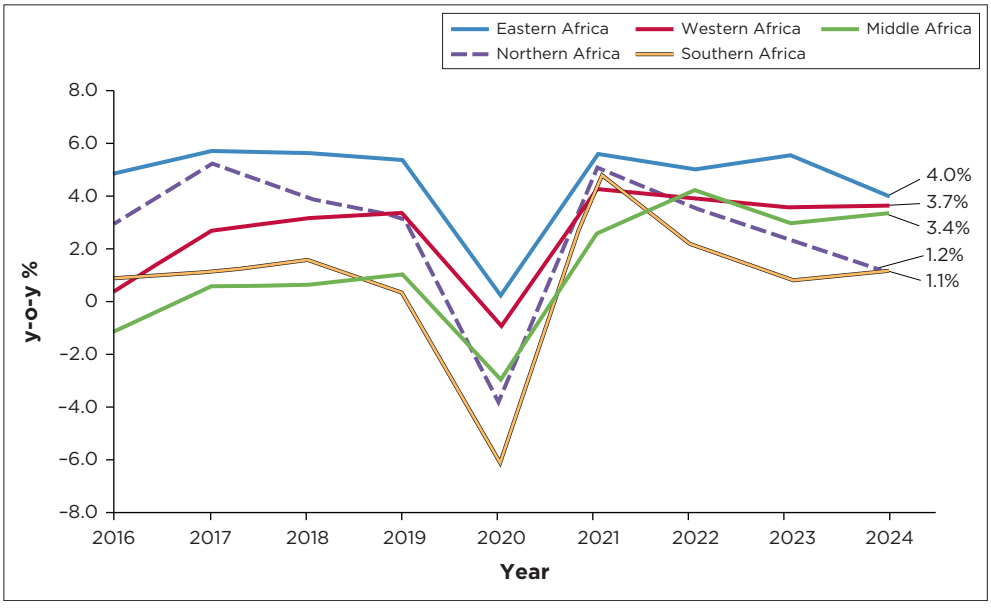


Source: Authors' calculations from the International Monetary Fund (2024c) and the UNCTAD Data Hub (2025).
Key: y-o-y %, year-on-year percentage; GDP, gross domestic product.

FIGURE 1.9: Africa's aggregate real gross domestic product and real gross domestic product per capita growth rates, 2016–2029 (recent history and International Monetary Fund projections).

the implementation of the AfCFTA and continued progress in structural transformation, including digitalisation and more permanent work-from-home arrangements. Moreover, industrialisation and structural change are being given priority in various continental initiatives, including Agenda 2063, the PIDA and the Action Plan for Boosting Intra-African Trade (AfDB 2021). Furthermore, it is forecast that the AfCFTA will deliver significant benefits to the industrial sector, which is consistent with Africa's aspirations to structurally transform its economy and achieve its sustainable development targets (UNECA 2020). There needs to be a strong focus on digitalisation and economic diversification to build resilience and foster regional and multinational cooperation (AfDB 2021).

The challenge is that economic activity across Africa differs from region to region, as do the sizes and wealth and development of different countries. Evident in Figure 1.10 is that both the historical growth and projections for the different geographic sub-regions of Northern Africa, Western Africa, Eastern Africa, Middle Africa and Southern Africa realised different performance outcomes in the past and are also expected to do so in the foreseeable future. Eastern Africa is projected to achieve the highest growth rate between 2025 and 2029 with an average annual growth rate of 4.7% over the period, followed by Western and Northern Africa with 2.7% and 2.6% respectively, and Middle and Southern Africa lagging at 1.3% and 0.8% respectively (IMF 2024c).

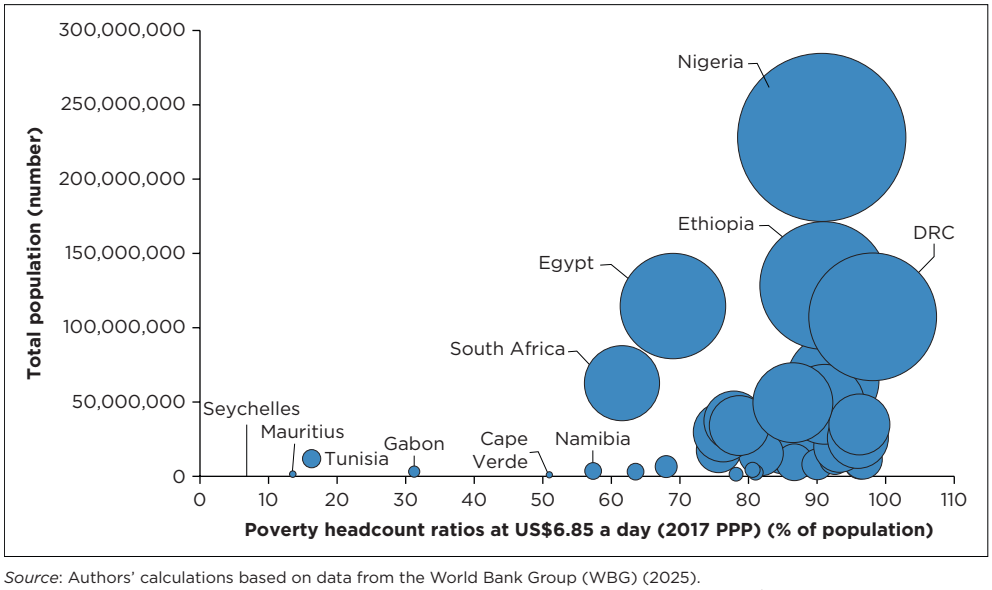


Source: Authors' calculations from the International Monetary Fund (2024c) and the UNCTAD (2025) Key: y-o-y %, year-on-year percentage.
Key: y-o-y %, year-on-year percentage.

FIGURE 1.10: African sub-regions' aggregate real gross domestic product growth rates, 2016–2024 (recent history and International Monetary Fund projections).

Furthermore, according to the IMF (2024a, 2024b), macro-economic vulnerabilities persist and inflation remains high in many countries on the continent, with the exception of some of the oil-exporting economies. As a result of COVID and related mitigation strategies, elevated public debt and rising debt service costs are crowding out resources for development spending. The result is that policymakers continue to face a tough balancing act in reducing vulnerabilities while addressing development needs and ensuring socially acceptable reforms amid tight financing constraints and increasingly muted medium-term growth forecasts.

When considering relative poverty and the context of population sizes in the different individual African countries, the challenge to increase welfare and economic wealth creation for the continent stands out as a stark reminder that it is an imperative for political and economic leaders of the continent to work towards economic wealth creation with focus and commitment. When considering the poverty headcount estimates from the World Bank World Development Indicators (World Bank 2025) for the individual economies in Africa, Figure 1.11 demonstrates that more than 40 of these economies have poverty headcount levels of more than 60% of their populations. Based on the latest UNStat (2025) estimates of population numbers, these ratios (considered at an individual country level) at the aggregate African continental level translate into more than 75% of the total population of the continent being deemed to be below the poverty line (i.e. US$6.85 per day in 2017 purchasing power parity [PPP] terms).



Source: Authors' calculations based on data from the World Bank Group (WBG) (2025).
Key: PPP, purchasing power parity; DRC, Democratic Republic of the Congo; %, percentage; US$, United States dollar.

FIGURE 1.11: African countries' population versus poverty headcount ratios.

Clearly, there is an urgent need for African countries to identify REOs to pursue, both within and beyond Africa. These will also inform structural economic transformation strategies to help build Africa's resilience and foster increased regional and multinational cooperation, which should ultimately be directed at uplifting the members of society in each African country.

The need to identify potential export markets

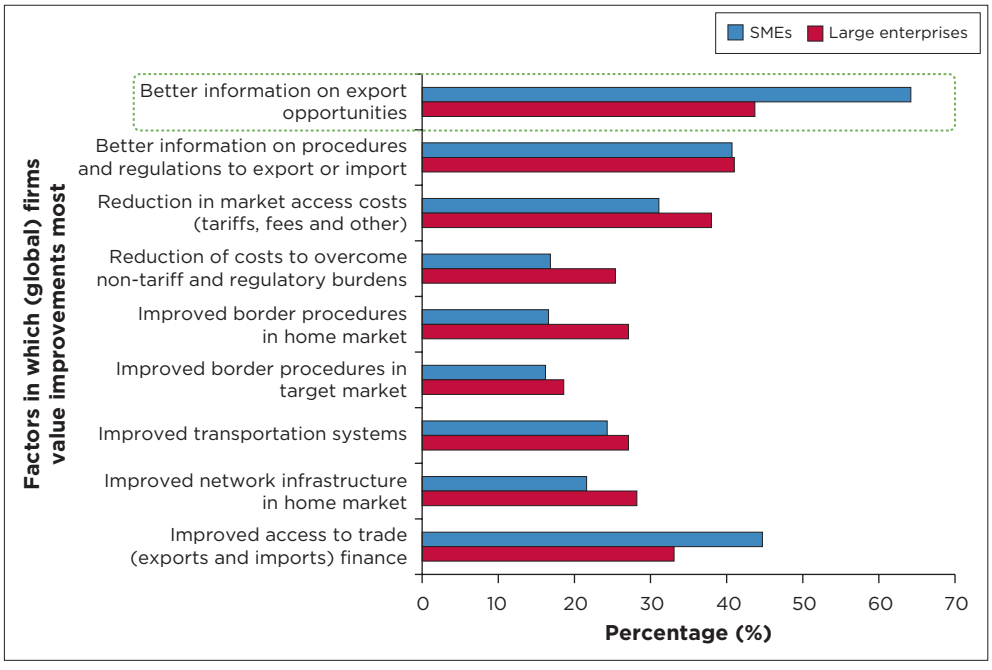
One of the main obstacles to successful trade expansion in Africa is that policymakers and businesses often lack relevant and reliable data on which to base their market selection and/or development decisions. Where data are available, notably in international databases, they are often not readily accessible – especially to small and medium-sized enterprises (SMEs) which face financial, knowledge and capacity constraints. Large companies trading internationally generally have significant human and financial resources to draw on when researching and exporting to markets in various regions. Small and medium-sized enterprises, in contrast, typically find it difficult to effectively identify and pursue export opportunities.

For countries to increase their trade at both the intensive[14] margin (exporting more existing products to existing markets) and the extensive margin (diversifying into either new products or markets, or both), they require information about potential REOs.

When companies were asked (in a survey) in which aspects of trade costs they would most value improvement, the top priority for improvement for both large firms and SMEs was access to information about exports (Figure 1.12). See the ITC Monitoring Survey (2015) in OECD/WTO (2015). Respondents represented a mix of enterprise sizes and different levels of experience in the international trade field. The results were tabulated and weighted according to the rankings assigned by the respondents.

Overall, SMEs indicated a significantly higher weight for the need for improved access to information on export opportunities (over 60% of responses) compared to large firms (over 40%). This may be partly because of larger firms typically having more internal resources available to allocate to the function of export opportunity identification. More generally, the responses of large firms were relatively equally distributed across different aspects of trade costs, while the responses of SMEs were clearly concentrated around three top priorities.

14. Brenton and Newfarmer (2009) define the expansion of existing products in existing markets as growth at the intensive margin and the introduction of 'new' products and new geographical markets as growth at the extensive margin.



Source: Authors' calculations based on data from OECD/WTO (2015).[15]
Key: SMEs, small and medium-sized enterprises; OECD, Organisation for Economic Co-operation and Development; WTO, World Trade Organization.

FIGURE 1.12: Trade costs for small and medium-sized enterprises and large firms – overall results.

The WEF's (2016) Global Enabling Trade Report includes this survey information and highlights the important role that trade plays in delivering concrete reforms to facilitate economic growth, most notably in developing economies. For this reason, this book demonstrates a methodology and approach to assist with the investigation and identification of REOs as well as to highlight potential strategic considerations that countries and companies can consider in their pursuit of economic development and market diversification.

The TRADE-DSM® methodology (where 'DSM' stands for Decision Support Model)[16] is both academically sound and sensitive to real-world information constraints as well as operational challenges prevalent in the African context. The methodology considers aspects discussed in this chapter, including the prevalence of many landlocked countries in Africa, low intra-Africa trade complementarity, and challenges around

15. Small and medium-sized enterprises are defined as firms with fewer than 250 employees. In the survey, responses were solicited from 418 SMEs and 103 large firms to the question: What are the three factors in which you would most value improvements? (OECD/WTO 2015).

16. TRADE-DSM is a registered trademark of the Trade and Development (TRADE) research focus area at the North-West University (NWU) in South Africa.

logistical infrastructure. The methodology, therefore, allows for an alternative perspective on opportunity identification compared to other mainstream approaches.

The basic principle underpinning the methodology is that of 'filtering' – that is, reducing the number of potential options to a reasonable set of 'realistic' options from which a final selection can then be made. In this regard, the TRADE-DSM methodology takes into consideration all possible worldwide product (HS 6-digit) and market (country) combinations. The methodology uses four major filters and various sub-filters to systematically eliminate less-promising markets until those with the greatest prospects of success are revealed.

In the chapters that follow, a number of detailed examples are provided that illustrate how this methodology can be used to engage in more realistic and fact-based decision-making, with a view to leveraging export diversification opportunities to support economic development and industrialisation strategies.

Conclusion

The question can be posed: What will make the AfCFTA different from other sub-regional trade groupings and agreements in Africa? Many people have placed their hopes in the ability of the AfCFTA to lift Africa out of poverty and, if well managed, to drive long-overdue structural changes and export growth and diversification on the continent. These hopes are realisable provided the right policies are designed and implemented, and there is sufficient political will and non-protectionist leadership to kickstart a new era built on increased and more integrated intra-Africa trade.

If the AfCFTA, as the largest FTA globally, is to live up to expectations, one of its cornerstones must be the achievement of far higher levels of integration. This means that there must be a committed and consolidated effort on the part of governments, the private sector, investors and development partners, and resources must be effectively deployed to ensure that the policy decisions taken reflect the realities on the ground. This is essential for making the AfCFTA work, considering the multi-dimensional and cross-cutting nature of the bloc. For example, the active engagement of the private sector and development partners is vital to ensure that NTMs do not become NTBs.

The potential benefits to be derived from the AfCFTA largely depend on countries' initial levels of trade openness, the extent of trade barriers in place and the relative strength of countries' trade sectors. A significant advantage of increased intra-African trade relative to trade with the rest of the world is that African countries will become more resilient in the

face of global price shocks and other forms of turbulence. African countries will also be encouraged to exchange a more diverse range of goods with their trading partners on the continent because Africa's trade with non-regional parties tends to be very concentrated and focused on primary commodities.

There are promising signs that African countries are already taking active steps to exploit the opportunities in national and regional markets within an AfCFTA context. In view of this, the AfCFTA could live up to its mandate and be a game-changer in Africa's economic diversification and inclusion efforts.

Importantly, the AfCFTA lays the foundation not only for more significant intra-continental trade but also for mutually beneficial trade and investment with countries outside Africa, which in turn will help to raise living standards across the continent. Although the increase, in absolute terms, of intra-Africa services trade is likely to be quite moderate, the increase in relative terms will be considerable and needs to be taken seriously. Relative increases in service sub-sectors will be higher than in most goods sub-sectors. Moreover, the current trend towards digitalisation could facilitate the development of many enhanced or new services by continental service providers, especially in the fields of health and education, thereby amplifying intra-Africa trade gains in service sectors.

An effective AfCFTA will strengthen Africa's production capacities, particularly in the industrial and services sectors. Tourism and transport are the service sub-sectors that would contribute the most to increased service outputs in Africa. Moreover, health and education are essential for growth and development – fields in which Africa cannot afford to miss the digitalisation trend. This has become painfully obvious in the wake of the COVID-19 pandemic.

Can AfCFTA provide the fuel to ignite a new era of intra-Africa trade? The answer must surely be yes, because the AfCFTA offers a unique opportunity for African countries to integrate more with each other (without forfeiting their competitive aspirations) as well as with the global economy, while also encouraging inclusion and seriously addressing poverty. Whereas some progress has been made in reducing poverty and driving inclusion, the AfCFTA provides an excellent platform for boosting productivity, stimulating employment and playing a more meaningful role in the global economy.

As previously discussed, the ELG hypothesis underpins the mandate of the AfCFTA but only if countries produce a greater variety and a better quality of products. Moreover, the literature tends to support bi-directional causality, that is, economic growth and development can prompt countries

to export more by, for instance, enabling them to produce a greater variety and a better quality of products. Hence, a key aspect that needs serious attention is improving access to information on export opportunities – certainly for large exporters, but more so for smaller ones. Of course, the identification of export opportunities is crucial, but so, too, is understanding the potential for export development and the latent demand on the continent which, when tapped, will enable members of the AfCFTA to integrate and trade more with one another.

More details on the identification of export opportunities for selected African countries and RECs are provided in Chapters 2–9 of this book.

Key takeaways from this chapter

- The AfCFTA has laid the foundation for more significant intra-continental trade as well as mutually beneficial trade and investment with countries outside of Africa, which will make an important contribution to higher living standards in Africa.
- The ELG hypothesis underpins the mandate of the AfCFTA, but only if countries produce a greater variety and a better quality of products.
- The literature tends to support bi-directional causality, that is, economic growth and development can prompt countries to export more by, for instance, producing a greater variety and a better quality of products.
- The AfCFTA is well placed to strengthen Africa's production capacities, particularly in the industrial and service sectors.
- The potential gains to be made from the AfCFTA mainly depend on countries' initial levels of trade openness, the trade barriers currently in place and the relative strength of countries' trade sectors.
- Increased levels of intra-Africa trade relative to trade with the rest of the world will make African countries more resilient in the face of global price shocks and other forms of turbulence.
- A key aspect that needs serious attention is improving access to information on export opportunities – certainly for large exporters, but even more so for smaller ones.
- The identification of export opportunities is important, but so too is understanding the potential for export development and the latent demand on the continent which, when tapped, will enable members of the AfCFTA to integrate and trade more with one another.
- The TRADE-DSM methodology is both academically sound and sensitive to real-world information constraints and operational challenges prevalent in the African context, allowing for an alternative perspective on opportunity identification compared to other mainstream approaches.

Appendix A1: Intra-Africa international products (merchandise) Trade Complementarity Index per African country

TABLE A1.1: Partners (columns Algeria–Eritrea).

	Bilateral TCI (avg 2015 to 2019)	Partner (Importer)																
	Country	Algeria	Angola	Benin	Botswana	Burkina Faso	Burundi	Cameroon	Cape Verde	Central African Rep.	Chad	Comoros	Congo, Dem. Rep.	Congo, Rep.	Côte d'Ivoire	Djibouti	Egypt, Arab Rep.	Equatorial Guinea	Eritrea
Reporter (Exporter)	Algeria	1.0	20.7	18.7	23.5	27.6	23.0	19.3	12.9	5.3	-	9.5	9.6	4.5	19.6	-	19.1	-	-
	Angola	6.6	1.0	19.2	20.0	26.8	21.2	18.9	13.6	6.4	-	7.8	7.0	5.9	20.4	-	18.5	-	-
	Benin	23.9	24.2	1.0	21.0	21.3	21.5	21.6	26.0	19.2	-	25.3	20.5	17.2	21.1	-	26.6	-	-
	Botswana	7.7	8.7	8.6	1.0	7.7	8.1	7.3	8.6	8.0	-	8.1	8.8	8.2	8.3	-	8.9	-	-
	Burkina Faso	9.0	12.1	8.1	36.1	1.0	6.9	7.1	9.1	7.5	-	7.9	7.1	27.3	9.6	-	12.0	-	-
	Burundi	16.8	21.6	17.9	36.2	16.1	1.0	16.7	18.7	20.3	-	21.9	15.2	19.5	18.2	-	17.3	-	-
	Cameroon	17.7	20.7	25.0	25.8	31.0	27.3	1.0	24.4	11.6	-	16.5	16.0	11.3	26.1	-	29.2	-	-
	Cape Verde	40.7	41.1	40.8	42.6	40.5	40.3	43.8	1.0	38.6	-	38.1	34.1	44.7	45.1	-	43.2	-	-
	Central African Rep.	34.9	32.9	35.7	31.7	28.3	30.5	32.7	32.3	1.0	-	40.9	35.2	40.2	32.3	-	32.8	-	-
	Chad	-	-	-	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-
	Comoros	22.6	24.4	31.0	31.9	20.2	23.2	22.6	25.7	21.6	-	1.0	19.0	14.5	22.9	-	25.2	-	-
	Congo, Dem. Rep.	5.8	9.8	4.0	5.6	5.6	5.8	5.8	4.5	8.7	-	5.8	1.0	3.0	5.0	-	7.3	-	-
	Congo, Rep.	13.1	20.9	26.1	20.3	29.7	24.3	23.2	18.4	15.5	-	13.7	9.5	1.0	28.2	-	25.4	-	-
	Côte d'Ivoire	21.7	31.2	26.9	35.0	27.3	28.6	27.3	28.5	18.6	-	19.3	17.0	17.6	1.0	-	30.4	-	-
	Djibouti	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	-	-	-

Table A1.1 continues on the next page→

TABLE A1.1 (cont.): Partners (columns Algeria–Eritrea).

Bilateral TCI (avg 2015 to 2019)	Partner (Importer)																	
Reporter (Exporter) Country	Algeria	Angola	Benin	Botswana	Burkina Faso	Burundi	Cameroon	Cape Verde	Central African Rep.	Chad	Comoros	Congo, Dem. Rep.	Congo, Rep.	Côte d'Ivoire	Djibouti	Egypt, Arab Rep.	Equatorial Guinea	Eritrea
Egypt	44.5	43.8	43.7	51.5	53.2	54.5	53.3	52.9	36.8	-	36.8	36.6	24.3	54.5	-	1.0	-	-
Equatorial Guinea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	-
Eritrea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0
eSwatini	15.8	13.6	11.9	15.5	11.6	15.5	14.4	18.5	13.1	-	16.5	12.9	13.4	15.1	-	15.7	-	-
Ethiopia	13.7	16.9	14.7	18.2	11.7	14.1	11.4	16.0	17.5	-	16.5	12.9	16.7	13.1	-	17.4	-	-
Gabon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gambia	26.8	32.6	31.4	24.4	31.4	30.8	30.2	33.6	37.5	-	26.7	23.4	29.6	34.3	-	32.2	-	-
Ghana	16.9	24.9	25.6	53.6	31.7	27.9	27.0	24.8	15.3	-	16.8	14.2	11.4	27.5	-	28.6	-	-
Guinea	8.7	8.8	8.9	38.1	6.2	16.5	7.6	10.8	26.9	-	14.8	11.8	25.9	11.0	-	12.0	-	-
Guinea-Bissau	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kenya	35.1	35.2	33.5	36.8	36.5	38.5	37.0	42.8	35.9	-	34.4	33.1	24.6	37.9	-	38.3	-	-
Lesotho	14.6	18.6	13.6	28.9	14.4	16.7	16.0	19.4	17.5	-	18.9	15.0	22.1	15.4	-	15.6	-	-
Liberia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Libya	8.5	21.5	22.4	23.6	29.0	24.2	19.6	16.8	14.1	-	13.5	12.5	29.2	24.5	-	23.0	-	-
Madagascar	13.9	13.5	17.4	17.5	12.7	15.8	15.0	15.6	15.6	-	13.0	12.3	10.2	16.1	-	15.3	-	-
Malawi	19.8	16.5	12.8	15.0	13.7	14.7	13.9	18.7	16.2	-	16.4	13.0	10.0	14.4	-	18.0	-	-
Mali	8.4	11.7	8.3	35.8	8.5	9.2	7.5	7.8	10.3	-	7.1	7.4	6.5	8.1	-	9.1	-	-
Mauritania	40.6	39.7	42.0	39.6	36.7	38.5	39.6	36.7	61.0	-	43.7	30.0	43.6	41.8	-	39.8	-	-
Mauritius	26.5	30.3	22.2	29.6	19.4	25.0	26.7	25.6	24.4	-	22.9	21.4	18.8	25.7	-	24.7	-	-
Morocco	37.2	29.6	31.0	32.5	37.6	37.5	39.8	37.9	38.9	-	36.8	37.6	21.7	34.8	-	33.9	-	-
Mozambique	15.6	24.7	26.3	28.3	34.4	29.1	25.7	24.1	17.5	-	17.3	14.7	10.8	29.6	-	29.5	-	-
Namibia	17.0	19.5	17.4	43.5	13.0	14.8	19.0	19.2	23.0	-	19.6	16.1	19.9	21.2	-	18.4	-	-
Niger	23.2	28.3	41.8	36.9	31.7	38.3	32.7	29.2	34.7	-	33.7	18.4	31.1	34.4	-	33.3	-	-

Table A1.1 continues on the next page→

TABLE A1.1 (cont.): Partners (columns Algeria–Eritrea).

Bilateral TCI (avg 2015 to 2019)	Partner (Importer)																	
Reporter (Exporter) Country	Algeria	Angola	Benin	Botswana	Burkina Faso	Burundi	Cameroon	Cape Verde	Central African Rep.	Chad	Comoros	Congo, Dem. Rep.	Congo, Rep.	Côte d'Ivoire	Djibouti	Egypt, Arab Rep.	Equatorial Guinea	Eritrea
Nigeria	8.7	20.9	19.7	18.9	28.0	22.7	20.0	15.5	10.5	-	8.4	11.3	16.5	23.4	-	20.7	-	-
Rwanda	25.2	37.0	36.9	48.9	35.9	39.6	35.8	36.5	34.9	-	36.3	25.7	29.6	36.4	-	35.3	-	-
São Tomé & Principe	21.6	25.9	32.2	31.2	26.4	27.5	24.7	27.3	22.5	-	27.8	22.3	33.2	27.4	-	27.3	-	-
Senegal	28.1	35.0	38.9	46.3	40.8	38.8	43.9	40.0	29.2	-	32.8	36.5	20.1	43.9	-	39.6	-	-
Seychelles	14.7	27.9	27.9	20.0	29.4	25.2	24.3	24.1	15.2	-	19.9	15.8	29.5	30.7	-	26.9	-	-
Sierra Leone	22.3	23.8	22.0	23.9	21.8	20.3	25.1	26.9	29.8	-	25.9	22.9	23.9	25.9	-	25.8	-	-
Somalia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Africa	49.6	45.2	42.2	65.4	49.9	50.3	49.9	49.6	46.9	-	46.9	40.9	31.3	50.1	-	53.4	-	-
South Sudan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sudan	19.0	21.7	24.4	46.4	25.7	25.0	23.4	24.6	26.2	-	18.0	16.6	23.6	25.6	-	28.7	-	-
Tanzania	21.1	24.8	22.9	46.0	24.0	25.5	28.7	30.1	25.8	-	23.7	25.6	20.6	29.2	-	28.9	-	-
Togo	34.5	38.6	37.6	35.9	37.9	39.7	39.3	43.3	30.4	-	39.9	35.2	19.6	38.8	-	38.1	-	-
Tunisia	45.3	43.4	37.1	40.1	42.6	44.6	46.6	48.5	41.7	-	35.0	42.2	31.4	43.7	-	44.4	-	-
Uganda	38.0	33.0	37.8	44.4	33.3	34.6	39.2	39.1	31.6	-	39.9	30.0	23.3	38.7	-	36.7	-	-
Western Sahara	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zambia	17.4	13.0	15.7	17.6	17.8	18.0	17.3	17.3	15.6	-	17.0	18.7	11.2	17.6	-	16.7	-	-
Zimbabwe	15.8	9.4	13.0	38.9	15.2	16.6	11.8	12.7	18.4	-	16.9	11.0	7.4	12.1	-	16.1	-	-

60 <= TCI implies higher complementarity
50 <= TCI < 60 implies mid-range complementarity
25 <= TCI < 50 implies some complementarity
TCI < 25 implies low complementarity
South Africa highlighted for ease of reference
Tunisia highlighted for ease of reference
Correlating entries for South Africa to Tunisia, and Tunisia to South Africa

Source: Authors' calculations based on data from the World Integrated Trade Solution (WITS) database (2021).
Key: avg, average; Dem., Democratic; Rep., Republic; TCI, Trade Complementarity Index.

TABLE A1.2: Partners (columns eSwatini–Mozambique).

Bilateral TCI (avg 2015 to 2019)	Partner (Importer)																	
	Country	eSwatini	Ethiopia	Gabon	Gambia	Ghana	Guinea	Guinea-Bissau	Kenya	Lesotho	Liberia	Libya	Madagascar	Malawi	Mali	Mauritania	Mauritius	Morocco	Mozambique
Reporter (Exporter)	Algeria	16.4	14.1	-	19.1	9.7	17.8	-	19.7	18.7	-	16.6	20.8	14.8	27.5	20.9	18.5	20.4	21.0
	Angola	15.1	13.7	-	18.9	6.3	17.5	-	19.4	15.0	-	17.6	18.9	12.5	28.0	25.5	21.7	18.4	21.4
	Benin	25.4	22.1	-	25.2	23.5	27.3	-	22.8	27.2	-	21.8	29.5	23.1	21.9	20.6	25.0	24.2	21.0
	Botswana	8.3	6.8	-	8.1	8.4	7.9	-	7.5	8.4	-	8.9	7.7	7.1	7.2	8.1	11.0	8.0	7.9
	Burkina Faso	12.3	7.2	-	7.8	7.2	12.2	-	8.4	17.7	-	9.3	13.1	7.3	7.0	15.4	14.6	10.9	8.4
	Burundi	19.0	14.4	-	17.2	15.9	17.4	-	16.3	23.2	-	20.3	20.7	19.0	17.0	17.4	20.0	17.1	16.0
	Cameroon	27.9	20.7	-	24.3	15.6	23.6	-	26.3	31.7	-	25.8	29.7	21.4	31.5	28.5	31.0	29.2	30.2
	Cape Verde	43.0	41.3	-	31.3	40.3	40.8	-	41.2	45.2	-	45.8	40.4	38.4	41.7	41.7	47.5	43.7	42.5
	Central African Rep.	35.3	30.4	-	30.7	36.6	34.7	-	31.0	35.5	-	34.3	31.8	34.0	28.6	30.1	34.3	33.5	29.0
	Chad	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Comoros	28.5	20.1	-	27.1	20.0	24.5	-	21.2	29.1	-	26.4	25.9	23.1	23.1	18.1	26.3	22.9	20.4
	Congo, Dem. Rep.	6.5	5.0	-	4.4	4.3	5.3	-	5.2	6.5	-	6.6	7.4	6.0	5.5	5.7	5.6	7.9	6.9
	Congo, Rep.	20.0	17.5	-	23.8	10.0	24.7	-	23.6	22.0	-	21.5	23.5	16.8	29.9	44.9	23.3	23.9	26.9
	Côte d'Ivoire	32.6	25.6	-	26.6	18.5	35.2	-	29.3	30.4	-	31.8	30.1	25.4	29.0	30.8	35.7	30.5	30.8
	Djibouti	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Egypt	56.7	49.1	-	42.9	42.4	46.5	-	55.4	52.0	-	54.1	53.4	48.1	56.9	46.3	58.4	57.2	52.7
	Equatorial Guinea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Eritrea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	eSwatini	1.0	13.9	-	17.4	16.6	12.5	-	16.1	19.5	-	19.1	15.9	14.3	12.5	14.1	16.5	15.4	13.9
	Ethiopia	17.5	1.0	-	13.6	12.9	11.0	-	13.4	19.9	-	19.6	13.6	13.2	14.8	14.6	19.1	14.7	12.8
	Gabon	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gambia	33.1	27.8	-	1.0	26.3	22.4	-	32.5	34.5	-	36.3	33.6	28.0	38.6	38.4	36.8	31.5	32.5

Table A1.2 continues on the next page→

TABLE A1.2 (cont.): Partners (columns eSwatini–Mozambique).

Bilateral TCI (avg 2015 to 2019)	Partner (Importer)																	
Reporter (Exporter) / Country	eSwatini	Ethiopia	Gabon	Gambia	Ghana	Guinea	Guinea-Bissau	Kenya	Lesotho	Liberia	Libya	Madagascar	Malawi	Mali	Mauritania	Mauritius	Morocco	Mozambique
Ghana	25.0	21.4	-	24.4	1.0	29.1	-	27.0	24.1	-	27.3	25.8	20.2	32.6	29.7	31.2	27.7	28.8
Guinea	10.3	6.5	-	8.0	10.1	1.0	-	7.9	13.0	-	13.3	11.7	8.7	7.4	21.8	14.1	11.2	10.3
Guinea-Bissau	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-
Kenya	43.0	35.7	-	33.9	34.9	42.0	-	1.0	42.9	-	43.6	38.8	40.0	37.6	33.0	41.1	38.2	38.3
Lesotho	21.4	15.2	-	12.8	15.5	13.8	-	15.4	1.0	-	21.2	22.0	14.9	16.0	13.5	22.1	16.0	15.5
Liberia	-	-	-	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-
Libya	19.8	17.5	-	19.9	7.0	17.3	-	22.5	21.4	-	1.0	22.7	16.2	30.1	36.2	26.0	21.9	25.1
Madagascar	19.0	11.5	-	12.2	13.2	12.2	-	12.1	18.9	-	20.7	1.0	11.7	12.7	13.4	24.1	15.3	13.3
Malawi	19.3	13.3	-	18.9	13.7	18.6	-	15.3	20.5	-	17.1	17.3	1.0	15.0	15.3	18.4	17.5	13.1
Mali	13.1	9.1	-	7.2	8.2	7.7	-	9.1	15.9	-	11.5	11.7	9.7	1.0	7.7	14.0	10.7	7.6
Mauritania	38.4	37.8	-	35.2	37.6	40.4	-	38.3	37.9	-	38.7	38.8	33.8	37.4	1.0	45.3	41.1	39.9
Mauritius	29.9	24.6	-	23.8	25.8	22.4	-	24.2	31.1	-	31.2	28.9	21.1	21.4	18.8	1.0	27.3	22.8
Morocco	36.7	38.6	-	31.3	44.3	33.9	-	35.5	36.1	-	39.2	34.4	38.0	40.0	27.4	40.8	1.0	35.9
Mozambique	25.2	20.8	-	27.6	14.9	27.7	-	27.8	27.1	-	28.4	27.7	20.9	37.4	33.5	32.2	28.2	1.0
Namibia	17.2	12.4	-	14.8	17.4	16.7	-	14.2	17.1	-	19.5	14.3	13.8	13.2	16.9	25.3	16.4	17.3
Niger	31.3	29.5	-	42.6	20.7	35.7	-	34.7	32.0	-	33.6	38.0	26.1	32.5	47.2	34.3	31.1	32.9
Nigeria	18.4	16.1	-	20.0	8.0	20.6	-	22.1	20.7	-	21.2	22.5	15.3	29.1	31.0	22.1	21.9	24.2
Rwanda	35.9	31.0	-	41.8	28.2	36.5	-	36.5	37.2	-	37.4	42.9	32.3	38.6	43.6	37.7	35.6	37.3
São Tomé & Principe	27.3	23.4	-	29.8	22.4	25.1	-	25.6	29.1	-	26.8	29.1	25.9	29.3	32.3	26.9	26.3	25.2
Senegal	39.7	31.5	-	39.5	31.1	36.7	-	37.3	37.5	-	38.4	41.9	35.8	44.5	36.2	47.8	38.5	40.5
Seychelles	24.1	19.5	-	25.7	14.0	24.2	-	23.8	27.2	-	24.1	27.9	20.9	29.0	37.2	30.0	24.8	26.3
Sierra Leone	25.6	23.9	-	20.3	27.8	13.4	-	23.4	28.7	-	22.5	27.2	23.4	22.2	22.3	29.4	28.1	24.4
Somalia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Africa	51.6	50.8	-	40.9	49.5	51.5	-	52.8	46.8	-	47.7	48.7	47.6	47.7	42.4	52.2	56.0	51.7
South Sudan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sudan	27.0	23.2	-	25.9	18.0	20.2	-	25.7	31.4	-	29.9	29.4	22.1	25.0	31.1	30.3	28.5	23.8

Table A1.2 continues on the next page→

TABLE A1.2 (cont.): Partners (columns eSwatini–Mozambique).

Bilateral TCI (avg 2015 to 2019)	Partner (Importer)																	
	Country	eSwatini	Ethiopia	Gabon	Gambia	Ghana	Guinea	Guinea-Bissau	Kenya	Lesotho	Liberia	Libya	Madagascar	Malawi	Mali	Mauritania	Mauritius	Morocco	Mozambique
Reporter (Exporter)	Tanzania	29.4	23.4	-	23.3	28.2	22.9	-	25.5	28.7	-	30.4	27.5	27.0	26.7	22.2	34.8	28.6	25.8
	Togo	47.1	35.9	-	44.2	35.4	32.3	-	41.2	41.1	-	39.2	48.6	37.6	42.5	35.4	43.0	39.8	36.7
	Tunisia	45.2	50.8	-	36.6	44.8	40.2	-	49.6	45.0	-	49.6	45.7	45.2	43.4	37.2	48.8	51.3	45.9
	Uganda	37.0	31.1	-	38.1	34.7	35.6	-	34.2	34.2	-	35.4	39.2	34.1	34.1	34.3	41.9	34.8	34.7
	Western Sahara	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Zambia	18.4	14.0	-	17.2	18.6	20.3	-	16.4	17.7	-	17.6	19.8	18.1	18.7	16.6	18.6	19.0	16.5
	Zimbabwe	13.1	12.7	-	11.5	12.4	13.4	-	13.9	12.6	-	14.6	13.8	13.0	13.5	13.0	16.2	15.2	10.7

60 <= TCI implies higher complementarity
50 <= TCI < 60 implies mid-range complementarity
25 <= TCI < 50 implies some complementarity
TCI < 25 implies low complementarity
South Africa highlighted for ease of reference
Tunisia highlighted for ease of reference
Correlating entries for South Africa to Tunisia, and Tunisia to South Africa

Source: Authors' calculations based on data from the World Integrated Trade Solution (WITS) database (2021).
Key: avg, average; Dem., Democratic; Rep., Republic; TCI, Trade Complementarity Index.

TABLE A1.3: Partners (columns Namibia–Zimbabwe).

Bilateral TCI (avg 2015 to 2019)	Partner (Importer)																		
Reporter (Exporter)	Country	Namibia	Niger	Nigeria	Rwanda	São Tomé & Príncipe	Senegal	Seychelles	Sierra Leone	Somalia	South Africa	South Sudan	Sudan	Tanzania	Togo	Tunisia	Uganda	Western Sahara	Zambia	Zimbabwe
	Algeria	17.6	8.1	28.5	20.9	15.4	25.2	13.8	14.3	-	22.7	-	9.7	33.7	15.9	16.2	21.1	-	24.7	32.4
	Angola	17.5	6.7	26.5	20.7	15.3	26.2	16.5	11.3	-	19.1	-	9.8	28.2	16.5	16.3	21.0	-	20.9	30.9
	Benin	23.4	25.4	17.3	23.9	24.9	22.1	19.5	22.7	-	21.7	-	20.6	20.5	26.5	23.7	24.0	-	23.8	21.4
	Botswana	13.6	7.5	7.3	8.6	8.7	7.4	8.0	8.7	-	9.4	-	7.2	7.5	8.3	7.8	11.9	-	7.8	7.6
	Burkina Faso	14.7	7.5	8.2	9.0	10.0	8.0	21.3	8.0	-	12.4	-	7.7	7.6	11.3	12.8	11.9	-	6.9	8.0
	Burundi	29.0	19.3	14.6	17.7	25.3	15.9	17.2	20.7	-	18.4	-	19.5	14.2	17.4	16.9	19.2	-	19.3	16.7
	Cameroon	23.0	15.2	31.0	27.2	22.6	31.1	22.4	20.2	-	26.1	-	19.5	34.5	29.0	27.2	26.7	-	26.2	34.1
	Cape Verde	45.5	36.7	41.9	40.2	36.9	41.0	49.5	37.8	-	44.5	-	39.4	42.6	41.9	44.5	40.7	-	43.0	42.6
	Central African Rep.	38.2	36.9	26.1	29.0	33.9	28.8	36.5	37.5	-	33.1	-	41.7	25.5	32.1	30.7	31.5	-	29.7	27.5
	Chad	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Comoros	27.0	29.8	20.5	22.3	26.5	23.2	17.8	24.9	-	23.5	-	26.1	17.8	22.9	22.4	22.6	-	23.1	22.5
	Congo, Dem. Rep.	19.7	4.3	4.7	4.6	13.4	5.3	4.5	5.2	-	11.1	-	5.0	5.3	6.8	7.3	5.0	-	14.4	5.9
	Congo, Rep.	22.3	11.0	30.5	23.7	20.1	31.1	40.0	16.7	-	22.9	-	13.8	27.4	19.4	22.5	22.7	-	22.7	33.1
	Côte d'Ivoire	34.3	18.9	27.1	30.6	27.6	29.5	29.0	22.2	-	33.2	-	23.6	28.9	29.5	29.8	31.4	-	28.3	29.0
	Djibouti	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Egypt	51.4	38.8	51.5	56.8	47.3	56.8	39.9	44.2	-	51.3	-	44.5	55.1	57.2	55.9	56.5	-	51.1	55.4
	Equatorial Guinea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Eritrea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	eSwatini	17.8	12.9	13.8	16.4	15.5	14.2	18.7	14.3	-	16.5	-	18.7	14.3	15.2	15.5	16.0	-	13.5	13.6

Table A1.3 continues on the next page→

TABLE A1.3 (cont.): Partners (columns Namibia–Zimbabwe).

Bilateral TCI (avg 2015 to 2019)	Partner (Importer)																		
Country	**Namibia**	**Niger**	**Nigeria**	**Rwanda**	**São Tomé & Principe**	**Senegal**	**Seychelles**	**Sierra Leone**	**Somalia**	**South Africa**	**South Sudan**	**Sudan**	**Tanzania**	**Togo**	**Tunisia**	**Uganda**	**Western Sahara**	**Zambia**	**Zimbabwe**
Ethiopia	19.4	12.6	11.0	13.4	15.2	12.5	14.9	14.1	-	16.0	-	14.5	11.6	13.8	16.3	13.4	-	12.3	11.8
Gabon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gambia	27.7	33.9	30.0	31.9	36.2	33.8	37.8	20.7	-	32.0	-	26.9	28.5	33.4	29.8	29.4	-	32.1	32.9
Ghana	29.1	14.0	30.0	29.3	27.3	33.5	24.4	18.9	-	29.8	-	17.9	29.1	24.9	24.7	31.3	-	28.3	34.2
Guinea	22.6	6.7	9.0	7.4	24.1	7.5	20.2	18.1	-	9.9	-	8.7	6.5	17.8	9.4	6.9	-	14.7	7.3
Guinea-Bissau	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kenya	42.9	32.7	32.7	39.7	36.1	38.5	32.1	36.6	-	37.9	-	36.1	35.3	39.9	38.2	37.9	-	38.3	35.4
Lesotho	21.2	15.1	13.3	18.9	24.1	14.3	19.4	17.7	-	17.8	-	15.5	15.0	19.9	18.7	20.0	-	14.3	13.2
Liberia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Libya	24.1	14.5	30.7	23.1	21.1	28.2	36.7	7.2	-	23.0	-	13.8	24.6	19.4	20.0	23.7	-	23.8	34.0
Madagascar	21.7	11.1	12.5	14.1	18.3	13.2	16.9	15.6	-	15.6	-	13.6	11.3	21.4	14.8	13.9	-	15.4	11.5
Malawi	15.6	16.1	13.0	16.3	19.1	15.9	13.2	16.3	-	16.6	-	20.8	12.9	15.1	16.7	13.8	-	11.8	13.8
Mali	13.9	8.5	7.1	10.3	8.8	7.8	7.5	7.1	-	13.7	-	7.7	8.7	11.7	11.0	12.9	-	10.1	9.7
Mauritania	46.1	41.6	43.0	38.0	60.0	39.8	47.9	40.1	-	42.5	-	41.3	34.6	45.5	40.4	35.4	-	42.7	39.6
Mauritius	31.4	21.2	23.8	27.8	26.9	21.9	24.6	24.1	-	31.4	-	26.9	22.3	26.4	28.2	25.4	-	22.5	21.0
Morocco	36.7	37.0	31.6	36.8	37.7	33.2	28.3	37.6	-	41.4	-	38.1	34.2	38.0	41.4	34.4	-	39.7	32.7
Mozambique	30.2	16.2	34.1	30.5	29.5	34.9	24.3	19.6	-	28.1	-	18.4	31.1	26.8	25.6	28.6	-	31.9	37.3
Namibia	1.0	13.8	18.1	16.5	23.5	15.7	28.1	17.0	-	16.4	-	12.3	13.2	18.5	15.7	17.9	-	23.0	13.5
Niger	34.2	1.0	29.7	36.5	43.2	38.2	34.9	37.4	-	31.1	-	33.3	31.0	38.0	30.9	38.0	-	34.4	34.0
Nigeria	18.8	10.9	1.0	21.7	18.6	28.0	24.2	12.8	-	24.6	-	11.7	29.7	18.4	19.8	21.6	-	22.2	32.3
Rwanda	41.3	30.8	32.4	1.0	46.9	37.0	35.5	33.2	-	34.6	-	30.1	32.9	38.9	32.6	41.7	-	39.3	35.6
São Tomé & Principe	25.5	27.1	23.8	25.3	1.0	27.5	29.8	27.7	-	25.7	-	25.2	25.7	25.9	24.8	25.6	-	28.6	27.7
Senegal	42.1	31.9	36.8	41.1	37.4	1.0	38.0	32.6	-	38.4	-	30.1	35.2	39.7	36.6	40.8	-	40.1	37.4
Seychelles	25.1	15.6	29.0	23.9	23.7	28.6	1.0	18.0	-	24.0	-	16.1	25.6	25.2	23.0	22.0	-	28.2	30.5

Reporter (Exporter)

Table A1.3 continues on the next page→

TABLE A1.3 (cont.): Partners (columns Namibia–Zimbabwe).

Bilateral TCI (avg 2015 to 2019)	Partner (Importer)																		
Country	**Namibia**	**Niger**	**Nigeria**	**Rwanda**	**São Tomé & Príncipe**	**Senegal**	**Seychelles**	**Sierra Leone**	**Somalia**	**South Africa**	**South Sudan**	**Sudan**	**Tanzania**	**Togo**	**Tunisia**	**Uganda**	**Western Sahara**	**Zambia**	**Zimbabwe**
Sierra Leone	27.8	25.1	22.0	20.8	25.7	22.4	22.4	1.0	-	25.1	-	26.6	22.5	27.1	25.2	22.9	-	28.0	22.6
Somalia	-	-	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-
South Africa	63.4	40.8	48.1	48.6	49.0	51.4	40.8	47.5	-	1.0	-	49.5	51.0	55.9	51.45	56.4	-	56.7	49.0
South Sudan	-	-	-	-	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-
Sudan	28.4	15.6	23.6	24.8	19.7	26.2	27.6	21.7	-	26.9	-	1.0	33.1	25.1	29.0	26.2	-	24.4	26.9
Tanzania	31.9	26.8	23.2	29.4	28.5	26.0	24.8	30.5	-	26.3	-	26.0	1.0	27.9	28.0	28.1	-	26.8	23.8
Togo	37.9	36.7	35.5	39.3	44.4	38.7	30.9	36.2	-	39.1	-	36.5	39.5	1.0	41.4	43.8	-	38.6	37.7
Tunisia	43.7	43.3	42.0	52.1	42.2	44.4	37.6	41.7	-	50.79	-	42.9	46.6	45.9	1.0	45.9	-	45.3	41.9
Uganda	34.5	37.9	31.8	40.7	37.4	36.3	32.1	34.2	-	30.1	-	36.0	28.0	38.0	34.2	1.0	-	27.0	32.3
Western Sahara	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	-	-
Zambia	26.7	18.0	15.5	18.0	17.2	16.6	12.4	16.3	-	16.5	-	14.5	15.4	17.2	17.9	17.7	-	1.0	15.6
Zimbabwe	21.5	13.7	10.4	14.8	17.3	13.7	9.8	15.6	-	11.0	-	12.3	12.2	21.0	15.0	18.9	-	18.3	1.0

Reporter (Exporter)

60 <= TCI implies higher complementarity
50 <= TCI < 60 implies mid-range complementarity
25 <= TCI < 50 implies some complementarity
TCI < 25 implies low complementarity
South Africa highlighted for ease of reference
Tunisia highlighted for ease of reference
Correlating entries for South Africa to Tunisia, and Tunisia to South Africa

Source: Authors' calculations based on data from the World Integrated Trade Solution (WITS) database (2021).
Key: avg, average; Dem., Democratic; Rep., Republic; TCI, Trade Complementarity Index

Chapter 2

TRADE-DSM refinements for landlocked countries

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Introduction

Engaging in international market selection for the purposes of export promotion, development and investment is a complex process, best informed by a structured approach to screening less-suitable markets (or product–market combinations) and narrowing the set of possible choices to a more manageable number from a resource constraints and strategy

17. This chapter has been substantially reworked by 50% as per the Department of Higher Education and Training's *Research Outputs Policy of 2015* from Chapter 3 of Cameron's PhD thesis: Cameron, MJ 2021, 'Extending the TRADE-DSM (Decision Support Model) approach for landlocked countries: A case study of Rwanda', North-West University, South Africa, under the supervision of Professor Wilma Viviers.

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'match' perspective. Firms are often assumed to select markets on the basis of some rational process. However, Alexander, Rhodes and Myers (2007), using an extensive database of retailers' international activity in Western European markets, found strong evidence of non-systematic, strongly personalised and essentially belief-driven approaches serving as the basis for many market selection decisions. This phenomenon has also been observed by the authors of this chapter in most of their export strategy engagements with private-sector firms in South Africa.

Because policies aimed at diversifying export products and destination markets are obviously very different, policymakers are advised to use the right tool for the right policy question (Carrère, Cadot & Strauss-Kahn 2011). To this end, Brenton and Newfarmer (2009) define the expansion of existing products in existing markets as growth at the intensive margin and the introduction of 'new' products and 'new' geographical markets as growth at the extensive margin. Brenton and Newfarmer (2009) also indicate that policies need to be sensitive to these different market expansion objectives.

A key feature of the TRADE-DSM (Decision Support Model) methodology is its ability to address both the intensive and extensive margin dimensions of the export promotion and development challenge. The methodology offers alternatives to exporting companies faced with saturated markets and/or declining growth in their traditional markets, while also enabling them to identify new products that could possibly be used to inform investment and industrial policy decisions.

However, if one adds the real-world constraints faced by policymakers and exporting companies in, for example, landlocked[18] countries, the scale of the market selection challenge for both the home market's policymakers (when formulating national export strategies and related policies) and exporting companies (when making specific product and market selection decisions) becomes even clearer. The serious logistics constraints experienced by landlocked countries because of their dependency on time-consuming and costly transit legs and numerous border crossings, as well as the landlocked 'penalty', are well documented. Several recent studies confirm that developing countries that are landlocked experience less economic growth than developing countries that have sovereign access to the sea, except for a few.[19] Various studies show that this geographical characteristic negatively impacts landlocked countries'

18. Note that the term 'landlocked' used in this publication's context is taken from the definition applied by the United Nations (UN 1982). Landlocked countries have no direct access to the sea and are bordered by a single or two or more neighbouring countries, which do have direct access to the sea (ocean). A landlocked country could also be 'doubly landlocked' in the sense that it is surrounded by other landlocked countries.

19. Rivero et al. (2019) found that access to the sea does not always guarantee growth and development in the long term, as demonstrated by, for example, Madagascar, Mozambique and (Republic of the) Congo.

international trade and the quality of their institutions (Moore 2017; Paudel 2014; Rivero et al. 2019). The United Nations Conference on Trade and Development's (UNCTAD) newly released data set consisting of trade cost by country, commodity and mode of transport shows that developing countries must exert twice as much transport-related effort[20] as developed countries to move their imports and exports by sea per dollar of maritime trade (UNCTAD 2024).

Landlocked countries' dependence on regional neighbours and transit corridors typically adds to the time and cost associated with trade, especially in the case of developing countries or countries in transition. The effect of time in transit is a major factor impacting export competitiveness, with the cost of that time a potentially significant (but often overlooked) barrier to trade. This aspect should therefore form part of the basis for realistic target market selection, as these barriers to trade can significantly alter the relative attractiveness of alternative target market candidates.

Based on the aforementioned facts, it is becoming increasingly evident that the TRADE-DSM methodology should be more reflective of such real-world issues. The TRADE-DSM as well as most other methodologies (such as that of the International Trade Centre [ITC]) have, up to this point, used simple geodesic distances and 'nearest port' assumptions to help inform export potential and related market selection decisions. When the relative outcomes of these modelling approaches are compared, they do not reflect the often lengthy (and thereby costly) land transit legs, with the result that they offer a distorted view of reality. This could impair international market selection and the strategic export decision-making process in general.

The African continent's aspirations in respect of the African Continental Free Trade Area (AfCFTA) will be well served if policy and strategy formulation are informed by a structured and thoroughly researched process that includes the geographical nuances, infrastructure connectivity and logistics implications of the various partner countries on the continent relative to one another, because 16 of the 54 countries[21] in Africa are landlocked.

This chapter, therefore, discusses a refinement to the TRADE-DSM methodology to adequately address (within the constraints of available data) the challenges associated with multiple country transits and border crossings and the impact thereof on logistics time and costs. With this

20. According to UNCTAD (2024), 'transport work' is calculated by multiplying the weight of the goods by the distance by which they need to be shipped.

21. The continent of Africa has 54 countries that are fully recognised by the UN, two independent states with limited or no recognition (Western Sahara and Somaliland) and several territories (mostly islands) controlled by non-African countries.

refinement, the methodology becomes even more useful as a strategic tool to inform regional integration and export promotion strategies and initiatives. To create the necessary context, the pre-2017 TRADE-DSM is first briefly discussed. This is followed by an explanation of the refinements made to the methodology to ensure more realistic treatment of the landlocked dimension, as implemented for the first time in the application of the methodology for Rwanda (Cameron, Viviers & Steenbergen 2017).

Overview of and background to the TRADE-DSM methodology

The basic principle underpinning the TRADE-DSM methodology is 'filtering' – that is, reducing the number of potential options to a reasonable set of 'realistic' options from which a final selection can then be made. In this regard, the TRADE-DSM methodology takes into consideration all possible worldwide product (Harmonized System [HS] 6-digit) and market (country) combinations. The methodology uses four major filters and various sub-filters to systematically eliminate less-promising markets until those with the greatest prospects of success are revealed.

A high-level description of these filters, based on Cuyvers, Steenkamp and Viviers (2012), is provided in the next section.

The TRADE-DSM export potential and realistic export opportunity identification process

The TRADE-DSM methodology uses four filters that sequentially eliminate less-realistic or uninteresting product–market combinations with a view to categorising and prioritising realistic export opportunities (REOs) in different positions on a grid (referred to as the TRADE-DSM REO Map), for the country or company for which the analysis is applied. These filters are summarised next:

- *Filter 1:* Broad general market potential, as reflected in economic size, growth, and political and commercial risks.

  Key variables considered in this filter include gross domestic product (GDP) and GDP per capita values and the annual growth rates of these variables, as well as country risk ratings of the Belgian public credit insurance agency, Office National du Ducroire (ONDD).[22]

22. Previously www.delcredere.be; now https://www.credendo.com/country_risk (the ONDD was rebranded the Credendo Group in 2013).

The purpose of this filter (sub-filter 1.1) is to eliminate countries that pose too high a relative political and/or commercial risk, compared to all other markets in the world, and also do not exhibit relative macro-economic size or growth (sub-filter 1.2). The rationale is to assist in investigating the export potential of a more limited set of countries (that meet these requirements) in the subsequent filters. Countries that would typically be excluded[23] at this stage are small (from an economic size and growth perspective) with relatively lower income (from a per capita income and growth perspective), which, in relative terms, pose a higher risk from a political and/or commercial risk perspective – in other words, countries that lack general potential at the macro level.

- *Filter 2:* Product–market import demand characteristics (relative size and growth trends).

  Key variables considered in this filter are import data per HS 6-digit product and country for all product–market combinations over a six-year period, based on the Centre d'Études Prospectives et d'Information Internationales (CEPII) Base pour l'Analyse du Commerce International (BACI) database. There are three descriptive, quantitative import demand characteristics calculated for each product–market combination in this filter: short-term import growth (in the past two years), long-term import growth (over the past five years) and import market size.

- *Filter 3:* Product–market market access conditions, including aspects such as market concentration (sub-filter 3.1) and accessibility in terms of relative tariff levels and transport logistics (distance and time – sub-filter 3.2).

  Cuyvers et al. (1995) recognise that being selected simply on the basis of size and growth does not imply that a market can easily be penetrated. Therefore, in filter 3, various restrictions to trade are incorporated so that the remaining possible export opportunities qualify for further screening. Two main categories of trade barriers are identified in this filter. The first (filter 3.1) is the degree of import procurement supplier (that is, import market) concentration, while the second (filter 3.2) is trade restrictions (Cuyvers 1997, 2004; Cuyvers et al. 1995). For import procurement supplier concentration, Hirschman's (1964) Herfindahl-Hirschman Index (HHI) is used to measure the degree of

23. Note, however, that in practice, in the trade and investment promotion space, filter 1 tends to be used only at the end of the filtering process in cases where too many options remain. This is especially true when analysing opportunities in less-developed markets, as in relative terms these markets will mainly be ranked towards the bottom of all markets in the world because of their relatively small economic size and relatively higher operational risks compared to developed markets.

concentration in a market, adjusted for the exclusion of the presence of the 'home market'.

Regarding trade barriers, two approaches have been applied over time. The initial approach used an index for 'revealed absence of trade barriers' (RATB), which was later augmented by the transport and logistics costs (TLC) approach (initial attempts are described in Pearson et al. 2010; Steenkamp et al. 2009; Viviers & Pearson 2007). The hypothesis in the case of RATB is that if the neighbours of the home market (exporting country) manage to establish a relatively strong market position in a target market, it should be possible for the home market to overcome trade barriers in that market and to ultimately trade with that market (Cuyvers 1997, 2004; Cuyvers et al. 1995).

For the TLC approach, more explicit assumptions are made regarding transport and logistics dimensions, such as international shipping time and cost per country, domestic time and cost to import, and the Logistics Performance Index (LPI), as published in the World Bank Doing Business (WBDB) Surveys (World Bank 2016). Hoekman and Nicita (2008) found that the LPI score and the Doing Business cost to import are both important measures of market access, as are ad valorem-equivalent (AVE) tariffs per product-equivalent tariff. The latter is presented as a percentage of the value of goods cleared through customs and calculated as the rate comparable to a tariff derived from unit quantities, such as weight, number or volume (ITC 2020). Also considered are AVE non-tariff barriers (NTBs) per product (Steenkamp 2011).

The aforementioned components are combined into a Market Access Index that provides a score for each unique product–market combination relative to all other product–market combinations included in the analysis. An index value, therefore, is interpreted in the context of its value relative to all other outcomes and is not meaningful on its own (Steenkamp 2011).[24]

- *Filter 4:* In the final instance, each product–market combination is categorised according to the home market's current exports and the target market's size, growth patterns and accessibility, as well as the home market's current revealed comparative advantage (RCA) and revealed trade advantage (RTA) (Cuyvers 1997; Cuyvers et al. 1995, 2012).

24. After data irregularities on *Doing Business* 2018 and 2020 were reported internally in June 2020, World Bank management paused the next *Doing Business Report* and initiated a series of reviews and audits of the report and its methodology. Read the full statement released by the World Bank Group in the *Doing Business Report:* https://www.worldbank.org/en/news/statement/2021/09/16/world-bank-group-to-discontinue-doing-business-report.

The RCA (referred to as sub-filter 4.1 in the methodology) is a key measure used as a proxy for aspects that are difficult to obtain empirical information on, such as the productivity of firms. Trade theory states that, typically, it is the more productive firms that export (Vollrath 1991). The RCA is also interpreted as a measure of both comparative (relative size of exports in the export basket) and competitive (in terms of the proxy for productivity) advantage of a product in a country's export context (Liu et al. 2018).

Some countries, such as the Netherlands, Singapore, South Africa and Hong Kong, are transit countries for many goods going into Europe, southeast Asia, China, southern Africa and other regions. Therefore, the results need to give an indication of whether the product under consideration is locally produced or probably only re-exported. This is determined by using the RTA index of Vollrath (1991) as a further sub-filter within filter 4 (referred to as sub-filter 4.2 of the methodology).

The RTA index accounts for both exports and imports simultaneously and is used as an indicator of product-level competitiveness. An RTA > 0 reveals a positive comparative trade advantage or trade competitiveness. It can be assumed that an RTA > 0 implies that the majority of the product exported is locally produced as it corrects for re-exports.

- *Relative size of 'untapped' potential export value:* Potential export markets are further categorised according to the home market's current export performance in these markets compared to the performance of the top six competitors in each of these markets.

  An 'unconstrained' potential 'untapped' export value is assigned to each identified product–market combination with a view to prioritising the shortlisted export opportunities. This potential untapped export value is considered the average market import value of the top six competitors in each market, excluding imports from the 'home market' if such a market happens to be one of the top six sources of imports for the target market for a given product. The 'unconstrained' qualifier refers to the fact that the potential is not impacted by production or supply constraints from the perspective of the home market (exporting country).

  The size of the 'untapped' potential provides a relative indication of the potential 'additional' size of different export opportunities relative to one another from the perspective of the home market, relative to its existing exports to the target market. It is possible that the actual export value from the home market is higher than this indicative potential export value. This means that the exporting country (home market) is one of the main exporters into a particular target market, and its share of total imports into the target market exceeds the average market value of the same product supplied to this same target market by the top six

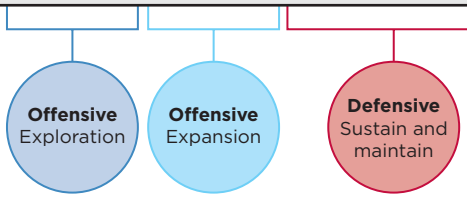
competitors (other than the home market). This therefore provides a realistic indication (all else constant) of the potential market value that the home market could target to obtain, in addition to its existing exports to the target market.

The 'all else constant' assumption implies that the home market would need to prise away market share from the group of other countries already supplying this product to the target market in question.

The outcomes are translated into an REO Map for ease of understanding and reference, as depicted in Figure 2.1.

It is evident from the grid or map in Figure 2.1 that the characteristics of any result (REOxy)[25] can then be used to inform appropriate – although still broadly defined – export promotion or marketing strategies. The home market characteristics as exporter to the target market (columns) are discussed in more detail under the next heading, followed by a summary description of the combination of row and column characteristics in the subsequent section.

Target market characteristics (Detailed product × market)	Realistic Export Opportunities (REOs)	Home market relative market share of target market			
		Small	Intermediately		Large
			Small	Large	
	Large	RE01,1	REO2,1	REO3,1	REO4,1
	Growing (*short and long term*)	RE01,2	REO2,2	REO3,2	REO4,2
	Large and growing (*short term*)	RE01,3	REO2,3	REO3,3	REO4,3
	Large and growing (*long term*)	RE01,4	REO2,4	REO3,4	REO4,4
	Large and growing (*short and long term*)	RE01,5	REO2,5	REO3,5	REO4,5



Source: Cameron and Viviers (2015), adapted from Cuyvers et al. (2012).
Key: REOs, realistic export opportunities; TRADE-DSM, TRADE-Decision Support Model.

FIGURE 2.1: TRADE-DSM REO Map.

25. The x refers to the home market relative market size column, while the y refers to the market characteristics row.

☐ ‘Home market’ market share characteristics of realistic export opportunities

The home market’s market share of supplying imports to the target market (indicated by the four columns in the TRADE-DSM REO Map, as depicted in Figure 2.1) is characterised as follows:

1. $REO_{1,1}$ to $REO_{1,5}$: The home market has a non-existent to very small market share, for various reasons, and an offensive exploration market strategy is appropriate for products where a comparative advantage exists or can be developed.
2. $REO_{2,1}$ to $REO_{2,5}$: The home market has a relatively small market share (but goods are being traded, so indications are that logistics and NTBs can be overcome) and REOs are situated in large and/or growing market segments; therefore, an offensive expansion market strategy can be advocated.
3. $REO_{3,1}$ to $REO_{4,5}$: The home market has already gained a relatively medium-large or large market share and therefore a defensive market sustain-and-maintain strategy also seems appropriate.

☐ ‘Target market’ characteristics of realistic export opportunities

The target (or importing) market’s (various potential target markets) characteristics (indicated by the five rows in the TRADE-DSM REO Map in Figure 2.1) in terms of both size and growth can also be used to inform market strategies:

1. $REO_{1,1}$; $REO_{2,1}$; $REO_{3,1}$: ‘Breaking into’ a large, ‘relatively’ new market, especially when the market share of the home market is still relatively small ($REO_{1,1}$ and $REO_{2,1}$).
2. $REO_{1,2}$; $REO_{2,2}$; $REO_{3,2}$: ‘Taking advantage of a growing market’, that is, opportunities in target markets that are growing in both the short and long terms.
3. $REO_{1,3}$; $REO_{2,3}$; $REO_{3,3}$: ‘Growing and consolidating’, that is, opportunities in target markets that have experienced growth in the recent past or emerging opportunities.
4. $REO_{1,4}$; $REO_{2,4}$; $REO_{3,4}$: ‘Leapfrogging’, that is, opportunities in target markets that exhibit long-term growth.
5. $REO_{1,5}$; $REO_{2,5}$; $REO_{3,5}$: ‘Jumping on the bandwagon’, that is, target markets that show large import volumes and growth in both the short and long terms.

The interpretation and application of the TRADE-DSM REO Map are provided in the form of practical examples in Chapter 5.

Past refinements of the TRADE-DSM methodology

This section provides additional background information on the TRADE-DSM methodology and its development, with the focus on the context and chronology of earlier, major methodological changes and how these have led up to the point where the current refinements will be introduced.

Context and chronology of the TRADE-DSM

The TRADE-DSM methodology was initially developed by Cuyvers et al. (1995) to identify the product–market combinations with the highest export potential for a single (exporting) country. It was specifically designed to provide export promotion agencies with a more scientific way of determining those products and destination countries on which to focus their scarce export promotion resources. The main aim of the TRADE-DSM methodology is therefore to identify product–market combinations with the highest export potential from the perspective of a single exporting country (which in this chapter is referred to as the 'home market'). Further refinements to the methodology have been introduced over the past two and a half decades.

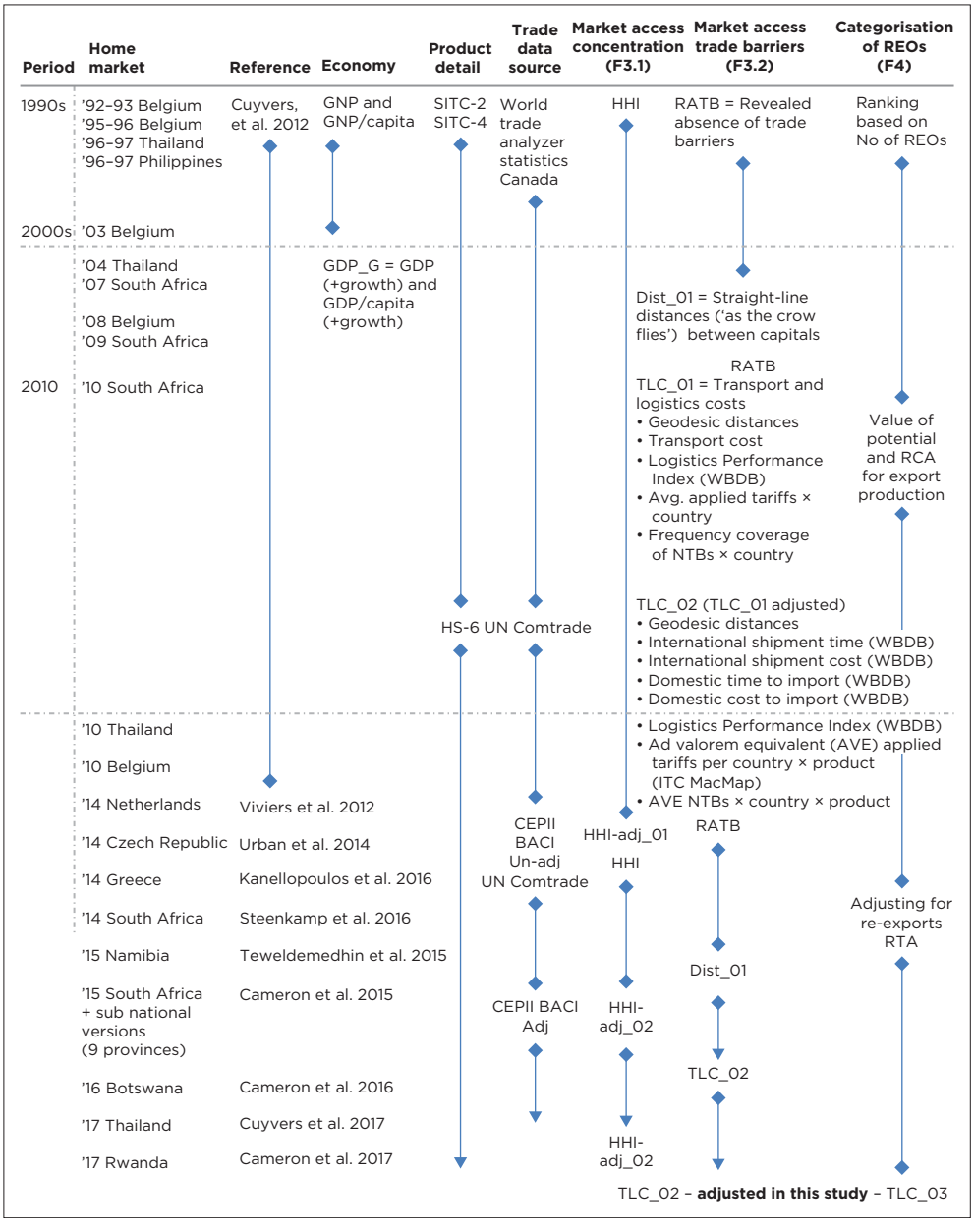
As mentioned in the introduction to this chapter, the TRADE-DSM methodology is dynamic in that it evolves continuously over time, as specific filters and requirements are uncovered or as new and better research, data and parameter information become available. A brief chronology of these developments and the countries for which the TRADE-DSM methodology has been constructed appear in Table 2.1.

Markets for which TRADE-DSMs have been constructed

Up until 2016, the TRADE-DSM methodology was applied in models constructed for Belgium (1992–93, 1995–96, 2003, 2008, 2010), Thailand (1996–97, 2004, 2010, 2017), the Philippines (1996–97), South Africa (2007, 2009, 2010, 2014, 2015), the Netherlands (2014), the Czech Republic (2014), Namibia (2015), Botswana (2016), Greece (2016) and the United States (US) (at state level for Louisiana, 2016) (see Cameron & Rossouw 2016; Cameron et al. 2017; Cuyvers 1997, 2004; Cuyvers et al. 1995; Cuyvers & Dumont 2008; Cuyvers & Viviers 2012; Kanellopoulos & Skintzi 2016; Oluwade 2018; Teweldemedhin & Chiripanhura 2015; Urban, Mejstřík & Chvalkovská 2014).

There are two 'main' branches of the TRADE-DSM methodology that have emerged to date. These two branches are mainly distinguished on the basis of the treatment of market access, which is commonly referred to as

TABLE 2.1: Chronology – the TRADE-DSM's major methodological developments and refinements.



Source: Authors' compilation, based on various references included in the chronology.
Key: REO, realistic export opportunity; GDP, gross domestic product; HHI, Herfindahl-Hirschman Index; RATB, revealed absence of trade barriers; WBDB, World Bank Doing Business; NTBs, non-tariff barriers; RTA, revealed trade advantage; TLC, transport and logistics costs; HS, Harmonized System; SITC, Standard International Trade Classification; GNP, gross national product; UN Comtrade, United Nations Commodity Trade; CMA-CGM, Compagnie Maritime d'Affrètement and Compagnie Générale Maritime (predecessor companies).

sub-filter 3.2 of the methodology. These two branches refer to the application of either the RATB approach or the TLC approach. Other points of difference include the international trade data sets used, the treatment of market concentration (filter 3.1) and economic variables (filter 1).

Underlying international trade data and classifications used

During the initial period of 1992–2009, TRADE-DSMs were constructed using annual international trade data aggregated on the basis of the Standard International Trade Classification (SITC) groupings and World Trade Analyzer (WTA) data from Statistics Canada (StatCan). Based on SITC revision 2 (which was active until 2006), around 786 product categories were defined at the 4-digit SITC level of detail.

From 2010 onwards, the significantly more detailed HS 6-digit trade data were used, based on the UN Comtrade (2020) data. However, when conducting a more detailed-level analysis, the mismatch between imports and exports 'as reported' between countries, as well as the lag of data reported for various countries, became more obvious. This led to a search for an alternative data source, and the CEPII BACI database was applied from 2014 onwards.

However, the CEPII BACI database treats the Southern African Customs Union (SACU), comprising South Africa, Namibia, Botswana, Lesotho and eSwatini (previously known as Swaziland), as a single export source or place of origin and import destination. For the purpose of distinguishing between the SACU member states, the CEPII BACI database is adjusted[26] every year to provide synthetic trade flows for each of the five member states, based on data reported by the individual states and partner-reported trade.

The benefit of using the CEPII BACI database is that it is constructed from the UN Statistics Division's Comtrade database, but reconciles the data as reported by more than 162 countries to the UN. The Cost, Insurance and Freight (CIF) import values and Free on Board (FOB) export values reported are reconciled to provide a single, consolidated, 'synthetic' trade figure for each bilateral trade flow on a comparable FOB basis, adjusted for country reporting inconsistencies. Furthermore, the CEPII methodology assesses the reliability of country reporting and takes these reporting quality weights into consideration when reconciling the bilateral trade flows. In this way, by making use of 'partner reporting', the CEPII BACI database can be expanded to cover bilateral trade values for 222 geographies (countries and island nations) at the HS 6-digit product disaggregation. The CEPII BACI database is updated every year (CEPII 2017).

26. The details of the CEPII BACI database adjustments do not form part of this study; more information is available on request from the authors.

Treatment of market concentration

In terms of market concentration, the HHI was applied up to 2014, after which the *adjusted* HHI was implemented. The adjustment removed the home market from the calculation to test whether the home market is the cause of import-market concentration for a product in a selected market.

Where the outcome is that the home market causes high import-market concentration, the outcome is adjusted to still 'pass' such an opportunity through the filter. The rationale for this treatment is that the home market is already a large supplier to the target market and so, for individual exporters from the home market, this is still an opportunity – irrespective of the overall value of the concentration index.

However, in this scenario, where the home market causes high import-market concentration, home-market firms that are 'new' to this specific target market may find that they are competing with their compatriots (own-country competitors) for a share of this target market. Because the data do not contain company-level details, the export opportunity needs to remain in the pool of selected markets to allow individual, firm-level decision-makers to decide whether the market is worth pursuing. When an evaluation is conducted at the firm level, the individual firm will know, based on their internal export sales data, whether or not the firm is among the suppliers representing this concentration in the market and will interpret the opportunity within their own context.

If it happens that a particular firm is responsible for most of the existing exports to the target market being evaluated, a decision may be taken not to pursue this opportunity any further (to avoid, for example, over-concentration in a particular market). If, on the other hand, this is a 'new' market for a particular firm, the decision-makers can determine whether they are in a position to target the market share already supplied by other firms from the home market.

Treatment of tariff barriers

The initial approach applied made use of an index of the RATB as a proxy for trade barriers. This RATB approach was a function of data availability in the early days (late 1980s and 1990s) of the development of the methodology. As explained earlier, the hypothesis was that if the neighbours of the home market (exporting country) were able to establish a relatively strong market position in a target market, it should be possible for the home market (exporting country) to overcome the trade barriers in (and also trade with) this target market.

The RATB index (M_{jk}) was constructed with the objective of gauging whether such barriers would seriously hamper the home market's exports to a selected target market. This objective was achieved by considering the export performance of selected neighbouring exporting countries, as follows:

$$M_{jk} = \frac{\frac{X_{Neighbour\ 1,j,k}}{X_{Neighbour\ 1,k}} + \frac{X_{Neighbour\ 2,j,k}}{X_{Neighbour\ 2,k}} + \frac{X_{Neighbour\ 3,j,k}}{X_{Neighbour\ 3,k}} + \ldots}{\frac{X_{World\ j,k}}{X_{World,k}}} \qquad \text{[Eqn RATB\_1]}$$

Where:

M_{jk} = the market share of the neighbours of the home market in target market (country *j*'s) imports of product category *k*, normalised with the relative share of the target market's share of imports from the world for the product;

$X_{Neighbours\ n,j,k}$ = the exports of product category *k* to target market *j* from each of the neighbouring countries (1 to *n*) of the home market (alternatively stated – the share of imports of target market *j* for product *k* obtained from home market neighbour *n*);

$X_{World\ j,k}$ = total world exports of product category *k* to target market *j*;

$X_{World\ k}$ = total world exports of product category *k*.

To illustrate, the case of Belgium as the home market (exporting country) is used (Cuyvers et al. 1995). The interpretation is that if Belgium's neighbours – in this case, the countries considered were France, Germany and the Netherlands – have been able to establish relatively strong market positions for a product in a particular target market, it would imply that trade barriers (if any exist) in this target market do not prohibit exports into this particular target market from these neighbouring countries. Hence, it should be possible for Belgium to export the same product to the target market in question, if Belgium does indeed produce this product for export.

Qualifying assumptions employed for this proxy are:

The neighbouring countries selected are exporting countries with similar economic structures to those of the home market.

A minimum of one of the selected neighbours does export the product relating to the possible export opportunity to the target market under investigation.

A higher relative share M_{jk} is indicative of a revealed absence of barriers to trade into this particular target market for the specific product under investigation.

The decision as to whether trade barriers, with which a possible export opportunity is confronted, can be overcome is informed by a rule-of-thumb condition: $M_{jk} \geq 0.95$. Based on this rule, if at least one of the neighbouring countries included in the index demonstrates an RCA in exporting product *k* to a particular target market *j*, it can be assumed that, by proxy, there should also be no revealed barriers to trade for the home market exporting product *k* to the target market under investigation, with a margin of error of 5% (Cuyvers 1997, 2004).

However, this kind of approach is more applicable in the case of, for example, the European Union (EU), where countries from a trade and development perspective operate under very similar conditions when it comes to tariffs, standards, and the regulatory and transport logistics environment. The outcomes in this case would also be more 'generalised' from a trade perspective, ignoring domestic production capacity and the economic structural heterogeneity of the home market compared to the neighbouring countries selected as proxies. The actual choice of so-called proxy countries to use in this case follows a relatively arbitrary approach.

When the application of this proxy approach (RATB) was initially attempted in the context of South Africa (see Pearson et al. 2010; Steenkamp et al. 2009; Viviers & Pearson 2007), based on SACU membership and proximity to the member states, the outcomes obtained were not realistic. This can in part be ascribed to the fact that the other SACU member states do not trade as much with the rest of the world as South Africa does, are not as diverse from an economic development and production and resource structure perspective, and were mostly dependent on trade with South Africa, as opposed to the rest of the world.

This led to an alternative approach (indicated as TLC_01 in Table 2.1) being pursued, which rather considered distances ('as the crow flies'), but this was also found not to yield robust results. A further refinement (indicated as TLC_02 in Table 2.1) by Steenkamp (2011) was therefore made based more on a logistics approach, as proxied by the WBDB indices for cost and time for imports, exports and logistics infrastructure performance (World Bank 2016).

Hoekman and Nicita (2008) found that in the LPI, published by the World Bank, and the *Doing Business Report* (World Bank 2016), the cost-to-import

measure and the AVE tariffs per product[27] are both important measures of market access. As a result, this TLC approach developed more explicit assumptions in terms of transport and logistics dimensions, such as international shipping time and cost per country and domestic time and cost to import, based on the WBDB Surveys (World Bank 2016). The approach applied in this context by Steenkamp (2011) was therefore to use these indices and, based on the 'closest' port assumption (as applied by the World Bank), to construct a logistics index for the market access filter from the home market's major port for exports (in South Africa's case, the port of Durban).

Finally, the AVE NTBs per product were considered (Steenkamp 2011), but were later discarded because the information became dated and because of limitations in the interpretation of the implications of these indicators.

Treatment of economic variables

The initial methodology (1992–2007) considered only relative ratios (shares) of macro variables, such as gross national product (GNP) and GNP per capita, at a specific point in time for target markets. This approach was subsequently also adjusted during the process of refining the 2007 application of the TRADE-DSM methodology for South Africa. The base economic market-demand comparison variable was changed to GDP and GDP per capita, including trends with respect to these concepts over a five-year period. The main purpose of this change was to also include a categorisation for small (in terms of economic size) but growing markets, because the initial approach would end up excluding smaller markets based on GNP and GNP per capita shares only. Therefore, from 2007 onwards, GDP and GDP per capita relative shares and trend patterns were applied instead and were used as proxies for overall market demand and wealth. The main source of this data was the National Accounts Estimates of Main Aggregates of the United Nations Statistics Division (UN 2016).

Summary

It is evident from the developments underpinning the TRADE-DSM methodology over time (1992–2015) that the landlocked issue was never explicitly identified or considered in the methodology. Part of the reason for this was that all the countries for which the TRADE-DSM methodology

27. An AVE tariff is defined as a tariff presented as a percentage of the value of goods cleared through customs and is calculated as the rate comparable to a tariff derived from unit quantities such as weight, number or volume (ITC 2020).

was applied up to 2015 had access to direct maritime transport, and so the landlocked issue never came to the surface. The 'closest port' assumption was sufficient for the high-level macro analysis conducted based on the various country TRADE-DSMs during this period.

With the application of the methodology for Rwanda (Cameron et al. 2017), the issue of Rwanda's landlockedness necessitated a re-evaluation of this aspect of the market access filter. The required refinements, designed to accommodate and adjust the TRADE-DSM methodology for landlocked countries, are discussed in the next section.

Methodology refinements related to the treatment of landlocked countries

The focus of the methodology refinements described in this section is on the incorporation of elements identified in the literature review by Cameron (2021), which are specifically relevant to landlocked countries and aspects related to transport logistics. For the sake of brevity, the literature review is not repeated here.

According to Cuyvers et al. (1995), it is a truism that a target market selected on the basis of size and growth does not necessarily mean – from a specific home market (exporter) perspective – that such a market can be easily penetrated. Therefore, in dealing with the TRADE-DSM methodology, trade restrictions are considered to further filter or screen the remaining possible export opportunities (in filter 3) by considering two main categories of barrier, namely the degree of concentration (filter 3.1) and trade restrictions (filter 3.2) (Cuyvers 1997, 2004; Cuyvers et al. 1995).

The studies by Raballand (2003), Hummels (2001, 2007) and Hummels and Lugovskyy (2006) pointed to two potential mechanisms to consider in the chosen market selection methodology, which would be more relevant to a landlocked country. The first mechanism is the treatment of multiple border crossings (i.e. transits through other countries), while the second mechanism is a more explicit consideration of the treatment of 'land distance' versus 'maritime distance'. These mechanisms therefore both relate to the time–cost of transit. Moreover, both mechanisms can be considered for the purpose of refining filter 3.2, which accounts for trade restrictions within the overall TRADE-DSM methodology. More specifically, these refinements to the TRADE-DSM methodology can be summarised as follows:

- *Refinement 1 – incorporation of transit dimension*: In terms of market access, to incorporate a detailed maritime and land-based logistics approach, including transit, modal switches and commercial links.

- *Refinement 2 – incorporation of maritime versus land routing*: A distance parameter that considers the difference between maritime and land-based paths needs to be included. Therefore, more detailed treatment of maritime and land-routing specifics is required. This is necessary because travel time and costs differ between land and maritime modes, and also not all goods can be transported via maritime transport all the way for all routes.
- *Refinement 3 – incorporation of cost of transit time*: To be able to model and incorporate the cost of transit time, the aforementioned two refinements are required because they directly influence transit time. What remains is to quantify the transit cost element in the refinement process.

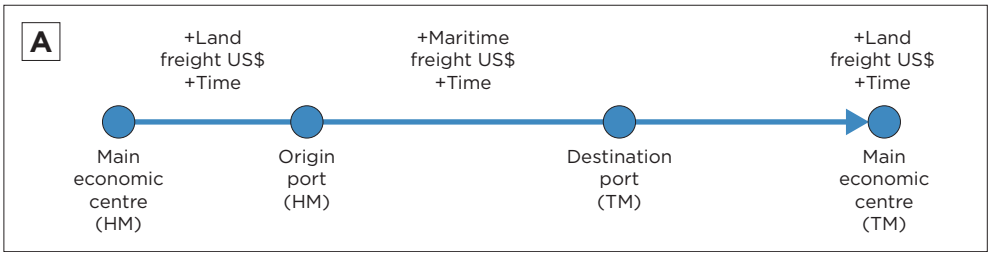
Overall, a logical, relative logistics approach therefore needs to be developed, which can augment the current filter 3.2 approach. This can be achieved by constructing a relative (between countries and routes) index-based measure that translates differences in distance and travel time (on land versus sea) and considering transit points, into a logistics cost component that will allow the identification of REOs to be more sensitive to these dimensions as they impact trade costs. The largest impact of such a refinement to the methodology is expected to be evident in the evaluation of opportunities associated with landlocked countries.

In the section 'Detailed quantitative example' in this chapter, some examples of routing scenarios are provided to help explain how the creation of this relative index-based logistics cost measure can be approached.

In order to develop the index-based logistics cost measure, the basic proposed mechanism is first discussed and illustrated. The differences between the simplified and the real-world logistics in terms of, for example, the use of 'simple' geodesic distance assumptions versus actual maritime routings are discussed as part of the development of the approach. Thereafter, the information requirements are discussed, the mechanism and the data are brought together in the second part of the discussion, and finally, a hypothetical quantitative example is discussed. The application of the approach, including detailed assumptions for a landlocked case, is then demonstrated for the case of Rwanda in Chapter 3.

Basic building blocks of a relative, index-based logistics cost measure

First of all, the basic building blocks on which to base the development of a relative, index-based logistics cost measure are discussed. In this regard, simplified routing diagrams serve to demonstrate the relevant concepts. The routing shown in Figure 2.2 is based on a container of goods shipped,



Source: Authors' own work.
Key: US$, United States dollar; HM, home market; TM, target market.

FIGURE 2.2: Example A - home market (sea access) to target market (sea access).

and the simplified transport modes are given as land (but in the real world may be land-based truck, rail, pipeline or air) and maritime (which could be sea or waterways [canal or river]). In the interests of simplicity, air transport is excluded from these examples.

Example A (Figure 2.2) illustrates a typical origin-to-destination flow for a home market (exporter) and target market (importer), where both the home market and target market have direct sea access. What is evident in this example is that the container is transported over land from the main economic centre in the home market to the (origin) port in the same home market. Then a modal switch takes place when the container is loaded onto maritime transport, to be deposited at the end of the maritime journey at the entry (destination) port of the target market. Another modal switch takes place when the container is again placed on land transport and transported to the main economic centre in the target market.

Therefore, the total logistics cost (freight and transit) of this journey (FTC_{ij}) from home market *i* to target market *j* is simply the sum of the costs of the different elements of each of the legs between transit points, as shown in Equation 1:

$$FTC_{ij} = (FC_{Tx1}+TC_{Tx1}+FC_{Tx2}+TC_{Tx2}+ FC_{Tx3}+ TC_{Tx3}) \quad \text{[Eqn 1]}$$

Where:

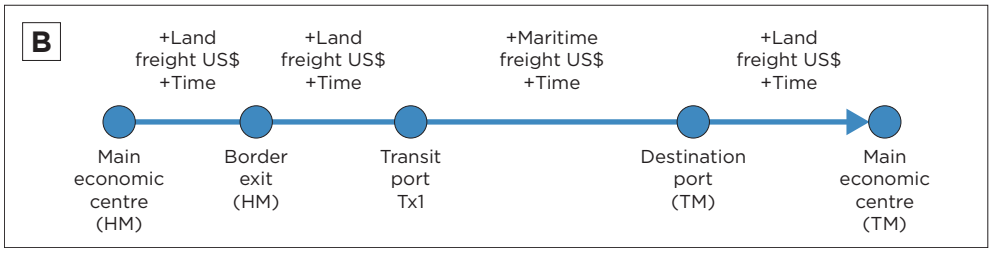
i = home market (origin or exporting country);

j = target market (destination or importing country);

Tx/ = transit point (e.g. exporting port, destination port, border post or modal switch point). In this example / = 1 to 3;

FC_l = freight cost of the transit leg (/) of the journey to the transit point *Tx*/;

TC_l = time value of the consignments travelling (in terms of stockholding costs, insurance, etc.) on the transit leg (/) to the transit point *Tx*/;



Source: Authors' own work.
Key: US$, United States dollar; HM, home market; TM, target market; Tx1..*n*, transit leg 1 to *n* of journey.
FIGURE 2.3: Example B – home market (landlocked) to target market (sea access).

