Analysing the trade resilience of the SADC member states during the Covid-19 pandemic

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Abstract

The Covid-19 pandemic has had profound implications for global trade, exposing the vulnerabilities of global and regional trade networks, emphasising the importance of resilience. This dissertation analysed the trade resilience of the Southern African Development Community (SADC) during the pandemic, with a focus on assessing how member countries responded to and recovered from the substantial disruptions to trade. To achieve this the study integrated qualitative and quantitative techniques, the qualitative component is embedded within the literature review, while the quantitative analysis was split into three distinct parts. The first part of the analysis focused on determining the impact of the Covid-19 pandemic on the trade flows of the SADC countries, using secondary data over an eight-year period (2015-2022). The second part analysed the effects of the Covid-19 pandemic on the trade resilience of the SADC member states. Finally, the third part of the analysis employed fuzzy-set qualitative comparative analysis (fsQCA) to evaluate the relationships between the determinants of trade resilience within the SADC context.

The analysis highlighted that the Covid-19 pandemic had a substantial impact on the SADC region, resulting in a significant decrease in trade flows. Despite the pandemic's widespread impact on trade, the severity of the shock varied notably among SADC member states. The findings underscore the region's reliance on global markets and the dominating role of major contributors such as South Africa. Findings from the trade resilience analysis revealed substantial variations between member states with regard to their abilities to resist and recover from the trade disruption. Countries found to be increasingly vulnerable to the trade disruption were shown to have limited economic diversification, an overreliance on single commodities or services, and lacking global and regional integration. The results from the fsQCA analysis compliments the existing literature on this subject matter and indicates that no single factor was enough to ensure trade resilience; rather, the combination of factors determined a country's ability to withstand and recover from the disruption. Key conditions contributing to trade resilience include logistics performance, healthcare preparedness, government response, levels of globalisation, and regional integration.

The study concludes that policymakers should prioritise resilience-building strategies that go beyond short-term crisis management and addresses long-term vulnerabilities. Further recommendations include investment in logistics and healthcare systems, diversification of export portfolios, and the strengthening of regional cooperation. By analysing the impact of the Covid-19 pandemic on the SADC countries, this study contributes to the literature on African trade and provides actionable insights for policymakers seeking to enhance the stability and sustainability of trade in the face of future disruptions.

List of Abbreviations

AEC	African Economic Community
AfCFTA	African Continental Free Trade Agreement
AfDB	African Development Bank
AMU	Arab Maghreb Union
AGO	Angola
AU	African Union
ARII	African Regional Integration Index
BWA	Botswana
CEES	Central and Eastern European Countries
CEN-SAD	Community of Sahel-Saharan States
CM	Common Market
COD	Democratic Republic of Congo
COMESA	Common Market for Eastern and Southern Africa
CU	Customs Union
DEATHS	Covid-19 related deaths
EAC	East African Community
ECCAS	Economic Community of Central Africa States
ECOWAS	Economic Community of East West African States
EGLOB	Economic globalization
FDI	Foreign Direct Investment
FSQCA	Fuzzy Set Qualitative Comparative Analysis
FTA	Free Trade Area
GATS	General Agreement on Trade in Services
GDP	Gross Domestic Product
GHS	Global Health Security Index
GNI	Gross National Income
GOVR	Government response
GVC	Global Value Chain
IGAD	Intergovernmental Authority on Development
ITC	International Trade Centre

LPI	Logistics Performance Index
LSO	Lesotho
MDG	Madagascar
MOZ	Mozambique
MUS	Mauritius
MWI	Malawi
NAM	Namibia
NCA	Necessary Conditions Analysis
NTI	Nuclear Threat Initiative
OAU	Organization of African Unity
OxCGRT	Oxford Covid-19 Government Response Tracker
PPE	Personal Protective Equipment
PTA	Preferential Trade Agreement
REC	Regional Economic Community
RTA	Regional Trade Agreement
SACU	South African Customs Union
SADC	South African Development Community
SGLOB	Social globalization
SSA	Sub-Saharan Africa
SYC	Seychelles
TZA	Tanzania
UNECA	United Nations Economic Commission for Africa
WHO	World Health Organization
WTO	World Trade Origanization
ZAF	South Africa
ZMB	Zambia
ZWE	Zimbabwe

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Chapter 1: Introduction

1.1 Background to the study

Over the past decade, there have been several events that have significantly shaped global trade – maybe none more so than the Covid-19 pandemic.

On 11 March 2020, the World Health Organisation (WHO) declared Covid-19 a pandemic, after its rapid spread across the globe following its origins in the province of Wuhan, China, the year before (Siddiqui *et al*., 2022). The pandemic represented one of the worst global health crises in over a century, surpassing the total number of infections from the Spanish Flu, which devastated the globe between 1918 and 1919, with over 50 million deaths. Although the Covid-19 virus, comparatively speaking, was not as lethal as the Spanish Flu, it is estimated to have infected more than 775 million people globally, with a death toll of over 7 million (World Health Organisation, 2024).

At the height of the pandemic, the reported cases of the Covid-19 virus increased dramatically in a short period of time. This surge in reported cases forced countries to implement emergency protective measures to try and curb the seriously deteriorating health crisis and alleviate the mounting pressures on healthcare systems around the world. Lockdowns, social distancing, closure of non-essential businesses, and extensive travel restrictions were among some of the protective measures implemented by governments. While somewhat effective in slowing the spread of the virus, the measures also significantly disrupted global supply chains and consumer demand levels, leading to an alarming overall decrease in economic activity (Mou, 2020). The economic shock generated by the pandemic, in combination with subdued economic momentum from the previous year (International Monetary Fund, 2019), further exacerbated an already fragile global economy.

Travel restrictions and border closures significantly disrupted global supply chains as the movement of raw materials and components became increasingly limited. These bottlenecks, compounded by port closures and reduced shipping capacity, impacted companies' manufacturing and production processes, thereby reducing global output (Mou, 2020). As a result, global GDP growth per capita experienced a significant decline, falling beyond the decrease reported after the 2008 economic crisis and far surpassing that of the 2015 global recession (see Figure 1-1).

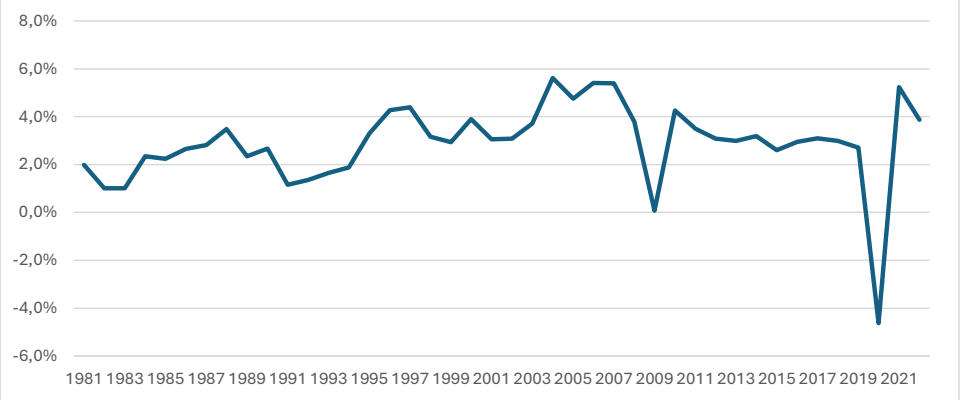


Figure 1-1: GDP per capita growth (annual %), 1980-2022

Source: Adapted from World Bank data (World Bank, 2024)