Example B (Figure 2.3) demonstrates the case of transit from a single landlocked home market to a target market with direct sea access.

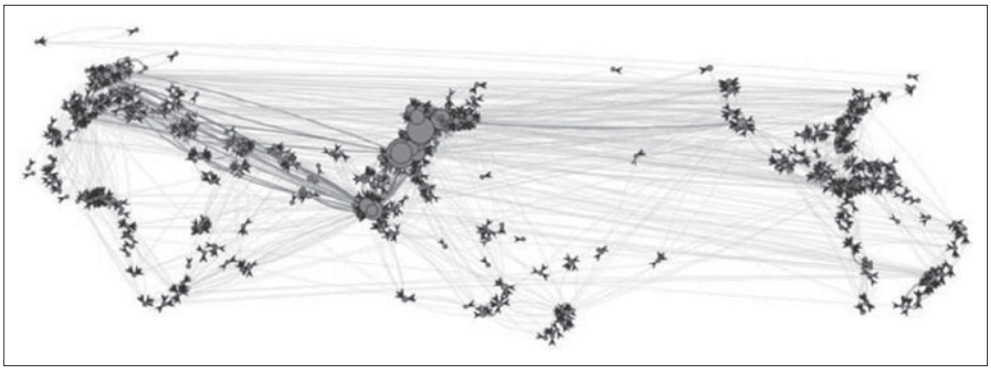
Following the same approach as in Example A, the cost elements that need to be considered in this instance could be simplified and described through the following simplified equation:

$$FTC_{ij} = (FC_{Tx1}+TC_{Tx1}+FC_{Tx2}+TC_{Tx2}+ FC_{Tx3}+ TC_{Tx3} + FC_{Tx4} + TC_{Tx4}) \quad \text{[Eqn 2]}$$

The only difference between Equation 1 and Equation 2 is that an additional 'leg' is introduced in the latter to indicate that, in this example, the home market is landlocked, that is, removed from direct sea access by one land border crossing. Therefore, the first leg in the transportation of the container is not directly to the exit port, but first to a border exit post, followed by transit through a neighbouring country and eventually a modal switch at the neighbouring country's exit port. All else constant, the total cost will simply increase with the cost components associated with the additional leg introduced.

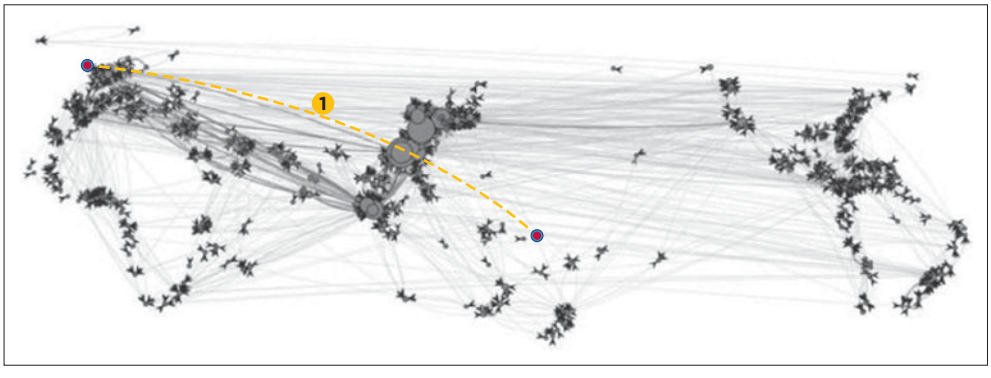
While the routing-and-legs concept is relatively straightforward, the assumptions about routing and the implied effects on distance, transit time and costs make the calculations more challenging. The following example from Bartholdi, Jarumaneeroj and Ramudhin (2016) is used to demonstrate this.

The map in Figure 2.4 illustrates a network of scheduled container services to/from 457 ports in the world during 2007. Each arrow indicates a scheduled container service from an origin port to a destination port for 2,479 links. These are 'as the crow flies' representations and not the actual geography of the shipping routes. The darker a link, the greater is the maritime trade intensity in terms of the Liner Shipping Connectivity Index (LSCI), developed by UNCTAD and described by Hoffman (2005). Ports represented by larger discs scored proportionally higher for port



Source: Bartholdi et al. (2016). Reproduced and republished under a Creative Commons Attribution (CC BY) 3.0 Unported License.

FIGURE 2.4: Network of scheduled container services to/from 457 ports in the world, 2007.



Source: Bartholdi et al. (2016). Reproduced and republished under a Creative Commons Attribution (CC BY) 3.0 Unported License.

FIGURE 2.5: Example of geodesic distance – Solomon Islands to Oslo, Norway.

connectivity. To demonstrate the real-world reality, the extreme example of shipping a container from Honiara (Solomon Islands) to Sortland (Norway) is discussed next.

This first example (Figure 2.5, not to scale) demonstrates the geodesic[28] distance between the Solomon Islands and Norway (represented by the thick dotted line 1). Using the simple geodesic distance from the CEPII GeoDist database, this distance is estimated at 13,861.47 km (Mayer & Zignago 2011). For illustrative purposes, if a container could be moved along this 'hypothetical' path by a container ship at the typical, average

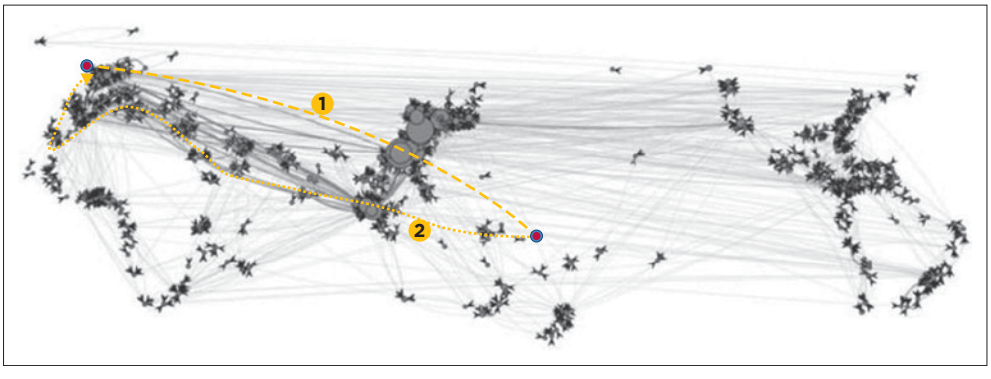
28. Geodesic distances are the shortest paths on a curved surface (e.g. sphere or ellipsoid like the earth), similar to a straight line on a flat surface (or plane).

speed of 24 knots,[29] the time taken to travel this distance would be around 13 days, excluding any port loading or unloading time. This geodesic distance is the basic assumption that most modellers use when incorporating distance as a variable in their gravity and/or other trade analysis. One of the reasons for many studies using this assumption is that obtaining information on alternative routes is challenging and not readily available.

When asking 'non-experts' which route they would guess a container ship would travel to transport the goods in this illustrative example, Figure 2.6 shows the typical answer (represented by the dotted line 2). This route assumes the shortest maritime distance via the Suez Canal, through the Mediterranean Sea, around Western Europe to Norway.

While only a 'guestimate', this route is much more realistic than the geodesic assumption illustrated in the preceding example. However, the distance in this route is 22,723.74 km,[30] which translates into a voyage time of 21.7 days (compared to 13 days in the previous example), using the same assumptions about maritime travel speeds. This is an increase of 67% on the estimated time associated with the geodesic distance, which will, in turn, translate into additional and (more importantly) different costs.

Lastly, the impact of commercial geography is illustrated, because it has a real impact on international movements of goods. The impact of commercial geography on especially maritime and air transport manifests in which routes are serviced, how frequently and at what capacity, and



Source: Bartholdi et al. (2016). Reproduced and republished under a Creative Commons Attribution (CC BY) 3.0 Unported License.

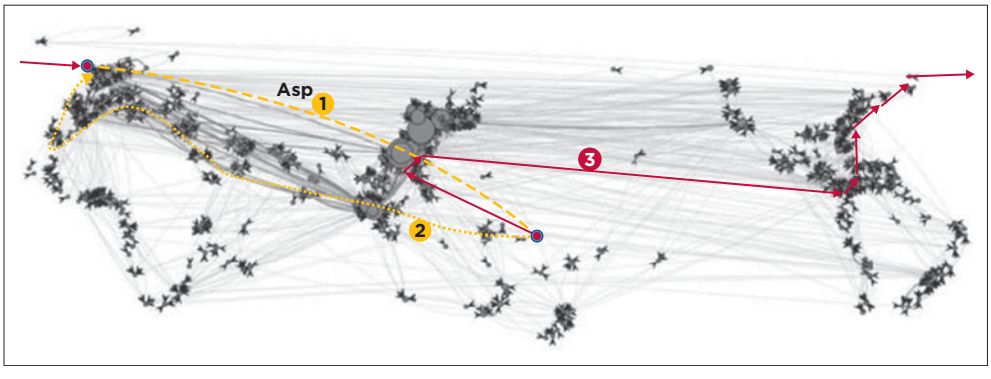
FIGURE 2.6: Example of 'guestimate' route – Solomon Islands to Oslo, Norway.

29. Most container ships are designed to travel at speeds of around 24 knots (Rodrigue, Comtois & Slack 2006).

30. See https://www.searates.com/

how actual shipments are routed in, for example, hub-and-spoke configurations to capitalise on economies of scale. (For more details, see Bartholdi et al. 2016.)

According to Bartholdi et al. (2016), to ship a container from Honiara (Solomon Islands) to Sortland (Norway) requires the traversing of nine links based on real-world transport service provision arrangements. This is represented by the solid line 3 in Figure 2.7. The container must first pass through Shanghai (China), then Busan (South Korea), Cristobal (Panama), Manzanillo (Panama), New York (US), Halifax (Canada), Argentia (Canada) and Reykjavik (Iceland) before finally arriving in Norway. The total voyage takes 56 days, not counting time in port for transhipments. This is an increase of 158% on the second 'guestimate' example and is a significant 331% increase on the 'most commonly employed' assumption about geodesic distance.



Source: Bartholdi et al. (2016) with annotations added by the authors. Reproduced and republished under a Creative Commons Attribution (CC BY) 3.0 Unported License.

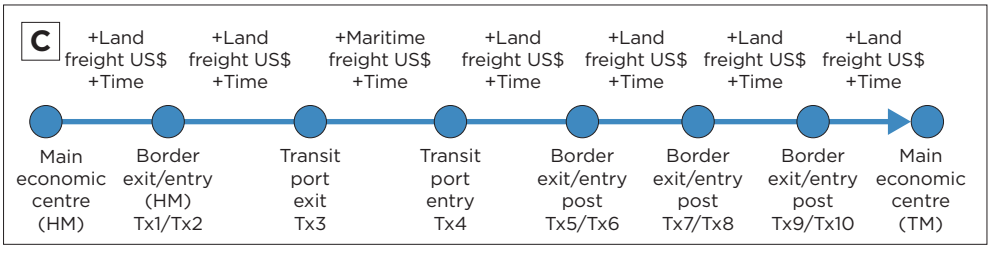
FIGURE 2.7: Example of 'commercial' route – Solomon Islands to Oslo, Norway.

In another real-world example (Example C, Figure 2.8), the route of a container – travelling from Kigali in Rwanda, via Tanzania and the port of Dar es Salaam, onto a ship to the port of Bandar Abbas (Iran), then overland through Turkmenistan, Uzbekistan and Kazakhstan to the final destination of Bishkek in Kyrgyzstan – is used to demonstrate that the combination of transits and modal switches can become significant because of real-world commercial geography issues.

In this example (Figure 2.9), the container transits five countries, with eight border entries/exits (four exits and four entries), one port exit and one port entry, two transport mode switches (from land to maritime and back to land), and a total of 10 potential points of delay that can increase the time and cost associated with the logistics flow of the container.

Source: Authors' own illustrations (map not to scale).

FIGURE 2.8: Example C - Kigali (Rwanda) to Bishkek (Kyrgyzstan).



Source: Authors' own work.
Key: US$, United States dollar; HM, home market; TM, target market; Tx1..*n*, transit leg 1 to *n* of journey.

FIGURE 2.9: Example C – home market (landlocked) to target market (landlocked).

These basic examples serve to demonstrate that complex routing legs can be simplified to basic building blocks related to transit entry/exit points and associated freight cost and time. The total logistics cost of this journey (FTC_{ij}) can therefore be simplified to Equation 3:

$$FTC_{ij} = \sum_{l=1}^{n} \left(FC_{Txl} + TC_{Txl} \right) \qquad \text{[Eqn 3]}$$

Where:

i = home market (origin or exporting country);

j = target market (destination or importing country);

TxI = transit point (e.g. exporting port, destination port, border post or modal switch point). In this example I = 1 to n;

FC_n = freight cost of the transit leg (I) of the journey to the transit point TxI;

TC_n = time value of the consignments travelling (in terms of stockholding costs, insurance, etc.) on the transit leg (I) to the transit point TxI.

The specification for the calculation of the filter 3.2 market access indicator ($CMAI_{ijk}$), as described in Steenkamp, Grater and Viviers (2016), can therefore be expressed in the following equation (the C preceding indicates 'current'[31] Market Access Index [MAI] equation):

$$CMAI_{ijk} = (avet \times AVET_{ijk} + aves \times AVES_{ij} + aved \times AVED_{j}) \leq C_{MAI} \quad \text{[Eqn 4]}$$

Where:

$AVET_{ijk}$ = AVE tariff for home market (exporter) i into target market (importer) j for product k;

$avet$ = weighting coefficient for $AVET_{ijk}$ overall for all combinations in the population of possibilities;

$AVES_{ij}$ = AVE international shipping cost for home market (exporter) i into target market (importer) j;

$aves$ = weighting coefficient for $AVES_{ij}$ overall for all combinations in population of possibilities;

$AVED_{j}$ = AVE domestic cost to import for target market (importer) j;

$aved$ = weighting coefficient for $AVED_{j}$ overall for all combinations in population of possibilities;

C_{MAI} = Pareto informed cut-off point for the relative Market Access Index ($CMAI$); the current assumption applied is $avet = aves = aved = 1/3 = 0.33$.

This basic market access component ($CMAI_{ijk}$) of the TRADE-DSM methodology does not consider the circumstances of landlocked countries, since, according to Steenkamp (2011):

31. In this context, the 'current' approach refers to the treatment of this element in studies conducted before this specific study which was aimed at refining this element of the TRADE-DSM methodology.

> [...] in the case of landlocked countries or coastal countries for which a quote could not be obtained, the cost of shipment to the nearest or most likely port, for which a quote is available, was used. (p. 68)

Furthermore, this market access approach does not use distance explicitly, as the rationale put forward is that shipping time and cost are considered to encapsulate distance.

The basic market access component, therefore, is too simplistic because it does not consider the circumstances of landlocked countries and includes only the closest port assumption. Specifically, this basic market access component has two shortcomings. Firstly, in some instances, a significant part of the total transport journey is ignored, along with the associated relative time and costs. Secondly, in the case of an exporting country such as South Africa, with direct access to a seaport, most modelling would yield relatively sensible results under these assumptions. However, the moment the home market or the destination market is landlocked, the outcomes when using the basic market access component will be severely skewed, unless the target market shares a border with the home market.

This shortcoming can be demonstrated more clearly in the following example: If a container is to be shipped from South Africa to Kigali in Rwanda (a landlocked country, not sharing a border with South Africa) under the basic market access component specification, the information from the port of Durban to the port of Mombasa in Kenya could be used.[32] This would involve a voyage of around 3,237 km and would take around eight days by sea if the port loading and unloading time, customs processing time, and other time-related factors are excluded. This would, however, ignore the additional 45.6% of travel time, on top of the voyage, incurred in travelling overland from Mombasa to Kigali via Uganda.

Similarly, if the consignment is to be sent overland from Durban to Rwanda via Botswana, Zambia and Tanzania, the travel time would be substantially different. This time difference would be because of multiple country border crossings, the condition of the roads, the prevalence of security checkpoints and the need for drivers to sleep, among other factors. The costs would also differ for different modes of transport (e.g. road versus maritime transport). Therefore, the route and implied mode of transport will have a signification impact on the assumptions made.

Another real-world example of a shortcoming is that the Durban-to-Rwanda case does not reflect the potential of re-shipping transfers, where the container would move on a feeder line to a major container hub where it would be offloaded and then loaded onto a main line vessel destined for

32. The port could also alternatively be Dar es Salaam in Tanzania, according to the World Bank assumptions that were applied. Kenya was used simply as an illustration.

a different part of the world – with the reverse sequence of events also being possible. Such container hubs include Shanghai, Singapore, Shenzhen, Busan (southeast Asia), Rotterdam and Antwerp (Western Europe), and Durban (southern Africa) (World Economic Forum [WEF] 2019).

The implication of this shortcoming is that some export opportunities for landlocked countries may be (severely) overstated in relative terms. For example, opportunities for Mongolia could appear in the outcomes; yet in practice, opportunities that ranked lower because of this understatement of the relative cost to get to a landlocked country may in fact rank higher (or better) once the method is more reflective of the effects of real-world commercial and transport geography.

Still on the theme of the simplified linear approach's shortcomings, Camisón-Haba and Clemente-Almendros (2020) assert that very few existing macro models of transport costs explore possible non-linear relationships or interactions with the explanatory variables. Furthermore, such models typically estimate the cost per mode of transport independently, without considering inter-modality (a combination of several modes used in the routing of a shipment). These authors also stress that classic models deal with non-measurable, fixed effects for a route or product by defining the routes and the goods traded between origin and destination countries, thereby discounting potential alternative routing flexibility and trade-offs between modes, as well as routes and product combinations (Camisón-Haba & Clemente-Almendros 2020).

From the aforementioned discussion, it is evident that the key issue with the current treatment of the basic market access component in the TRADE-DSM methodology that requires adjustment or refinement is to make it more sensitive in relative terms to the transport logistics challenges that landlocked countries face. Such adjustment lies specifically in the AVE international shipping cost ($AVES_{ij}$) component of Equation 4.

However, the purpose of refining the approach, as proposed in the introduction to this section, is not to explicitly model transport logistics accurately for all circumstances. Rather, the aim is to: (1) differentiate enough between countries' routing options so as to distinguish the outcomes of the landlocked penalty linked to possible export target markets; and (2) enable decision-makers to witness this otherwise 'hidden' dimension of trading with a landlocked developing country.

Refined Market Access Index calculation

As detailed in the preceding sections, the basic market access indicator ($CMAI_{ijk}$) needs to be adjusted to include a relative, index-based logistics cost measure. By replacing the current $AVES_{ij}$ component of the $CMAI_{ijk}$

index represented in Equation 4 with the total logistics costs (FTC_{ij}), the proposed new index ($LMAI_{ijk}$) can therefore be expressed as Equation 5. The '*L*' indicates the MAI adjusted for landlocked countries. It should be noted that because the domestic cost-to-import component is being incorporated into the total logistics costs (FTC_{ij}), this term is dropped from the restated Equation 4 in Equation 5:

$$LMAI_{ijk} = (avet \times AVET_{ijk} + avef \times FTC_{ij}) \leq C_{MAI} \quad \text{[Eqn 5]}$$

Where:

$AVET_{ijk}$ = AVE tariff for home market (exporter) *i* into target market (importer) *j* for product *k*;

avet = weighting coefficient for $AVET_{ijk}$ for all combinations in population of possibilities;

FTC_{ij} = AVE (normalised by cost of a 40-foot container) of the total logistics costs (freight and transit) for home market (exporter) *i* into target market (importer) *j*;

avef = weighting coefficient for FTC_{ij} for all combinations in population of possibilities;

C_{MAI} = Pareto informed cut-off point for the relative Market Access Index (*LMAI*); the current assumption applied is *avet = avef = 1/2 = 0.5*.

The components of Equation 5 were defined and explained in the preceding section and hence the explanation is not repeated here. The challenge that remains is determining quantitative data that can inform the components of the TLC (FTC_{ij}).

Data challenges

The real challenge is to obtain international shipping routes, times and costs, as there is no single, consistent and authoritative source of this information and the information is dynamic, that is, it changes over time. This gap is not only because there are many players in the market who are determining prices; it is also a function of different variables impacting service provisions, such as partner–country trade imbalances, infrastructure capabilities and availability, and the risks associated with piracy and weather, among other factors.

Directional trade imbalances imply that many carriers have to backhaul empty containers on their return voyages. The price of shipping cargo in one direction is therefore not the same as the price of a return trip. Port infrastructure is one of the key building blocks in transport costs and

influences factors such as what size of ship can enter any given port, as well as the time needed to load or unload ships. Piracy, in turn, is a very real threat to shipowners and mariners in certain parts of the world. While the number of ships actually attacked may seem minimal, the prevailing risk results in higher shipping rates as a result of higher insurance premiums, additional costs of security measures on board ships, and the need to follow alternative sea routes to avoid potentially risky areas. Alternative routes add to the travel time and associated costs (Bartholdi et al. 2016).

Finally, even fuel costs and the general demand for container shipping can influence the speed at which container vessels travel. According to Rodrigue (2020), shipping costs rise exponentially relative to the speed of a voyage; hence, shipping companies aim for a balance between running costs and time spent between ports. In this regard, shipping lines can travel more slowly in times of lower demand or higher fuel prices, as happened during the 2008–2009 global financial crisis (Rodrigue 2020).

The Organisation for Economic Co-operation and Development (OECD) is engaged in a project on maritime transport costs[33] which involves collecting maritime transport cost data from a variety of sources. The challenge is that such data are available only for a limited number of countries (Argentina, Australia, Brazil, Bolivia, Chile, Colombia, Ecuador, New Zealand, Paraguay, Peru, the US and Uruguay) and are also dated (the data set is available for the period 2003–2007 only).

Other factors mentioned in this section, such as the backhaul of empty containers, piracy and related insurance costs, or the need to deviate from the shortest economical routes, while very important, are also extremely difficult to quantify for all modelled countries and routes in the world.

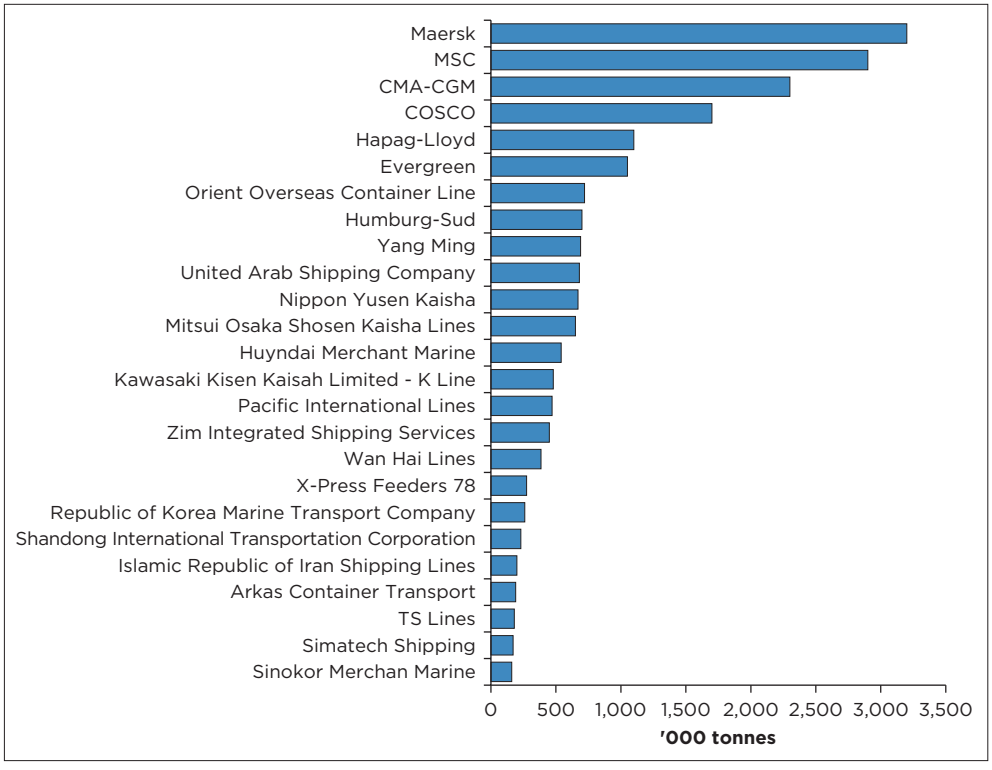
For these reasons, this chapter had to follow a somewhat 'eclectic' approach, using a manual process to compile routing tables, distances, travel times, and associated costs for the home market, which could be modelled into all the destinations in the world for which data on international trade and economic variables were available. Such an approach is both advantageous and disadvantageous. The advantage is that it is a more relevant and realistic representation of the logistics flows from the specific home market and can therefore be compiled and applied to the model. The disadvantage is that the relative effort and resources required to do this prohibit one from easily constructing a single model for the whole world, with all routings considered.

The various data sources for cost estimates, route options and scheduling are discussed next.

33. See https://stats.oecd.org/Index.aspx?DataSetCode=MTC

Data sources

The information sources for cost estimates, route options and scheduling, used in the refined logistics market access indicator compilation process, include online sources such as World Freight Rates,[34] Searates.com,[35] the Logistics Cluster[36] and Google Maps.[37] For shipping routing tables, the four largest containership operators (at the time of writing), which handle around 50% of global container cargo (see Figure 2.10), were used, in descending order of annual container tonnage that can be transported by the fleet of vessels owned by the particular containership operator, subject to whether or not a route was serviced by the company. They are Maersk,[38]



Source: Authors' compilation based on UNCTAD Secretariat calculations (UNCTAD 2017).
Key: UNCTAD, United Nations Conference on Trade and Development; MSC, Mediterranean Shipping Company; COSCO, China Ocean Shipping (Group) Company.

FIGURE 2.10: Largest containership operators (top 25).

34. See http://www.worldfreightrates.com/en/freight

35. See https://www.searates.com/

36. See http://www.logcluster.org/

37. See https://www.google.co.za/maps

38. See https://www.maersk.com/

Mediterranean Shipping Company (MSC),[39] CMA-CGM[40] and China Ocean Shipping (Group) Company (COSCO).[41] For localised maritime services, various other sources were used, such as Pacific International Lines[42] for East Africa.

However, the costs of transit through the various countries on the route are not generally available. The approach applied, therefore, was to make use of a weighted[43] cost to import from the *Doing Business Report* into each of the transit countries (World Bank 2016) (see footnote 40).

While this may not be entirely accurate, it does provide a *realistic relative* mechanism to differentiate between the cost impacts of landlocked and non-landlocked target countries. For example, the relative difference between transits for landlocked countries in the EU, with much lower border transit drag versus, say, Central Africa or Central Asia, is also clearly reflected in this approach (with more details supplied in the next section).

A further limitation of the approach is that most of the information is only relevant relative to the specific exporting country (home market) at a specific point in time and is not created for all routes between all trading partners over time. This process may not yield the exact commercial costs for actual shipment purposes. However, the proposed approach, by comparing various sources with one another, provides reasonable relative outcomes from routing, cost and time estimates from a particular exporting country (home market) to different parts of the world. This approach needs to be contextualised relative to the purpose of the TRADE-DSM, which is to provide a refined methodology that allows relative discrimination between different options and not to provide completely accurate commercial values in absolute, real-world terms.

Detailed quantitative example

This section provides an illustrative example to explain the detail of the proposed approach and the relevant data to be used for the various data elements and parameters. The previous Example C route in Figure 2.9 is used as the basis for this discussion. While the generalised Equation 3 consists of two components (FC_n being the freight cost of the transit leg (l)

39. See https://www.msc.com/routefinder

40. See https://www.cma-cgm.com

41. See http://lines.coscoshipping.com/

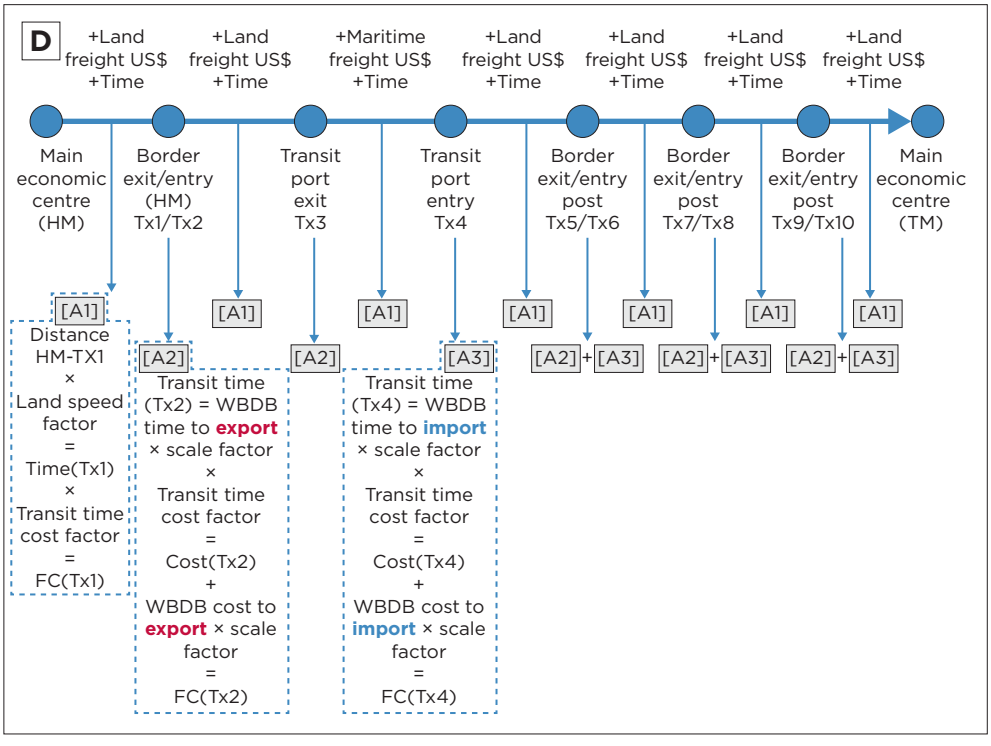
42. See https://www.pilship.com/en-pil-pacific-international-lines/1.html

43. For an initial assumption, a mechanistic weight of 0.5 is applied. More research around this element may be required for future refinements.

of the journey to the transit point *Tx*/; and TC_n being the time value of the consignments travelling on the transit leg (*l*) to the transit point *Tx*/), the application of this concept necessitates a further distinction between cost components, as illustrated in Figure 2.11.

The distinction between these alternative components is shown as [A1] (transit component between entry and exit points), [A2] (transit country exit points) and [A3] (transit country entry points) in Figure 2.11.

To standardise the cost element for the purpose of using it in the overall MAI calculation, a normalisation factor needs to be applied so that the values can be expressed in AVE magnitudes. To this end, the World Bank approach of using a value associated with a typical container being transported is used. A cargo value of US$50,000 for a 40-foot container is applied and all cost variables are expressed relative to this base in percentage terms, which is also referred to as the AVE of the cost variables (World Bank 2016).



Source: Authors' own work.
Key: US$, United States dollar; HM, home market; TM, target market; WBDB, World Bank Doing Business; FC, freight cost; Tx1..*n*, transit leg 1 to *n* of journey.

FIGURE 2.11: Detailed logistics cost example.

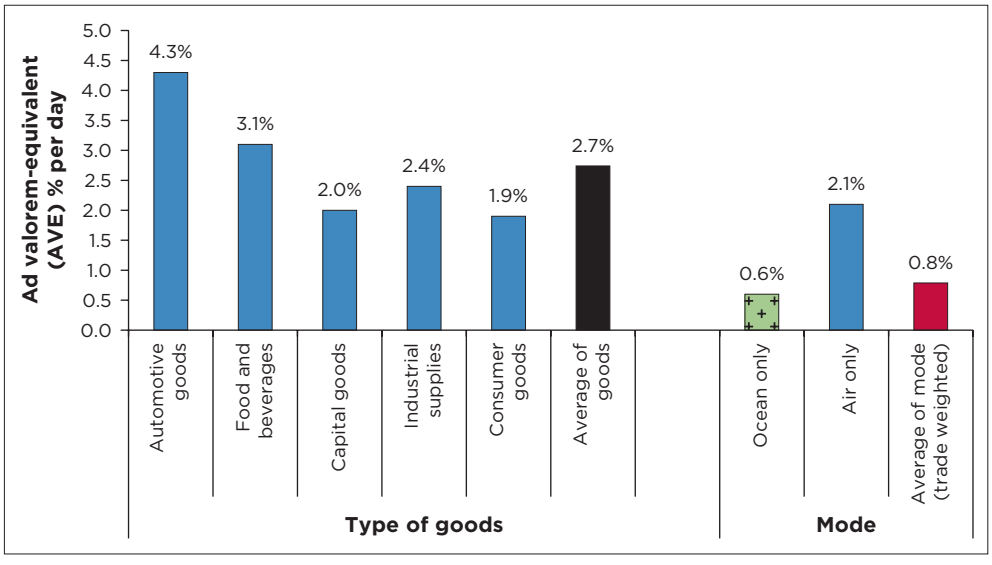
Furthermore, for all transit legs, a transit time–cost factor needs to be applied. The literature review revealed that different authors have found a range of outcomes for this concept over time (Behar & Venables 2011; Bosker & Garretsen 2007; Djankov, Freund & Pham 2010; Faye et al. 2004; Hummels 2001, 2007; Hummels & Lugovskyy 2006; Hummels & Schaur 2013; Korinek & Sourdin 2009; Paudel 2014; Raballand 2003; Rivero et al. 2019; UNCTAD 2017; World Bank 2002; World Trade Organization [WTO] 2008).

In generalised terms, goods' shipping times incur inventory-holding and depreciation costs that vary depending on the type of product and time from origin to destination. For some products, this could literally include spoilage of, for example, fresh produce or cut flowers, or fast-changing technological obsolescence of certain goods, such as consumer electronics (Hummels & Schaur 2013). These authors provide one of the most detailed quantitative models to determine the price or tariff equivalent of the time delay in international trade. Two important observations from their modelling are that increased ocean shipping times lead to a switch to air modal selection, while, conversely, high relative airfreight prices lead to a switch to ocean shipping.

However, in the TRADE-DSM methodology, the international trade data available at the time this study was conducted do not make a distinction between transport modes for all commodities and all countries. So, while this is an important observation, the limitation imposed by the trade data limits the focus to the non-air transit time–cost factor, which in this case is dominated by maritime transport.

Based on Hummels and Schaur (2013), estimates of the air transit time–cost factor at the high end are that one additional day in transit is equivalent to a 2.1% tariff-equivalent cost and, for the whole sample across both modes (air and maritime), between 0.6% and 2.1% ad valorem. The Hummels and Schaur (2013) model is further expanded to analyse major product groups. The estimates are provided in Figure 2.12.

It is evident from the time–cost factor estimates provided in Figure 2.12 that substantially higher time values are associated with automotive goods (4.3% per day), while for food and beverages, they are lower (3.1% per day). In the case of food and beverages, storability in the case of perishable products is particularly important. Hummels and Schaur (2013) further observe that for these types of goods, firms respond to long shipment times by making more frequent shipments using air transport. For the other groups, the time value is estimated at 2.0% for capital goods, at 2.4% for industrial supplies and at only 1.9% for consumer goods. From the investigation, two critical characteristics of products emerge in this context, namely perishability and whether the product is a manufactured



Source: Authors' own calculations based on Hummels and Schaur (2013, p. 2956).
Key: AVE, ad valorem-equivalent; %, percentage.

FIGURE 2.12: Time–cost factor estimates.

intermediate input, which is typically associated with global value chains (GVCs) and just-in-time production processes.

For the purpose of this refinement to the TRADE-DSM methodology, a weighted (by trade value) average of the time–cost factor is calculated. High-level estimates of the relative share of global trade of major transport modes attribute 80% of global trade by volume and more than 70% by value to maritime transport (UNCTAD 2017). At the same time, air cargo is estimated to represent around 35% of global trade in value terms and less than 1% in volume terms (International Civil Aviation Organization [ICAO] 2017; Shepherd, Shingal & Raj 2016). These estimated shares of each mode are contradictory as they add up to more than 100% of value. However, for this study, because only the 'relative' contribution is required to estimate this parameter, the average time–cost of the Hummels and Schaur (2013) estimates is calculated on the basis of relative trade weights. The maritime estimate is therefore weighted at 70%. The outcome obtained is 0.79% ad valorem, which compares well with the initial estimates of 0.8% ad valorem (Hummels 2001, 2007; Hummels & Lugovskyy 2006).

This approach is a simplification, as not all product categories have the same modal use response to changes in freight prices and to time delays. Furthermore, the impact of travel time converges to a point beyond which the additional journey time has no effect on the time–cost parameter. For example, Hummels and Schaur (2013) found that the time–cost in Asia

for 23 days is around 2.3% per (additional) day. However, at 34 days, the effect reaches zero for each additional day. Hummels and Schaur (2013) also found that the average travel time for Asia is around 23 days, while in Africa, it is around 34 days.

For the purpose of this refinement, the AVE (based on what this study terms the 'Hummels AVE assumption' or 'constant') of international shipping time and domestic cost to import of 0.8% per 24 hours, with a maximum of 34 days, is therefore applied.[44]

General transit leg type [A1] assumptions

The alternative component [A1] in Figure 2.11 refers to the general transit leg, which contains an origin and destination, and the 'actual' terrestrial or maritime distance between these two points. Depending on whether the route mode is land or maritime, a differentiated average speed factor is applied.

For the maritime distances and associated journey time, the major container shipping lines' routing schedules are first used (see the section 'Data sources' in this chapter for the relevant literature). Where major shipping lines do not service the route, alternative sources such as Searates.com and Worldfreightrates.com are used. Where none of the sources has information on a route, internet searches are conducted to see if any relevant information can be obtained from other maritime sites and reports. From these, estimates could be created based on the most logical route, as determined by surface map distances and average speed assumptions. For maritime, the typical average speed of 24 knots (see the section 'Basic building blocks of a relative, index-based logistics cost measure' in this chapter) then applied. In the case of river transport, such as in Central Africa and the Volga, slower speed assumptions are used to show the difference between these waterways and open seas.

For land distances and speeds, the route's terrain and traffic will determine the actual speed. Therefore, Google Maps is used to inform this parameter. Where none of the sources has information on a route, internet searches are conducted to see if any relevant information can be obtained from regular travel sites and travellers' or truckers' comments, as well as other research reports. Again, estimates are created based on the most logical route determined from surface map distances and average land-speed assumptions for truck traffic.

44. Future refinements could include the use of more differentiated time–cost parameters per product type, as estimated by Hummels and Schaur (2013) and shown in Figure 2.12.

General transit exit (export) point [A2] assumptions

In the case of the alternative component [A2] in Figure 2.11, consideration needs to be given to the fact that this case represents an exit (export) point from a country, either through a border post or a sea port. The World Bank's cost-to-import and export estimates from the Trading Across Borders section of the *Doing Business Report* were used to obtain the domestic cost associated with transporting and clearing goods for all the target countries under investigation (World Bank 2016).

These 'cost-to-import or -export' estimates include the cost associated with all documentation, inland transport and handling, customs clearance and inspections, port and terminal handling, and official costs (no bribes) (World Bank 2013). In calculating the cost to import or export for each country, the fees levied on a 20-foot container of general cargo valued at US$50,000 were used by the World Bank. The cost does not include tariffs or costs related to ocean transport. Although the *Doing Business Report* (World Bank 2016) collects and publishes data on the time and cost of domestic transport, it does not use this data in the calculations; hence the need to construct routing tables and cost estimates for both domestic and international road (truck) transport, as well as maritime shipping routes and costs.

To create a relative cost index for this component, a simplified assumption is made by using the WBDB estimates of the time and the cost to export (World Bank 2016). The time to export is converted into a cost equivalent by multiplying hours by the Hummels constant, as defined in the previous section.

However, the assumption is that transit points do not represent the same time and cost values as origin and final destination entry and exit points. This assumption is based on two observations, namely: (1) transit points are not treated exactly the same as ports of origin for exports and final destination entry ports in terms of documentation and associated cost and time requirements; and (2) the World Bank only provides estimates of export costs and time for the purposes of origin and final destination transactions.

The challenge, however, is that these transit cost elements are not readily available. A simplified assumption, therefore, has to be made that where a port or country exit border post is part of a transit movement, only 50% (0.5) of the WBDB estimates (World Bank 2016) for exporting time and costs will be applied. While not entirely accurate, the purpose is again to provide a logical way to model (relative) additional costs associated with transit entry and exit points as part of the overall journey of the goods being transported.

General transit entry (import) point [A3] assumptions

Similar to the alternative component [A2] case, the alternative component [A3] in Figure 2.11 considers the fact that this case represents an entry (import) point into a country (either through a border post or a seaport). The same simplified assumption for exit points is then used for entry points. The WBDB estimate (World Bank 2016) for time to import is converted into a cost equivalent by multiplying hours by the 'Hummels constant', and only 50% (0.5) of the WBDB estimate (World Bank 2016) for importing time and costs is then applied.

Generalised voyage logistics cost calculation

The total AVE percentage of the cost to transport goods from the port in the exporting country to the final destination in the importing country is calculated by adding (unweighted) the AVE tariff per product–market combination to the AVE international shipping cost. Furthermore, the AVE of international shipping time (based on the assumption of 0.8% per 24 hours up to a maximum of 34 days or 816 hours, after which it is assumed to be zero for every additional hour travelled) and the domestic cost to import also need to be added.

The total logistics cost of a journey (FTC_{ij}) from Equation 3 can therefore be expanded to the following set of equations:

$$FTC_{ij} = iTx1\left(f\left(FC_{[A2]iTx1} + TC_{[A1]iTx1}\right)\right) + jTxn\left(f\left(FC_{[A2]jTxn} + TC_{[A2]jTxn}\right)\right) + \sum_{1=0}^{n-1} TxC_{TxI} \quad \text{[Eqn 6]}$$

and for the home market export leg $iTx1$:

$$FC_{[A2]iTx1} = \rho \times WBDB\ cost\ to\ export_{iTx1} + \rho \times WBDB\ time\ to\ export_{iTx1} \times \tau + fr_{iTx1} \quad \text{[Eqn 7]}$$

$$TC_{[A1]iTx1} = travel\ time\ hours_{iTx1}\left(f\left(\frac{iTx1\ distance\left(land, maritime\right)}{iTx1\ speed\left(land, maritime\right)}\right)\right) \times \tau \quad \text{[Eqn 8]}$$

For the target market import leg $jTxn$:

$$FC_{[A3]jTxn} = \rho \times WBDB\ cost\ to\ import_{jTxn} + \rho \times WBDB\ time\ to\ import_{jTxn} \times \tau + fr_{jTxn} \quad \text{[Eqn 9]}$$

$$TC_{[A1]jTxn} = travel\ time\ hours_{jTxn}\left(f\left(\frac{jTxn\ distance\left(land, maritime\right)}{jTxn\ speed\left(land, maritime\right)}\right)\right) \times \tau \quad \text{[Eqn 10]}$$

and lastly, for any transit border points (which are treated as a combination of import and export cost and time estimates):

$$TxC_{TxI} = TC_{[A1]TxI} + FC_{[A2]TxI} + FC_{[A3]TxI} \quad \text{[Eqn 11]}$$

and:

$$TC_{[A1]TxI} = travel\ time\ hours_{TxI} \left(f\left(\frac{TxI\ distance(land, maritime)}{TxI\ speed(land, maritime)} \right) \right) \times \tau \quad \text{[Eqn 12]}$$

$$FC_{[A2]TxI} = \rho \times WBDB\ cost\ to\ import_{TxI} + \rho \times WBDB\ time\ to\ import_{TxI} \times \tau + fr_{TxI} \quad \text{[Eqn 13]}$$

$$FC_{[A3]TxI} = \rho \times WBDB\ cost\ to\ export_{TxI} + \rho \times WBDB\ time\ to\ export_{TxI} \times \tau + fr_{TxI} \quad \text{[Eqn 14]}$$

Where:

i = home market (origin or exporting country);

j = target market (destination or importing country);

$iTxI$ = home market leg from main economic hub to port of export;

$jTxn$ = target market leg from main port of import to economic hub;

TxI = transit point (e.g. exporting port, destination port, border post or modal switch point).

In this example, l = 0 to n-1 (to cater for bordering countries l = 0), and the last transit point before entry point (n) to target market will be point n-1;

TxC_{TxI} = total transit point (TxI) time–cost value which is a function of weighted entry and exit point time and cost of exporting [A2] / importing [A3] ($FC_{[A2]TxI} + FC_{[A3]TxI}$) plus time–cost of distance travelled [A1] within the transit country ($TC_{[A1]TxI}$);

fr_{TxI} = freight cost of the transit leg (l) of the journey to the transit point TxI;

$WBDB\ cost\ to\ import_{TxI}$ = World Bank *Doing Business Report* (World Bank 2016) indicator of cost to import for specific transit country entry point;

$WBDB\ time\ to\ import_{TxI}$ = World Bank *Doing Business Report* (World Bank 2016) indicator of time to import for specific transit country entry point;

$WBDB\ cost\ to\ export_{TxI}$ = World Bank *Doing Business Report* (World Bank 2016) indicator of cost to export for specific transit country exit point;

$WBDB\ time\ to\ export_{TxI}$ = World Bank *Doing Business Report* (World Bank 2016) indicator of time to export for specific transit country exit point;

ρ = weight assigned for WBDB cost estimate (World Bank 2016) components for purpose of transit (for this study, set to 0.5);

τ = time–cost of transit based on the 'Hummels AVE' assumption (currently set at 0.8% per 24 hours up to a maximum of 34 days or 816 hours, after which it is assumed to be zero for every additional hour travelled).

A mechanism has now been created to allow for the consideration of a more refined relative logistics index. While the topic of exactly how distance influences export decisions remains a challenge (Ellis 2007), this refined approach will (in relative terms) provide outcomes that are more aligned to the transit characteristics of international freight logistics and should therefore better reflect the realities faced by landlocked countries.

Methodology refinements related to data volatility

Historical international trade data can be inherently volatile, with many possible fluctuations from period to period and at the most detailed level. As a result, various indicators calculated and derived from trade data can exhibit wide swings from year to year. However, for the purpose of the more strategic identification of REOs, a more structural approach has been introduced in the treatment of calculations over a period of time. Applying weighted average imports and exports values smooths out years with unprecedented high or low values and allows a better focus on the more sustained REOs (Cuyvers et al. 2017).

The typical arithmetic average method assumes that all observations are of equal importance and gives them equal weights when calculating results. The alternative approach that we followed is based on a simple exponential smoothing approach, which involved attaching larger weights to more recent observations than to observations from the distant past. The smallest weights are associated with the oldest observations. By bracketing to the latest six years, we calculated five data points in the case of, for example, growth rates, shares, RCAs, RTAs, and so on. For any variable that has a time dimension with sufficient data for five years (in the case of levels values like import or export values) and six years in the case

of, for example, growth rates, outcomes are based on the normalised weighted formula shown in Equation 15:

$$y_{tw} = \left(\frac{\alpha}{\sum_1^n \left(\alpha + \alpha(1-\alpha) + \alpha(1-\alpha)^2 + \ldots + \alpha(1-\alpha)^n \right)} \right) y_{T} + \left(\frac{\alpha(1-\alpha)}{\sum_1^n \left(\alpha + \alpha(1-\alpha) + \alpha(1-\alpha)^2 + \ldots + \alpha(1-\alpha)^n \right)} \right) y_{T-1} + \left(\frac{\alpha(1-\alpha)^2}{\sum_1^n \left(\alpha + \alpha(1-\alpha) + \alpha(1-\alpha)^2 + \ldots + \alpha(1-\alpha)^n \right)} \right) y_{T-2} + \ldots + \left(\frac{\alpha(1-\alpha)^n}{\sum_1^n \left(\alpha + \alpha(1-\alpha) + \alpha(1-\alpha)^2 + \ldots + \alpha(1-\alpha)^n \right)} \right) y_{T-n} \quad \text{[Eqn 15]}$$

Where:

y_{tw} = the resulting time-weighted variable;

α = the smoothing parameter and $0 \leq \alpha \leq 1$;

T = point in time, for typical variable observations in series $y1, y_n$;

n = years, typically 1, 2, 3, 4 and 5.

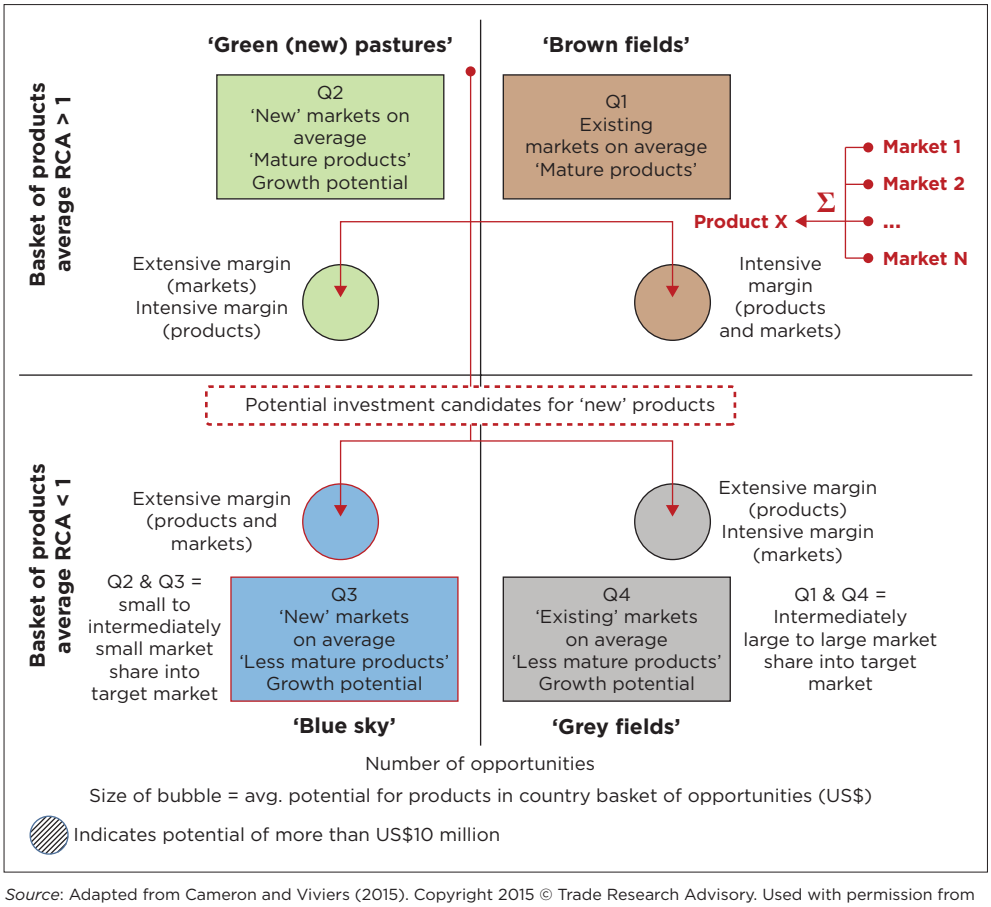
This approach is applied to all levels, growth rate and share calculations (filters 1, 2) as well as particular variables, such as calculations of RCA, RTA (filter 4) and degree of concentration (*adjusted* HHI) in filter 3 since the Botswana (2016) application of the revised methodology.

Extending the TRADE-DSM results interpretation – considering intensive and extensive margins

As mentioned in the introduction to this chapter, policies aimed at diversifying products for export versus diversifying destination markets are obviously very different, and policymakers need to be correctly informed to use the right tool for the right policy consideration. The concepts of intensive and extensive margins are therefore important for informing both policy and the outcomes from the TRADE-DSM approach. While identifying potential realistic export *promotion* opportunities was traditionally the focus of the application of the TRADE-DSM approach, a rich set of information is generated when calculating these export

promotion opportunities. Extending the application of information generated by the modelling process also addresses the question of potential 'immature' or export development opportunities. The REO export maturity, market share, and growth and diversification conceptual model shown in Figure 2.13 explains how this is done.

The TRADE-DSM REO Map (see Figure 2.1) produces an outcome that makes it possible to evaluate REOs and, in turn, inform the nature of the export promotion strategy to be developed based on the specific allocated REOxy category. These results are then arranged (as opposed to eliminated) so as to reflect the REOs from a product perspective based on average market potential per opportunity, while the relative (existing) specialisation



Source: Adapted from Cameron and Viviers (2015). Copyright 2015 © Trade Research Advisory. Used with permission from the copyright holders.
Key: RCA, revealed comparative advantage; avg., average; US$, United States dollar; Q, quadrant.

FIGURE 2.13: Realistic export opportunity export maturity, market share, and growth and diversification conceptual model.

(or not) of the home market's exports represented by the RCA is shown in a conceptual framework similar to that of the well-known Boston Consulting Group (BCG) growth-share matrix (also applied by the ITC Trade Map), as depicted in Figure 2.13.

The conceptual framework applied is underpinned by the following logic: the REOs have already been 'filtered' through the TRADE-DSM methodology, which considers many factors, including market share and growth (as per the BCG approach). Thus, the intention is to inform decision-makers of the additional attributes associated with each opportunity as it passes through the TRADE-DSM filtering process. The products being evaluated/investigated and their associated opportunities (based on the identified REOs) are then further categorised according to five existing TRADE-DSM attributes, namely: (1) export potential (average per opportunity); (2) maturity (as indicated by the RCA); (3) market diversification potential (as indicated by the number of markets for which the REO indicates an opportunity for a specific product); (4) relative market share (REOs in columns 1 and 2 indicating relatively low market share are associated with 'new' markets in Q2 and Q3, while REOs in columns 3 and 4 are associated with 'existing' markets for which the exporting country in question already has an intermediately large to large market share); and (5) market growth potential (as indicated by the TRADE-DSM methodology classification of the market characteristics of these potential markets).

The REOs are therefore plotted on the basis of the aforementioned dimensions, as follows: (1) the X axis contains the number of potential markets (diversification); (2) the Y axis shows relative competitiveness (more or less mature [RCA]); (3) the bubble size represents the market potential per product (aggregated across markets); (4) Q2 and Q3 contain REOs in columns 1 and 2 indicating low market share, termed 'new' markets; and (5) Q1 and Q4 contain columns 3 and 4 indicating intermediately large to large market share, termed 'existing' markets.

The outcome, therefore, is that the various REOs are positioned in one of the four quadrants, namely (1) Q1, termed 'Brown fields', representing mature export products with growth potential in markets already well serviced by the exporting country (product–market combinations classified into columns 3 and 4 of the TRADE-DSM REO Map), depicted in Figure 2.1; (2) Q2, termed 'Green (new) pastures', representing mature products with growth potential in new markets (product–market combinations classified into columns 1 and 2 of the TRADE-DSM REO Map); (3) Q3, termed 'Blue sky', representing less-mature export products with growth potential in new markets; and (4) Q4, termed 'Grey fields', representing less-mature products with growth potential in markets already well serviced by the exporting country.

Figure 2.13 serves to illustrate both the elegance and power of the TRADE-DSM methodology – elegance in that it allows for a quick visual inspection and comparison of high-ranking REOs, and power in that it points to where, with additional investment and/or support, promising export opportunities could become true winners. To help policymakers in their diversification efforts, either from the extensive or intensive margin perspective, as articulated by Brenton and Newfarmer (2009), the different margin combinations pertaining to the four quadrants are also indicated, with Q1 containing intensive margin opportunities relating to both products and markets, Q2 containing extensive margin opportunities relating to markets combined with intensive margin opportunities relating to products, Q3 containing extensive margin opportunities relating to both markets and products, and Q4 containing extensive margin opportunities relating to products with intensive margin opportunities relating to markets.

This framework can therefore be applied to develop a view of all the potential product–country combinations that policymakers in a home country may be interested in analysing for the purpose of strategic decision-making in the interests of industrial development and export promotion. The representation can also be compiled from the perspective of markets and their average potential basket of products. This particular view, however, is not discussed in detail in this chapter.

In summary, the approach can inform policymakers through the differentiation between a product-centric and a market-centric approach (as well as a combination of these two dimensions) for both the intensive and extensive margins.

Conclusion

This chapter explained the intricacies of international market selection in the context of export promotion, development and investment. It underscored the necessity of a structured process to effectively screen and narrow down potential markets or product–market combinations. This winnowing process is crucial for resource optimisation and strategic alignment.

The chapter expounded on the underlying principle of the TRADE-DSM methodology, emphasising its role in systematically filtering out less-viable options and presenting a set of realistic choices for final selection. Employing four major filters, accompanied by various sub-filters, the methodology comprehensively assesses worldwide product (HS 6-digit) and market (country) combinations. This meticulous approach ensures that the markets with the highest likelihood of success are foregrounded.

Furthermore, the chapter highlighted real-world challenges faced by policymakers and exporting entities, particularly in landlocked countries, and emphasised the scale of the market selection challenge for both national policymakers, who shape export strategies, and exporters, who make specific product and market decisions. The chapter also delved into how the TRADE-DSM methodology has been adapted to incorporate a logistics cost measure, utilising a relative index-based approach. This adjustment acknowledges the logistical nuances inherent in international market selection.

Additionally, the chapter discussed the methodology's unique feature of addressing both the intensive and extensive margin dimensions of export promotion and development. Moreover, it provided alternatives for companies facing market saturation or declining growth in traditional markets, identified new products for potential investment and industrial policy decisions, and visually represented these aspects through the quadrants of the REO export maturity, market share, and growth and diversification conceptual model.

To assess the implications of refinements to the TRADE-DSM methodology, Chapter 3 presents an application of the fully refined methodology in identifying REOs for Rwanda.

Key takeaways from this chapter

- This chapter endeavoured to elucidate the pre-2021 iteration of the TRADE-DSM methodology and subsequently detailed the refinements made to enhance its effectiveness.
- The fundamental components of this exploration were the provision of a comprehensive overview of the pre-2021 TRADE-DSM, the contextualisation of its development chronology, and the introduction of the refinements (specifically in relation to the treatment of landlocked countries) and enhanced interpretation for strategic application and policymaking.
- In their pursuit of export diversification, policymakers face the imperative of selecting appropriate tools tailored to distinct policy objectives, while also recognising the inherent divergence between policies aimed at product diversification and those aimed at market diversification (Carrère et al. 2011).
- To navigate this nuanced landscape, Brenton and Newfarmer (2009) differentiate between growth at the intensive margin, involving the expansion of existing products in existing markets, and growth at the extensive margin, involving the introduction of 'new' products and entry into new geographical markets. The nuanced nature of these objectives

calls for policies that are attuned to the specificities of each objective (i.e. intensive versus extensive margin).

- In view of these multifaceted objectives, the latest enhancements to the TRADE-DSM methodology stand out for their ability to encompass both the intensive and extensive margin dimensions of the export promotion and development challenge.
- This added capacity provides exporting companies that are facing market saturation or declining growth in traditional markets with alternatives.
- The introduction of the quadrant analysis approach concurrently assists with the identification of new products that can inform and enrich investment and industrial and export policy decisions by policymakers.

Chapter 3

Export diversification: The case of a landlocked country in Africa, Rwanda

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Introduction

The World Economic Forum (WEF) and International Trade Centre (ITC) have been conducting a series of long-term surveys with exporters in various countries to determine key issues that need to be addressed in order to enhance global trade. Respondents have consistently ranked

45. This chapter has been substantially reworked by 50% per the Department of Higher Education and Training's *Research Outputs Policy of 2015* from Chapter 4 of Cameron's PhD thesis: Cameron, MJ 2021, Extending the TRADE-DSM (Decision Support Model) approach for landlocked countries: A case study of Rwanda, North-West University, South Africa, under the supervision of Professor Wilma Viviers.

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'identifying potential markets and buyers' as one of the top three challenges impeding their ability to export more effectively (WEF 2016).

International market selection is a critical component of exporting. However, the international market selection process is often viewed as complex. Factors contributing to this perceived complexity include resource constraints and different organisational (firm-level) capabilities; the heterogeneous nature of different markets and ever-changing consumer tastes and preferences; and the presence of, and frequent changes in, export market barriers (Górecka & Szałucka 2013; İpek & Biçakcioğlu-Peynirci 2019). Whether conducted on a national, sub-national or institutional level, international market selection and related export promotion activities need to consider similar aspects to those that apply to individual companies. The difference, though, is that they are less tied to a specific context, such as a corporate strategy. They are more aligned to national industrial policy and economic strategic imperatives, for example, intra-regional cooperation and integration, and global value chain (GVC) and regional value chain (RVC) development (Elms & Low 2013; Farole 2016).

Various export promotion interventions can help to identify potential markets and buyers. However, as a policy instrument, export promotion is generally regarded as a public service and in many countries is supplied by the public sector (Cuyvers, Steenkamp & Viviers 2012). However, a number of studies have shown that the more traditional and most widely used export promotion activities, such as participation in trade missions and trade fairs, have delivered progressively diminishing returns (Alvarez 2004; De Wulf 2001; Lederman, Olarreaga & Payton 2006). There is clearly a need for a more scientific approach and alternative instruments to identify realistic export opportunities (REOs), which will better inform export promotion activities and, in turn, produce more positive returns.

An example of a country in which export growth is an urgent government priority – but which needs an alternative approach to identifying REOs – is Rwanda. The country has expressed its intention to model itself on some of the newly industrialised economies (NIEs) (World Bank 2018). To this end, export dynamism and regional integration are among the six[46] high-priority strategic areas that underpin Rwanda's drive for export growth (World Bank 2018). Policymakers in Rwanda have realised that, in order to reduce the country's widening trade imbalance, ensure non-farm job creation and stimulate economic growth, export expansion is necessary. In this regard,

46. The six high-priority areas are (1) human capital development; (2) export dynamism and regional integration; (3) well-managed urbanisation; (4) competitive domestic enterprises; (5) agricultural modernisation; and (6) capable and accountable public institutions (World Bank 2018, p. xxi).

Rwanda's policymakers are following an evidence-based approach to identifying and stimulating export opportunities – in other words, engaging in 'focused export promotion' (MINICOM 2015).

Geographically, however, Rwanda is landlocked, located in the middle of the African continent with relatively weak transport logistics connectivity to world markets. According to the World Bank (2018), more than 90% of Rwanda's goods exports are transported by truck. As a result, the country relies heavily on other African countries' land transport corridors for access to the sea. To identify and stimulate export opportunities, the Rwandan government therefore needs an evidence-based approach that reveals more representative, real-world factors impacting the country's export and investment decisions. Such an approach should provide important insights for policymakers, trade and investment promotion agencies (TIPAs) and individual exporting companies – all of which have to make export product and market selection choices.

To assist Rwandan policymakers, it is important to identify the methodology that can inform the identification of 'realistic' (which could be realised in the near term) export opportunities from a global perspective, from all possible products that are most relevant, given Rwanda's landlocked status. Such a methodology, which is sensitive to the special characteristics of landlocked countries, could also serve other landlocked countries, of which there are currently 49 in the world (including partially recognised states).[47]

To illustrate the outcomes of applying the refined 2021 TRADE-DSM (Decision Support Model) methodology (as discussed in Chapter 2) and highlighting the difference in outcomes (as a result of the refinement to the logistics cost component [$LMAI_{ijk}$] of the TRADE-DSM methodology), the case of Rwanda as a landlocked country is discussed in this chapter. This involves a number of steps.

The first step is to investigate and understand the transport and economic geography of Rwanda. To this end, a set of logistics cost estimates is compiled for Rwanda to all possible destination markets, based on the refined methodology. The outcomes of these logistics cost estimates are then contrasted with the basic geodesic distance assumptions (as applied in the ITC methodology and various other studies) as well as with

47. Partially recognised states refer to territories seeking diplomatic recognition from the international community as *de jure* sovereign states but that have not been universally recognised as such by all formal states. Examples include the State of Israel; for example, 29 United Nations (UN) member states do not formally recognise Israel as a legitimate state (Jewish Virtual Library [JVL] 2024). In the African context, an example is the Sahrawi Arab Democratic Republic (SADR), also referred to as Western Sahara. While the SADR is a member of the African Union (AU), it is recognised by only 40 UN member states, but not, for example, by its direct neighbour, Morocco (United Nations Department of Political and Peacebuilding Affairs [DPPA] 2024).

the previous basic market access component ($CMAI_{ijk}$) approach of the 'nearest port' assumption applied in the TRADE-DSM modelling prior to this refinement. This comparison is mainly focused on a country-level analysis of travel distance, time and costs between Rwanda and potential export markets and, at a high level, the impacts thereof on the identified REOs.

The TRADE-DSM methodology is then applied for the refined treatment of the logistics cost component ($LMAI_{ijk}$). Finally, a policy and decision-making analysis is conducted on the set of outcomes, as informed by the refined logistics cost component ($LMAI_{ijk}$) methodology.

Comparative analysis of the impacts of refinements

The various contextual elements designed to refine the logistics cost component of the TRADE-DSM methodology are discussed in this section.

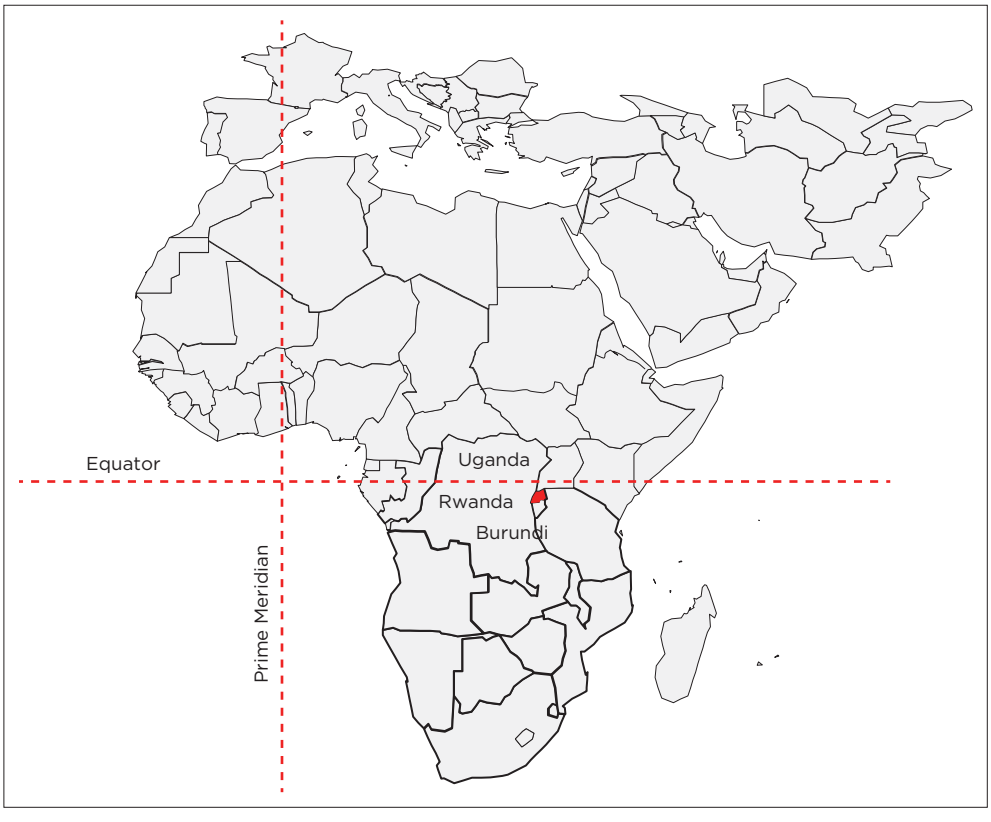
Understanding Rwanda's transport and economic geography

Rwanda's first key characteristic that needs consideration is the country's geographical position. Rwanda is roughly in the middle (latitude) and on the east (longitude) of the African continent, surrounded and bordered by Burundi to the south, the Democratic Republic of the Congo (DRC) to the west, Tanzania to the east and Uganda to the north (see Figure 3.1).

Rwanda's second characteristic is that it is economically landlocked. To illustrate, none of the current or planned 'trans-Africa' highway developments directly touch Rwanda (see Figure 3.2). The closest is the Lagos–Mombasa route (see Figure 3.2), running west to east.

Fortunately, however, there are two focused regional East Africa initiatives being rolled out under the auspices of the Central Corridor Transit Transport Facilitation Agency (CCTTFA) and the Northern Corridor Transit and Transport Coordination Authority (NCTTCA), which aim to improve direct and transit trade through the two major corridors (see Figure 3.3 Panel [a] and Panel [b]).

While these entities are attempting to improve transport and trade performance in the two corridors, Rwanda is still dependent on the port of Mombasa (having to transit through both Kenya and Uganda) and the port of Dar es Salaam (having to transit through Tanzania). There is limited access to the west of the country because of a lack of decent road



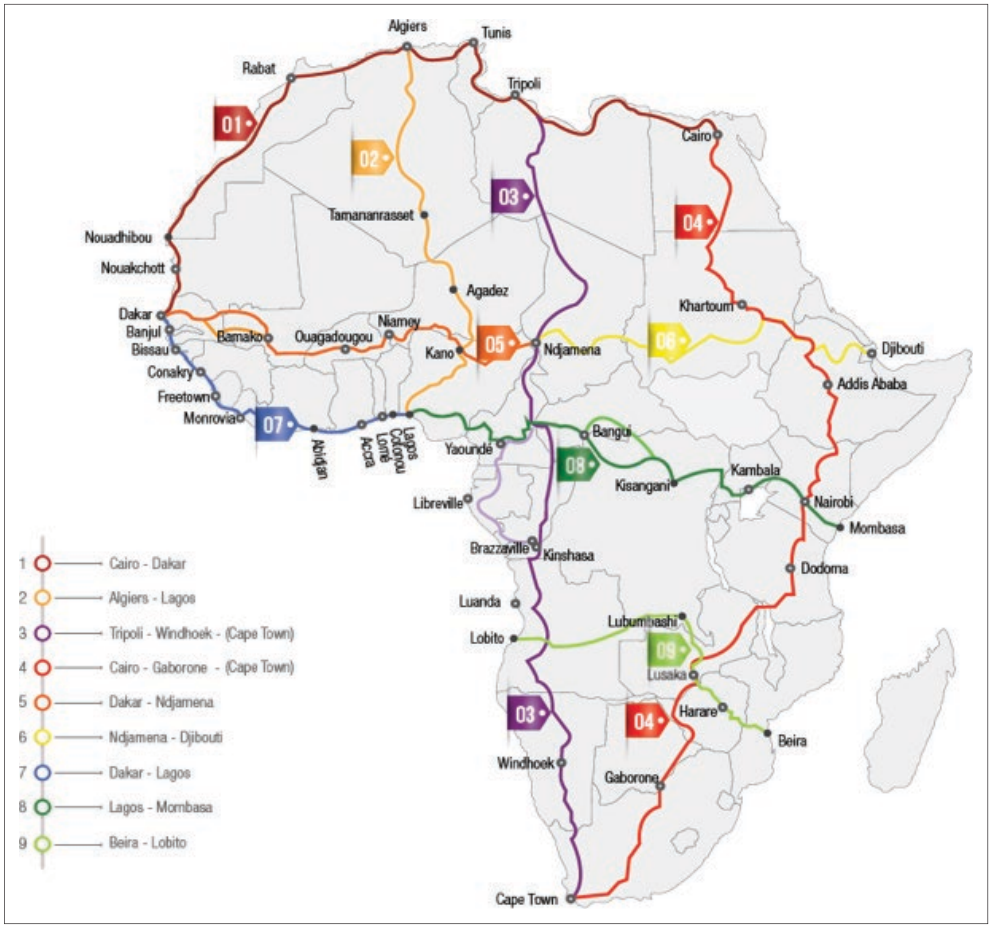
Source: Authors' own illustrations (map not to scale).
FIGURE 3.1: Geographical location of Rwanda and its bordering neighbours.

infrastructure in the eastern part of the DRC. To the south, road access to the port of Durban (South Africa) is possible by transiting through Tanzania, Zambia, Zimbabwe and Botswana. Air transport is very expensive globally. The next section provides a more detailed analysis of Rwanda's own trade and logistics data as well as insights into the country's modes of transport and exit and entry points.

Export flow assumptions informed by Rwanda's national export data

Rwanda's own detailed international trade data[48] were used to inform initial routing from within the country, border exit points and neighbouring countries. As an additional information source, South Africa's detailed import

48. Provided by Victor Steenbergen, (former) country economist for Rwanda, International Growth Centre.



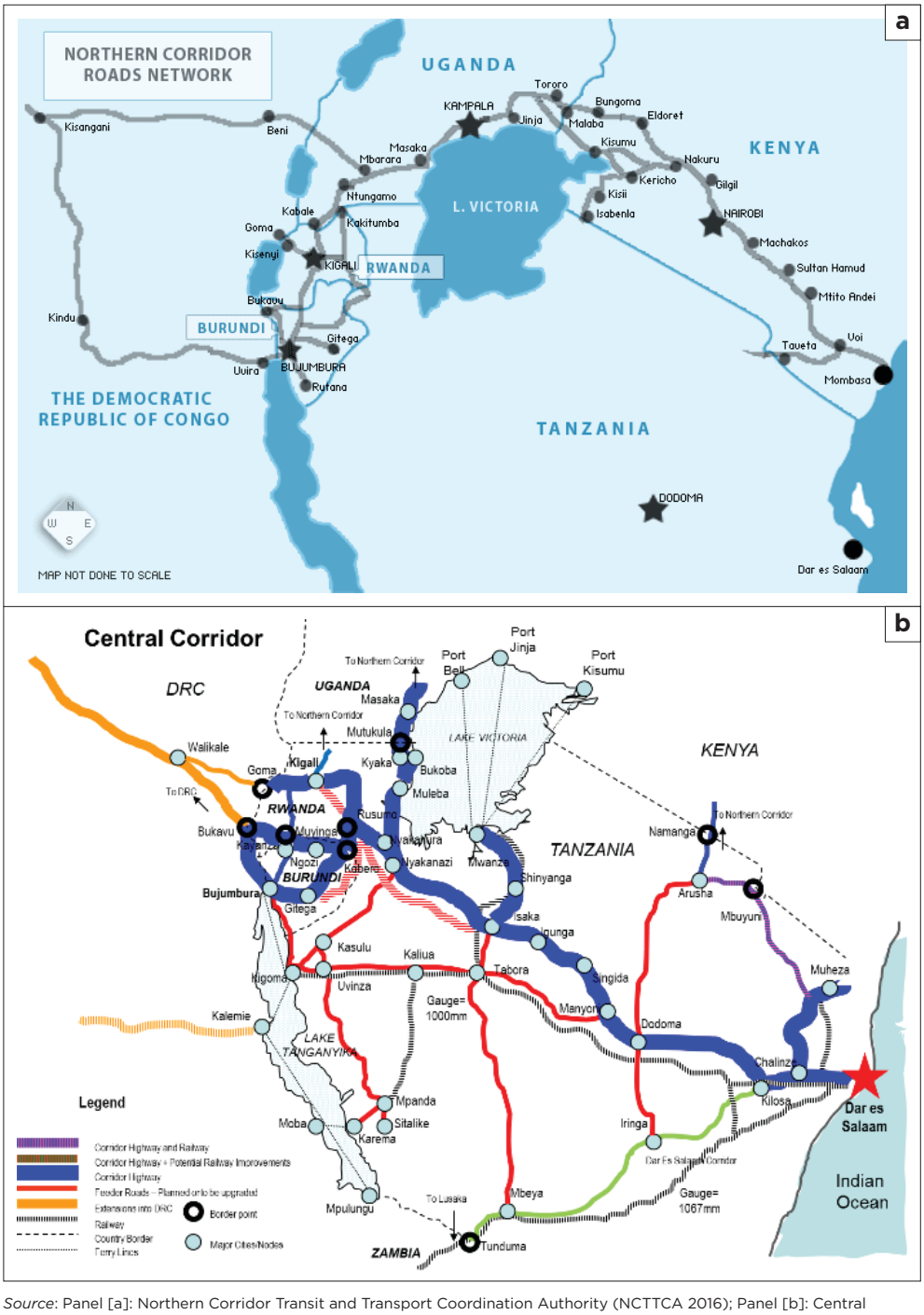
Source: African Development Bank (AfDB 2003). Reproduced and republished under a Creative Commons Attribution (CC BY) 3.0 IGO License.

FIGURE 3.2: Geographical economic context of Rwanda and its bordering neighbours.

statistics, including border entry points,[49] were used to determine the most probable export flows from Rwanda to South Africa via southern Africa.

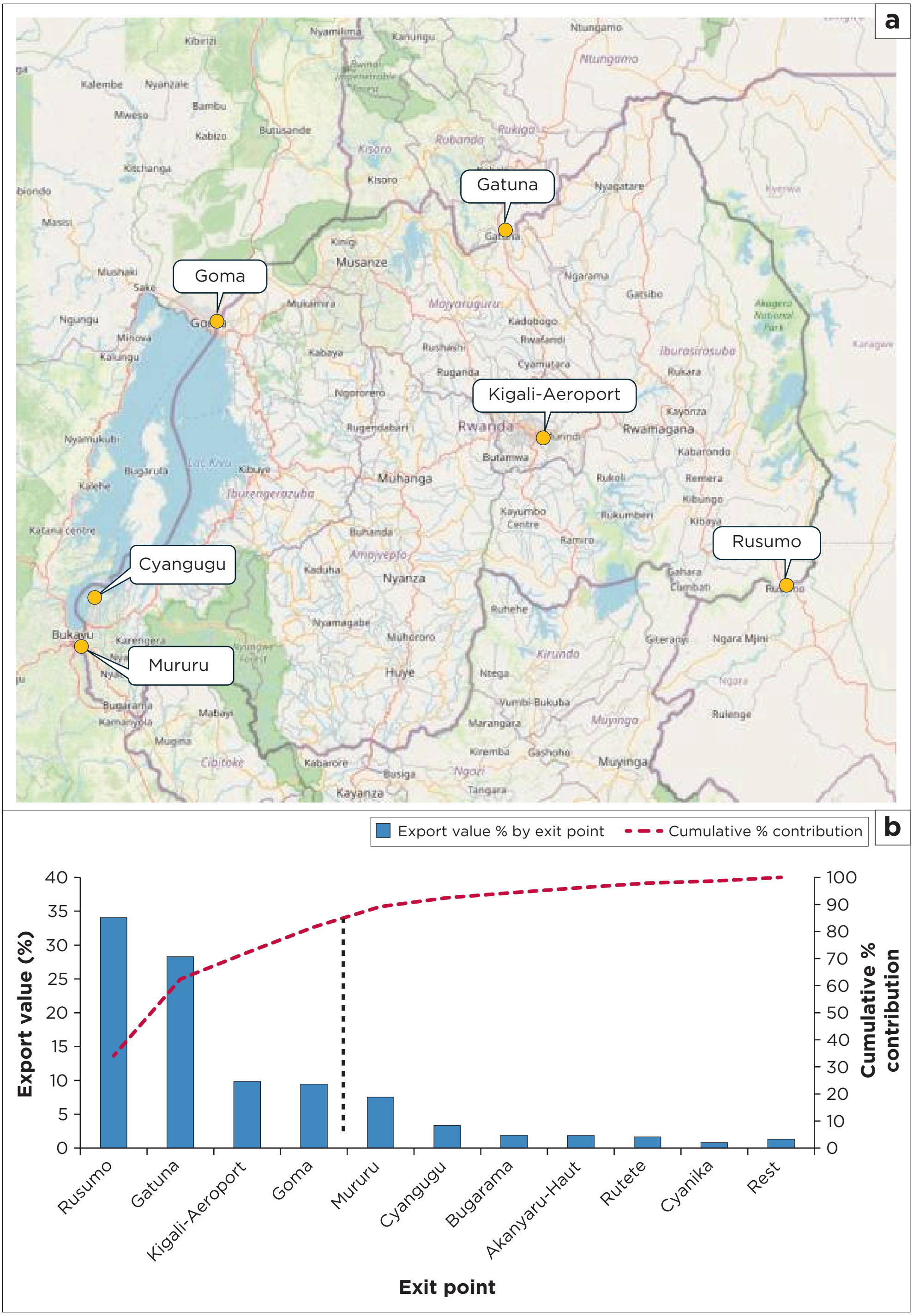
Based on an analysis of the detailed information obtained on Rwanda's imports and exports (Figure 3.4), it is evident that more than 80% of the country's exports in value terms flow through four border exit points, namely Rusumo (Tanzania border), Gatuna (Uganda border), Kigali-Aeroport (Rwanda's international airport) and Goma (DRC border). In total value terms, just under 10% of exports leave the country by air (Kigali-Aeroport), while the rest are transported by land and sea, once through the ports of Mombasa (Kenya) and Dar es Salaam (Tanzania).

49. Obtained from the South African Revenue Service's (SARS) Department of Customs and Excise (SARS 2017).



Source: Panel [a]: Northern Corridor Transit and Transport Coordination Authority (NCTTCA 2016); Panel [b]: Central Corridor Transit Transport Facilitation Agency (CCTTFA 2016).

FIGURE 3.3: Northern and Central Transit Corridors – Rwanda and its bordering neighbours.



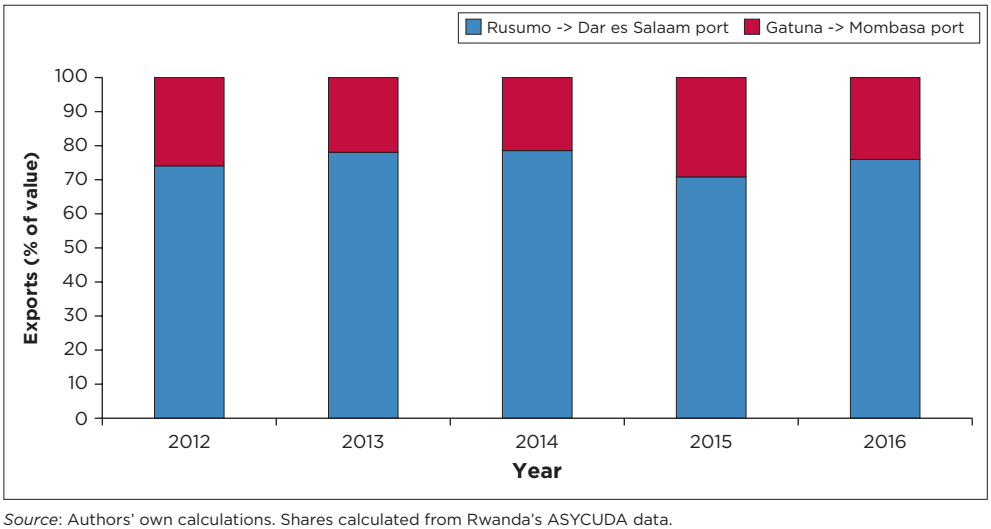
Source: Authors' own annotations on OpenStreetMaps (13 October 2025) Panel [a], based on data from Central Corridor Transit Transport Facilitation Agency (CCTTFA 2016) and Northern Corridor Transit and Transport Coordination Authority (NCTTCA 2016). Panel [b] shares were calculated from Rwanda's automated system for customs data using Automated System for Customs Data (ASYCUDA) data.
Key: %, percentage.

FIGURE 3.4: Rwanda exports by major border exit points.

On the assumption that exports via Rusumo destined for countries other than Burundi, the DRC, Tanzania or Kenya can either flow through the port of Dar es Salaam or travel by road to neighbouring countries to the south (Botswana, Malawi, Zambia or Zimbabwe), it is possible to derive an estimate (in value terms) of exports transported via the port of Dar es Salaam.

Similarly, for exports leaving the country through Gatuna, not bound for Uganda, the DRC, South Sudan, Tanzania or Kenya, it is assumed that these exports will travel via maritime transport from Mombasa. From Figure 3.5, it is evident that various other sources (see, e.g. Business Daily 2017; East African 2017; Mwita 2016; Nation 2013; Ojulu 2013) indicate oscillation in overall cargo trade (in tonnage terms) between Mombasa and Dar es Salaam. For Rwanda, it seems that (in value terms) Dar es Salaam has handled between 70% and 80% of Rwanda's exports on a consistent basis for some time. Therefore, for the purposes of this study, in modelling cargo transport, export flows are assumed to mainly go through the port of Dar es Salaam.[50]

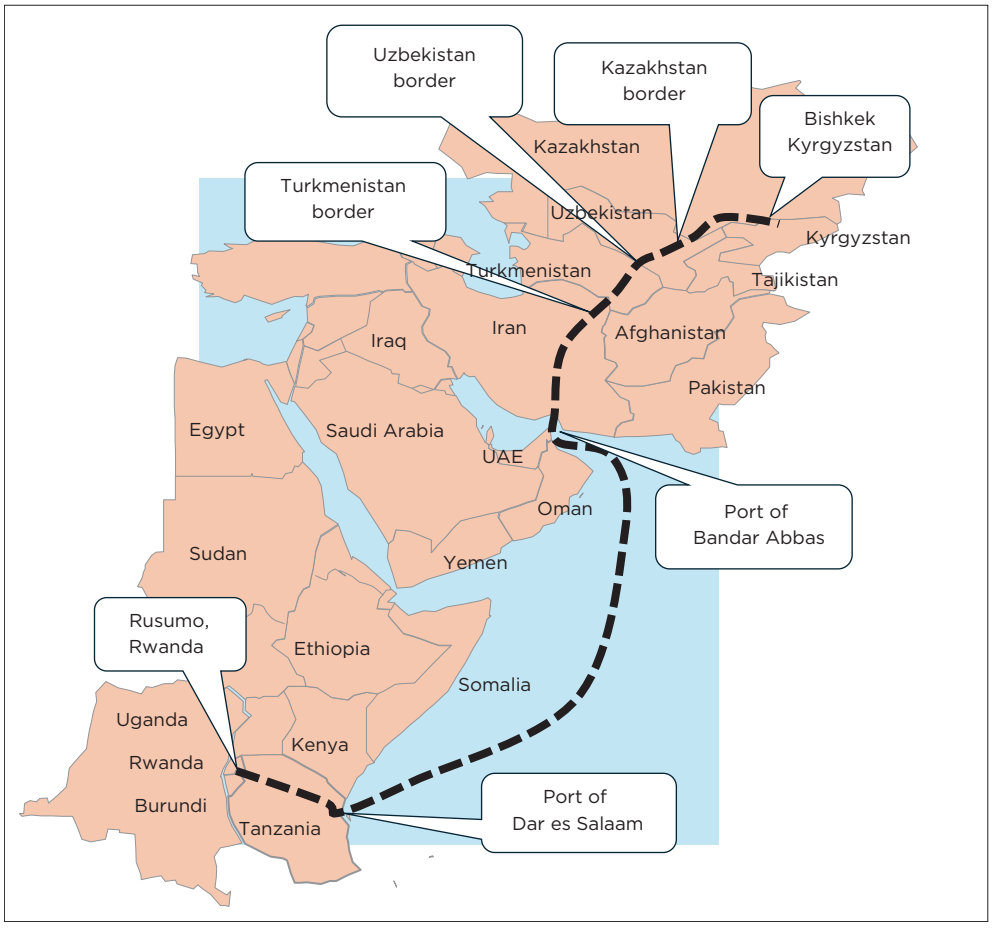
More specific information regarding routing costs and times within the East Africa Northern and Central Corridors were obtained from reports published by the CCTTFA (2016) and the NCTTCA (2016).



Source: Authors' own calculations. Shares calculated from Rwanda's ASYCUDA data.
Key: ASYCUDA, Automated System for Customs Data; %, percentage.

FIGURE 3.5: Rwanda exports by major port exit points.

50. With the model having been constructed, it is possible to investigate the impact of alternative scenarios. However, the authors of this chapter are of the opinion that this will have an insignificant effect on the overall results; it may have more of an impact on the economies of Kenya and Tanzania.



Source: Authors' own illustrations (map not to scale).

FIGURE 3.6: Actual example of costing elements applied.

A numerical example of routing assumptions

In this section, a practical route from Rwanda to a target market, as provided in the previous section is used to inform the quantification of the impact of the refined methodology. A map (not to scale) of the actual route from Kigali in Rwanda to Bishkek in Kyrgyzstan is shown in Figure 3.6.

Firstly, the geodesic distance from Kigali in Rwanda to Bishkek in Kyrgyzstan in terms of the Centre d'Études Prospectives et d'Information Internationales (CEPII) GeoDist data set (CEPII 2017; Mayer & Zignago 2011) puts this route at 6,685.9 km, with an estimated travel time of 6.3 days.[51] To further demonstrate the real-world complexity of commercial geography, a second example (Figure 3.7) shows the routing from Dar es Salaam to

51. At 24 knots, this equates to 44.5 km per hour.

Source: Authors' own illustrations (map not to scale).

FIGURE 3.7: Example of route from Dar es Salaam to Belarus.

Belarus, which is in close geographical proximity to Kyrgyzstan. However, the route is different via the Suez Canal, around Western Europe. One can therefore not simply assume that destination markets close to each other will be serviced along the same routes. In geodesic distance terms, the estimated distance from Kigali (Rwanda) to Belarus is 6,213.2 km with 5.8 days' travel time, which is similar to the distance and time to Kyrgyzstan.

The length of the route displayed in Figure 3.7 is 13,497.3 km, which is more than double the geodesic distance of 6,213.2 km.

In terms of the basic market access component ($CMAI_{ijk}$) approach, Steenkamp (2011) states that if a country is landlocked, the shipping time to the nearest or most likely port is used, based on the ports used by the World Bank in their *Doing Business 2009 Report* (Djankov, Freund & Pham 2006), which was supplied to Steenkamp (2011).

Therefore, in this approach, distance was not used; only freight costs were considered. Based on this information, the World Bank states that either Mombasa (Kenya) or Dar es Salaam (Tanzania) was used for Rwanda, while for Kyrgyzstan, it was Quendou or Tianjin (China) or Bandar Abbas (Iran). Using the shortest route assumption, the closest import port would therefore be Bandarabas (Iran), with cargo flowing through the port of Dar es Salaam. The assumption is informed by the export flows analysis conducted on Rwanda's detailed reported data and discussed in the previous section.

The freight rate used by Steenkamp (2011) for this route was between US$2,710.26 and US$2,995.56. The World Bank *Doing Business Report* (World Bank 2009a) calculation of the cost to import into Kyrgyzstan was estimated as per Table 3.1. No consideration was given to the cost of exporting from the port of origin or from any of the transit countries.

It is evident from Table 3.1 that the World Bank estimates for the import and export cost and time elements vary significantly across the various countries, which will ultimately have a major influence on the costs applied for modelling purposes.

For the two routes – Kigali (Rwanda) to Bishkek in Kyrgyzstan and Kigali (Rwanda) to Minsk in Belarus – the routing based on the revised methodology is described in Figure 3.8.

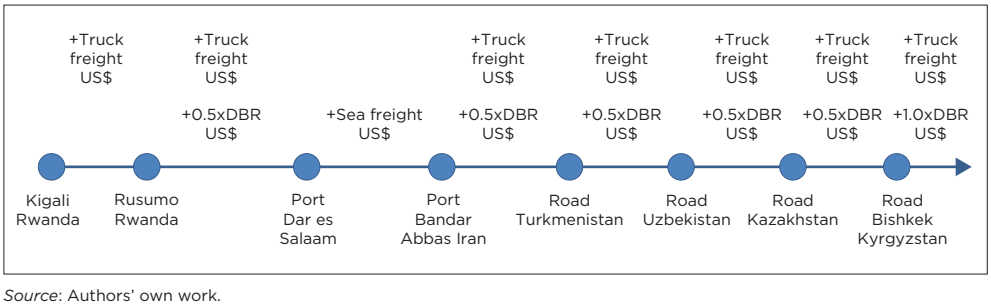
For Kigali (Rwanda) to Bishkek in Kyrgyzstan, the route sequence (Figure 3.8) is:

- From Kigali, Rwanda (exit Rusumo border post) via road transport (137 km) (Google Maps 2017); 3.35 hours @ 48 km/hour; 97 hours to process the export (World Bank 2016)
- To Dar es Salaam, Tanzania (1,302 km) (Google Maps 2017); 65.10 hours @ 48 km/hour (World Bank 2016)

TABLE 3.1: Cost and time to import/export.

Country	Flow	Trading across borders – time to import/export: Border compliance (hours)	Trading across borders – cost to import/ export: Border compliance (US$)	Trading across borders – time to import/ export: Documentary compliance (hours)	Trading across borders – cost to import/ export: Documentary compliance (US$)
Belarus	Import	1	0	4	0
	Export	5	108	4	140
Iran	Import	107	565	159	143
	Export	148	660	284	197
Kazakhstan	Import	133	574	132	430
	Export	2	0	6	0
Kyrgyzstan	Import	37	512	36	200
	Export	27	485	24	190
Rwanda	Import	294	530	72	121
	Export	97	183	42	110
Tanzania	Import	402	1,350	240	375
	Export	96	1,160	96	275
Uzbekistan	Import	111	278	174	292
	Export	112	278	174	292
Turkmenistan†	Import	76	421	143	293
	Export	77	420	119	290

Source: Authors' tabulated data from the World Bank Group (2016).
†As the World Bank survey does not cover Turkmenistan, the average of regional neighbours (Afghanistan, Azerbaijan, Iran, Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan) was used for estimates of the various parameters.
Key: US$, United States dollar.



Source: Authors' own work.
Key: US$, United States dollar; DBR, Doing Business Report.

FIGURE 3.8: Example of a route from Dar es Salaam to Belarus.

- Then a transport mode switch to maritime transport at the port; 96 hours to process the export (World Bank 2016)
- Then the maritime route to the port of Bandar Abbas in Iran (4,731 km) (Google Maps 2017); 315.41 hours @ 15 km/hour; 107 hours to process the import (World Bank 2016)
- Then a transport mode switch back to road from the port and transit through Iran with an exit point at Sarakhs (1,545 km) (Google Maps 2017); 77.25 hours @ 48 km/hour; 148 hours to process the export (World Bank 2016)

- Then the entry point into Turkmenistan; 76 hours to process the import (World Bank 2016)
- Then transit through Turkmenistan with an exit point at Farab (457 km) (Google Maps 2017); 9.5 hours @ 48 km/hour; 77 hours to process the export (World Bank 2016)
- Then an entry point into Uzbekistan; 111 hours to process the import (World Bank 2016)
- Then transit through Uzbekistan with an exit point at Gagarin (563 km) (Google Maps 2017); 28.15 hours @ 48 km/hour; 112 hours to process the export (World Bank 2016)
- Then an entry point into Kazakhstan; 133 hours to process the import (World Bank 2016)
- Then transit through Kazakhstan with an exit point at Kamyshanovka (708 km) (Google Maps 2017); 35.4 hours @ 48 km/hour; 2 hours to process the export (World Bank 2016)
- Then an entry point into Kyrgyzstan; 27 hours to process the import (World Bank 2016)
- And finally transit through Kyrgyzstan to Bishkek (51.9 km) (Google Maps 2017); 1.08 hours @ 48 km/hour.

The overall distance covered by this route is 9,512.4 km. The total time involved in the shipment would be 11.5 weeks (80.5 days) in total (based on actual travel as well as port and transit delays, in line with previously explained assumptions).

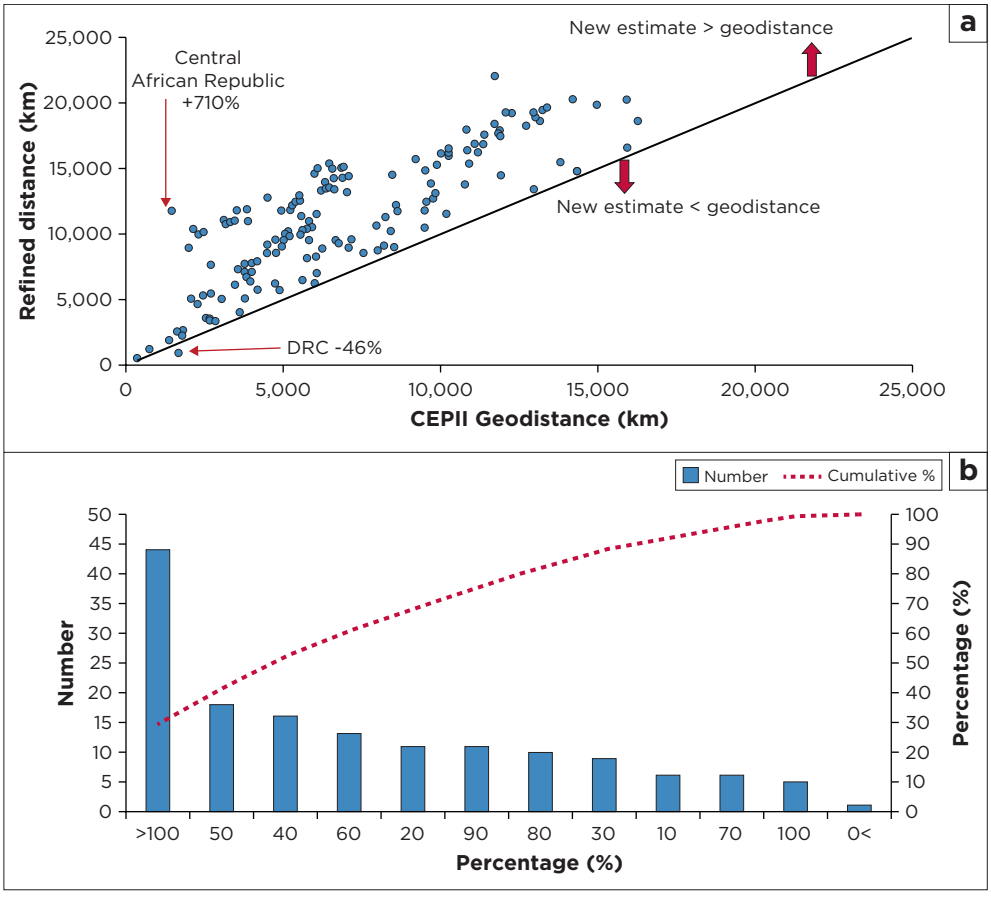
Outcomes compared to geodesic distance assumption and current approach

First of all, the outcomes are compared to the CEPII GeoDist data set (Mayer & Zignago 2011) estimates. According to the CEPII GeoDist data set (Mayer & Zignago 2011), this route is 6,685.9 km and the estimated travel time is 6.3 days @ 44.5 km/hour. If the speed assumption is reduced to an average of 13 knots (around 24 km/hour), the estimated travel time would be 11.6 days.

In the Steenkamp (2011) approach, data were available for only 150 countries. Therefore, for comparison purposes, the subset of these same 150 countries is used. Within the group of countries, 27 are landlocked. When comparing only travel distances and time, the difference between the two approaches (geodesic distance and basic market access component ($CMAI_{ijk}$)), the basic market access component approach yields a more realistic, real-world distance, which is 42% more than the geodesic distance. In terms of time, however, the difference between the two approaches is much more significant at 594%.

Various studies (Clark 2007; Martinez-Zarzoso & Nowak-Lehmann 2007) found that distance does not directly reflect costs. Based on this study's approach, the time effect of the transport route is clear and translates into a time–cost equivalent of 17.8% in ad valorem-equivalent (AVE) (compared to 9.3% for the 11.6-day geodesic distance-equivalent). The time–cost estimate from the refined logistics cost component ($LMAI_{ijk}$) approach for just the actual travel time would therefore increase by 92% compared to the most conservative geodesic distance case.

In terms of the distance results, the outcome differs by more than 100% for 30% (44 out of 150) of the countries (Figure 3.9, Panel [b]). There are another 18 countries where the difference is between 40% and 50%, 16 countries where it is between 30% and 40%, and 13 countries where it is between 50% and 60%. For a single country, the DRC, the result is lower



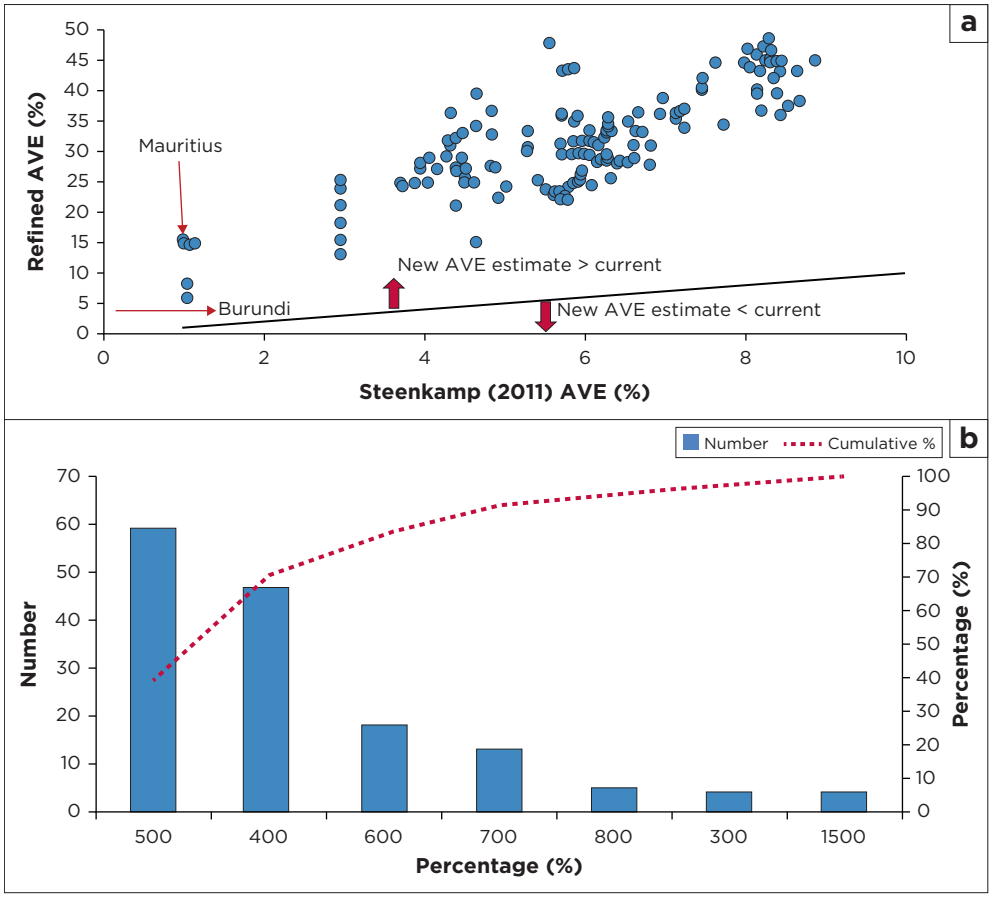
Source: Authors' own work.
Key: km, kilometre; CEPII, Centre d'Études Prospectives et d'Informations Internationales; DRC, Democratic Republic of the Congo.

FIGURE 3.9: Differences in distance estimates.

(–46%) than the geodesic distance estimate (Figure 3.9, Panel [a]). The largest percentage difference is observed for the Central African Republic at 710%.

While it is interesting to note the differences in actual distances in kilometres, of greater interest are the associated time and cost implications of these changes. As mentioned previously, based on the approach applied by Steenkamp (2011), the overall travel cost element would be between US$2,710.26 and US$2,995.56 for this route (using the closest port assumption), while with the import cost (World Bank 2016) component (as per Equation 4) for Kyrgyzstan, another US$512 still needs to be added. The result is therefore in the range of US$3,222.26 to US$3,507.56.

The outcomes based on the refined logistics cost component ($LMAI_{ijk}$) approach are depicted in Figure 3.10.



Source: Authors' own work.
Key: AVE, ad valorem-equivalent.

FIGURE 3.10: Differences in ad valorem-equivalent cost estimates.

The country with the largest relative change in AVE cost estimates is Mauritius at 1,470%. As a neighbouring country of Rwanda, Burundi increases from zero to 3.81%, which is immaterial in relative size. As Burundi is a neighbour, no transport cost element is associated with this market in the basic market access component ($CMAI_{ijk}$) approach. However, in the refined logistics cost component ($LMAI_{ijk}$) approach, the road distance from Kigali to Bujumbura of 275 km which, with the border crossing and overall time of 6.9 hours, is arguably a much more realistic calculation.

In aggregate terms, the overall AVE cost estimate of Steenkamp (2011) translates into an AVE of between 6.4% and 7.0% (considering the normalisation value of US$50,000). In contrast, based on the refined approach, the final outcome results in a time–cost AVE of 41.6% to move a container valued at US$50,000 from Kigali in Rwanda to Bishkek in Kyrgyzstan. This translates into an outcome for this route that is roughly five times (or 493%) higher than in the basic market access component ($CMAI_{ijk}$) approach.

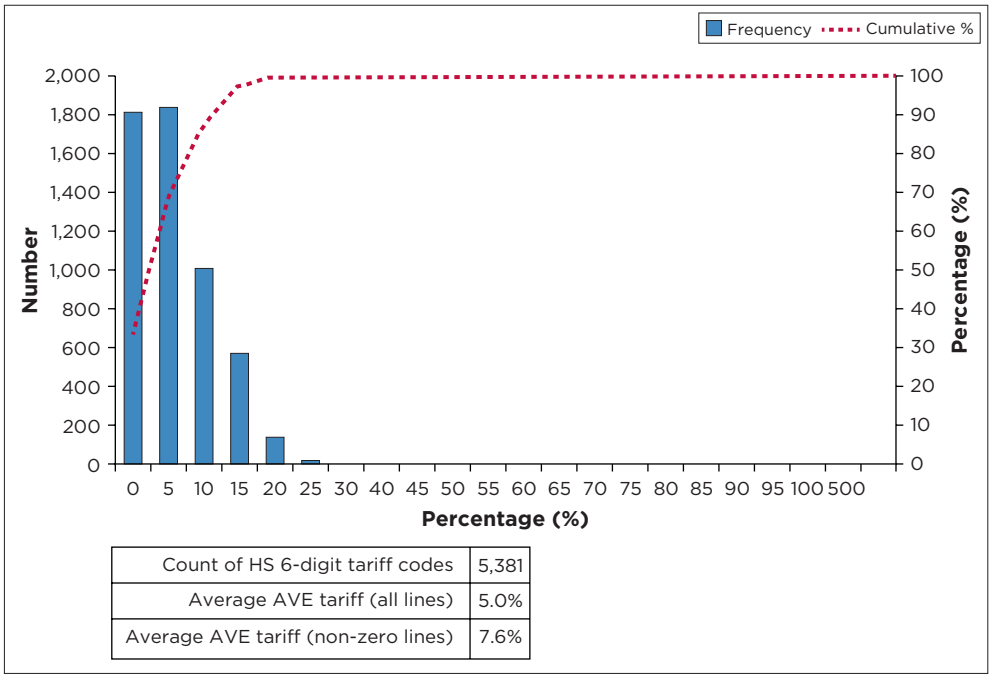
When considering the expected ratio of transport cost to, for example, tariff levels, one needs to consider the relative import tariff levels in the target markets. For this purpose, a histogram and descriptive statistics of the level and distribution of import tariffs into Kyrgyzstan (based on ITC TradeMap data) are provided in Figure 3.11.

The analysis of Kyrgyzstan's import tariffs shows that for the 5,381 Harmonized System (HS) 6-digit tariff lines, the average (unweighted) tariff level is 5% and for all non-zero tariff lines it is 7.6%.

The basic market access component ($CMAI_{ijk}$) approach estimate (high end) of the AVE cost element is therefore approximately 7%, resulting in a ratio of transport AVE to tariff AVE of 0.9 (and 1.4 for the less conservative 5% if zero-rated tariff lines are included). These are two landlocked countries, with Kyrgyzstan actually being doubly landlocked. To reiterate, five countries need to be crossed, through eight border entries/exits (four exits and four entries), one port exit and one port entry, two transport mode switches (from land to maritime and back to land) and a total of 10 potential 'formal' points of delay,[52] which can increase the time and cost associated with the logistics flow of a container on this route.

Based on the generalised findings from various studies mentioned in Chapter 2, one would therefore expect this ratio to be multiples of the average tariff levels. According to the World Trade Organization

52. Formal points of delay in this context refer to formal border crossings, excluding any delays because of, for example, 'ad hoc' police roadblocks or non-official episodes, such as accidents or other causes of delay.



Count of HS 6-digit tariff codes	5,381
Average AVE tariff (all lines)	5.0%
Average AVE tariff (non-zero lines)	7.6%

Source: Authors' own work.
Key: HS, Harmonized System; AVE, ad valorem-equivalent.
FIGURE 3.11: Kyrgyzstan's import tariff distribution.

(WTO 2008), one would expect a factor of around three times and up to five times for sub-Saharan Africa. For the refined logistics cost component ($LMAI_{ijk}$) approach, the result in this case is around 5.5 times, which is much more in line with expected ratios based on various independent, partial quantitative investigations conducted over time. The fact that this outcome is on the higher side is probably linked to the fact that Rwanda is in sub-Saharan Africa and the target market (Kyrgyzstan) is doubly landlocked and only accessible via less-developed Central Asian economies, as modelled by Raballand (2003).

Another important study in this regard is that of Limão and Venables (2001) who found that for landlocked countries, the transport cost was around seven times the maritime distance-equivalent per kilometre. For this route, the ratio is nearly three times, based on the refined logistics cost component ($LMAI_{ijk}$) approach. For the basic market access component ($CMAI_{ijk}$) approach, it is not possible to check this because the focus was only on maritime transport (as no comparative, land-based transport cost element was available in the previous studies that made use of the basic market access component ($CMAI_{ijk}$) approach).

A further comparison would be to investigate outliers in terms of the lowest AVE cost ranked versus the highest AVE cost ranked in the

TABLE 3.2: Top 10 lowest-cost ranked (best) markets from Rwanda.

Rank	Previous ($CMAI_{ijk}$) approach	Refined ($LMAI_{ijk}$) approach	Previous ($CMAI_{ijk}$) approach ranking
1	Mauritius	Uganda	3
2	Madagascar	Kenya	4
3	Uganda	Comoros	9
4	Kenya	Seychelles	5
5	Seychelles	Madagascar	2
6	Mozambique	Mozambique	6
7	Malawi	DRC	36
8	Zimbabwe	Malawi	7
9	Comoros	Mauritius	1
10	Botswana	South Africa	13

Source: Authors' own work.
Note: As Burundi did not have data in the Steenkamp (2011) country set, the country is excluded, but is actually ranked no. 1 for the refined logistics cost component ($LMAI_{ijk}$) approach. The shading in Table 3.2 indicates that the country appears in both approaches.
Key: DRC, Democratic Republic of the Congo.

two approaches. In this regard, Table 3.2 provides the lowest-cost AVE-ranked countries for each approach. For the refined logistics cost component ($LMAI_{ijk}$) approach outcomes, the rank for the corresponding basic market access component ($CMAI_{ijk}$) approach is also shown.

In general, the countries ranked with the lowest AVE cost estimates are in relatively close geographical proximity to Rwanda. However, countries like Burundi, Zambia and Ethiopia are excluded on the basis of the 'nearest port' assumption and thus have no cost under the previous ($CMAI_{ijk}$) approach. Uganda is included on the assumption that Mombasa (Kenya) is the nearest port. Tanzania is excluded because Dar es Salaam was used as the closest port and therefore Tanzania's cost was also estimated at zero. Clearly, these assumptions under the basic market access component ($CMAI_{ijk}$) approaches are too simplistic.

What is evident from Table 3.2 is that eight out of the 10 countries appear in both sets of results. However, in terms of the outcomes, it is evident that Mauritius is ranked highest (with relatively the lowest cost) in the basic market access component ($CMAI_{ijk}$) approach, which does not correspond with it being geographically further removed than, for example, Uganda (which shares a border with Rwanda) or Kenya or Tanzania (through which a container would need to transit to get to Mauritius). However, once the inland journey leg via Tanzania is added, Mauritius moves down to 9th position, well below Uganda (1st), Kenya (2nd) and various other geographically closer markets – which, consequently, is a more realistic relative outcome overall.

In terms of the 'highest' AVE cost estimates, Table 3.3 shows the 10 countries ranked at the bottom (i.e. highest AVE cost estimate) of the refined logistics cost component ($LMAI_{ijk}$) approach outcomes.

TABLE 3.3: Top 10 highest-cost ranked markets from Rwanda.

Rank	Previous ($CMAI_{ijk}$) approach	Refined ($LMAI_{ijk}$) approach	Previous ($CMAI_{ijk}$) approach ranking
150	Grenada	Tonga	137
149	Guyana	Mexico	50
148	Kiribati	Honduras	135
147	Suriname	Panama	128
146	Trinidad and Tobago	Belize	140
145	Papua New Guinea	Costa Rica	130
144	Dominica	Haiti	138
143	Venezuela	Antigua and Barbuda	136
142	Barbados	Grenada	150
141	Colombia	Trinidad and Tobago	146

Source: Authors' own work.

Global tariffs applicable to exports from Rwanda

The second cost component in the composite relative market index for filter 3.2 (see Chapter 2) is import tariffs imposed on exports from Rwanda in different target markets.

While Rwanda is a member of the East African Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA), various other agreements also inform the tariff levels that some or all of Rwanda's export products will face. The information provided in this section is from the ITC's MacMap AVE tariff rates (ITC 2017).

According to the International Monetary Fund (IMF 2005), the MacMap database is unique and extremely accurate in its measurement of tariffs imposed on individual country exports because it accounts for bilateral, regional and preferential tariff systems. The MacMap database is also specifically suited to this study as the data are available on the HS 6-digit product level and consider different tariff regimes, such as the most-favoured-nation (MFN), and agreements such as those between EAC members and COMESA members. It was not the intention of this study, however, to include details on all the applicable trade agreements and rules of origin. (For more information on this, refer to the ITC's Market Access Map website.)[53]

The analysis, which is based on the information obtained from the ITC's MacMap, covers (from Rwanda's perspective) all possible trading partners in the world for each HS 6-digit product level appearing in the CEPII (Centre d'Études Prospectives et d'Informations Internationales) BACI (Base pour l'Analyse du Commerce International) data set. In the analysis, it was found

53. https://macmap.org/

that there are a number of product–market lines for which the ITC MacMap data have no entries. The way to address this was to revert to tariffs calculated on the basis of average (unweighted) higher-level aggregates. Therefore, a set of HS 4-digit unweighted average tariffs for all product–market combinations was first calculated, followed by HS 2-digit (chapter) unweighted average tariffs. For any HS 6-digit product-level product–market entries in the CEPII BACI data that had no corresponding entries in the ITC MacMap data, a high-level hierarchy of average tariffs was obtained from the calculated HS 4-digit unweighted average tariffs. If no HS 4-digit unweighted average tariffs existed, the HS 2-digit (chapter) unweighted average tariffs were applied.

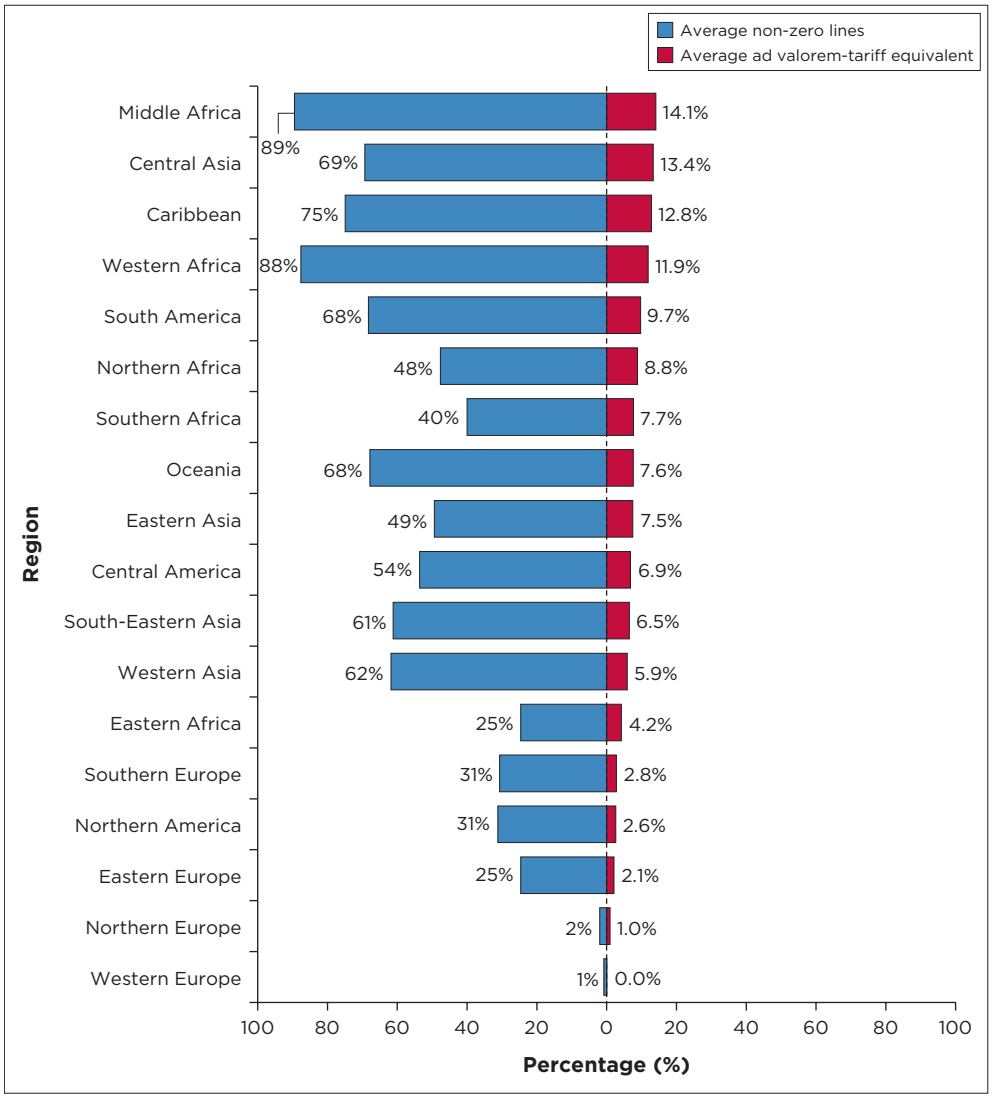
The outcomes were aggregated by region for illustrative purposes, as there was a total of more than 1 million product–market HS 6-digit product-level combinations. Figure 3.12 provides two summarised extracts of information relevant to this analysis.

The bars on the left-hand side of the vertical axis represent the percentage of HS 6-digit product-level line items on which a tariff exists (for any non-zero item, irrespective of the value of the specific tariff). It is evident that Middle Africa has the largest number of lines, with an associated tariff at 89% of all tariff lines, followed by Western Africa at 88% of tariff lines. The bars on the right-hand side of the vertical axis represent the unweighted average tariff levels for each region. Again, in the case of Middle Africa, countries in this region not only have on average the most tariff lines but also the highest average AVE tariff equivalent (unweighted), at 14.1%. Northern and Western Europe have the lowest, both in terms of the number of tariff lines and the average AVE tariff percentage.

The final element to be added, therefore, is the AVE tariff for home market (exporter) *i* into target market (importer) *j* for product *k* ($AVET_{ijk}$).

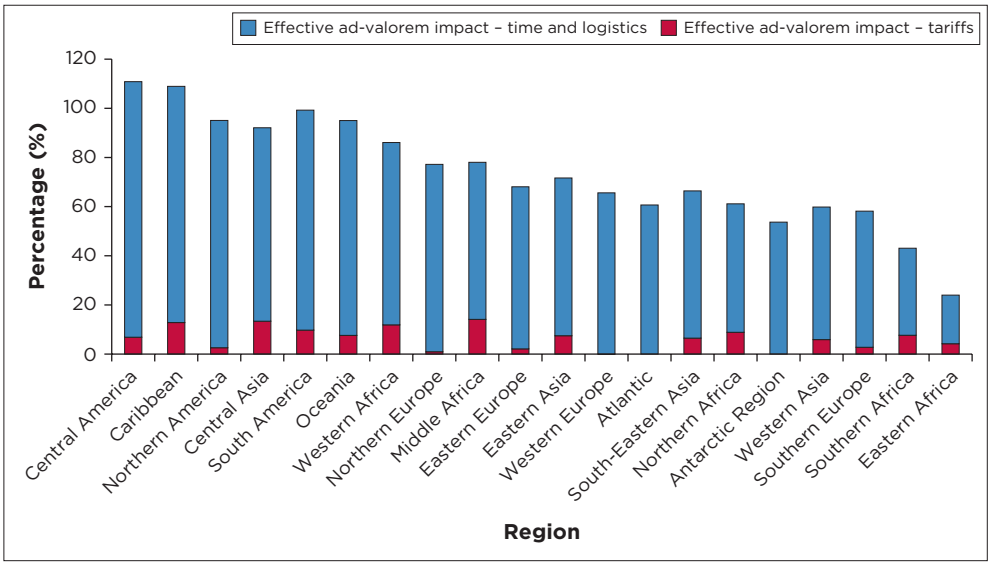
By combining the tariff information and the logistics cost information in the refined logistics cost component ($LMAI_{ijk}$) approach, Figure 3.13 provides a summarised overview of the revised relative, effective (unweighted) ad valorem outcomes.

It is evident that, overall, the import tariff-informed component of the AVE relative Market Access Index is relatively small compared to the international shipping logistics cost and time component. In laymen's terms, the index implies that for a container whose contents are valued at US$50,000 and which is shipped from Kigali, the effective AVE cost to transport such a container to Central America would equate to around US$105,427, while the same container would involve an effective AVE cost of around US$61,986 in the East African region (these were the values at the time of writing and would need to be updated periodically).



Source: Authors' calculations based on data from the International Trade Centre (ITC) Market Access Map (MacMap) (ITC 2017).
FIGURE 3.12: Rwanda – tariffs applied in target markets (average unweighted ad valorem-equivalent and percentage of non-zero tariff lines by region).

Therefore, in relative terms, it would cost nearly double to transport the container to Central America compared to somewhere in East Africa, considering the direct and proxied cost elements associated with all the documentation, inland transport and handling, customs clearance and inspections, port and terminal handling and official costs, international road and maritime shipping, and the time value of the consignments (based on the Hummels constant – see Chapter 2 for more details).



Source: Authors' own work.

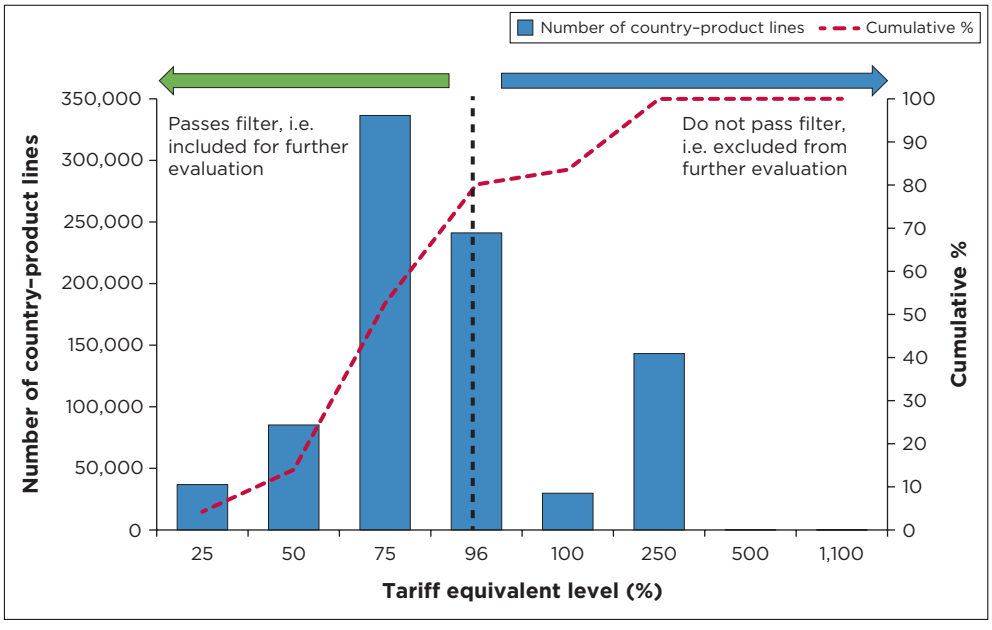
FIGURE 3.13: Rwanda – effective ad valorem (unweighted) impact of logistics and import costs and time.

However, it must be kept in mind that these are relative costs aimed at differentiating potential market–product combinations for the purposes of modelling and gaining strategic information. They are not actual commercial rates that would apply to similar, real-world transactions.

The last element in the equation is the Pareto informed cut-off value (C_{MAI}) which is calculated (see Figure 3.14) across the population of all HS 6-digit product–market lines that could be considered to be exported from Rwanda to the rest of the world (irrespective of Rwanda's current production and export capabilities).[54] Specialisations in terms of revealed comparative advantage (RCA) and other parameters are used as filters to help scope the interpretation of the outcomes. Options with an RCA < 1 are not excluded, as in the product space approach. Based on the set of assumptions described in this section, the Pareto-informed cut-off value for Rwanda is therefore C_{MAI} = 0.9625 (depicted in Figure 3.14).

Therefore, all HS 6-digit product–market lines that pass the accessibility filter (sub-filter 3.2 – see Chapter 2) have an accessibility tariff-equivalent index of 96.25% or less. This translates into around 700,000 HS 6-digit product–market lines that meet this criterion. The median accessibility

54. In this regard, the TRADE-DSM methodology differs from other methodologies, such as the product space approach, in that all potential export product and market combinations are evaluated according to demonstrated import demand for all countries and all products. For more information on the product space approach, see http://atlas.cid.harvard.edu/



Source: Authors' own work.
Key: %, percentage.
FIGURE 3.14: Market Access Index distribution outcomes and Pareto cut-off value applied.

tariff-equivalent index is around 74%, while the maximum is in excess of 1,000%. While Figure 3.13 shows that, on average, the import tariff-informed component of the AVE relative Market Access Index is relatively small compared to the international shipping logistics cost and time component, in exceptional cases the reverse is true.

There are more than 140,000 HS 6-digit product–market lines (16.4% of the total population of product–market lines) that have an accessibility tariff-equivalent index of 250% or more. This means that in such instances, the import tariff-informed component far outweighs the international shipping logistics cost and time component.

A practical example is Fiji in Oceania. While the international shipping logistics cost and time component for Fiji is 89.5%, for selected HS 6-digit products Fiji has 1,329 HS 6-digit product lines with import tariffs in excess of 100% and 15 product lines with import tariffs in excess of 250%. This is illustrated in Table 3.4.

In a later section, the set of outcomes informed by the refined logistics cost component ($LMAI_{ijk}$) approach is analysed for the purpose of providing policymakers with insights that will assist them in developing an export promotion strategy for Rwanda.

TABLE 3.4: Examples of tariffs applied by Fiji.

Product: 22072010 – Undenatured ethyl alcohol of an alcoholic strength by volume of 80% volume or higher; ethyl alcohol and other spirits, denatured, of any strength: Ethyl alcohol and other spirits, denatured, of any strength; of an alcoholic strength by volume of 57.12% vol or less **Partner**: Rwanda **Data source**: ITC (MacMap) **Year**: 2013 **Nomenclature**: HS Rev. 2012 **AVE methodology**: AVE based on the World Tariff Profile (WTP)	**Tariff regime** MFN duties (applied) Applied tariff (as reported): US$52.01/lt Applied tariff (converted): US$28,971.13/ton Total ad valorem-equivalent tariff: 1,000%
Product: 24022000 – Cigars, cheroots, cigarillos and cigarettes, of tobacco or of tobacco substitutes: Cigarettes containing tobacco **Partner**: Rwanda **Data source**: ITC (MacMap) **Year**: 2013 **Nomenclature**: HS Rev. 2012 **AVE methodology**: AVE based on the WTP	**Tariff regime** MFN duties (applied) Applied tariff (as reported): US$169.14/kg or 1,000 cigarettes, whichever is the greater Applied tariff (converted): US$94,216.05/ton but not less than US$0.09/ton Total ad valorem-equivalent tariff: 814.71%

Source: Authors' tabulated data from International Trade Centre (ITC 2017).
Key: US$, United States dollar; WTP, World Tariff Profile; MFN, most-favoured-nation; ITC, International Trade Centre; AVE, ad valorem-equivalent; HS, Harmonized System.

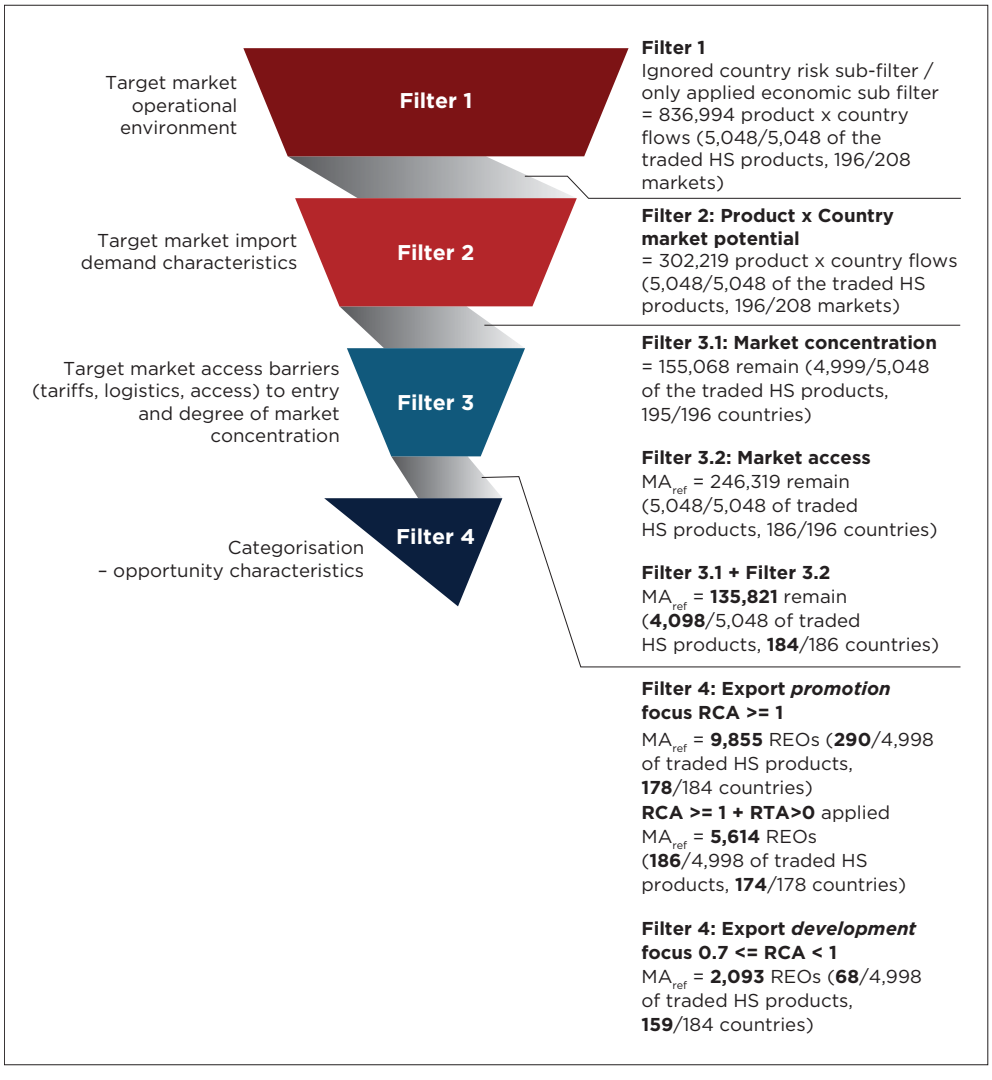
Applying the TRADE-DSM

In this section, the TRADE-DSM methodology is applied in a step-by-step manner to illustrate the outcomes of the refined approach (illustrated in Figure 3.15). The refinement to the TRADE-DSM methodology only impacts filter 3.2 (market access) onwards.

Application of filter 1

Filter 1 consists of two sub-filters. The first sub-filter (filter 1.1) considers the political and/or commercial risk to the exporting country, while the second (filter 1.2) incorporates the macro-economic size and growth of the various target markets, measured as gross domestic product (GDP) and GDP per capita, as well as GDP growth and GDP per capita growth values.

The application of filter 1 eliminates 55 markets from the global economy. While filter 1 of the TRADE-DSM methodology is normally applied for general academic analysis, the sub-filter of political and economic risk was ignored in this particular case. The reason for this deviance from the 'normal' approach is that 21 African countries would be excluded, including neighbours to Rwanda such as Burundi, the DRC, Malawi, Mozambique, Zimbabwe and South Sudan. Part of the focus of opportunity identification



Source: Authors' calculations based on the TRADE-DSM methodology applied for each filter stage. Used with permission from Trade Research Advisory.
Key: TRADE-DSM, TRADE-Decision Support Model; HS, Harmonized System; MA_{ref}, refined market access; RCA, revealed comparative advantage; REO, realistic export opportunity; RTA, revealed trade advantage.

FIGURE 3.15: TRADE-DSM filtering approach applied for Rwanda – outcomes per filter.

for Rwanda requires that African countries be included. The sub-filter (filter 1.1) was therefore not applied in the filtering process described in Chapter 2. Only the sub-filter for economic size and growth (filter 1.2) was applied for the filter 1 step, as displayed in Figure 3.15.

Based on all possible HS 6-digit product–market lines for which data exist, there is an initial population of 873,243 possibilities (consisting of 208 markets and 5,048 HS 6-digit product lines). The theoretically possible population is 208 × 5,048 = 1,049,984 possible combinations. However, in

practice, not all countries import all products or record trade in all product lines; hence, the lower actual population (873,243) compared to the theoretical population (1,049,984) of possible outcomes.

Application of filter 2

In filter 2, the requirement of relative size and growth is applied for each individual HS 6-digit product–market line, and as a result, the combinations of product–market lines that are retained come to 302,219.

Application of filter 3

In filter 3's sub-filter 3.1, the import supply country concentration measure is applied, resulting in 155,068 combinations of product–market lines remaining. The application of sub-filter 3.2, which is the composite relative market access index (whose construction specifically for Rwanda is discussed in detail in the section 'Comparative analysis of the impacts of refinements' in this chapter), results in 246,319 combinations of product–market lines remaining.

However, the methodology requires that the intersection of the outcomes from these two sub-filters is the overall result for this filter, which leaves 135,821 product–market lines (from the original starting point of 836,994 possible combinations requiring consideration, which is around 15.6% of initial possibilities). Overall, 190 countries and 4,098 products remain.

Application of filter 4

In the last step (filter 4), the outcomes are categorised in various ways for the purposes of informing export promotion decision-making. Firstly, in terms of the outcome 'categorisation' applied in the filter 4 step (Figure 3.15) of the TRADE-DSM methodology, there are 9,855 product–market line opportunities that can be classified as Rwanda having an RCA > 1. This set of outcomes is made up of 290 HS 6-digit product lines and 178 target markets (countries). When the re-export test (revealed trade advantage/ RTA > 0) is applied, this drops to 186 product lines at the HS 6-digit level and 174 countries, with a final number of 5,614 product–market line combinations.

Export development and investment opportunities

When relaxing the RCA > 1 requirement, products are identified that the home market already exports but that are not viewed as having a

comparative advantage when compared to the world averages. To inform potential export development and investment opportunities for export purposes, the group of products with an RCA ≥ 0.7 and RCA < 1 is also highlighted in Figure 3.15. These products yield 2,093 combinations (68 products and 159 countries) that could potentially be further investigated in order to determine what actions are required (e.g. possible investment in plant and equipment, knowledge-building and training) to increase the relative exports of such products.

Discussion of the results

This section aims to provide outcomes based on the refined TRADE-DSM methodology, adjusted using the refined logistics cost component ($LMAI_{ijk}$) approach, for Rwanda's policymakers to consider as part of their industrial policy and export strategy formulation process.

The next section ('Overview of results') presents Rwanda's outcomes, as informed by the adjusted TRADE-DSM approach. These outcomes are then summarised from a global and regional perspective in in the section 'Regional and sectoral summary of results' in this chapter, while an overview of outcomes from a country and product perspective follows in the section 'Top markets and products identified for Rwanda' in this chapter. Some discussion is provided to aid interpretation, but it is beyond the scope of this study to analyse and document each of the individual product–market lines in detail.

Overview of results

In arranging the 5,614 product–market line combinations according to the TRADE-DSM REO Map (explained and depicted in Figure 3.15), it is notable that 99% and 98% (Table 3.5) of the number and associated potential, respectively, of these opportunities are in the first column (1). This means that these are products that Rwanda can and does export but is currently not exporting to the potential identified markets categorised in this first column.

Around 41% of the potential is associated with markets classified as $REO_{1,5}$, meaning markets that exhibit import demand for the product lines that are both relatively large and growing in the short and long term (refer to Chapter 2 for a detailed explanation of the TRADE-DSM REO Map matrix). These opportunities are discussed in more detail in subsequent sections. The focus of the discussion is on export promotion prioritisation by potential target market, informed by the relative 'untapped' potential of such opportunities (also see Chapter 2 for an explanation of the calculation of relative 'untapped' potential).

TABLE 3.5: TRADE-DSM REO Map outcomes for global opportunities for Rwanda.

Map of realistic export opportunities (REOs) number [% of total number] 'Untapped' potential value in US$ million (m) [% of total value]		Relative market share of home market into target market(s)				Row totals
		Small (1)	Intermediately small (2)	Intermediately large (3)	Large (4)	
Product x target market (country) – size and growth	Large (1)	417 [7.43%] $21,937 m [17.07%]	1 [0.02%] $3 m [0.00%]	- [0.00%] $0 m [0.00%]	1 [0.02%] $0 m [0.00%]	**419** **[7.46%]** **$21,940 m** **[17.08%]**
	Growing (2) (short and long term)	4,034 [71.86%] $31,698 m [24.67%]	18 [0.32%] $12 m [0.01%]	14 [0.25%] $3 m [0.00%]	34 [0.61%] $5 m [0.00%]	**4,100** **[73.03%]** **$31,718 m** **[24.69%]**
	Large and growing (3) (short term)	101 [1.80%] $7,686 m [5.98%]	2 [0.04%] $41 m [0.03%]	1 [0.02%] $6 m [0.01%]	- [0.00%] $0 m [0.00%]	**104** **[1.85%]** **$7,734 m** **[6.02%]**
	Large and growing (4) (long term)	213 [3.79%] $14,623 m [11.44%]	4 [0.07%] $8 m [0.01%]	1 [0.02%] $14 m [0.01%]	3 [0.05%] $0 m [0.00%]	**221** **[3.94%]** **$14,646 m** **[11.40%]**
	Large and growing (5) (short and long term)	757 [13.48%] $52,352 m [40.74%]	4 [0.07%] $67 m [0.05%]	4 [0.07%] $26 m [0.02%]	5 [0.09%] $7 m [0.01%]	**770** **[13.72%]** **$52,451 m** **[40.82%]**
	Column totals	**5,522** **[98.36%]** **$128,296 m** **[99.85%]**	**29** **[0.52%]** **$131 m** **[0.10%]**	**20** **[0.36%]** **$50 m** **[0.04%]**	**43** **[0.77%]** **$12 m** **[0.01%]**	**5,614** **[100.0%]** **$128,488 m** **[100.0%]**

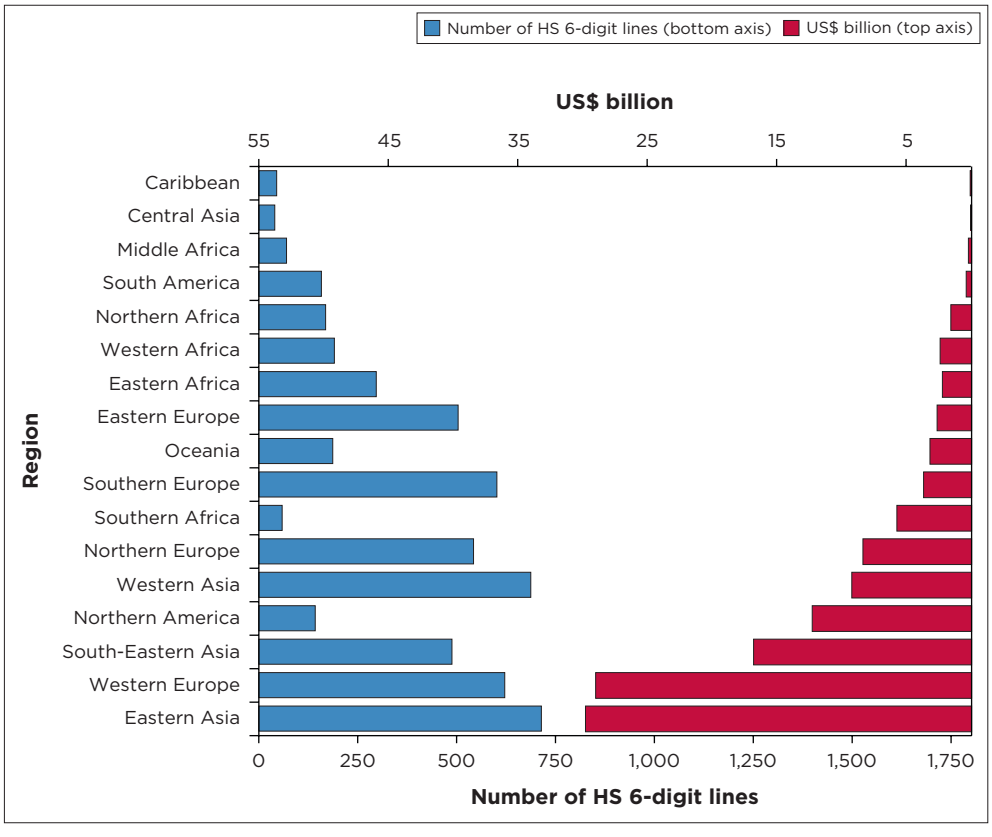
Source: Authors' own work.
Note: Values are rounded at the lower level in the table; hence totals may not exactly reflect the sum of the individual values appearing in the rows.
Key: $, United States dollar; m, million; %, percentage; TRADE-DSM, TRADE-Decision Support Model.

A geographical and sectoral summary is provided in the next section to contextualise the outcomes obtained from the filtering process, as explained in the preceding section and presented in Table 3.5.

Regional and sectoral summary of results

By aggregating the outcomes into geographical regions, Eastern Asia and Western Europe appear to be the major potential regional markets, both in terms of number and value of 'untapped' potential, as identified on the basis of the refined TRADE-DSM methodology (Figure 3.16).

Next, Western Asia presents the most opportunities in terms of number, but less 'untapped' potential compared to, for example, South-Eastern Asia (which shows more 'untapped' potential value, but less in terms of number of opportunities). Clearly, as is to be expected, Africa (covering

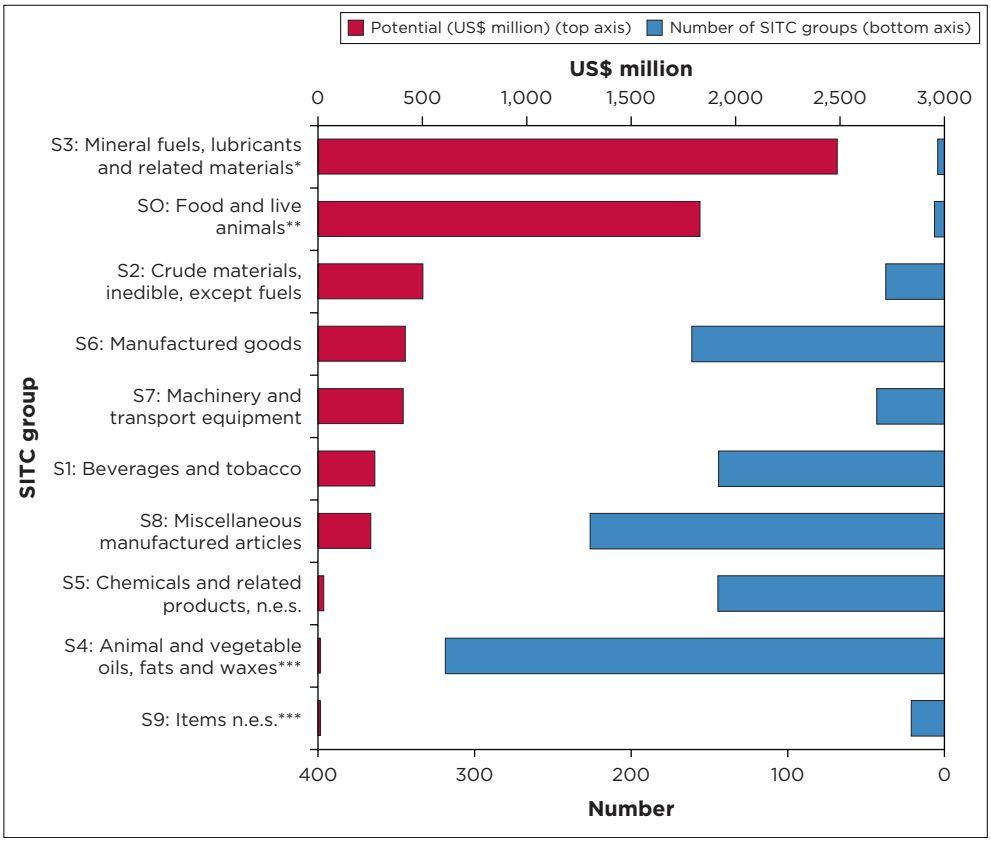


Source: Authors' own work.
Key: HS, Harmonized System; US$, United States dollar; REO, realistic export opportunity.

FIGURE 3.16: Global realistic export opportunities – outcomes by region.

Southern, Eastern, Western and Northern Africa) represents fewer opportunities, both in terms of number and 'untapped' value, compared to Eastern Asia, Western Europe and South-Eastern Asia. From a geographical perspective, these results point to major potential opportunities for Rwanda lying beyond the direct neighbouring and regional countries in Africa.

For the overall set of outcomes, Figure 3.17 provides a view of both potential value and number of lines identified as possible opportunities for Rwanda to pursue, grouped according to major Standard International Trade Classification (SITC) groupings as opposed to HS product codes.



Source: Authors' own work.
Key: US$, United States dollar; n.e.s., not elsewhere specified; REO, realistic export opportunity; SITC, Standard International Trade Classification.
*It is evident that petroleum-related products, in the Mineral fuels, lubricants and related materials group (S3),[55] dominate in terms of potential, but the number of opportunities is relatively small. This is because most countries in the world have to import petroleum-related products, and Rwanda, in terms of its export statistics, does have an RCA > 1 for this group of products. However, further analysis shows that the petroleum extraction sector in Rwanda is not very well developed. The only petroleum extraction-related activity is the extraction of dissolved methane from the waters of Lake Kivu (World Bank 2009b). In 2016, it was reported that Rwanda had resumed its search for petroleum deposits in Lake Kivu, joining other countries in the region that were already looking forward to starting commercial oil production (Kenya Engineer 2016).
**For Items n.e.s. (S9), a more in-depth analysis shows that these items are dominated by non-monetary gold[56] (excluding gold ores and concentrates).
***The items Animal and vegetable oils, fats and waxes (S4) and Chemicals and related products, n.e.s. (S5) have small relative potential and, on the grounds of scale, do not appear to have any values in the chart.

FIGURE 3.17: Global realistic export opportunities by major Standard International Trade Classification (SITC) group.

55. S33: Petroleum, petroleum products and related materials containing sub-groups of S3.330: Crude petroleum and S33.512: Paraffin wax, microcrystalline petroleum wax, slack wax, ozokerite, lignite wax, peat wax, other mineral waxes, and similar products obtained by synthesis/other processes, whether/not coloured.

56. S97: Gold, non-monetary (excluding gold ores and concentrates) and sub-group S97.101: Gold (including gold plated with platinum), non-monetary, unwrought/in semi-manufactured forms/in powder form.

Top markets and products identified for Rwanda

Based on the observations of Brenton and Newfarmer (2007) that the expansion of existing products in existing markets contributes more to export growth than the diversification into new products or new markets, the identified REOs are presented in terms of the differentiation between the extensive and intensive margin markets and products.

Regarding the outcomes from the refined TRADE-DSM methodology, the results can be aligned to the concept of extensive and intensive margins by considering the combination of home market supply (columns in the TRADE-DSM REO Map, as described in Chapter 2) into the target market and the RCA of the particular product in question.

Intensive margin realistic export opportunities

Based on the TRADE-DSM outcomes for Rwanda, 63 product–market combinations (the sum of the total number of opportunities from columns 3 and 4 in Table 3.5) meet all the filters' requirements, representing 40 unique HS 6-digit product codes and 19 individual countries.

For these product–market combinations, Rwanda is an intermediately large to large supplier already (i.e. the intensive margin for countries), while the set of products have RCAs greater than or equal to 1 (that is, the intensive margin for products). The associated 'untapped' potential value of this set of 63 opportunities amounts to approximately US$62 million (see Table 3.6). This 'untapped' potential equates to around 8.4% of reported exports for Rwanda in 2015.

It is evident from Table 3.6 that China represents the country with the largest potential for two products that are already traded with China (HS261590: Niobium/tantalum/vanadium ores & concentrates and HS261100: Tungsten ores & concentrates).

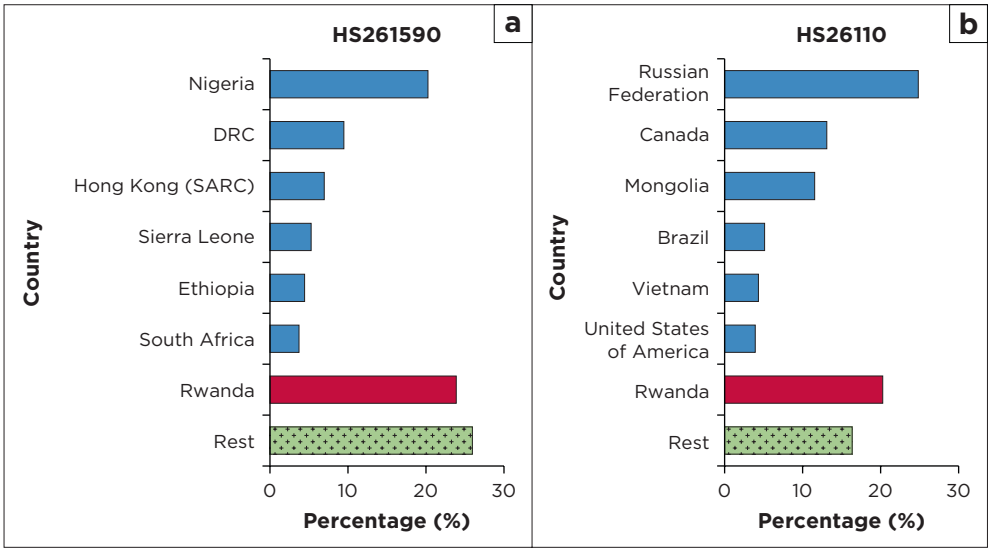
To demonstrate, Figure 3.18 displays Rwanda's relative share in supplying imports into China for both products (HS261590 in Panel [a] and HS261100 in Panel [b]). Rwanda supplies more than 20% of China's imports of both these products; hence, the characterisation of these product–market combinations as examples of intensive margins. Also evident is the fact that China imports from a variety of partner countries; hence, both these opportunities pass the market concentration sub-filter 3.1 (see Chapter 2).

The logic, therefore, is that Rwanda has an opportunity to gain market share from other supplying markets for these products in China. However, this assumption needs to be further investigated in terms of mining production capacity and whether more exports would be feasible.

TABLE 3.6: Intensive margin markets: Existing markets and existing products.

Item	Country	Product count	'Untapped' potential (US$ million)
1	China	2	17.83
2	Kenya	7	17.35
3	United States (US)	1	7.37
4	Thailand	1	5.30
5	DRC	20	3.32
6	Hong Kong (SARC)	1	2.43
7	Mexico	1	2.38
8	Singapore	2	2.26
9	Kazakhstan	1	1.62
10	Japan	1	0.42
11	Belgium–Luxembourg	3	0.33
12	Uganda	8	0.32
13	Malaysia	1	0.29
14	Tanzania (United Rep.)	6	0.10
15	United Kingdom (UK)	1	0.08
16	Sri Lanka	2	0.05
17	Australia	1	0.04
18	Switzerland	3	0.02
19	Czech Republic	1	0.01
	Grand total	**63**	**61.51**

Source: Authors' own work.
Note: Values are rounded at the lower level in the table; hence, totals may not exactly reflect the sum of the individual values appearing in the rows.
Key: US$, United States dollar; DRC, Democratic Republic of the Congo.



Source: Authors' own work.
Key: DRC, Democratic Republic of the Congo; HS, Harmonized System.

FIGURE 3.18: Rwanda's relative share of imports into China (time-weighted shares).

Regarding the intensive margin products associated with the extensive margin countries, the top 20 by value of 'untapped' potential are shown in Table 3.7.

TABLE 3.7: Top 20 intensive margin product realistic export opportunities: Existing markets and existing products.

Item	Product HS 6-digit	Description	RCA	'Untapped' potential (US$ million)
1	HS261590	Niobium/tantalum/vanadium ores & concs.	12,708.172	23.28
2	HS090240	Other tea, black (fermented) & partly fermented tea, whether or not flavoured, in immediate packings of a content >3 kg	537.362	14.17
3	HS260900	Tin ores & concs.	3,659.214	7.55
4	HS261100	Tungsten ores & concs.	2,889.663	7.15
5	HS090230	Tea, black (fermented) & partly fermented tea, whether or not flavoured, in immediate packings of a content not >3 kg	233.983	2.95
6	HS100640	Broken rice	56.286	1.84
7	HS210320	Tomato ketchup & oth. tomato sauces	20.862	0.41
8	HS410120	Whole bovine (incl. buffalo)/equine hides & skins, wt. per skin not >8 kg (simply dried)/10 kg (dry-salted)/16 kg (fresh/wet-salted/othw. presvd.)	205.513	0.36
9	HS110220	Maize (corn) flour	465.017	0.21
10	HS220110	Mineral waters (nat./art.) & aerated waters, not cont. added sugar/oth. sweetening matter/ flavoured	3.481	0.15
11	HS220850	Gin and Geneva	6.105	0.11
12	HS010290	Live bovine animals other than pure-bred breeding animals	19.609	0.10
13	HS040210	Milk in powder/granules/oth. solid form, fat content by wt. not >1.5%	2.031	0.09
14	HS640199	Waterproof footwear with outer soles & uppers of rubber/plastics (excl. of 6401.10).(excl. of 6401.91 & 6401.92) [see complete text #106]	21.185	0.09
15	HS151590	Fixed vegetable fats & oils (excl. of 1515.11–1515.50), incl. jojoba oil & fractions thereof, whether or not ref. but not chemically modified	5.874	0.09
16	HS410390	Raw hides & skins, n.e.s. in Ch.41 (fresh/salted/ dried/limed/pickled/othw. presvd. but not tanned/ parchment-dressed/furth. prepd.) [see complete text #43]	304.470	0.07
17	HS720430	Waste & scrap of tinned iron/steel	16.950	0.06
18	HS110311	Groats/meal of wheat	21.187	0.05
19	HS040130	Milk & cream, not concentrated/sweetened, fat content by wt. >6%	3.548	0.05
20	HS110620	Flour, meal & powder of sago/roots/tubers of 07.14	209.599	0.03
		Rest (15 products)		0.16
		Grand total		**59**

Source: Authors' own work.
Note: Values are rounded at the lower level in the table; hence, totals in this table may not exactly reflect the sum of the individual values appearing in the rows.
Key: US$, United States dollar; n.e.s., not elsewhere specified; HS, Harmonized System; RCA, revealed comparative advantage.

Extensive margin market and intensive margin product realistic export opportunities

In the case of new product–market combinations for products that have an RCA > 1 (i.e. the intensive margin from a product perspective) but for countries where Rwanda is an intermediately small to small existing supplier (i.e. the extensive margin for countries), there are 5,551 product–market combinations that meet these requirements (the sum of columns 1 and 2 in Table 3.5). These combinations need to be further investigated.

From a country perspective, 174 countries are associated with this set of 5,551 product–market combinations and 320 unique HS 6-digit product lines, representing around US$128 billion of 'untapped' potential. For the sake of brevity, only the top 20 'new' potential markets according to the value of 'untapped' potential for existing products are listed in Table 3.8.

It is evident from Table 3.8 that the US represents the largest potential (US$12.3 billion) for 143 products for which Rwanda has an RCA > 1. These 'new' potential exports to the US are too numerous to discuss in this study;

TABLE 3.8: Top 20 extensive margin market realistic export opportunities: New markets and existing products.

Item	Country	Product count	'Untapped' potential (US$ billion)
1	United States (US)	143	12.3
2	Hong Kong (SARC)	82	9.5
3	Switzerland	69	8.1
4	India	83	6.3
5	Germany	149	6.2
6	Netherlands	105	6.2
7	Singapore	79	5.9
8	China	124	5.5
9	South Africa	53	5.1
10	United Kingdom (UK)	129	4.9
11	Belgium–Luxembourg	98	4.2
12	France	128	4.0
13	Japan	90	3.6
14	Indonesia	60	3.4
15	Korea, Rep. of (South)	82	3.0
16	United Arab Emirates (UAE)	67	3.0
17	Turkey	60	2.8
18	Malaysia	75	2.7
19	Australia	71	2.6
20	Vietnam	67	1.6
	Rest	3,737	27.7
	Grand total	**5,551**	**128.4**

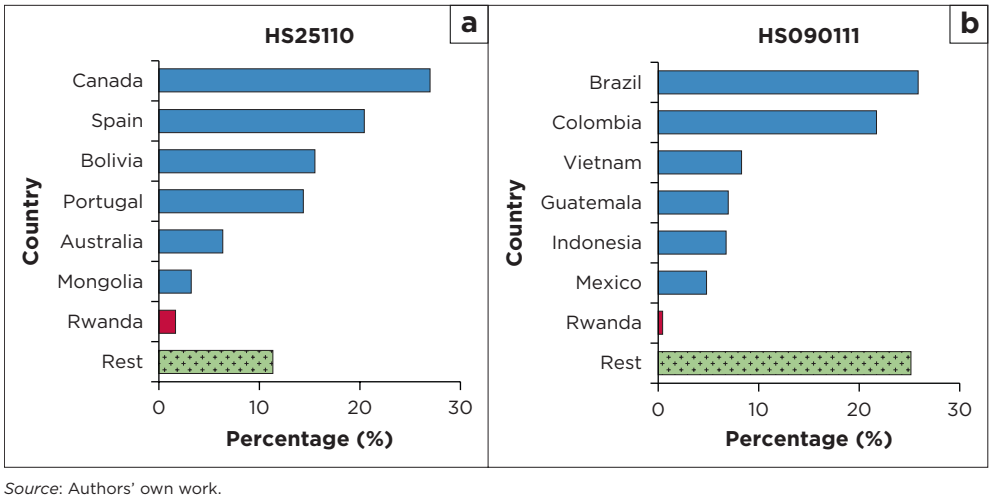
Source: Authors' own work.
Note: Values are rounded at the lower level in the table; hence, totals may not exactly reflect the sum of the individual values appearing in the rows.
Key: US$, United States dollar.

therefore, two examples are selected for illustrative purposes. The first product selected is HS261100: Tungsten ores & concentrates (which was also a product in the previous extensive market and product example), and the second, alternative product selected is HS090111: Coffee, not roasted, not decaffeinated.

Figure 3.19 therefore displays Rwanda's relative share in supplying imports into the US of both these products (HS261100 in Panel [a], and HS090111 in Panel [b]). Rwanda supplies only around 0.5% and 1.7%, respectively, of imports of these products into the US. These product–market combinations are therefore characterised as examples of the extensive margin in terms of the target market, but the intensive margin in terms of the products (because Rwanda has an RCA > 1 for these products). Also evident is the fact that the US imports from a variety of partner countries; hence, both these opportunities pass the market concentration sub-filter 3.1 (see Chapter 2).

In this example, the logic is similar to that in the previous example for China – in other words, Rwanda has an opportunity to gain market share from other supplying markets for these products into the US, as all indicators point to the fact that from a methodological perspective, these opportunities are evaluated as being 'realistic'. However, again, this assumption needs to be further investigated from the perspective of mining production capacity and whether more exports would be feasible. Similarly, the same observation applies to HS090111: Coffee, not roasted, not decaffeinated.

In terms of the intensive margin products associated with the extensive margin countries, the top 20 by value of 'untapped' potential are shown in Table 3.9.



Source: Authors' own work.
Key: HS, Harmonized System.

FIGURE 3.19: Rwanda's relative share of imports into the United States of America (time-weighted shares).

TABLE 3.9: Top 20 intensive margin product realistic export opportunities: New markets and existing products.

Item	Product HS 6-digit	Description	RCA	'Untapped' potential (US$ million)
1	HS854370	Other machines and apparatus	1.082	3,065
2	HS740400	Copper waste & scrap	1.124	2,120
3	HS090111	Coffee, not roasted, not decaffeinated	85.828	2,082
4	HS230400	Oil-cake & oth. solid residues, whether or not ground/in pellets, from extraction of soybean oil	1.048	1,526
5	HS843143	Parts suit. for use solely/princ. with the boring/sinking mach. of 8430.41/8430.49	1.281	1,313
6	HS220300	Beer made from malt	5.819	1,308
7	HS100630	Semi-milled/wholly milled rice, whether or not polished/glazed	9.919	1,107
8	HS392310	Boxes, cases, crates & sim. arts., of plastics	2.645	899
9	HS720421	Waste & scrap of stainless steel	7.520	708
10	HS190531	Sweet biscuits	6.728	657
11	HS220290	Non-alcoholic beverages other than waters of 2202.10 (not incl. fruit/veg. juices of 20.09)	3.700	615
12	HS040221	Wheat/meslin flour	70.623	509
13	HS040221	Tanned/crust hides & skins of bovine (incl. buffalo)/equine animals, without hair on, in the wet state (incl. wet-blue), whether or not split but not furth. prepd. (excl. of 4104.11)	1.448	509
14	HS040221	Milk in powder/granules/oth. solid form, unsweetened, fat content by wt. >1.5%	1.019	509
15	HS800110	Tin, not alloyed, unwrought	2.134	493
16	HS040120	Milk & cream, not concentrated/sweetened, fat content by wt. >1% but not >6%	1.689	489
17	HS970300	Original sculptures & statuary, in any mat.	1.311	379
18	HS410411	Tanned/crust hides & skins of bovine (incl. buffalo)/equine animals, without hair on, in the wet state (incl. wet-blue), full grains, unsplit; grain splits but not furth. prepd.	2.066	298
19	HS070190	Potatoes other than seed potatoes, fresh/chilled	6.442	296
20	HS261400	Titanium ores & concs.	22.721	246
		Rest (128 products)		8,413
		Grand total		**27,544**

Source: Authors' own work.
Note: Values are rounded at the lower level in the table; hence, totals may not exactly reflect the sum of the individual values appearing in the rows.
Key: US$, United States dollar; HS, Harmonized System; RCA, revealed comparative advantage.

In conclusion, it must be kept in mind that the purpose of the TRADE-DSM methodology is to highlight the opportunities predominantly informed from a demand-side perspective. Such identified opportunities may then inform supply-side and, for example, mining and industrial development policy issues. As such, potential opportunities for export development and investment can also be informed by the outcomes of the TRADE-DSM methodology.

More specifically, the TRADE-DSM also allows investigation of opportunities that meet all the filtering constraints but where the home market (Rwanda in this instance) does not 'yet' have a comparative advantage. This would inform the context of the extensive margins for both countries and products. The next section briefly discusses this case for the Rwanda outcomes.

Extensive margin realistic export opportunities

The 'standard' application of filter 4.1 (RCA > 1) in the TRADE-DSM methodology (see Chapter 2) yields products conforming to the intensive margin that are typically aligned to short- to medium-term export promotion initiatives. However, the question regarding the identification of opportunities for export development and investment purposes (at the product extensive margin) can also be informed by the TRADE-DSM methodology by relaxing the RCA > 1 requirement (as illustrated in Figure 3.15 and discussed in the section 'Export development and investment opportunities' in this chapter).

The outcomes from this alternative methodology yielded 2,093 REOs based on a combination of 68 products and 159 markets. The top 20 target markets according to the value of 'untapped' potential are listed in Table 3.10.

TABLE 3.10: Top 20 extensive margin market realistic export opportunities: New markets and new products.

Item	Country	Product count	'Untapped' potential (US$ million)
1	United States (US)	51	1,397
2	Germany	52	566
3	France	41	528
4	United Kingdom (UK)	43	429
5	China	35	348
6	Netherlands	31	306
7	Belgium–Luxembourg	26	279
8	Hong Kong (SARC)	26	208
9	Canada	24	200
10	Japan	24	168
11	Spain	40	164
12	Saudi Arabia	35	162
13	Norway	12	143
14	Italy	29	128
15	Austria	19	114
16	Korea, Rep. of (South)	26	113
17	Russian Federation	14	100
18	Poland	34	99
19	Czech Republic	20	86
20	Australia	18	84
	Rest	1,493	1,406
	Grand total	**2,093**	**7,029**

Source: Authors' own work.
Note: Values are rounded at the lower level in the table; hence, totals in this table may not exactly reflect the sum of the individual values appearing in the rows.
Key: US$, United States dollar.

In terms of the extensive margin products associated with the extensive margin countries, the top 20 by value of 'untapped' potential are shown in Table 3.11.

TABLE 3.11: Top 20 extensive margin product realistic export opportunities: New markets and new products.

Item	Product HS 6-digit	Description	RCA	'Untapped' potential (US$ million)
1	HS090121	Coffee, roasted, not decaffeinated	0.803	858
2	HS220210	Waters, incl. min. waters & aerated waters, cont. added sugar/oth. sweetening matter/flavoured	0.884	692
3	HS870390	Vehicles princ. designed for the tpt. of persons (excl. of 87.02 & 8703.10–8703.24), with C-I int. comb. piston engine (diesel/semi-diesel), n.e.s. in 87.03	0.997	663
4	HS852560	Transmission apparatus incorporating reception apparatus	0.892	428
5	HS391590	Waste, parings & scrap, of plastics n.e.s. in 39.15	0.852	344
6	HS850610	Primary cells & primary batteries, manganese dioxide	0.799	275
7	HS611430	Garments, n.e.s., knitted or crocheted, of man-made fibres	0.831	262
8	HS190219	Uncooked pasta, not stuffed/othw. prepd., not cont. eggs	0.790	238
9	HS853180	Electric sound/visual signalling app. (e.g. bells/ sirens/indicator panels/burglar/fire alarms), other than 85.12/85.30, n.e.s. in 85.31	0.859	227
10	HS852550	For radio-telephony or radio-telegraphy	0.825	216
11	HS711790	Imitation jewellery other than of base metal	0.868	194
12	HS870310	Vehicles (excl. of 87.02) princ. designed for the tpt. of persons, specially designed for travelling on snow; golf cars & sim. vehicles	0.867	168
13	HS847910	Machinery for public works/building or the like having individual functions, n.e.s. in Ch. 84	0.909	156
14	HS850211	Electric generating sets with C-I int. comb. piston engines (diesel/semi-diesel engines), of an output not >75kVA	0.791	141
15	HS040291	Milk & cream, concentrated (excl. in powder), unsweetened	0.915	130
16	HS620452	Women's/girls' skirts & divided skirts (excl. knitted or crocheted), of cotton	0.960	121
17	HS681091	Prefabricated structural components for building/ civil engineering, of cement/concrete/art. stone, whether or not reinf.	0.998	120
18	HS392610	Office/school supplies, of plastics & oth. mats. of 39.01–39.14	0.798	114
19	HS842820	Pneumatic elevators & conveyors	0.853	105
20	HS151710	Margarine (excl. liquid margarine)	0.727	102
		Rest (44 products)		1,475
		Grand total		**7,029**

Source: Authors' own work
Note: Values are rounded at the lower level in the table; hence, totals in this table may not exactly reflect the sum of the individual values appearing in the rows.
Key: US$, United States dollar; n.e.s., not elsewhere specified; HS, Harmonized System; RCA, revealed comparative advantage.

While these products have an RCA < 1, the analysis points to these opportunities having associated 'new' markets with demand meeting all the TRADE-DSM requirements. As an example, the largest opportunity product (Table 3.11), namely HS090121: Coffee, **roasted**, not decaffeinated, would also be in close proximity to HS090111: Coffee, **not roasted**, not decaffeinated, identified in terms of the opportunity analysis focusing on intensive margin products.

Summary observations and recommendations for the case of Rwanda

The following is a general summary of the results from the identification of REOs for Rwanda:

- Rwanda should continue with its regional engagement and integration drive in order to lower trade and logistics costs in all its different dimensions. Based on various research papers (in addition to this study), reducing trade and logistics costs is a major challenge, not only for Rwanda but also for the whole region. Significant improvements in this regard are, in the long run, likely to have the most impact on the economies in the region.
- While Rwanda is relatively small, with comparatively fewer resources than some of its neighbours, human capital development can be a major differentiator. The requirement to develop human resources so that they become human capital in the production and export value chain is also well documented, and there is a concerted effort to achieve this essential for the country's future economic development. The drive to grow and diversify the economy of Rwanda should be underpinned by the recommendations from the Hausmann and Chauvin (2015) study regarding requirements for rural-to-urban migration – particularly as demand for human capital increases in concentrated urban areas, which has implications for schooling and other forms of education.
- While regional economic integration and development are important, in the short to medium terms the potential demand from neighbouring markets is extremely small (as demonstrated in Figure 3.16). Therefore, a dual strategy should be followed which involves, on the one hand, developing regional markets, and, on the other hand, developing relationships and enabling trade with the rest of the continent as well as with more distant international markets.
- Different strategies will be required for different market and product combinations, and a more detailed analysis of these dimensions needs to form the foundation of fact-based export and investment promotion activities.

While the focus on intensive margin opportunities (both in terms of countries and products) is postulated to be less expensive and to hold more potential for generating returns (Brenton & Newfarmer 2007), it would be advisable for policymakers in Rwanda to follow a two-pronged strategy.

For the specific REOs identified through the application of the refined TRADE-DSM methodology, the country should, in the short and medium terms, focus its export and investment promotion efforts on the intensive margin in terms of both products and markets. In parallel, consideration should be given to the identified opportunities in the group of extensive margin markets and the intensive margin relating to new markets for existing products.

The second area of focus should be on REOs as identified in the extensive margin which could potentially become comparatively competitive, with assistance from government and other support programmes.

Conclusion

Rwanda is a typical example of a landlocked country that needs a well-informed and pragmatic export and industrial development strategy. Using Rwanda as a case study, this chapter demonstrated the application of the refined TRADE-DSM methodology (as discussed in Chapter 2) to address the challenges inherent in traversing multiple transit countries and borders, which add to logistics time and costs. This refined approach involved identifying REOs from all conceivable market and product combinations, with specific consideration given to those factors affecting landlocked countries.

The chapter set out to initially explore and contextualise Rwanda's transport infrastructure and economic geography, and to evaluate the import tariffs imposed on Rwandan products by potential trading partners. In this regard, the chapter systematically demonstrated the application of the TRADE-DSM filters, emphasising the impact of each filter on outcomes, particularly in relation to the refined logistics cost component ($LMAI_{ijk}$) from filter 3.2 onwards.

The significance of this chapter lies in the refined TRADE-DSM methodology's incorporation of a more realistic approach to determining international logistics costs. This enhancement contributes to a more dependable evaluation and comparison of identified export opportunities in the form of product–market combinations. The inclusion of transit countries and consideration of real-world logistics flows yield outcomes that are more realistic than those generated by alternative methodologies.

The analytical process culminated in a succinct discussion of the outcomes for Rwanda, approached from the vantage point of policymaking. The assessment encompassed considerations pertaining to export promotion, export development and investment opportunities. A salient finding from the study underscores that, while there are several relatively modest, short-term export opportunities for Rwanda involving existing products to existing markets, a substantial and promising opportunity emerged for existing products in 'new' markets, exemplifying the extensive margin for markets and the intensive margin for products. Furthermore, at the extensive margins for both products and markets, noteworthy potential opportunities were identified for the development of both 'new' products and 'new' markets.

Conclusive recommendations were subsequently presented based on the discerned REOs, offering a comprehensive set of insights for policymakers in the trade and economic development fields.

Key takeaways from this chapter

- The objective of the study was not to provide an exhaustive or authoritative account of export opportunities. Rather, it was to exemplify, specifically for Rwanda's policymakers, the outcomes from the application of the refined TRADE-DSM methodology to aid decision-making. The refinement required for the Rwanda case, in terms of inclusion of transit countries and consideration of real-world logistics flows, yielded outcomes that are more realistic than those generated by alternative methodologies. Moreover, they will benefit from further applications of the methodology in the future.
- Although the granularity of outcomes at the HS 6-digit product level offers a distinct advantage, it also poses challenges in terms of ensuring data quality and reporting frequency, particularly in the case of less-developed countries and products with lower trading frequency.
- The study posited that concentrating on intensive margin opportunities, both in terms of countries and products, is likely to be more cost-effective with greater potential for generating returns. However, a prudent strategy for Rwandan policymakers would be to follow a two-pronged approach, namely:
    - In the short and medium terms, export and investment promotion efforts should focus on the intensive margin, encompassing both products and markets – in other words, enhancing exports of existing products to *existing* markets.
    - At the same time, attention should be given to extensive margin markets and intensive margin products – in other words, enhancing exports of existing products (including less mature export products)

to *new* markets. This could potentially become a source of competitive advantage with targeted assistance from government and other support programmes.

- Rwanda should continue to implement interventions that facilitate system-building, network creation, institutional development and alignment of strategic priorities. As an immediate priority, it is advisable to scrutinise key assumptions and potentially deepen the analysis to ensure robustness. To inform responsible strategic decisions in the longer term, a more detailed investigation and evaluation of each identified opportunity, using the refined TRADE-DSM methodology, is necessary. In the meantime, the current outcomes already provide valuable guidance to policymakers.

Chapter 4

Export diversification: The case of Tunisia, with a focus on the African Continental Free Trade Area

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Introduction

The benefits of exports for economic growth have long been recognised by economists and policymakers. Over the last few decades, countries that have adopted strong export strategies have seen rewarding growth rates, with Taiwan, South Korea, Singapore, Malaysia and others often being cited as examples. Examining some of the newly industrialised countries, Chow (1987) provided empirical evidence of the causal relationship between export growth and industrial development in such countries. More recently, Yao (2006) highlighted the positive effect of exports on economic performance in China.

After following an import substitution policy for more than 20 years, commencing in the early 1970s, Tunisia – like other developing countries – gradually switched to an export-oriented policy. The country reinforced its trade relations with the European Union (EU) by signing a bilateral association agreement in July 1995 with the aim of creating a Euro–Mediterranean free trade area by 2010 for several products, excluding agri-food. This agreement has boosted Tunisia's exports of machinery, electronics and other manufactured products and made European markets the main recipients of Tunisian exports. In contrast, Tunisia's trade with Africa has been weak for a long time, except in the case of Algeria and Libya which are among the main destinations for Tunisia's exports. However, their share in Tunisia's exports is well below the EU's share. Until 2017, African countries

received less than 10% of Tunisia's total exports, with West Africa and North Africa being the main importing regions.

Over the past decade, the Tunisian economy has been under much pressure because of political instability at home and in the region, which has translated into a significant trade deficit for the country. Tunisia has tried to address these difficulties through market diversification, exploring new markets with particular attention given to African markets. Tunisia's strategic vision for trade with the African continent is taking shape through various actions, such as securing observer status in the Economic Community of West African States (ECOWAS) in 2017, as well as signing agreements such as the African Continental Free Trade Area (AfCFTA) agreement in 2018[57] and the Common Market for Eastern and Southern Africa (COMESA) agreement in 2019. This strategy is motivated by Tunisia's desire to improve the competitiveness of its firms to achieve its overall growth and industrialisation goals.

The purpose of this chapter is to contribute to the realisation of Tunisia's strategic trade vision by identifying new export opportunities for Tunisian products in African markets. To this end, we use the TRADE-DSM (Decision Support Model) approach, as discussed in Chapter 2, to identify realistic export opportunities (REOs) for firms wishing to expand their sales reach into foreign markets. The rest of this chapter is organised into various sections: 'Data and specific adjustments', followed by 'Contextual analysis – overview of Tunisia's trade flows trends', then 'Applying the TRADE-DSM in the Tunisia–Africa country context' and finally 'Conclusion and policy recommendations'.