To mitigate the losses, governments and international institutions reacted aggressively by utilising various tools at their disposal to try and manage the economic downturn and maximise economic recovery (Centre for Economic Policy Research, 2021). Fiscal policies were primarily aimed at ensuring the longevity of firms and managing unemployment (World Bank, 2022). The global response was, however, mixed, as illustrated in Figure 1-2, in part because of existing constraints originating from high debt leading up to 2020, which averaged 48 percent of GDP in 2019 (Tsatsaronis *et al*., 2022). According to the World Development Report (World Bank, 2022), high income countries borrowed significantly more compared to lower- and middle-income countries. While lower- and middle-income countries did not take on large amounts of additional debt, many of the countries pushed the limits of what they were able to borrow. The government response of many countries therefore added to the existing fiscal deficits due to a larger accumulation of debt, as governments had to find alternative sources to fund their fiscal response (Makin & Layton, 2021).

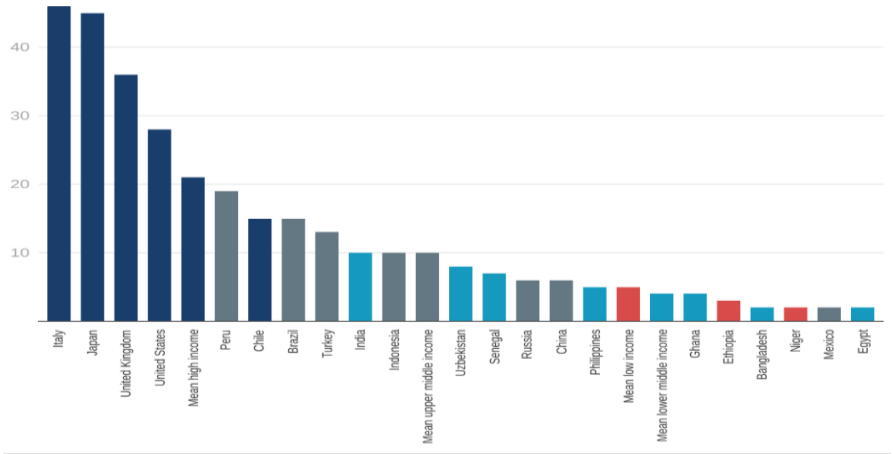


Figure 1-2: Fiscal response to the Covid-19 crisis by selected countries, based on income group

Source: Adapted from World Bank data (The World Bank, 2024)

The Covid-19 pandemic also created liquidity strains and heightened volatility within money and capital markets. In response, central banks around the world implemented several measures to ease monetary policy, providing liquidity to stabilise markets and ensure their continued functioning. Some central banks reduced their repo rates and encouraged commercial banks to lower interest rates and associated fees, while others expanded credit provision in the economy or introduced stimulus packages for the private sector (Centre for Economic Policy Research, 2021).

The pandemic had a profound effect on international trade, triggering disruptions to supply chains, business activities, and shifts in consumer behaviour, thereby accelerating trends such as digitalisation and reshoring while highlighting vulnerabilities of global trade networks (International Trade Council, 2023). As a result, global trade in goods and services declined during the first two quarters of 2020, as illustrated in Figure 1-3. The pandemic had varying effects on both goods and services, with the latter being more negatively impacted. While trade in goods contracted by 23 percent in the first quarter of 2020, trade in services declined by 30 percent. This difference has largely been attributed to the demand for necessities that remained stable throughout the pandemic in comparison to services, which were mostly shelved during that period (World Trade Organisation, 2021)

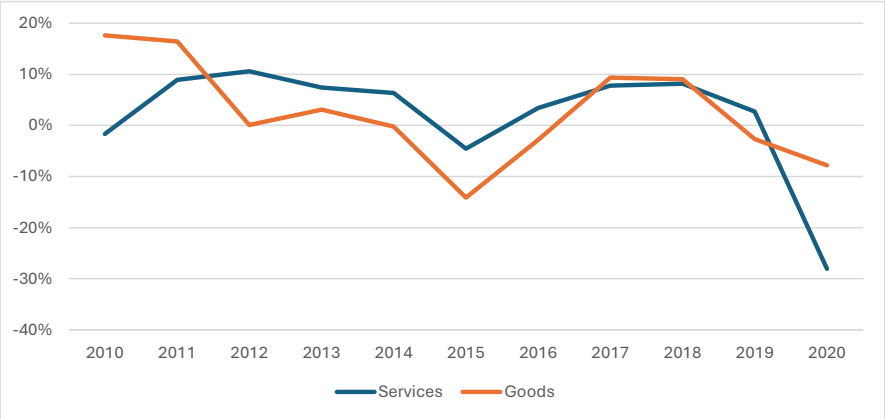


Figure 1-3: Global trade in goods and services (2010-2020, quarterly)

Source: Adapted from UN Comtrade Data (United Nations Statistics Division, 2025)

Africa was by no means isolated from the impact of the Covid-19 pandemic. Although the region reported the lowest number of infections and deaths (see Figure 1-4 below), it still suffered a significant loss of life with over 175 000 deaths (World Health Organisation, 2024).

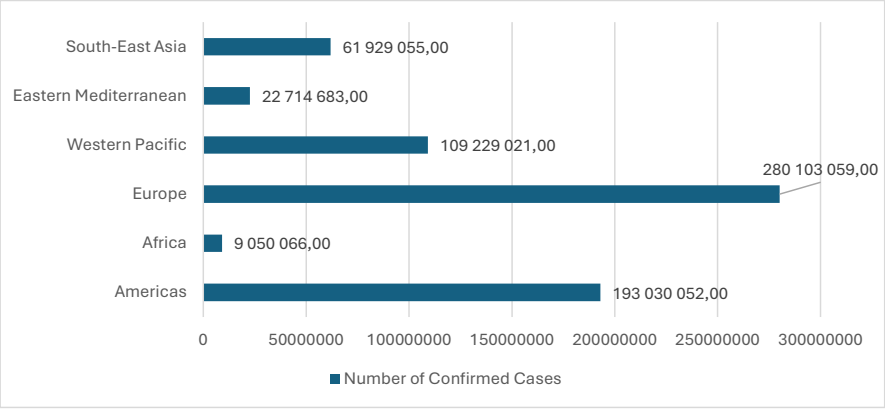


Figure 1-4: Covid-19 confirmed cases by region, April 23, 2023

Source: Adapted from WHO Covid-19 Dashboard (World Health Organisation, 2024)

The economic impact of the pandemic in Africa was both extensive and severe because of existing poverty, strained healthcare systems and the limited financial capacity of governments to effectively manage the crisis (Ujunwa *et al*., 2021). Even though the recession that resulted from the pandemic marked the worst Africa had experienced in the last five decades, the decline in average GDP per capita was significantly lower compared to other regions, decreasing by a comparatively modest 2.1 percent in 2020 (African Development Bank, 2021). The decline in GDP was also mixed across the continent's various regions with Southern Africa reporting the largest decrease of 7 percent (African Development Bank, 2021). Figure 1-5 below presents the difference in GDP per capita in 2020 compared to 2019 for all African countries, excluding Libya. Upper middle-income countries in Southern Africa (Mauritius, Botswana, South Africa and Namibia) were the worst affected.