Data and specific adjustments

Various sources of data and parameter estimates are used in the TRADE-DSM methodology. Hoekman and Nicita (2011) found that the Logistics Performance Index (LPI) score and the Doing Business cost-to-import measures (World Bank 2016) are both important measures of market access, as are ad valorem-equivalent (AVE) tariffs per product (typically obtained from the International Trade Centre's [ITC 2020] Market Access Map [MacMap]). An AVE tariff is defined as a tariff presented as a percentage of the value of products cleared through customs and is calculated as the rate comparable to a tariff derived from unit quantities, such as weight, number or volume (ITC 2020). A further element of the methodology

57. This agreement was validated by the Assembly of the Representatives of the People (ARP) on 22 July 2020, thereby adding Tunisia to the 30 countries that had already ratified the founding convention of the AfCFTA.

considers the domestic time and cost to import and the LPI, as published in the World Bank Doing Business (WBDB) Surveys (World Bank 2016).

The international trade data used in the TRADE-DSM are briefly discussed in the next section, followed by the major factors considered in filter 3 that constitute barriers to entry into target markets, as represented by shipping time and cost, logistical efficiency, tariffs and degree of market concentration.

International trade data used

The international trade data that informed the TRADE-DSM outcomes as applied in this study are based on Gaulier and Zignago's (2010) Centre d'Études Prospectives et d'Informations Internationales (CEPII 2020) Base pour l'Analyse du Commerce International (BACI) world trade database (2019 – Harmonized System [HS] 2012 revision). According to Gaulier and Zignago (2010), the CEPII (2020) BACI database reports export values, excluding re-exports – unlike the usual international trade data, such as those supplied by the United Nations (UN) Comtrade. Although later data (2019) are available from the Comtrade database and the ITC's TradeMap, the modelling requirement for reconciled data places a limit on the currency of the data. The TRADE-DSM analysis in this chapter, therefore, made use of data for the period 2014–2018 and contextual data analysis for the period 2010–2018.

Furthermore, specific broad product groups that were excluded from the basic analysis include monetary gold, basic gold and diamonds, platinum group metals, and arms and ammunition (see Table A4.4 in Appendix A4 for detailed HS 6-digit product codes).

Logistics flow assumptions

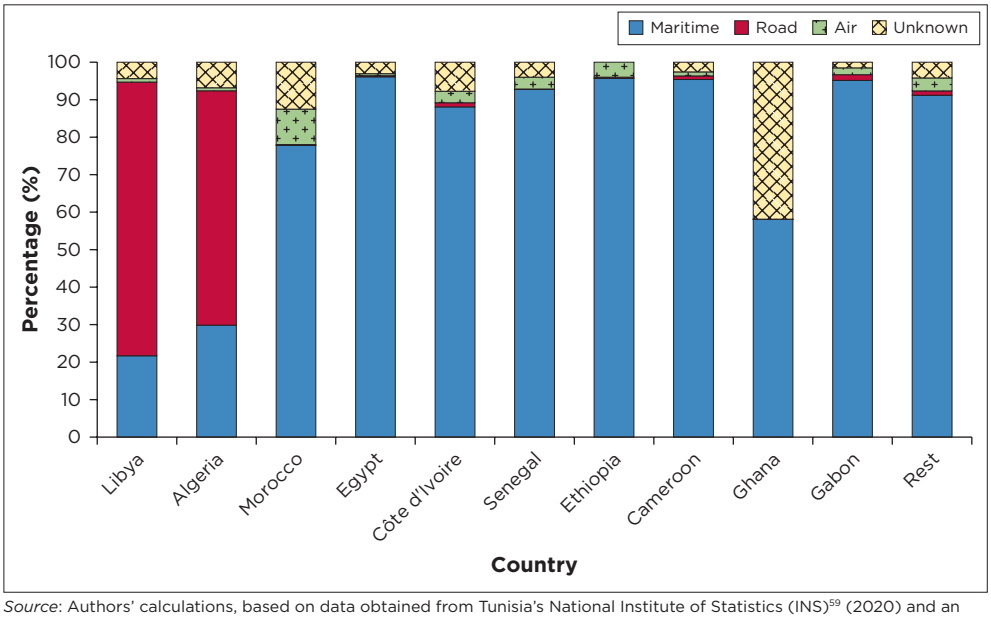
The TRADE-DSM methodology requires that for each home market (in this instance, Tunisia) a logistics flow matrix is constructed containing assumptions about the routing of a typical container from the major port (in this instance, the port of Radès) for maritime exports and the main economic centre (in this instance, the city of Tunis) for land-based exports.

The port of Radès is the geographical extension of the port of La Goulette. It specialises in container traffic and rolling units and handles around 79% of the tonnage of containerised products (Ministry of Transport[58] 2016).

58. Website of the Ministry of Transport: http://www.transport.tn/

The land-based routing of exports originating in Tunisia and destined for Africa was informed by detailed export statistics and expert opinions.

Figure 4.1 shows that most destinations in Africa are served by maritime transport. As expected for direct border-sharing neighbours, Libya and Algeria, the dominant mode is road. Expert opinion, however, points to the fact that in recent times, the closure of land borders with Libya has diverted trade to maritime routes to that country. The assumptions applied in the model developed for Tunisia can be illustrated at a high level in Figure 4.2. Therefore, with the exception of Algeria, all other potential target markets are assumed to be served by maritime transport.



Source: Authors' calculations, based on data obtained from Tunisia's National Institute of Statistics (INS)[59] (2020) and an interview with a customs expert.

FIGURE 4.1: Tunisia's exports to Africa – relative share of value by mode.

Information sources for cost estimates, route options and scheduling used in the refined logistics market-access indicator compilation process included online sources such as World Freight Rates,[60] Searates.com,[61] the Logistics Cluster[62] and Google Maps.[63] In terms of shipping route tables, the four largest containership operators, representing around 50% of global container cargo, were used in descending order of annual container

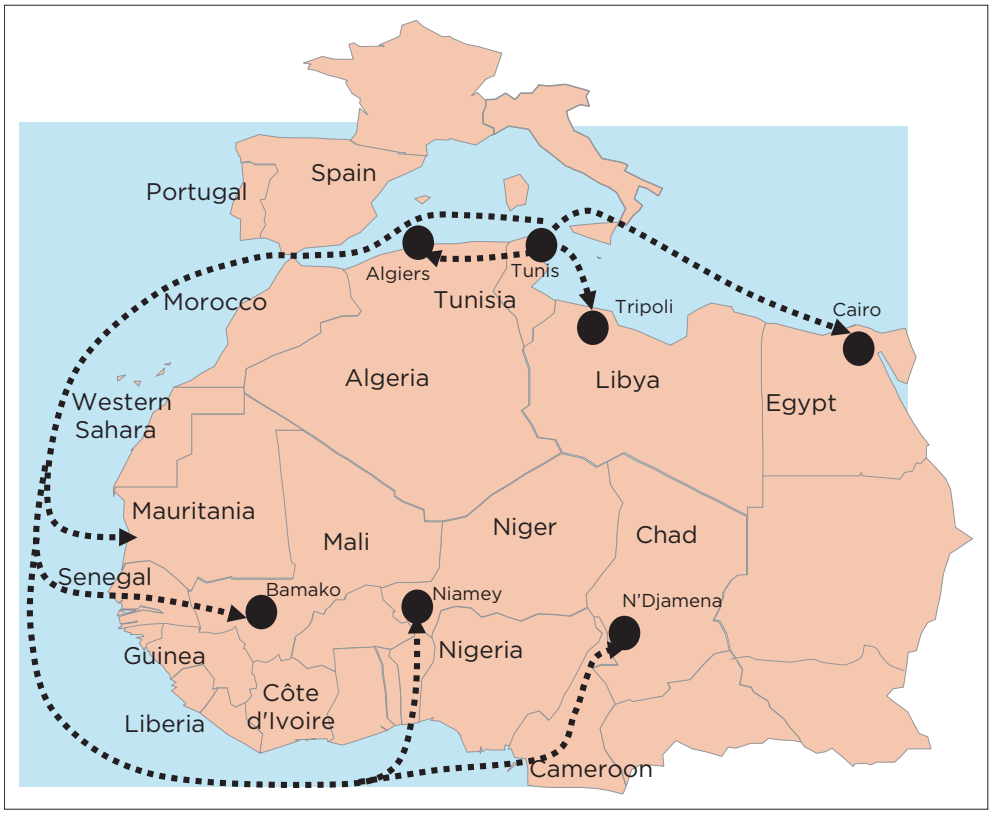
59. Website of the INS: http://www.ins.tn/

60. See http://www.worldfreightrates.com/en/freight

61. See https://www.searates.com/

62. See http://www.logcluster.org/

63. See https://www.google.co.za/maps



Source: Authors' own illustrations (map not to scale).

FIGURE 4.2: Tunisia's exports to Africa – major logistics routes assumed.

tonnage that could be transported by the fleet of shipping vessels owned by a particular containership operator – subject to whether or not a route was serviced by the company. These were Maersk,[64] Mediterranean Shipping Company (MSC),[65] CMA-CGM[66] (a French shipping line), and China Ocean Shipping (Group) Company (COSCO).[67] For localised maritime services, various other sources were used, such as Pacific International Lines[68] for East Africa.

64. See https://www.maersk.com/

65. See https://www.msc.com/routefinder

66. See https://www.cma-cgm.com

67. See http://lines.coscoshipping.com/

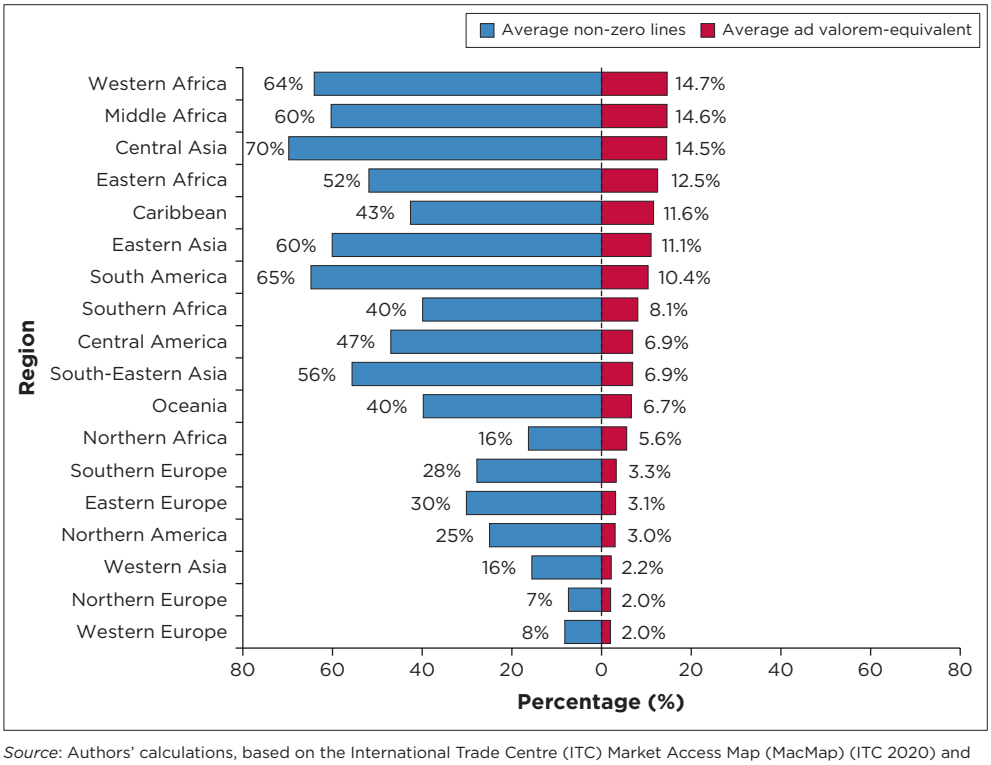
68. See https://www.pilship.com/en-pil-pacific-international-lines/1.html

Tariffs

Another key aspect considered in the market access filter of the TRADE-DSM methodology was tariffs applied to products exported from Tunisia and imported into target markets. The tariff information used was based on the ITC MacMap data set, except for Libya whose tariffs were not available in the ITC MacMap system at the time of the analysis.

Information for Libya was sourced directly from Libya's customs authority (Libya Customs Authority 2020). The country has a decree (Ministry of Economy, Trade and Investment No. 9 of 1376) that certain products may not be imported (see Table A4.3 in Appendix A4 for more details), which impacts 134 HS 6-digit product lines.

The import tariffs applicable to products exported from Tunisia to the various target markets are summarised in Figure 4.3. The left-hand bars display the average non-zero tariff lines aggregated by geographical region, while the right-hand bars indicate the simple average of AVE tariffs on aggregate.



Source: Authors' calculations, based on the International Trade Centre (ITC) Market Access Map (MacMap) (ITC 2020) and Libya Customs Authority (2020).

FIGURE 4.3: Tunisia – tariffs applied in target markets (average unweighted ad valorem-equivalent and percentage of non-zero tariff lines by region).

What is evident is that the two regions with the highest average AVEs are Western and Middle Africa (with 14.7% and 14.6%, respectively). In terms of number of non-zero tariff lines, Central Asia leads with 69.8% of lines having a tariff, followed by South America (64.8% of lines) and Western Africa (64.1% of lines).

The areas with the lowest number and rates of tariffs from Tunisia's perspective are Northern and Western Europe.

Domestic time and cost to import

Transit costs through the various countries on the route are not generally available. The approach applied was to make use of a weighted[69] cost to import from the *Doing Business Report* into each of the transit countries (World Bank 2016).

While this may not be entirely accurate, it does provide for a realistic *relative* mechanism to differentiate cost impacts between, say, landlocked and non-landlocked target countries. For example, the relative difference between transits for landlocked countries within the EU, with much lower border transit delay, versus, say, Middle Africa or Central Asia is also clearly reflected in this approach. (For more details, see Cameron 2020.)

Summary

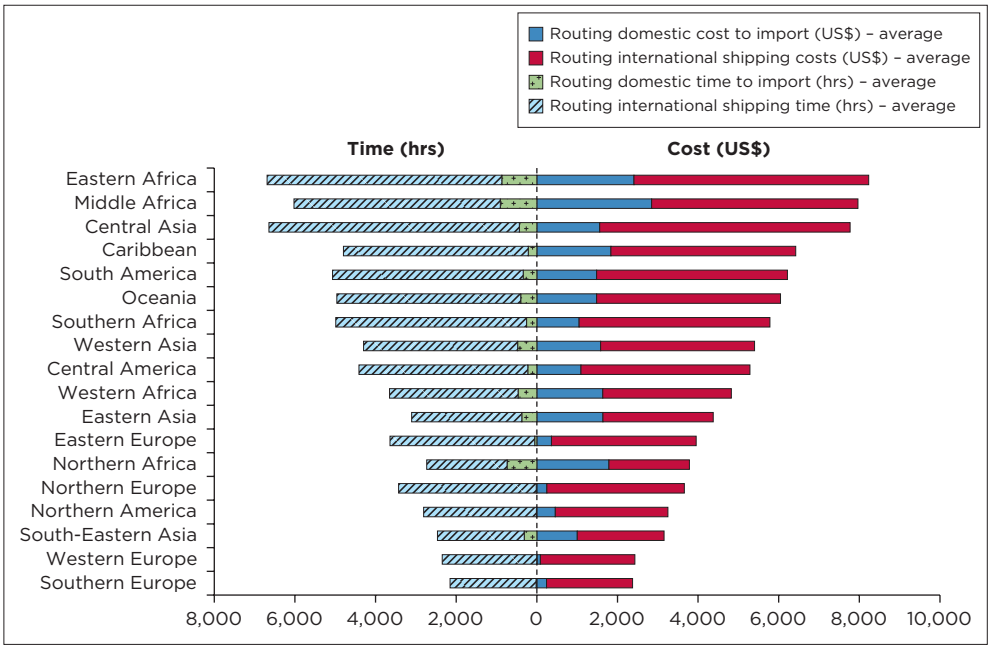
Figure 4.4 shows the overall relative contributions of international routing (maritime logistics as well as land-based transport and transits) versus domestic cost and time to import applied to the modelled cost and time elements for the Tunisia model assumptions.

It is evident that the overall cost and time involved in getting to Africa are in general the highest in the world. For Africa, the domestic cost to import makes up a large share (relative to international shipping costs) compared with, for example, Europe and southeast Asia.

These assumptions form the basis of filter 3.2 of the methodology, which specifically considers these elements, and are different for each country (home market) for which the model is constructed.

A contextual overview of Tunisia's historical trade flows is presented next, followed by the outcomes of the modelling exercise.

69. As an initial assumption, a mechanistic weight of 0.5 was applied.



Source: Authors' calculations, based on data sources mentioned in the section 'Data sources' in Chapter 2.
Key: hrs, hours; US$, United States dollar.

FIGURE 4.4: Tunisia – relative cost and time contributions across regions.

Contextual analysis – overview of Tunisia's trade flows trends

Tunisia's international trade trends

In this section, we provide an overview of Tunisia's trade balance developments from 2010 to 2018. The trade data are from the CEPII (2020) BACI database provided by Gaulier and Zignago (2010) and are available on the CEPII website.[70] The CEPII (2020) BACI database is more consistent than the UN Comtrade and World Bank's World Development Indicators (WDI) databases because they are adjusted for the reported difference between the exporting and importing countries.[71] We used CEPII (2020) BACI database with the Harmonized System (HS revision 2012).

As shown in Figure 4.5, Tunisia ran a trade surplus in services throughout the period, with a declining trend starting at 6.6% of gross domestic

70. To calculate the trade balance as a percentage of gross domestic product (GDP), we used the GDP data from the World Bank's WDI database.

71. For more details on the difference between the CEPII BACI database and other sources of trade flows, see Figure A4.1 in Appendix A4.

Source: Authors' calculations based on CEPII BACI (2020) and UN Comtrade (2020).
Note: Trade flows of services are from the UN Comtrade database.
Key: %, percentage; GDP, gross domestic product; CEPII, Centre d'Études Prospectives et d'Informations Internationales; BACI, Base pour l'Analyse du Commerce International; UN, United Nations.

FIGURE 4.5: Tunisia's trade balance and components as a percentage of gross domestic product.

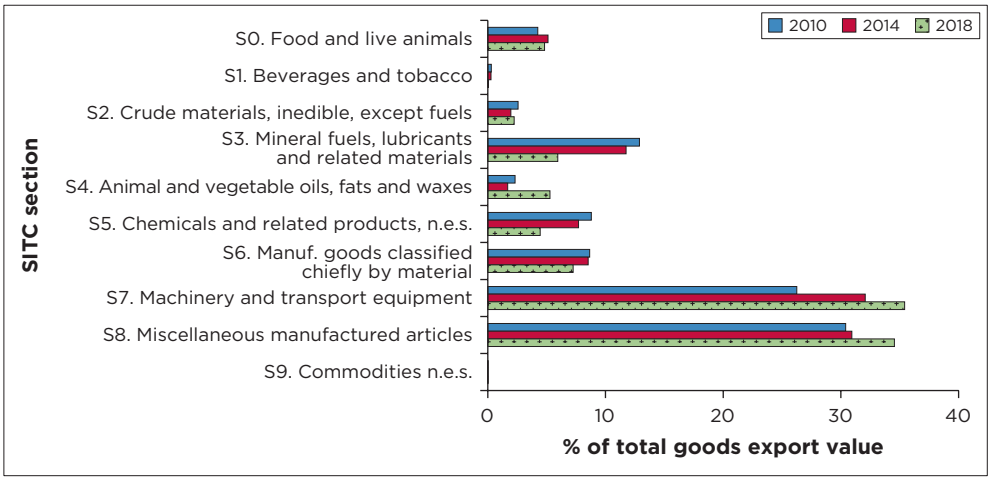
product (GDP) in 2010 and reaching 1.6% of GDP by 2018. This surplus was dwarfed by a persistent trade deficit in products, fluctuating between 9% and 17% of GDP during the same period. Tunisia thus appeared to be a net importer with a worsening trade balance, reaching –9.4% of GDP in 2018.[72]

The trade deficit was mainly because of the high Tunisian demand for foreign products and the low foreign demand for Tunisian products. To examine this deficit in more detail, we used disaggregated data for products. The data in Figure 4.6, Figure 4.7 and Figure 4.8 came from the CEPII (2020) BACI database. For comparative purposes, we used the Standard International Trade Classification (SITC) revision 4 product classification. In this classification, there are 10 sections for products – less than the HS classification which comprises 21 sections.[73] At the end of this sub-section, we provide Tunisia's trade balance using the products and commodities HS 2012 2-digit classification.

Figure 4.6 shows the share of exports by the SITC revision 4 main sections. About 70% of Tunisian exports of products are composed of Machinery and transport equipment (S7) and Miscellaneous manufactured articles (S8). Regarding Machinery and transport equipment, the share of

72. By using the CEPII BACI trade data HS07 of 2020, we noted that the downhill trend seemed to start in 2007, going from a surplus of 1% of GDP to a deficit of more than 9% of GDP at the end of the period (graph available on request).

73. The trade flows in the CEPII BACI database are provided in HS product nomenclature. We used the UN trade statistics' conversion table HS 2012–SITC4.



Source: Authors' calculations based on CEPII BACI (2020).
Note: The complete names of SITC revision 4 sections are available in Table A4.2 in Appendix A4. Export shares following the product HS 2012 classification are provided in Figure A4.2 in Appendix A4.
Key: SITC, Standard International Trade Classification; CEPII, Centre d'Études Prospectives et d'Informations Internationales; BACI, Base pour l'Analyse du Commerce International; HS, Harmonized System, %, percentage; n.e.s., not elsewhere specified.

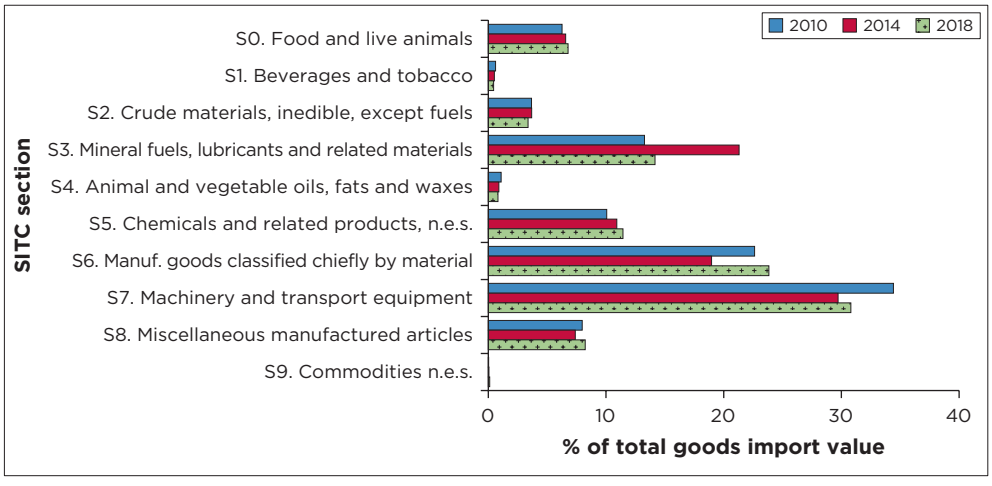
FIGURE 4.6: Tunisia's export share by Standard International Trade Classification (SITC) revision 4 main sections, 2010, 2014 and 2018.

exports increased by nine percentage points between 2010 and 2018, going from 26% in 2010 to 35% in 2018. The share of Miscellaneous manufactured articles represented almost 30% of Tunisia's total exports in the period 2010–2014, while it increased by four percentage points in 2018.

In terms of a decline in contribution to overall exports, Mineral fuels, lubricants and related materials (S3) and Chemicals and related products, n.e.s. (S5) showed a decrease in their shares of about 7% and 4%, respectively, between 2010 and 2018. The rest of the product groups recorded an almost constant share during the period, except for Animal and vegetable oils, fats and waxes (S4) whose share decreased by 0.6% between 2010 and 2014, and then increased again to 5.3% of total exports in 2018.

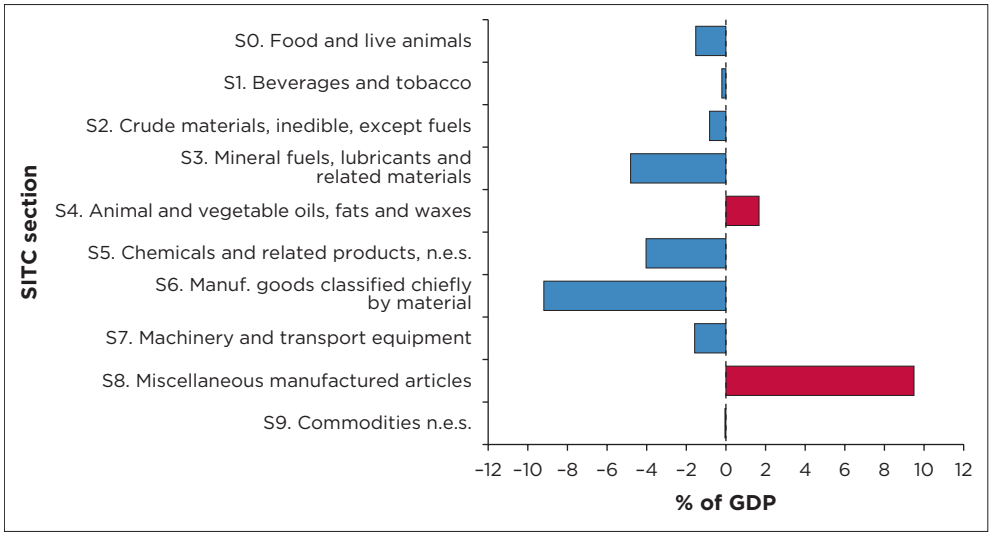
Figure 4.7 shows that about 80% of Tunisian imported products in 2018 were composed of products belonging to the groups Machinery and transport equipment (S7), Manufactured goods classified chiefly by material (S6), Mineral fuels, lubricants and related materials (S3), and Chemicals and related products, n.e.s. (S5) (30.8%, 23.8%, 14.2% and 11.4%, respectively). Furthermore, the share of S7 decreased by 2018 (from 34.3% to 30.8%), while S6, S3 and S5 experienced increases in relative shares of the period.

According to Figure 4.8, Tunisia had a trade surplus in only two groups of products, namely Animal and vegetable oils, fats and waxes (S4), and



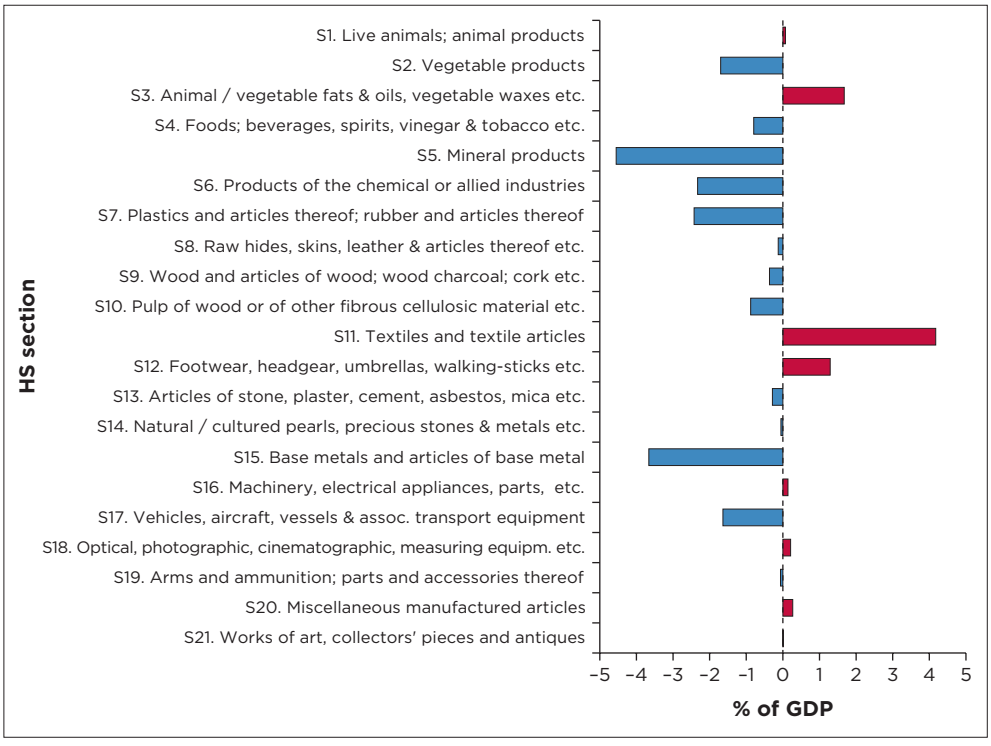
Source: Authors' calculations based on CEPII BACI (2020).
Note: The complete names of SITC revision 4 sections are available in Table A4.2 in Appendix A4. Import shares following the product HS 2012 classification are provided in Figure A4.3 in Appendix A4.
Key: SITC, Standard International Trade Classification; CEPII, Centre d'Études Prospectives et d'Informations Internationales; BACI, Base pour l'Analyse du Commerce International; HS, Harmonized System; n.e.s., not elsewhere specified; %, percentage.

FIGURE 4.7: Tunisia's import share by Standard International Trade Classification (SITC) revision 4 main sections, 2010, 2014 and 2018.



Source: Authors' calculations based on CEPII BACI (2020).
Note: The complete names of the SITC revision 4 sections are available in Table A4.2 in Appendix A4.
Key: SITC, Standard International Trade Classification; BACI, Base pour l'Analyse du Commerce International; HS, Harmonized System; CEPII, Centre d'Études Prospectives et d'Informations Internationales; n.e.s., not elsewhere specified; %, percentage; GDP, gross domestic product.

FIGURE 4.8: Tunisia's trade balance as a percentage of gross domestic product by Standard International Trade Classification (SITC) revision 4 main sections, 2018.



Source: Authors' calculations based on CEPII BACI (2020).
Note: The complete names of the HS 2012 sections are available in Table A4.1 in Appendix A4.
Key: CEPII, Centre d'Études Prospectives et d'Informations Internationales; BACI, Base pour l'Analyse du Commerce International; HS, Harmonized System; n.e.s., not elsewhere specified; %, percentage; GDP, gross domestic product.

FIGURE 4.9: Tunisia's trade balance as a percentage of gross domestic product by Harmonized System (HS) 2012 classification, 2018.

Miscellaneous manufactured articles (S8), representing almost 1.7% of GDP and 9.5% of GDP, respectively. This low surplus explains the Tunisian product trade deficit, where exports of products did not cover imports. Figure 4.8 also shows that the trade deficit was mainly attributed to S6, S3 and S5. The highest deficit was in S6 (9.2% of GDP), followed by S3 (4.8%) and S5 (4%).

In terms of the HS 2012 classification (Figure 4.9), Tunisia had a trade surplus in just seven groups in 2018.[74] Textiles and textile articles (S11) are crucial for Tunisia because they include the main manufacturing sector whose surplus represents more than 4.2% of GDP (2018). This sector is followed by Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes (S3) with a trade surplus of almost 1.68% of GDP. Footwear, headgear, umbrellas, sun umbrellas,

74. In Figure 4.9, the trade balance of S21 was positive and represented 0.001% of GDP.

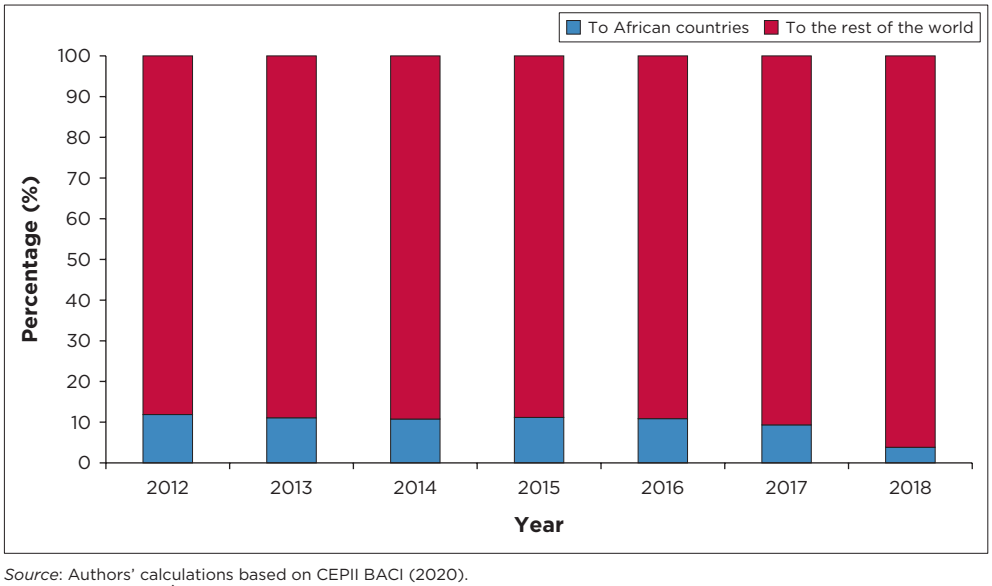
walking-sticks, seat-sticks, whips, riding-crops and parts thereof; prepared feathers and articles made therewith; artificial flowers; articles of human hair (S12) are in third place with a trade surplus of 1.3% of GDP in 2018.

The remaining sections that generated a surplus (S1, S16, S18, S20 and S21) recorded very low surpluses, each not exceeding 0.3% of GDP. In addition, Figure 4.9 shows that the trade deficit was the largest for products belonging to S5 (–4.5% of GDP), S15 (–3.67% of GDP), S7 (–2.42% of GDP), S6 (–2.33% of GDP), S2 (1.7% of GDP) and S17 (–1.64% of GDP). The remaining sections had a deficit below 1% of GDP.

Tunisia–Africa trade flows trends

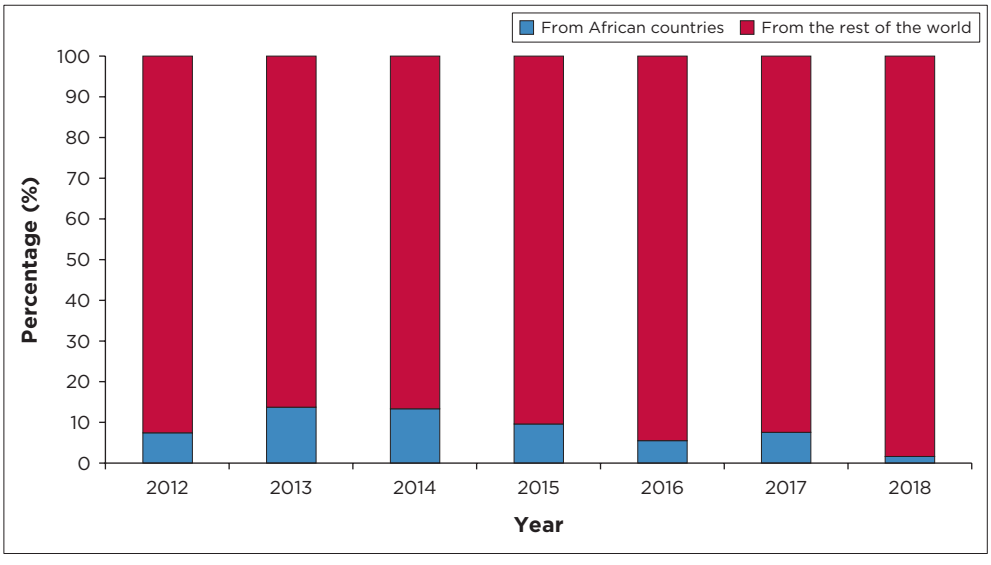
Regarding Tunisia's trade flows with Africa, Figure 4.10 shows that the share of Tunisian exports to African countries did not exceed 11% of its total exports from 2012 to 2018. Figure 4.11 shows roughly the same trend with respect to imports, with imports from African countries constituting 7.5% of Tunisia's total imports in 2012 and only 1.6% in 2018. This confirms that African countries are not Tunisia's main trading partners at present.

Figure 4.12 shows that, at the regional level, North Africa is the main destination for Tunisian exports in Africa. This share was 80% in 2012 but



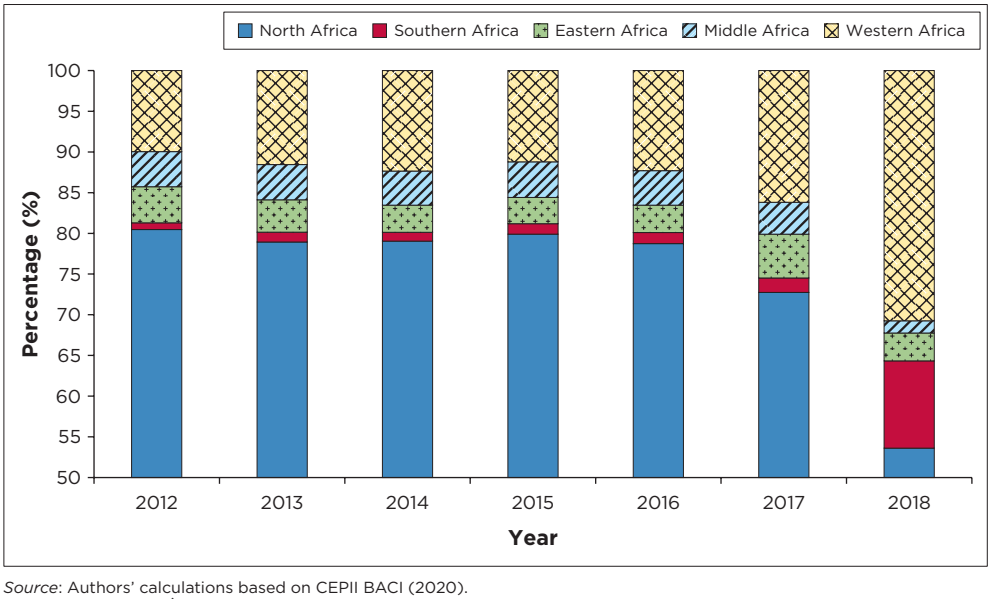
Source: Authors' calculations based on CEPII BACI (2020).
Key: CEPII, Centre d'Études Prospectives et d'Informations Internationales; BACI, Base pour l'Analyse du Commerce International.

FIGURE 4.10: Share of Tunisia's exports to African countries versus the rest of the world.



Source: Authors' calculations based on CEPII BACI (2020).
Key: CEPII, Centre d'Études Prospectives et d'Informations Internationales; BACI, Base pour l'Analyse du Commerce International.

FIGURE 4.11: Share of Tunisia's imports from African countries versus the rest of the world.



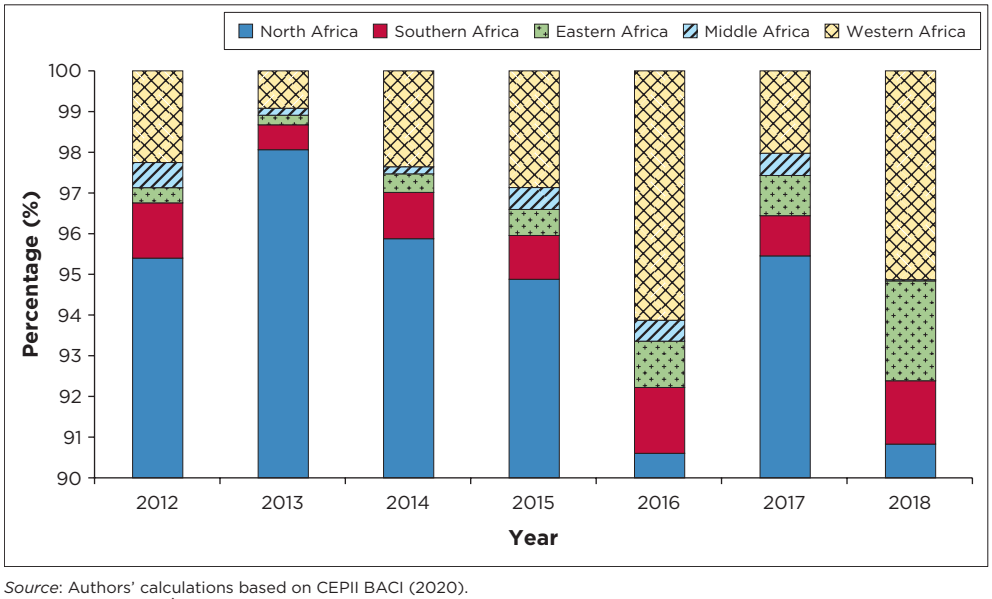
Source: Authors' calculations based on CEPII BACI (2020).
Key: CEPII, Centre d'Études Prospectives et d'Informations Internationales; BACI, Base pour l'Analyse du Commerce International.

FIGURE 4.12: Tunisia's exports to Africa, share by region.

then shrank to 54% in 2018. This decrease was covered by an increase in exports to Western Africa, from just under 10% in 2012 to 31% in 2018. Southern Africa received 10.7% of Tunisian exports in 2018. Eastern Africa showed a relatively steady share of 3.4% (2018) and Middle Africa dropped to 1.5% of Tunisian exports by 2018. In terms of imports, Figure 4.13 shows that North Africa was by far the main African region exporting to Tunisia during the period.

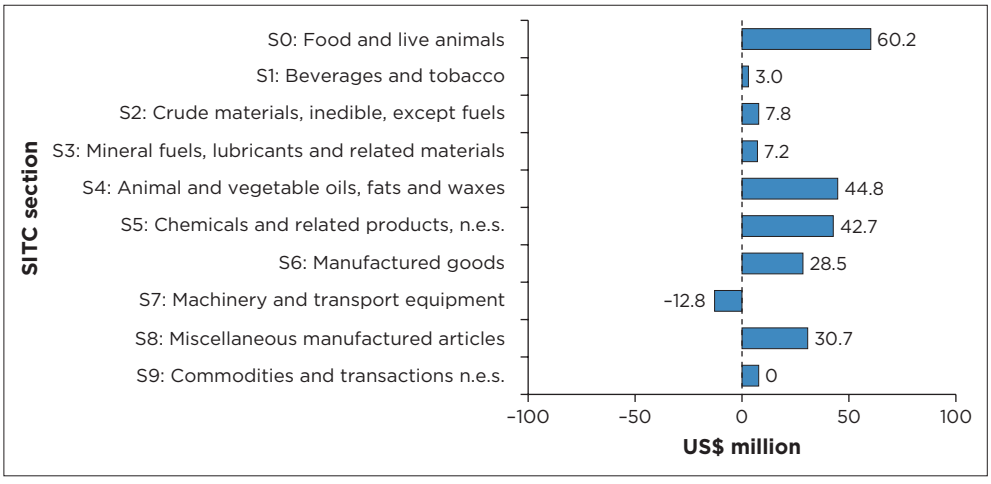
Figure 4.14 and Figure 4.15 display Tunisian net trade flows (or trade balance) with African countries in 2018, using the SITC revision 4 and HS 2012 classifications, respectively. According to the SITC revision 4 classification, Tunisia was a net exporter to Africa in most products, with a net surplus of more than US$20 million in S0, S4, S5, S6 and S8. Tunisia was a net importer only in S7 (Machinery and transport equipment). S9 shows zero US$ flows because there was no trade in products belonging to that section.

In terms of the HS 2012 classification (Figure 4.15), Tunisia had a net surplus of more than US$50 million in S2 (Vegetable products) and S5 (Mineral products), with negative net trade mainly in S4, S8, S9, S11, S13 and S16.



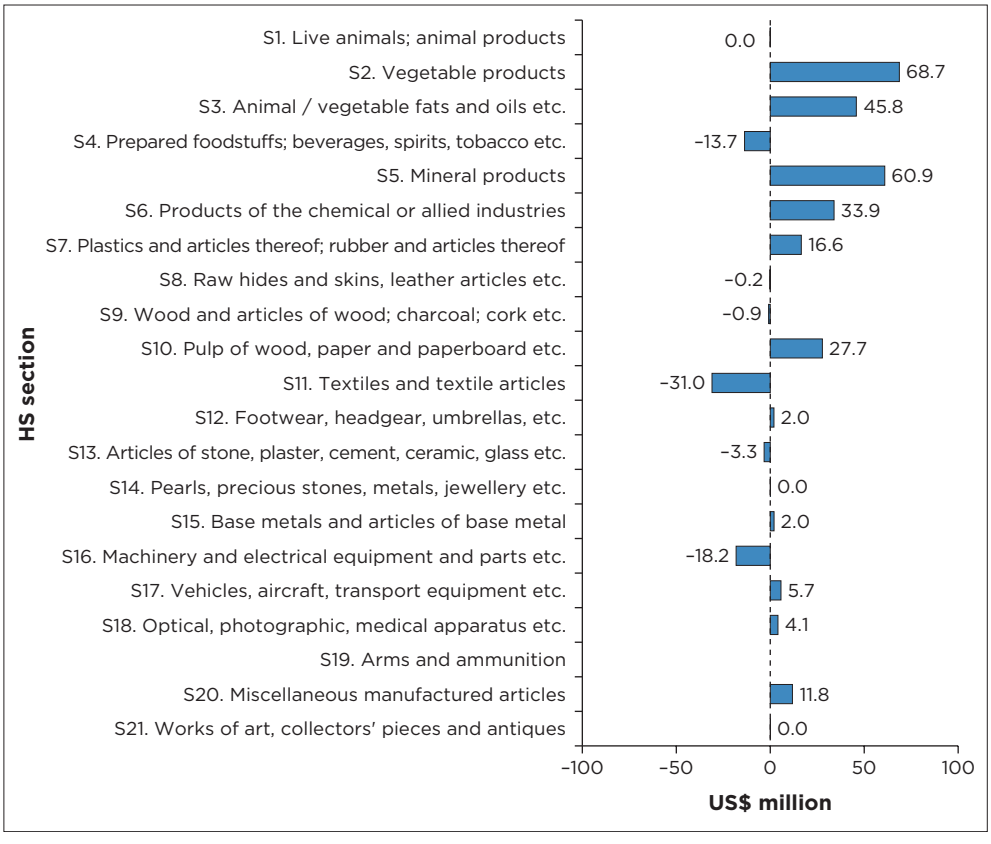
Source: Authors' calculations based on CEPII BACI (2020).
Key: CEPII, Centre d'Études Prospectives et d'Informations Internationales; BACI, Base pour l'Analyse du Commerce International.

FIGURE 4.13: Tunisia's imports from Africa, share by region.



Source: Authors' calculations based on CEPII BACI (2020) and UN Comtrade (2020).
Key: SITC, Standard International Trade Classification; n.e.s., not elsewhere specified; US$, United States dollar; CEPII, Centre d'Études Prospectives et d'Informations Internationales; BACI, Base pour l'Analyse du Commerce International; UN, United Nations.

FIGURE 4.14: Tunisia's net trade with Africa by Standard International Trade Classification (SITC) revision 4 main sections, 2018.



Source: Authors' calculations based on CEPII BACI (2020).
Key: HS, Harmonized System, US$, United States dollar; CEPII, Centre d'Études Prospectives et d'Informations Internationales; BACI, Base pour l'Analyse du Commerce International.

FIGURE 4.15: Tunisia's net trade with Africa by Harmonized System (HS) 2012 main sections, 2018.

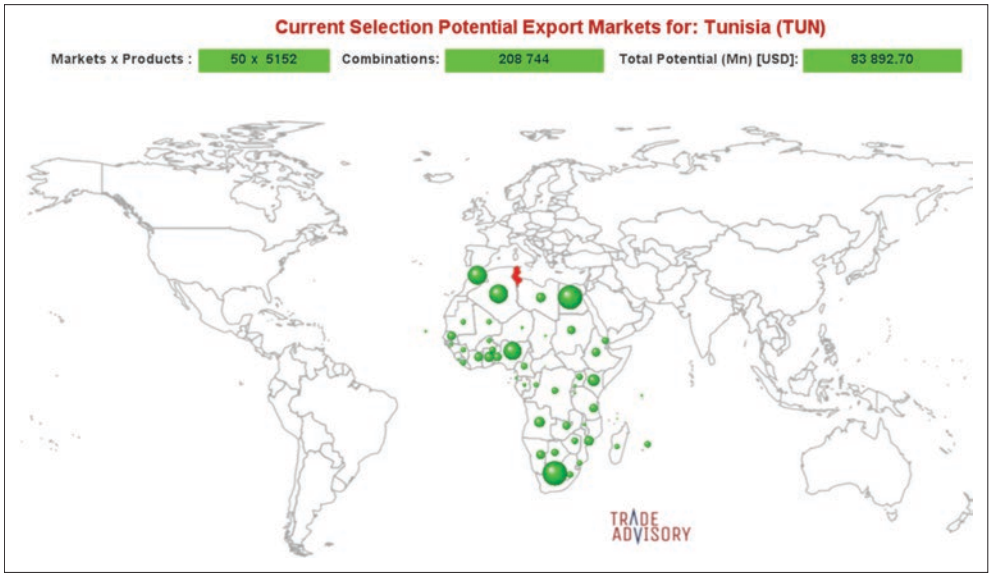
Applying the TRADE-DSM in the Tunisia–African country context

We applied the methodology described in Chapter 2 to investigate the export opportunities for Tunisia in African markets. The different outcomes obtained are presented in the next section.

TRADE-DSM filtering outcomes

The TRADE-DSM-approach normally considers all countries in the world using the available required information. However, in this case, we applied a 'pre-filter' by selecting African countries only. The sub-section below describes the filtering process.

Filter 1 is not applied as Africa is generally more 'risky' than other parts of the world, and because the scope of the research was Africa, we did not want to exclude any countries based on political or commercial risks. Excluding products as per Table A4.3 in Appendix A4, there were 208,744 possible combinations for which sufficient data were available for the modelling. The combinations were derived from 50 countries and 5,152 HS 6-digit product codes. Excluded countries were Tunisia (because the model considered exports from Tunisia to other African markets), Western Sahara, South Sudan and Somalia (because of insufficient data for the latter three countries) (see Figure 4.16).



Source: Authors' compilation, based on the TRADE-DSM Navigator results for Tunisia (2020). Reproduced and published with permission from Trade Research Advisory.
Key: USD, United States dollar; Mn, million; TRADE-DSM, TRADE-Decision Support Model.

FIGURE 4.16: Geographical spread of relative imports of African countries (excluding Tunisia).

With the application of filter 2, the 208,744 possible combinations were reduced to 68,255 (50 countries and 5,016 products). Taking into account the import supplying country concentration (determined by the adjusted Herfindahl-Hirschman Index [HHI]), sub-filter 3.1 reduced the possible combinations down to 30,060 (50 countries and 4,476 products).

The application of sub-filter 3.2 relating to market access (tariffs and logistics) resulted in a further reduction in possible combinations from 30,060 down to 19,103 (37 countries and 4,347 products).

The use of sub-filter 4.1, revealing that Tunisia can export and has a revealed comparative advantage (RCA) of RCA > 1, resulted in a further reduction to 3,672 possible combinations (36 potential markets and 716 products, out of more than 5,000 where Tunisia was 'good' at exporting 'now').

The application of sub-filter 4.2, which considered Tunisia's revealed trade advantage (RTA) (which constituted a proxy for the existence of local production capacity for export purposes) further reduced the possible combinations from 3,672 to 2,999 (36 countries and 590 products). The 126 products excluded at this step suggested that the latter were rather tied to re-exporting operations and not local production for export purposes.

If the added requirement for absolute positive growth (sub-filter 2.4) had been applied, there would have been a further reduction to 2,907 combinations (36 countries and 583 products). However, for the sake of completeness, this filter was not applied when generating the results presented in the next section.

Summary of outcomes

We found that in the African context, 36 markets met all TRADE-DSM key filters, for which Tunisia has 2,999 opportunities with an aggregate 'untapped' potential value of US$2.28 billion (see Table 4.1).

Figure 4.17 shows the geographical distribution of these markets, according to their associated potential.

The opportunities are classified in Table 4.2 in accordance with the TRADE-DSM REO Map. This map is a key feature of the TRADE-DSM methodology which organises the REOs in terms of two criteria, that is, the relative market share of the home market (in this case, Tunisia) in the destination market's imports of a particular product and the destination market's demand characteristics of the particular product under investigation. The aggregate results can be presented using the same principles and are presented in Table 4.2.

TABLE 4.1: Country ranking – total realistic export potential.

Rank	Country	Number of opportunities (HS 6-digit tariff codes)	Value of 'untapped' potential (US$1,000)
1	Morocco	237	449,438
2	Egypt	221	342,634
3	South Africa	136	288,421
4	Algeria	81	196,712
5	Nigeria	79	137,331
6	Libyan Arab Jamahiriya	128	124,486
7	Botswana	133	87,264
8	Sudan	42	85,431
9	Ghana	142	81,317
10	Côte d'Ivoire	186	65,723
11	Angola	106	64,562
12	Namibia	117	46,192
13	Senegal	159	46,115
14	Mauritius	206	44,503
15	Kenya	59	30,695
16	Djibouti	19	28,812
17	eSwatini (formerly Swaziland)	136	28,453
18	Guinea	77	25,167
19	Seychelles	198	13,419
20	Mauritania	55	13,375
21	Benin	63	12,084
22	Burkina Faso	51	12,036
23	Lesotho	75	9,363
24	Mali	24	9,272
25	Liberia	52	9,066
26	Cape Verde	91	7,133
27	Niger	22	6,243
28	Togo	23	3,144
29	Gambia	30	2,299
30	Mozambique	14	1,911
31	Guinea-Bissau	18	1,590
32	Madagascar	7	743
33	São Tomé and Principe	8	433
34	Cameroon	1	163
35	Equatorial Guinea	2	17
36	Gabon	1	14
Total		**2,999**	**2,275,561**

Source: Authors' compilation, based on the TRADE-DSM Navigator results for Tunisia (2020). Reproduced and published with permission from Trade Research Advisory.
Key: HS, Harmonized System; US$, United States dollar; TRADE-DSM, TRADE-Decision Support Model.

We observed that 95.1% of the identified 2,999 opportunities and 93.7% of the estimated associated 'untapped' potential value related to target markets where imports from Tunisia represented less than 5% of the imports of these 36 target markets for the set of 590 products. In other words,

Source: Authors' compilation, based on the TRADE-DSM Navigator results for Tunisia (2020). Reproduced and published with permission from Trade Research Advisory.
Key: TRADE-DSM, TRADE-Decision Support Model.

FIGURE 4.17: Geographical distribution of Tunisia's export potential in Africa.

Tunisia currently supplies very little to the 36 markets. With reference to the export strategies described in Chapter 2 (in the section 'The TRADE-DSM export potential and realistic export opportunity identification process' and shown in Figure 2.1), we can conclude that for most of the export opportunities, Tunisia should adopt an offensive market exploration strategy. Furthermore, 81.1% of the value of 'untapped' potential was associated with target markets classified as $REO_{1.2}$, meaning growing markets in both the short and the long terms.

Markets to which Tunisia supplies an intermediately small share of imports represent 2.6% of the opportunities and 4.2% of the 'untapped' potential value. Markets to which Tunisia supplies an intermediately large share of imports represent around 0.9% of opportunities and 0.9% of the 'untapped' potential value. Markets to which Tunisia supplies a large share of imports represent only 1.4% of the opportunities and 1.2% of the 'untapped' potential value.

TABLE 4.2: TRADE-DSM REO Map outcomes of Tunisia's export opportunities in Africa.

Map of realistic export opportunities (REOs) number [% of total number] 'Untapped' potential value in US$ million (m) [% of total value]		Relative market share of home market into target market(s)				Row totals
		Small (1)	Intermediately small (2)	Intermediately large (3)	Large (4)	
Product x target market (country) – size and growth	Large (1)	4 [0.1%] $28.40 m [1.2%]	-	2 [0.1%] $4.24 m [0.2%]	3 [0.1%] $1.96 m [0.1%]	**9** **[0.3%]** **$34.60 m** **[1.5%]**
	Growing (2) (short and long term)	2,810 [93.7%] $1,845.89 [81.1%]	76 [2.5%] $64.51 [2.8%]	23 [0.8%] $12.82 [0.6%]	36 [1.2%] $8.76 m [0.4%]	**2,945** **[98.2%]** **$1,931.98** **[84.9%]**
	Large and growing (3) (short term)	1 [0.0%] $0.06 m [0.0%]	1 [0.0%] $1.18 m [0.1%]	-	-	**2** **[0.1%]** **$1.24 m** **[0.1%]**
	Large and growing (4) (long term)	8 [0.3%] $32.22 m [1.4%]	1 [0.0%] $14.01 m [0.6%]	-	-	**9** **[0.3%]** **$46.23 m** **[2.0%]**
	Large and growing (5) (short and long term)	29 [1.0%] $226.30 m [9.9%]	1 [0.0%] $15.49 m [0.7%]	1 [0.0%] $3.92 m [0.2%]	3 [0.1%] $15.79 [0.7%]	**34** **[1.1%]** **$261.50 m** **[11.5%]**
	Column totals	**2,852** **[95.19%]** **$2,132.87 m** **[93.7%]**	**79** **[2.6%]** **$95.20 m** **[4.2%]**	**26** **[0.9%]** **$20.98 m** **[0.9%]**	**42** **[1.4%]** **$26.51 m** **[1.2%]**	**2,999** **[100.0%]** **$2,275.55 m** **[100.0%]**

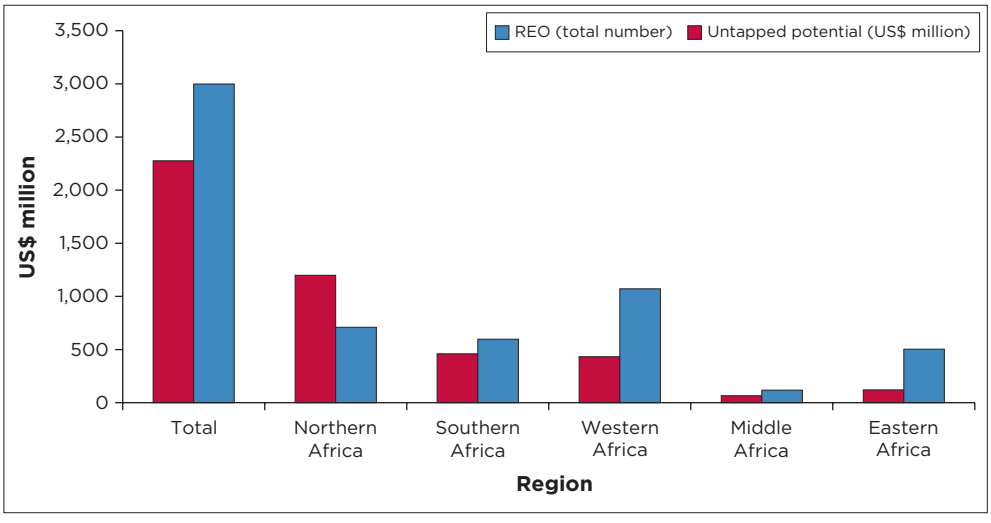
Source: Authors' compilation, based on the TRADE-DSM Navigator results for Tunisia (2020). Reproduced and published with permission from Trade Research Advisory.
Key: TRADE-DSM, TRADE-Decision Support Model; REO, realistic export opportunity; $, United States dollar; m, million; %, percentage

Regional-level outcomes

At the regional level, Figure 4.18 and Figure 4.19 show that the highest value of 'untapped' potential is associated with Northern Africa (US$1,199 million), representing 53% of the total 'untapped' value. The highest number of opportunities, in turn, is associated with Western Africa (1,072 REOs), representing 36% of the total number of opportunities .

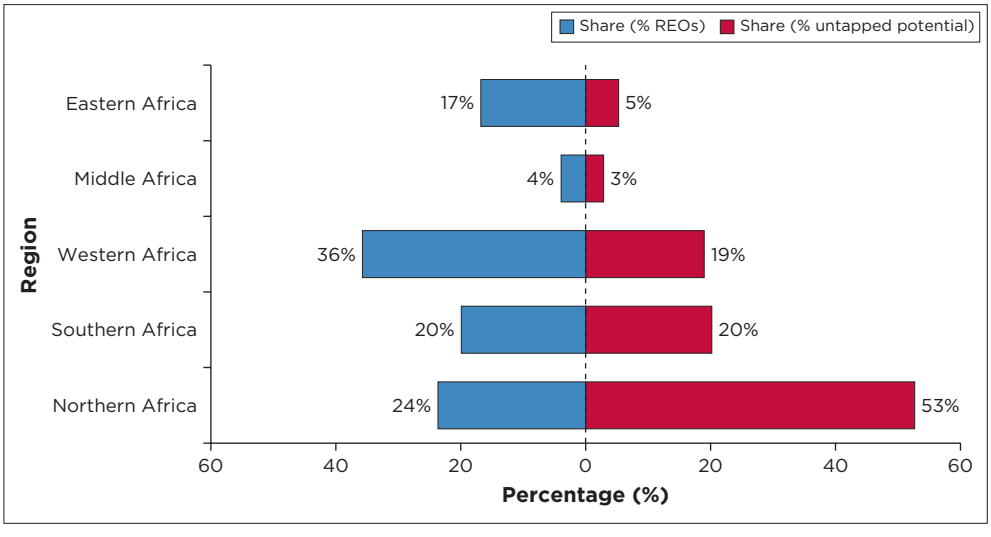
Country-level outcomes

Figure 4.20 displays Tunisia's existing trade (depicted as proportional bubble sizes) versus potential opportunities. It is a graphical representation of part of the information provided in the TRADE-DSM REO Map (see Figure 2.1). To illustrate, it is evident that with Morocco, which has the most export opportunities, existing trade is also relatively significant. By way of another example, existing exports from Tunisia to South Africa seem very



Source: Authors' compilation, based on the TRADE-DSM Navigator results for Tunisia (2020). Reproduced and published with permission from Trade Research Advisory.
Key: REO, realistic export opportunity; TRADE-DSM, TRADE-Decision Support Model; US$, United States dollar.

FIGURE 4.18: Tunisia's realistic export opportunities in different African regions.



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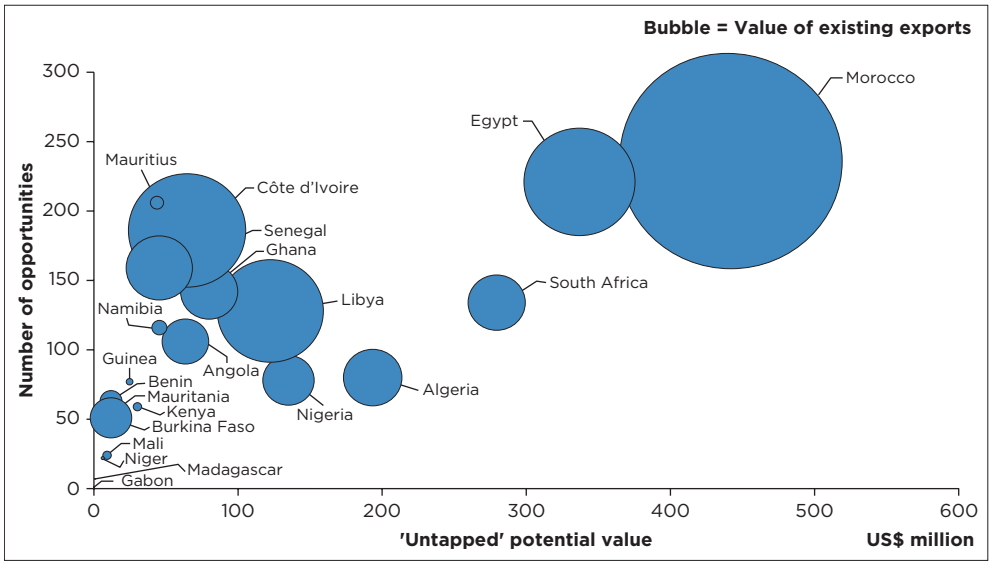
Key: REO, realistic export opportunity; TRADE-DSM, TRADE-Decision Support Model.

FIGURE 4.19: Tunisia's export opportunities in Africa (regional shares).

limited; yet the TRADE-DSM approach identifies quite a number of export opportunities in South Africa for Tunisia (the third highest in Africa). This is consistent with what appears in cells 1,1 to 2,5 of the TRADE-DSM REO Map. For this target market, opportunities exist where Tunisia currently has a low to intermediately low market share, and so a combination of offensive and



Source: Authors' compilation, based on the TRADE-DSM Navigator results for Tunisia (2020). Reproduced and published with permission from Trade Research Advisory.
Key: TRADE-DSM, TRADE-Decision Support Model; US$, United States dollar.

FIGURE 4.20: Tunisia's trade with African countries – existing trade versus potential opportunities.

expansive market exploration strategies will be required to develop these opportunities.

Regarding the top 15 markets that pass all of the key TRADE-DSM filters (see Table 4.1), Tunisia has existing export capacity in 571 different products, with a combined 'untapped' potential value of US$2.09 billion.

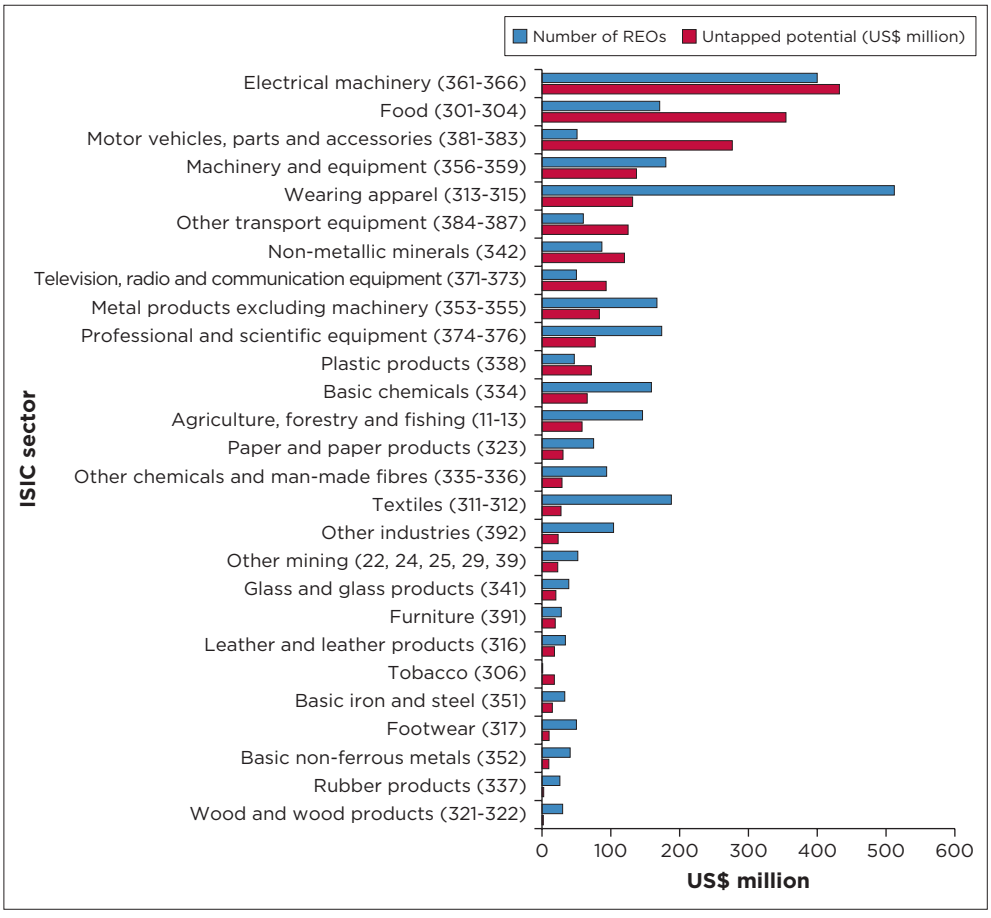
Sector-level outcomes

In total, Tunisia can export 590 products falling within 27 broad economic sectors. Figure 4.21 shows that the Electrical machinery sector (361–366 International Standard Industrial Classification [ISIC] codes) has the largest 'untapped' potential (US$432.2 million), while the Wearing apparel sector (313–315 SIC codes) exhibits a larger number of opportunities (512).

Conclusion and policy recommendations

With Tunisia's trade policy is currently strongly oriented towards the African continent, this chapter focused on the export opportunities for Tunisia in African markets.

Using the TRADE-DSM methodology (as applied in a 2020 version for Tunisia), we demonstrated that Tunisia has the existing export capability and capacity to supply 36 African markets with 590 different products.



Source: Authors' compilation, based on the TRADE-DSM Navigator results for Tunisia (2020). Reproduced and published with permission from Trade Research Advisory.
Key: REO, realistic export opportunity; ISIC, International Standard Industrial Classification; US$, United States dollar; TRADE-DSM, TRADE-Decision Support Model.

FIGURE 4.21: Tunisia's export opportunities by International Standard Industrial Classification (ISIC) sector (number and value).

This represents an 'untapped' potential value of US$2.28 billion. More than 95% of the identified export opportunities relate to markets in which Tunisia has a historically small or non-existent relative market share. Furthermore, within this group of potential opportunities, 81.1% are in markets exhibiting global import demand trends that are growing both in the short and the long terms. As a result, an offensive market exploration strategy would be required to take advantage of these growing and mostly unexploited markets.

An offensive market exploration strategy implies that active 'investigation' and fact-finding are required, supplemented by detailed in-market research, active intergovernmental engagement and trade promotion activities, such as

export promotion, trade fair participation, and export training and education. This type of strategy is typically the most resource-intensive, but it is necessary to diversify into new markets for products that Tunisia is already good at exporting.

At the regional level, the analysis showed that the highest value of 'untapped' potential is associated with Northern Africa, while the highest number of opportunities is associated with Western Africa. Because these regions are already supplied by some Tunisian firms, providing support to such firms will encourage them to track available opportunities in the markets where they are active and to produce more in ways that will help them increase their share of total exports and their contribution to GDP.

At the country level, some markets such as Egypt and South Africa exhibit comparatively significant export opportunities, while existing trade with Tunisia is relatively low. In the markets where Tunisia has proven to have significant 'untapped' potential opportunities, it should build on its prior export experience to develop its offensive exploration strategy. Furthermore, Tunisia should strengthen its bilateral trade with countries like Algeria, Morocco and Nigeria. One way to do this is to facilitate e-commerce by enabling micro and small firms to secure bank financing and to receive and send money through online platforms. This will help firms boost sales to those countries with the greatest number of opportunities.

At the sectoral level, the Electrical machinery sector has the largest 'untapped' potential, while the Wearing apparel sector has the highest number of opportunities. It therefore makes sense for Tunisia to develop strategies to boost investment in those manufacturing sectors that have a number of real export opportunities, where the demand is high and less sensitive to external shocks.

Given the low rate of economic growth that Tunisia is currently experiencing (World Bank 2024), attempting to reduce the country's trade deficit and the unemployment rate is challenging. Tunisia needs to take swift steps in the interests of economic recovery to boost production and increase exports, especially to African countries where export opportunities are present. With the active trading phase of the AfCFTA having commenced on 01 January 2021, Tunisia can capitalise on the clear potential in Africa by actively developing and realising the identified opportunities on the continent.

Identifying high-potential markets and buyers is regarded as one of the first and most significant stumbling blocks to starting out in or expanding exports (World Economic Forum [WEF] 2016). Our analysis addressed this problem by providing policymakers, economic decision-makers and

company executives in Tunisia with valuable information that should go a long way towards improving export promotion strategies and ultimately stimulating greater exporting activity. Clearly, there are many valuable yet unexploited opportunities for Tunisian firms on the African continent. It is now time to pursue them and turn them into success stories.

Key takeaways from this chapter

The TRADE-DSM model produced interesting results pertaining to Tunisia's untapped export potential in Africa:

- Tunisia has approximately US$2.28 billion-worth of 'untapped' export potential relating to 2,999 export opportunities in 36 African countries.
- More than 95% of the identified export opportunities relate to markets in which Tunisia has a historically small or non-existent relative market share. An offensive market exploration strategy would be required to take advantage of these opportunities.
- The Electrical machinery sector has the largest 'untapped' potential, while the Wearing apparel sector has the highest number of opportunities.
- The challenge for Tunisia lies in developing strategies to boost investment in those manufacturing sectors that have real export opportunities where the demand is high and less sensitive to external shocks.

Appendix A4

TABLE A4.1: Section names according to Harmonized System (HS) 2012 classification.

HS 2012 classification by main section
S1. Live animals; animal products
S2. Vegetable products
S3. Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes
S4. Prepared foodstuffs; beverages, spirits and vinegar; tobacco and manufactured tobacco substitutes
S5. Mineral products
S6. Products of the chemical or allied industries
S7. Plastics and articles thereof; rubber and articles thereof
S8. Raw hides and skins, leather, furskins and articles thereof; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (other than silk-worm gut)
S9. Wood and articles of wood; wood charcoal; cork and articles of cork; manufactures of straw, of esparto or of other plaiting materials; basketware and wickerwork
S10. Pulp of wood or of other fibrous cellulosic material; recovered (waste and scrap) paper or paperboard; paper and paperboard and articles thereof
S11. Textiles and textile articles
S12. Footwear, headgear, umbrellas, sun umbrellas, walking-sticks, seat-sticks, whips, riding-crops and parts thereof; prepared feathers and articles made therewith; artificial flowers; articles of human hair

Table A4.1 continues on the next page→

TABLE A4.1 (cont.): Section names according to Harmonized System (HS) 2012 classification.

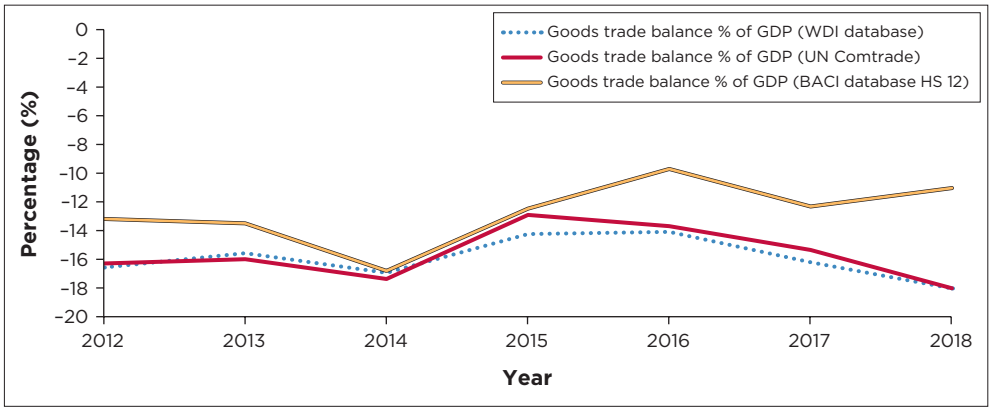
HS 2012 classification by main section
S13. Articles of stone, plaster, cement, asbestos, mica or similar materials; ceramic products; glass and glassware
S14. Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal and articles thereof; imitation jewellery; coin
S15. Base metals and articles of base metal
S16. Machinery and mechanical appliances; electrical equipment; parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles
S17. Vehicles, aircraft, vessels and associated transport equipment
S18. Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; clocks and watches; musical instruments; parts and accessories thereof
S19. Arms and ammunition; parts and accessories thereof
S20. Miscellaneous manufactured articles
S21. Works of art, collectors' pieces and antiques

Source: Authors' extract from World Customs Organization (WCO 2012).
Key: HS, Harmonized System.

TABLE A4.2: Section names according to Standard International Trade Classification (SITC) revision 4 classification.

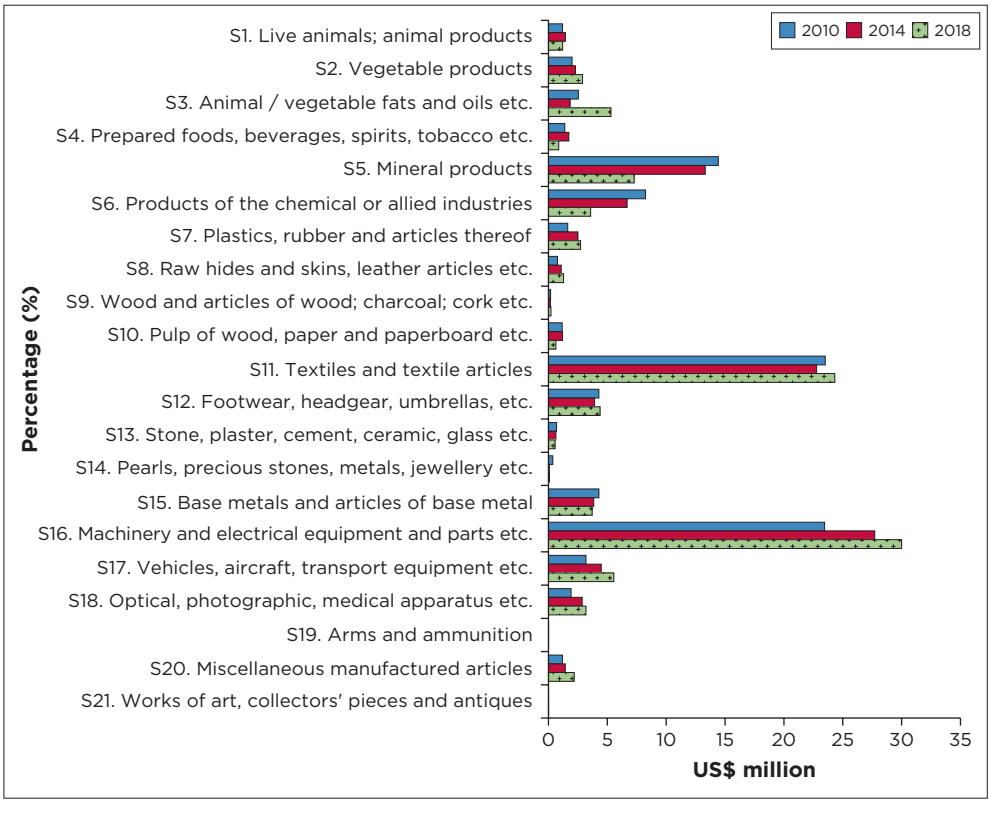
SITC revision 4 classification by section
S0. Food and live animals
S1. Beverages and tobacco
S2. Crude materials, inedible, except fuels
S3. Mineral fuels, lubricants and related materials
S4. Animal and vegetable oils, fats and waxes
S5. Chemicals and related products, n.e.s.
S6. Manufactured goods classified chiefly by material
S7. Machinery and transport equipment
S8. Miscellaneous manufactured articles
S9. Commodities and transactions not classified elsewhere in the SITC

Source: Authors' compilation from UNSD (2006).
Key: SITC, Standard International Trade Classification; n.e.s., not elsewhere specified.



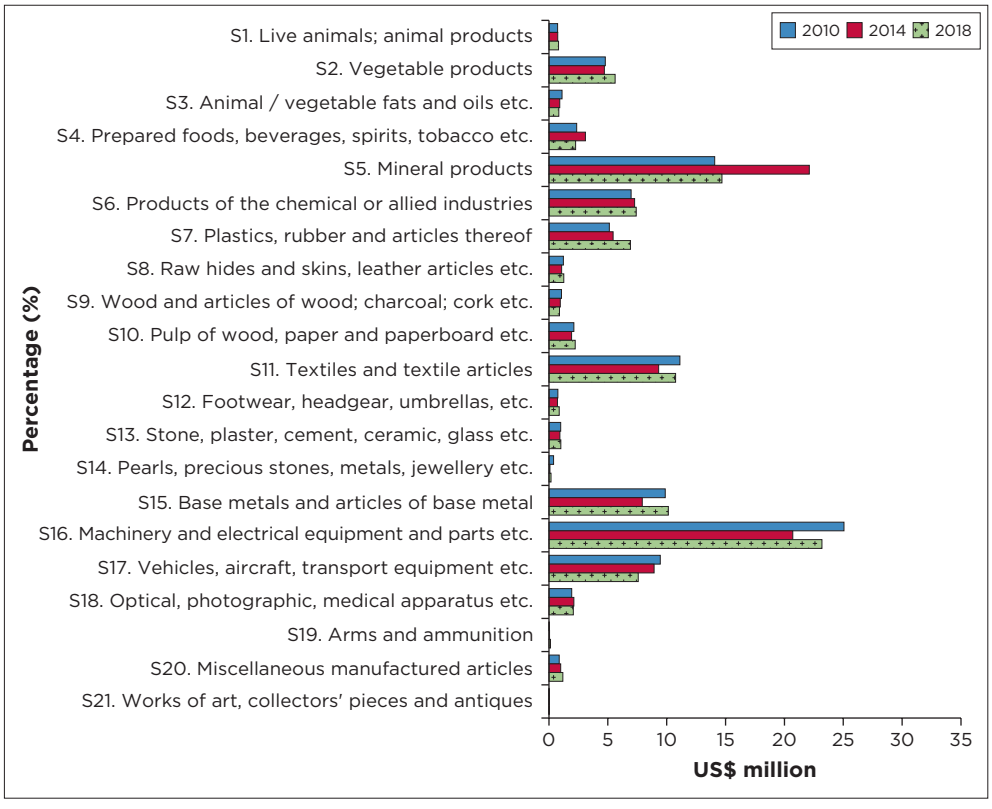
Source: Authors' calculations based on CEPII BACI (2020), World Bank (2020) and UN Comtrade (2020).
Key: GDP, gross domestic product; WDI, World Development Indicators; BACI, Base pour l'Analyse du Commerce International; HS, Harmonized System; CEPII, Centre d'Études Prospectives et d'Informations Internationales; UN Comtrade, United Nations Commodity Trade.

FIGURE A4.1: Goods trade balance as a percentage of gross domestic product, reported by three different sources.



Source: Authors' calculations based on CEPII BACI (2020).
Key: US$, United States dollar; CEPII, Centre d'Études Prospectives et d'Informations Internationales; BACI, Base pour l'Analyse du Commerce International.

FIGURE A4.2: Tunisia's export share by Harmonized System (HS) 2012 section, 2010, 2014 and 2018.



Source: Authors' calculations based on CEPII BACI (2020).
Key: US$, United States dollar; CEPII, Centre d'Études Prospectives et d'Informations Internationales; BACI, Base pour l'Analyse du Commerce International.

FIGURE A4.3: Tunisia's import share by Harmonized System (HS) 2012 section, 2010, 2014 and 2018.

TABLE A4.3: Excluded products.

HS 2012 product classification
Items that are not allowed to be supplied based on the Decree of the Ministry of Economy, Trade and Investment No. 9 of 1376
* Live pigs, meat, grease, leather and all its derivatives * Wines, alcoholic beverages of all kinds * Preserved meat, prepared foods and animal fats for the purpose of human consumption * Table eggs prepared for direct consumption, poultry and live and slaughtered birds except ancestors and mothers of poultry for the purpose of education * Fresh fruits citrus, grapes, figs, apricots, melons, dates, plums, peaches, olive oil, fresh vegetables, dried and prepared for consumption except dry legumes * Natural mineral water * Automotive engines, tires and spare parts * Bread improvers containing potassium (potassium bromate) * Weapons: - - The importation of arms and ammunition is absolutely prohibited - Hunting rifles

Source: Authors extracted items from the Decree of the Ministry of Economy, Trade and Investment No. 9 of 1376: link: https://www.embassyoflibya.eu/customs-attache/.
Key: HS, Harmonized System.

TABLE A4.4: Excluded products according to Harmonized System (HS) 2012 classification.

HS 2012 product classification
Gold related items:
Chapter 71: Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad etc.
HS710812: Metals: gold, non-monetary, unwrought (but not powder)
HS710813: Metals: gold, semi-manufactured
HS710811: Metals: gold, non-monetary, powder
HS710900: Base metals or silver: clad with gold, not further worked than semi-manufactured
HS711810: Coin (other than gold coin), not being legal tender
HS710610: Metals: silver powder
HS711291: Waste and scrap of precious metals: of gold, including metal clad with gold but excluding sweepings containing other precious metals
HS711100: Base metals, silver or gold, clad with platinum: not further worked than semi-manufactured
HS710820: Gold, monetary
HS711419: Goldsmiths' wares: articles of and parts thereof, of precious metal (excluding silver) whether or not plated or clad with precious metal
HS710692: Metals: silver, semi-manufactured
HS711420: Goldsmiths' and silversmiths' wares: articles of and parts thereof, of base metal clad with precious metal
HS710691: Metals: silver, unwrought, (but not powder)
HS711411: Silversmiths' wares: and parts thereof, of silver, whether or not plated or clad with other precious metal
Diamond related items:
Chapter 71: Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad etc.
HS710310: Stones: precious (other than diamonds) and semi-precious stones, unworked or simply sawn or roughly shaped, not strung, mounted or set
HS710239: Diamonds: non-industrial, (other than unworked or simply sawn, cleaved or bruted), but not mounted or set
HS710229: Diamonds: industrial (other than unworked or simply sawn, cleaved or bruted), but not mounted or set
HS710399: Stones: precious (other than diamonds) and semi-precious stones (other than rubies, sapphires and emeralds), worked other than simply sawn or roughly shaped, not strung, mounted or set
HS710590: Stones: precious and semi-precious, dust and powder, of natural or synthetic precious or semi-precious stones, excluding diamonds
HS710231: Diamonds: non-industrial, unworked or simply sawn, cleaved or bruted, but not mounted or set
HS710510: Stones: precious and semi-precious, dust and powder, of diamonds
HS710210: Diamonds: whether or not worked, but not mounted or set, unsorted
HS710221: Diamonds: industrial, unworked or simply sawn, cleaved or bruted, but not mounted or set

Table A4.4 continues on the next page→

TABLE A4.4 (cont.): Excluded products according to Harmonized System (HS) 2012 classification.

HS 2012 product classification
Platinum group metals (PGM) related items:
Chapter 71: Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad etc.
HS711039: Metals: rhodium, semi-manufactured
HS711031: Metals: rhodium, unwrought or in powder form
HS711021: Metals: palladium, unwrought or in powder form
HS711029: Metals: palladium, semi-manufactured
HS711011: Metals: platinum, unwrought or in powder form
HS711049: Metals: iridium, osmium, ruthenium, semi-manufactured
HS711019: Metals: platinum, semi-manufactured
HS711041: Metals: iridium, osmium, ruthenium, unwrought or in powder form
Arms and ammunition related items:
Chapter 93: Arms and ammunition; parts and accessories thereof
HS930510: Firearms: parts and accessories, of revolvers or pistols
HS930520: Firearms: parts and accessories, of shotguns or rifles of heading 9303
HS930591: Firearms: parts and accessories, of military weapons of heading 9301
HS930400: Firearms: (e.g. spring, air or gas guns and pistols, truncheons), excluding those of heading no. 9307
HS930390: Firearms: n.e.c. in heading no. 9303
HS930599: Firearms: parts and accessories, of firearms other than the military weapons of heading 9301
HS930690: Ammunition: n.e.c. in chapter 93
HS930700: Arms: swords, cutlasses, bayonets, lances and the like, parts thereof and scabbards and sheaths therefor
HS930630: Ammunition: cartridges and parts thereof n.e.c. in heading no. 9306
HS930621: Ammunition: shotgun cartridges
HS930330: Firearms: sporting, hunting or target-shooting rifles n.e.c. in heading no. 9303
HS930629: Ammunition: parts of shotgun cartridges
HS930310: Firearms: muzzle-loading
HS930200: Revolvers and pistols: other than those of heading no. 9303 or 9304
HS930190: Military weapons: other than revolvers, pistols, and arms of heading 9307, n.e.c. in heading 9301
HS930120: Military weapons: rocket launchers, flame-throwers, grenade launchers, torpedo tubes and similar projectors
HS930320: Firearms: sporting, hunting or target-shooting shotguns, including combination shotgun-rifles
HS930110: Military weapons: artillery weapons (e.g. guns, howitzers, and mortars)

Source: Authors extracted items from the Decree of the Ministry of Economy, Trade and Investment No. 9 of 1376: link: https://www.embassyoflibya.eu/customs-attache/.
Key: HS, Harmonized System; n.e.c., not elsewhere classified.

Chapter 5

Export diversification: The case of South Africa, with a focus on the African Continental Free Trade Area

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Introduction

Export diversification has become an important economic objective in development strategies, especially in developing countries. Many developing countries, which are dependent on primary goods and have a relatively small export portfolio, face much uncertainty where their exports are concerned (Hamed, Hadi & Hossein 2014). Economic development therefore coincides with transformation strategies where countries move from the production of primary goods to industrial goods and/or services. This is mostly to avoid instability in the prices of primary goods in global markets.

Export diversification helps to alleviate the problem of being confined to a narrow and often precarious export portfolio, enabling countries to become more economically resilient and less vulnerable to external shocks. However, this requires in-depth knowledge of where the export development and diversification opportunities lie – both in terms of markets and products. Such a requirement hinders trade diversification efforts across the African continent.

This study focused on the critical need for enhanced market intelligence to help overcome barriers to export diversification in Africa through a case study for South Africa. By identifying 'untapped' opportunities in new markets and new products, the study aimed to underscore the immense potential for growth across the continent, while emphasising the importance of strategic prioritisation in export promotion efforts.