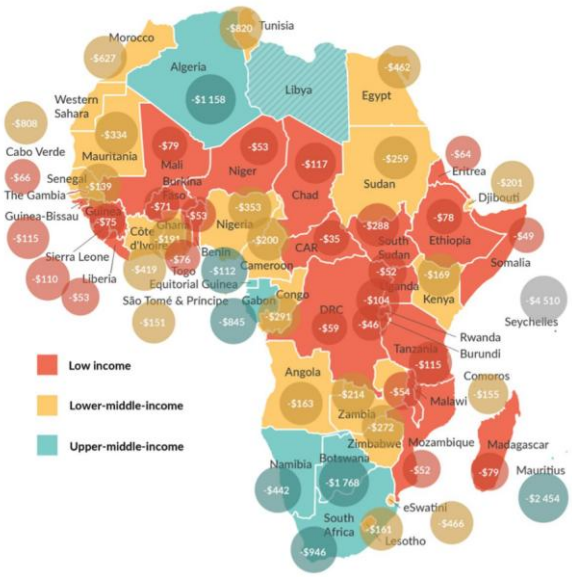


Figure 1-5: Decline in GDP per capita: 2020 compared to 2019

Source: African Futures, 2024

The GDP decline and slowed economic activity in Africa meant that a greater portion of the population was at risk of losing their jobs (Ujunwa *et al*., 2021). Nigeria and South Africa, the two largest economies in Africa, reported alarming spikes in unemployment during 2020, reaching 27.1 percent and 30.8 percent, respectively (Fagbemi *et al*., 2022). This decrease in unemployment can largely be attributed to the workforce consisting predominantly of low-skilled and informally employed workers, who had limited opportunities to work remotely (Ujunwa *et al*., 2021).

African trade also took a sizeable hit during the first wave of the pandemic (the second quarter of 2020), following the trend from other parts of the globe, resulting in decreased export volumes of 32 percent, a decrease in import volumes by 26 percent, and a decrease in intra-regional trade by 25 percent, as illustrated in Figure 1-6 (UNCTAD, 2021). This decrease is problematic because even though Africa only makes up a small portion of global trade, most of the region's economies get a significant share of their national revenue from trade (Kassa, 2020).

		2020				2021		
		Q1	Q2	Q3	Q4	Q1	Q2	Q3
Africa	Exports	-3%	-32%	-14%	-8%	4%	24%	20%
	Imports	-10%	-26%	-10%	4%	3%	15%	19%
	Intra-Regional	-1%	-25%	-8%	-1%	4%	30%	19%

Figure 1-6: Export and import trends in Africa, 2020-2021

Source: (UNCTAD, 2021)

The Covid-19 pandemic also affected the South African Development Community (SADC) substantially. Infections were widespread across member states, resulting in over 130 000 casualties. Within the SADC region, South Africa reported the highest number of infections and deaths, likely owing to the country's large population (Moffat & Dube, 2021). The pandemic highlighted the economic vulnerabilities within the regional economy as economic output was significantly impacted, declining by 4.51 percent from 2019. The manufacturing sector, which is identified as a key accelerator of growth to the SADC, contracted by 8.7 percent in 2020, following a growth percentage of 1.2 percent the year before. In contrast, the agricultural sector expanded by 5.2 percent in 2020, a significant improvement on the reported growth in 2019 (SADC, 2021).

While exact figures on job losses across the SADC countries are challenging to confirm, the Covid-19 pandemic led to significant employment disruptions throughout the region. The impact was particularly severe in sectors reliant on physical presence and cross-border activities, with millions of jobs affected across both formal and informal sectors.

1.2 Trade resilience and the SADC

The South African Development Community (SADC) plays a vital role in Africa, fostering economic integration, promoting political stability, supporting infrastructure development, and enhancing regional cooperation. Its initiatives also contribute significantly to the overall development and stability of the Southern African region. The SADC has a combined population of 363 million people and represents Africa's third largest Regional Economic Community (REC) in terms of GDP (Moyo, 2024). Apart from South Africa, which is classified as an emerging market, SADC members primarily consist of low- or lower-middle-income developing economies, which are highly dependent on intra-regional SADC trade, and are extremely vulnerable to external shocks, due to developmental challenges (Muntschick, 2020). International trade is crucial for the SADC as it drives economic growth, promotes regional integration, enhances economic resilience, creates jobs, fosters innovation, and supports political stability. By prioritising trade, the SADC can achieve greater economic development and improved living standards for its member states.

The Covid-19 pandemic had a significant impact on SADC trade. Figure 1-7 provides an overview of the decline in trade in the region (imports, exports and total trade) during the pandemic. The decline in trade was most severe during the first wave, immediately after protective measures were implemented in April 2020. SADC imports declined from a pre-Covid high of $139.8 billion (October 2019) to $80.1 billion (April 2020), while SADC exports declined from a pre-Covid high (October 2019) of $139.8 billion (October 2019) to $55 billion (April 2020), representing a 49 percent decline in overall trade.

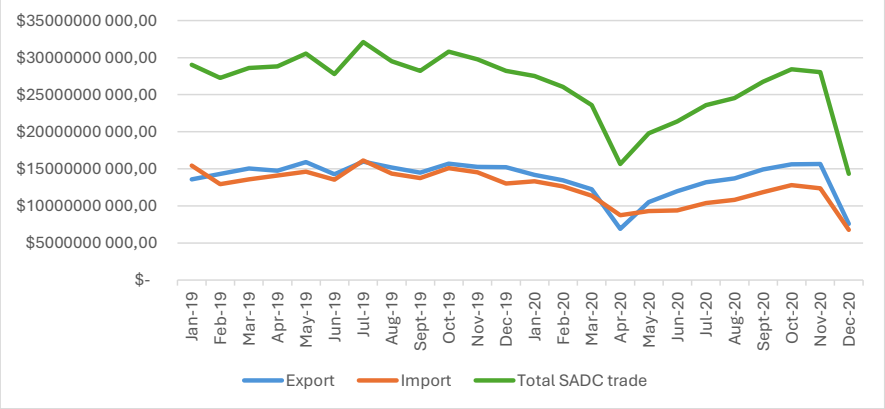


Figure 1-7: Decline in SADC trade during Covid (US dollar thousands)

Source: Adapted from UN Comtrade Data (United Nations Statistics Division, 2025)

Given that the SADC countries were severely affected by the Covid-19 pandemic, this study will focus on analysing the trade resilience of the SADC countries during the pandemic period. In the wake of the Covid-19 pandemic, researchers and policymakers have become increasingly aware of the significance of trade resilience driven by growing concerns over similarly devastating disruptions in the future. This, in turn, has had a substantial impact on policies and developments, shifting the focus toward building economies capable of withstanding and recovering from such shocks.