Literature review

This section explores the literature on export development and diversification, emphasising its significance in strengthening intra-Africa trade. Within this discourse, we delve into the decomposition of export diversification and whether it matters and also look specifically at export diversification attempts in Africa. Through this analysis, we set out to emphasise the intricate dynamics and important role of export diversification in fostering economic growth and regional integration across the African continent.

Decomposition of export diversification: What does it really mean?

Researchers generally agree that export diversification matters, especially for developing countries. Export diversification, by definition, involves changing a country's export structure. This can be achieved by changing the existing basket of commodities or products or transforming them

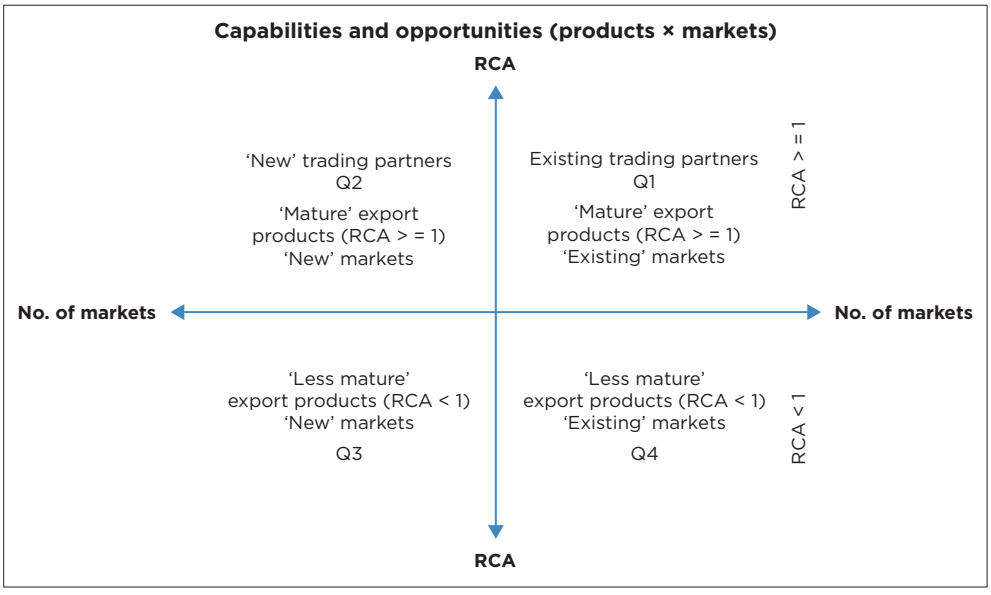
through technology and innovation. In practice, diversification is largely achieved through a combination of change (introducing new alternative products) and transformation (adding greater value to existing export products). Export diversification therefore enables countries to build resistance to changes in prices or demand brought about by a slowdown in the economies of importing countries.

Export diversification also encourages a shift away from an over-reliance on primary commodities towards more value-added goods and services, resulting in more sophisticated products (Department of Trade, Industry and Competition [DTIC] 2022; Songwe & Winkler 2012). Productivity and the overall value of exports improve as products become more sophisticated and valuable. This also paves the way for greater inclusion of small and medium-sized enterprises (SMEs), greater innovation as more markets open, increased productivity and alleviation of export instability (Hausmann, Hwang & Rodrik 2006). Inelastic and fluctuating global demand typically results in a narrow export basket for countries that rely heavily on exports of raw materials. By stabilising export revenues, export development and diversification help countries to mitigate against unfavourable, shock-induced terms of trade.

Figure 5.1 differentiates between export growth at the intensive margin (export specialisation) and the extensive margin (export diversification). Growth at the intensive margin involves increasing exports of existing products to existing, established markets (Q1 in Figure 5.1), the rationale being that this trade margin will intensify export ties in terms of growth and survival (Brenton & Newfarmer 2009). The intensive margin of trade accounts for the bulk of export growth, especially in developing countries (Felbermayr & Kohler 2006).

The extensive margin, in contrast, involves increasing exports either through product diversification, where new products are exported to existing markets, or through market diversification, where new or existing products are exported to new markets. More specifically, trade at the extensive margin can be expanded in three ways (see Figure 5.1): (1) exporting existing products to new markets (Q2); (2) exporting new products to existing markets (Q4); and (3) exporting new products to new markets (Q3).

The extensive margin, therefore, can be characterised as the broadening of export relationships. Expanding foreign trade links is crucial for the economic diversification and growth of a country (Klinger & Lederman 2011). By diversifying their exports, countries operating at the extensive margin can reap significant economic benefits. While fuelling growth and development, it also makes countries less vulnerable to external shocks (and the frequency thereof), supports firms' export-led growth and risk



Source: Adapted from Cameron and Viviers (2015).
Key: No., number; Q, quadrant; RCA, revealed comparative advantage.
FIGURE 5.1: Intensive and extensive margin quadrants.

management strategies, and adds value to supply chains (Klinger & Lederman 2011).

For a more complete discussion of the TRADE-DSM (Decision Support Model) approach to the intensive and extensive margins, refer to the section 'Extending the TRADE-DSM results interpretation – considering intensive and extensive margins' in Chapter 2.

Export diversification in Africa

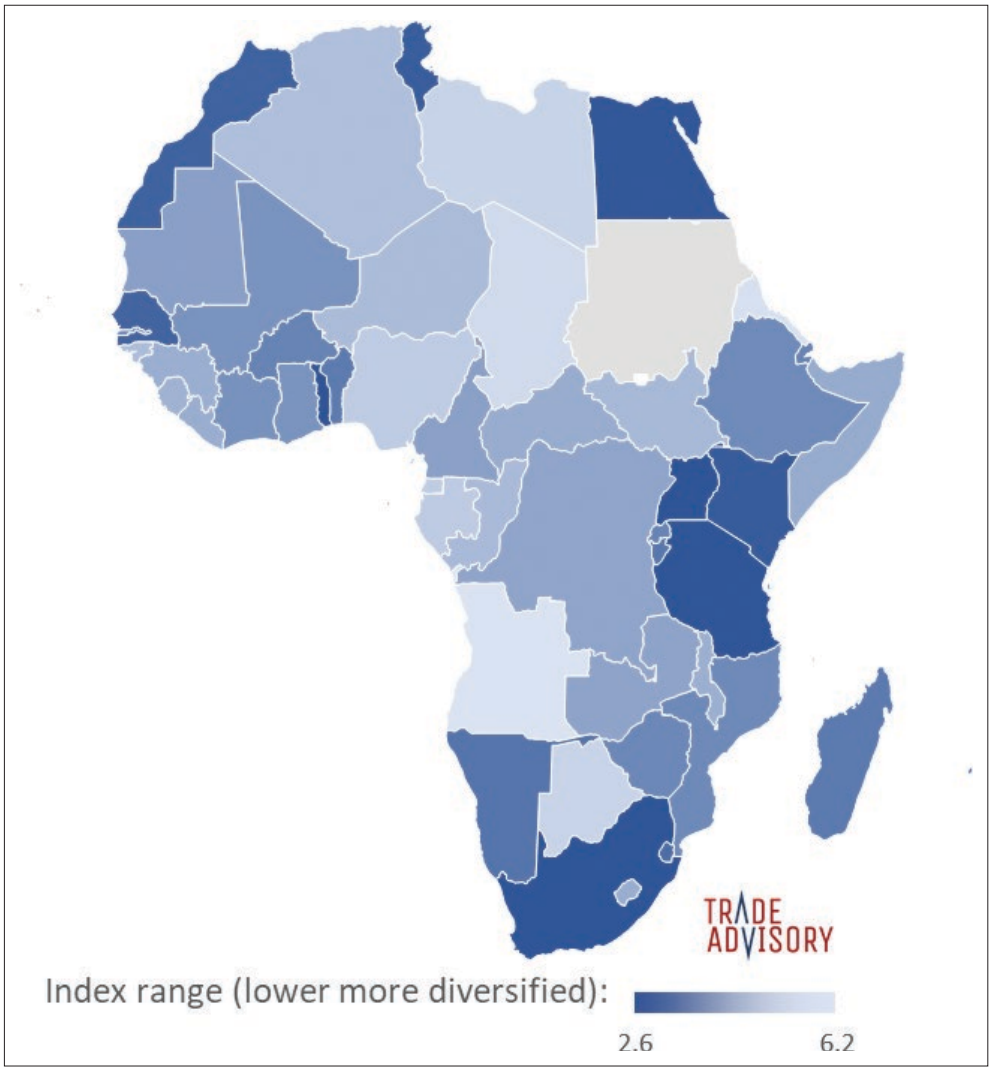
As the global economy changes and development has slowed in many parts of the world, there is increasing uncertainty about the future. This has been having a marked impact on countries that rely largely on the production and export of a narrow range of commodities and/or goods. While slowing global growth is posing a challenge to traditional exports, some economic changes have given developing countries new opportunities to diversify. For instance, the development of regional value chains (RVCs) and global value chains (GVCs), which disperse production across a number of geographical regions, presents new opportunities for emerging and less-developed countries to develop and increase their exports. African countries are no exception in this regard.

A high export concentration and reliance on exports of basic commodities are key components of the existing structure of African economies. To change this status quo, successful diversification into manufactured goods is needed, because one of the primary drivers of dynamic and long-term economic growth in a country is its manufacturing sector. This is mainly because manufactured products typically have large income elasticities of demand, thereby enhancing potential for the expansion of export activities (United Nations Conference on Trade and Development [UNCTAD] 2003).

Consequently, it has become increasingly apparent that African countries cannot solely and sustainably rely on exports of basic goods and raw materials. Countries need to transition to more value-added products while also diversifying their exports. Moreover, the literature makes it abundantly clear that a more integrated Africa would offer African countries a bigger market for these sorts of exports (Songwe 2019; UNCTAD 2003, 2022). The diversification of exports is therefore a crucial step in countries' quest to build their resilience against economic downturns and price dips. Export diversification also makes it possible for SMEs to participate more meaningfully in the economy, which fosters innovation, productivity and efficiencies. Furthermore, the African continent may see an increase in foreign direct investment (FDI), with investors being more willing to risk their money in accessing the sizeable African market through the African Continental Free Trade Area (AfCFTA). This may have the added benefit of facilitating investment diversification beyond purely extractive industries.

The coronavirus disease 2019 (COVID-19) epidemic highlighted the fragility of African countries, highlighting their heavy reliance on imports of necessities, including food, gasoline, machinery and other manufactured products. This underlines again how vulnerable most African countries are to exogenous shocks (Cotton, Remy & Nicholls 2020).

Many of the rapidly developing countries in the world diversified their economies between 1990 and 2014. However, this was not the case for most African countries, which instead relied on the rents from their extractive industries, resulting in only a marginal overall improvement in export diversification on the continent (Songwe 2019; United Nations Economic Commission for Africa [UNECA] 2018). Worryingly, Central and Northern Africa's exports became more and more concentrated, while South Africa's exports, which were relatively more diverse, fell behind on the diversification front (Songwe 2019; UNECA 2018).



Source: Authors' compilation using International Monetary Fund (IMF) data (2014). Used with permission from Trade Research Advisory.
Note: As these are Theil indices,[75] lower values (indicated by darker colour shades) indicate higher levels of export diversification. Countries appearing in greyscale indicate no supporting data.

FIGURE 5.2: Africa – relative export diversification index.

Figure 5.2 illustrates the low levels of export diversification on the continent. Some of the more diversified economies in Africa are South Africa (2.59), Tanzania (2.6), Kenya (2.75), Egypt (2.65), Tunisia (2.79) and Morocco (2.92), while some of the least diversified countries are Angola (6.21),

75. These calculate the overall intensive (changes in diversification within groups) and extensive (changes in diversification between groups) Theil indices following the definitions and methods used in Cadot, Carrére and Strauss-Kahn (2011).

Chad (6.0), Libya (5.8), Nigeria (5.62) and Algeria (5.31) (International Monetary Fund [IMF] 2014).

Summary

Considering Africa's low levels of export diversification, the AfCFTA is anticipated to make it easier for countries to access new African markets as they expand their product lines. Consequently, the more ambitious countries' trade liberalisation efforts are, the better are the prospects of growth in intra-Africa trade – provided the necessary improvements are made to 'hard' trade-enabling infrastructure, such as roads, rail and port infrastructure, access to energy and overall trade efficiency. Industrial sectors are anticipated to see the highest growth in intra-Africa trade, affording African countries invaluable opportunities to industrialise under the AfCFTA. Manufactured goods account for a significantly greater percentage of intra-regional exports than merchandise exports leaving the continent (DTIC 2022; UNECA 2018). It is therefore imperative for these countries to seek new avenues for diversification, industrialisation and value chain growth if they are to deliver the AfCFTA's promise both to diversify and reform African countries. These should be accompanied by sound export policies and strategies.

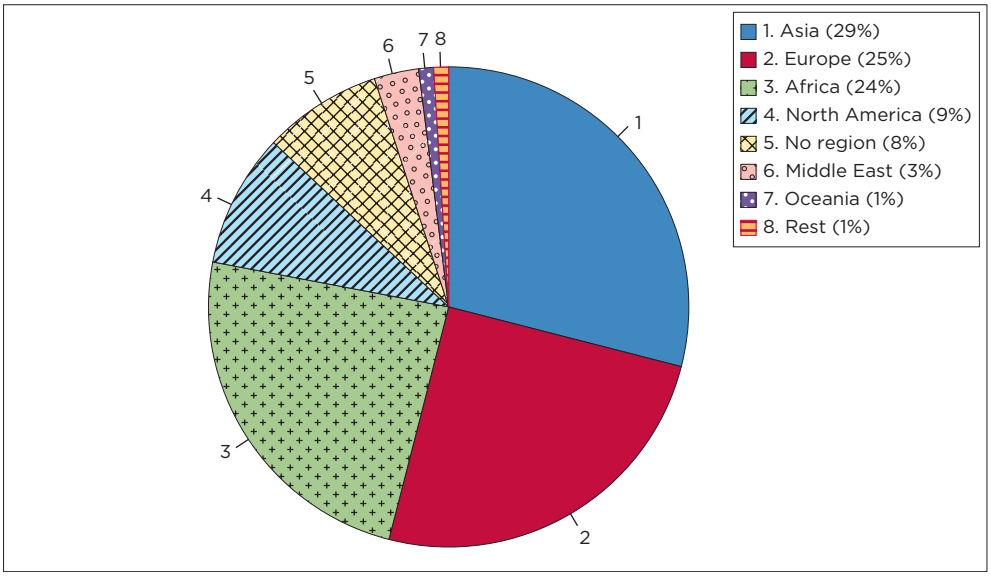
In order to illustrate how enhanced market intelligence can help to overcome barriers to export diversification in Africa, the next section discusses a case study on South Africa. By identifying 'untapped' opportunities in new markets and new products for South Africa, the study underscores the immense potential for growth across the continent, while emphasising the importance of strategic prioritisation in export promotion efforts.

The structure of South Africa's economy and exports

Prior to the financial crisis of 2008–2009, South Africa had strong economic momentum and had enjoyed a long stretch of high and positive economic growth. The country had made real progress in reducing poverty and unemployment, with rapid improvements in the financial and business services sectors. However, manufacturing remained underdeveloped. The accelerating growth rate that South Africa was seeing was mainly because of the country's primary commodity exports, including gold, iron ore and platinum. South Africa has since experienced several years of low or practically non-existent growth, even prior to the COVID-19 pandemic, which has worsened these trends.

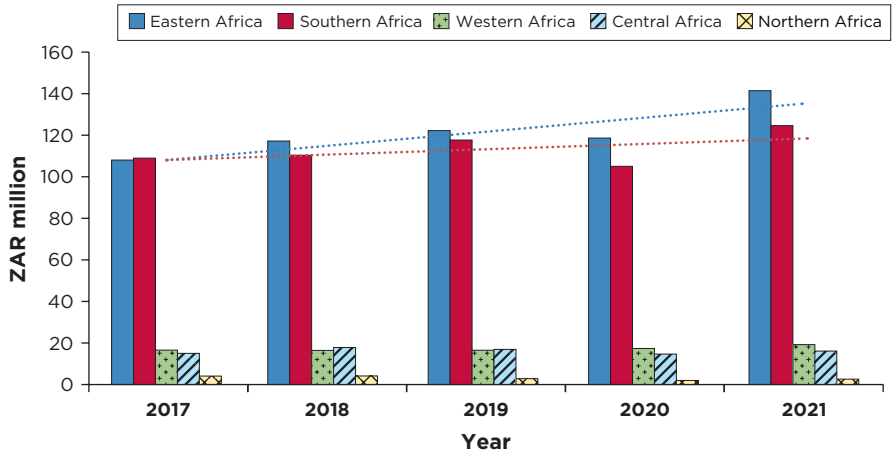
The literature suggests that South Africa's sub-par export performance can be attributed to its lagging structural reforms, which have left the country overly dependent on exports of primary commodities to drive export growth (Hausmann & Klinger 2006; Rodrik 2008). It is believed that South Africa could escape its sluggish growth trap by expanding its manufactured exports (DTIC 2022). However, not only is the manufacturing sector shrinking, but it is also focused on exports of low-skilled, resource-based goods (Hausmann & Klinger 2006; Rodrik 2008). Because of this, South Africa's export portfolio is relatively simple when compared to its level of income, which makes it difficult for the country to develop its export capacity and expertise (Matthee, Idsardi & Krugell 2015).

The data show that in 2020, 24% of South Africa's total exports were to the rest of Africa, while 29% were destined for Asia and 25% for Europe (see Figure 5.3) (South African Revenue Service [SARS] 2022). The main African markets to which South Africa exports are other members of the Southern African Customs Union (SACU) and Southern African Development Community (SADC), with exports mainly consisting of petroleum oils (excluding crude), goods vehicles, electrical energy, and iron ore and concentrates (tralac 2021). Only 3% of South Africa's total exports and 12% of intra-Africa exports are destined for non-SACU and non-SADC African countries (tralac 2021).



Source: Authors' own compilation using trade statistics from the South African Revenue Services (SARS) (2022).

FIGURE 5.3: South Africa's export destinations by geographical region (average 2017–2021).



Eastern Africa	122.1	132.3	138.0	133.7	159.5
Southern Africa	123.1	124.6	132.5	118.4	140.4
Western Africa	18.6	18.9	18.6	19.9	22.1
Central Africa	17.4	20.4	19.4	16.8	18.2
Northern Africa	4.8	4.7	3.0	2.4	3.5

Source: Authors' own compilation using trade statistics from the South African Revenue Services (SARS) (2022).
Key: ZAR, South African Rand.

FIGURE 5.4: South Africa's export destinations by geographical region (average 2017–2021).

In an African context, Eastern Africa exhibits the most demand for South African exports, followed by Southern Africa, Western Africa, Central Africa and, lastly, Northern Africa (see Figure 5.4). In addition, exports from South Africa to Eastern Africa exhibited the strongest growth of sub-regions in Africa over the 2017–2021 period.

Applying the TRADE-DSM

This section provides a demarcation of the method and key assumptions applied for this study. Before the results of the application of the TRADE-DSM approach for South Africa's export opportunities in Africa are presented, Table 5.1 provides a summary of the method and results of previous studies on South Africa's export diversification drive, including studies using the TRADE-DSM approach.

The TRADE-DSM methodology, as discussed in Chapter 6, was applied to identify export opportunities for South Africa specifically in the rest of Africa. Consequently, only African countries were selected for this TRADE-DSM application. Similar to the application discussed in Chapter 6, filter 1 was deliberately not applied to avoid countries being excluded on the basis of political and commercial risks. This resulted in 50 African countries being

TABLE 5.1: Summary of selected studies on export opportunities and diversification (with a South African focus), 2010–2022.

Author	Year	Method	Results
Pearson et al.	2010	Using the TRADE-DSM, the study identified potential export opportunities for South Africa in China, India and Brazil	The authors reported a total of 51 export opportunities in Brazil, 198 in India and 259 in China. China offered the most export opportunities of any of the countries, highlighting the significance of the Chinese market for South African exports.
Steenkamp and Viviers	2012	The study used the TRADE-DSM to identify viable export markets for South African goods in the rest of Africa	The results showed that the markets with the highest potential export values for South Africa were Western, Eastern and Northern Africa. Nigeria offered the largest potential export value. However, South Africa has utilised only 13.35% of the 'untapped' potential in African markets.
Steenkamp, Grater and Viviers	2016	The study examined how the TRADE-DSM could streamline the identification of South Africa's most promising export opportunities in sub-Saharan Africa	The results showed that South Africa had more than 1,600 potential country–product combinations to investigate. A longer-term analysis, however, revealed that market access issues had locked up more than 40% of additional export potential that could have gone to sub-Saharan Africa.
Matthee and Gallego	2017	The study first identified the variables influencing the likelihood of South Africa exporting to a certain destination (extensive margin), using a gravity model, and then analysed trade flows to identify the elements influencing export volumes (intensive margin)	The results showed that while the range of South Africa's export products is relatively diversified, the number of export markets is limited
Jansen van Rensburg et al.	2018	This study addressed two questions: (1) whether the TRADE-DSM could help close the information gap that exists between exporters and export promotion organisations in the Indian Ocean Rim Association (IORA); and (2) whether the TRADE-DSM can serve as a foundation for the creation of an IORA-wide export promotion strategy	The TRADE-DSM was shown to be a particularly accessible solution to the market selection dilemma, as it accurately filtered out numerous unrealistic product–market combinations. The bilateral export opportunities identified for South Africa and Thailand highlighted the model's versatility and the crucial role it could play in IORA's efforts to improve its export performance.
Ferreira and Steenkamp	2020	The study used the TRADE-DSM to analyse each country's import demand and export supply, thereby pinpointing unique intra-regional trade potential among selected Tripartite Free Trade Area (TFTA) member states, including South Africa	The results revealed 334 trade opportunities among the TFTA member states in question, of which 232 (almost 70%) were not being utilised

Source: Authors' own work.
Key: IORA, Indian Ocean Rim Association; TFTA, Tripartite Free Trade Area; TRADE-DSM, TRADE-Decision Support Model.

included in the analysis, with South Sudan, Western Sahara, Somalia and Réunion being dropped because of insufficient data, as well as South Africa, being the 'home market' or exporting country.

Because the AfCFTA aims to reverse Africa's premature deindustrialisation by tapping into the vast manufacturing opportunities on the continent, the study excluded most mining, primary agricultural goods and primary forestry goods – although it included these goods if anything was processed or manufactured (e.g. paper excluding pulp or furniture). See Table 5.2 for a list of product groups showing the excluded Harmonized System (HS) 6-digit products.

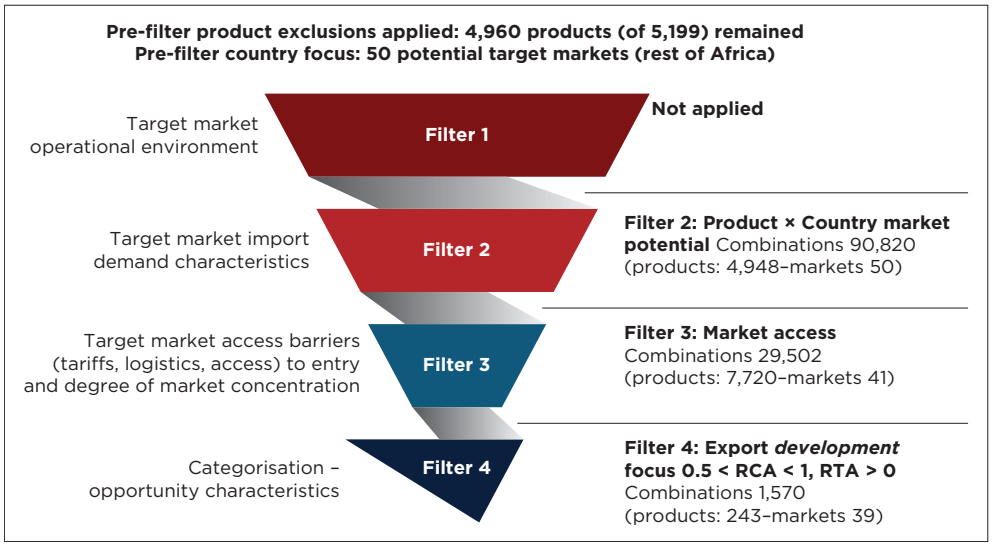
After the product exclusions were applied, 4,960 HS 6-level products (of the total 5,199 products) remained, resulting in 219,243 combinations before the TRADE-DSM filters were applied. Figure 5.5 illustrates the stepwise filtering results for South Africa within the AfCFTA.

With the application of filter 2 (import demand characteristics), the 219,243 combinations spanning 50 African countries and 4,960 products were reduced to 90,820 combinations. The number of possible opportunities was further reduced to 40,644 (50 countries and 4,773 products) with the application of sub-filter 3.1 where the import-supplying country concentration was considered. The application of sub-filter 3.2, which considered import market accessibility, resulted in a further

TABLE 5.2: List of products excluded from the study.

Product groups excluded	Details (Chapter and no. of excluded HS 6-digit codes)
Live animals and fish-related	HS01 (34), HS03 (8)
Basic gold and precious metals related	HS71 (14)
Basic platinum group metals (PGMs)-related	HS71 (8)
Basic copper products	HS26 (1), HS74 (11), HS79 (6)
Basic diamonds related	HS71 (9)
Coal-related	HS27 (15)
Crude oil-related	HS27 (1)
Petroleum-related	HS27 (28)
Natural gas (energy)-related	HS27 (1)
Other mining-related	HS26 (1)
Automotive-related (determined by original equipment manufacturers [OEMs] in a GVC context)	HS40 (3), HS83 (1), HS84 (13), HS85 (1), HS87 (83), HS94 (1)
Arms and ammunitions-related	HS87 (1), HS93 (18)
Other unclassified goods	HS97 (7), HS99 (5)
Total*	270

Source: Authors' own work.
Notes: The total* of 270 product codes refers to the nomenclature definitions. The difference between 5,199 and 4,960 products for Africa relates to reported trade data and comes to only 239, because not all products in the nomenclature have reported trade for all the African countries under investigation.
Key: HS, Harmonized System; GVC, global value chain.

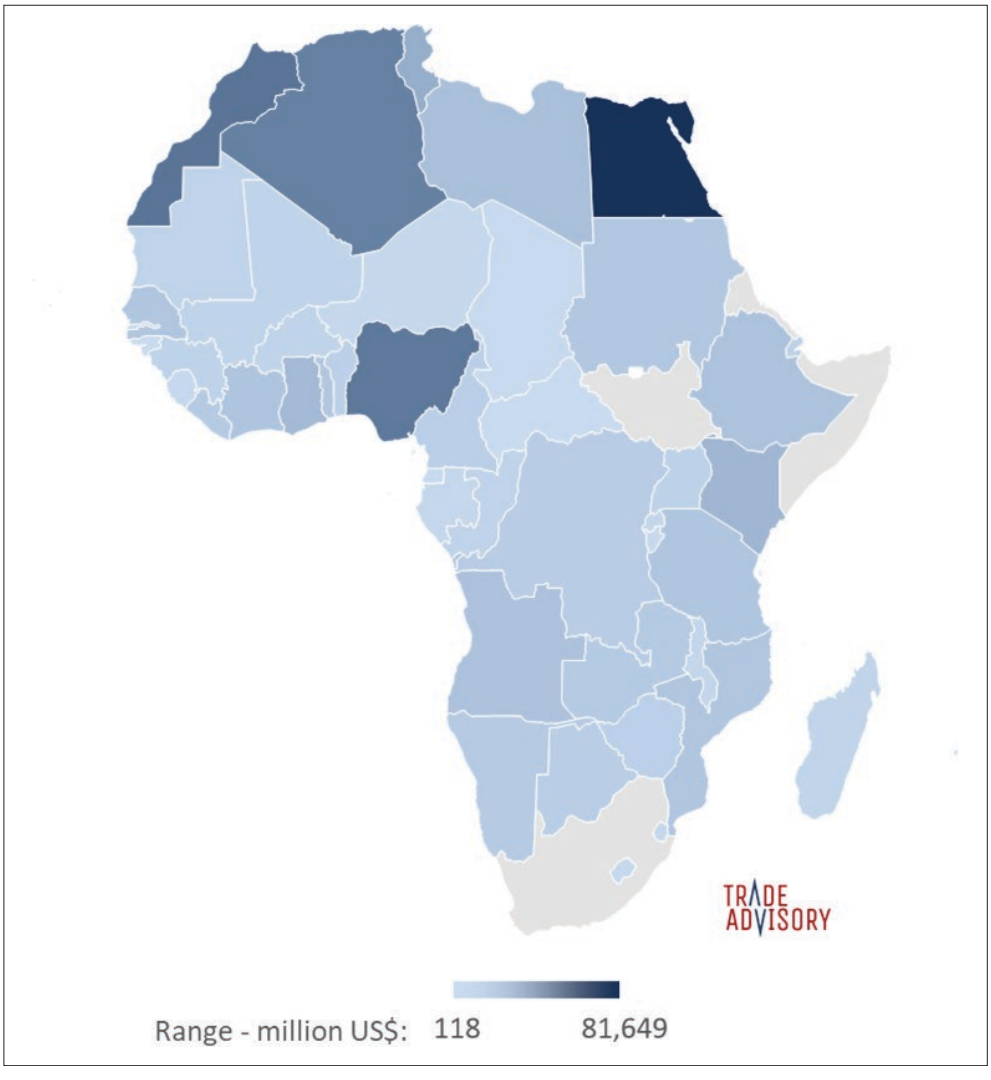


Source: Authors' compilation, based on the TRADE-DSM results (2021). Used with permission from Trade Research Advisory.
Key: RCA, revealed comparative advantage; RTA, revealed trade advantage; TRADE-DSM, TRADE-Decision Support Model.
FIGURE 5.5: Illustration of stepwise filtering results – South Africa to African Continental Free Trade Area members.

reduction in possible combinations to 29,502 (41 countries and 4,720 products). In filter 4, we focused on the revealed comparative advantages (RCAs) between 0.5 and 1 as well as relatively 'new' markets, which was Quadrant 3. We therefore relaxed filter 4 (considering outcomes in columns 1 and 2 only) to focus on longer-term export development, not only 'low-hanging fruit'. The tariffs applied in filter 3 were the tariffs currently applied (not as proposed under the AfCFTA).

After the TRADE-DSM filters were applied, 39 markets remained, with 243 products and 1,570 combinations, with an 'untapped' potential value of US$662 million. With filter 3.2 (accessibility in terms of logistics and tariffs), nine markets had a higher cost index than the cut-off of 80% of countries in the world and were therefore excluded by this filter. Affected countries were Burundi, Cameroon, the Central African Republic, Chad, the Democratic Republic of the Congo (DRC), Egypt, Equatorial Guinea, São Tomé and Principe, and Tanzania. It is important to emphasise that these are pre-COVID data. However, the pandemic highlighted the importance of diversification, especially when crisis and uncertainty overlap.

Figure 5.6 shows the imports into Africa (excluding South Africa) based on five-year time-weighted average imports calculated from Centre d'Études Prospectives et d'Informations Internationales (CEPII 2021). The results show the imports of all 50 African countries and the full set of 5,199 products at the HS 6-digit product level (HS 2012 revision).

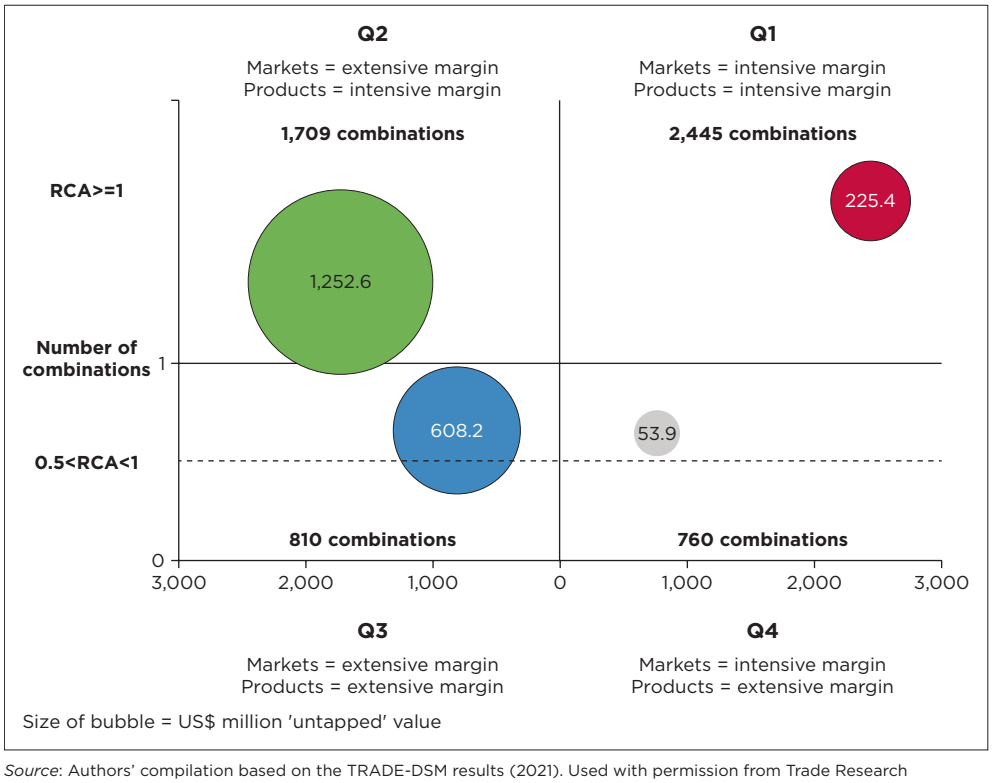


Source: Authors' calculations based on CEPII BACI (2021). Used with permission from Trade Research Advisory.
Note: South Africa was excluded by design, but the other countries greyed out had no reported import data in the BACI dataset.
Key: US$, United States dollar; CEPII, Centre d'Études Prospectives et d'Informations Internationales; BACI, Base pour l'Analyse du Commerce International.

FIGURE 5.6: Relative values of imports of African countries.

Discussion of the results

Figure 5.7 provides a summary illustration of all the realistic export opportunities (REOs) for Africa by quadrant, thereby conveying a holistic picture of how South Africa's 'untapped' opportunities in Africa are distributed. Although the focus of this chapter is on Q3, that is, the extensive margin focusing on new products and new markets, it is important to briefly look at the other opportunities identified in Q1, Q2 and Q4.



Source: Authors' compilation based on the TRADE-DSM results (2021). Used with permission from Trade Research Advisory.
Note: For display purposes, the logs of RCAs are taken.
Key: RCA, revealed comparative advantage; US$, United States dollar; Q, quadrant; TRADE-DSM, TRADE-Decision Support Model.

FIGURE 5.7: Summary of South Africa's realistic export opportunities for Africa by quadrant.

The results shown in the quadrant chart are based on unweighted average RCAs across all HS 6-digit products (vertical axis), number of products (horizontal axis) and aggregate 'untapped' value in US$ millions (size of bubbles). In Q1, opportunities for existing products and markets are referred to as 'Brown fields' opportunities. In Q2, opportunities for new markets for existing 'mature' products are referred to as 'Green pastures' opportunities. In Q3, opportunities for new markets as well as 'immature' or 'new' products are referred to as 'Blue sky' opportunities. Finally, in Q4, opportunities for immature products for existing markets are referred to as 'Grey fields' opportunities.

Q1: Intensive margin REOs: **Existing markets (REO columns 3 and 4)** and **existing products (RCA ≥ 1)** 34 markets, 628 products

In total, 2,445 opportunities were identified, with an associated estimated 'untapped' potential value of US$225.41 million. South Africa supplies an intermediately large share of the target market's(s') imports for

approximately 4.5% (2.4% of the value) of these opportunities. The market(s) to which South Africa supplies a large share of imports account(s) for 38.2% (in number terms) and 8.1% (in value terms).

Q2: Extensive margin REOs: **New markets (REO columns 1 and 2)** and **existing products (RCA ≥ 1)**

In total, 1,709 opportunities were identified, with an associated estimated 'untapped' potential value of US$1,252.64 million. Of these opportunities, 23.4% (in number terms) and 53.3% (in estimated 'untapped' potential value terms) are associated with markets to which South Africa supplies none to very little of the target market's(s') imports. The market(s) to which South Africa supplies an intermediately small share of the target market's(s') imports account(s) for 6.4% (in number terms) and 5.2% (in value terms).

Q4: Extensive margin REOs: **New products (0.5 ≤ RCA < 1)** and **existing markets (REO columns 3 and 4)**

In total, 760 opportunities were identified, with an associated estimated 'untapped' potential value of US$53.90 million. South Africa supplies an intermediately large share of the target market's(s') imports for approximately 1.5% (0.8% of the value) of these opportunities. The market(s) to which South Africa supplies a large share of the target market's(s') imports account(s) for 11.8% (in number terms) and 1.7% (in value terms).

For more details on the results relating to Q3, Table 5.3 provides the map of the various REOs according to South Africa's relative market share and the demand characteristics of the target markets.

From Figure 5.7 and Table 5.3, it is clear that Q3 shows the combinations of new markets and new products, which constitute approximately 28.4% of the number of REOs identified. In total, 810 opportunities were identified, with an estimated 'untapped' potential value of US$608.17 million. Of these opportunities, 83.3% (in number terms) and 94.3% (in estimated 'untapped' potential value terms) are associated with markets to which South Africa supplies very little to none of the target market's(s') imports. Of the identified opportunities, only 16.7% (5.7% in value terms) are associated with markets to which South Africa supplies an intermediately small share (less than 10%) of the target market's(s') imports.

Figure 5.8 displays the 36 countries and 810 'untapped' potential export opportunities identified associated with Q3, with a combined value of US$608.2 million. It is notable that the North African (US$249 million) and West African (US$224 million) markets represent the largest 'untapped' potential in relative terms (see Figure 5.9). Figure 5.10 offers further insight by illustrating South Africa's top 20 export opportunities within Q3.

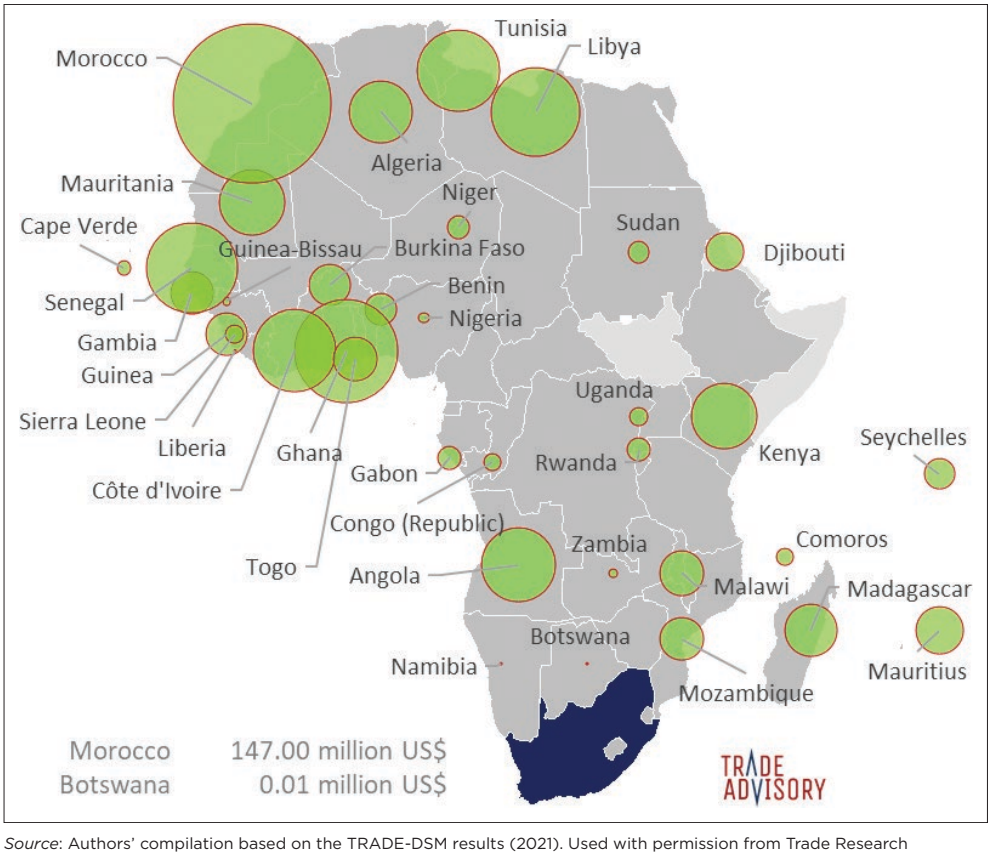
TABLE 5.3: TRADE-DSM REO Map outcomes of South Africa's export opportunities in Africa – Quadrant 3.

Map of realistic export opportunities (REOs) number [% of total number] 'Untapped' potential value in US$ million (m) [% of total value]		Relative market share of home market into target market(s)				
		Small (1)	**Intermediately small (2)**	**Intermediately large (3)**	**Large (4)**	**Row totals**
Product x target market (country) – size and growth	**Large (1)**	4 [0.5%] $63.21 m [10.4%]	-	-	-	**4 [0.5%] $63.21 m [10.4%]**
	Growing (2) (short and long term)	663 [81.9%] $467.16 m [76.8%]	134 [16.5%] $33.12 m [5.5%]	-	-	**797 [98.4%] $500.28 m [82.3%]**
	Large and growing (3) (short term)	-	-	-	-	**-**
	Large and growing (4) (long term)	4 [0.5%] $34.43 m [5.7%]	1 [0.1%] $1.42 m [0.2%]	-	-	**5 [0.6%] $35.86 m [5.9%]**
	Large and growing (5) (short and long term)	4 [0.5%] $8.83 m [1.5%]	-	-	-	**4 [0.5%] $8.83 m [1.5%]**
	Column totals	**675 [83.3%] $573.63 m [94.3%]**	**135 [16.7%] $34.55 m [5.7%]**	**-**	**-**	**810 [100.0%] $608.17 m [100.0%]**

Source: Authors' compilation based on the TRADE-DSM results (2021). Used with permission from Trade Research Advisory.
Key: US$, United States dollar; m, million; TRADE-DSM, TRADE-Decision Support Model.

In terms of products, the top 20 HS 2-digit chapters represent 93% of the 'untapped' potential and 72% of the number of products at the HS 6-digit product level. Products in chapter 19 – Preparations of cereals, flour, starch or milk; pastrycooks' products – represent 'untapped' potential of US$105 million and 33 individual products, followed by chapter 73 – Articles of iron or steel – with 76 individual product codes. Keeping in mind that the individual products are located in Q3, implying RCAs of <1 and >0.5, some of these individual products may require some form of assistance, development or investment (typically those with RCAs closer to 0.5). Others may be very close to 1 and for all practical purposes are potentially 'export ready' and only in need of marketing to push up the value of exports to the point where the product reaches an RCA of 1 or more and is classified as a comparative advantage for South Africa.

The challenge is that not all products and markets will yield the same relative returns. Hence, some prioritisation may be required, especially if resources for export promotion and development are constrained. To help

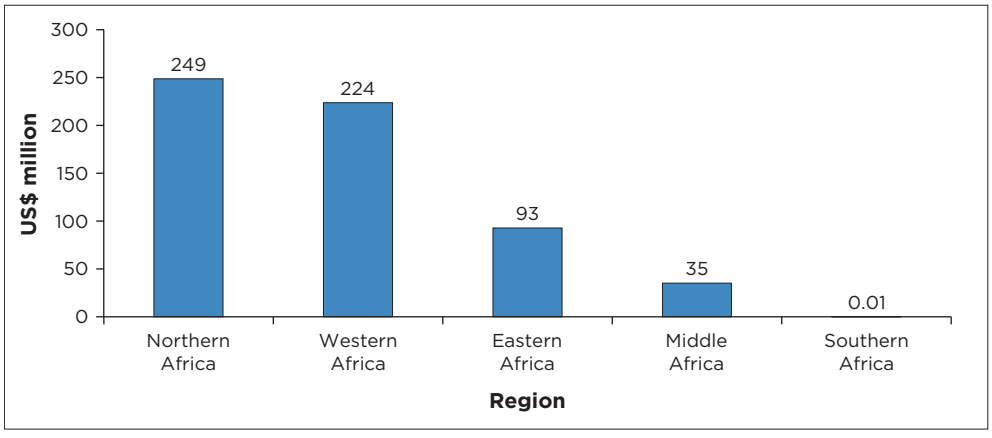


Source: Authors' compilation based on the TRADE-DSM results (2021). Used with permission from Trade Research Advisory.
Note: Country names with no associated results are not shown in the map, for example, Burundi, Cameroon, Democratic Republic of the Congo (DRC), Egypt, etc.
Key: US$, United States dollar; TRADE-DSM, TRADE-Decision Support Model.

FIGURE 5.8: Geographical distribution of South Africa's untapped trade potential in Africa.

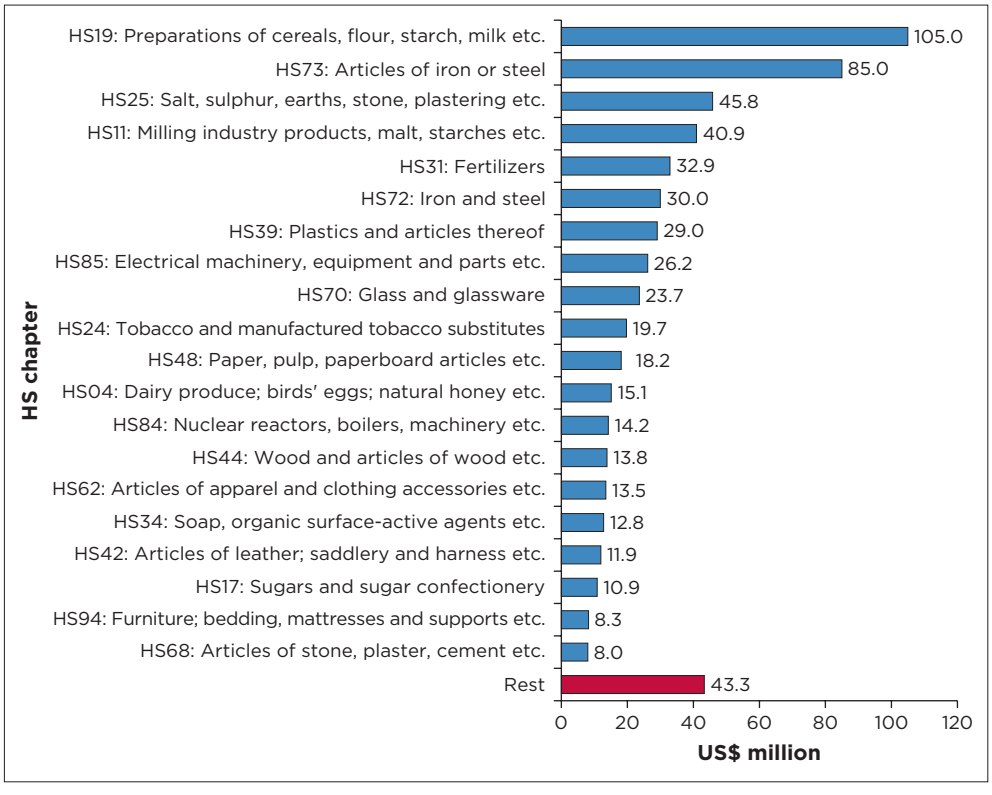
inform this dimension of export strategy formulation, Figure 5.11 provides a view of the relative relationship between value and number of products by potential target market, demonstrating clearly that Morocco is a significant outlier in terms of potential 'untapped' value and number of products. But how does one select the next best options?

Considering the Pareto principle from a value perspective, 19 top target markets represent 80% of the 'untapped' value, with Djibouti accounting for the lowest value in this group at US$7.7 million. Using the same principle from a product perspective, 17 markets represent 80% of the number of opportunities, the lowest number being 23 associated with Benin. Having imposed these lower-limit combinations of potential 'untapped' value and number of products, the group of markets meeting these thresholds is indicated in Figure 5.11.



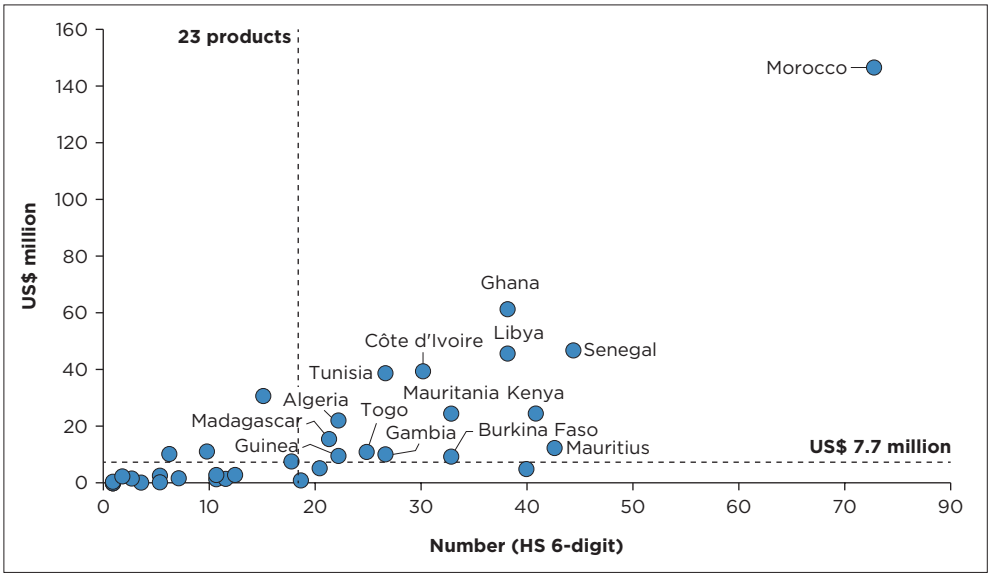
Source: Authors' compilation based on the TRADE-DSM results (2021). Used with permission from Trade Research Advisory.
Key: US$, United States dollar; TRADE-DSM, TRADE-Decision Support Model.

FIGURE 5.9: South Africa's regional untapped potential – Quadrant 3.



Source: Authors' compilation based on the TRADE-DSM results (2021). Used with permission from Trade Research Advisory.
Key: HS, Harmonized System; US$, United States dollar; TRADE-DSM, TRADE-Decision Support Model.

FIGURE 5.10: South Africa's top 20 export opportunities by Harmonized System (HS) chapter – Quadrant 3.



Source: Authors' compilation based on the TRADE-DSM results (2021). Used with permission from Trade Research Advisory.
Key: US$, United States dollar; HS, Harmonized System; TRADE-DSM, TRADE-Decision Support Model.

FIGURE 5.11: South Africa's opportunity target markets by value and number – Quadrant 3.

Therefore, for South Africa to focus on the markets with the most promise in terms of product diversification (i.e. a higher number of opportunities per market) and value associated with each target market, this group of 15 markets represents the most combined potential at the extensive margin. What is noticeable is that Central and Southern African countries are not present in this group. While this approach may seem very 'mechanistic', it is underpinned by a structured and fact-based approach that can be explained and repeated. From a policymaking perspective, there are obviously also socio-economic and political imperatives to consider, but this mechanism demonstrates an objective approach to rational economic decision-making from an export diversification perspective.

■ Conclusion

The diversification and sophistication of a country's export portfolio has been shown to be an important determinant of economic growth. In this regard, the AfCFTA may contribute to the types of profound reforms needed to boost growth through export diversification. However, one of the main obstacles to trade and export diversification on the continent is access to information about export opportunities. Before considering distribution constraints, exporters must first be able to identify potential buyers, because selecting the 'right' market is an important first step towards export success.

The results of this study focused specifically on one part of the extensive margin, that is, identifying new markets and new products. In total, 810 opportunities were identified in 36 countries with an estimated 'untapped' potential value of US$608.17 million. Of these opportunities, only 16.7% (5.7% in value terms) were related to markets where South Africa supplied a moderately small proportion of the target market's(s') existing imports. It is interesting that North African and West African markets were those with the highest 'untapped' potential on the continent for South Africa. From a product perspective, new products in new markets accounted for 40% of the realistic export potential identified for manufactured and processed goods. The top 20 HS 2-digit product chapters represented 93% of the 'untapped' potential and 72% of the number of products at the HS 6-digit product level.

The analysis identified 15 markets representing the most combined potential for South Africa at the extensive margin, namely Algeria, Burkina Faso, Gambia, Ghana, Guinea, Côte d'Ivoire, Kenya, Libya, Madagascar, Mauritania, Mauritius, Morocco, Senegal, Tunisia and Togo.

It is important to keep in mind that while some of the products highlighted may require some type of investment or development, others may already be export-ready and just require marketing to boost export values and to be classified as a comparative advantage for South Africa. However, as resources for export promotion and development are frequently limited, the challenge is to prioritise potential target markets based on the relative relationship between value and number of products.

The results presented here also matter for policymaking and should inform South Africa's strategy for industrialisation and export diversification. Because the AfCFTA aims to reverse Africa's premature deindustrialisation by tapping into the vast manufacturing opportunities on the continent, this study excluded mining and primary agricultural goods, unless any of these goods were processed or manufactured. The study therefore provided important information on realistic 'untapped' export opportunities to help diversify South Africa's manufactured and industrial exports.

From an export diversification perspective, this is an objective method for making rational economic decisions, while from a policy perspective, there are also socio-economic and political imperatives to consider. Nonetheless, this is a necessary first step in diversifying South Africa's exports.

A more detailed investigation and evaluation of each of the opportunities identified for South Africa in the rest of Africa is needed. However, this study shows policymakers where their focus could be and what could be considered in the ongoing negotiations underpinning the AfCFTA.

Key takeaways from this chapter

- This study underscored the paramount importance of export diversification in driving economic growth, particularly within the framework of the AfCFTA.
- It also highlighted that a critical barrier to export diversification is the limited access to information about export opportunities, emphasising the need for robust market intelligence mechanisms. The study identified 'untapped' export opportunities spanning both new markets and new products, offering clear direction for South Africa's export expansion efforts.
- Notably, the study identified that a significant proportion of South Africa's 'untapped' trade potential lies in North African and West African markets, suggesting that these regions may hold promising opportunities for growth.
- The analysis revealed that new products in new markets constitute a substantial proportion of the realistic export potential for manufactured and processed goods, suggesting avenues for diversification from a product perspective.
- The study also underscored the challenges associated with resource constraints in export promotion and development, thereby reinforcing the importance of strategic prioritisation.
- By identifying specific markets (15 in total) representing the greatest combined potential at the extensive margin, the study provides policymakers with a roadmap for targeted export promotion efforts.
- These comprehensive insights into export opportunities have the potential to inform South Africa's strategies for industrialisation and export diversification within the AfCFTA framework, thereby offering a credible route to sustainable economic development and prosperity.

Chapter 6

Export diversification: The case of north and south – bilateral opportunities for South Africa and Tunisia

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Introduction

With South Africa and Tunisia being located at opposite ends of the African continent and their main export markets being Europe and other major trading regions, one might think that the two countries have relatively little to offer one another in terms of reciprocal trade opportunities. To date, trade between South Africa and Tunisia has been very limited. One of the reasons for this is that both South Africa's and Tunisia's exports have traditionally been resource-based (with a focus on mining) with relatively little complementarity. Another reason is the distance between the most southern and northern countries in Africa.

However, recent years have seen South Africa and Tunisia diversify into the production of more value-added goods and services, which means that new opportunities are potentially opening up for greater two-way trade. Their respective governments are also giving increasing attention to the expansion and diversification of the countries' export sectors in the face of pressing economic challenges at home – from lacklustre economic growth to rising unemployment and inequality. Policymakers have recognised that there is potential for the two countries to address their similar economic challenges through heightened reciprocal trade.

In 2019, for the purpose of increasing trade and investment between South Africa and Tunisia, South Africa's deputy minister of trade and industry, Nomalungelo Gina, and Tunisia's secretary of state for foreign affairs, Sabri Bachtobji, committed to strengthening the bilateral economic relationship between their countries. They both emphasised that the two governments needed to establish a framework and create a conducive environment for business communities from South Africa and Tunisia to interact and work with each other. Despite the two countries being at opposite ends of the continent, there are many economic opportunities that can be explored and successfully leveraged with government support (Department of Trade, Industry and Competition [DTIC] 2019).

According to Mr Bachtobji (DTIC 2019):

> Our countries have enjoyed historically strong political ties, but it is incumbent upon us to strengthen our economic ties and increase economic cooperation between our countries. As government, we need to work together in setting up a framework and creating an environment that encourages our business communities to explore the economic opportunities that are available in both countries. There is quite a number of sectors in the Tunisian economy that teem with opportunities that the South African companies can take advantage of through trade, partnerships, investment and joint ventures.

Similarly, Ms Gina stressed the importance of increasing two-way trade and investment between South Africa and Tunisia so that jobs could be created and the two economies could grow (DTIC 2019).

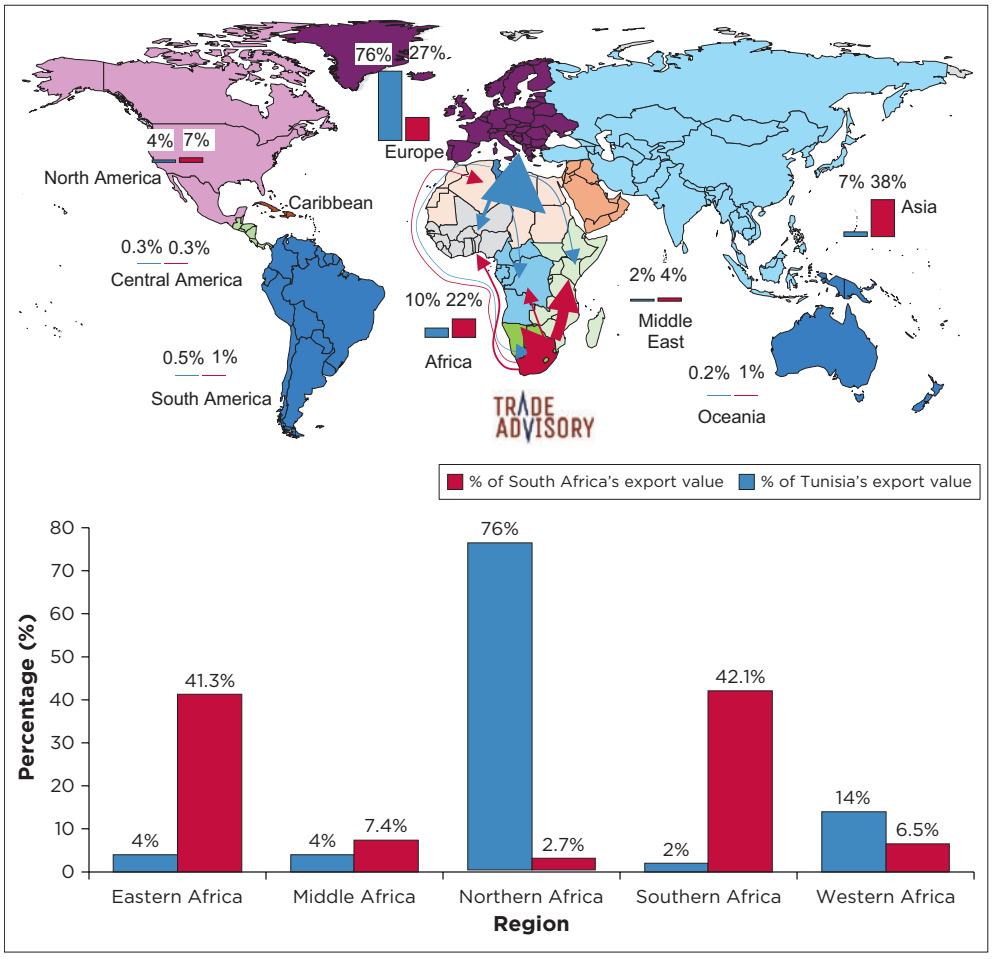
Over the five years from 2013 to 2018, trade between South Africa and Tunisia, which amounted to approximately ZAR462 million in 2018, reflected a mixture of growth and decline.[76] With the global trade arena experiencing much turbulence and traditional trade relationships facing increasing uncertainty, and with the African Continental Free Trade Area (AfCFTA) agreement having taken effect in January 2021, many African countries have been giving more attention to intra-Africa trade. Although trade on the continent is still very limited (see Chapter 1), attitudes are changing, particularly at the policy level.

As demonstrated in Figure 6.1, Tunisia's exports are mainly geared to European markets. Over the period 2015–2019, 76% of Tunisia's exports on average, in value terms, were destined for Europe,[77] while exports destined for Africa over the same period were comparatively limited (10%). Within Africa, Tunisia mainly exports to North Africa (representing 76% of Tunisia's total exports to Africa) and West Africa (representing 14% of Tunisia's total exports to Africa). Only 2% of Tunisia's exports to Africa were destined for southern Africa. In this context, South Africa accounted for only 0.15% of Tunisia's total exports and would therefore be a 'new' market for Tunisia in relative terms.

Around 19% of South Africa's exports in value terms over the period 2015–2019 went to Africa. South Africa's main export focus on the African continent is other Southern African Customs Union (SACU) and Southern African Development Community (SADC) member states (accounting for around 85% of South Africa's exports to Africa), with which South Africa has well-established trade ties. Exports from South Africa to Tunisia, in

76. It was against this backdrop that the governments of South Africa and Tunisia launched a bilateral research project under the auspices of the South Africa–Tunisia Science and Technology Collaboration initiative in 2019. The research project is aimed at identifying realistic and sustainable export opportunities between the two countries. A research consortium comprising the World Trade Organization (WTO) Chairs Programme at the North-West University (South Africa) and the University of Tunis (Tunisia) respectively was awarded the project. This research project is being funded by South Africa's National Research Foundation (NRF), Tunisia's Ministry of Higher Education and Scientific Research and Tunisia's Department of Science and Technology.

77. The international trade data informing the TRADE-DSM (Decision Support Model) outcomes as applied in this study were based on the Centre d'Études Prospectives et d'Informations Internationales (CEPII) Base pour l'Analyse du Commerce International (BACI) world trade database (2019 – HS 2012 revision). According to CEPII, the BACI reports export values excluding re-exports, unlike the usual international trade data, such as the United Nations (UN) Comtrade. Although later data were available from the Comtrade database and the International Trade Centre's (ITC) TradeMap, the modelling requirement for reconciled data placed a limit on the currency of the data. The current TRADE-DSM analysis in this chapter therefore made use of data for the period 2015–2019.

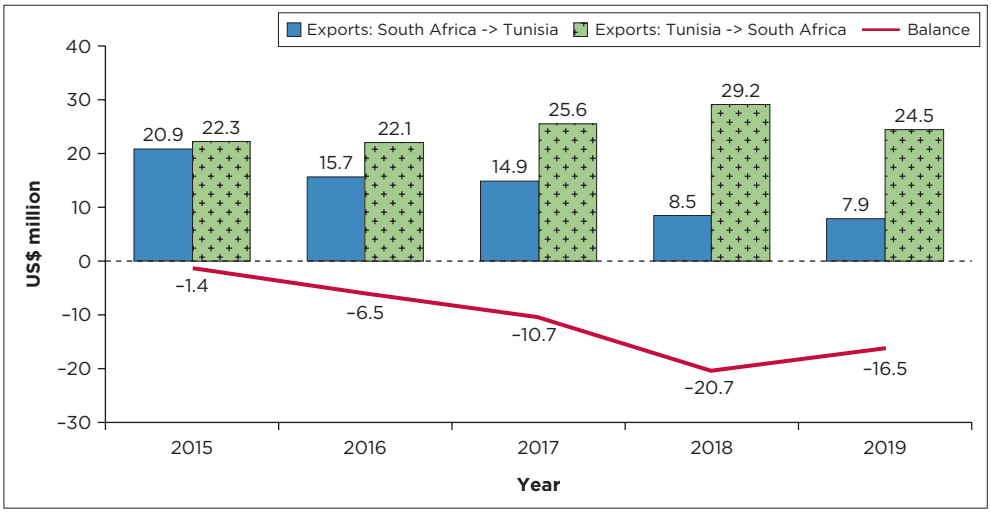


Source: Authors' calculations based on CEPII BACI (2021). Reproduced and published with permission from Trade Research Advisory.
Note: The share of total exports to Africa by sub-region corresponds with the line thickness of the arrows.
Key: CEPII, Centre d'Études Prospectives et d'Informations Internationales; BACI, Base pour l'Analyse du Commerce International.

FIGURE 6.1: Share of total exports to different world regions and to Africa by sub-region; and percentage of South Africa's and Tunisia's export value in these various regions (average 2015–2019).

turn, accounted for only about 0.01% of South Africa's total exports over the period.

Regarding total bilateral trade between South Africa and Tunisia, Figure 6.2 shows that the total value of South Africa's exports to Tunisia declined over the period 2015–2019, while the total value of Tunisia's exports to South Africa increased over the period. The overall result is that the merchandise trade balance between the two countries had increased in Tunisia's favour to around US$16.5 million by 2019.



Source: Authors' calculations based on CEPII BACI (2021). Reproduced and published with permission from Trade Research Advisory.
Key: US$, United States dollar; CEPII, Centre d'Études Prospectives et d'Informations Internationales; BACI, Base pour l'Analyse du Commerce International.

FIGURE 6.2: Total bilateral trade and trade balance between South Africa and Tunisia (2015–2019).

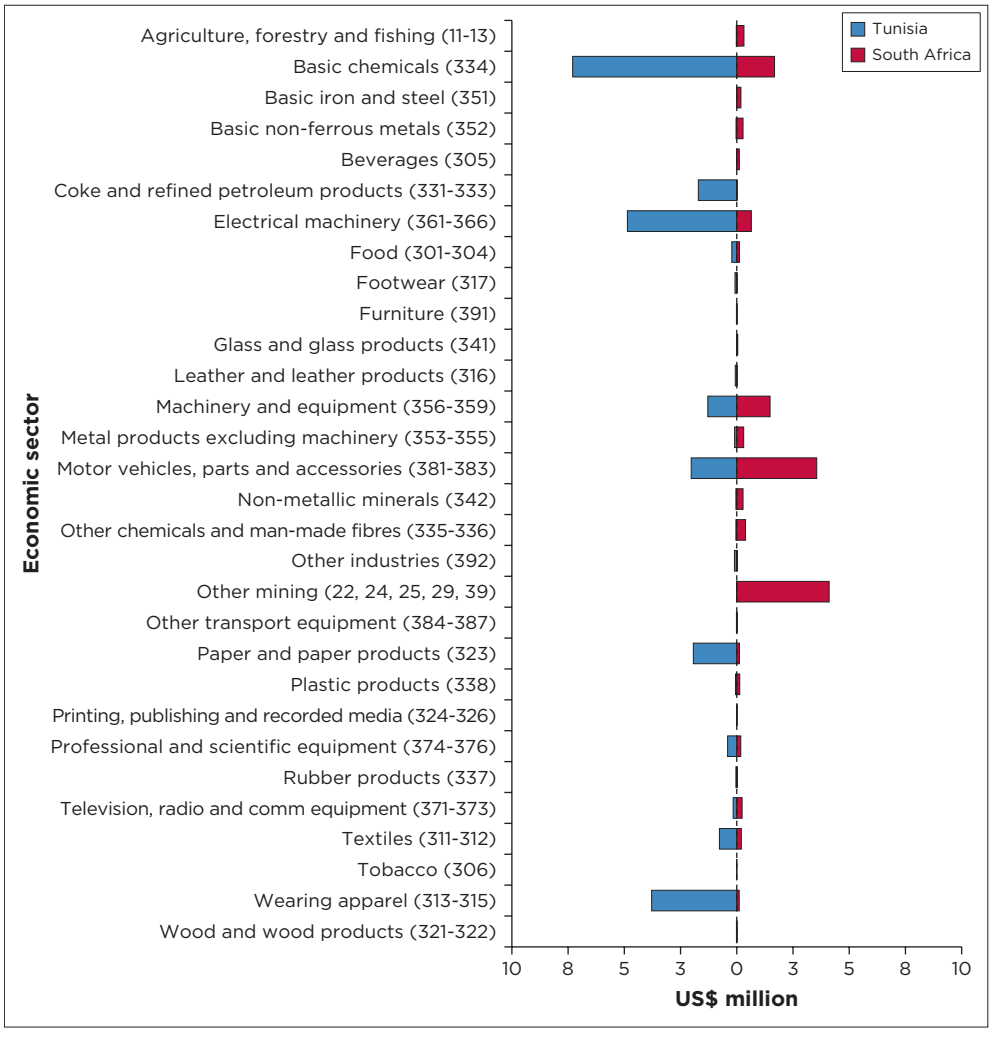
Regarding the value of trade, on average, for the period in question between the two countries by major sector (see Figure 6.3), the Basic chemicals sector accounted for the majority of exports from Tunisia to South Africa, followed by Electrical machinery, Wearing apparel, and Motor vehicles, parts and accessories, as well as some Paper and paper products.

South Africa's exports to Tunisia are mainly associated with Other mining, Motor vehicles, parts and accessories, Basic chemicals, and Electrical machinery. While there is some activity in the remaining sectors, the relative trade in respect of these is small.

However, the synergies between South Africa and Tunisia could in time translate into a more robust trading relationship. To this end, it is important to identify realistic bilateral export opportunities between these two countries. The need to identify potential export opportunities and the underlying challenges in this regard are discussed in the next section.

The need to identify potential export markets

As mentioned in Chapter 1, one of the main obstacles to successful trade expansion in Africa is that policymakers and businesses often lack relevant and reliable data on which to base their market selection and/or development decisions. Chapter 1 concludes that for countries to increase



Source: Authors' calculations based on CEPII BACI (2021). Reproduced and published with permission from Trade Research Advisory.
Key: US$, United States dollar; CEPII, Centre d'Études Prospectives et d'Informations Internationales; BACI, Base pour l'Analyse du Commerce International.

FIGURE 6.3: Structural existing bilateral trade between South Africa and Tunisia by economic sector (average 2015–2019).

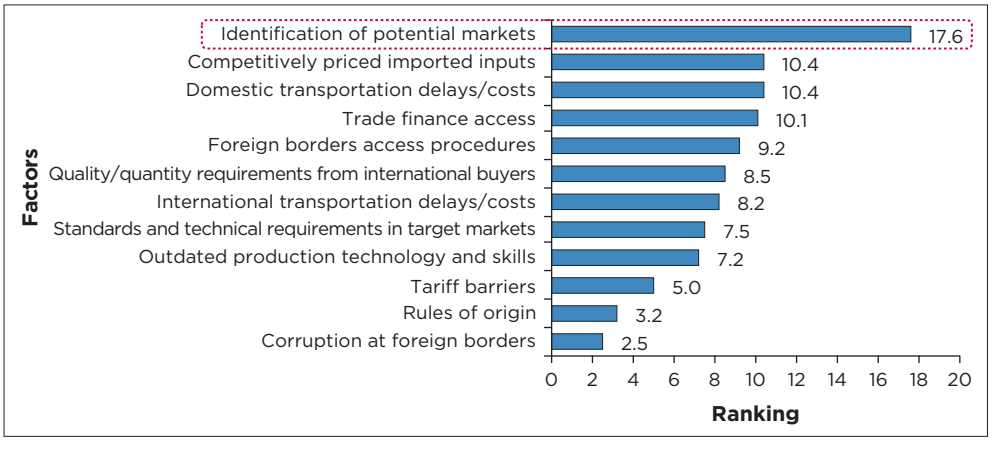
their trade at both the intensive[78] margin (exporting more existing products to existing markets) and the extensive margin (diversifying into either new products or new markets, or both), they require information about potential realistic export opportunities (REOs).

78. Brenton and Newfarmer (2009) define the expansion of existing products in existing markets as growth at the intensive margin and the introduction of 'new' products and new geographical markets as growth at the extensive margin.

The results of Tunisia's and South Africa's responses to the questions relating to the five aspects of trade costs in which they would most value improvement are summarised in Figure 6.4 and Figure 6.5, respectively. These results are taken from the World Economic Forum (WEF 2016), which expands on the International Trade Centre (ITC) Monitoring Survey (2015), as contained in Organisation for Economic Co-operation and Development/World Trade Organization (OECD/WTO 2015). In the survey, respondents represented a mixture of sizes of enterprises and different levels of experience in international trade. The results were tabulated and weighted according to the rankings assigned by the respondents.

Figure 6.4 and Figure 6.5 show that while the identification of potential markets and buyers ranks in first place for Tunisia, it ranks relatively lower for South Africa. Tunisia's score of 17.6 signals that this factor is by far the most problematic from an exporting perspective. The score for the second most problematic factor in Tunisia (access to competitively priced imported inputs) is comparatively much lower at 10.4.

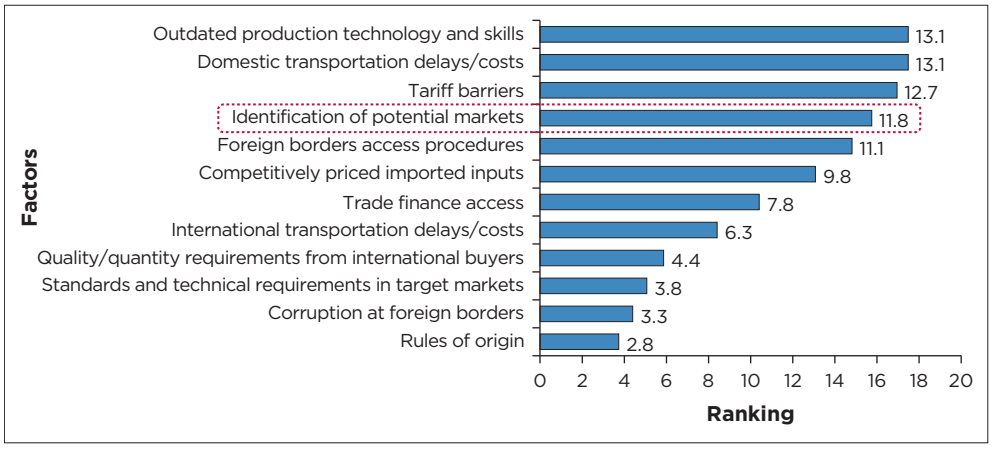
South Africa's score for the factor, the identification of potential markets (and buyers), ranked fourth, but is close (at 11.8) to the score for the highest-ranking factor, that of outdated production technology and skills availability (at 13.1). This is a result of significant challenges relating to other factors associated with logistics, energy, technology and skills in the recent history of South Africa's economic landscape. Considering that the ratio of the differential[79] between this fourth-ranked factor and the most significant



Source: Authors' representation of results from WEF (2016).
Note: Respondents to the WEF Executive Opinion Survey were asked to select the five most problematic factors by allocating a ranking between 1 (most problematic) and 5 (least problematic). The scores in the figure are based on a weighted result of these rankings for Tunisia.
Key: WEF, World Economic Forum.

FIGURE 6.4: Tunisia – most problematic factors for exporting.

79. Calculated as 1 - (11.8/13.8) = 0.10.



Source: Authors' representation of results from WEF (2016).
Note: Respondents to the WEF Executive Opinion Survey were asked to select the five most problematic factors by allocating a ranking between 1 (most problematic) and 5 (least problematic). The scores in the chart are based on a weighted result of these rankings for South Africa.
Key: WEF, World Economic Forum.

FIGURE 6.5: South Africa – most problematic factors for exporting.

factor is only 0.10, while comparatively the fourth factor-differential ratio[80] for Tunisia is 0.43, one can conclude that although the market identification factor is ranked in fourth place for South Africa, it remains at the top in relative terms with the other three factors. Therefore, it is still very or equally important.

In the global context, as discussed in Chapter 1, as well as in the case of South Africa and Tunisia specifically, it is clear that choosing a suitable foreign market is one of the most important international business decisions that firms can make. It is also one of the most significant export barriers to overcome when firms wish to enter new foreign markets and/or expand their current export operations (Cavusgil & Naor 1987; Johanson & Vahlne 1990; Katsikeas & Morgan 1994; Leonidou 1995; Ozturk, Joiner & Cavusgil 2015; Reid 1981; Wiedersheim-Paul, Olson & Welch 1978).

Ozturk et al. (2015, p. 120) assert: 'International market selection (IMS) and foreign market opportunity analysis (FMOA) are critical success factors in the international market expansion of firms'. The IMS decision has significant implications for exporting companies, governments, industry associations and other stakeholders. Yet it is made complicated by a plethora of information sources and analytical models to choose from. Furthermore, despite the ready availability of and access to information and analytical techniques, past research shows that many organisations make IMS decisions in a haphazard manner, often using non-systematic

80. Calculated as 1 - (10.1/17.6) = 0.43.

and biased approaches (Calof 1997; Calof & Viviers 2020; Cameron, Viviers & Steenbergen 2017; Malhotra & Papadopoulos 2007).

Increasing exports is one of the most efficient ways of enhancing firms' and consequently countries' growth. Increased exports directly and positively impact job creation, poverty alleviation and economic development and help to promote sustainable and balanced economic growth in a country or region (Calof & Viviers 2020; Cuyvers, Steenkamp & Viviers 2012; Czinkota & Ronkainen 1998; Los, Timmer & De Vries 2015). This is one of the reasons why many national or government export promotion agencies (EPAs) have introduced export assistance programmes or information services that focus on the intelligence needs of exporters (Calof 1997; Czinkota & Johnston 1981; Denis & Depelteau 1985).

However, even if exporters and export promotion organisations have access to relevant information, the sheer volume of information makes the decision-making process complex, time-consuming and costly, particularly given the speed at which scientific research is accelerating. The number of analytical models and theories for selecting international markets has increased as well, yet many exporters lack an appropriate methodology or systematic approach for choosing foreign markets (see Calof & Viviers 2020; Hughes 2017).

One possible solution to this dilemma that exporters and their respective countries and organisations have at their disposal is the TRADE-DSM approach. This approach identifies REOs in the form of combinations of products and markets as well as those export opportunities with the highest trade potential for exporters in the countries concerned. The TRADE-DSM is recognised by leading international organisations as a reputable and scientific methodology that assists exporters, export promotion organisations and governments in making complex market selection decisions (see Chapter 2).

The next section provides a demarcation of the TRADE-DSM methodology and key assumptions applied for this particular analysis for the purpose of identifying bilateral REOs between South Africa and Tunisia.

Applying the TRADE-DSM

Bilateral trade between South Africa and Tunisia is relatively low, as mentioned in the introduction to this chapter. South Africa is ranked 46th (0.15%) as a supplier of Tunisia's imports (averaged over the period 2015–2019), while Tunisia is ranked 123rd (0.01%) as a supplier of South Africa's imports, as shown in the BACI world trade database (CEPII 2021).

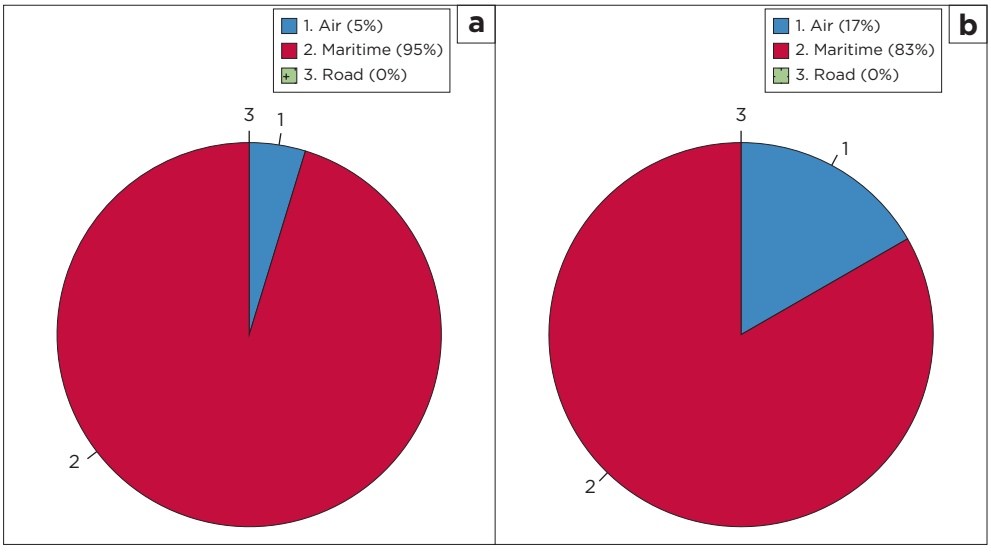
As discussed in Chapter 1, the relative 'fit' between country pairs in terms of the complementarity of their respective export and import patterns provides an indication of the potential for trade synergies between the two countries. For the country pair, Tunisia and South Africa, Tunisia as an exporter to South Africa has a Trade Complementarity Index[81] (TCI) of 50.79, while South Africa as an exporter to Tunisia has a slightly higher average TCI of 51.45.

The TCIs for these two countries – in both cases, close to 50 – indicate that bilateral trade opportunities exist, but they are not being fully realised. However, it is evident that while at the macro level these indicators provide a view regarding the 'overall fit' (or not), in which exact sectors or products the opportunities may exist is not clear, and the results can potentially look totally different at the lower product level – for example, at the Harmonized System (HS) 6-digit detail level. Furthermore, there seems to be potential complementarity based on total trade data alone – that is, not accounting for existing bilateral flows between the country pair or practical real-world issues impacting trade flows between the countries (as mentioned in Chapter 1). Tariff-related costs and non-tariff barriers, such as market access hurdles, competition and logistical challenges, also impact the potential for trade to develop between potential country pairs in respect of certain products.

For this reason, we applied the TRADE-DSM approach for both markets and compared the outcomes, not only with each country's product range but also with the overall TCI outcome. Key assumptions that impact the model's outcomes for Tunisia and South Africa can be reviewed in Chapter 2 as well as in Chapter 4 (specific to Tunisia) and in Chapter 5 (specific to South Africa).

While some products (especially high-value and perishable products such as medical reagents and equipment) traded between South Africa and Tunisia are mainly transported by air, the majority of traded products between the two countries are moved via maritime transport. What is evident from Figure 6.6 is that, on average, only 5% of the value of exports from South Africa to Tunisia over the period 2015–2019 was reported to be transported by air (Panel [a]) and was associated mainly with direct exports (country of export reported as South Africa).

81. It should be recalled that the TCI measures the extent to which the export profile of country (or country group) *j* matches the import profile of country (or country group) *k*, the trade partner of country *j*. Outcomes range from 0 to 100, with 0 indicating that there is no correspondence between country *j*'s export structure and country *k*'s import structure, while at the other end of the scale 100 indicates a perfect match in the two partners' export/import pattern. Therefore, the thinking is that two countries with a relatively high index may gain from trade expansion following the signing of a preferential trade agreement.



Source: Authors' own compilation using statistics from the South African Revenue Service (SARS 2021).
FIGURE 6.6: Share of value of exports and imports – South Africa to Tunisia by mode of transport (average 2015–2019).

Looking at the process in reverse, 17% of imports from Tunisia into South Africa were reported to be transported by air (Panel [b]). On average, only 7% of the value of these imports was associated with direct imports (country of export reported as Tunisia); the rest were routed via other countries in Europe and other locations.

The combined value of goods (imports and exports) transported by air accounted for 13% of bilateral trade between the two countries, while the combined value of goods transported by maritime transport accounted for 87% of bilateral trade. However, a detailed product breakdown of global trade flows is not available by mode of transport. Therefore, for the purposes of this analysis, only maritime logistics were considered as a proxy for potential transaction flows between the two countries.

Regarding tariff barriers, at the time of writing, the AfCFTA-proposed tariff reductions were not available and had therefore not been implemented. Hence, the modelling applied the 'as-is' ad valorem-equivalent (AVE) tariffs for the period, as reported by the ITC's (2019a) Market Access Map (MacMap).

As mentioned in Chapter 5, as the AfCFTA aims to reverse Africa's premature deindustrialisation by tapping into the vast manufacturing opportunities on the continent, this study excluded certain mining and primary agricultural products, as well as primary forestry products. However, it included these goods if anything was processed or manufactured (e.g. paper but excluding pulp). See Table 6.1 for a list of product groups in which the excluded HS 6-digit products appeared.

TABLE 6.1: Excluded products.

Excluded broad product groups	Details (Chapter and no. of HS 6-digit codes excluded)
Live animals and fish-related	HS01 (34), HS03 (8)
Basic gold and precious metals-related	HS71 (14)
Basic platinum group (PGMs)-related	HS71 (8)
Basic copper products	HS26 (1), HS74 (11), HS79 (6)
Basic diamonds-related	HS71 (9)
Coal-related	HS27 (15)
Crude oil-related	HS27 (1)
Petroleum-related	HS27 (23)
Natural gas (energy)-related	HS27 (1)
Other mining-related	HS26 (1)
Automotive related (determined by original equipment manufacturers [OEMs] in a global value chain [GVC] context)	HS40 (21), HS70 (3), HS83 (2), HS84 (13), HS85 (7), HS87 (74), HS91 (1), HS94 (1), HS96 (1)
Arms and ammunition-related	HS87 (1), HS93 (18)
Other unclassified goods	HS97 (7), HS99 (1)
Total (based on nomenclature, not on reported data)	279

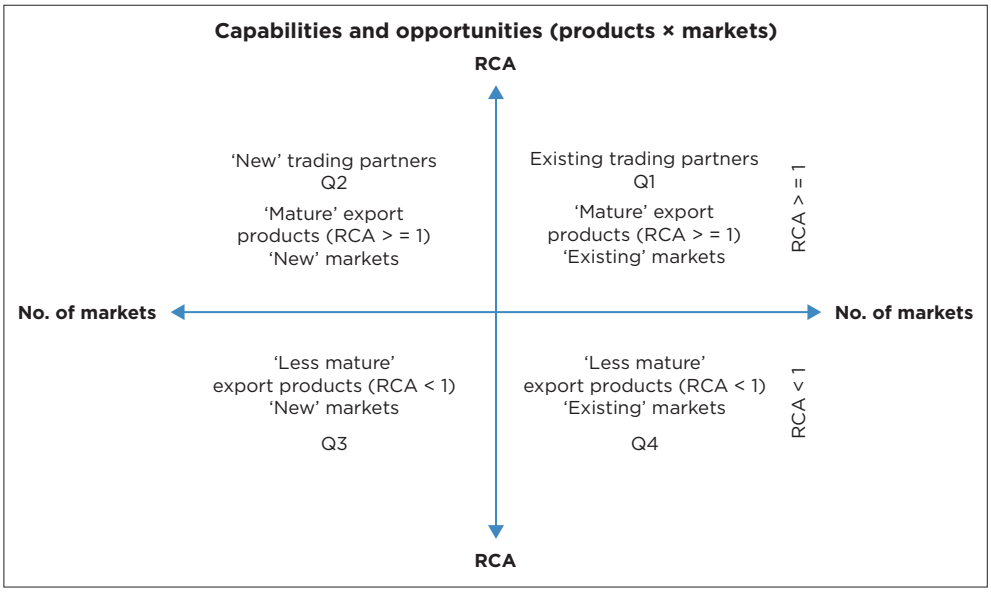
Source: Authors' own work.
Key: HS, Harmonized System.

The focus of our analysis was on the short-term, 'export-ready' or 'mature' export products between the two countries with a revealed comparative advantage (RCA > 1). As explained in Chapter 2, filter 4 regards the RCA as a key measure used as a proxy for aspects on which it is difficult to obtain empirical information, such as the productivity of firms. The RCA is also seen to be a measure of both the comparative advantage (the relative size in the export basket) and competitive advantage (the proxy for productivity) of a product (Liu et al. 2018).

The second element of filter 4 provides an indication of whether the product in question is locally produced or probably only re-exported. This is determined by using the revealed trade advantage (RTA) as a further sub-filter within filter 4. More details are provided in Chapter 2.

Regarding the REOs represented in the strategic analytical framework (described in Chapter 2) that supports this conceptual model, the focus of this analysis was on opportunities classified as Quadrant 1 (Q1 in Figure 6.7), representing mature export products with growth potential in markets already well serviced by the exporting country, and Quadrant 2 (Q2 in Figure 6.7), representing mature products with growth potential in new markets.

In Figure 6.7, opportunities classified as Q3, representing less-mature export products with growth potential in new markets, and Q4, representing less-mature products with growth potential in markets already well serviced by the exporting country, were therefore not included in the analysis. There may, however, be merit in investigating the Q3 and Q4 opportunities in future studies in the context of the countries' export development and



Source: Authors' own compilation to explain the TRADE-DSM results.
Key: Q, quadrant; No., number; RCA, revealed comparative advantage; TRADE-DSM, TRADE-Decision Support Model.
FIGURE 6.7: Conceptual model depicting export maturity, market share and growth.

industrialisation expansion plans. Typically, though, it takes longer for these types of opportunities to produce positive results, as production capabilities and/or capacity may need to be developed.