This shift has subsequently placed trade resilience at the centre of renewed interest to both researchers and policymakers alike. The field of study on trade resilience has also grown dramatically, post-pandemic, resulting in numerous publications specifically focused on resilience (Kassa, 2020; Kolahchi *et al*., 2021; Mena *et al*., 2021; Ujunwa *et al*., 2021). Despite this, little focus has been placed on the trade resilience of the SADC. This shortage of research is concerning, considering the SADC's economic significance within the broader African context. Given the vulnerability of SADC members to external shocks, it is also vital that further research is conducted that addresses the community's existing resilience, and the ways in which it could be improved.

This research study aims to fill this gap by conducting a comprehensive analysis of the trade resilience of the SADC region, within the context of the Covid-19 pandemic. By analysing the experiences of each of the SADC members, the study seeks to identify areas within the region that require improvement to enhance trade resilience.

1.3 Problem statement

The Covid-19 pandemic has profoundly disrupted global trade, challenging the resilience of regional trade systems. Within the context of the SADC, which is an essential regional economic bloc comprising diverse member states, the pandemic's impact has been particularly pronounced. While SADC countries have historically faced various trade barriers and economic vulnerabilities, the pandemic further exacerbated these challenges, affecting trade flows, economic stability, and regional integration. This study aims to analyse the trade resilience of the SADC countries during the Covid-19 pandemic. Specifically, it seeks to analyse how the pandemic has influenced trade patterns and economic performance within the region, while identifying potential conditions that could promote trade resilience. By assessing the capacity of SADC countries to adapt to and recover from the trade disruptions caused by the pandemic, the study will provide insights into the effectiveness of existing trade policies as well as the strengths and weaknesses of regional trade mechanisms.

1.4 Research question

The following primary and secondary research questions have been formulated based on the problem this study seeks to address.

1.4.1 Primary research question

How was the trade resilience of SADC countries affected by the Covid-19 pandemic?

1.4.2 Secondary research questions

- What does the existing literature reveal about trade resilience and its key determinants?
- What does existing literature reveal about the trade resilience of African countries?
- What were the effects of the Covid-19 pandemic on trade flows of the SADC countries?
- What configuration of factors in the SADC may have contributed to trade resilience during the Covid-19 pandemic? In other words, what selection of possible conditions might foster trade resilience in the SADC?

1.5 Research objectives

The primary and secondary research objectives have been formulated based on the primary and secondary research questions outlined previously.

1.5.1 Primary research objective

The primary objective of this research study is to analyse how the Covid-19 pandemic affected the trade resilience of SADC countries.

1.5.2 Secondary research objectives

To facilitate the achievement of the primary objective, the following secondary objectives have been formulated:

- Provide an overview of the existing literature on trade resilience and its key determinants.
- Identify what existing empirical research reveals about the trade resilience of African countries.
- Determine the impact of the Covid-19 pandemic on the trade flows of SADC member states.
- Analyse the effects of the Covid-19 pandemic on the trade resilience of SADC countries.
- Evaluate the relationships between the determinants of trade resilience to identify configurations of factors that sufficiently contribute to trade resilience.
- Compare trade resilience across SADC countries.

1.6 Significance of the research

Analysing the trade resilience of the SADC members is critical for promoting regional economic stability and growth, especially considering the high vulnerability of the economies within the SADC. As the risks of global shocks increase due to factors such as war, global warming and political instability, the trade resilience of the SADC countries is vital to ensure the economic well-being of the member states. Analysing the trade resilience of the SADC countries within the context of the Covid-19 pandemic can also assist in identifying specific areas within the community that require strengthening, thereby increasing the SADC's capacity to withstand future shocks. The findings are expected to provide valuable insights to enhance regional trade strategies and improve the resilience of SADC member states against future global disruptions.

The study will contribute to the current literature on trade resilience, particularly from an African perspective. It also has the potential to make a meaningful contribution by offering insights that can inform policymaking, support economic stability and improve regional and international trade.

1.7 Research design and methodology

This research study will employ a qualitative and quantitative approach to comprehensively analyse the resilience of trade systems within the SADC. The research design integrates the quantitative analysis of trade data with the qualitative analysis of other empirical studies and existing literature. The quantitative analysis will identify patterns and trends in trade flows within the SADC, while the

thematic analysis will provide a deeper understanding of the factors influencing trade resilience, thereby complementing the quantitative findings. By combining both quantitative and qualitative approaches, the study aims to offer a nuanced understanding of trade resilience within the SADC and examine differences among member states.

To achieve this, the study will systematically undertake the following stages to effectively integrate qualitative and quantitative analyses and accomplish the research objectives.

1.7.1 Literature review

An extensive review of existing literature (secondary data) will be conducted to facilitate the achievement of the primary and secondary objectives of the study. Firstly, the review will provide an overview of trade, e.g. why countries trade, what the benefits of international trade are, and what the significance of trade within the SADC is. Thereafter, the review will focus on existing literature to obtain a deeper understanding of trade resilience and the various elements that contribute to the trade resilience of a country. Finally, the review will provide an overview of trade within the SADC region and discuss existing literature on the trade resilience of the SADC member states.

The literature review will establish a baseline of the existing assumptions surrounding the SADC's trade resilience as well as identifying gaps in the research. This process will also inform the selection of indicators for analysing the trade resilience of member states during the empirical analysis, with reference to the independent variables chosen for this study.

1.7.2 Empirical analysis

The empirical analysis of this study will be undertaken in three parts. Firstly, country-level trade data will be analysed to assess the impact of the Covid-19 pandemic on the trade flows of SADC countries. Secondly, the study will examine the effects of the pandemic on the trade resilience of these countries. Finally, the analysis will focus on identifying configurations of country-level factors that may have promoted trade resilience within the SADC during the Covid-19 pandemic. The following section outlines the stages involved in the empirical analysis.

Stage 1: Determining the impact of Covid-19 on the trade flows of the SADC countries

Country-level trade data will be used to track the trade flows of the SADC members over an eight-year period from 2015 to 2022. The data will be presented in tables and graphs to provide a visual

representation for analysis. The information derived from the analysis will be used to gain insight into the extent of the pandemic's impact on the trade flows of the SADC.

Stage 2: Analysing the effects of the Covid-19 pandemic on the trade resilience of the SADC countries.

To analyse the extent to which the pandemic affected trade resilience, the study will measure changes in resilience across different stages of the pandemic. This will be done by assessing each country's robustness, the ability to withstand external shocks, and recovery (responsiveness), the ability to recover effectively from disruptions. Trade resilience in a given month is measured by the year-on-year monthly percentage change in the combined total of a country's imports and exports (Mena *et al.*, 2021). Robustness is determined by the decline in trade in any given month during the pandemic compared to pre-pandemic levels, while recovery is measured by the time taken for trade to return to its pre-pandemic average after the largest decline.

Stage 3: Evaluating the relationship between the determinants of trade resilience using the fsQCA approach.

Fuzzy-set qualitative comparative analysis (fsQCA) will be employed to examine the factors contributing to trade resilience and their interrelationships. fsQCA, though still evolving, has been shown to be a valuable tool for testing causality under complex conditions (Mena *et al.*, 2021). This approach acknowledges that real-world situations are complex and *fuzzy*, meaning that factors are not assigned exact values but are evaluated in degrees or *shades* (Mena *et al*., 2021). fsQCA recognises that the relationships between independent variables and the dependent variable can be nonlinear, with different contributions, depending on the context. This methodology is well-suited to investigate how combinations of conditions contribute to trade resilience outcomes.

The fsQCA approach will be applied to the SADC following the steps outlined by Pappas and Woodside (2021) and Mena *et al.* (2021). The methodology will closely follow Mena *et al.* (2021), who examined combinations of factors contributing to trade resilience during the Covid-19 pandemic. However, this study will extend that methodology by including intra-regional trade as a variable, motivated by Pretorius *et al.* (2017), who highlighted the importance of regional integration for economic resilience in the SADC.

1.7.3 Data sources

The following secondary data sources have been selected based on the methodology requirements of the study as well as the variables selected for this study. The variables selected for this analysis are based on the published works of Mena *et al.* (2022) and Pretorius *et al.* (2017), as discussed previously.

The variables identified in these studies have been recognised as the most significant and appropriate to the topic and will be discussed in detail during the literature review. The variables include trade resilience (dependent variable); logistics performance; healthcare preparedness; economic and social globalisation; government response; gross national income; and intra-regional trade (independent variables). The sources will be triangulated to provide a comprehensive understanding of trade resilience capturing both the quantitative trends and qualitative insights:

a) United Nations Commodity Trade Statistics Database (UN Comtrade)

The UN Comtrade is the world's largest database of trade statistics. For use by governments, academic institutions, research centres, and businesses, the United Nations Comtrade database compiles comprehensive worldwide yearly and monthly trade information by product and trading partner. Over 99% of global merchandise trade is represented by data provided by the United Nations Statistics Division, which covers over 200 countries (United Nations, 2024). The UN Comtrade data will be accessed through Trade Map, an online platform developed by the International Trade Centre (ICT).

b) Logistics performance index (LPI)

The LPI is an interactive benchmarking tool, created by the World Bank, to assist countries in identifying challenges and opportunities regarding their logistics trade performance (The World Bank, 2024). The index is based on a weighted average of six factors, with a minimum of 1 and a maximum of 5.

c) Global health security (GHS) index

The GHS index compares and evaluates health security and associated capabilities across 195 countries. The index was developed specifically to assist countries in preventing, detecting and responding to epidemics and pandemics, and provides a value from 0 to a 100 (Nuclear Threat Initiative; Johns Hopkins Center for Health Security, 2024). The GHS index scores are determined by a panel of experts who assess countries based on a questionnaire of 140 questions organised across six categories (Mena *et al*., 2021).

d) Economic and social globalisation index

The economic and social globalisation index, developed by the Swiss Economic Institute (KOF) (2023), measures the extent of globalisation in countries worldwide. The index is part of the broader KOF globalisation index, which includes a political dimension. The index is designed to capture the economic and social dimensions of globalisation by assessing various components and indicators. The index scores, which are values of 0 to 100, are calculated as a weighted average of the scores from the sub-domains of both the economic and social dimensions (KOF Swiss Economic Institute, 2023).

e) The Oxford Covid-19 Government Response Tracker (OxCGRT) stringency index

The OxCGRT stringency index is a composite measure created by researchers at the University of Oxford to track and compare government responses to the Covid-19 pandemic across different countries and regions. The index is calculated based on nine response indicators, each of which is assigned a score on an ordinal scale that reflects the level of government intervention. The scores are aggregated and normalised to produce a value of 0 to 100 (Hale *et al.*, 2020).

f) The African regional integration index (ARII)

The ARII will be used to measure regional integration in the SADC. The ARII is a comprehensive tool developed to measure and assess the level of regional integration across African countries. Launched by the African Union (AU) and the African Development Bank (AfDB) in collaboration with the United Nations Economic Commission for Africa (UNECA), it provides a systematic approach to evaluate how well African countries are integrated with each other. It uses 16 indicators, grouped into five dimensions, to measure how well each country and region in Africa is integrated with its neighbours. The five dimensions include: trade integration, infrastructure integration, regional investment, financial integration, and social integration (African Regional Integration Index, 2024).

The ARII focuses exclusively on regional integration in Africa as it compares the levels of regional integration among African countries with each other. It is therefore substantially different from the economic and social globalisation Index, which measures the extent of globalisation globally and which assigns a global score.

1.8 Chapter classification

This dissertation will consist of the following chapters.

Chapter 1: Introduction and background to the study

This chapter will provide the background to and establish the scope of the study. The chapter will also serve as the basis of the study, by providing context for the subsequent chapters. The chapter will include the problem statement; research questions; research objectives; research design and methodology; and an outline of the different chapters of the study.

Chapter 2: Literature review

In this chapter, the existing body of literature related to the research topic will be reviewed and synthesised. It includes an analysis of previous research, theories, and findings relevant to the study, highlighting gaps in the literature that the dissertation aims to address.

Chapter 3: Research design and methodology

This chapter will describe the research design and methodology of the dissertation and include sections that include the research design and context, the data sources and the methodology employed for this study as well as the rationale behind it.

Chapter 4: Results and findings

This chapter will present the results of the research and will focus on reporting the empirical findings of the study, highlighting the most significant findings in relation to each of the empirical objectives.

Chapter 5: Conclusions

This concluding chapter will summarise the key findings of the research and interpret the results in relation to the research objectives. The results and their implications will be discussed for relevant stakeholders, including policymakers and researchers, seeking to explore the topic further.

Chapter 2: Literature review

2.1 Introduction

The Covid-19 pandemic profoundly disrupted global trade systems, exposing vulnerabilities within supply chains worldwide. Amid these unprecedented challenges, understanding the dynamics of trade resilience has become critical for policymakers, economists, and researchers. This chapter reviews the existing body of literature on the importance of trade, trade resilience, and regional integration, with a particular focus on the impact of the Covid-19 pandemic. It seeks to contextualise trade as a fundamental component of global economic systems while exploring how nations and regions have responded to the pandemic's disruptions.

The chapter is structured as follows. Firstly, it explores foundational trade theories to establish the underlying motivations for international trade and its role in economic growth, poverty alleviation, and technological advancement. Next, the discussion turns to the importance of trade resilience and regional integration, particularly in developing economies. The chapter then examines trade resilience within the context of the Covid-19 pandemic. Special attention is given to the complexities of trade resilience, particularly within the context of the Covid-19 pandemic, which exposed vulnerabilities in global supply chains and underscored the need for robust and adaptive trade systems. The chapter will then discuss the existing literature on the determinants of trade resilience, which will be applied to the study in the empirical analysis. Finally, the chapter contextualises these discussions within the SADC, emphasising the region's specific vulnerabilities and the potential for strengthening trade resilience through regional collaboration.

By combining these perspectives, this chapter provides a comprehensive foundation for understanding trade resilience, its determinants, and its critical role in mitigating the economic fallout of global crises such as the Covid-19 pandemic.

2.2 Theoretical overview

2.2.1 Trade theory: Why do nations trade?

Nations engage in trade for various reasons, ranging from economic efficiency to access to resources and markets (Broda *et al*., 2017). Theoretical foundations from classical, neoclassical, and modern economic trade theories provide a framework for understanding the drivers of international trade. Additionally, factors such as market access, technological advancement, and economic integration also play significant roles (Rodrik, 2018).