We therefore directed our attention at opportunities at the intensive margin (Q1), which relates to the expansion of existing products in existing markets (Brenton & Newfarmer 2009), for those products in which Tunisia and South Africa have existing export capabilities (RCA > 1) and which they already trade with each other. In addition, we focused on opportunities at the extensive margin (Q2), for products in which both countries have existing export capabilities (RCA > 1) but which they do not trade with each other or in which they have very limited trade. Hence, increasing bilateral exports equates to 'new' markets for these products.

The next section provides the outcomes from the process and a high-level discussion of key observations.

Discussion of the results

Because this is an illustrative application of the TRADE-DSM approach to demonstrate relevance for bilateral opportunity identification, the overall process and outcomes are discussed first, including some detailed HS 6-digit product-level examples for Tunisia and South Africa, respectively. Thereafter, a higher-level summary of specific opportunities associated

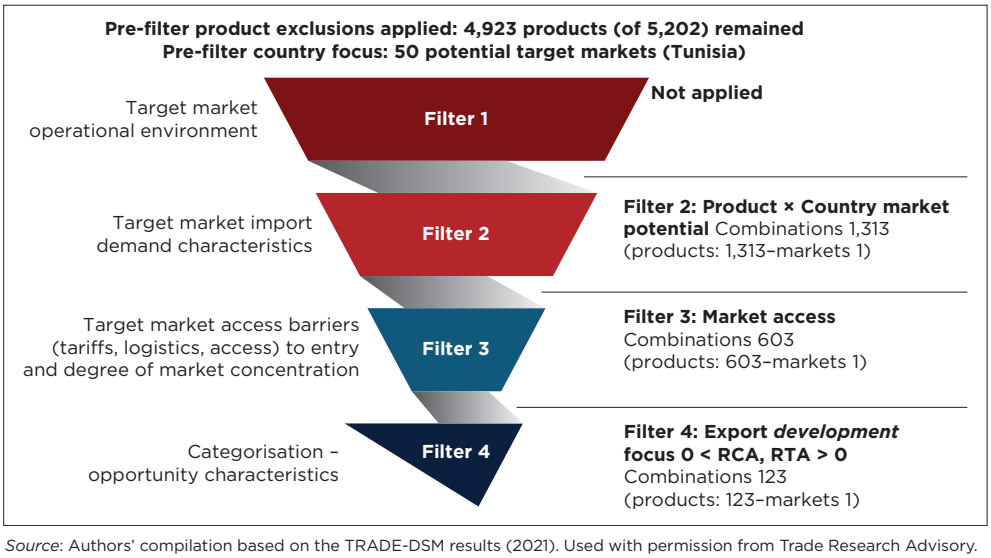
with 'export-ready' opportunities aggregated by economic sector is provided. The outcomes are then compared with the overall complementarity indices between the country pair.

Summary of overall process outcomes and product-level examples

The reduction of all possible products for export, from South Africa to Tunisia, to only those that are deemed to be REOs based on the filtering process for products, is summarised in Figure 6.8.

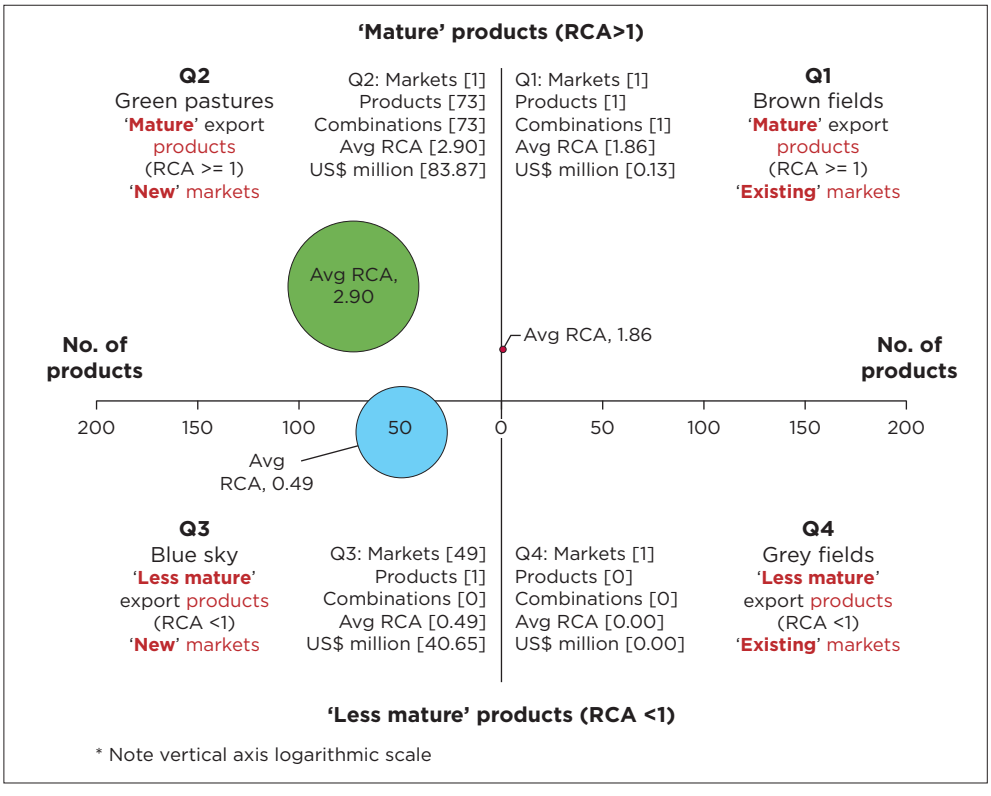
Of the more than 5,000 HS 6-digit tariff lines in the HS nomenclature, 279 individual products are excluded (explained in the previous section), as listed in Table 6.1. Once the relative import demand analysis is conducted (filter 2), 1,313 products remain, but these are further reduced to 603 after filter 3 (relative market access in terms of tariffs, logistics and market competition) is applied. When considering the RTA requirements for both the intensive and extensive margin products in filter 4, a final set of 123 products remains.

These are, however, opportunities both at the intensive (RCA ≥ 1) and extensive (0 < RCA < 1) margins and are depicted in an aggregate form in Figure 6.9. Of the 123 products, one is classified into Q1, 73 into Q2 and 49 into Q3. The relative size of the associated 'untapped' potential aggregated across all products in each quadrant is reflected in the relative size of the bubble. The group of 73 products in Q2, for example, exhibits an



Source: Authors' compilation based on the TRADE-DSM results (2021). Used with permission from Trade Research Advisory.
Key: RCA, revealed comparative advantage; RTA, revealed trade advantage; TRADE-DSM, TRADE-Decision Support Model.

FIGURE 6.8: Illustration of stepwise filtering results – South Africa's opportunities to Tunisia.

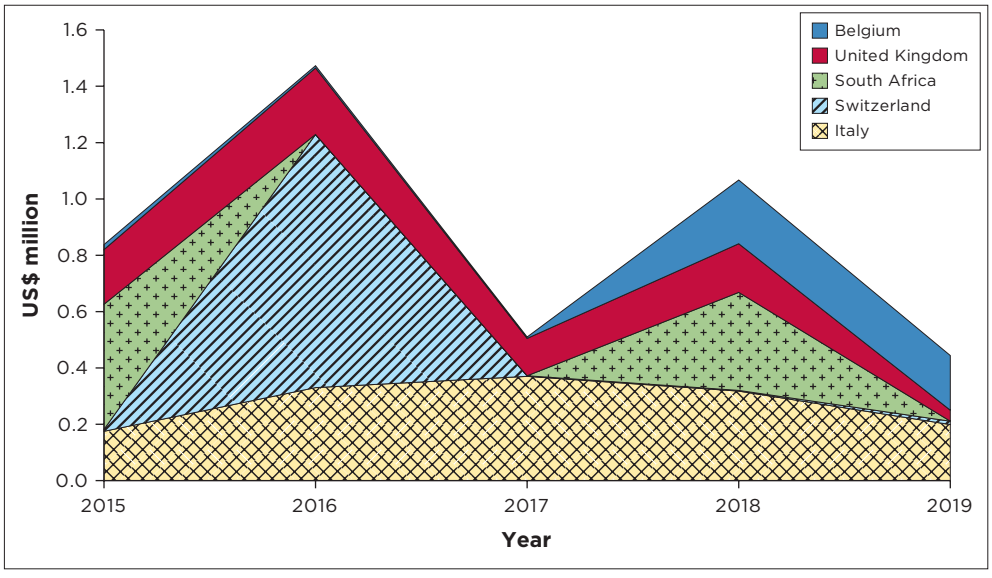


Source: Authors' compilation based on the TRADE-DSM results (2021). Used with permission from Trade Research Advisory.
Key: Avg, average; No., number; US$, United States dollar; Q, quadrant; RCA, revealed comparative advantage; TRADE-DSM, TRADE-Decision Support Model.

FIGURE 6.9: Summary of bilateral opportunities – South Africa to Tunisia.

overall 'untapped' potential of US$83.87 million combined (see Chapter 2 for more details on the definition and calculation of the 'untapped' potential). This group (Q2) has an average RCA of 2.9. For Q3, the 49 products overall represent 'untapped' potential of US$40.65 million combined with an average RCA of around 0.49.

There is a single product in Q1, with 'untapped' potential of US$0.13 million. South Africa has a time-weighted RCA of 1.86 for this product and has already provided an intermediately large share of this product to Tunisia over the five years from 2015 to 2019, based on CEPII data. The product in question is *HS8546.90 Electrical insulators: Other than of glass and ceramics*, with South Africa having supplied around 18% on a time-weighted basis (see Chapter 2 for more details on the time-weighted calculation) of Tunisia's imports of this product – one of the top five sources of imports of the product for Tunisia for this period. When investigating the reported imports into Tunisia on the ITC's TradeMap, we found that zero imports are reported in Tunisia's directly reported data. However, as can be



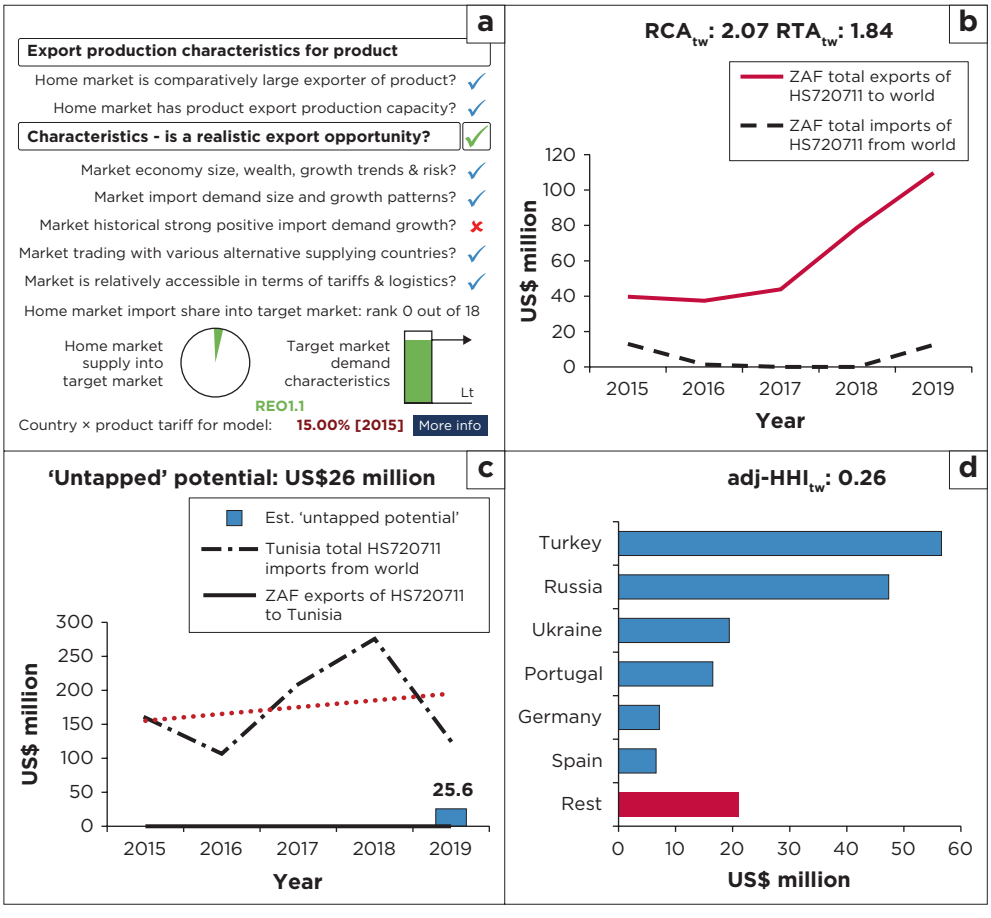
Source: Authors' calculations, based on the International Trade Centre (ITC) TradeMap (ITC 2019b).
Key: US$, United States dollar.

FIGURE 6.10: Import values into Tunisia for HS8546.90 (2015–2019).

seen in Figure 6.10, the mirror trade reported data correspond with the CEPII estimates and South African Revenue Service (SARS 2021) statistics for exports of this product from South Africa to Tunisia.

While the complete set of outcomes is shown for all types (quadrants) of intensive and extensive margin opportunities from South Africa to Tunisia, the focus of the rest of the analysis is on the 'traditional' or 'export-ready' type of opportunities only, represented in Q1 (gaining further market share in Tunisia) and Q2 (creating access or opening up exports of products previously not exported or only exported in small amounts to Tunisia, with Tunisia being a 'new' market for these products). Additional potential opportunities, represented by Q3, could be identified through future research.

To further illustrate the outcomes in Q2, consider the example of *HS7207.11 Iron or non-alloy steel: Semi-finished products of iron or non-alloy steel: Containing by weight less than 0.25% of carbon, of rectangular (including square) cross-section, width less than twice thickness*. The outcomes of the evaluation of this opportunity from South Africa to Tunisia are summarised in Figure 6.11 (Panel [a]). South Africa's total exports and imports of the product are shown in Figure 6.11 (Panel [b]). It is evident that South Africa's time-weighted RCA for this product is 2.07 (therefore, $RCA_{tw} \geq 1$) and its RTA is 1.84 (therefore, $RTA_{tw} > 0$). It should also be noted that South Africa has historically managed to grow its exports of the product to around US$100 million.



Source: Authors' calculations based on the TRADE-DSM results and CEPII (2021). Used with permission from Trade Research Advisory.
Key: RCA, revealed comparative advantage; RTA, revealed trade advantage; US$, United States dollar; adj., adjusted; est., estimated; CEPII, Centre d'Études Prospectives et d'Informations Internationales; REOs, realistic export opportunities; HS, Harmonized System; HHI, Herfindahl-Hirschman Index; TRADE-DSM, TRADE-Decision Support Model.

FIGURE 6.11: South Africa to Tunisia detailed Q2 example of HS7207.11 (Steel).

Regarding import demand, Figure 6.11 (Panel [c]) shows Tunisia's total import demand trends over the period. While total import demand fluctuates around the US$150 million mark, the associated estimated 'untapped' potential for this product is shown to be around US$26 million, with the average of the time-weighted imports sourced from the top six competitors supplying into Tunisia over the period. If South Africa managed to grow its exports to Tunisia to this value, it would increase from a zero base and be a 'reasonable' value compared to existing export capability. However, as the approach does not consider South Africa's actual production capacity, this may not be the case, or much more production may even be possible.

Lastly, Figure 6.11 (Panel [d]) shows which countries are the top competitors and shows the adjusted Herfindahl–Hirschman concentration index at

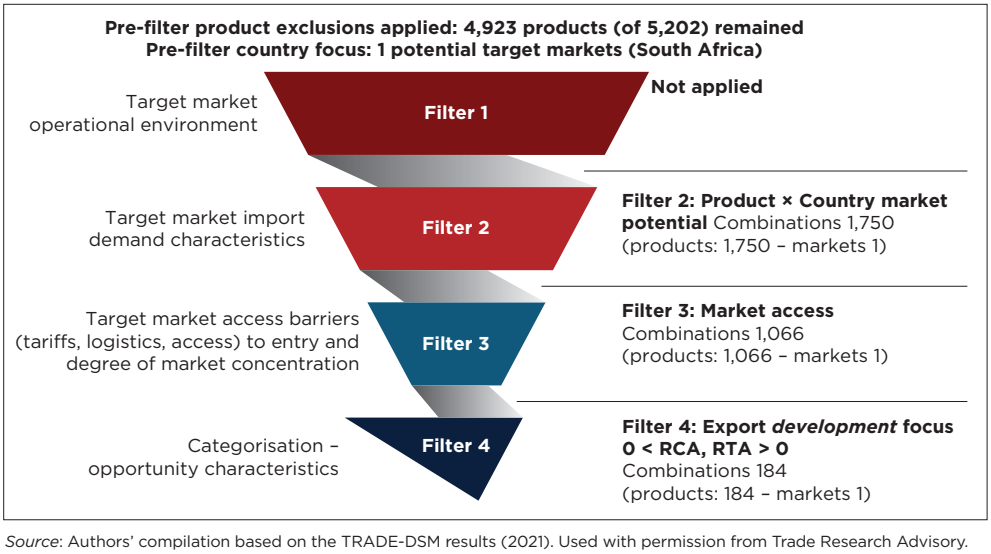
around 0.26. (Closer to 1 is more concentrated, while closer to 0 is less concentrated. Refer to Chapter 2 for more details.) Suffice to say that the approach identifies an actual example at the HS 6-digit level within reasonable parameters.

At the time of the evaluation, Tunisia imposed a 15% AVE import duty on the imports of this product. Overall, the REO classification allocated to this opportunity is $REO_{1,1}$, meaning that this opportunity into Tunisia is a relatively large but stagnant market (row 1 in the TRADE-DSM REO Map Map discussed in Chapter 2), and South Africa supplies none or very little of Tunisia's imports of this product (column 1 in the TRADE-DSM REO Map discussed in Chapter 2).

Each of the identified 123 HS 6-digit products could be analysed in this fashion to understand the evaluation in more detail. However, it is beyond the scope of this study to do so.

Similar to the preceding discussion of South Africa's identified opportunities for Tunisia, Figure 6.12 depicts the reduction of all possible products for export from Tunisia to South Africa.

The focus of the ensuing discussion is the application of filter 2 onwards. A total of 1,750 products that Tunisia could potentially export to South Africa remain, but these are further reduced to 1,066 after filter 3 (relative market access in terms of tariffs, logistics and market competition) is applied. In the end, a total of 184 products (slightly more than from South Africa to Tunisia) remain after the RCA and RTA requirements in filter 4 for both intensive and extensive margin products have been considered.

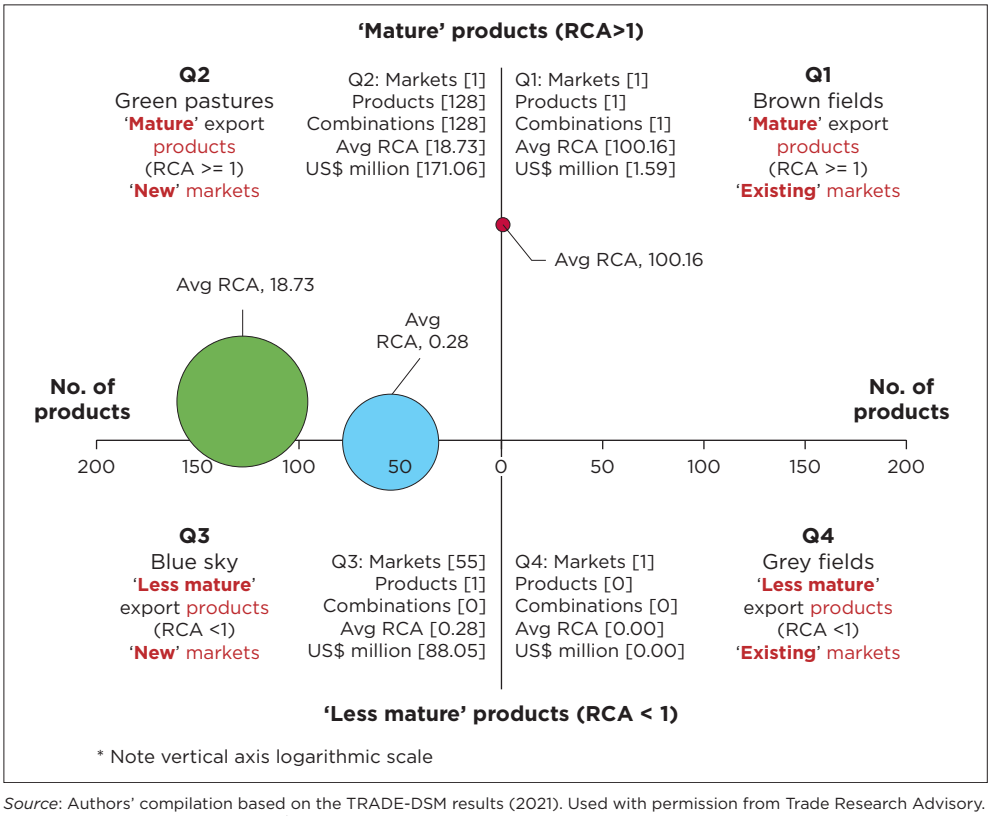


Source: Authors' compilation based on the TRADE-DSM results (2021). Used with permission from Trade Research Advisory.
Key: RCA, revealed comparative advantage; RTA, revealed trade advantage; TRADE-DSM, TRADE-Decision Support Model.

FIGURE 6.12: Illustration of stepwise filtering results for Tunisia's opportunities to South Africa.

These are depicted in an aggregate form in Figure 6.13. Again, a single product is classified into Q1 (with an overall estimated 'untapped' potential of US$1.59 million), while 128 are classified into Q2 and 55 into Q3. The group of 128 products in Q2 exhibits an overall 'untapped' potential of US$171.06 million combined and has an RCA = 18.73 on average. The 55 products in Q3 represent 'untapped' potential of around US$88.05 million combined and a relatively low average RCA of around 0.28. As mentioned previously, no details on production capabilities and capacity are known for this group, nor whether there is excess production capacity for the Q2 opportunities. This analysis aimed to identify opportunities. How the opportunities are realised would be a separate discussion from a production strategy perspective and has not been included in the analysis.

For interest's sake, we considered the single product identified in Q1, which is *HS2826.12 Aluminium fluoride*. Tunisia is classified as a 'large' source of imports of this product for South Africa on a time-weighted basis over the period 2015–2019. By studying reported import statistics for



Source: Authors' compilation based on the TRADE-DSM results (2021). Used with permission from Trade Research Advisory. Key: Avg, average; No., number; US$, United States dollar; Q, quadrant; RCA, revealed comparative advantage; TRADE-DSM, TRADE-Decision Support Model.

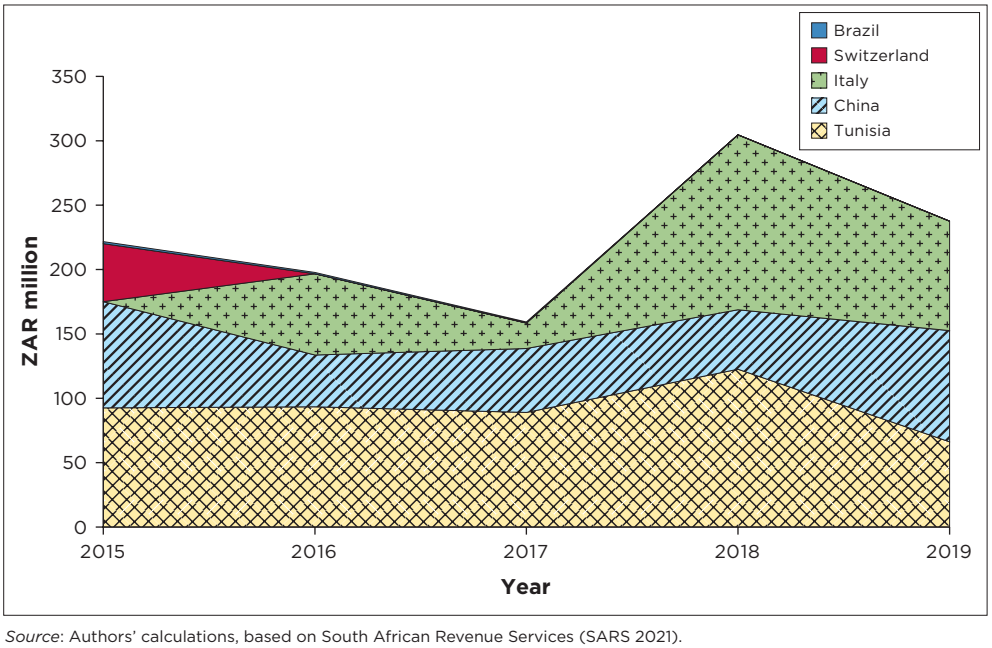
FIGURE 6.13: Summary of bilateral opportunities – Tunisia to South Africa.

South Africa, it became clear that the model had indeed identified a product for which Tunisia could probably formulate a strategy to gain more (or regain) market share in South Africa, which already seems to be a lucrative market for Tunisia. From Figure 6.14, it appears that Italy and China have made inroads into the market share previously supplied by Tunisia.

Similar to the detailed example provided for the South Africa-to-Tunisia case (HS7207.11 Iron or non-alloy steel …), we investigated *HS281530: Peroxides of sodium or potassium* as an example of the Tunisia-to-South Africa case.

The outcomes of the evaluation of this opportunity from Tunisia to South Africa are summarised in Figure 6.15 (Panel [a]). Tunisia's total exports and imports of the product are shown in Figure 6.15 (Panel [b]). It is evident that Tunisia's time-weighted RCA for this product is 10.51 (therefore, $RCA_{tw} \geq 1$) and its RTA is 4.71 (therefore, $RTA_{tw} > 0$). It should also be noted that Tunisia has historically managed to grow its exports of the product to around US$200,000.

Regarding import demand, Figure 6.15 (Panel [c]) shows South Africa's total import demand trends over the period. While total import demand fluctuates around the US$1.2 million mark, the associated estimated 'untapped' potential for this product is around US$150,000, with the average

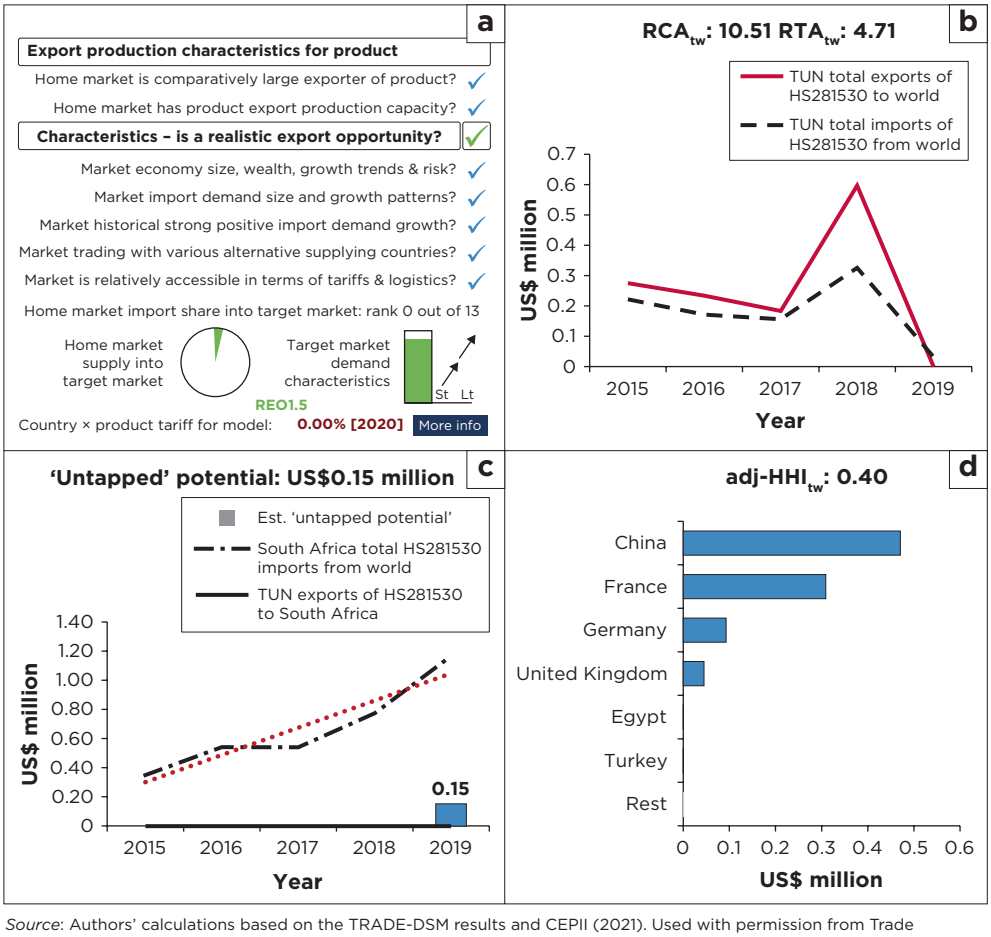


Source: Authors' calculations, based on South African Revenue Services (SARS 2021).
Key: ZAR, South African Rand.

FIGURE 6.14: Import values into South Africa of HS2826.12 (2015–2019).

of the time-weighted imports sourced from the top six competitors supplying into South Africa over the period. If Tunisia managed to grow its exports to South Africa to this value, it would increase from a zero base and therefore be a 'reasonable' value compared to its existing export capabilities. However, as the approach does not consider actual production capacity within Tunisia, this may not be the case, or much more production may even be possible.

Lastly, Figure 6.15 (Panel [d]) shows which countries are the top competitors and shows the adjusted Herfindahl–Hirschman concentration index to be around 0.40. (Closer to 1 is more concentrated; closer to 0 is less concentrated. Refer to Chapter 2 for more details.) Again, suffice to say that the approach identifies an actual example at the HS 6-digit level within reasonable parameters.



Source: Authors' calculations based on the TRADE-DSM results and CEPII (2021). Used with permission from Trade Research Advisory.
Key: RCA, revealed comparative advantage; RTA, revealed trade advantage; REOs, realistic export opportunities; HS, Harmonized System; US$, United States dollar; Adj., adjusted; Est., estimated; HHI, Herfindahl-Hirschman Index; TRADE-DSM, TRADE-Decision Support Model.

FIGURE 6.15: Tunisia to South Africa – detailed Q2 example of HS2815.30 (Peroxides).

At the time of the evaluation, South Africa imposed no import duty on the imports of this product. Overall, the REO classification allocated to this opportunity is $REO_{1,5}$, meaning that this opportunity into South Africa is a relatively large and growing market both in the short and longer terms (row 5 in the TRADE-DSM REO Map discussed in Chapter 2) and Tunisia supplies none or very little of South Africa's imports of this product (column 1 in the TRADE-DSM REO Map discussed in Chapter 2).

As mentioned in the case of South Africa to Tunisia, each of the identified 184 HS 6-digit products could be analysed in this fashion to understand the evaluation in more detail. However, it is beyond the scope of this study to do so.

Sectoral-level aggregate summary of outcomes

As mentioned previously, while the complete set of outcomes is shown for all types (quadrants) of intensive and extensive margin opportunities from Tunisia to South Africa, and vice versa, the focus of the rest of the analysis is on the 'traditional' or 'export-ready' type of opportunities only, as represented in Q1 and Q2. To this end, Figure 6.16 provides a summary of the bilateral REOs associated with Q1 and Q2 for both South Africa and Tunisia.

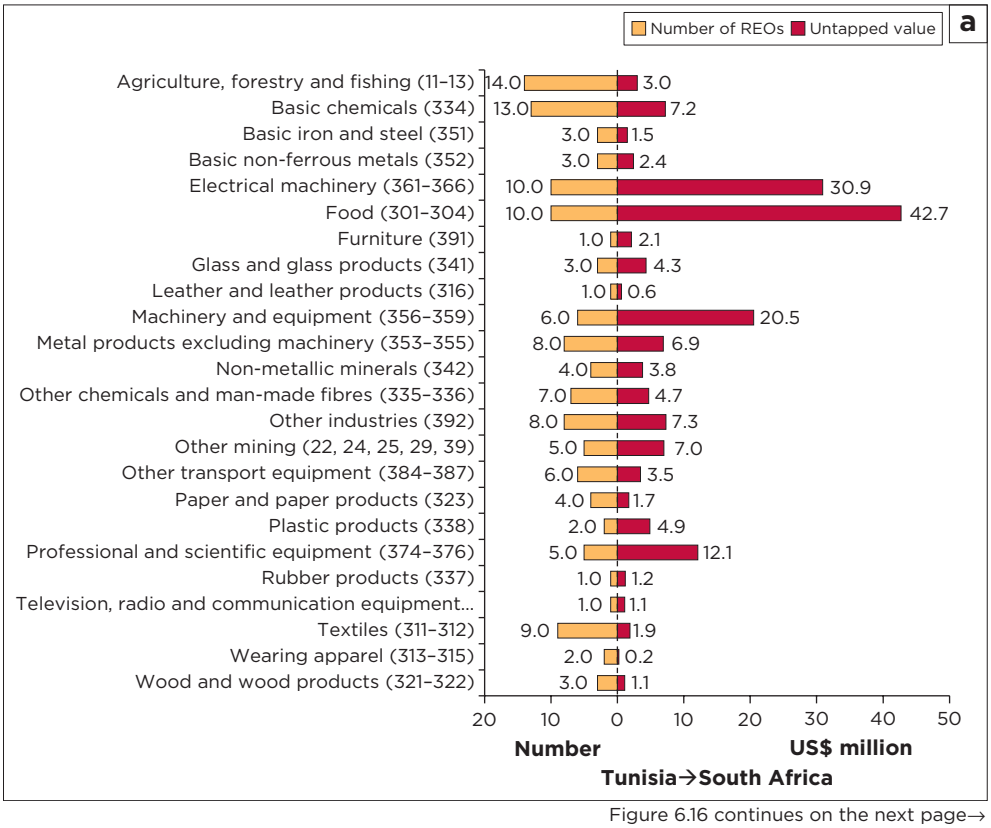
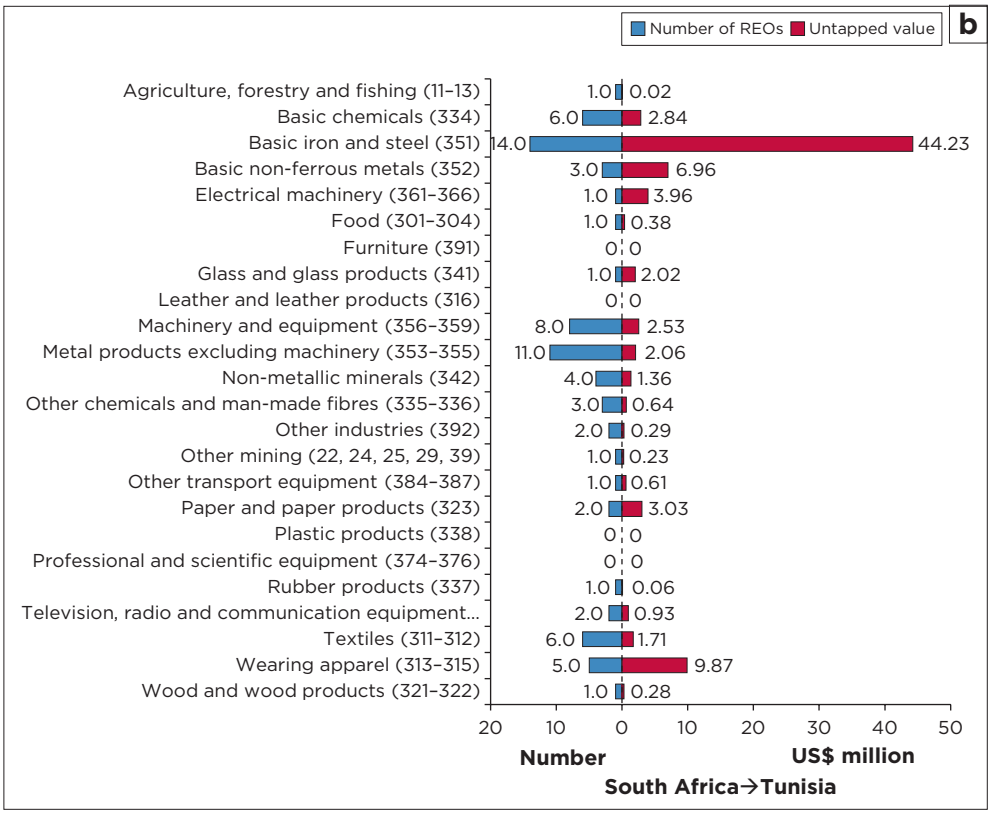


Figure 6.16 continues on the next page→



Source: Authors' compilation based on the TRADE-DSM results (2021). Used with permission from Trade Research Advisory.
Key: US$, United States dollar; REOs, realistic export opportunities; TRADE-DSM, TRADE-Decision Support Model.

FIGURE 6.16: Summary of bilateral opportunities by sector – Tunisia and South Africa.

It is evident that for Tunisia to South Africa, opportunities associated with the economic sectors of Agriculture, forestry and fishing, Basic chemicals, Electrical machinery, and Food reflect the highest number of individual tariff lines, while in 'untapped' value terms, the Food, Electrical machinery, and Machinery and equipment sectors, as well as products in the Professional and scientific equipment sector have the most potential, relatively speaking.

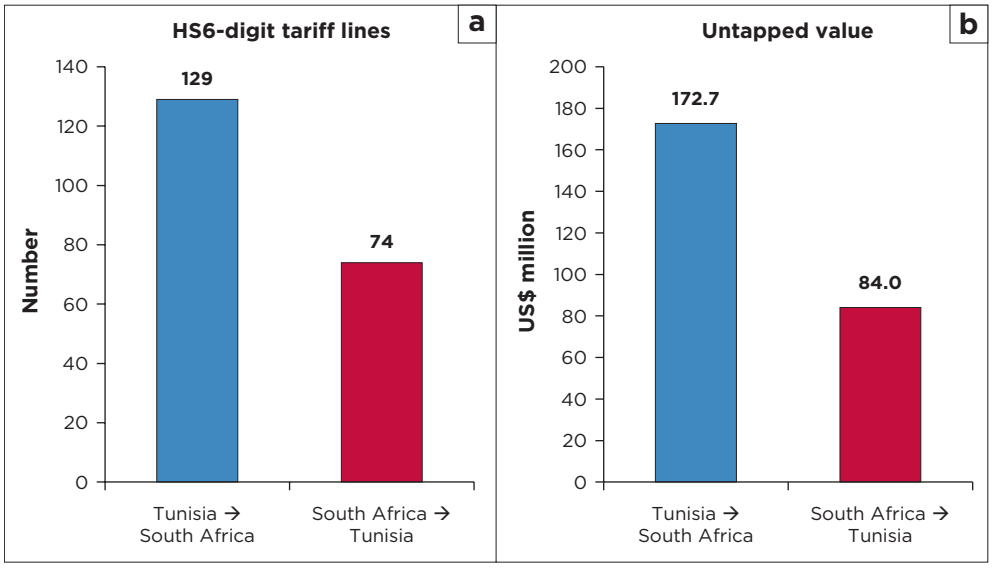
From South Africa to Tunisia, it is evident that products in the Basic iron and steel, Metal products excluding machinery, and (the more general) Machinery and equipment sectors have the largest number of product opportunities. In 'untapped' value terms, the Basic non-ferrous metals and Wearing apparel sectors have the largest number of opportunities.

While it is expected that opportunities from South Africa into Tunisia in relative terms may be smaller, because Tunisia has a much smaller economy (in economic and population terms) than South Africa, Tunisia also seems to have a greater diversity of opportunities into South Africa than the other way around. From Figure 6.16, it is evident that with some sectors in which Tunisia has opportunities in the South African market, the reverse is not the case.

Notably for South Africa, sectors such as Furniture, Leather and leather products, Plastic products, and Professional and scientific equipment exhibit no opportunity into Tunisia for South African products. There could be various reasons for this – from South Africa's productivity and RCA capabilities to competitor concentration, relatively higher logistics and import tariff costs, or simply a lack of import demand in Tunisia for products from these sectors. The fact that Tunisia has potential opportunities into the South African market for these products points to the fact that from a production and RCA perspective, Tunisia must have an advantage over South African sectors.

In summary, Figure 6.17 shows that, overall, Tunisia has 129 individual HS 6-digit products with an associated 'untapped' value of around US$172.7 million, which signals the potential for further investigation into their accessibility into the South African market.

South Africa, in turn, has only 74 products with an associated 'untapped' value of around US$84.7 million, which signals the potential for further investigation into their accessibility into the Tunisian market. The number of products identified for South Africa is around 57% (74/129) of that for Tunisia, while the 'untapped' value is around 48.7% (84/172.7) only.



Source: Authors' compilation based on the TRADE-DSM results (2021). Used with permission from Trade Research Advisory.
Key: HS, Harmonized System; US$, United States dollar; TRADE-DSM, TRADE-Decision Support Model.

FIGURE 6.17: Aggregate of bilateral opportunities between Tunisia and South Africa (by value and number).

However, each product opportunity (or lack of opportunity) needs to be investigated individually to understand the context and to facilitate relevant strategy formulation around aspects such as export promotion, market development and potential production-side interventions aimed at assisting existing or potential new exporting producers of these identified opportunities to capitalise on these insights.

Conclusion

This chapter underscored the importance of information pertaining to export opportunities for both Tunisia and South Africa, drawing insights from the WEF's Executive Opinion Survey. An application of the TRADE-DSM methodology was presented in the chapter, demonstrating the identification of bilateral opportunities characterised by synergies (as opposed to competition and protection) between the two countries. The aggregate-level analysis revealed 'average' trade complementarity, denoted by a TCI of 50.79 for Tunisia as an exporter to South Africa and 51.45 for South Africa as an exporter to Tunisia.

While the TCI analysis might suggest a relative advantage for South Africa into Tunisia, the pragmatic insights derived from the TRADE-DSM methodology indicate the opposite. In relative terms, South Africa is anticipated to have slightly fewer (57%) of the product opportunities into Tunisia compared to Tunisia's opportunities into South Africa. Furthermore, the 'untapped' value associated with South African opportunities into Tunisia is estimated at around 49% of the opportunities in the opposite direction.

Crucially, the TRADE-DSM's consideration of factors beyond trade data, including tariff-related costs, non-tariff barriers, market accessibility, competition and logistics at the micro level of HS 6-digit tariff product definitions, gives greater credence to the fact-based opportunity identification process. This capability addresses the imperative for factual information on export opportunities while concurrently facilitating a strategic understanding at the policy level. This consideration becomes pivotal when evaluating opportunities associated with the different quadrants discussed in this chapter.

Although a comprehensive analysis of potential export diversification opportunities linked to Q3 opportunities was not explicitly provided in this chapter, Chapter 5 provided an illustrative example of outcomes relevant to policymakers and entrepreneurs seeking insights into potential product and market diversification opportunities, as denoted by Q3 in our approach.

Key takeaways from this chapter

- Different stakeholders require tools and information tailored to their specific goals and objectives. It is imperative, however, for the fundamental constructs of information to remain consistent. The bilateral application of the TRADE-DSM approach, as elucidated in this chapter, addresses high-level strategic requirements on a bilateral scale. Simultaneously, it provides pragmatic insights into specific opportunities at the individual exporting company level, while also encompassing the needs of small and medium enterprises. Notably, this approach maintains internal consistency and draws upon a more comprehensive informational spectrum, beyond mere trade statistics ratios.
- For government policymakers, particularly trade negotiators, the application of the methodology outlined in this chapter offers a useful platform for strategy formulation. This platform facilitates better-informed and synergistic analyses of realistic opportunities, while also fostering collaboration among negotiators from different countries. The derived insights can then be used in shaping more pertinent and viable negotiation offers, potentially leading to tangible and substantive economic advantages for the constituents of both trading partners. At the firm level, the approach gives rise to a better-informed strategy formulation process, grounded in opportunities with genuine potential. As illustrated in the chapter, this approach may also uncover unconventional and unexpected outcomes.
- Crucially, pursuing these opportunities at the firm level aligns the focus products (sectors) with higher-level strategic considerations. This alignment both informs and facilitates the implementation of bilateral agreements, enhancing the likelihood of success for both national and individual firms' export objectives.
- Nevertheless, meticulous attention to detail is paramount. Prior to using this information in bilateral negotiations or individual company applications, each opportunity demands thorough scrutiny and understanding. The TRADE-DSM approach streamlines this otherwise-formidable task, transforming it into a systematic and productive process. This allows, at the outset, for concentrated attention to be given to country–product combinations with the most realistic potential.
- Finally, while these identified opportunities are not exhaustive or a panacea, they represent a manageable and productive subset of clearly defined possibilities that can and should be prioritised for initial investigation.

Chapter 7

Industrialisation of regional economic communities: Applying the TRADE-DSM approach to Economic Community of Central African States[82]

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82. This chapter is a revised version of a research project conducted by MJ Cameron/Trade Research Advisory in 2022 for the United Nations Economic Commission for Africa (UNECA), titled 'A micro-level approach to export diversification in Central Africa (ECCAS) considering supply, demand and logistics', Technical Study Report for the Subregional Office for Central Africa (SRO-AC) (project code: 2500271340).

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Introduction

Chapter 1 in this book describes how African countries are focusing on identifying key and/or unique opportunities and the steps needed to take full advantage of national, regional and global markets within the context of the African Continental Free Trade Area (AfCFTA), while also being mindful of current challenges and constraints of political uncertainty, security barriers and institutional failure, which are not modelled. The market space created by the AfCFTA will offer a host of commercial opportunities to African countries, while still honouring other, pre-existing[83] free trade areas (FTAs) underpinning specific regional economic communities (RECs). Most African countries are therefore evaluating the options and opportunities for industrialisation within the dualistic context of existing RECs and the larger AfCFTA.

For example, an African country located within the Economic Community of Central African States (ECCAS[84]) is Cameroon, which, through its Industrialisation Master Plan (known as Plan Directeur d'Industrialisation or PDI for short), aims to become the factory of the new industrial Africa by 2035 (République du Cameroun 2015) within the context of the AfCFTA.

The industrial approach advocated by the PDI is intended to make Cameroon a logistics hub, manufacturer and food supplier on the African continent. More specifically, the PDI has identified five industrial pillars as the basis of Cameroon's future economy, namely: (1) Forest-wood and derivatives; 2) Mining, metallurgy and steel; 3) Hydrocarbons and petrochemicals; 4) Chemistry and pharmacy; and 5) Cotton, textile and manufacturing.

The United Nations Economic Commission for Africa (UNECA) identified the TRADE-DSM (Decision Support Model) approach as a novel alternative

83. Also important are post-AfCFTA-implemented FTAs, such as that of the Common Market for Eastern and Southern Africa (COMESA), East African Community (EAC) and Southern African Development Community (SADC). This is also referred to as the COMESA–EAC–SADC Tripartite Free Trade Area (TFTA), which came into effect on 25 July 2024.

84. The ECCAS bloc consists of 11 member states: Angola, Burundi, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo (DRC), Equatorial Guinea, Gabon, Republic of Congo (Congo), Rwanda, and São Tomé and Príncipe.

to informing policymakers in Cameroon how to meet their industrial objectives and commissioned the construction of a model and accompanying analysis for Cameroon which would act as a prototype for the larger group of ECCAS member states (Cameron 2021). A summarised version of this study is described in Kilolo et al. (2022). Initially piloted for Cameroon, the model and accompanying analysis were subsequently extended to the broader group of ECCAS member states to investigate potential intra-regional and broader AfCFTA opportunities for an REC (Cameron, Carrico & Kilolo 2022).

The aim of this chapter, therefore, is to demonstrate how the TRADE-DSM methodology can reveal opportunities with a realistic chance of being successful – not only in producing for exports in general but also for specific target markets within the REC and more broadly across the African continent. To this end, the TRADE-DSM methodology was applied for the case of Cameroon and replicated for the rest of the ECCAS member states in the context of developments within the AfCFTA.

Literature overview: Export-led and -driven manufacturing

As mentioned in Chapter 1, many studies have empirically tested whether and how the export-led growth hypothesis is valid, as indicated by Hagemejer and Mućk (2019).

Exporting (and importing) enables countries to accumulate know-how and tacit knowledge by, for instance, sharing ideas, achieving economies of scale for innovations and directly sourcing technologically embodied knowledge (Grossman & Helpman 2015). Exporting firms tend to be more productive than non-exporters (Wagner 2007). Moreover, expanding exports at the extensive margin can help to reduce the risk of volatility in demand (Bennett et al. 2019).

It is therefore not surprising that at the macro policy level, observers and policymakers in different countries, including many in sub-Saharan Africa and South Asia, believe that economic growth can largely be achieved by developing new manufacturing industries for the purpose of exporting (Rodrik 2015). In this regard, many policymakers have looked to the newly industrialised economies (NIEs)[85] for guidance, given their experience of achieving economic growth and development through export-led manufacturing.

85. The initial newly industrialised economies were generally considered to be the Republic of Korea (South), Taiwan, Hong Kong, Singapore and the People's Republic of China, followed by the second tier consisting of Malaysia, Thailand, Indonesia and the Philippines (Weiss 2005).

In Chapter 1, it was pointed out that a key lesson to be learnt from the NIEs is that manufacturing-geared export growth, in combination with macro balances, can induce a positive cumulative and positively reinforcing process. Furthermore, at the firm level, empirical research suggests that stimulating new exports is one of the most efficient ways to improve firm capabilities. When faced with international competitive pressures and new demand for higher-quality and larger markets, firms tend to grow, become more productive and invest in higher-quality products (Bernard & Jensen 1999; Bustos 2011; De Loecker 2007; Kugler & Verhoogen 2011; Lileeva & Trefler 2010; Pavcnik 2002; Van Biesebroeck 2005).

A recent study by Guo, Zhu and Boschma (2020), using firm-level data for China, produced some critical observations for policymakers. Firstly, a firm is likely to enter a market if the potential cost is low and the benefit is high, given the firm's existing export experience. Secondly, exporters tend to enter markets that are close to their existing networks of contacts (not necessarily in terms of geographical distance, but rather in terms of existing trade activity with members of those networks).

The United Nations Conference on Trade and Development's (UNCTAD) newly released data set consisting of trade costs by country, commodity and mode of transport shows that remoteness results in higher costs of connecting to global value chains (GVCs), which need to be overcome to ensure competitiveness (UNCTAD 2024). One of UNCTAD's observations was that remoteness can be especially challenging for small economies where domestic demand is insufficient to drive sustained economic growth, forcing businesses to target larger markets that are far away. This chapter similarly finds that it is relatively difficult for exporters to switch to target markets that are remote from their current export markets (again, not specifically in terms of geographical distance) and that policies aimed at promoting such large shifts are inherently riskier and more challenging.

In Africa, in addition to exporters' proximity to networks, real-world physical geography and transport connectivity and infrastructure play a crucial role in the identification of potential opportunities. (Chapter 2 provides an in-depth discussion of the refinement to the TRADE-DSM in this context.)

While there may be a widespread perception that supply chains are global (hence, the emergence of the term 'global value chains'), Baldwin and Lopez-Gonzalez (2013) regard this perception as incorrect. Their international trade-based analysis showed that supply chains are mostly regional, not global. They further found that three distinct geographical blocs have emerged in the global economy where there is a high intensity of intra-industry trade in intermediate goods, namely 'Factory Asia', 'Factory North America' and 'Factory Europe'. Mold (2022) rightfully asks why a

'Factory Africa' is missing from this analysis and states that the AfCFTA should aim to resolve the problems associated with the disarticulated nature of Africa's regional outputs by creating a 'Factory Africa'.

While the overall export potential of ECCAS member states to the rest of the world may be significantly larger than the export potential within ECCAS and with the rest of Africa (in the short to medium terms), the focus of this chapter is on formulating strategies for increasing intra-Africa and intra-ECCAS trade and on possible value chains that could be developed within these regional contexts.

According to the United Nations Industrial Development Organization (UNIDO) (Sturgeon & Memedovic 2010), the pre-determined category of intermediate goods in trade is often used to examine issues related to GVCs. The same mechanism is employed in the analysis in this chapter to reveal the potential for regional value chains (RVCs) associated with intermediate goods trade. However, to realistically identify export diversification potential, policymakers need to consider both supply capability relative to demand and market access.

The next section provides a high-level summary of the assumptions used for the purposes of the intra-ECCAS and ECCAS-to-rest of Africa analysis, based on information reported by the African Development Bank (AfDB) on the infrastructure corridor developments on the African continent.

Applying the TRADE–DSM

This section provides a demarcation of the method and key assumptions applied for this study.

Market focus

The TRADE-DSM methodology, discussed in detail in Chapter 2 of this book, was applied to identify export opportunities for the ECCAS member states, with a distinct focus on opportunities associated with nearby regional neighbours within ECCAS and the rest of Africa and less focus on the rest of the world. Similar to the applications in Chapters 3, 4, 5 and 6, filter 1 was deliberately not applied so as to avoid countries being excluded on the basis of political and commercial risks. As a result, for each member state, 50 other African countries were included in the analysis, with South Sudan, Western Sahara, Somalia and Réunion being excluded because of insufficient data and ECCAS constituting the 'home market' or exporting country.

Product focus

The modelling and analysis were based on the Harmonized System (HS) revision 2012 6-digit product tariff codes. To provide a summarised analysis for policy insight purposes, results were aligned with broader economic sectors and the UNCTAD classification of goods by stages of processing (SoP), namely raw materials (World Integrated Trade Solution [WITS] n.d.[a]), intermediate goods (WITS n.d.[b]) and final goods for consumer (WITS n.d.[c]) or capital (WITS n.d.[d]) use.

Key logistics routing assumptions

The TRADE-DSM approach and analysis were applied, and a custom TRADE-DSM model was constructed for each ECCAS member state. In each model the point of origin was the main economic hub of the member state. Specific consideration was given to how formalised trade (containers) as a proxy for all other goods would be moved from each member state's point of origin to 180 countries in the world – mainly by maritime transport but also, where relevant, by road for overland transits.

Furthermore, assumptions were made regarding major corridor developments on the African continent, with specific reference to how such corridor developments would facilitate exports from each country to relevant African target markets. These assumptions were based on information reported by the AfDB (2019).

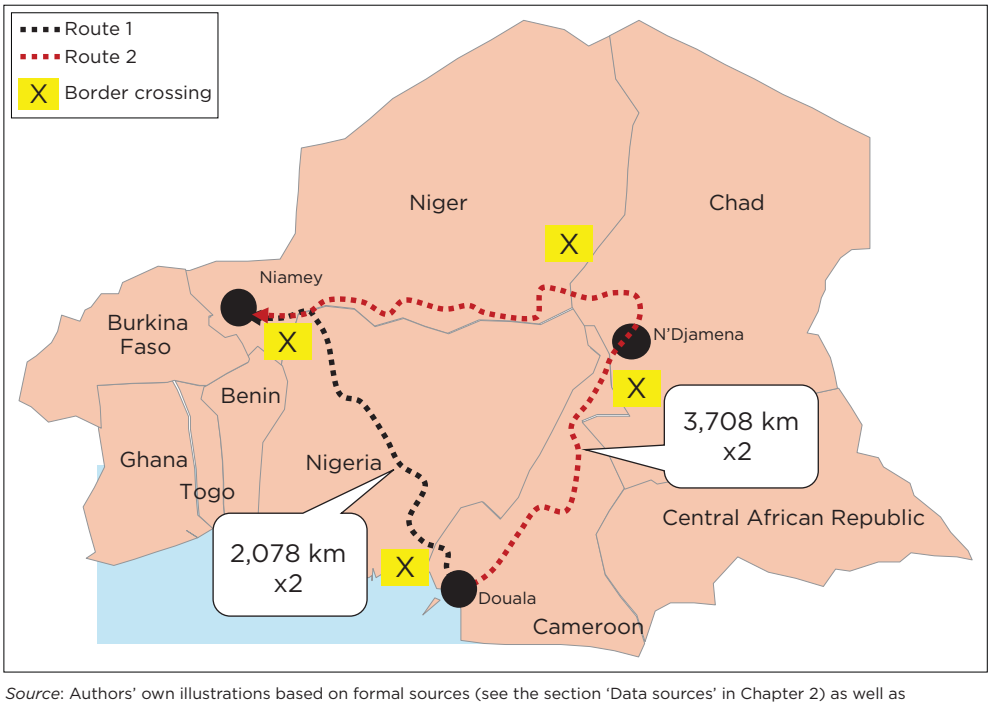
As an example, we discussed the case of Cameroon in more detail (high-level summary maps for the other ECCAS member states are provided in Appendix A7). The country is defined by its geography; hence, the logistics element of the TRADE-DSM approach is key. This also holds true for most of the other ECCAS member states, with four of the 11 members being landlocked. (Chapter 3 provides more detail on this characteristic, using the example of Rwanda.)

Cameroon, with a population of approximately 27 million, links two of Africa's major regions – the vibrant and densely populated West Africa (with a population of close to 410 million) and the densely forested and less populated Central African region (with a population of around 150 million) (United Nations [UN] 2020). Cameroon is therefore situated between a region with strong political, social and economic interactions (West Africa), dating back to pre-colonial times, and a region where the natural environment constitutes an obstacle to socio-economic integration (Central Africa), leaving many places isolated and remote.

In this sense, Cameroon can be viewed as belonging to a special geopolitical category of countries forming 'land bridges', such as Turkey (connecting Europe and Asia), Mexico (connecting the two Americas) and Ukraine (connecting Europe and Russia). For such countries, trade and logistics are crucial. The region's only deep-water port (Douala) is a key logistics hub through which exports and imports, from and to Central Africa and Chad, flow.

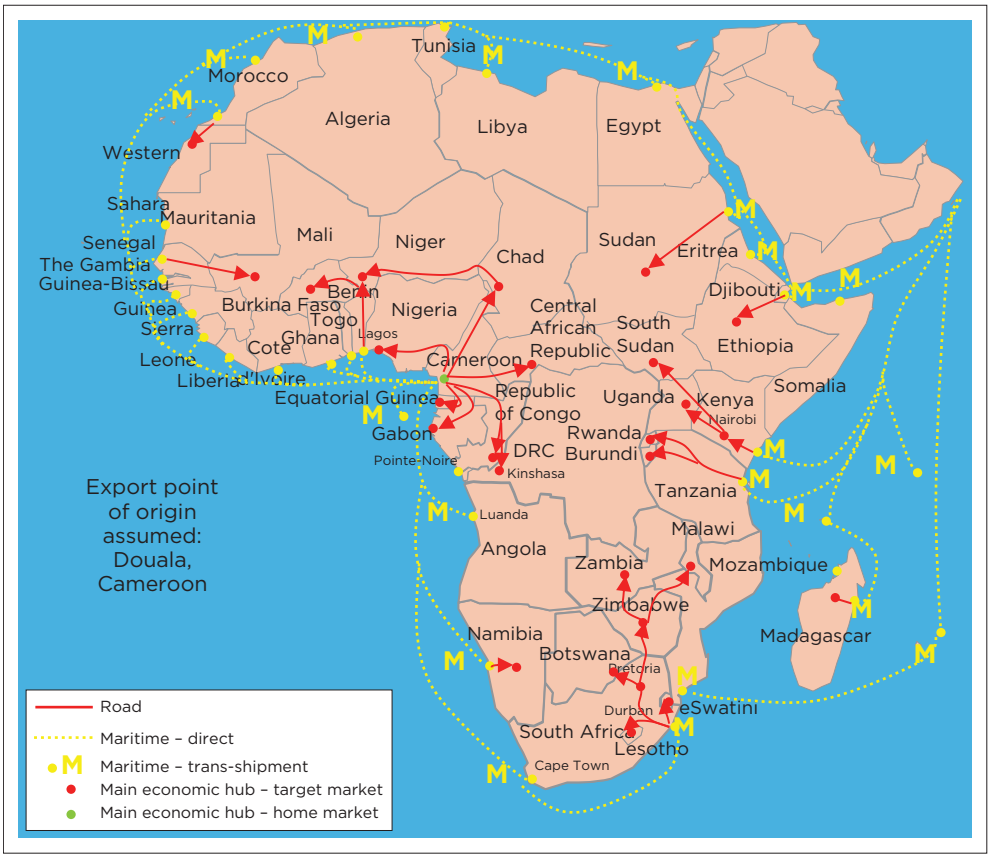
To illustrate the logistics details, Figure 7.1 provides a view of assumptions regarding the movement of a container from Cameroon to, for example, Niger. Initially, the 'shortest real-world route' (indicated as route 1 on the map) informed the routing and subsequent time and cost implications from Cameroon to Niger. During the study, various stakeholder sessions were held. Based on officials' understanding of the challenges and concerns associated with route 1, the necessary adjustments were made, as reflected in route 2 in Figure 7.1.

Assumptions regarding the shipping of a container from Cameroon to any of the major destinations on the African continent (which is of primary concern in this chapter) are summarised in Figure 7.2. Notably, most of Northern, Eastern and Southern Africa and even Western Africa can only be commercially serviced by ship (a key underlying assumption of the



Source: Authors' own illustrations based on formal sources (see the section 'Data sources' in Chapter 2) as well as engagement with Cameroon government representatives (map not to scale).

FIGURE 7.1: Illustration of detailed logistics assumptions (a) – Cameroon (example).



Source: Authors' own illustrations based on formal sources as well as engagement with Cameroon government representatives (map not to scale) and Cameron (2021).

FIGURE 7.2: Illustration of Cameroon's detailed logistics assumptions (b) – rest of Africa.

TRADE-DSM approach being that maritime transport[86] is the major mode for modelling purposes).

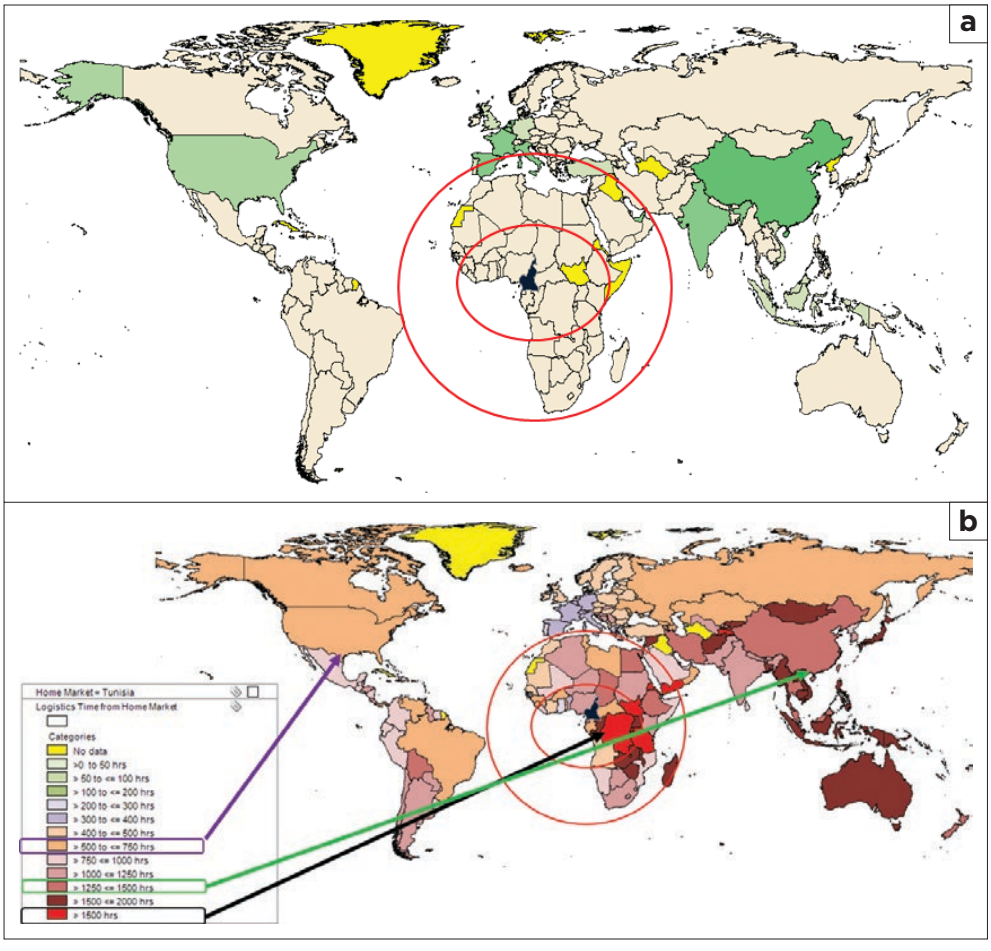
While Figure 7.2 focuses on Africa only, a routing matrix was constructed for all possible destinations (180 countries) that had sufficient data on all aspects required for the modelling approach. Results from the overall set of indices calculated are depicted in Figure 7.3, Panels [a] and [b].

It is evident that, based on recent historical trade (Figure 7.3, Panel [a]), countries that represent the largest value in terms of exports from Cameroon are furthest away, in geospatial terms, from Cameroon compared to any of its neighbours.

86. While air transport plays an important role in connecting Africa, the detailed trade data required to include this mode in the modelling were not consistently and generally available at the time of the modelling and analysis. However, the UN is driving the reporting of this dimension of trade statistics globally. For more on this, see: https://comtrade.un.org/data/doc/UpgradePlan

While there are many reasons for this, including past economic developments and relationships (such as the impact of colonialism) and relative wealth in, and demand for, particular products in different countries in the world, Panel [b] in Figure 7.3 provides an interesting context. It is notable that most of the direct neighbouring countries or countries nearby are (in a relative logistical time context) just as far, or even further away, from Cameroon as some of the large trading partners that historically received most of Cameroon's exports.

At the time of this study, we found that moving a container from Cameroon to the DRC, Rwanda, Uganda or Burundi, for example, was more expensive in terms of logistical time and cost than moving the same container to China or Taiwan. Likewise, countries such as Egypt, the Central African Republic and Equatorial Guinea are in similar index bands to the United States (US) or Brazil. While these indices are based on fairly high-level data, the relative



Source: Authors' own work.

FIGURE 7.3: Cameroon's current trade patterns relative to the logistics context.

results appear to reflect the realities faced by logistics providers and companies trading with these markets. It is important to note that the absolute value of indices is less important than the relative outcome.

Adding the African Development Bank logistics and African Continental Free Trade Area tariff scenarios

As discussed in the section 'Literature overview: Export-led and -driven manufacturing' in this chapter, when developing inputs for an export strategy, it is critical to use not only 'theoretical' desktop assumptions about aspects such as connectivity and international trade logistics. These aspects have real-world impacts and, if not considered or addressed in a practical sense, there could be a misalignment between expectations and real-world export potential.

This chapter therefore considers two key aspects relating to market access with a view to informing the next level of analysis. The first is the potential tariff reductions under the AfCFTA, and the second is the assumptions fuelled by trade facilitation corridor developments across the whole of Africa.

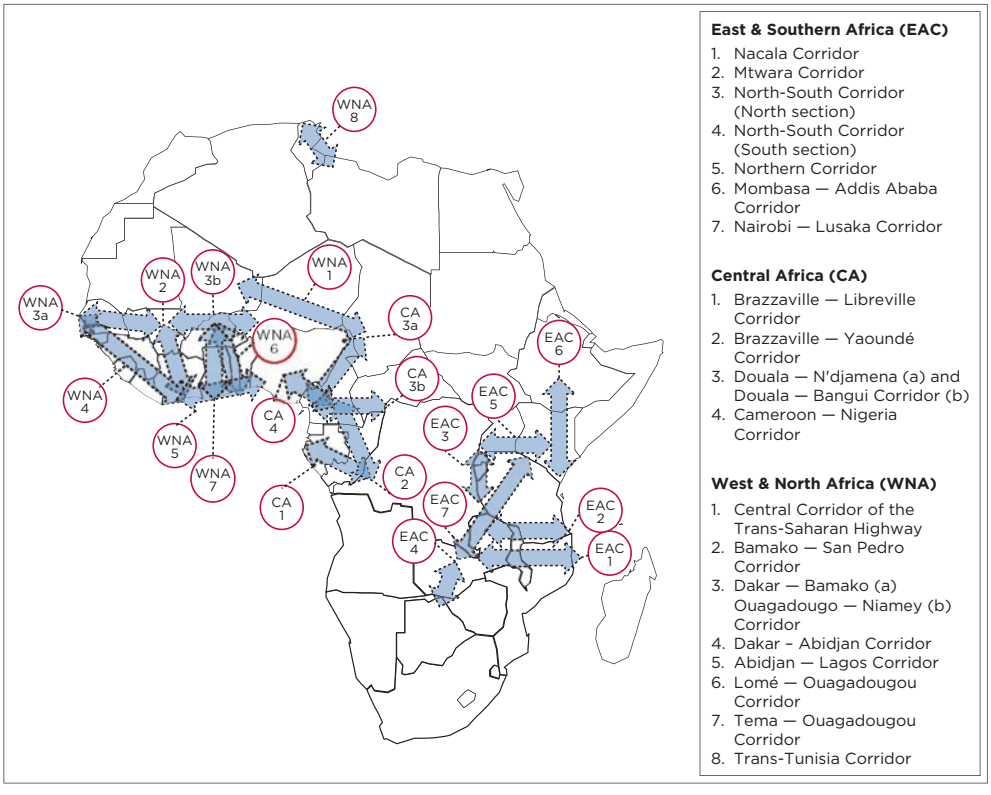
In the area of trade-enabling infrastructure development, much has happened, is happening and will happen in the future on the African continent. The role of trade-enabling transport logistics should not be underestimated, both in opening up markets to foreign trade and in allowing domestic production to become more export-oriented. For this part of the analysis we turned to the AfDB report titled *Cross-border road corridors – the quest to integrate Africa* (AfDB 2019). The main corridors, according to the AfDB (2019), are shown in Figure 7.4.

Based on these corridors, a set of logistics improvement assumptions potentially at play was formulated specifically from Cameroon's perspective, within the continent and the trade logistics routing context.

Not all corridor improvements listed in Figure 7.4 are directly relevant to Cameroon. For the purposes of this chapter, the following 15 destination markets were assumed to be affected (see Table 7.1).

The approach taken with respect to these assumptions was to translate the expected productivity improvements into an equivalent logistics time–cost reduction on relevant routes (from the perspective of Cameroon).

It should be noted that some of the projects mentioned in this chapter had already been implemented. Hence, they formed part of the baseline from which the modelling started and did not affect the results under



Source: Authors' own annotations (map not to scale) based on AfDB (2019).
FIGURE 7.4: Africa logistics – regional integration.

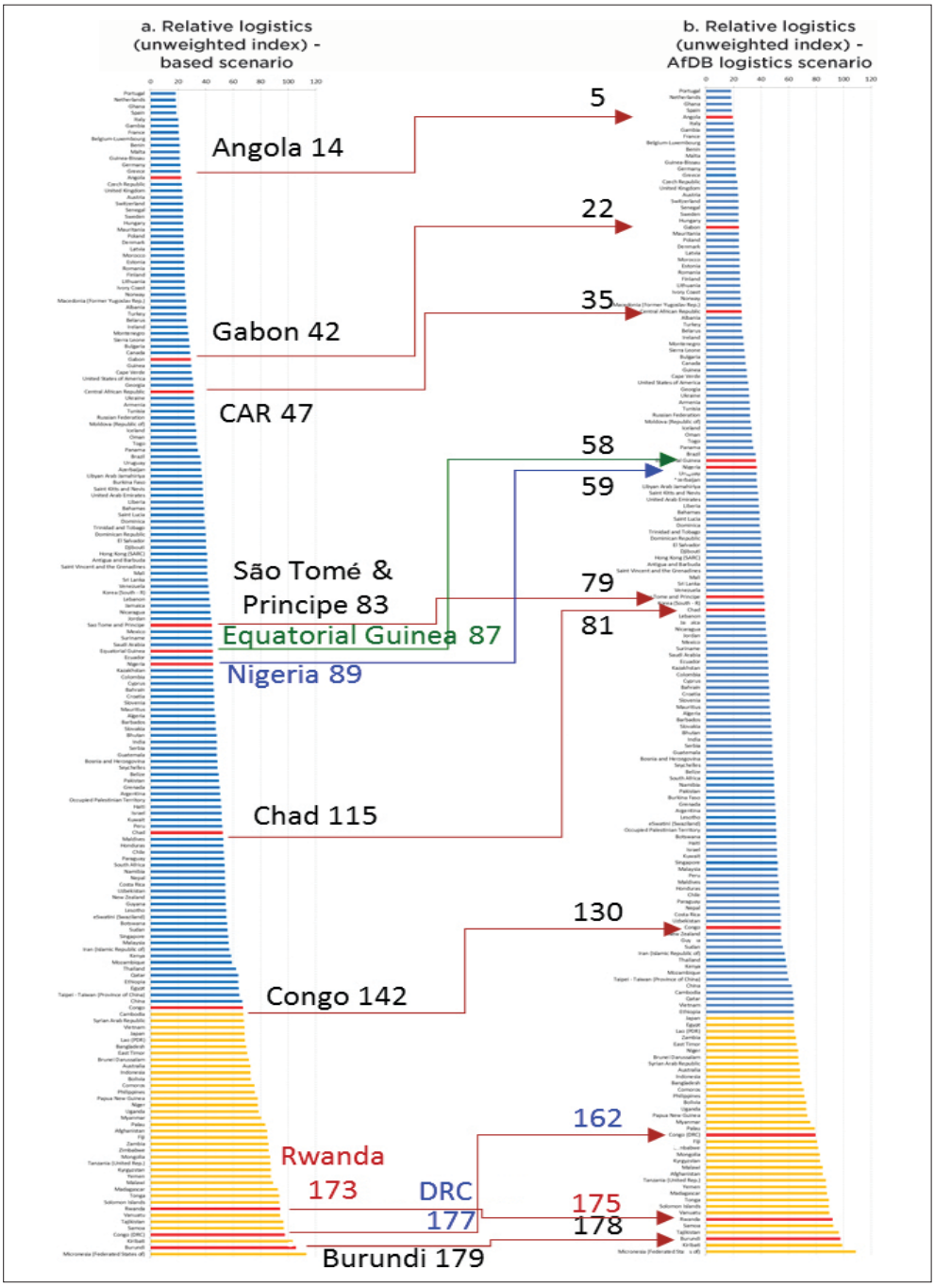
TABLE 7.1: Target markets affected by Africa logistics assumptions.

1. Angola	9. Niger
2. Burundi	10. Nigeria
3. Central African Republic	11. Rwanda
4. Chad	12. São Tomé and Principe
5. Congo	13. Uganda
6. DRC	14. Zambia
7. Equatorial Guinea	15. South Sudan
8. Gabon	

Source: Authors' own work.
Key: DRC, Democratic Republic of the Congo.

these scenarios. Figure 7.5 provides a high-level view of how these assumptions impacted (improved) the affected target markets from the perspective of Cameroon, relative to the rest of the 180 markets in the global trade network that the TRADE-DSM aimed to model as an example.

It is worth mentioning that international trade does not take place in a single direction; rather, it is an integrated process. Hence, logistics performance (quality, accessibility and efficiencies) are key factors



Source: Authors' own work.
Key: AfDB, African Development Bank; CAR, Central African Republic; DRC, Democratic Republic of the Congo.

FIGURE 7.5: Africa logistics – assumption implications for selected countries.

determining a country's ability to access partner countries while being accessed by partners in return. In addition, not only is the 'existence' of the infrastructure (which is a necessary but insufficient condition) important, but changes in infrastructure and logistics benefit 'all' – including the competition. Other countries on the continent and in the world will therefore also have greater access to markets in Africa, and vice versa, when access improves because of positive changes in trade-enabling and facilitating infrastructure.

It is therefore crucial that industrial policy be aligned with various other policy areas, including transport and logistics. To illustrate this integration and interdependence, we observed that, owing to the logistics assumption changes, the relative outcome for all countries was potentially affected. Except for Rwanda (declining by two positions from rank 173 to 175 out of 180), all other markets saw some improvements in the relative rankings, based on the logistics model assumptions. The most significant changes were observed for Chad (34 positions), Nigeria (30 positions), Equatorial Guinea (30 positions) and Gabon (20 positions).

The second element considered in the construction of a baseline for this analysis was possible tariff reductions as another dimension of market access. On the assumption that the AfCFTA is functionally operational, it stands to reason that African countries should be able to access various partner countries on the continent at low or zero-tariff rates in the near future. However, at the time this study was conducted (July 2021), no specific information was publicly available on the individual countries' product codes that would remain protected, nor what the precise phase-down schedules would look like. Consequently, a simplified assumption had to be made to reduce to zero all tariffs for African countries that import goods from Cameroon (as well as for the rest of the ECCAS member states). Better-informed tariff scenarios would be possible once these have been agreed upon by member states and have been made public. It is important to note, however, that the modelling made use of applied ad valorem-equivalent (AVE) estimates obtained via the International Trade Centre (ITC) Market Access Map (MacMap) platform. These rates may not exactly conform to national tariff line rates but rather reflect effective average rates.

The international trade data used

As explained in Chapter 2, the model made use of the Centre d'Études Prospectives et d'Informations Internationales (CEPII 2021) Base pour l'Analyse du Commerce International (BACI) data released in February 2021 (HS 2012 revision). Where data are missing, the BACI data set estimates such values through a process of mirror-reported data.

Informal cross-border trade (ICBT), however, accounts for a considerable amount of actual trade between neighbouring countries in Africa (Nkendah 2013; Ogalo 2010; The Economist 2018). According to Nkendah (2013), most of this ICBT relates to agriculture and food-related products, which poses a significant challenge to policymakers and planners. In the absence of quality statistical measurements, it is extremely difficult to plan for and provide appropriate infrastructure. It would therefore make sense for the relevant stakeholders in the Cameroon government to obtain and record better trade statistics as far as is practically possible.

Informing export diversification – considering both supply capability relative to demand and market access

Given the complexity of policy formulation, for the purposes of industrial development and ultimately economic growth, it is important to place sufficient emphasis on both supply-side and demand-side considerations when setting out to inform discussions on industrialisation via exports. Considering only supply-side aspects could lead to countries developing capabilities for which there are no clearly accessible markets within the context of this study's geography (and its focus on Africa).

Furthermore, as mentioned in Chapter 2, the differences between policies aimed at diversifying export products and policies aimed at diversifying destination markets are significant, and policymakers need to use the right tool to address the right policy question. It was also noted in Chapter 2 that a key feature of the TRADE-DSM methodology is its ability to address both the intensive and extensive margin dimensions of the export promotion and development challenge.

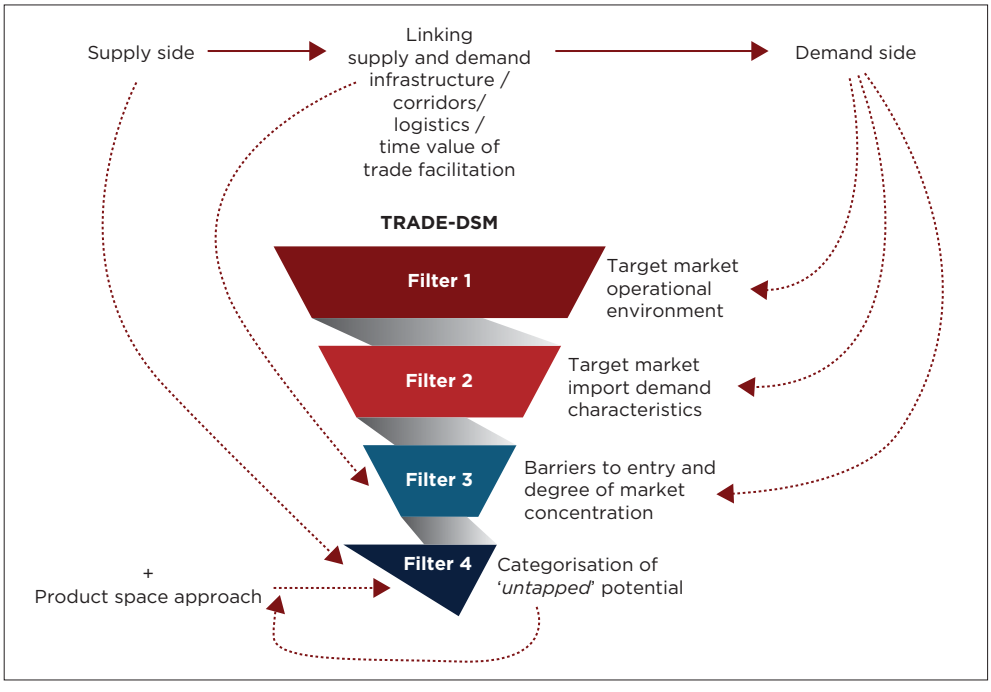
However, the TRADE-DSM methodology does not consider alternative new products that could be introduced into the country's economy; it focuses only on those products that already form part of the historical reported exports of the country – although these products may be judged to be at various levels of export production maturity and capabilities.

The product space, as conceptualised by Hausmann and Klinger (2007) and Hidalgo et al. (2007), suggests that to effectively diversify a country's export basket, new products should share similar capabilities with existing ones. Jumping to products with strong links to current exports facilitates this shift, allowing countries to increase the complexity as well as the diversity of their export activities. The interconnectedness of products in concentrated areas of the space simplifies diversification, as countries can leverage existing capabilities to engage successfully in new and more complex activities. The product space concept is based on the idea that each product requires a

particular combination of capabilities, and countries need to identify and build missing capabilities to develop new products. The degree of 'relatedness' between products helps to predict a country's ability to compete with and produce new, potentially successful products in the future.

The product space methodology (which focuses only on production-related characteristics of exports) is therefore a natural candidate to be combined with the TRADE-DSM methodology (which focuses predominantly on demand-side elements), with the overlap being the incorporation of a country's revealed comparative advantage (RCA) in the export of a particular product. (See Chapter 2 for more details on the RCA as applied in the TRADE-DSM methodology and Chapter 8 for more details on the product space approach.)

To ensure a more balanced approach from both a supply and demand perspective, the application of the TRADE-DSM methodology (using a demand-side focus with some supply-side considerations in terms of demonstrated comparative advantage in existing exports and logistical considerations in terms of linking to the possible target markets from the specific perspective of each home market) is enhanced by conducting a further iteration of analysis from a supply-side perspective (informed by the product space methodology), as illustrated in Figure 7.6.



Source: Author's own work (Cameron 2021).
Key: TRADE-DSM, TRADE-Decision Support Model.
FIGURE 7.6: Informing the supply-side and demand-side analysis.

Combining the TRADE-DSM model and the product space approach involves the following steps:

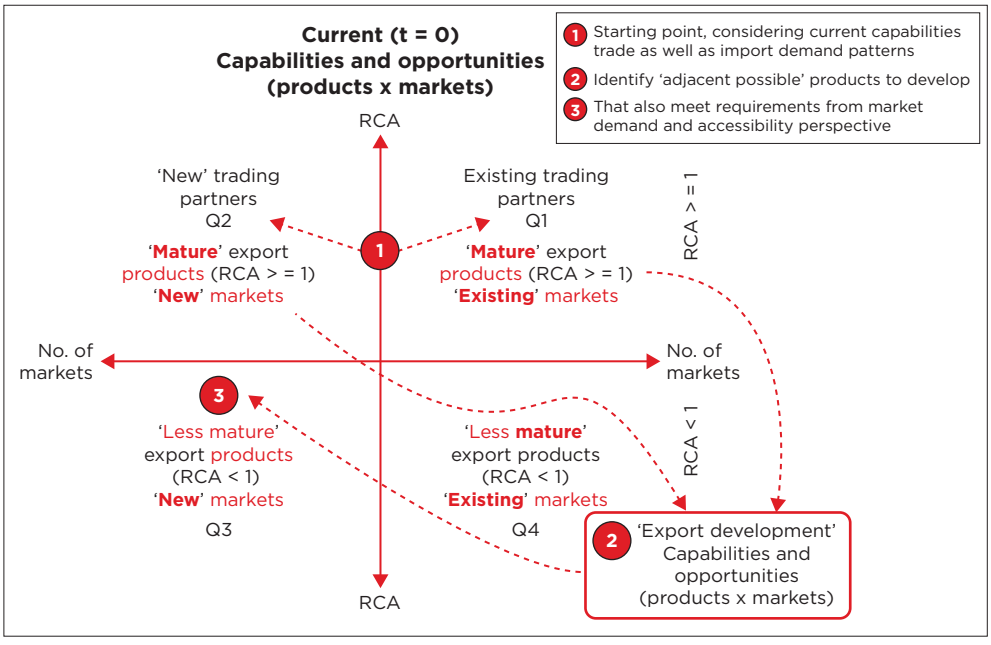
Firstly, the implications of different outcomes obtained from the TRADE-DSM analysis are considered, notably the 'home market' export capabilities as well as import demand patterns and market access elements (as briefly explained in Chapter 2). The focus of the first round of analysis is on identifying those products for which the 'home market' has an RCA on an average five-year time-weighted basis[87] ($RCA_{tw} \geq 1$) and a revealed trade advantage (RTA) with 'proxies' for relative export maturity as well as local production capacity for the purpose of exports ($RTA_{tw} > 0$). The analysis is therefore aimed at intensifying trade for these products (intensive margin for products), combined with a focus on existing target markets (intensive margin for markets) and possible expansion of, or development of new, markets (also extensive margin for markets).

Secondly, an analysis of the top five associated 'adjacent possible' products, as identified by the product space proximity index (see Chapter 8), is conducted for each of the 'mature' export products identified in the first step. To identify potential products for which the 'home market' already has 'some export capability', the products identified through the product space analysis – which also appear in the basket of existing export goods but are deemed 'relatively immature' (for which the 'home market's RCA is $0 < RCA_{tw} < 1$) – are then sub-selected. This ensures that any 'new/immature' potential products selected already have some traction in the export basket of the 'home market'.

Thirdly, 'completely new' possible products are investigated. These are products for which the TRADE-DSM shows demand potential and relatively accessible markets for the 'home market' being analysed. For these products, the 'home market's RCA is $RCA_{tw} = 0$ and its RTA is $RTA_{tw} < 0$, but these opportunities relate to some existing export production capabilities that are informed by outcomes from the first step and the product space proximity index.

The results from the TRADE-DSM approach can be categorised into four quadrants (Q1, Q2, Q3 and Q4), as depicted in Figure 7.7 (the quadrants aligning with the concepts introduced in Chapter 2). These centre on the 'maturity' of exports of a product, as proxied by the RCA_{tw} (on the vertical axis), the number of markets associated with each of the identified potential HS 6-digit product codes (horizontal axis) and the characteristics of current exports (or not) from the 'home market' to such markets (left or right of the vertical axis).

87. In this five-year, time-weighted average calculation, the most recent year weighs the most, and each year before that approximately half the preceding one. Therefore, if the latest year is given as year t, then year t weighs 51.61%, year t-1 weighs 25.81%, year t-2 weighs 12.9%, year t-3 weighs 6.45% and year t-4 weighs 3.23%, with the sum of weights over the period equal to 1.



Source: Author's own work (Cameron 2021).
Key: No., number; Q, quadrant; RCA, revealed comparative advantage.

FIGURE 7.7: Overview of the combined product–market selection approach.

Quadrant 1 explained

The results categorised into Q1 have the following characteristics:

1. Products are 'mature', with $RCA_{tw} \geq 1$.
2. The 'home market' appears to have some production capacity for exports, as these products also meet the requirement of $RTA_{tw} > 0$.
3. Markets are existing trading partners where the 'home market' already supplies intermediately large to large shares of the target markets' import demand.

Q1 can be seen to inform the intensive margin from both a product perspective and a market perspective. This quadrant is referred to as the '**Brown fields**' quadrant (analogous to engineering or investment projects that expand existing facilities). Q1 comprises existing exports to existing markets for which the 'home market' already supplies a relatively significant share of import demand.

Quadrant 2 explained

The results categorised into Q2 have the following characteristics:

1. Products are 'mature', with $RCA_{tw} \geq 1$.
2. The 'home market' appears to have some production capacity for exports, as these products also meet the requirement of $RTA_{tw} > 0$.

3. Markets are 'new' or 'small' trading partners where the 'home market' supplies zero or intermediately small shares of the target markets' import demand.

Q2 can be seen to inform the intensive margin from a product perspective and the extensive margin from a market perspective. For ease of reference, this quadrant is called the 'Green pastures' quadrant (analogous to engineering or investment projects that create new facilities). Q2 comprises existing export products for the 'home market', but with the focus on new or previously under-serviced markets.