Economic theory on trade as a driver of growth has been part of economic dogma dating back to the 18th century, rooted in the classical works of Adam Smith (1723-1790) and David Ricardo (1772-1823). The trade theories proposed by Smith and Ricardo lay the foundation for understanding the fundamental motivations behind international trade (Lam, 2015; Thirlwall, 2000). Smith's theory of absolute advantage argues that countries benefit from specialising in the production of goods they can produce more efficiently than others, thereby driving international trade (Smith, 1776). Ricardo's theory of comparative advantage, on the other hand, suggests that even if one country is more efficient in producing all goods, trade can still benefit both nations if they specialise in the goods they produce relatively more efficiently (Ricardo, 1817). The neoclassical theories of the 19th century refined the classical view by incorporating factors of production and their variability. A prominent example of one of these theories is the Hecksher-Ohlin model, which famously expands on the classical theories by incorporating differences in factor endowments such as labour, capital, and land (Heckscher, 1919; Ohlin, 1967). The model suggests that countries export goods that use their abundant resources for production and import goods that require resources in relative scarcity (Baldwin, 2008). While the neoclassical theories improved on the fundamental understanding of what drives trade, the theories relied on assumptions that ignored the complexity of real-world trade dynamics, making them somewhat unrealistic (Lam, 2015).

Modern trade theories emerged to address the gaps left by the earlier trade theories, emphasising the role of economies of scale, technological innovation, and product differentiation (Lam, 2015). These new trade theories challenged traditional models by observing that which could not be explained solely by comparative advantage or factor endowments. Perhaps one of the best-known modern trade theories is Paul Krugman's new trade theory, which highlights the significance of economies of scale and monopolistic competition, explaining intra-industry trade between nations with similar factor endowments (Krugman, 1985). Here, market access is critical, as it allows firms to exploit economies of scale by selling to larger markets, reducing per-unit costs, and fostering competitive industries. Technological advancement also plays a pivotal role in modern trade, as emphasised by the exogenous growth model of Solow (1956), which argues that technological progress is the primary determinant of long-term economic growth and international productivity

differences (Chirwa & Odhiambo, 2018). Endogenous growth models, such as those developed by Romer (1986) and Grossman and Helpman (1991), extend this perspective by incorporating technological innovation as an internal factor driven by investment in research and development, human capital, and knowledge spillovers (Chirwa & Odhiambo, 2018). These theories link trade to long-term growth, suggesting that international trade facilitates the transmission of knowledge, innovation, and advanced technologies across borders (Romer, 1986). Countries that participate in international trade, therefore, gain access to state-of-the-art technology, thereby improving productivity and creating pathways for industrial improvement.

This evolution of trade theories demonstrates the complexity of international trade dynamics. While classical and neoclassical theories provide foundational insights into why nations trade, modern theories address the intricacies of globalisation, economies of scale, and technological advancement.

2.2.2 The importance of trade

The importance of trade has been widely discussed in literature. One of the main arguments for the promotion of international trade is its ability to drive economic growth. Krugman (1994) was one of the first authors to highlight that economies that engage more in trade tend to experience higher GDP growth rates compared to countries that have a more protectionist stance. The idea that trade is a source of economic growth is also supported by the export base theory, which holds that increases in exports help local economies through productivity gains and externalities (Lam, 2015). Trade also drives growth, as it facilitates access to larger markets, which enables firms to expand their operations, boost productivity and cut expenses (Melitz, 2003). Kassa (2020) notes that developing countries, particularly in Africa, often rely on trade income as a major source of national revenue, which, in turn, serves as an important driver of economic growth.

One of the added benefits of trade is the subsequent impact it has on alleviating poverty, as business operations expand to address growing demand from international markets, thereby leading to an increase in job opportunities and income levels (Bannister & Thugge, 2001; Brambilla & Porto, 2017). Other than its economic growth potential and its ability to alleviate poverty, international trade also leads to technological diffusion[1]. Access to other markets translates to additional resources, enabling economies to acquire resources that may not be available domestically and facilitating the exchange of technology and innovation across borders. Through trade, countries can therefore import advanced technologies and machinery that contribute to improving productivity, which, in turn, fosters innovation (Sampson, 2015; Thirlwall, 2000). Trade therefore also acts as an important conduit for the transfer of innovation and information resulting in several dynamic gains (Perla & Tonetti, 2014; Sampson,

[1] Technological diffusion refers to the process by which a new technology or innovation spreads and is adopted across individuals, organisations, and even countries.

2015; Thirlwall, 2000). A real-world example of this can be observed in East Asian economies, where trade liberalisation was largely responsible for rapid industrial growth over the four decades leading up to 2010 (see Lim, 2014).

In recent years, the proliferation of global value chains (GVCs) has also significantly impacted international trade, transforming its structure, with product components being manufactured and assembled across multiple countries. GVCs have enabled economies to integrate into the global economy without having to develop entire industries domestically, simply by specialising in specific segments of the production process (Baldwin & Lopez-Gonzalez, 2015). Through increased interconnectedness, GVCs have also allowed firms to reduce costs, improve efficiency, and foster innovation. The expansion of preferential trade agreements (PTAs) over the last three decades has further deepened global integration and has allowed GVCs to spread significantly (Razeq, 2022).

This discussion highlights how international trade serves as a powerful engine for economic transformation, fuelling higher GDP growth, alleviating poverty through job creation, and accelerating technological diffusion by granting firms access to advanced inputs and ideas. The rise of GVCs and the spread of PTAs have only deepened these effects. As these dynamics have matured, they have naturally promoted closer regional integration, bringing neighbouring economies into stronger alignment to increase the benefits of cross-border exchange. For regions such as the SADC, these theoretical insights are particularly relevant, as the reliance on trade for growth and development means that shocks such as the Covid-19 pandemic directly test the region's ability to maintain trade flows and economic stability. Understanding why nations trade, and the benefits that flow from trade, therefore provides a crucial foundation for analysing how resilient SADC's trade has been in the face of global disruptions. In the next section, we turn our attention to this regionalisation process, examining how integration frameworks have evolved and the ways in which they reinforce the gains unlocked by global trade.

2.2.3 Trade and regional integration

Regional integration has played a crucial role in shaping global trade dynamics over the last several decades. Regional economic integration refers to the process of implementing measures that permit the unrestricted flow of economic units, such as capital, people, goods, and services between national markets (Belassa, 1961; Nguyen, 2019). According to Belassa (1961) and Hosny (2013), there are four different stages of economic integration, namely a free trade area (FTA), a customs union (CU), then a common market (CM), and finally an economic union (Belassa, 1961; Hosny, 2013). Within a free trade area, member countries remove trade barriers among themselves while maintaining independent external tariffs for members outside of the area. In addition to removing internal trade barriers, member countries also adopt a common external tariff, thereby creating a customs union. A

common market extends custom union principles by allowing the free movement of labour and capital across borders. Finally, an economic union includes policy harmonisation in areas such as taxation and monetary policy.

Since its origins in post-World War II Europe, regional integration has expanded significantly across the globe, reflected in the growing number of regional trade agreements (RTAs). As of 22 January 2025, 373 RTAs were in force, with an additional 56 identified but not yet notified to the World Trade Organization (WTO) (WTO, 2025). In Africa, regional integration has gained substantial momentum, exemplified by initiatives such as the Southern African Customs Union (SACU), the Southern African Development Community (SADC), and the African Continental Free Trade Area (AfCFTA).

Over the years, different regions have created important trade and non-trade connections between their members. These connections play a key role in shaping economic activity, building wealth, and supporting innovation in the global economy (Bobowski & Menkes, 2024). Furthermore, regional integration offers multiple trade-related advantages, as identified in the groundbreaking work of Viner (1950), who showed that regional integration allows for trade creation and expansion where there is a shift from the inefficient domestic producers in one country, to lower-cost producers within the region, allowing better resource allocation. If, however, the shift is in the opposite direction, i.e. from a low-cost producer to a high-cost producer, then trade diversion takes place, which could have an adverse effect on welfare (Hosny, 2013).

Integration also promotes economies of scale through access to larger markets, which allows firms to achieve lower production costs and attract intra-regional and foreign direct investments, resulting from a larger unified market that is more attractive to investors, and promotes the adoption of new technology and improvement of firm efficiency due to increased competition, thereby contributing to economic growth (Hosny, 2013). Furthermore, regional trade agreements (RTAs) organise trade in a way that can boost preferential access to preferred markets, enhance institutions, encourage upward standardisation, raise domestic productive capacity, and introduce technological expertise within the domestic market (DiCaprio *et al*., 2017). The formation of regional trade blocs has therefore facilitated economic cooperation, enhanced market access, and contributed to economic growth.

For developing countries, regional integration can be used as an important tool to enhance their participation in global trade with economic development serving as the primary focus. The evolution of their engagement in regional integration has closely followed shifts in trade policy. Belassa and Stoutjesdijk (1975) explain that regional integration among developing countries was initially driven by import substitution, which was later discovered to have various limitations originating from inefficient industries and market size constraints. Later, a broader view emerged in support of export-led growth policies and greater participation in global trade.

Regional integration also remains a critical goal for Africa, offering various economic, political, and social benefits. There is a great deal of promise for regional integration to reduce poverty and unemployment in Africa and spur more robust and equitable economic growth (Kayizzi-Mugerwa *et al*., 2014). However, despite its potential, regional integration in the continent has been slow.

The idea of African integration dates back to the post-independence period when newly independent states sought unity as a means of resisting neo-colonial economic dependence (Kayizzi-Mugerwa *et al*., 2014). Africa's integration trajectory, shaped by the Monrovia approach, led to the establishment of the Organization of African Unity (OAU) in 1963 and its eventual transition into the African Union (AU) in 2002 (Kayizzi-Mugerwa *et al*., 2014). Significant milestones in regional integration within the continent include the Lagos Plan of Action (1980), which was aimed at reducing Africa's dependence on European markets, and the Abuja Treaty (1991), which provided a roadmap for achieving an African Economic Community (AEC) by 2028 (Draper, 2012). The treaty led to the formation of several RECs, which have since played a central role in regional trade and economic cooperation.

Today, Africa's integration is structured around eight officially recognised RECs. Among them, the East African Community (EAC) has made the most progress toward deeper integration, including plans for a monetary union and political federation (Kayizzi-Mugerwa *et al*., 2014). Other notable RECs include the Arab Maghreb Union (AMU), the Common Market for Eastern and Southern Africa (COMESA), the Community of Sahel-Saharan States (CEN-SAD), the Economic Community of Central African States (ECCAS), the Economic Community of West African States (ECOWAS), the Intergovernmental Authority on Development (IGAD), and the Southern African Development Community (SADC), which is the focus of this study given its central role in regional trade and its particular vulnerability during the Covid-19 pandemic (see section 2.3).

The African Continental Free Trade Area (AfCFTA), which came into force in 2019, represents the continent's most recent and most ambitious attempt at integration, aiming to create a single market for goods and services across the continent (Leshoele, 2023). The AfCFTA is a landmark initiative aimed at boosting intra-African trade by creating a single market for goods and services across the continent. By reducing tariffs and non-tariff barriers, the AfCFTA is expected to enhance economic integration, promote industrialisation, and support job creation. It also provides a platform for African countries to strengthen their position in global value chains, attract investment, and drive sustainable development. With its potential to connect over 1.4 billion people across 55 countries, the AfCFTA represents a major step toward economic transformation and unity in Africa.

However, despite significant political commitments, implementation remains inconsistent across RECs. Slow progress in regional integration stems from various challenges. One of the major reasons is the poor implementation of agreements at the national level, caused by governments that sign treaties but fail to integrate them into domestic policy (Kayizzi-Mugerwa *et al*., 2014). The reluctance

of national governments to cede political power to supranational bodies also slows progress (Leshoele, 2023). Additionally, countries belong to multiple RECs, which creates regulatory conflicts and inefficiencies (Draper, 2012; Hartzenberg, 2011). This is compounded by other inefficiencies originating from underdeveloped transport and energy networks that significantly hinder trade and integration efforts (Draper, 2012).

While increased interconnectedness has its benefits, it also has other important implications for economic and trade resilience, as countries are no longer solely reliant on domestic industries. As economies become more interconnected, they also become more exposed to external shocks, prompting concerns regarding economic and trade resilience. While it is clear that trade has played a substantial role in fostering economic growth, poverty reduction and technological diffusion, it is essential to focus on resilience to ensure economies continue to reap the benefits of international trade.

In the case of the Southern African Development Community (SADC), regional integration has provided a framework for boosting intra-regional trade and reducing dependence on external markets. However, as will be discussed in sections 2.4 and 2.5, the Covid-19 pandemic exposed structural weaknesses in the SADC's integration, as disruptions in supply chains, transport networks, and external demand highlighted the region's vulnerability to global shocks. This makes the analysis of trade resilience within SADC particularly critical to understanding how regional integration can both cushion and amplify the effects of crises such as Covid-19.

2.3 Resilience

2.3.1 An overview of resilience

The concept of resilience has featured in various areas of social sciences and has been adopted and adapted by numerous disciplines including psychology, engineering, and economics. Although the conceptualisation often varies at different levels, resilience generally refers to a system's ability to deal with a disruption (Mena *et al*., 2021). Martin-Breen and Anderies (2011) outline three resilience frameworks, namely engineering resilience, which focuses on recovery to a single equilibrium; systems resilience, which emphasises maintaining functionality in the event of a disruption; and complex adaptive resilience, which considers both system-wide and component-level adaptation. Unlike engineering resilience, which assumes a fixed *normal* state, systems resilience acknowledges dynamic change, while complex adaptive resilience highlights a continuous evolution in response to disruptions.

Economic resilience[2] functions under similar principles. Just as complex adaptive systems evolve in response to environmental changes, economies with high resilience are often characterised by their capacity to absorb impacts and adjust their practices to ensure functionality is maintained. This adaptability is essential for sustaining growth, mitigating risks, and promoting long-term stability. Briguglio *et al.* (2006) note that the ability of an economy to have systems in place, which function as shock absorbers, effectively reduces the effects of a disruption, or even renders the effects obsolete. The researchers explain that having a multi-skilled labour force, for example, can be used as an effective tool for absorbing the effects of an external shock by being able to move resources to an area within the economy being particularly affected. This study, however, will focus exclusively on trade resilience, which will subsequently be discussed.