☐ Quadrant 3 explained

The results categorised into Q3 have the following characteristics:

1. Products are 'less mature', with $0 < RCA_{tw} < 1$.
2. The 'home market' appears to have some production capacity for exports, as these products also meet the requirement of $RTA_{tw} > 0$.
3. Markets are 'new' or 'small' trading partners where the 'home market' supplies zero or intermediately small shares of the target markets' import demand.

Q3 can be seen to inform the extensive margin from both a product perspective and a market perspective. This quadrant is referred to as the 'Blue sky' quadrant (analogous to engineering or investment projects that create totally new concepts). Q3 comprises 'immature/new' products for the 'home market', as well as previously under-serviced markets or totally new markets.

☐ Quadrant 4 explained

The results categorised into Q4 have the following characteristics:

1. Products are 'less mature', with a slightly lower $0 < RCA_{tw} < 1$.
2. The 'home market' appears to have some production capacity for exports, as these products also meet the requirement of: $RTA_{tw} > 0$.
3. Markets are existing trading partners where the 'home market' already supplies a relatively significant share of the target markets' import demand.

Q4 can be seen to inform the extensive margin from a product perspective and the intensive margin from a market perspective. This quadrant is referred to as the 'Grey fields' quadrant (i.e. 'immature/new' products to existing markets). Such markets typically have insufficient demand to help grow the 'home market's exports, or there are other currently 'unknown' factors inhibiting further growth into these markets – hence, the reference to 'grey'.

Following the aforementioned approach, the export strategy development process is informed from three different perspectives:

- *short-term*, more accessible export promotion opportunities (as informed by the first step in the preceding process);
- *medium-term* export development and possible investment opportunities that may require more effort and a longer time frame to yield results (as informed by the second step in the preceding process); and
- *longer-term*, new investment opportunities aimed at exports that may require major new product or sector developments and will probably take the longest to yield results.

The designations of short, medium and longer term are 'generalised' to mean opportunities that are mature, less mature and currently non-existent in the historical export basket context. Where a product already exhibits an RCA, the rationale is that implementation should be possible in the short term (say, between one and three years) and will require mostly an export promotion focus and related activities.

Medium-term opportunities exist in the base exports of ECCAS member states' export baskets but with a relatively lower comparative advantage, implying that some form of export development will need to take place. In practice, the nature of such development could range from lifting the information barrier to expanding physical production facilities. It would be reasonable to expect that such opportunities will take longer to yield returns and become more mature (say, between three and five years).

With longer-term opportunities, the identified products relate to existing skills, technology and production processes of products in which the countries in question already have a comparative advantage (thus constituting the next possible products that could be developed, in keeping with the product space approach concept). However, the reality is that these products do not manifest at all in recent formally reported trade statistics. It therefore seems reasonable to assume that more development and possibly even full greenfield investments are required to build the production base of such product groups. The rationale, therefore, is that these products would take the longest to yield results (say, more than five years).

In practice, though, real-world examples have shown that in some instances these generalised expected time frames can differ significantly from one case to the next. For example, in South Africa, it was demonstrated that the production, assembly and export of a relatively high-tech product such as solar panels could be executed within a couple of months. This was because the technology had been packaged as a reasonably 'portable' solution that could easily be containerised and dispatched. The more challenging aspects of the initiative were acquiring the operations location, delivering reliable and quality services (such as in electricity provision) and

managing the transport links (for more details on this case study, see Cameron, Viviers & Kritzinger van Niekerk 2017).

This implementation-time characteristic should therefore be interpreted from an intuitive and illustrative perspective rather than from an empirically informed or factual basis. It does, however, help to structure the strategy and sensitise policymakers' thinking to potential time frames associated with different types of opportunities, none of which can deliver results 'overnight'.

Furthermore, the process and opportunities selected can be dissected according to specific geographies. Such detailed analysis exceeds the scope of this chapter.

Discussion of the results

As indicated in the introduction to this chapter, the focus of our analysis was on intra-ECCAS and ECCAS-to-Africa trade potential. To aid the analysis, the aggregate outcomes for the region were considered in the light of regional aggregations for intra-ECCAS and ECCAS-to-(the rest of) Africa only.

The results were arranged according to what should be possible to realise in the short, medium and longer terms, as explained in the preceding section. As previously noted, these time-frame qualifications simply serve to indicate a reasonable period of implementation, which is linked to the underlying comparative advantage (or not) of existing exports in the make-up of the member states' economies.

Avoiding double counting of regional 'untapped' potential

It should be noted that, in order to calculate the regional 'untapped' value, simply aggregating each individual home market's identified 'untapped' potential for a particular product into a set of common target markets may overstate the potential by between one and 10 times. To accommodate a situation in which the same opportunity exists for more than one ECCAS member state in the same set of target markets, the average of the 'untapped' potential was therefore used in this multi-country analysis.

This can be illustrated through an example. The product *HS071333: Vegetables, leguminous: kidney beans, including white pea beans (Phaseolus vulgaris), shelled, whether or not skinned or split, dried* qualifies as an opportunity for both Cameroon and Rwanda in the same set of 10 target markets. The 'untapped' potential for both Rwanda and Cameroon in these markets refers to the same import demand pool, albeit adjusted to the situation where the home market (e.g. Rwanda) is one of the current major import partners of the target markets for the product in question. Therefore,

if both Rwanda and Cameroon are among the top supplying partners to a target market for the product in question, the 'untapped' potential value will be slightly different from Rwanda's and Cameroon's perspectives. As it is not known how much of Rwanda's market share will be absorbed by Cameroon (in the hypothetical situation where Cameroon aims to supply more of this product into these 10 target markets, thereby competing with Rwanda), it cannot be assumed that all potential will be available to each of the competitors. Hence, by making use of the average of the 'untapped' potential for a group of commonly occurring opportunities, a more realistic pool of 'untapped' potential is determined at a regional or multi-market level.

The summary results discussed in the ensuing sections therefore account for potential 'multiple counting' of opportunities by making use of the average 'untapped' opportunity value when aggregating from an HS 6-digit level product across the different ECCAS member states.

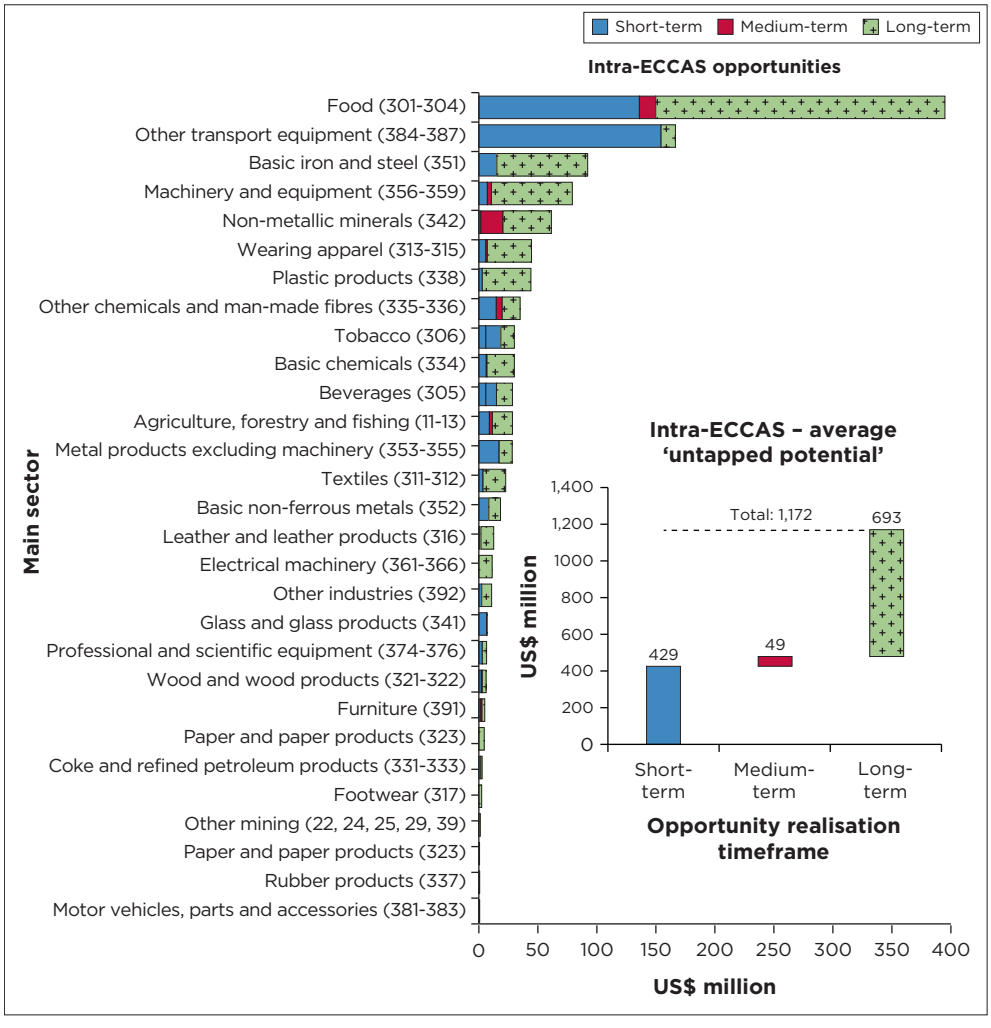
Furthermore, it should be noted that when the 'untapped' potential is identified for an individual home market, the value is expressed as the 'full share' of untapped potential – in other words, not averaged across the region. Therefore, it would not necessarily make sense to compare the regional ECCAS aggregate 'untapped' potential with the 'untapped' potential reported for an individual member state. Such a comparison would only be sensible under the extreme assumption that the home market is assumed to 'utilise' 100% of the 'untapped' potential for a particular product for all identified common markets, while none of the other ECCAS member states utilises any of this identified 'untapped' potential.

Lastly, it should be noted that this analysis was based on the assumption that the underlying import demand structures of the target markets remained relatively the same over the preceding five years. While this may be a constraining assumption, in the absence of detailed information on future changes in import demand structures for these markets, it provided a departure point based on what was known at the time of the analysis.

Intra-Economic Community of Central African States 'untapped' potential

While the modelling was conducted at the HS 6-digit product level detail (as demonstrated in the preceding discussion on potential multiple counting), for policymaking and strategic application the results were aggregated into broad economic activities, based on the International Standard Industrial Classification (ISIC) revision 4. This allowed for easy comparison with other economic statistical data, such as sectoral gross domestic product (GDP) and employment estimates that are typically reported on ISIC.

The overall (short-, medium- and longer-term) opportunities' 'untapped' potential amounts to a combined[88] average 'untapped' potential of US$1.172 billion. For context, this is equivalent to 1.12 times the historical five-year, time-weighted intra-ECCAS exports (see Figure 7.8). This potential consists



Source: Author's own work (Cameron 2021).
Key: ECCAS, Economic Community of Central African States; US$, United States dollar.

FIGURE 7.8: Intra-Economic Community of Central African States 'untapped' potential – overall and by main sector (in value terms).

88. As discussed, modelling was conducted for each individual country, with results shown as 'all else constant' – therefore, other ECCAS member states are not utilising the same identified opportunities, as indicated by bubbles/bars in the charts/maps. Hence, one cannot simply add values represented by bubbles/bars together as this would lead to 'multiple counting' of the same opportunities. It should also be noted that some product exclusions were applied, such as weapons and ammunition-related and personal effects, among others.

of US$429 million (× 0.4 $historic_{tw}$ intra-ECCAS exports) in short-term opportunities, US$49 million (× 0.5 $historic_{tw}$ intra-ECCAS exports) in medium-term opportunities and US$693 million (× 0.67 $historic_{tw}$ intra-ECCAS exports) in longer-term opportunities.

From a sectoral perspective, the top five sectors represent 68% of the 'untapped' potential associated with intra-ECCAS demand. These sectors are Food, Other transport equipment, Basic iron and steel, Machinery and equipment, and Non-metallic minerals.

Regarding potential 'low-hanging fruit', the top five sectors that are 'export ready' represent 73% of the identified short-term 'untapped' potential within the ECCAS region. These sectors are Food, Other transport equipment, Basic iron and steel, Machinery and equipment, and Non-metallic minerals. For medium-term and longer-term opportunities within the ECCAS region, the Food, Basic iron and steel, Machinery and equipment, Non-metallic minerals and Plastic products exhibit the largest 'untapped' potential that can be developed.

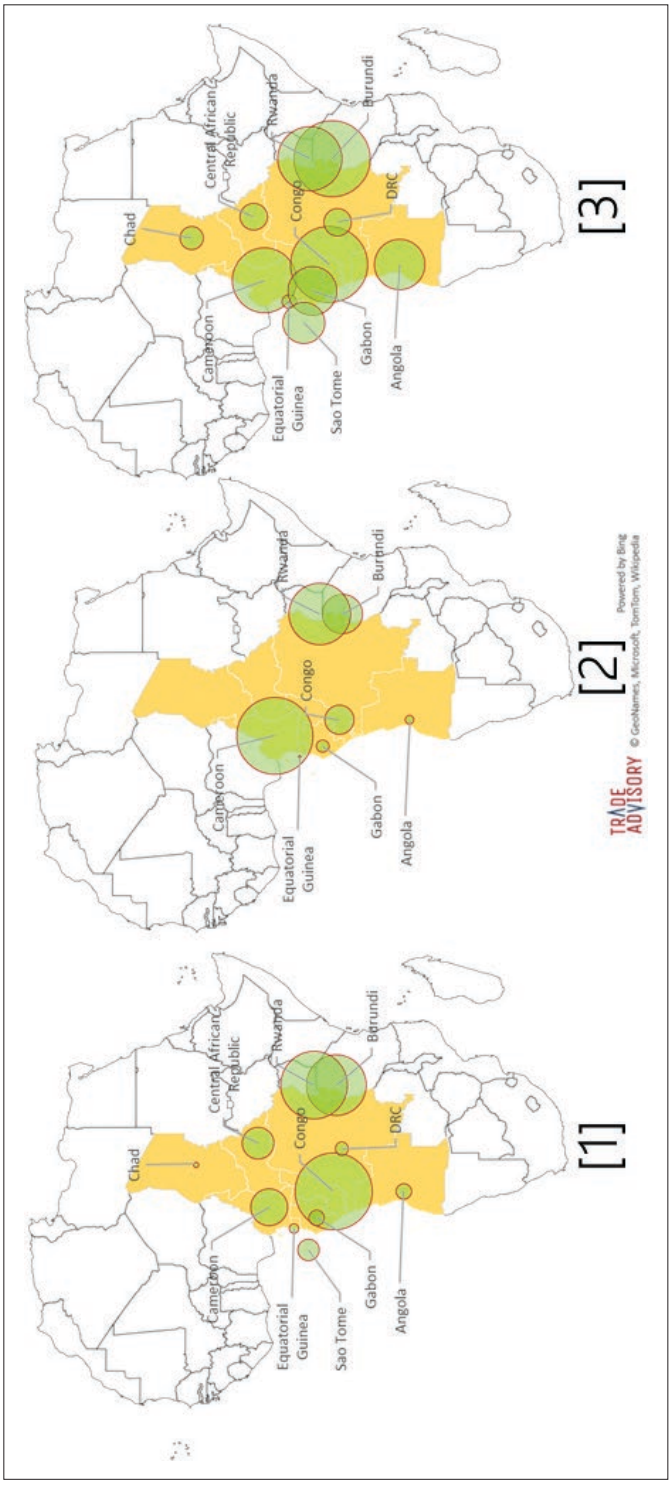
Regarding individual ECCAS member states acting as 'source markets', overall, Congo, Burundi, Rwanda and Cameroon exhibit the greatest potential to supply to the ECCAS region in the short term (see Figure 7.9), followed by Angola, Gabon, and São Tomé and Principe as the next largest group and, lastly, Central African Republic, DRC, Chad and Equatorial Guinea.

Because the modelling and analysis were based on individual HS 6-digit level product codes, Figure 7.10 shows the overall number of individual HS 6-digit product codes associated with the identified value of 'untapped' potential. Notably, overall, with more than 100 to over 300 products, Rwanda exhibits the largest number of products, followed by Cameroon, Burundi, Angola and DRC. Countries with a range of more than 20 and less than 100 products include the Central African Republic, São Tomé and Principe, Congo, Gabon and Equatorial Guinea.

The products associated with the longer-term opportunities (light grey part of the bars in the chart) are completely 'new' products that are related to existing products in these countries' current export basket.

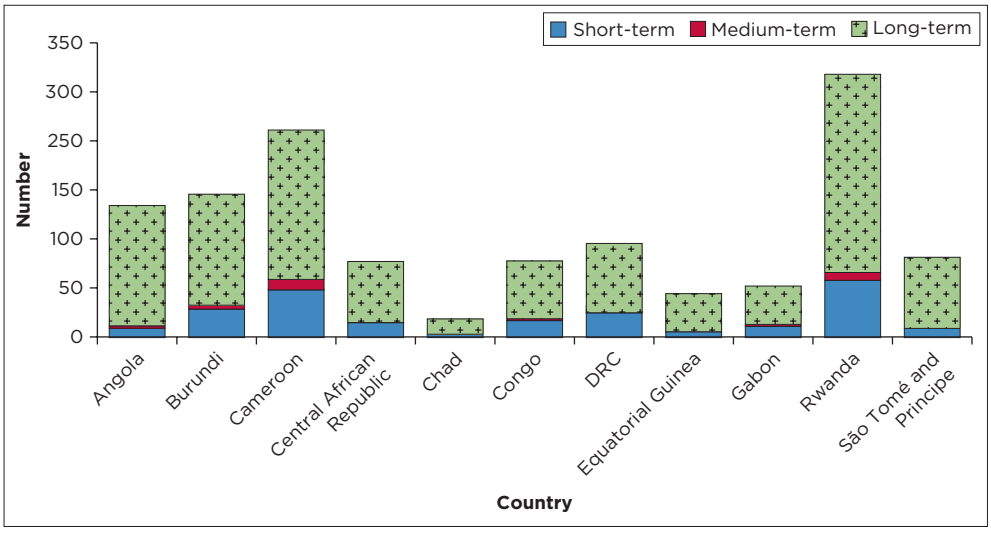
The make-up of individual products associated with each of these source markets is, however, different from one market to the next and needs to be investigated in more detail from the specific country's perspective (which is beyond the scope of this chapter).

To demonstrate, Figure 7.11 provides a breakdown of products according to the UNCTAD classification of goods by SoP (WITS n.d.[a], n.d.[b], n.d.[c], n.d.[d]), with all those HS 6-digit products associated with the Food sector (ISIC) as an example. Only a relative share of the 'untapped' potential breakdown is provided because of the potential 'multiple counting' issue



Source: Author's own representation (map not to scale) (Cameron 2022). Reproduced and published with permission of Trade Research Advisory.

FIGURE 7.9: Intra-Economic Community of Central African States 'untapped' potential – by member state and type (in value terms).



Source: Author's own work (Cameron 2022).
Key: DRC, Democratic Republic of the Congo; ECCAS, Economic Community of Central African States; HS, Harmonized System.

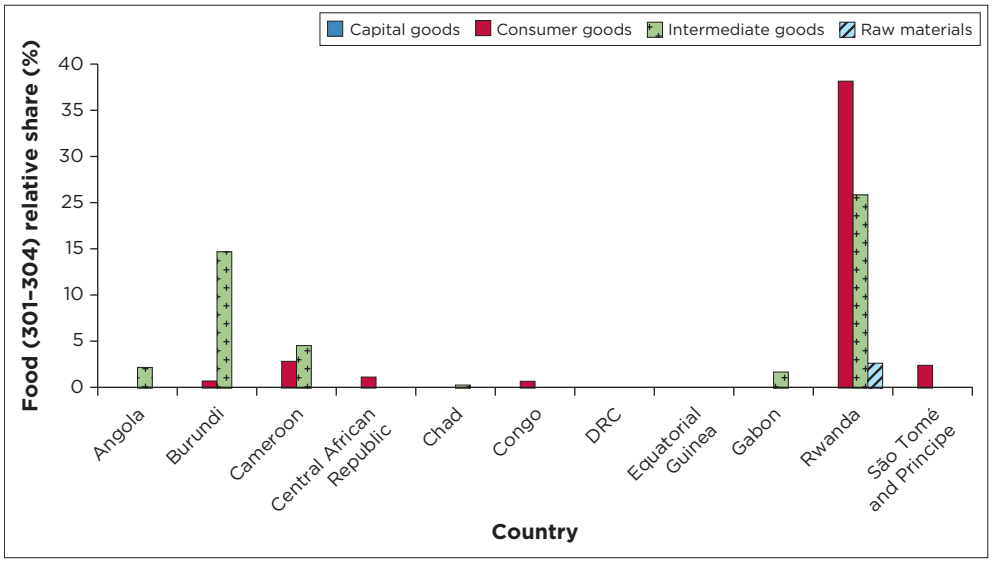
FIGURE 7.10: Intra-Economic Community of Central African States 'untapped' potential – unique identified (HS 6-digit) products (in number terms).

associated with comparing product-level outcomes across ECCAS member states.

The breakdown in Figure 7.11 shows that in the short term, for example, Rwanda has the most identified 'untapped' potential associated with food-related products in the ECCAS region. This implies that for these particular products in the short term, the combination of Rwanda's underlying production structure and relative 'maturity' of exports for a particular product set (compared to other ECCAS member states), the accessibility to other ECCAS markets, and the relative demand and competitor supply characteristics in the other ECCAS member states were all relatively in favour of Rwanda.

However, within the broader group of products, most are shown to be consumer-related food products, such as *HS090121: Coffee: roasted, not decaffeinated*. For Rwanda, intermediate food-related goods were also identified, including *HS110814: Starch: manioc (cassava)*.

In contrast, for Angola, an intermediate good with potential in ECCAS markets is *HS030354: Fish: frozen, mackerel (Scomber scombrus, Scomber australasicus, Scomber japonicus), excluding fillets, livers, roes and other fish meat of heading 0304*. This product does not feature (as expected) in the basket of HS 6-digit products identified for Rwanda, while *HS110814: Starch: manioc (cassava)* does not feature in the basket identified for Angola.



Source: Author's own work (Cameron 2022).
Key: %, percentage; DRC, Democratic Republic of the Congo.

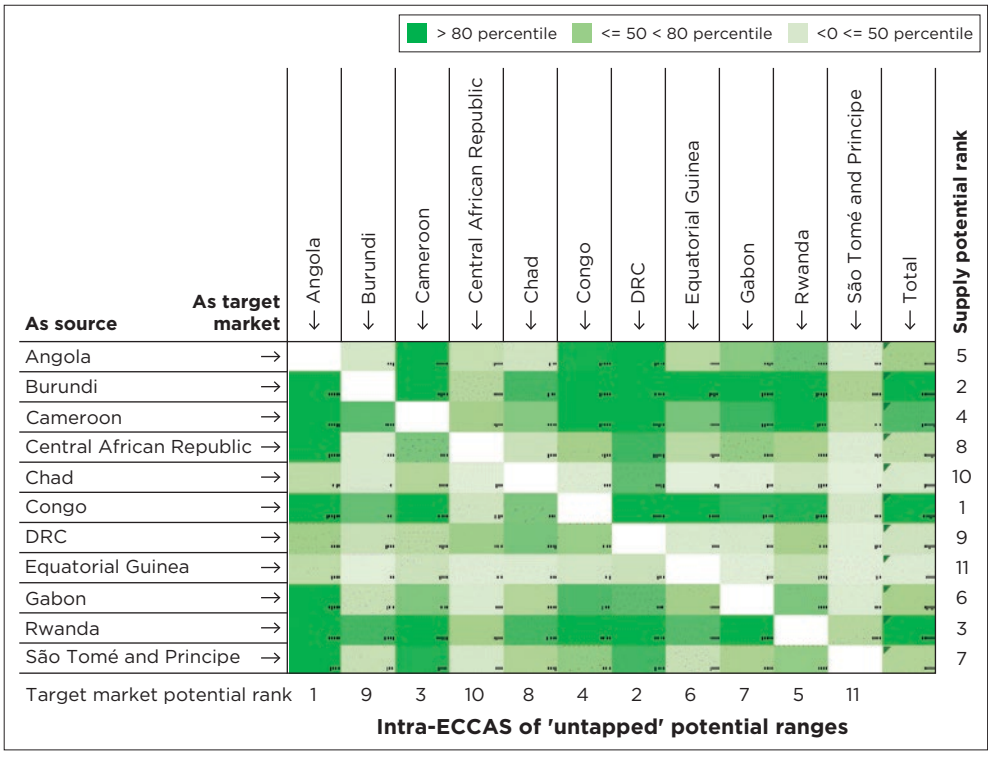
FIGURE 7.11: Intra-Economic Community of Central African States 'untapped' potential – food by member state and United Nations Conference on Trade and Development stages of processing (by value).

However, as mentioned earlier in this section, a product such as *HS071333: Vegetables, leguminous: kidney beans, including white pea beans (Phaseolus vulgaris), shelled, whether or not skinned or split, dried* is associated with the potential baskets of more than one ECCAS member state.

With the ECCAS member states acting both as sources of identified products and as potential target markets for the other member states, Figure 7.12 provides a comparison of the target markets' total 'untapped' potential (i.e. for the short, medium and longer terms combined) from the perspective of each ECCAS member state.

From this perspective, Angola exhibits the most 'untapped' potential in relative terms as a target market for seven of the ECCAS members (Burundi, Cameroon, the Central African Republic, Congo, Gabon, Rwanda, and São Tomé and Principe). In contrast, São Tomé and Principe, the Central African Republic and Burundi exhibit the least 'untapped' potential in relative terms.

This multi-directional analysis can be expanded into different dimensions, for example, across economic sectors, product groups or stages of production. As RVCs are of interest, the following 'slice' of intra-ECCAS relative 'untapped' potential associated with all products identified as typically 'intermediate' goods (based on UNCTAD's classification of goods by SoP) is constructed. The rationale for this is that value chains typically depend on raw and intermediate input flows; therefore, investigating this dimension of the identified opportunities may help to shed some light on potential value chains within ECCAS that warrant further investigation.

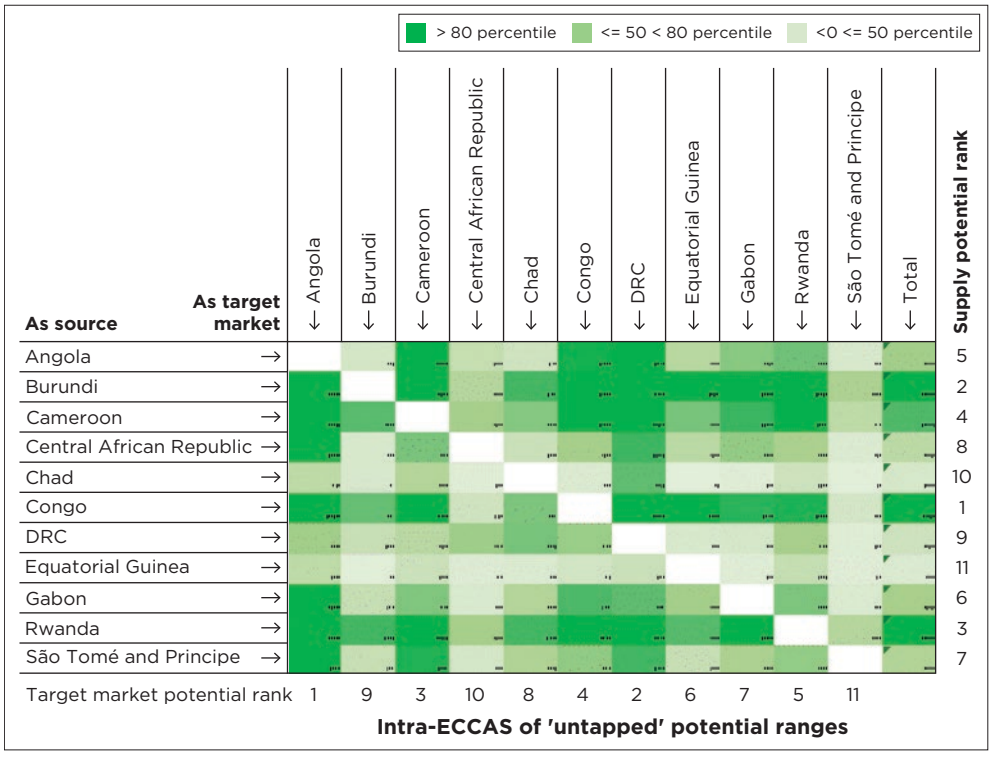


Source: Author's own work (Cameron 2022).
Key: DRC, Democratic Republic of the Congo.

FIGURE 7.12: Intra-Economic Community of Central African States 'untapped' potential – total by source and target member state (relative ranges).

In this regard, Figure 7.13 shows the intra-ECCAS relative 'untapped' potential for intermediate goods for both the possible supply and demand contexts.

Regarding ECCAS member states' existing production and export capabilities – augmented by medium- and longer-term opportunities in products that could possibly be developed on the basis of existing but historically low RCAs, combined with 'next adjacent possible' products according to product space thinking – Figure 7.13 highlights that there could be potential in creating additional intra-ECCAS intermediate goods trade sourced (from a relative supply potential perspective) from Burundi, Rwanda and Cameroon. The next group in terms of relative potential consists of Angola and Congo, followed by the Central African Republic, Chad and Gabon, with the lowest potential associated with São Tomé and Principe, Equatorial Guinea and the DRC. As far as potential target markets are concerned for this group of products, Angola, the DRC and Cameroon exhibit the greatest 'untapped' demand potential.



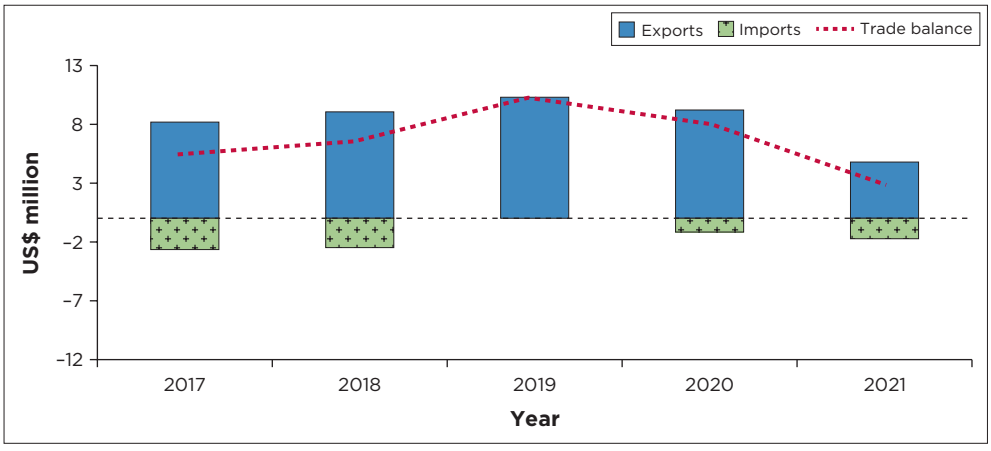
Source: Author's own work (Cameron 2022).
Key: DRC, Democratic Republic of the Congo.

FIGURE 7.13: Intra-Economic Community of Central African States 'untapped' potential – intermediate goods by source and member state (relative ranges).

It may seem counter-intuitive that the DRC has such low potential. However, while the DRC's main exports are copper products, only three HS 6-digit products[89] are associated with demand for intermediate goods (based on UNCTAD's classification) among nine of the ECCAS member states, with relatively low import demand from a monetary value perspective. Most of the DRC's potential in relation to these products can be found in the rest of Africa and the rest of the world.

A curious outcome is that Burundi features strongly in this group where intermediate goods are concerned. On closer inspection, one intermediate good, i.e. *HS110100: Wheat or meslin flour*, is in the basket of products identified for Burundi as a potential export product to the other ECCAS member states. On further investigation, the latest (at the time of writing) reported trade statistics from ITC TradeMap (see Figure 7.14) demonstrate

89. These are HS740200 Copper: unrefined copper anodes for electrolytic refining, HS740319 Copper: refined, unwrought, n.e.c. in item no. 7403.1 and HS740311 Copper: refined, unwrought, cathodes and sections of cathodes.



Source: Authors' calculations, based on the International Trade Centre (ITC) TradeMap (ITC 2022).
Key: HS, Harmonized System; US$, United States dollar.

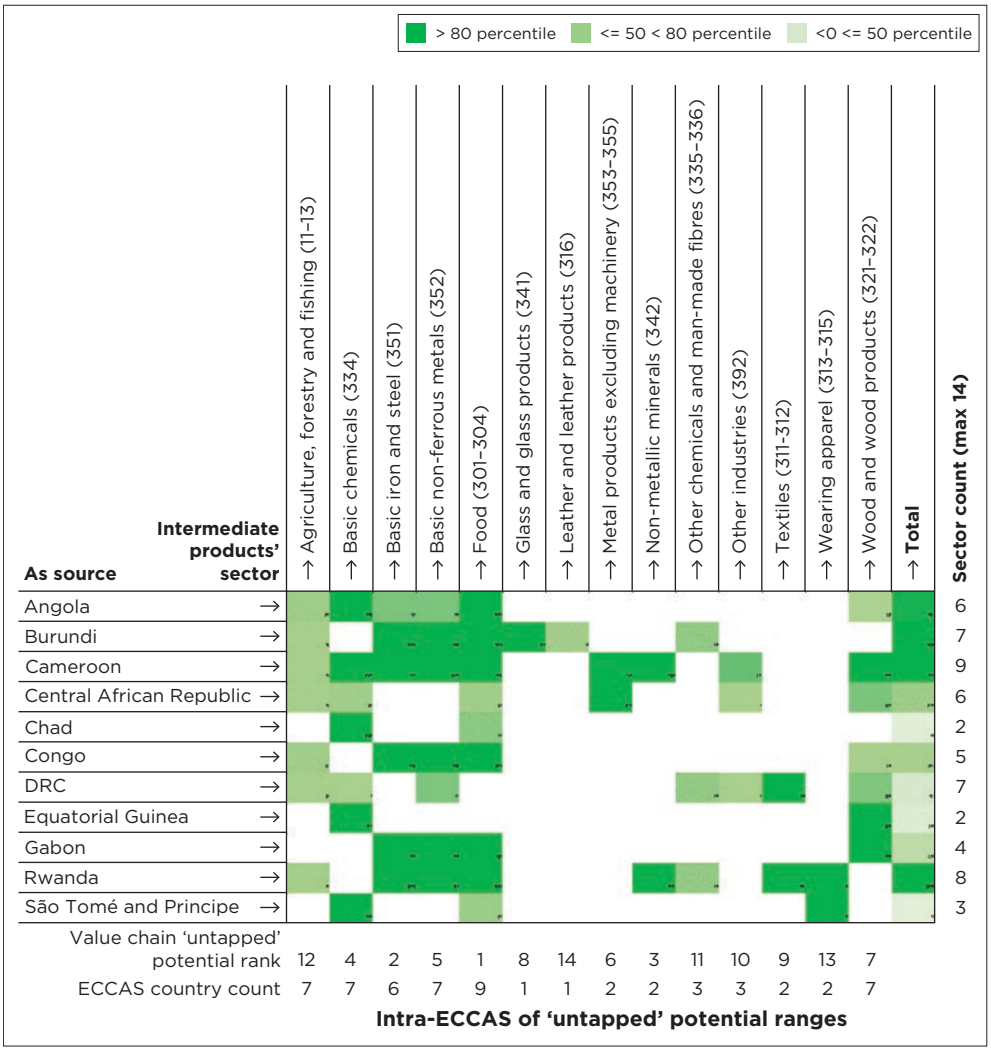
FIGURE 7.14: Example – Burundi trade for wheat (HS1101.00).

that Burundi does indeed appear to have a positive trade balance for this product on an ongoing basis and, with the exception of exports to the DRC and Rwanda, Burundi does not export this product to any of the other ECCAS member states.

It should be noted, however, that this modelling did not explicitly consider production-related requirements, such as availability and capacity utilisation of arable land (which would be more relevant to agricultural products). It might also be that Burundi imports the lower value-added raw product and processes the higher value-added flour product before exporting. However, the aim is to, as a first step, identify realistic export product opportunities for further investigation. On the strength of more detailed research, it may well be found that production-related challenges make certain products unsuitable for further development. These types of production-side challenges are currently beyond the scope of this approach and this study.

However, the advantage of this approach when analysing possible products and sectors or RVCs is that the point of departure is existing 'proven' demand (through reported trade statistics). While the demand may be underestimated because of challenges with the reported statistics, the upside is that when a product or group of products and markets is identified in this way, the potential will, with high probability, be larger rather than smaller, thereby revealing those opportunities with realistic prospects of becoming viable options to develop.

Following this logic, Figure 7.15 provides a view of the relative 'untapped' potential of intra-ECCAS intermediate goods by economic sector and source country across all opportunities (short, medium and longer terms).



Source: Author's own work (Cameron 2022).
Key: DRC, Democratic Republic of the Congo; ECCAS, Economic Community of Central African States.

FIGURE 7.15: Intra-Economic Community of Central African States 'untapped' potential – intermediate goods' possible value chains (relative ranges).

The sector with the largest intermediate goods-related 'untapped' potential across most of the countries is the manufactured[90] food products sector (ISIC 301–304). Exceptions are the DRC and Equatorial Guinea, based on the current assumptions – especially in the light of existing production structures.

90. All sectors with an ISIC digit starting with 3nn are higher value-added manufactured goods. Therefore, while the description might, for example, be: 'Wood and wood products (321–322)', this does not refer to low value-added forestry basic logging outputs, but rather to further processed products like sawn or planed wood planks, manufactured veneer sheets; plywood, laminboard, particle board and other panels and boards, wooden containers, manufactured builders' carpentry and joinery products like window and door frames, shuttering, wooden flooring panels, kitchenware and wooden articles of furniture, among others.

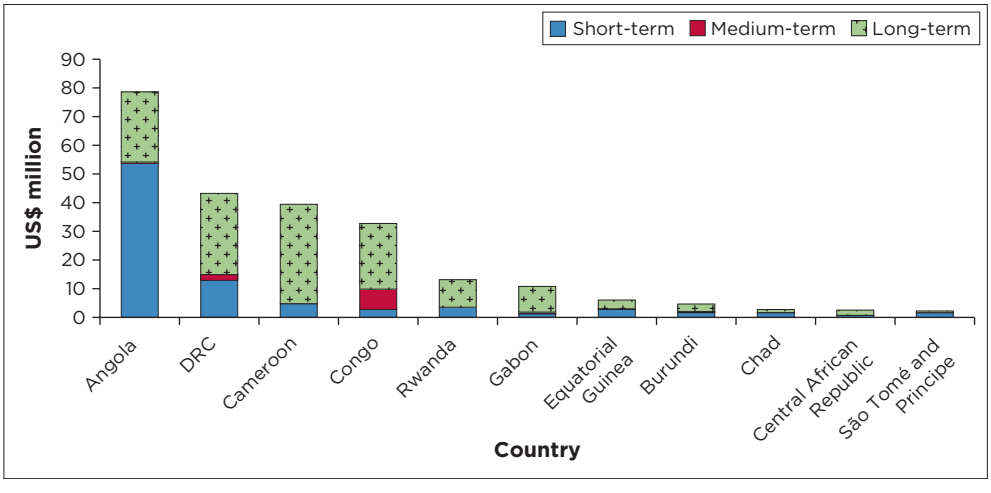
The sector with the second largest 'untapped' potential is manufactured Basic iron and steel (ISIC 351), appearing in the baskets of six ECCAS member states, followed by manufactured Non-metallic minerals (ISIC 342), appearing in the baskets of only two member states. A more promising sector might be manufactured Basic chemicals (ISIC 334), positioned in fourth place in terms of 'untapped' value and appearing in the baskets of member states.

The 'untapped' import demand potential across the ECCAS member states for further processed, manufactured, intermediate food-related products is shown in Figure 7.16. The largest potential market is Angola, followed by the DRC, Cameroon and Congo.

Angola exhibits the most potential for short-term opportunities; Cameroon, the DRC and Congo exhibit the most potential for longer-term opportunities; and Congo exhibits the most potential for medium-term opportunities.

As explained previously, this analysis first evaluated each ECCAS member state's opportunities in isolation and then combined the results. This implies that while potential exists, it does not mean that all countries will be able to tap into all the available potential, as there will be natural underlying competition between ECCAS member states to cater to the same demand.

Furthermore, the analysis followed the product space assumption of 'evolutionary' development of products and exports thereof, as opposed to 'jumping' to totally new and unrelated products in the product space. While 'jumping' is a viable strategy, the prerequisites for success are



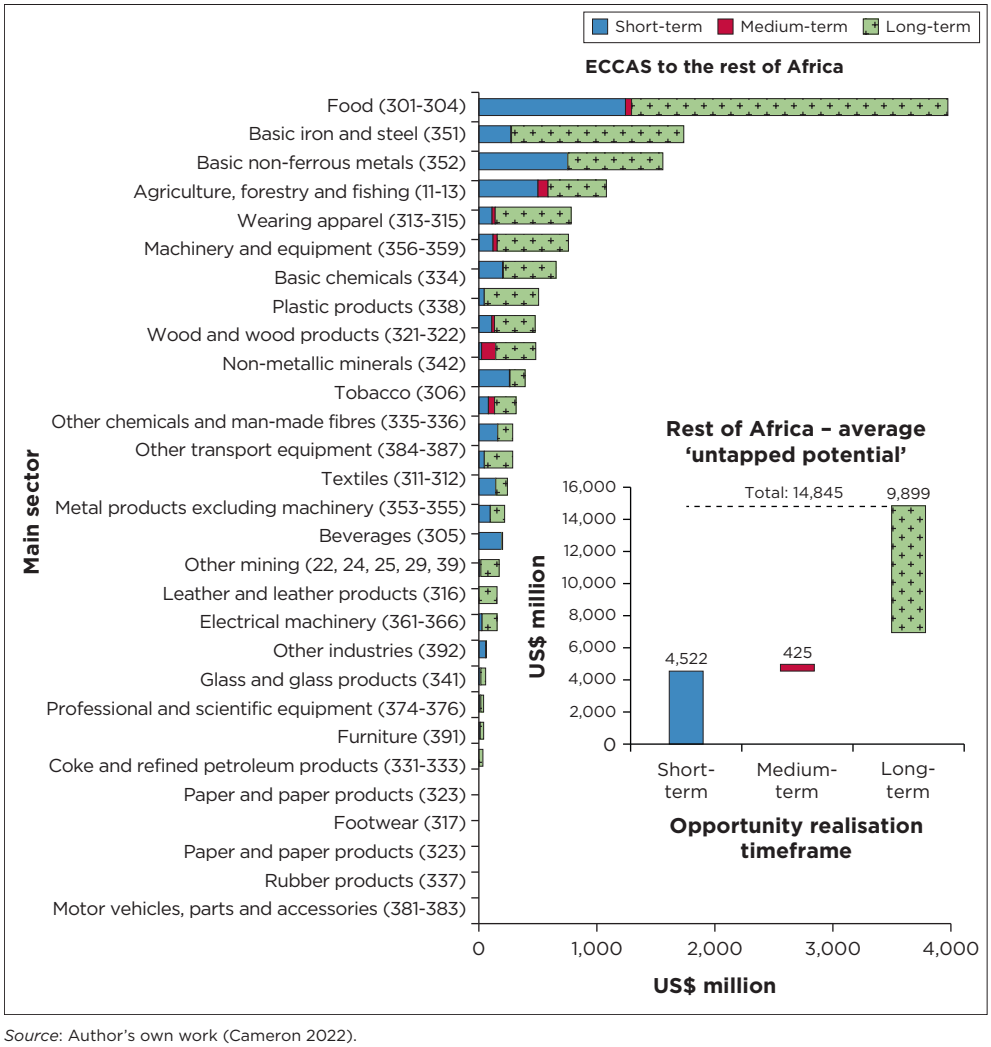
Source: Author's own work (Cameron 2022).
Key: US$, United States dollar; DRC, Democratic Republic of the Congo; ECCAS, Economic Community of Central African States.

FIGURE 7.16: Intra-Economic Community of Central African States 'untapped' potential – intermediate food (301–304) products by market (relative ranges).

significant, and relatively few cases (other than a recent one reported by Pinheiro et al. 2018) have historically appeared in studies on trade development.

Economic Community of Central African States to rest of Africa 'untapped' potential

Regarding the potential for ECCAS member states to the rest of Africa, Figure 7.17 provides a summary overview of the total potential, similar to the preceding section, which focused only on intra-ECCAS potential.



Source: Author's own work (Cameron 2022).
Key: ECCAS, Economic Community of Central African States; US$, United States dollar.

FIGURE 7.17: Economic Community of Central African States to rest of Africa 'untapped' potential – overall and by main sector (in value terms).

The overall 'untapped' potential (short-, medium- and longer-term opportunities) to the rest of Africa amounts to a combined[91] average 'untapped' potential of around US$14.84 billion. To create some context, this is equivalent to 2.6 times the five-year, time-weighted historical exports from ECCAS to the rest of Africa.

This potential is made up of US$4.5 billion (× 0.8 $historic_{tw}$ ECCAS-to-rest of Africa exports) of short-term opportunities, US$0.42 billion (× 0.08 $historic_{tw}$ ECCAS-to-rest of Africa exports) of medium-term opportunities and US$9.9 billion (× 1.74 $historic_{tw}$ ECCAS-to-rest of Africa exports) of longer-term opportunities. From a sectoral perspective, the top five sectors represent 63% of the 'untapped' potential associated with the rest-of-Africa demand. These sectors are manufactured Food products; manufactured Basic iron and steel products; manufactured Basic non-ferrous metal products; primary Agricultural, forestry and fishing-related products; and manufactured Wearing apparel.

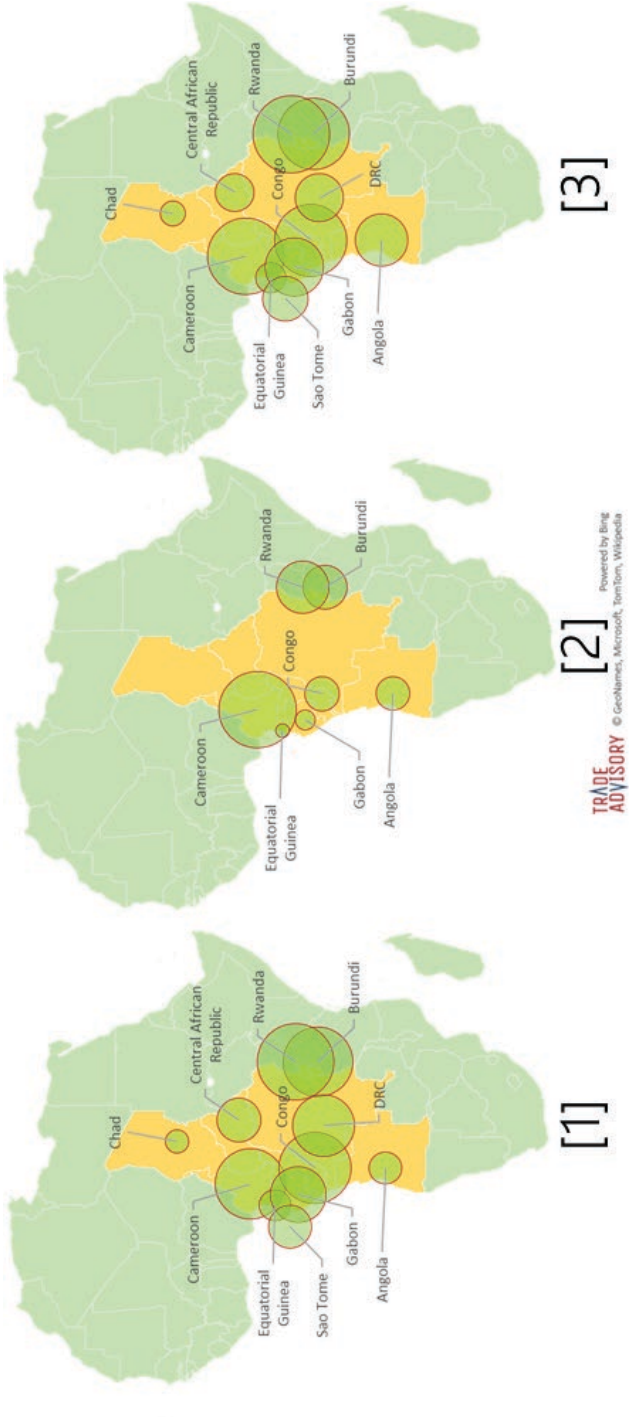
In terms of potential 'low-hanging fruit', the top five sectors that are 'export ready' represent 67% of the identified shorter-term 'untapped' potential within the ECCAS region. These sectors are Food; Basic non-ferrous metals; Agriculture, Forestry and fishing; Basic iron and steel; and Tobacco. For medium- and longer-term opportunities within the ECCAS region, the Food, Basic iron and steel, Basic non-ferrous metals, Wearing apparel, and Machinery and equipment sectors exhibit the largest 'untapped' potential that can be developed.

Regarding individual ECCAS member states acting as 'source markets', overall, Rwanda, Congo and Cameroon, followed by Burundi and the DRC, exhibit the most potential to supply to the rest of Africa in the short term (see Figure 7.18), followed by Gabon, the Central African Republic, and São Tomé and Principe, and lastly Angola, the DRC, Equatorial Guinea and Chad.

For the rest of Africa, Figure 7.19 shows the total number of individual product codes associated with the value of 'untapped' potential. Overall (similar to the intra-ECCAS summary), with a range of more than 100 to over 200 products, Rwanda exhibits the largest number of products, followed by Cameroon, Burundi, Angola and the DRC. Countries with a range of more than 20 and less than 100 products are the Central African Republic, São Tomé and Principe, Congo, Gabon and Equatorial Guinea.

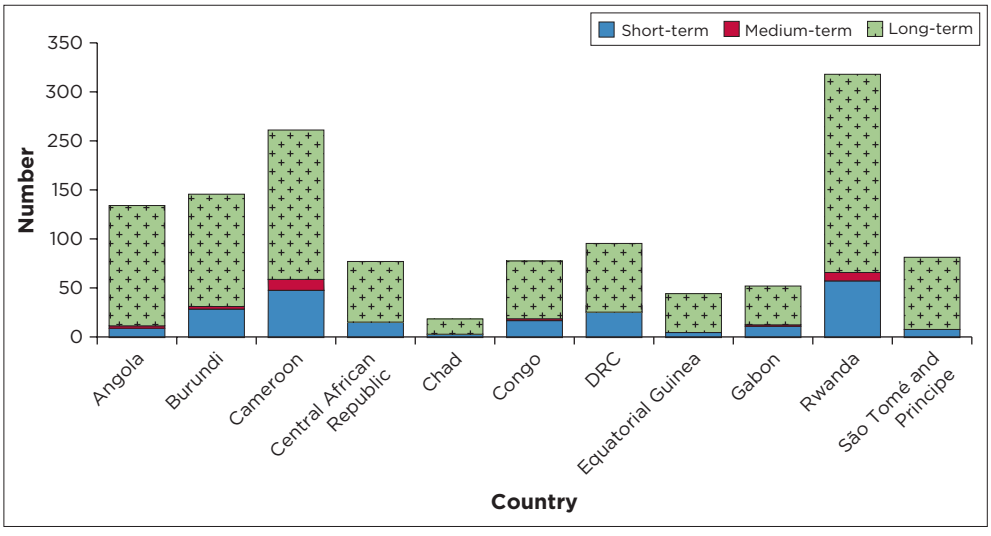
Again, it should be noted that the products associated with long-term opportunities (the light grey part of the bars in the chart) are completely 'new'

91. As discussed, modelling was conducted for each individual country, with results shown as 'all else constant' – therefore, other ECCAS member states are not utilising the same identified opportunities as indicated by bubbles/bars in charts/maps. Hence, one cannot simply add values represented by bubbles/bars together as this would lead to 'multiple counting' of the same opportunities. It should also be noted that some product exclusions were applied, such as weapons and ammunition-related, personal effects, among others.



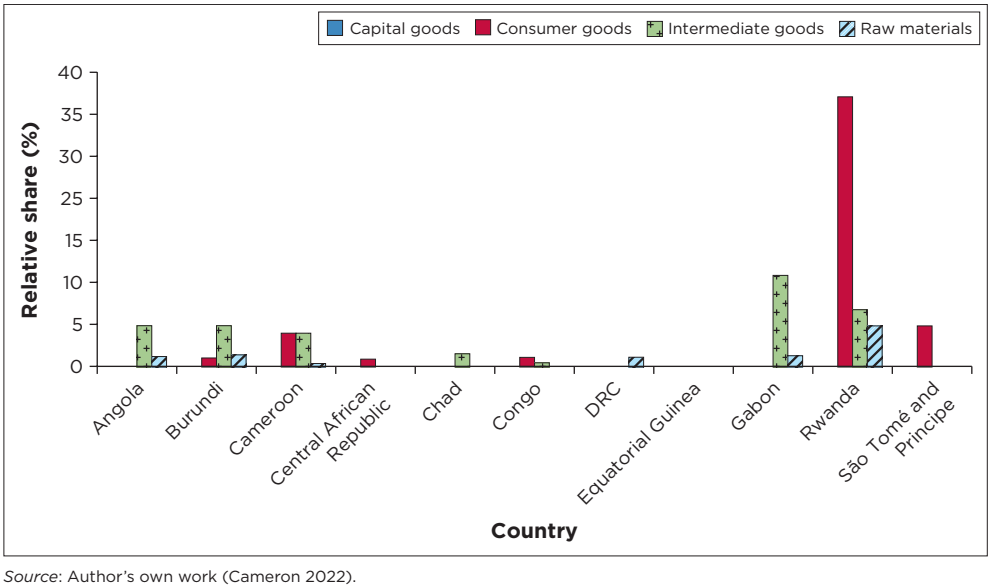
Source: Author's own representation (map not to scale) (Cameron 2022). Reproduced and published with permission from Trade Research Advisory.

FIGURE 7.18: Economic Community of Central African States to rest of Africa 'untapped' potential – by member state and type (by value).



Source: Author's own work (Cameron 2022).
Key: HS, Harmonized System; DRC, Democratic Republic of the Congo; ECCAS, Economic Community of Central African States.

FIGURE 7.19: Intra-Economic Community of Central African States 'untapped' potential – unique identified products (HS 6-digit) (by number).



Source: Author's own work (Cameron 2022).
Key: %, percentage; DRC, Democratic Republic of the Congo.

FIGURE 7.20: Economic Community of Central African States to rest of Africa 'untapped' potential – food (301–304) by member state and United Nations Conference on Trade and Development stages of processing (by value).

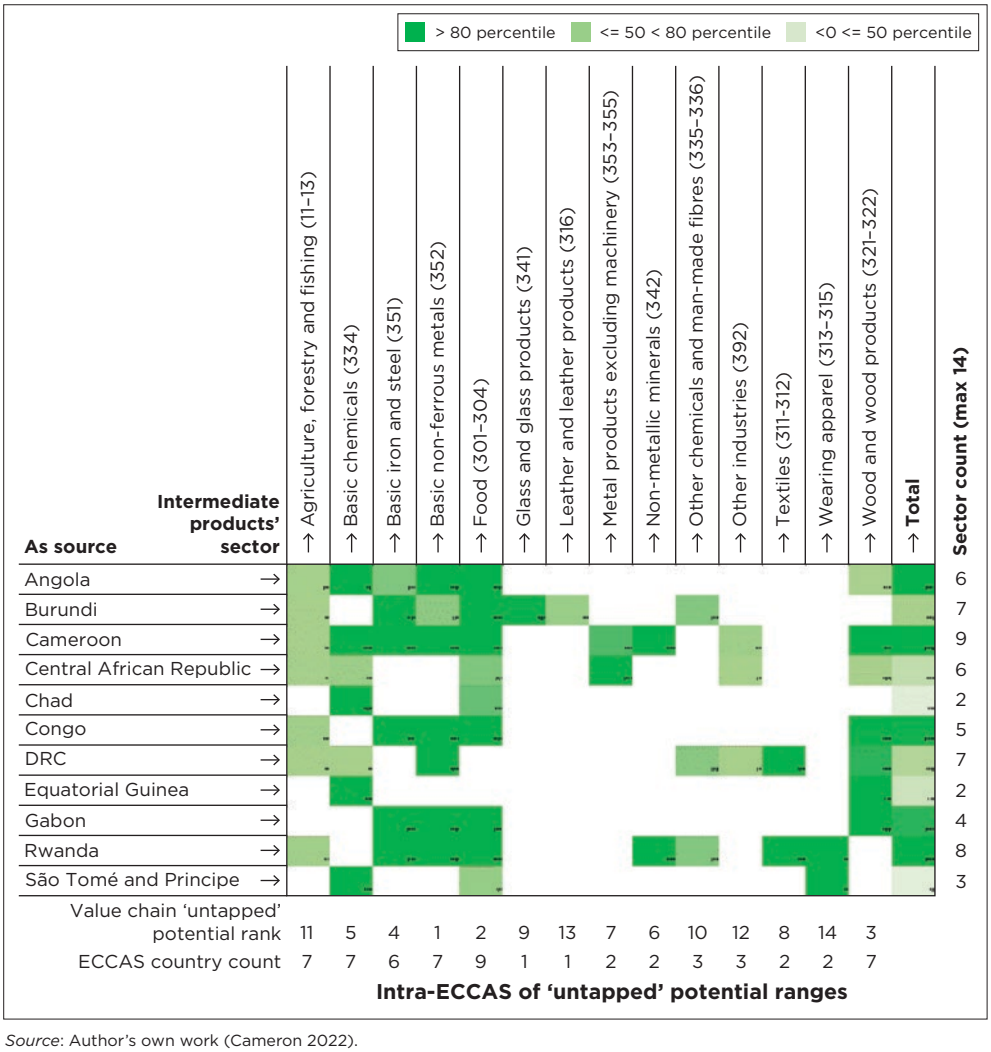
products related to existing products in the current export basket of these countries.

The breakdown in Figure 7.20 shows that in the short term, Rwanda again has the most 'untapped' potential associated with food-related products to the rest of Africa. However, contrary to the previous example

of food from Rwanda to ECCAS markets, the relative ratio of food-related products to the rest of Africa is much larger than for intermediate goods. Other countries with significant intermediate food-related products with 'untapped' potential to the rest of Africa are Gabon, Angola, Burundi and Cameroon.

Figure 7.21 shows intermediate goods' relative 'untapped' potential by economic sector and source country across all opportunities (short, medium and longer terms) to the rest of Africa.

The sector with the largest intermediate goods-related 'untapped' potential to the rest of Africa across most source countries in ECCAS is



Source: Author's own work (Cameron 2022).
Key: DRC, Democratic Republic of the Congo; ECCAS, Economic Community of Central African States.

FIGURE 7.21: Economic Community of Central African States to rest of Africa 'untapped' potential – intermediate goods' possible value chains (relative ranges).

manufactured Basic non-ferrous metals products (ISIC 352), appearing in the baskets of seven ECCAS member states.

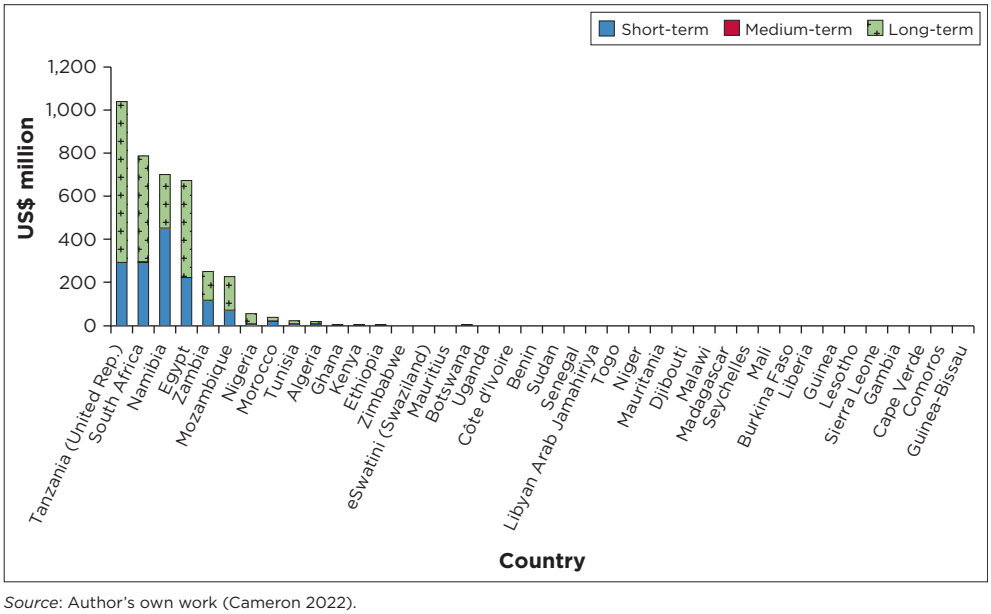
The sector with the second-largest 'untapped' potential is manufactured Food products (ISIC 301–304), appearing in the baskets of nine ECCAS member states, followed by (further value-added) manufactured Wood and wood products (ISIC 321–322), appearing in the baskets of seven ECCAS member states.

The 'untapped' import demand potential across the ECCAS member states for intermediate manufactured Basic non-ferrous metals-related products is shown in Figure 7.22. The largest potential market is Tanzania, followed by South Africa, Namibia, Egypt, Zambia, Mozambique, Nigeria, Morocco and Tunisia.

Namibia exhibits the most potential for short-term opportunities, while Tanzania, South Africa and Egypt exhibit the most potential for longer-term opportunities.

Summary

The foregoing analysis demonstrated the identified potential for both intra-ECCAS trade and trade with the rest of Africa. Evident from Figure 7.8 and Figure 7.17 is that the potential for the ECCAS market (at US$1.172 billion) accounts for around 7% of the total potential associated with the African continent from the perspective of the ECCAS member states. To provide



Source: Author's own work (Cameron 2022).
Key: US$, United States dollar.

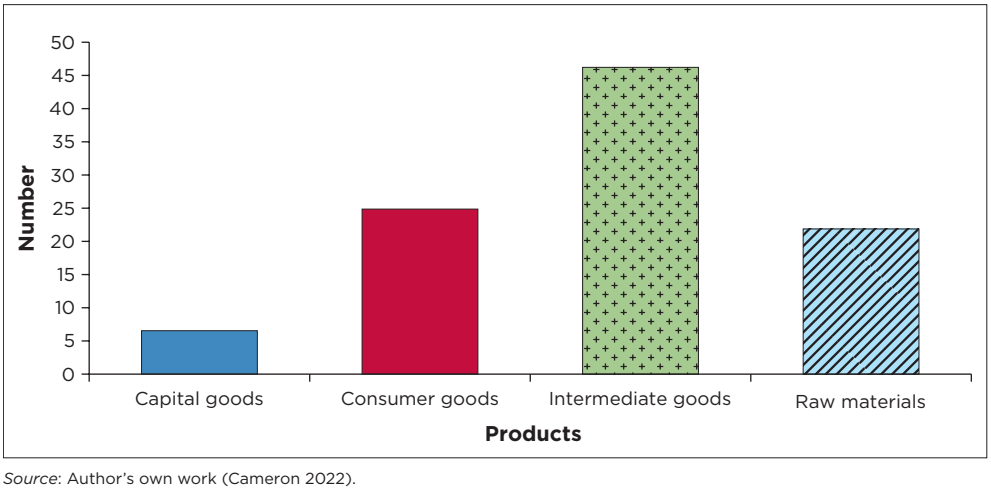
FIGURE 7.22: Economic Community of Central African States to rest of Africa 'untapped' potential – intermediate Basic non-ferrous metals (352) products by market (relative ranges).

some context, the ECCAS member states represent around 15.6% of Africa's population (United Nations Department of Economic and Social Affairs [UNDESA] 2019) and 9.7% of Africa's GDP (UN 2020).

Overall, most of the potential products are associated (in relative value terms) with UNCTAD's intermediate manufactured goods stage of production (see Figure 7.23), indicating that a large share of the potential could be conducive to RVC formation. Consumer goods and raw materials are of similar importance, while the least potential is associated with capital goods. This is a reflection of the fact that, in product space terminology, ECCAS members' current export capabilities are far removed from some of the denser parts of higher value-added capital equipment goods.

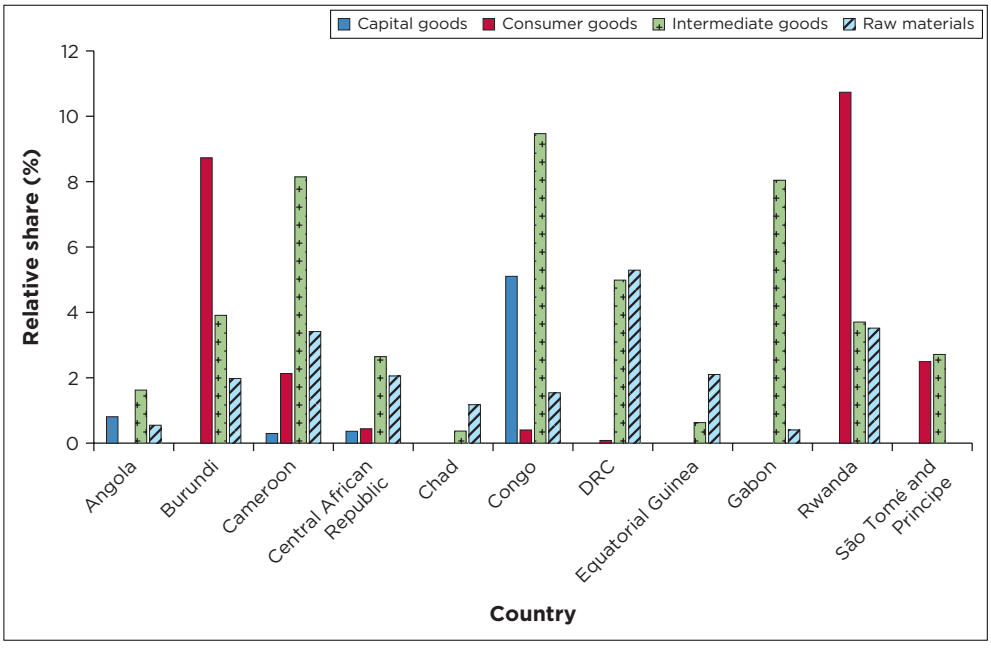
While not impossible to 'jump' directly from the periphery to higher value-added and complex capital equipment manufacturing, it would require significant focus, leadership, resources and investment. This includes investment in human capital, skills development and training that generate long-term returns. However, it would be necessary to place such economies on a fundamentally different growth and development trajectory. In the interim, expanding less complex production and exporting activities in parallel would provide crucial resources for reinvestment in these longer-term development objectives.

When considering the potential product groupings at the member state level, the differences between the make-up of the baskets of different member countries become more obvious, with only two countries exhibiting relatively large consumer goods potential, while intermediate goods dominate the baskets of the rest of the countries. Only Congo, Angola, the



Source: Author's own work (Cameron 2022).

FIGURE 7.23: Economic Community of Central African States to Africa 'untapped' potential – total by United Nations Conference on Trade and Development stages of processing (relative ranges).



Source: Author's own work (Cameron 2022).
Key: DRC, Democratic Republic of the Congo; %, percentage.

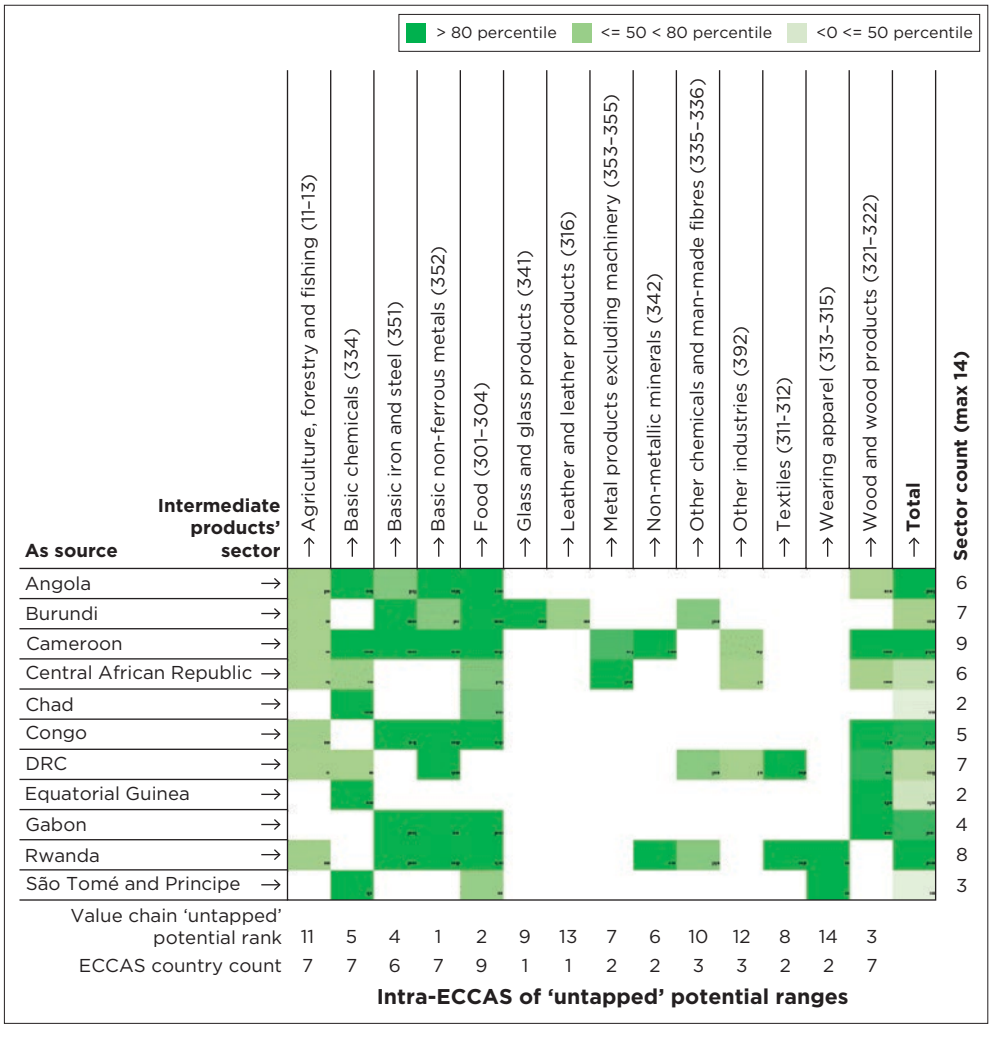
FIGURE 7.24: Economic Community of Central African States to Africa 'untapped' potential – total by source state and United Nations Conference on Trade and Development stages of processing (relative ranges).

Central African Republic and Cameroon exhibit significant capital products potential (see Figure 7.24).

The potential for intermediate goods trade across the whole of Africa (including ECCAS) is shown in Figure 7.25. While Food is the top sector in terms of 'untapped' potential and coverage for intra-ECCAS trade, it comes in at second place on a continent-wide basis, after Basic non-ferrous metals (which is dominated by copper-related products). However, the potential offered by Food (for nine ECCAS member states) is larger than that offered by Basic non-ferrous metals-related products (for seven ECCAS member states). Wood and wood products also exhibit relatively large potential across the continent, followed by Basic iron and steel – albeit only for six ECCAS member states.

Based on this high-level approach, from an industrialisation perspective, it may make sense to further investigate five focus sectors for potential RVC formation from the broader intra-ECCAS and continental perspectives. At the aggregate level, these are:

- Basic non-ferrous metals manufacturing
- Food manufacturing



Source: Author's own work (Cameron 2022).
Key: DRC, Democratic Republic of the Congo; ECCAS, Economic Community of Central African States.

FIGURE 7.25: Africa 'untapped' potential – intermediate goods' possible value chains (relative ranges).

- Wood and wood products manufacturing
- Basic iron and steel manufacturing and
- Basic chemicals manufacturing.

The other listed sectors also exhibit potential for RVC formation – although less (relatively) than the first five sectors. However, this view simply offers some insights into possible areas of focus – especially in the light of intra-regional cooperation and the need for more in-depth sectoral focus areas, because the sectors represented here are at a very high level of aggregation. Each member state therefore needs to consider its own potential and aspirations.

Conclusion

It is crucial for ECCAS member states to formulate evidence-based trade and industrialisation strategies in order to maximise their limited resources. To this end, this study provided a quantitative analysis to inform strategic export and industrialisation policy-related decisions, with opportunities identified at the detailed product level and by target market.

To achieve export growth, investments are necessary in the areas of logistics, infrastructure and trade facilitation. Furthermore, import demand patterns in target markets must be carefully assessed to determine product suitability in the face of global competition.

This study presented an approach to sharpening the policy mix by combining information from the latest evidence-based research on economic development from an export production angle as well as market-access and demand-side challenges of economic geography. The outcomes from this study provide rich information for ECCAS member states' policymakers and decision-makers, which will assist them in formulating strategies that have the potential to shape their countries in line with an envisaged 'Factory Africa'.

Key takeaways from this chapter

- The HS 6-digit country-level, bottom-up approach demonstrates that Africa (and the ECCAS region) offers diverse potential, with different ECCAS member states being more (or less) suitable as intra-regional supplying economies.
- Overall, intra-ECCAS exports represent around 7% of the identified export potential of ECCAS member states to Africa, while ECCAS member states represent around 15.6% of Africa's population (UNDESA 2019) and 9.7% of Africa's GDP (UN 2020).
- Contrary to various other approaches, no constraints were placed in this study on the 'production' capabilities of the ECCAS economies – hence, 'untapped' potential can be significant (in some cases, far beyond the capacity that can realistically be created). However, the intention was to open policymakers' and decision-makers' minds to the art of possibility while remaining grounded in realistic facts, as reimagining Africa's economic development requires 'out-of-the-box' thinking.
- This chapter also emphasised the importance of considering target market characteristics (both domestic and potential 'client' markets) when planning and developing export and industrialisation strategies – in other words, considering not only inward-looking aspects but also outward-looking dimensions of where products will be sold and how they will reach the markets in question.

- In addition, the chapter illustrated the combined application of the TRADE-DSM and product space methodologies to give decision-makers a view of 'untapped' potential, considering current export strengths, together with potential future 'adjacent possible' developments and a consolidated view of target market demand and access dimensions.
- Intermediate manufactured Food-related products featured strongly as having potential to be further developed and better traded on an industrial scale. As such, they should by default be one of the core focus areas of governments and policymakers as well as being central to the development of more integrated RVCs, not only within ECCAS but also across Africa more broadly.
- From an industrialisation perspective, it may make sense to further investigate five manufacturing-related sectors – Basic non-ferrous metals group, processed Foods, Wood and wood products, Basic iron and steel products, and Basic chemicals – for possible RVC formation from a broader intra-ECCAS and continental perspective. However, this view merely offers insights into possible areas of focus, especially in the light of intra-regional cooperation and more in-depth sectoral focus areas, given that the sectors represented here are at a very high level of aggregation. Ultimately, each member state needs to consider its own aspirations and potential.
- Strategic decision-making requires the acquisition of sound information, which should be a priority. This is especially true for trade (import and export) statistics and information on connectivity (physical roads, rail, maritime and air) and the condition of such infrastructure, as these are among the key contributors to export-led growth.
- While not explicitly modelled, critical enablers to growth would further include available, affordable, accessible, reliable and high-quality energy and physical infrastructure, as well as robust institutional capabilities and capacity.

Appendix A7

This appendix contains key logistics assumptions for each ECCAS member state.

Angola

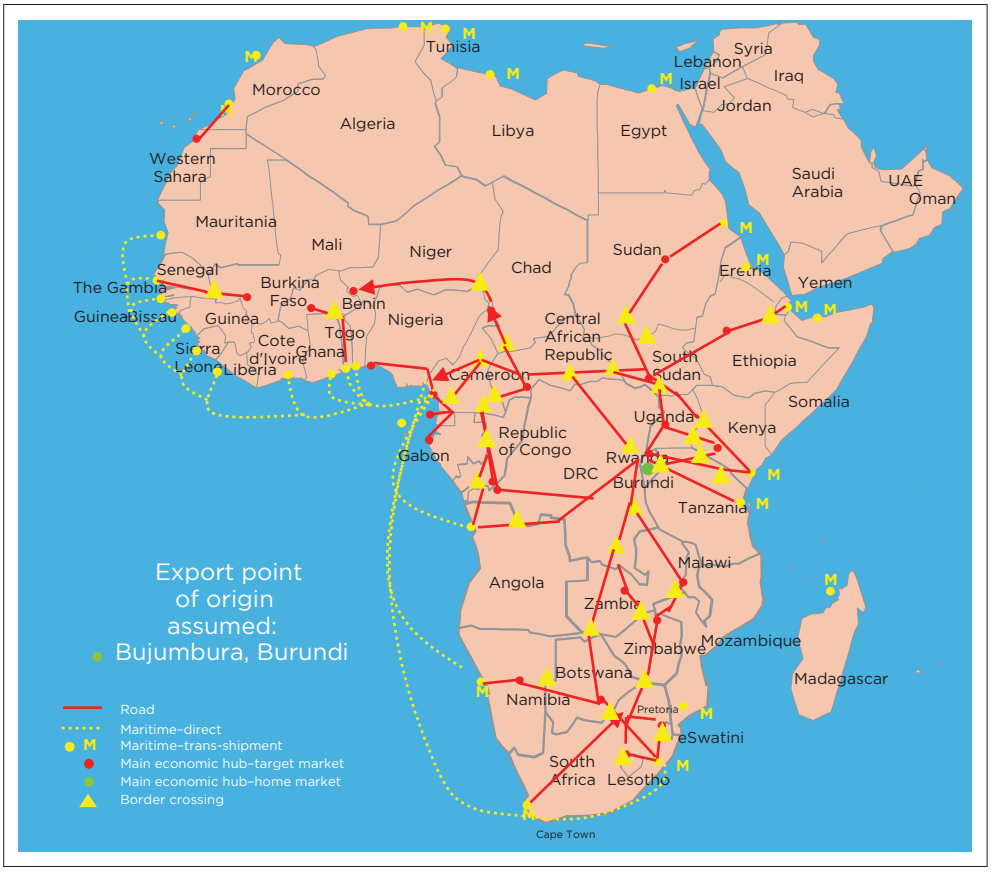
The current assumption of the model is that the main origin of exports leaving Angola is Luanda. Land-based routes to neighbouring countries are indicated on the map in Figure A7.1, but most other destinations are reached via maritime transport. While air transport is used and possible, most products are still traded by sea, and so these assumptions reflect land and sea transport routes only.

Source: Authors' own illustrations based on formal sources (see (see the section 'Data sources' in Chapter 2) (map not to scale) and Cameron et al. (2022).
Note: Maps are not to scale nor fully complete and serve only to illustrate the level of detail considered in making assumptions for each home market's connections to possible target markets.

FIGURE A7.1: Key logistics assumptions – focus on Angola to Africa.

Burundi

The current assumption of the model is that the main origin of exports leaving Burundi is Bujumbura. Land-based routes to neighbouring countries are indicated on the map in Figure A7.2, but most other destinations are reached via maritime transport. While air transport is possible and used, most products are still traded by sea, and so these assumptions reflect land and sea transport routes only.



Source: Authors' own illustrations based on formal sources (map not to scale) and Cameron et al. (2022).
Note: Maps are not to scale nor fully complete and serve only to illustrate the level of detail considered in making assumptions for each home market's connections to possible target markets.

FIGURE A7.2: Key logistics assumptions – focus on Burundi to Africa.

Cameroon

The current assumption of the model is that the main origin of exports leaving Cameroon is the port of Douala. Land-based routes to neighbouring countries are indicated on the map in Figure A7.3, but most other destinations are reached via maritime transport. While air transport is

Source: Authors' own illustrations based on formal sources (map not to scale) and Cameron et al. (2022).
Note: Maps are not to scale nor fully complete and serve only to illustrate the level of detail considered in making assumptions for each home market's connections to possible target markets.

FIGURE A7.3: Key logistics assumptions – focus on Cameroon to Africa.

possible and used, most products are still traded by sea, and so these assumptions reflect land and sea transport routes only.

Central African Republic

The current assumption of the model is that the main origin of exports leaving the Central African Republic is Bangui. Land-based routes to neighbouring countries are indicated on the map in Figure A7.4, but most other destinations are reached via maritime transport. While air transport is possible and used, most products are still traded by sea, and so these assumptions reflect land and sea transport routes only.

Source: Authors' own illustrations based on formal sources (map not to scale) and Cameron et al. (2022).
Note: Maps are not to scale nor fully complete and serve only to illustrate the level of detail considered in making assumptions for each home market's connections to possible target markets.

FIGURE A7.4: Key logistics assumptions – focus on the Central African Republic to Africa.

Chad

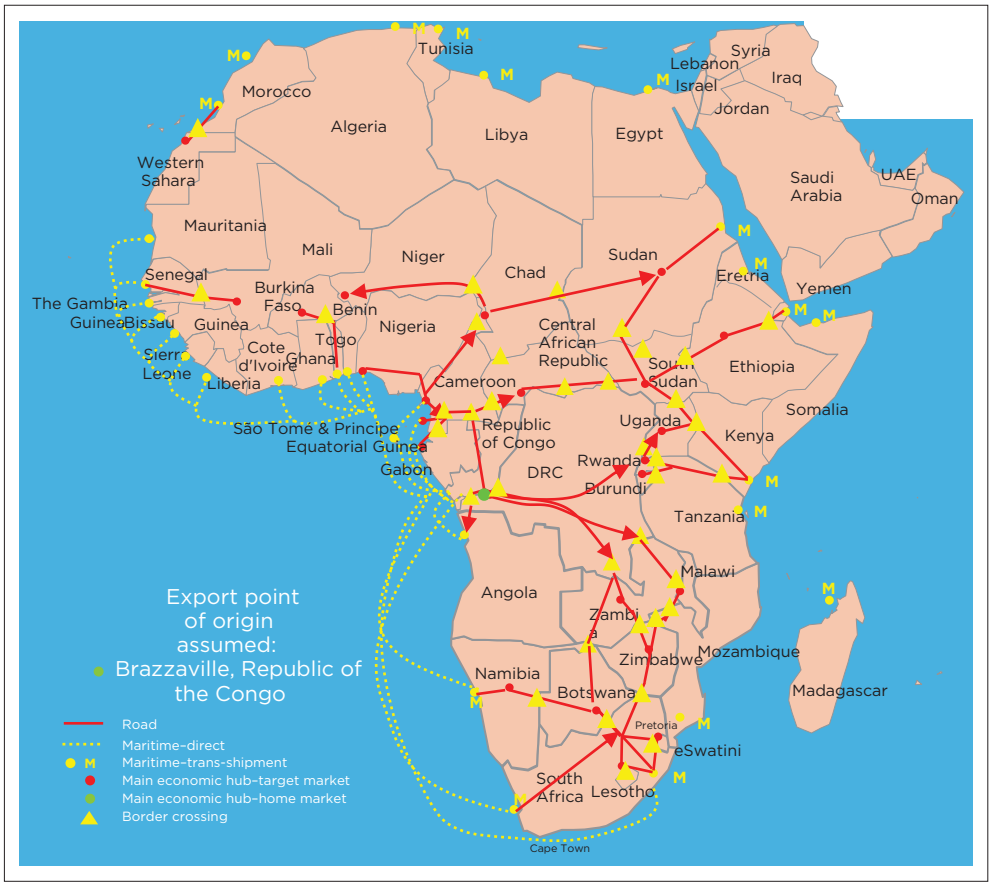
The current assumption of the model is that the main origin of exports leaving Chad is N'Djamena. Land-based routes to neighbouring countries are indicated on the map in Figure A7.5, but most other destinations are reached via maritime transport. While air transport is possible and used, most products are still traded by sea, and so these assumptions reflect land and sea transport routes only.

Source: Authors' own illustrations based on formal sources (map not to scale) and Cameron et al. (2022).
Note: Maps are not to scale nor fully complete and serve only to illustrate the level of detail considered in making assumptions for each home market's connections to possible target markets.

FIGURE A7.5: Key logistics assumptions – focus on Chad to Africa.

Congo

The current assumption of the model is that the main origin of exports leaving Congo is Brazzaville. Land-based routes to neighbouring countries are indicated on the map in Figure A7.6, but most other destinations are reached via maritime transport. While air transport is possible and used, most products are still traded by sea, and so these assumptions reflect land and sea transport routes only.

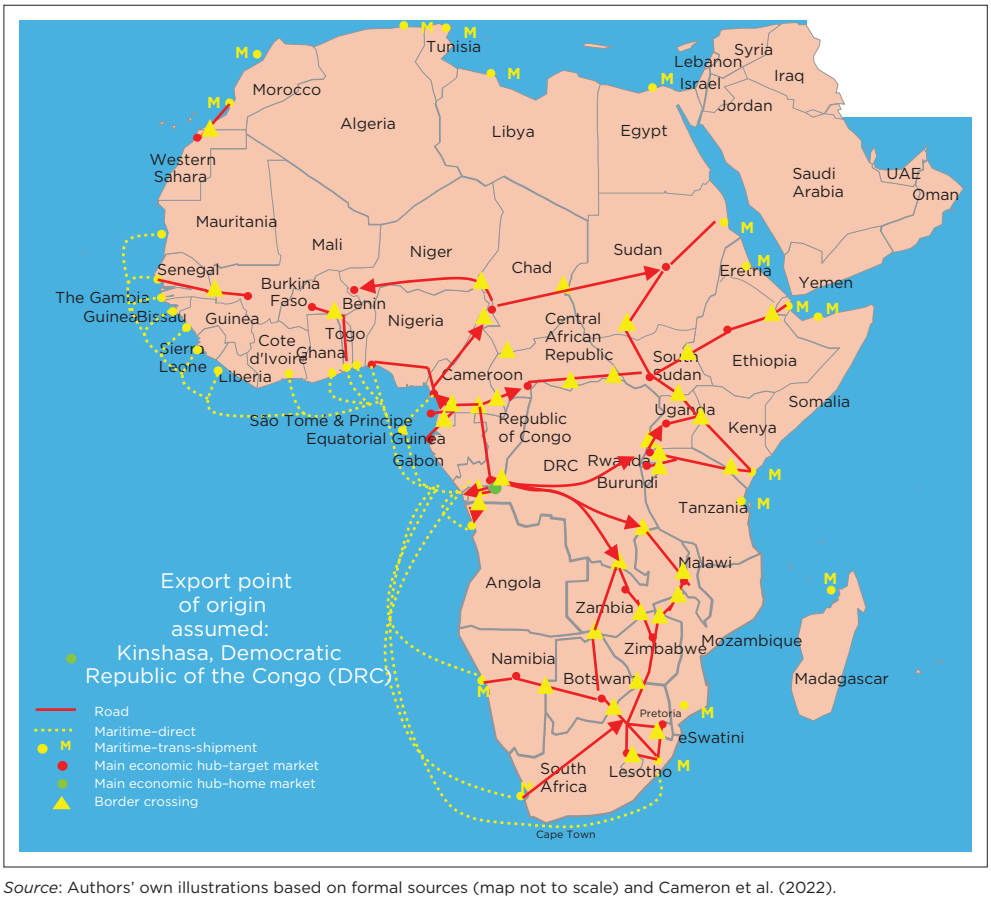


Source: Authors' own illustrations based on formal sources (map not to scale) and Cameron et al. (2022).
Note: Maps are not to scale nor fully complete and serve only to illustrate the level of detail considered in making assumptions for each home market's connections to possible target markets.

FIGURE A7.6: Key logistics assumptions – focus on Congo to Africa.

Democratic Republic of the Congo

The current assumption of the model is that the main origin of exports leaving the DRC is Kinshasa. Land-based routes to neighbouring countries are indicated on the map in Figure A7.7, but most other destinations are reached via maritime transport. While air transport is possible and used, most products are still traded by sea, and so these assumptions reflect land and sea transport routes only.



Source: Authors' own illustrations based on formal sources (map not to scale) and Cameron et al. (2022).
Note: Maps are not to scale nor fully complete and serve only to illustrate the level of detail considered in making assumptions for each home market's connections to possible target markets.
Key: DRC, Democratic Republic of the Congo.

FIGURE A7.7: Key logistics assumptions – focus on the Democratic Republic of the Congo to Africa.

Equatorial Guinea

The current assumption of the model is that the main origin of exports leaving Equatorial Guinea is Malabo. Land-based routes to neighbouring countries are indicated on the map in Figure A7.8, but most other destinations are reached via maritime transport. While air transport is possible and used, most products are still traded by sea, and so these assumptions reflect land and sea transport routes only.

Source: Authors' own illustrations based on formal sources (map not to scale) and Cameron et al. (2022).
Note: Maps are not to scale nor fully complete and serve only to illustrate the level of detail considered in making assumptions for each home market's connections to possible target markets.

FIGURE A7.8: Key logistics assumptions – focus on Equatorial Guinea to Africa.

Gabon

The current assumption of the model is that the main origin of exports leaving Gabon is Libreville. Land-based routes to neighbouring countries are indicated on the map in Figure A7.9, but most other destinations are reached via maritime transport. While air transport is possible and used, most products are still traded by sea, and so these assumptions reflect land and sea transport routes only.

Source: Authors' own illustrations based on formal sources (map not to scale) and Cameron et al. (2022).
Note: Maps are not to scale nor fully complete and serve only to illustrate the level of detail considered in making assumptions for each home market's connections to possible target markets.

FIGURE A7.9: Key logistics assumptions – focus on Gabon to Africa.

Rwanda

The current assumption of the model is that the main origin of exports leaving Rwanda is Kigali. Land-based routes to neighbouring countries are indicated on the map in Figure A7.10, but most other destinations are reached via maritime transport. While air transport is possible and used, most products are still traded by sea, and so these assumptions reflect land and sea transport routes only.

Source: Authors' own illustrations based on formal sources (map not to scale) and Cameron et al. (2022).
Note: Maps are not to scale nor fully complete and serve only to illustrate the level of detail considered in making assumptions for each home market's connections to possible target markets.

FIGURE A7.10: Key logistics assumptions – focus on Rwanda to Africa.

São Tomé and Principe

The current assumption of the model is that the main origin of exports leaving São Tomé and Principe is São Tomé. Land-based routes to neighbouring countries are indicated on the map in Figure A7.11, but most other destinations are reached via maritime transport. While air transport is possible and used, most products are still traded by sea, and so these assumptions reflect land and sea transport routes only.

Source: Authors' own illustrations based on formal sources (map not to scale) and Cameron et al. (2022).
Note: Maps are not to scale nor fully complete and serve only to illustrate the level of detail considered in making assumptions for each home market's connections to possible target markets.

FIGURE A7.11: Key logistics assumptions – focus on São Tomé and Principe to Africa.

Chapter 8

Expanding Tunisia's export horizons: Leveraging the TRADE-DSM and product space approaches

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Introduction

The Association Agreement concluded in 1995 between Tunisia and the European Union (EU) resulted in a substantial increase in trade between the two parties. From 2013 to 2019, 56% of Tunisia's total exports arrived in a limited number of EU countries, specifically France (28.5%), Italy (16.2%) and Germany (11.6%). These exports mainly consisted of textiles, machinery, transport equipment and extractives. Despite Tunisia's production potential, only 4.4% of the country's exports reached African countries during the same period – excluding Libya (3.3%) and Algeria (2.9%), with which Tunisia shares borders and strategic interests.

Tunisia's economy was disrupted by local and regional political strife in 2011. Already crippled by high unemployment, particularly among young graduates, the country experienced an additional loss of competitiveness in the face of unrest and political instability on its borders – specifically in Libya, Tunisia's second-biggest trade partner prior to 2011. Nevertheless, Tunisia's diversified economy enabled it to maintain a certain level of resilience against the fallout from these disturbances. Diversification has always been regarded as a means to build resilience against economic shocks, because it paves the way for deeper integration into value chains and boosts employment opportunities.

To identify diversification opportunities, Hausmann, Hwang and Rodrik (2007) suggest that a country's current export basket can significantly shape its future performance. They argue that a country's endowments, as manifested in its exports, dictate the path to diversification. Building on this rationale, the present study aimed to identify the path that Tunisia should follow to seamlessly transition towards more 'complex' products, leveraging its existing capabilities.

Previous studies have identified, from various perspectives, industries that would be advantageous for Tunisia's development. According to a report by the African Development Bank (AfDB 2012), the garment sector

is recommended when prioritising job creation, while the machinery sector takes precedence when exploring the sophistication and strategic value of products. Additionally, in their study on Tunisia's product space, Bustos and Yildirim (2017) recommend that the country should focus its production on the machinery and electrical sectors, and to a lesser extent, the chemical and plastic rubber sectors.

Hausmann et al. (2013) show that, according to the Product Complexity Index (PCI),[92] communities[93] exhibit similar levels of complexity. Their findings reveal that products in the machinery, electronics and chemicals sectors tend to be significantly more complex than the lower-ranked products in the garment cluster or in peripheral communities such as oil and tropical agriculture. This implies that Tunisia has the potential to develop into complex sectors.

The coronavirus disease 2019 (COVID-19) pandemic, which started in 2019, provided a further incentive for Tunisia to diversify its exports and trading partners with a view to mitigating the severe consequences of the disturbances and to stimulate growth. In recent years, Tunisia has taken important steps in this regard, demonstrating its commitment to strengthening partnerships, particularly within Africa. The country acquired observer status in the Economic Community of West African States (ECOWAS) in 2017, officially joined the Common Market for Eastern and Southern Africa (COMESA) in 2019 and signed the African Continental Free Trade Area (AfCFTA) agreement in March 2018, with negotiations still ongoing.

The AfCFTA offers major opportunities for African countries to deepen their economic integration by striving to liberalise 90% of tariff lines and eliminate other non-tariff trade barriers. The agreement entered into force in 2019, following the deposition of instruments of ratification by 22 member states, as required by article 23 of the establishing agreement. However, formal trade under the agreement was delayed and only came into effect in January 2021. Tunisia, in line with this commitment, ratified the agreement in September 2020 and formally deposited its instrument of ratification in November 2020, the month in which the agreement entered into force for Tunisia.

A study conducted by Maliszewska and Ruta (2020) estimated that the AfCFTA will result in a nearly 29% increase in African exports by 2035, with

92. The PCI ranks products according to the level of capabilities required for their production. It is based on the diversity of countries (number of products exported by each country) and ubiquity of products (number of countries that export each product).

93. Communities refer to families of products that are most likely to be co-exported, indicating that they share a significant proportion of the required production capabilities.

an 81% increase in intra-continental exports and a 19% increase in exports to non-African countries. This indicates substantial untapped export potential for the continent. Moreover, the study projected an accelerated increase in intra-AfCFTA exports to AfCFTA partners, with some countries, including Tunisia, experiencing a doubling or even tripling of their exports.

This chapter identifies both new and expanded export opportunities for Tunisia in African markets. Following the concepts developed by Hausmann and Klinger (2006, 2007) and Hidalgo et al. (2007), the chapter emphasises the crucial role of a country's current productive knowledge in the diversification process. Making the transition from acknowledging available resources to turning them into new areas of business is an efficient way of stimulating new exports, as it reduces the cost of the shift, improves skills and creates new employment opportunities.

Central to this study was the application of the 'product space' concept to identify the goods in which Tunisia could develop a comparative advantage in the future. These goods will potentially lead to more diversification, improving the country's position in the product space. To complement this approach, the chapter integrates the findings with the outcomes of the application of the TRADE-DSM (Decision Support Model), extensively covered in Chapter 2. The TRADE-DSM employs a different but complementary approach that considers the demand and particular tariff as well as non-tariff trade barriers in potential target markets when setting out to identify export opportunities.

The final list of target products should meet five conditions. They should: (1) lie at Tunisia's knowledge frontier; (2) create paths for future diversification; (3) satisfy the demand in the target markets; (4) minimise the risks emanating from the characteristics of the different destination countries; and (5) maximise Tunisia's competitive advantage.

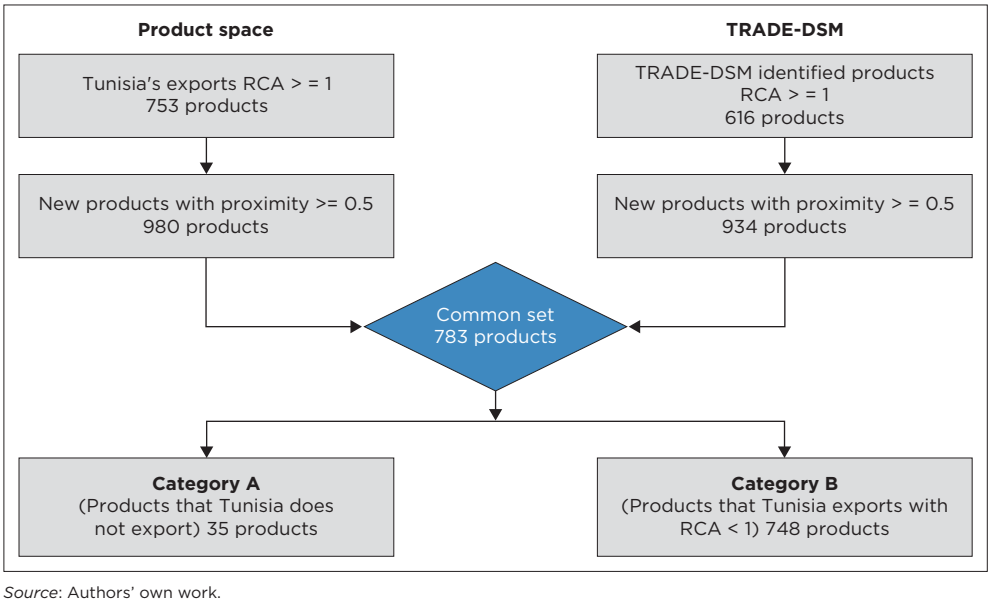
Methodology and data

The methodology employed in this study combined two approaches: the product space and the TRADE-DSM approach. This enabled us to identify a set of strategically important products for Tunisia to develop and export, optimising the production cost and assessing the probability of success when targeting potential markets. The product space methodology focused on products closely related to Tunisia's current competitive exports, that is, products exported with a revealed comparative advantage (RCA), so as to minimise the cost of the transition. The TRADE-DSM, in turn, focused on demand and the different barriers to entry, using filters to identify the most promising product–market combinations that ensure competitiveness in the potential destination markets.

The final output of this study was a convergence of two product sets, illustrated in Figure 8.1. The first set comprises products that share similarities with Tunisia's current competitive exports, while the second set comprises products that share similarities with Tunisia's exports for which realistic target market conditions exist. Similarities were determined by assessing each product's location in the product space and selecting those with proximities ≥ 0.5 to products in Tunisia's current competitive exports product basket. The final set includes products that satisfy the conditions of success for Tunisian companies, from both the supply and demand sides. The methodology is explored in more detail next.

The product space in brief

The product space, as conceptualised by Hausmann and Klinger (2006, 2007) and Hidalgo et al. (2007), identifies diversification pathways for countries by visualising the network of exported goods. The latter is a visualisation of all exported goods worldwide, where a higher frequency of co-exporting indicates stronger ties between the goods. This methodology suggests that for effective diversification, new products should share similar capabilities with existing ones. Jumping to products with strong links to current exports facilitates the shift, allowing countries to increase the complexity of their export activities. The interconnectedness of



Source: Authors' own work.
Note: 'Products' denote HS 6-digit product groupings.
Key: HS, Harmonized System; TRADE-DSM, TRADE-Decision Support Model; RCA, revealed comparative advantage.

FIGURE 8.1: Methodology summarised – combining the product space and the TRADE-DSM.

products in concentrated areas of the space simplifies diversification, as countries can leverage existing capabilities to engage successfully in new and more complex activities.

The product space concept is based on the idea that each product requires a particular combination of capabilities, and countries need to identify and address missing capabilities to develop new products. The degree of 'relatedness' between products helps predict a country's ability to compete with and produce new, potentially successful products in the future.

Relatedness is determined by a measure called 'proximity'. The latter reflects the likelihood of two products being co-exported by a country on the basis of similarity in terms of institutions, infrastructure, physical factors or technology, or a combination thereof. In this study, proximity was computed using export data spanning a seven-year period (averages), from 2013 to 2019, extracted from Centre d'Études Prospectives et d'Informations Internationales (CEPII 2021) Base pour l'Analyse du Commerce International (BACI) data for Harmonized System (HS) products (HS 2012 revision) disaggregated at the 6-digit level.

$$\phi_{pp'} = \frac{\sum_c M_{cp} \; M_{cp'}}{max\left(k_{p,0}, k_{p',0}\right)} \qquad \text{[Eqn 1]}$$

$\varphi_{pp'}$ is the proximity between products p and p'. M_{cp} and $M_{cp'}$ are equal to 1 if country c exports product p or p' with an RCA (Balassa 1965) greater than 1, and 0 otherwise. $K_{p,0}$ and $K_{p,0}$ are the ubiquities of products p and p' respectively. Ubiquity is measured by summing over the columns of matrix M_{cp}. A country has an RCA in a product if the product's share in the country's total exports is larger than its share in total world exports.

$$RCA_{cp} = \frac{\frac{X_{cp}}{\sum_p X_{cp}}}{\frac{\sum_c X_{cp}}{\sum_{c,\,p} X_{cp}}} \qquad \text{[Eqn 2]}$$

$X_{c,p}$ is the export value of country c in product p. The export–RCA matrix is constructed, after which re-exports are identified and excluded. Re-exports do not accurately reflect the country's existing capabilities, serving rather as the starting point for identifying additional export opportunities. To further refine the RCA, adjustments are made when the trade balance of a product is negative. In this case, the RCA is downgraded. The export-to-import ratio is computed and then the export–RCA matrix is updated accordingly (International Trade Centre [ITC] 2015).

As is evident from the literature, Balassa's RCA index, despite its popularity owing to its simplicity and minimal data requirements, has been widely criticised for its properties and methodological shortcomings (Hinloopen & Van Marrewijk 2001; Laursen 2015; Leromain & Orefice 2014; Vollrath 1991; Yeats 1985). The index is also criticised for not accounting for differences in country size, leading to bias in favour of small countries (Shepherd 2022; Stellian & Danna-Buitrago 2022).

To overcome these shortcomings, several revisions to the RCA index have been proposed (e.g. Dalum, Laursen & Villumsen 1998; Hoen & Oosterhaven 2006; Lafay 1992; Proudman & Redding 2000; Vollrath 1991; Yu, Cai & Leung 2009), with some revisions based on two-way trade or net trade (Bowen 1983; Danna-Buitrago & Stellian 2022; Donges & Riedel 1976; Gnidchenko & Salnikov 2015; Huang & Ottaviano 2023). Nonetheless, these revisions also present their own limitations (Jones & Bethmann 2023).

While many studies have proposed adjustments to the RCA measure to address specific limitations, others have developed alternatives to align more closely with the theoretical foundations of comparative advantage. In particular, recent academic work has increasingly shifted towards gravity-based measures of comparative advantage (Chor 2010; Costinot, Donaldson & Komunjer 2012; French 2017; Leromain & Orefice 2014; Shepherd 2022). The main concern is that RCA reflects biases from various determinants of trade flows – such as trade policies, trade costs and other external factors – rather than isolating pure comparative advantage. Revealed comparative advantage may also reflect trade barriers, historical trade relationships, infrastructures, and institutions (Leromain & Orefice 2014; Siggel 2006). Additional critiques highlight that RCA excludes domestic shipments and reflects not only supply-side productivity but also demand-side factors and trade costs (Shepherd 2022).

Another major critique of the RCA index is that it may reflect a country's overall economic size, but to a lesser extent its performance in a specific sector (Shepherd 2022). Consequently, a cross-country comparison based on RCA can be misleading. In general, RCA measures may not be considered a credible means of comparing countries' productivity across time periods (French 2017). While this is an important consideration, our study does not engage in cross-country comparisons or rankings based on RCA values. Instead, our focus is on identifying the products that a country produces most efficiently within its existing export basket. These products serve as the 'effective starting point' for determining which goods are most likely to succeed in international markets and, therefore, represent potential targets for policy intervention.

While Balassa's RCA is not viewed as a direct measure of productivity, as noted by several critics, it can serve as an indicator of a country's export

'performance' for specific goods. In this context, Balassa's RCA reflects observed trade patterns, illustrating a country's presence in global markets, although these patterns may result from a range of factors beyond theoretical comparative advantage, which aligns with the central objective of this study.

The TRADE-DSM in brief

The TRADE-DSM, a filter-based decision support model scrutinises country–product combinations at a highly disaggregated level of products, evaluating export opportunities from different perspectives (Cameron & Viviers 2017). This study employed three filters from the TRADE-DSM approach.

The first filter is based on specific product–market characteristics, and the relative size and growth of import demand for each HS 6-digit product. Three criteria are used in this filter: short-term import growth, long-term import growth and import market size. The second filter incorporates two criteria: the degree of import market concentration and trade barriers. The third filter comprises two criteria: the RCA, serving as an indicator of relative export advantage or competitiveness, and the revealed trade advantage (RTA), acting as an indicator of product-level competitiveness and productive capacity. (More details on the filters used in the TRADE-DSM approach are provided in Chapter 2.)

Results

Tunisia's specialisation pattern

This study assumed that Tunisia's current specialisation pattern in production is a determinant of its future diversification path. This assumption was based on the fact that countries often diversify into products that require existing or similar capabilities, facilitating the shift to new production lines and processes. Tunisia's export basket is relatively diversified, unlike countries relying on a narrow range of resources for growth, such as natural resources. The diversification and complexity of a country's trade basket are indicative of its industries' true level of development.

Tunisia's export basket, reflecting a fair level of diversity and complexity, was ranked 45th out of 133 countries in 2019, based on the Economic Complexity Index (ECI) developed by Hausmann et al. (2013).[94] In the subsequent analysis, RCA was used to reveal the characteristics of Tunisia's specialisation pattern. The RCA indicates a country's trade specialisation in a given product based on its relative market share in that product.

94. https://atlas.cid.harvard.edu/rankings

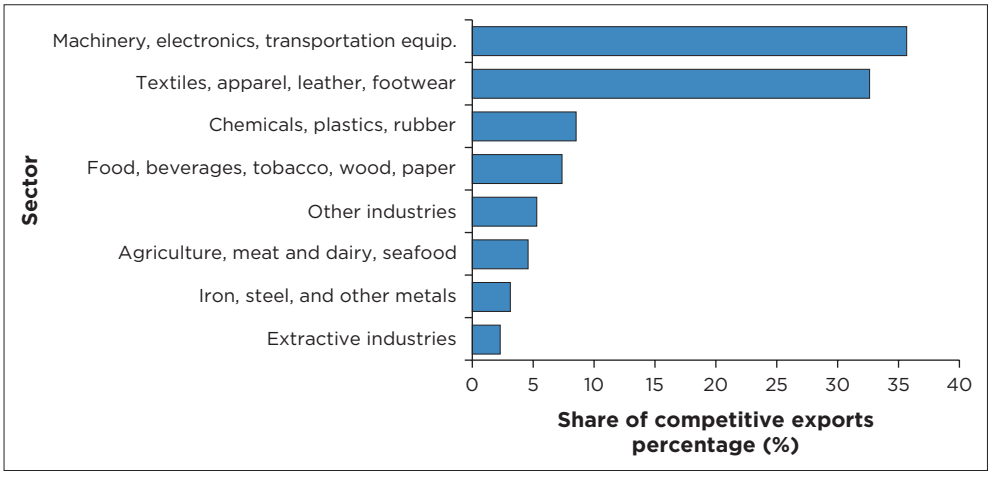
In the period 2013–2019, Tunisia exported 4,605 HS 6-digit products. After excluding re-exports, the findings show that 753 products were exported with an RCA $\geq$ 1, representing 79.8% of total exports (based on export value). The results also show that in each sector, the country is exporting a significant share of highly competitive products, hereafter termed 'source products'. These source products serve as a starting point to identify the path towards the future development of capabilities and exports in Tunisia.

Figure 8.2 shows the distribution of products in which Tunisia has a significant share in world exports. Notably, exports from the Machinery and Textiles sectors represent the highest shares. About 36% and 33% of the products exported by Tunisia with an RCA belong to the Machinery, electronics, transportation equipment and Textiles, apparel, leather, footwear sectors, respectively. This translates into 85.7% and 96% of total exports belonging to the respective sectors.

While other sectors exhibit relatively lower shares of products exported with an RCA $\geq$ 1, these products still represent a significant share of total exports for these sectors. They account for 18.8% of Extractive industries; 66.1% of Iron, steel, and other metals; 92.7% of Agriculture, meat and dairy, seafood; 85% of Food, beverages, tobacco, wood, paper; 81% of Chemicals, plastics, rubber; and 77% of Other industries.

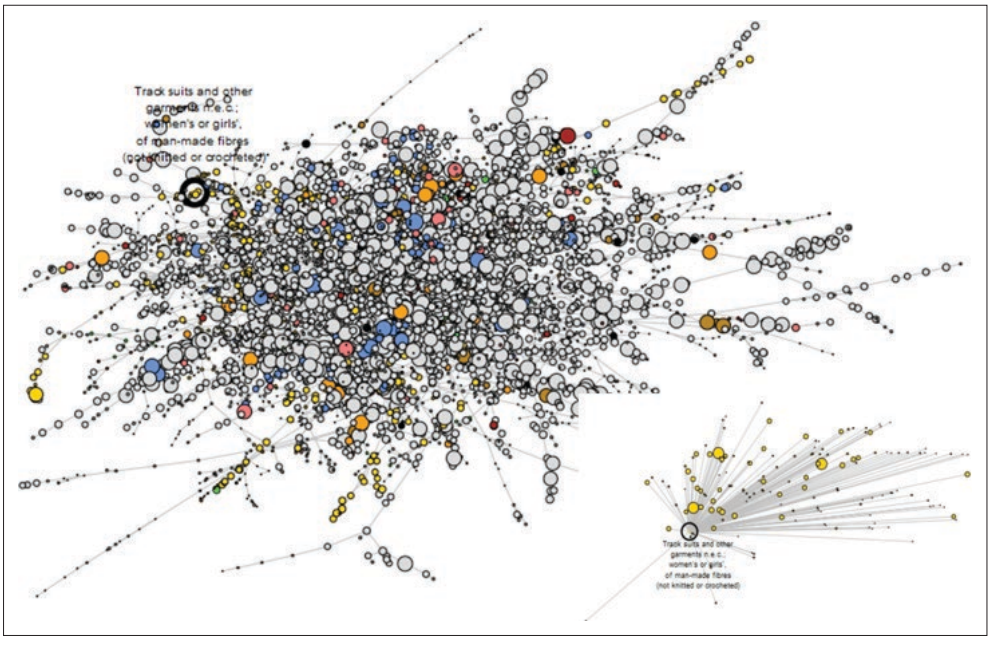
Connectedness of Tunisia's export basket

A product's position in the product space provides interesting insights into its ties. The ties within the network convey the similarity of the required capabilities for each pair of products. The proximity matrix employed to visualise the product space (see Figure 8.3) shows very low values – an



Source: Authors' own work.
Key: equip., equipment; %, percentage.

FIGURE 8.2: Tunisia's specialisation sectors.



Source: Authors' calculations using export data averages (2013–2019) extracted from CEPII (2021) BACI datasets.
Note: The size of the bubbles is proportional to the weighted degree of products, determined as the sum of direct proximities. The colour key is as follows: silver: products exported by Tunisia without an RCA or not exported at all; green: Agriculture, meat and dairy, seafood; brown: Food, beverages, tobacco, wood, paper; black: Extractive industries; dark gold: Chemicals, plastics, rubber; light coral: Other industries; gold: Textiles, apparel, leather, footwear; orange: Iron, steel, and other metals; blue: Machinery, electronics, transportation equipment.
Key: CEPII, Centre d'Études Prospectives et d'Informations Internationales; BACI, Base pour l'Analyse du Commerce International; RCA, revealed comparative advantage.

FIGURE 8.3: Tunisia's exports in the product space.

expected consequence of the high level of data disaggregation. Naturally, products like 'green tea' and 'black coffee' appear to be less co-exported than the aggregated categories of 'tea' and 'coffee'. Only 19% of proximities exceed 0.2, with 0.2% exceeding 0.5. Zero proximities account for 12% of the matrix. The number of countries exporting both tea and coffee may be reduced to zero if, for instance, we consider only 'green tea' and 'black coffee' instead of their aggregated groups, resulting in a higher prevalence of zero proximities.

This section explores the quality of the connections in the product space.

In this analysis, a proximity of 0.5 serves as a minimum threshold to identify product diversification opportunities. For example, if products *a* and *b* have a proximity of 0.5, it implies that 50% of countries co-export these products, indicating a significant shared amount of factors of production. The results show that out of 5,199 products, 1,497 have a proximity above or equal to 0.5, with at least one product with an RCA exported by Tunisia. Of these, 517 with an RCA are already exported, highlighting the considerable within-sector connectedness of Tunisia's

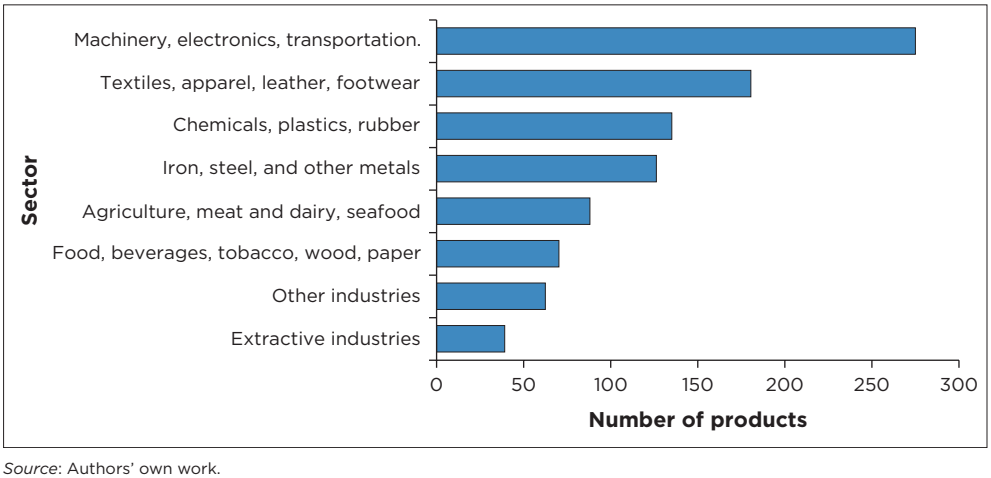
export basket. Table 8.1 shows the connectedness of products in each sector, revealing that products belonging to the Textiles and Machinery sectors exhibit the highest average proximities.

Products exported with an RCA ≥ 1 are excluded, as the primary objective is to develop new skills and capabilities. The list concludes with 980 products in which Tunisia can successfully diversify in the future. These are highly proximate to what Tunisia already produces and exports competitively. Figure 8.4 shows that the Machinery and Textiles sectors comprise the largest number of these products.

TABLE 8.1: Within-sector connectedness of the product space (proximities).

Sector	Agriculture, meat and dairy, seafood	Food, beverages, tobacco, wood, paper	Extractive industries	Chemicals, plastics, rubber	Textiles, apparel, leather, footwear	Iron, steel, and other metals	Machinery, electronics, transportation equipment	Other industries
Number of products	611	502	337	966	886	563	901	430
Average proximity	0.122	0.143	0.122	0.149	0.199	0.165	0.191	0.139
Standard deviation	0.089	0.089	0.084	0.094	0.108	0.092	0.098	0.092
Minimum	0	0	0	0	0	0	0	0
25%	0.056	0.078	0.061	0.08	0.121	0.1	0.121	0.07
50%	0.107	0.134	0.111	0.138	0.179	0.157	0.185	0.127
75%	0.171	0.197	0.171	0.205	0.266	0.222	0.254	0.194
Maximum	0.833	0.9	0.469	1	0.913	0.933	0.846	0.833

Source: Authors' own work.
Note: Three products remain unclassified, which explains why the sum of products in the count row does not amount to 5,199.



Source: Authors' own work.
FIGURE 8.4: Distribution of products highly connected to Tunisia's competitive exports (in number terms).

Tunisia's export opportunities

Tunisia's export opportunities are those that meet both internal and external conditions. External conditions refer to the TRADE-DSM filters described in Chapter 2, which are specific to particular target markets. Internal conditions refer to the country's available resources. The final list of products should align with these conditions to ensure the successful engagement in new production activities. This list is derived from the intersection of two lists: products with a minimum proximity of 0.5 to the TRADE-DSM list and those with a minimum proximity of 0.5 to Tunisia's competitive exports.

The initial step is to select products with high proximities to the TRADE-DSM list. The result is a list of products that share similar characteristics, assumed to meet the target markets' conditions. The TRADE-DSM list comprises 616 products. When allocated in the product space, these products connected to 437 others with a proximity ≥ 0.5. After removing those with an RCA already exported by Tunisia, the final list of products comes to 934. The intersection of these products with those closely related to Tunisia's current competitive exports yields 783 products.

These outputs fall into two categories: Category A comprises 'new products' not exported by Tunisia (35 in total),[95] while Category B comprises products exported by Tunisia with an RCA < 1 (748 in total).[96] Figure 8.1 presents a summary of these steps and the results obtained.

While the identified products may not necessarily exhibit high value added, considering how value can be added is crucial for strategic decision-making and efficient resource allocation. Added value can be measured using different approaches, such as the skill- and technology-intensity classification (Basu & Das 2011) and complexity index, among others. Table 8.2 presents the distribution of the final list of products based on the required levels of skill and technology, as well as the end use of the products. The product groups are categorised according to the skill- and technology-intensity classification by Basu and Das (2011).[97]

Table 8.2 shows that most products are intermediates belonging to the Machinery sector, followed by Textiles, Iron and Chemicals. Final products are predominantly found in the Agriculture and Textiles sectors. Products requiring high-level skills and technology are mainly in Chemicals, plastics, rubber; those requiring medium-level skills and technology are mainly in Machinery; and those requiring low-level skills and technology are mainly in

95. See Table A8.1 for the full list of products.

96. See Table A8.2 for the top 50 products.

97. See Figure A8.1 for the distribution of skill and technology intensity across Harmonized System (HS) sections.

TABLE 8.2: Distribution of the final list of products.[1]

Sectors / end use	Agriculture, meat and dairy, seafood		Chemicals, plastics, rubber		Extractive industries		Food, beverages, tobacco, wood, paper		Iron, steel and other metals		Machinery, electronics, transportation equipment		Other industries		Textiles, apparel, leather, footwear	
	I	F	I	F	I	F	I	F	I	F	I	F	I	F	I	F
A	7	47	1		1		11	17	10						6	
B					20	4	20	3					4	11	80	36
C					1				70	4	9	2	1			
D			19								194	9				
E			67	5							8		22	1		
F						1							4	7		
G	1		4		6				13		14	1	1		5	1

Source: Authors' own work.
Notes: The table shows the number of products for each sector, skill-and technology-intensity classification, and end use. The columns I and F denote intermediate and final goods, respectively. A denotes Non-fuel primary commodities; B, Resource-intensive manufactures; C, Low-skill and technology-intensive manufactures; D, Medium-skill and technology-intensive manufactures; E, High-skill and technology-intensive manufactures; F, Mineral fuels; G, Unclassified products.
[1]The System of National Accounts (SNA) of Broad Economic Categories (revision 4) (United Nations [UN] 2002) is used to distinguish between final and intermediate goods. In this study, capital goods are considered intermediates.

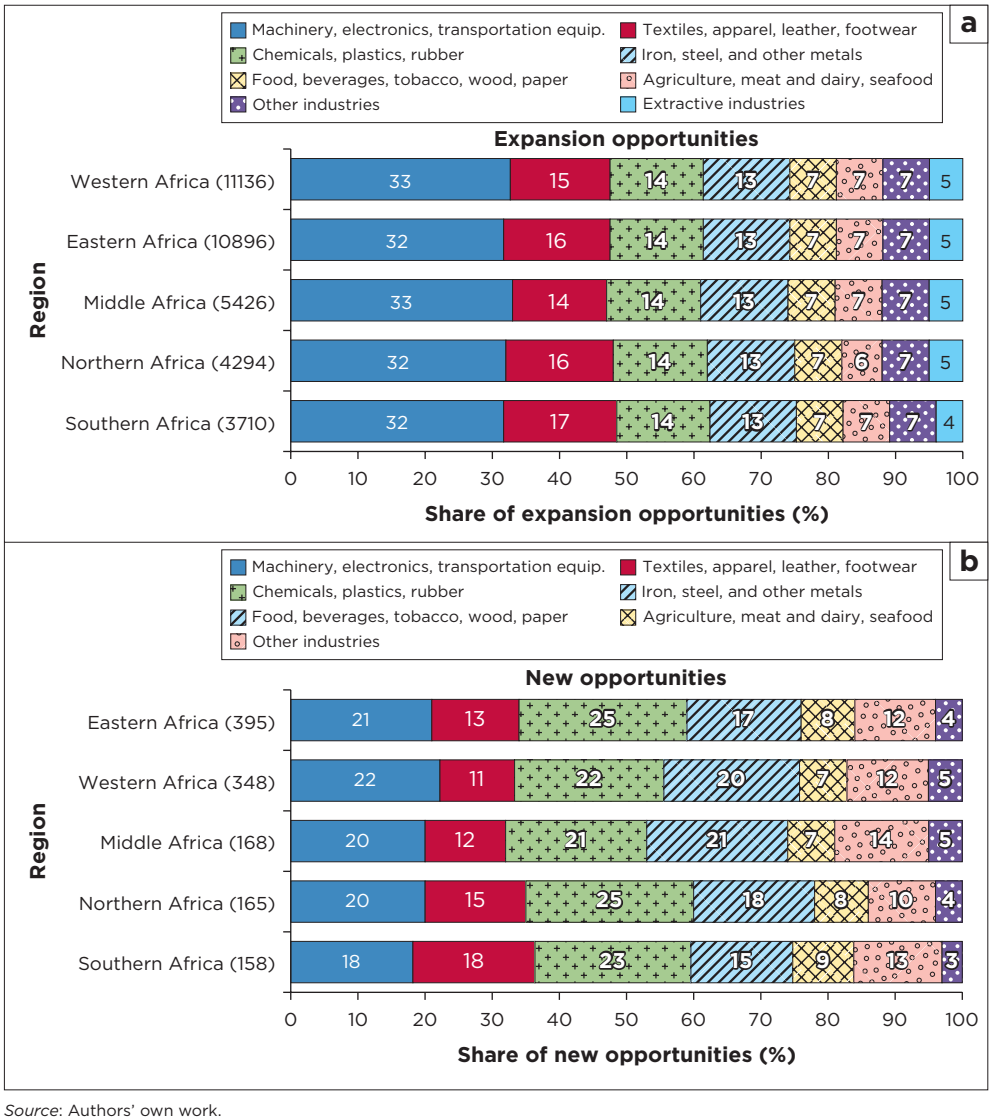
Iron, steel, and other metals. Resource-intensive products are mainly in Textiles, apparel, leather, footwear; and to a lesser extent in Extractives and Food, beverages, tobacco, wood, paper. Finally, non-fuel primary commodities mainly consist of products found in the Agriculture sector.

Figure 8.5 shows that most opportunities are located in Western and Eastern Africa. Western Africa presents 11,136 product–market expansion opportunities, with 33% in the Machinery sector, 15% in Textiles, and 14% in Chemicals. Expansion opportunities primarily comprise products from the Machinery and Textiles sectors. In contrast, new opportunities belong mainly to the Chemicals and Machinery sectors.

Conclusion

This chapter focused on Tunisia's export opportunities to African markets, considering both the country's available resources and potential external barriers. A critical step in identifying export opportunities is assessing Tunisia's capability to successfully produce new items. These items should share similar or closely related factors of production with those that the country already produces competitively, thereby facilitating the adaptation of current productive capabilities. The 'proximity' measure was used to detect similarities between the items.

In addition to proximity, consideration of product value added or complexity was necessary. Examining the evolution of Tunisia's product space between 1980 and 2009 revealed the country's success in keeping



Source: Authors' own work.
Notes: The figure shows the geographical distribution of countries that provide good market conditions by sector. The regions' names are followed by the number of opportunities (product–country pairs). Expansion opportunities include products that are already exported by Tunisia but with an RCA < 1. New opportunities include products that are not exported by Tunisia at all.
Key: RCA, revealed comparative advantage; %, percentage.

FIGURE 8.5: Geographical distribution of Tunisia's export opportunities.

pace with technological advances and diversifying into new products (AfDB & Government of Tunisia & Government of the United States [US] 2013). Prioritising the production of higher value-added and more complex products is crucial for industrial development.

The findings reveal potential for Tunisia to develop a comparative advantage in nearly 800 different HS 6-digit products in the future.

Predominantly, these products belong to the Machinery, electronics, and transport equipment sector, followed by the Textiles, apparel, leather and footwear sector. Most export opportunities are located in Western and Eastern Africa. Notably, products requiring high-level skills and technology are mainly in the Chemicals, plastics, rubber sector, while those requiring medium-level skills and technology are predominantly in the Machinery sector.

Although the results show that Tunisia can develop 55 agricultural products that are in high demand in African countries, these products represent primary commodities and will not help the country to move into a more advantageous position in the product space. Agricultural products are very often protected by tariff and non-tariff barriers. Countries can classify them into the 3% excluded or 7% sensitive tariff lines under the AfCFTA. Therefore, the benefits of the agreement may not affect this category of products, or it may take longer to remove the barriers to these compared to the other tariff lines. Maliszewska and Ruta (2020) estimate that manufactured exports would see a 101% increase in intra-Africa trade and a 46% increase in trade with the rest of the world. Agricultural exports would see smaller gains, with a 49% increase in intra-Africa trade and a 10% increase in trade with the rest of the world.

This study did not distinguish between export regimes. Given the well-developed offshore regime in Tunisia, exports of certain products may not truly reflect the country's inherent ability to export as they are often linked to European markets as part of regional value chains (RVCs). The evolution of Tunisia's manufactured exports since the early 1970s has been predominantly influenced by firms operating under the offshore regime. In contrast, trade under the onshore regime exhibited lower dynamism and growth levels (International Bank for Reconstruction and Development [IBRD] 2009).

Firms operating under the offshore regime enjoy tax and duty privileges provided by the host country. According to Baghdadi, Ben Kheder and Arouri (2019), nearly 74% of Tunisia's total exports from 2002 to 2014 were attributed to offshore companies, with their study highlighting legislative incentives as a key factor in their success. However, these incentives do not extend to onshore firms, potentially placing them at an economic disadvantage. With the implementation of the AfCFTA, onshore companies might face additional challenges on the competitiveness front.

Key takeaways from this chapter

- Tunisia's specialisation pattern, as defined by the RCA, shows high potential for development.

- The positioning of Tunisia's exports within the product space is crucial for the future development of local industries, as it determines the connectedness of the country's export basket. Notably, Tunisia's specialisation in the Machinery and Textiles sectors, followed by Chemicals, has established a well-connected export basket, in contrast to the primary sectors positioned on the periphery.
- The study revealed the presence of almost 800 different 'additional' HS 6-digit products in which Tunisia could potentially develop a comparative advantage in the future. These products belong mainly to the Machinery, electronics, and transport equipment sector, followed by Textiles, apparel, leather and footwear.
- Products with opportunities requiring high-level skills and technology mainly belong to Chemicals, plastics, rubber, while those demanding medium-level skills and technology mainly belong to the Machinery sector.
- Most export opportunities are located in Western and Eastern Africa.

Appendix A8

TABLE A8.1: Final list of products that Tunisia does not export.

HS12	Sector	Description
020641	Agriculture, meat and dairy, seafood	Offal, edible; of swine, livers, frozen
040891	Agriculture, meat and dairy, seafood	Eggs; birds' eggs (not in shell, excluding yolks only), dried, whether or not containing added sugar or other sweetening matter
081210	Agriculture, meat and dairy, seafood	Fruit, edible; cherries, provisionally preserved, but unsuitable in that state for immediate consumption
120590	Agriculture, meat and dairy, seafood	Oil seeds; rape or colza seeds, other than low erucic, whether or not broken
150110	Food, beverages, tobacco, wood, paper	Pig fat; lard, other than that of heading 0209 and 1503
283719	Chemicals, plastics, rubber	Cyanides and cyanide oxides; other than of sodium
290381	Chemicals, plastics, rubber	Halogenated derivatives of cyclanic, cyclenic or cycloterpenic hydrocarbons; 1,2,3,4,5,6-Hexachlorocyclohexane (HCH (ISO)), including lindane (ISO, INN)
291030	Chemicals, plastics, rubber	Epoxides, epoxyalcohols, epoxyphenols and epoxyethers; with a three-membered ring and their halogenated, sulphonated, nitrated or nitrosated derivatives, 1-chloro-2,3-epoxypropane (epichlorohydrin)
292019	Chemicals, plastics, rubber	Esters; thiophosphoric esters (phosphorothioates) and their salts; other than parathion (ISO) and parathion-methyl (ISO) (methyl-parathion)
292142	Chemicals, plastics, rubber	Amine-function-compounds; aromatic monoamines and their derivatives, aniline derivatives and their salts
292424	Chemicals, plastics, rubber	Cyclic amides (including cyclic carbamates) and their derivatives; ethinamate and its salts
293331	Chemicals, plastics, rubber	Heterocyclic compounds; containing an unfused pyridine ring (whether or not hydrogenated) in the structure, pyridine and its salts
293430	Chemicals, plastics, rubber	Heterocyclic compounds; containing in the structure, a phenothiazine ring-system (whether or not hydrogenated), not further fused
293723	Chemicals, plastics, rubber	Steroidal hormones, their derivatives and structural analogues; oestrogens and progestogens
380630	Chemicals, plastics, rubber	Ester gums
440391	Food, beverages, tobacco, wood, paper	Wood; oak, in the rough, whether or not stripped of bark or sapwood, or roughly squared, untreated
440392	Food, beverages, tobacco, wood, paper	Wood; beech, in the rough, whether or not stripped of bark or sapwood, or roughly squared, untreated
490510	Other industries	Globes; printed
520614	Textiles, apparel, leather, footwear	Cotton yarn; (not sewing thread), single, of uncombed fibres, less than 85% by weight of cotton, less than 192.31 but not less than 125 decitex (exceeding 52 but not exceeding 80 metric number), not for retail sale

Table A8.1 continues on the next page→

TABLE A8.1 (cont.): Final list of products that Tunisia does not export.

HS12	Sector	Description
520621	Textiles, apparel, leather, footwear	Cotton yarn; (not sewing thread), single, of combed fibres, less than 85% by weight of cotton, measuring 714.29 decitex or more, (not exceeding 14 metric number), not for retail sale
520632	Textiles, apparel, leather, footwear	Cotton yarn; (not sewing thread), multiple or cabled, of uncombed fibres, less than 85% by weight of cotton, 714.28 to 232.56 decitex (15 to 43 metric number) per single yarn, not for retail sale
520645	Textiles, apparel, leather, footwear	Cotton yarn; (not sewing thread), multiple or cabled, of combed fibres, less than 85% by weight of cotton, less than 125 decitex (exceeding 80 metric number) per single yarn, not for retail sale
550942	Textiles, apparel, leather, footwear	Yarn; (not sewing thread), multiple (folded) or cabled yarn, containing 85% or more by weight of synthetic staple fibres, n.e.c. in heading no. 5509, not put up for retail sale
590220	Textiles, apparel, leather, footwear	Textile fabrics; tyrecord of high tenacity yarn of polyester
721050	Iron, steel, and other metals	Iron or non-alloy steel; flat-rolled, width 600 mm or more, plated or coated with chromium oxides or with chromium and chromium oxides
721310	Iron, steel, and other metals	Iron or non-alloy steel; bars and rods, hot-rolled, in irregularly wound coils, containing indentations, ribs, grooves or other deformations produced during the rolling process
721924	Iron, steel, and other metals	Steel, stainless; flat-rolled, width 600 mm or more, hot-rolled, (not in coils), of a thickness of less than 3 mm
722011	Iron, steel, and other metals	Steel, stainless; flat-rolled, width less than 600 mm, hot-rolled, of a thickness of 4.75 mm or more
722550	Iron, steel, and other metals	Steel, alloy; flat-rolled, width 600 mm or more, cold-rolled
843330	Machinery, electronics, transportation equip.	Haymaking machinery
844530	Machinery, electronics, transportation equip.	Textile machinery; doubling or twisting machines
846021	Machinery, electronics, transportation equip.	Machine-tools; grinding machines (other than flat-surface), in which positioning in any one axis can be set up to at least an accuracy of 0.01 mm, numerically controlled
860110	Machinery, electronics, transportation equip.	Rail locomotives; powered from an external source of electricity
860310	Machinery, electronics, transportation equip.	Railway or tramway coaches, vans and trucks; self-propelled, powered from an external source of electricity (excluding those of heading no. 8604)
870530	Machinery, electronics, transportation equip.	Vehicles; fire fighting vehicles

Source: Authors' calculations, based on the two methods combined.
Key: HS, Harmonized System.

TABLE A8.2: Final list of products that Tunisia exports without a revealed comparative advantage (top 50).

HS12	Sector	Description	RCA
520625	Textiles, apparel, leather, footwear	Cotton yarn; (not sewing thread), single, of combed fibres, less than 85% by weight of cotton, measuring less than 125 decitex (exceeding 80 metric number), not for retail sale	0.978
600641	Textiles, apparel, leather, footwear	Fabrics; knitted or crocheted fabrics, other than those of headings 60.01 to 60.04, of artificial fibres, unbleached or bleached	0.977
870829	Machinery, electronics, transportation equip.	Vehicles; parts and accessories, of bodies, other than safety seat belts	0.977
081350	Agriculture, meat and dairy, seafood	Nuts, edible; mixtures of nuts or dried fruits of chapter 08	0.977
200510	Food, beverages, tobacco, wood, paper	Vegetable preparations; homogenised vegetables, prepared or preserved otherwise than by vinegar or acetic acid, not frozen	0.966
080719	Agriculture, meat and dairy, seafood	Fruit, edible; melons, other than watermelons, fresh	0.955
611212	Textiles, apparel, leather, footwear	Track suits; of synthetic fibres, knitted or crocheted	0.933
070992	Agriculture, meat and dairy, seafood	Vegetables; olives, fresh or chilled	0.903
420232	Textiles, apparel, leather, footwear	Cases and containers; of a kind normally carried in the pocket or in the handbag, with outer surface of plastic sheeting or of textile materials	0.898
252210	Extractive industries	Quicklime; excluding calcium oxide and hydroxide of heading no. 2825	0.898
853390	Machinery, electronics, transportation equip.	Resistors; parts of the resistors of heading no. 8533	0.882
392290	Chemicals, plastics, rubber	Plastics; bidets, lavatory pans, flushing cisterns and similar sanitary ware n.e.c. in heading no. 3922	0.868
080830	Agriculture, meat and dairy, seafood	Fruit, edible; pears, fresh	0.845
845490	Machinery, electronics, transportation equip.	Machines; parts of converters, ladles, ingot moulds and casting machines, of a kind used in metallurgy or in metal foundries	0.842
420292	Textiles, apparel, leather, footwear	Cases and containers; n.e.c. in heading 4202, with outer surface of plastic sheeting or of textile materials	0.839
691010	Extractive industries	Ceramic sinks, wash basins, wash basin pedestals, baths, bidets, water closet pans, flushing cisterns, urinals and similar sanitary fixtures; of porcelain or china	0.812
841229	Machinery, electronics, transportation equip.	Engines; hydraulic power engines and motors, other than linear acting (cylinders)	0.809
760429	Iron, steel, and other metals	Aluminium; alloys, bars, rods and profiles, other than hollow	0.797
251520	Extractive industries	Ecaussine and other calcareous monumental or building stone; alabaster, having a specific gravity of 2.5 or more	0.791
841720	Machinery, electronics, transportation equip.	Ovens; non-electric, bakery ovens, including biscuit ovens	0.791
520210	Textiles, apparel, leather, footwear	Cotton; yarn waste (including thread waste)	0.778

Table A8.2 continues on the next page→

TABLE A8.2 (cont.): Final list of products that Tunisia exports without a revealed comparative advantage (top 50).

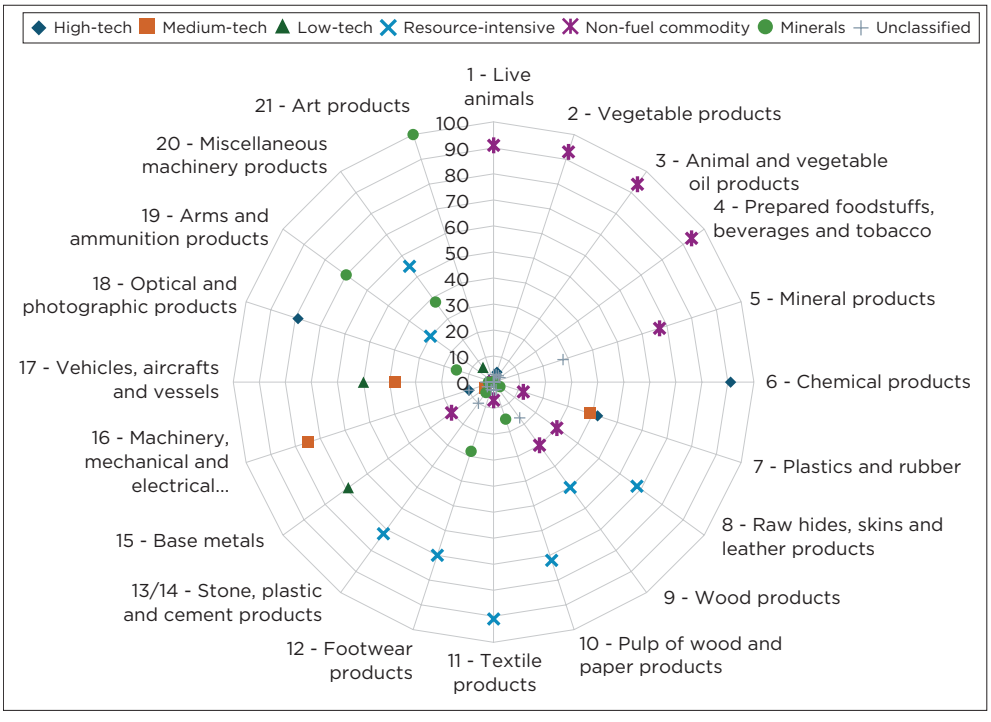
HS12	Sector	Description	RCA
550999	Textiles, apparel, leather, footwear	Yarn; (not sewing thread), of synthetic staple fibres, mixed mainly or solely with fibres (other than wool, fine animal hair or cotton), n.e.c. in heading no. 5509, not put up for retail sale	0.777
200190	Food, beverages, tobacco, wood, paper	Vegetable preparations; vegetables, fruit, nuts and other edible parts of plants, prepared or preserved by vinegar or acetic acid (excluding cucumbers and gherkins)	0.77
848120	Machinery, electronics, transportation equip.	Valves; for oleohydraulic or pneumatic transmissions	0.762
960860	Other industries	Pens; ball-point, refills comprising the ball point and ink-reservoir	0.757
190532	Food, beverages, tobacco, wood, paper	Food preparations; waffles and wafers, whether or not containing cocoa	0.745
903289	Other industries	Regulating or controlling instruments and apparatus; automatic, other than hydraulic or pneumatic	0.743
611710	Textiles, apparel, leather, footwear	Shawls, scarves, mufflers, mantillas, veils and the like; knitted or crocheted	0.728
900490	Other industries	Spectacles, goggles and the like; (other than sunglasses) corrective, protective or other	0.709
520644	Textiles, apparel, leather, footwear	Cotton yarn; (not sewing thread), multiple or cabled, of combed fibres, less than 85% by weight of cotton, 192.30 to 125 decitex (53 to 80 metric number) per single yarn, not for retail sale	0.698
650500	Textiles, apparel, leather, footwear	Hats and other headgear; knitted or crocheted, or made up from lace, felt or other textile fabric, in the piece (but not in strips), whether or not lined or trimmed; hair-nets of any material, whether or not lined or trimmed	0.692
630533	Textiles, apparel, leather, footwear	Sacks and bags; of a kind used for the packing of goods, of man-made textile materials, of polyethylene or polypropylene strip or the like, not flexible intermediate bulk containers	0.692
847180	Machinery, electronics, transportation equip.	Units of automatic data processing machines; n.e.c. in item no. 8471.50, 8471.60 or 8471.70	0.685
870880	Machinery, electronics, transportation equip.	Vehicle parts; suspension systems and parts thereof (including shock-absorbers)	0.683
440139	Food, beverages, tobacco, wood, paper	Wood; for fuel, sawdust and wood waste and scrap, whether or not agglomerated in logs, briquettes, pellets or similar forms; other than wood pellets	0.67
854370	Machinery, electronics, transportation equip.	Electrical machines and apparatus; having individual functions, not specified or included elsewhere in this chapter, n.e.c. in heading no. 8543	0.663
854390	Machinery, electronics, transportation equip.	Electrical machines and apparatus; parts of the electrical goods of heading no. 8543	0.661
853720	Machinery, electronics, transportation equip.	Boards, panels, consoles, desks and other bases; for electric control or the distribution of electricity, (other than switching apparatus of heading no. 8517), for a voltage exceeding, 1,000 volts	0.658
630392	Textiles, apparel, leather, footwear	Curtains (including drapes) and interior blinds, curtain or bed valances; of synthetic fibres, not knitted or crocheted	0.65

Table A8.2 continues on the next page→

TABLE A8.2 (cont.): Final list of products that Tunisia exports without a revealed comparative advantage (top 50).

HS12	Sector	Description	RCA
761010	Iron, steel, and other metals	Aluminium; structures (excluding prefabricated buildings of heading no. 9406) and parts of structures, doors, windows and their frames and thresholds for doors	0.645
620293	Textiles, apparel, leather, footwear	Anoraks (including ski-jackets), wind-cheaters, wind-jackets and similar articles; women's or girls', of man-made fibres, other than those of heading no. 6204 (not knitted or crocheted)	0.643
844859	Machinery, electronics, transportation equip.	Machines; parts and accessories of machines or auxiliary machinery of heading no. 8447, other than sinkers, needles and other articles used in forming stitches	0.643
901540	Other industries	Surveying equipment; photogrammetrical surveying instruments and appliances	0.641
853630	Machinery, electronics, transportation equip.	Electrical apparatus; for protecting electrical circuits, n.e.c. in heading no. 8536, for a voltage not exceeding 1,000 volts	0.637
680291	Extractive industries	Marble, travertine and alabaster; articles thereof, (other than simply cut or sawn, with a flat or even surface)	0.63
640590	Textiles, apparel, leather, footwear	Footwear; n.e.c. in chapter 64	0.618
853080	Machinery, electronics, transportation equip.	Signalling, safety or traffic control equipment; for roads, inland waterways, parking facilities, port installations or airfields (excluding those of heading no. 8608)	0.614
070999	Agriculture, meat and dairy, seafood	Vegetables; edible, n.e.c. in chapter 7, fresh or chilled	0.608
030819	Agriculture, meat and dairy, seafood	Aquatic invertebrates; sea cucumbers (Stichopus japonicus, Holothurioidea), frozen, dried, salted or in brine, smoked, whether or not cooked before or during the smoking process	0.608
940510	Other industries	Chandeliers and other electric ceiling or wall light fittings; excluding those used for lighting public open spaces or thoroughfares	0.6

Source: Authors' calculations, based on the two methods, combined.
Key: HS, Harmonized System; n.e.c., not elsewhere classified; RCA, revealed comparative advantage.



Source: Klotz, Kniahin and Jansen (2016), based on Basu and Das (2011).
Notes: The range 0–100 is the share of each group of products within each HS section. Nearly 90% of Chemical products fall into the high-tech category. Machinery, mechanical and electrical products are mainly classified as medium-tech, at around 70%. Plastic and rubber products share an approximately equal distribution between high-tech and medium-tech, each accounting for around 40%. About 70% of Base metals fall into the low-tech category. Textiles, leather and footwear, and Wood and paper products are mainly categorised as resource-intensive. Agricultural products and Prepared foodstuffs, beverages and tobacco are mainly classified as non-fuel primary products.

Key: HS, Harmonized System.

FIGURE A8.1: Skill- and technology-intensity distribution among Harmonized System (HS) sections.

Chapter 9

Strategic considerations for the success of the African Continental Free Trade Area

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Introduction

Chapter 1 set the broad backdrop for this book, exploring Africa's most ambitious trade and development initiative to date – the launch of the African Continental Free Trade Area (AfCFTA), the flagship project of the African Union's (AU) Agenda 2063. The AfCFTA, which has had a long gestation period and is being operationalised in stages, aims to prise open

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markets, promote cooperation among member states, boost intra-regional trade and investment, increase firms' productivity and competitiveness, and make a dent in the continent's high levels of unemployment, vulnerable employment and poverty across the continent.

The continent is already segmented into a number of regional economic communities (RECs),[98] including the Economic Community of West African States (ECOWAS), the Common Market for Eastern and Southern Africa (COMESA) and the Southern African Development Community (SADC), whose members enjoy preferential access into each other's markets as well as some harmonised trade rules and procedures. One could argue that the aims of the AfCFTA are similar to those of the RECs – except that the AfCFTA will operate on a much grander scale, harnessing the respective strengths and existing structures of the different RECs in an integrated, continent-wide effort to unleash Africa's considerable economic and trade potential.

As it gains momentum, the AfCFTA will not replace existing regional groupings or disrupt bilateral trade relationships on the continent. Rather, it will provide the broad framework for Africa's ongoing trade and development efforts, providing guidance to members states in their dealings both on and off the continent, encouraging regulatory and logistical cohesion in their trading activities, and creating a platform for Africa to negotiate with multilateral and regional bodies as well as individual countries in different parts of the world. With the rapidly shifting power dynamics in the world – especially between the West and the East, and the North and the South – altering the geopolitical and geoeconomic landscapes, it makes sense for all African countries to work together to leverage their collective talents and resources with a view to strengthening their position in the world.

Given this context, important questions to ask, therefore, are:

> Will the AfCFTA be a game changer for Africa, acting as a driver of increased bilateral and intra-regional trade, competitiveness and economic growth? Will it provide the platform for Africa to reduce its heavy reliance on large, influential trading partners such as China, the European Union (EU) and the United States (US), to which it mainly exports commodities in exchange for imports of value-added goods and technologies?

98. The AU recognises eight RECs (AU n.d.). These are the Arab Maghreb Union (AMU – five members); the Community of Sahel-Saharan States (CEN-SAD – 95 members); the Common Market for Eastern and Southern Africa (COMESA – 21 members); the East African Community (EAC – seven members); the Economic Community of Central African States (ECCAS – 11 members); the Economic Community of West African States (ECOWAS – 15 members); the Intergovernmental Authority on Development (IGAD – eight members); and the Southern African Development Community (SADC – 16 members). Note that ECOWAS members Burkina Faso, Mali and Niger announced (on 28 January 2024) their intention to withdraw from ECOWAS, with the effective date being 29 January 2025 (ECOWAS 2025). The complexity created by overlapping memberships is demonstrated in Figure 1.4 in Chapter 1.

Africa will remain a popular trading partner for as long as it has metals, minerals and other in-demand commodities to sell. Yet following a generally low value-added export strategy and a generally high value-added import strategy will do little to boost African countries' investment and economic development prospects. This is what the literature has repeatedly said, and this has been Africa's own experience, although most countries on the continent have found it difficult to escape this cycle (MacLeod & Luke 2023).

While the AfCFTA provides important structures, regulatory frameworks and negotiating platforms to steer member states' trade and development efforts, it is not a panacea for entrenched problems such as low levels of industrialisation, a lack of export diversification, limited knowledge of export market opportunities, and severe infrastructural and logistical hurdles. These still have to be addressed if Africa is to catch up, developmentally, with other parts of the world, while also finding new sources of competitive advantage that will earn the continent a distinctive place in the global economy.

Notwithstanding the importance of the AfCFTA as a driver of a fresh new outlook on trade and development on the continent, it is a means to an end, not an end in itself. To produce true and lasting value, the AfCFTA needs to function in an optimised environment, using its various levers to unlock the continent's potential in new and more sustainable ways.

This book has set out to show that the AfCFTA can deliver value – and even be a game changer for Africa – provided various gaps and shortcomings are addressed and new forms of competitive advantage are identified and developed. This will go a long way towards reducing Africa's dependency on the rest of the world, creating more revenue streams from trade and attracting higher levels of investment. While the negotiated modalities underpinning the AfCFTA agreement constitute an essential legal and operational framework to guide member states' trade and development activities on the continent, it is the strategic work done 'on the ground' that will turn words and undertakings into reality.

Specific attention is given in this book to a number of trade enablers or building blocks, including export opportunity identification, export diversification and industrialisation – aspects that are not typically discussed in studies and reports on the AfCFTA. In addition, an important theme running through most chapters is the logistical challenges that impact exporting and importing on the continent – from the landlocked[99] state of

99. Note that the term 'landlocked' used in this book is based on the definition applied by the United Nations (UN 1982). Landlocked countries have no direct access to the sea and are bordered by a single or two or more countries, which do have access to the seas (ocean). A landlocked country can also be 'doubly landlocked' in the sense that it is surrounded by other landlocked countries.

some countries to the parlous condition of transport routes and infrastructure and customs red tape. These non-tariff barriers (NTBs), which are often spoken about in official strategy documents but rarely analysed in depth, add to the time and cost involved in trading on the continent and must be seriously addressed through private- and public-sector involvement.

This final chapter brings the book to a close by:

- discussing several key factors that will determine the ultimate success of the AfCFTA
- offering a number of actionable recommendations for African decision-makers in the public and private sectors
- providing an overarching conclusion.

Key factors determining the success of the African Continental Free Trade Area

As discussed in Chapter 1, the AfCFTA is significant for various reasons. The main reason is that it has the potential to enhance African countries' economic growth and development prospects by stimulating more robust intra-Africa trade which to date has been comparatively low relative to other world regions, according to formally reported data on goods trade on the continent (Cameron 2020; Hummels 2007; Mold 2022).

The AfCFTA also lays the foundation for mutually beneficial trade and investment partnerships with countries outside Africa, which will help to raise living standards in Africa – provided African countries produce a greater variety of and better-quality goods and services. In this regard, the literature tends to support the concept of bi-directional causality – in other words, higher levels of economic growth and development can prompt countries to export more as they will be able to produce a greater variety and a better quality of goods (Baldwin & Harrigan 2011; Hagemeijer & Mućk 2019; Hummels & Klenow 2005). The result is a positive, self-sustaining cycle.

Amid all the enthusiasm surrounding the AfCFTA and the hard work that has gone into its conceptualisation, launch and negotiations to date, the success of the AfCFTA is dependent on several key factors.

Mitigating the effects of tariff revenue losses

Tariffs have been a key sticking point in the AfCFTA negotiations because of the sensitivities surrounding the impact of the agreement on countries' tariff revenue, and thus welfare – especially countries whose economies are heavily reliant on such revenue. As a result, the process of member states

proposing and accepting schedules of tariff concessions has been very protracted (tralac 2022).

Despite the myriad concerns raised about potential tariff revenue losses, the African Tax Research Network (ATRN) observed that in 2020, import duties accounted for only 6.41% of total tax revenue on the continent and were the least-contributing tax instrument (the top three being value-added tax [VAT], personal income tax and corporate income tax). In addition, in the existing tax base, imports from Africa averaged only 13% between 1995 and 2020. The ATRN concluded that the direct tariff revenue losses associated with the AfCFTA would mostly be marginal in the short term and that the long-term benefits (including lower trade costs and improved competitiveness, more regional value chains [RVCs], and greater product variety and consumer choice) may compensate for the short-term losses (African Tax Administration Forum [ATAF] 2022).

Even though the direct tariff revenue losses may not be as significant as some stakeholders would believe, trade liberalisation always creates winners and losers. The least-developed countries (LDCs) in Africa will probably derive less benefit initially from their participation in the AfCFTA than some of their more economically advanced peers. However, this may change over time, depending on how well the LDCs are able to leverage AfCFTA opportunities. For example, some LDCs may be able to access new regional and sub-regional production networks, enabling them to acquire new skills and technologies and inroads into new markets.

Until the aforementioned benefits materialise, though, it is important to ensure that complementary mechanisms are in place to ensure that LDCs do not suffer initial damage because of more intense trade liberalisation. Such mechanisms could include a revenue-sharing agreement (such as that within the Southern African Customs Union [SACU][100]) and the establishment of a basic safety net (United Nations Conference on Trade and Development [UNCTAD] 2021b).[101] Another mitigation strategy is to reduce the cost of compliance with non-tariff measures (NTMs). Non-tariff measures increase the cost of living, especially for poorer households and small enterprises in Africa because of the high proportion of foodstuffs contributing to household expenditure, the costs associated with meeting

100. The SACU Revenue-Sharing Formula (RSF) allocates revenue from a common pool to member states according to three components: customs component, excise component and development component (SACU n.d.).

101. An example of a safety net is the launch, by the Afreximbank, of the AfCFTA Adjustment Facility which is a mechanism that provides short- to medium-term financing to vulnerable countries (Afreximbank 2022). By 2021, the Afeximbank had raised US$8 billion for this purpose. Another type of safety net is the expected boost in intra-Africa trade under the AfCFTA which will help to compensate for tariff revenue losses (United Nations Economic Commission for Africa [UNECA] n.d.).

various technical requirements in production processes as well as various administrative costs. Importantly, too, expanding intra-Africa trade will translate into more significant outputs overall, as well as greater welfare gains and employment opportunities (UNECA 2019).

Identifying and pursuing new and more diverse export opportunities

Hausmann, Hwang and Rodrik (2007) suggest that a country's current export basket significantly shapes its future performance while its endowments (as reflected in its exports) dictate its diversification pathway. The transfer of resources from current to new business areas is an efficient way of stimulating new exports, as it reduces the cost of the shift, enhances skills and creates new employment opportunities. To this end, the 'product space' concept helps a country to identify goods in which it could develop a comparative advantage in the future. Such goods will potentially lead to greater export diversification, thus improving the country's position in the product space.

The efficacy of the AfCFTA will be heavily dependent on the expeditious advancement of value addition (through industrialisation) and export diversification and the creation of more sophisticated product and service offerings by African countries, which in turn will foster a more inclusive trade environment (MacLeod, Luke & Guepie 2023). Export diversification is of paramount importance as it cultivates a country's resilience against fluctuations in demand owing to economic downtowns in importing countries, price volatility, and (increasingly) shifts in trade and geopolitical alliances which could disrupt even the most established markets.

For commodity-exporting countries, in particular, diversification acts as a pivotal mechanism to induce countries to transition towards the production of higher value-added goods and services. However, as demonstrated by Songwe (2019), empirical evidence for the period 1990–2014 revealed that export diversification in African countries largely remained stagnant, with only marginal improvements noted across the continent. Notably, Central and North African countries witnessed an escalation in export concentration, even as countries with more diversified portfolios, such as South Africa and Morocco, experienced setbacks.

In contrast, East Asian countries' economic trajectory over the past three decades has been characterised by an expansion in both the range and quality of exports. For the AfCFTA to realise its transformative potential and dispense its full array of benefits, African countries need to proactively foster diversification, reinforcing these efforts with growth-enhancing policies and strategies (Songwe 2019).

Access to reliable data and market intelligence is crucial for informed decision-making. However, many African countries are hampered in their efforts to enrich and expand their export baskets by a lack of information about realistic export opportunities (REOs) on the continent – that is, export opportunities that are in line with the countries' production capabilities and are accessible from a market and logistical perspective. The TRADE-DSM (Decision Support Model) was discussed in detail in this book as an innovative market selection methodology that has the power to pinpoint export opportunities in any country or region in the world. It does this by employing filters that progressively eliminate less-promising opportunities (in the form of product–market combinations) by matching supply and demand conditions for various products in different markets.

Many African countries are weighed down by poor infrastructure, making overland transport very difficult and expensive, even relative to ocean transport to destinations much further afield. The TRADE-DSM also considers logistical hurdles, such as poorly maintained transport routes, defective infrastructure and border inefficiencies, which can add considerably to the cost and time involved in shipping consignments from one point to another.

The integration of the TRADE-DSM with the product space concept (as conceptualised by Hausmann et al. 2007; Hausmann & Klinger 2006; Hidalgo et al. 2007) reveals 'new' or alternative products that will pave the way for new export (and, by implication, investment) opportunities for the countries concerned. Such products must satisfy five critical criteria:

- They must lie within the origin country's knowledge frontier.
- They must lead to future diversification possibilities.
- They must satisfy the demand evident in the destination country(ies).
- They must minimise the risks inherent in the destination country(ies).
- They must maximise the origin country's competitive advantage(s).

The combined application of the TRADE-DSM and product space concept also allows the identification of expanded (existing) export opportunities. The pursuit of increased intra-Africa trade goes hand in hand with the identification of REOs in both the intensive margin and the extensive margin.[102]

102. Brenton and Newfarmer (2009) define the expansion of existing products in existing markets as growth at the intensive margin and the introduction of new products and new (geographical) markets as growth at the extensive margin.

Achieving policy coherence and inclusivity

Effective trade policies form the bedrock of a country's trade activities, but these cannot be divorced from broader economic interests and priorities, which are addressed in other policies (fiscal, monetary, industrial, investment, competition, digital, migration, environmental and gender policies, among others). It is naturally important for national policies to be coherent and complementary so that resources are allocated effectively and stakeholder participation is as inclusive as possible. Moreover, in the broader African context, such policies should dovetail (where possible) with the aims and undertakings of relevant RECs and the AfCFTA.

While the AfCFTA can address various demand-side and supply-side constraints to trade, supportive national policies need to be in place that address local conditions and needs but also enable countries to simultaneously take advantage of national, regional and global market opportunities with tailored support from national, regional and global partners (UNCTAD 2021b; UNECA 2019). Such policies might be aimed at: building productive capacity through training and upskilling programmes (both in the public and private sectors), creating conditions for more value-added manufacturing and export diversification, attracting more foreign direct investment through the use of appropriate incentives, facilitating value chain development and access, encouraging responsible technological uptake, overhauling sub-optimal trade infrastructure and facilities, protecting the environment from unrestrained industrial expansion, driving an inclusive growth culture by uplifting marginalised communities and extending more economic opportunities to informal businesses, and so on.

As a general rule, trade policies should discourage the abuse of market power and the exploitation of vulnerable segments in society, while also ensuring equitable market access. Investment policies should play a complementary role in that they should ensure that export revenues are channelled into productive local investment which will help to create conditions for sustainable economic development. This is not to say that local investment should prioritise import substitution and localisation at the expense of exports. A strong and vibrant export sector is always needed to provide producers with the necessary scale to enhance their competitiveness, to spread their risk and to attract investment that will help to oil the wheels of the economy and create new diversification opportunities (UNCTAD 2021a).

Achieving policy coherence requires public- and private-sector awareness and involvement, and sufficient financial resources and skills. Unfortunately, getting the right policy mix is challenging for most countries. One of the problems is that there is often insufficient engagement between

the public and private sectors and/or their interests and priorities are misaligned. In addition, government officials are often ill-equipped to formulate and oversee the implementation of cross-cutting policies, while business representatives generally lack the time and appetite to get involved in policymaking exercises. Moreover, a frequent lack of accountability for policy implementation and outcomes means that policies (however well crafted) lack champions and drivers. Effective trade policies need to be informed by in-depth research, reliable information, inclusive participation, accountability and efficiency in decision-making processes to ensure successful implementation (MacLeod & Luke 2023). These processes are costly and often beyond governments' budgets. As a result, policies may lack the necessary insights and rigour as well as measures to gauge their effectiveness.

Driving greater continental and global integration through private-sector participation

As a global event, the coronavirus disease 2019 (COVID-19) pandemic was devastating for African economies and highlighted the continent's dependence on the rest of the world – from critical vaccines to food and energy supplies. However, the special challenges induced by COVID-19 were not unique to Africa; nor will Africa necessarily bear the brunt of unexpected future crises – whether of a health, economic, climate or geopolitical nature.

A clear message that African countries have been sent in recent years, as disruptive global events have increased in frequency and intensity, is that the success of the AfCFTA will depend heavily on the efficacy of implementation of the underlying agreement. This calls for member states – individually and collectively – to tackle continental and global obstacles that will inevitably present themselves, by working towards enhanced continental and global integration. In this regard, the private sector has an indispensable role to play as it is the engine that will make the AfCFTA work. Some of the key focus areas in which the private sector will make a vital contribution are:

- *Mobilising support for the AfCFTA*. Private-sector leaders should take steps to make Africa more attractive and accessible to the business and investment communities both on and off the continent, while also creating awareness of the benefits of the AfCFTA. Without private-sector involvement and commitment, the AfCFTA will struggle to gain traction and acceptance. Trade policies and agreements can be highly technical and difficult to grasp by the layman. Private-sector entities (such as law firms and business consultancies) are well placed to

'decode' complex documents into more accessible language, which businesses can then rely on for the purposes of strategic decision-making.

Fortunately, Africa is a major drawcard for investors. The ability of investors being able to access (via the AfCFTA) a larger, more cohesive market with lower transaction costs and a supportive investment protocol is an essential lever in the continent's investment promotion and facilitation efforts. Investors are particularly concerned about intellectual property rights and competition policy, given the quickening pace of e-commerce and the risks this poses to privacy and security of information. These, then, should be prioritised in private-sector investment drives.

- *Establishing business clusters and economic zones*. African firms could derive significant benefit from establishing and/or participating in business clusters and economic zones, which would be valuable sources of information and support and also act as springboards into new markets. Through these collaborative groups, firms would have the opportunity to enhance their knowledge, form new symbiotic business partnerships, benefit from technology transfer, hone their production skills and management practices, and be more alert to emerging trends (Organisation for Economic Co-operation and Development [OECD] 2020).
- *Preparing the workforce for the future*. African firms need to ensure that their employees have the necessary skills to make a meaningful contribution in a fast-changing and challenging global trade space. In recent years, the demand for cheap labour has diminished as more countries have decided to keep their production processes local. Providers of hitherto cheap labour are therefore under pressure to deliver value in new and more sustainable ways, especially as digital advances have the potential to increasingly marginalise all but the most highly skilled workers. Workers are also being displaced because technology can often do the job of humans at a fraction of the cost.

  Taking full advantage of the AfCFTA will be demanding from an education and skills development perspective. While governments are generally responsible for broad-based foundational and tertiary education in countries, the private sector is better placed to provide focused (e.g. sector-based) skills training and continuous development opportunities, which will ensure that their workforces develop the knowledge and competencies to remain relevant and productive well into the future. An educated and skilled population will ensure that businesses can compete both in local and regional markets in Africa and will help to fuel much-needed industrialisation on the continent (Ekekwe 2019).

- *Harnessing complementarities between trade and investment.* Boosting productivity, enhancing competitiveness and supporting the government in its quest to accelerate economic growth are all noble (and attainable) goals of business. However, they are dependent on trade and investment policies and regulations that are geared towards unlocking trade and investment potential. In the context of the AfCFTA, African countries' trade and investment promotion agencies have a vital role to play as they are 'at the coal face', dealing with firms' trade and investment activities and concerns on a day-to-day basis. In some countries, trade and investment are seen as complementary functions and combined into a single government portfolio. In other countries, they are treated separately, which can result in their obvious complementarities and collective power being overlooked. The private sector can do much to influence people's (and especially the government's) attitudes about the critical relationship between trade and investment at the local, regional and global levels.
- *Investing in transport infrastructure*. It is well known that Africa's intra-regional trade performance has been severely hampered by inefficient and costly transport corridors and infrastructure. If this not seriously addressed, it could jeopardise the future of the AfCFTA, constituting a major stumbling block to private-sector activity and the smooth running of RVCs and global value chains (GVCs). While it takes considerable investment to develop, maintain or overhaul a country's transport infrastructure and is therefore typically the responsibility of government, the private sector can – and often does – collaborate with government entities, providing funding and assuming responsibility for selected activities in which it has noted expertise. Joining forces in this way will go a long way towards alleviating some of the existing bottlenecks and unnecessarily high transport costs that are weighing heavily on Africa's trade performance. MacLeod et al. (2023) identify the development of transport infrastructure as crucial for transforming the trade dynamics in Africa. Specific projects like the Trans-African Highway network (also considered and discussed in more detail in Chapter 7) are mentioned, indicating ongoing efforts to connect regions through improved transport infrastructure.

  A useful vehicle for private-sector involvement in Africa's transport overhaul within the ambit of the AfCFTA is the African Development Bank's Programme for Infrastructure Development in Africa (PIDA) which is a strategic framework for infrastructure development in association with development partners and other stakeholders (AU 2022).
- *Facilitating the freer flow of goods and services*. A wide range of tariffs and NTBs have affected the flow of goods and services on the continent,

often acting as a deterrent to intra-Africa trade. The AfCFTA Secretariat has given considerable attention to the problem of tariffs and NTBs but the latter, in particular, are difficult to curtail because they are often disguised as technical standards or buried in multiple layers of red tape. The private sector can play its part by not contributing to, and indeed actively challenging, evident NTBs in its dealings with government and in its own operations. Specific steps that can be taken to improve the flow of goods and services include identifying and removing hotspots that cause delays, streamlining processes and information flows through greater automation, advocating for better interconnectivity between regulatory agencies, and employing risk management systems and procedures.

Reducing trade barriers on the continent will also encourage more investment in infrastructure, which will help to overcome the challenge of inadequate or misaligned infrastructure links between countries and clear the way for higher levels of trade, using different transport modes (Burger 2021). The more aggressively NTBs are tackled, the greater are the chances of Africa being able to industrialise through trade. Furthermore, liberalising through reduced tariffs and NTBs will be much more impactful than liberalising merely through reduced tariffs (UNECA n.d.).

- *Maintaining the momentum in the AfCFTA process*. Since its inception in 2018, the AfCFTA has been trapped between the negotiating and implementation phases and effective implementation has been evasive (MacLeod et al. 2023). Clearly, operationalising the AfCFTA is a massive undertaking and ensuring that it delivers results is a complex, continent-wide endeavour. It is therefore important for the public and private sectors to stay focused and committed to upholding the agreement (African Union Development Agency/New Partnership for Africa's Development [AUDA-NEPAD] 2021) and do what it can to maintain the momentum – by exercising strong leadership, being actively involved in the negotiation process, engaging in prudent strategic decision-making, making wise, forward-looking investments, and setting an example to others. In this way, the private sector can help to build solidarity with and between government and business in other member states.

Recommendations for stakeholders

This section distils the core insights from the various chapters in this book and translates them into concise recommendations for policymakers, trade and investment promotion agencies, and private firms that are keen to take advantage of the AfCFTA in their existing or future dealings with Africa.

Intra-Africa trade and the African Continental Free Trade Area

The AfCFTA's overarching goal is to transform African economies by boosting intra-Africa trade. The underlying agreement seeks to create a single continental market, removing tariffs on 90% of goods and liberalising service sectors, which will create many opportunities for export diversification and will help to stimulate economic growth. However, the success of the agreement depends on its effective implementation at the country level, which means that its various provisions must be contextualised in line with individual countries' domestic realities.

Recommendation: Policymakers in Africa should harmonise their domestic trade policies and strategies with those of the AfCFTA and contribute to a reduction in NTMs.

Challenges faced by landlocked countries in Africa

Landlocked countries in Africa face unique challenges, including higher transport costs, more risky journeys and longer trade turnaround times. The AfCFTA needs to give special attention to the circumstances of landlocked countries to ensure their equitable participation. The refined TRADE-DSM methodology incorporates transit costs, making it a valuable tool for investigating export diversification opportunities among landlocked countries.

Recommendation: Trade and investment promotion agencies and private firms in landlocked countries in Africa should use the refined TRADE-DSM methodology to identify REOs. The policy formulation process should focus on reducing transit times and costs, improving border efficiency, and investing in multi-modal transport infrastructure.

The export diversification imperative in Africa

Export diversification is crucial for mitigating trade shocks, building resilience and inducing sustainable growth. In the African context, it involves identifying new products and markets, particularly in the manufacturing sector. Export diversification will be key to the AfCFTA's success and is fundamental to Africa's development in the short and longer terms. It is also likely to become increasingly important to the rest of the

world as geopolitical relationships evolve under Trump 2.0[103] and countries are forced to reevaluate their trade and investment alliances and markets.

Recommendation: Policymakers should implement policies that incentivise diversification, promote value addition and improve technological capabilities. Trade and investment promotion agencies should continue to support companies in diversifying into new products and markets, focusing on those sectors in which the country has a comparative advantage and that provide opportunities for economic transformation.

The role of information and market intelligence

A lack of reliable data on market opportunities is a significant obstacle to trade expansion, with small and medium-sized enterprises (SMEs) being particularly vulnerable in this regard. The TRADE-DSM methodology helps to overcome this obstacle by providing a structured, user-friendly approach to market selection.

Recommendation: Governments, trade and investment promotion agencies and private firms should invest in market intelligence gathering and dissemination, creating accessible platforms for businesses to source information on potential export markets. This includes promoting the use of structured and well-informed tools such as the TRADE-DSM.

The strategic value of the TRADE-DSM methodology

The TRADE-DSM methodology is a valuable tool for identifying REOs. It employs a filtering process that reduces potential options to a manageable and realistic set of opportunities, presented as product–market combinations. The methodology has been refined to include logistics costs, making it more appropriate for assessing opportunities for landlocked countries, of which Africa has many. The TRADE-DSM also provides a framework for interpreting results, using the REO Map to inform export strategy.

103. The term ‘Trump 2.0’ has become common shorthand in political circles for Donald Trump’s evolving political persona and approach, especially in the context of his 2024 presidential campaign and subsequent second term.

Recommendation: Trade and investment promotion agencies and private firms should adopt the TRADE-DSM methodology as a key component of their export promotion strategy formulation process. Policymakers should use the methodology to formulate targeted strategies for different sectors and markets, thereby ensuring the efficient allocation of limited resources and the leveraging of identified export opportunities. The use of the methodology should also be prioritised in the development of RVCs.

Strategic prioritisation and resource allocation

Given the limited resources available to countries for trade and investment promotion activities, strategic prioritisation is essential. The TRADE-DSM methodology contributes to this process by identifying the most promising from a very wide range of opportunities. Focusing on specific markets and sectors is necessary to maximise impact and also to create conditions for regional integration. The methodology also helps to inform industrial, export promotion and investment policies.

Recommendation: Policymakers and trade and investment promotion agencies should prioritise sectors and markets that offer the greatest potential for growth, considering both the intensive and extensive margins. They should also allocate resources strategically, based on the evidence from the TRADE-DSM and other analytical tools. The prioritisation should align with national development goals and promote equitable participation in the AfCFTA.

The importance of regional value chains

The AfCFTA can significantly boost the development of RVCs and trade diversification, which are key aspects of promoting intra-Africa trade and industrialisation (MacLeod et al. 2023). The TRADE-DSM methodology helps to identify potential value chains within a regional context, with a specific focus on intermediate goods.

Recommendation: Policymakers and trade and investment promotion agencies should promote the development of RVCs by creating an enabling environment for cross-border trade. This includes reducing trade barriers, improving infrastructure and supporting regional specialisation. The TRADE-DSM should be used to identify sectors and products with the greatest potential for RVC development

The need for continuous improvement

The global economy is dynamic, and the TRADE-DSM methodology should be continuously refined as new data and information become available. Moreover, the effectiveness of export promotion strategies should be regularly evaluated, with the refined TRADE-DSM methodology used as the basis for analysis.

Recommendation: Policymakers and trade and investment promotion agencies should regularly update and refine their analytical tools, including the TRADE-DSM, to incorporate new information and address evolving challenges. This will ensure the tools' robustness and relevance for policymaking. In addition, investment in data collection and statistical capacity should be prioritised.

Conclusion

The AfCFTA presents a unique opportunity for African countries to achieve sustainable economic development through a stronger industrialisation drive and enhanced trade and investment performance. However, unleashing the potential of the AfCFTA requires a strategic and evidence-based approach.

An important question to ask is: What will make the AfCFTA different from other sub-regional trade groupings in Africa? After all, despite the existence of several RECs, each supported by ambitious economic blueprints and strategies, Africa has continued to lag behind other developing regions in numerous ways. Can the AfCFTA help Africa to turn the corner at last?

Many are optimistic about the AfCFTA's inherent ability to inject a new dynamism into Africa, igniting economic opportunities, driving business dealings and lifting millions of Africans out of poverty. It represents a potentially cohesive force that has long been missing on the continent. Others, though, are more sceptical, believing that Africa needs to learn to walk before it can run, so to speak, with the AfCFTA representing a much more complex undertaking than RECs which, to date, have faced numerous financial, administrative and operational challenges and have not functioned optimally. How, then, could the AfCFTA succeed where other, less ambitious initiatives have faltered or failed?

There are many factors that will contribute to the success (or otherwise) of the AfCFTA, several of which have been discussed in the chapters of this book. A critical, overarching factor, of course, is political will, evidenced in a mind-set and leadership style that embrace the notion of African countries

operating in a far more open, efficient, transparent and collaborative manner. This will go a long way towards elevating the AfCFTA from yet another 'good idea on paper' to a viable vehicle for effecting sustainable change on the continent. The potential is immense, but the risks are high.

If the AfCFTA is to work, there must also be active engagement on the part of stakeholders – governments, development partners and the private sector. Their vision and interests should be aligned and their work integrated. This is important for ensuring that the various stakeholders' NTMs do not become NTBs. Effective, inclusive leadership within each of these interest groups is non-negotiable in this regard.

Africa is far from homogeneous. Some countries are far worse off, economically, than others, which makes integration challenging and makes countries reluctant to open their markets to competition and forfeit their tariff revenue and other charges on cross-border trade. However, the benefits to be derived from the AfCFTA could make trade liberalisation worth it, especially if it results in easier access to production networks and value chains, and less reliance on primary commodity exports. Operating in a large, continental market will also expose businesses and individual traders to more innovation and product ideas and create new markets, closer to home. This makes sense at both a micro (business) level and at a macro (economic and geopolitical) level, affording Africa the chance to forge a new and more distinctive identity relative to other developing regions.

However, arguably the greatest challenge facing Africa as it contemplates ways to optimise its trade and investment performance under the AfCFTA banner is its infrastructural and institutional shortcomings. These are the result of many years of under-investment and/or neglect, and they will take many years to overhaul. Admittedly, some countries are more seriously affected than others. Yet overall, trade on the continent is known to be physically hazardous as well as financially risky and costly.

To some people, these problems may seem like the perfect reason to walk away from an ambitious project like the AfCFTA which – if it is to gain traction and change the nature of trade on the continent – calls for forward-thinking policies, enlightened leadership, transparent business dealings, technological advances, efficient transport corridors and facilities, and streamlined customs processes. Adding to the challenge is the fact that many African governments are fiscally constrained while businesses do not have the strong, collective voice needed to mobilise project financing. However, the world has changed, and African countries can no longer depend on the level of foreign aid or concessional loans that they have come to enjoy from development institutions. This is all the more reason why African countries need to work together, to share their ideas, skills and resources to build a more self-sufficient continent.

The massive hurdles that Africa faces cannot be ignored or downplayed. The time to address them is now, especially as the pace of change quickens and the risk of being left further behind intensifies. Africa has reached the proverbial tipping point. Many small steps can be taken that will start to make a difference, and momentum will pick up as successes are realised. Hopefully, the AfCFTA will become a symbol of a new era for the continent.

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Chapter 1

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This book makes a significant and timely contribution to research. It addresses the pivotal question of how to translate the grand political ambition of the African Continental Free Trade Area (AfCFTA) into tangible economic outcomes, a central challenge for African development. The book's primary achievement is providing a systematic, data-driven methodology that demystifies the process of trade development and transforms the lofty ambition of continental integration into a series of manageable, concrete tasks. The shift in focus from the treaty's text to the foundational 'building blocks' of trade is a pragmatic and exciting approach.

The book is a valuable and vital work. It provides an indispensable, practical toolkit for its intended audience of policymakers, trade promotion officials and private-sector executives. For academics, it is an excellent case study in applied methodological work, showcasing the TRADE Decision Support Model (TRADE-DSM) as a robust tool to address one of our time's most pressing policy challenges. In this quest, it succeeds admirably.

Professor Riaan Rossouw, Divergent Minds, South Africa; FTI Consulting, South Africa; North-West University, South Africa; AEXI, the Netherlands and Germany

This is a fascinating and highly informative book which offers a detailed analysis of trade opportunities in Africa, with a specific focus on the African Continental Free Trade Area (AfCFTA). It includes specific case studies on how some African countries can expand their trade opportunities both in Africa and beyond. It also explains many of the key constraints in terms of tariff and non-tariff barriers and logistics costs on the African continent. The concluding chapter is particularly powerful and brings many of the key elements and findings together in illuminating ways.

The book is academically rigorous while also offering strong practical and policy relevance. It will be exceptionally useful for those seeking to leverage future trade opportunities and to understand the importance of the AfCFTA in advancing deeper intra-African trade.

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