2.3.2 Trade resilience

Trade resilience has emerged as a critical field of study within international trade and, in recent years, a growing number of publications have focused on this subject. Academic journals, reports from international organisations, and government agencies have collectively contributed to a growing body of literature on the subject, especially over the last two decades. As noted by Simmie and Martin (2009), research interest in trade resilience has often been sparked by major global disruptions, such as the 2008 financial crisis, the 2011 Fukushima disaster, and, more recently, the Covid-19 pandemic.

Trade resilience is highly intricate, due to its dynamic nature, involving a range of political, economic, and technological factors. Trade resilience also forms part of several interrelated forms of resilience within the broader scope of economics, alongside concepts such as economic resilience and supply chain resilience. These areas often intersect in academic research, contributing frequently to the understanding of this subject.

As mentioned previously, trade resilience refers to the capacity of a country to withstand disruptions to trade and recover after a disruption has occurred (Mena *et al*., 2021). Researchers identify two central concepts of trade resilience, namely robustness (also referred to as resistance) and recovery (Mena *et al*., 2021; Pretorius *et al*., 2017). Robustness refers to the capacity of an economy to absorb or withstand the effects of a disruption while maintaining its essential functions (Pretorius *et al*., 2017). This means that, during an external shock, such as a disruption to supply chains, a robust trade system will be able to keep functioning, even if it means operating at a reduced capacity. Other strategies that contribute to trade robustness include the diversification of trade partners, flexibility in procurement and leveraging technology to mitigate risks (Miroudot, 2020).

[2] Economic resilience refers to the ability of a country's economy to recover from or adapt to the consequences of economic shocks to which it may be naturally vulnerable (Briguglio *et al*., 2006).

Recovery, on the other hand, focuses on a system's ability to bounce back after a disruption has occurred. This often involves restoring trade volumes, rebuilding supply chains, and regaining lost market access (Mena *et al*., 2021). Recovery is intricately linked to flexibility, allowing it to effectively promote recovery after being negatively impacted by a disruption. Briguglio *et al.* (2006) suggest that recovery may be hindered in situations where an economy has existing constraints that negatively impact the recovery process. For example, during the Covid-19 pandemic, the fiscal responses implemented by countries around the world were somewhat mixed, due to existing limitations originating from high debt leading up to 2020 (Tsatsaronis *et al*., 2022). The accumulation of additional debt likely compounded the challenges of fostering recovery, even after the most severe phase of the pandemic had passed. Furman *et al.* (2020) note that empirical evidence indicates that comprehensive policies, including direct financial aid and tax incentives, were crucial in mitigating the effects of the economic downturn during the pandemic, and that these actions established a foundation that helped to preserve political stability on which long-term economic expansion rested.

Trade plays a pivotal role in economic resilience, as it allows economies to access resources, finance and technology that enable them to better deal with disruptions (Kuźnar, 2024). One of the most important aspects to note regarding trade resilience is that trade's impact on economic resilience is often twofold, meaning that while trade can protect economies by offering alternatives, it can also amplify vulnerability by transmitting shocks across borders, due to its propensity to spread shocks across borders (see Kuźnar, 2024; UNCTAD, 2022). According to Calì (2015), trade can act as a critical driver of stability through economic development, job creation, ensuring income, and enhancing access to essential goods, which is vital for food security purposes.

Research by Montalbano *et al.* (2005), on the other hand, which examined the impact of regional trade liberalisation on macroeconomic stability in Central and Eastern European Countries (CEECs) shows that while trade openness brings economic benefits, it also increases exposure to global shocks, making resilience strategies critical for maintaining stability. These findings are supported by Nguyen *et al.* (2023), who indicate how increased trade openness can negatively impact economic stability, thereby undermining a country's trade resilience. The World Bank's report, *Trading Away from Conflict: Using Trade to Increase Resilience in Fragile States*, is perhaps one of the best resources that shows this duality. It highlights the complex relationship between trade and stability, illustrating how trade policies can either support economic resilience or exacerbate instability (see Calì, 2015). This duality makes discussions focused on trade resilience increasingly complex, as both the positive and negative effects of contributing factors need to be considered.

One of the most important aspects of trade resilience is its ability to influence economic stability. This is highly important given that macroeconomic stability is often associated with sustainable economic growth and is fundamental to ensure development, income security and employment opportunities (Nguyen, 2019). A disruption can therefore have an immediate effect on economic stability. For

instance, sudden drops in commodity prices can directly affect government revenue and cause disruptions to vital public services. The instability of export earnings, in turn, could lead to economic downturns and social unrest, especially in countries that rely heavily on natural resources (Calì, 2015).

In fragile and conflict-affected states, maintaining economic stability is a significant challenge. Asamoah *et al.* (2016) analysed the link between economic stability and foreign direct investment (FDI) in Sub-Saharan Africa (SSA), noting that economic uncertainty had a significant negative impact on FDI flows (Asamoah *et al*., 2016; Ogbonna *et al*., 2022). In addition to being a vital source of long-term funding for infrastructure projects and other developmental objectives, FDI can spur economic diversification and assist African nations in reducing their reliance on natural resources (Anyanwu & Yameogo, 2015).

Research by Briguglio *et al.* (2006, 2008) focuses on economic vulnerability and resilience, specifically in small states, and both articles provide critical insights into trade resilience, especially for countries that are increasingly exposed to external shocks. The researchers explain that economic vulnerability (i.e. an economy's inherent exposure to disruptions, which stems from high degrees of economic openness, a lack of export diversification and weak policy frameworks) exacerbates the effects of external shocks (Briguglio *et al*., 2006 and 2008).

Research that focuses on the trade resilience of vulnerable regions is particularly important for this study, as it provides critical insights into the unique challenges and capacities of small and vulnerable economies within the SADC region. Several SADC member states, such as Lesotho, Eswatini, Malawi, Comoros, Seychelles, Botswana, and Namibia, fall into this category due to factors including limited domestic market size, geographic isolation, and high exposure to external economic and environmental shocks. These developing countries often struggle due to the comparatively smaller size of their economies and the corresponding diversity of economic activities, decreased competitiveness, and restricted access to external capital, required to boost productivity (Pretorius *et al*., 2021). Additionally, their economies tend to be narrowly focused and heavily dependent on a few primary commodities or sectors (see section 2.4), making them particularly vulnerable to fluctuations in global demand and prices. As such, understanding how these economies can build resilience to trade disruptions is essential for promoting inclusive and sustainable economic growth within the SADC framework.

2.3.3 Trade resilience and the Covid-19 pandemic

As mentioned in the first chapter of this study, the impact of the Covid-19 pandemic was profound, and it significantly impacted various aspects of society (Coquidé *et al*., 2022). While the pandemic represented an unprecedented health crisis, the resulting economic fallout was substantial, as

economic activity slowed, bringing supply networks to a virtual halt (Jomthanachai *et al*., 2022). International trade, in particular, was heavily affected by the pandemic, stemming from a decreased global demand compounded by other disruptions originating from increased border restrictions, closures, and other logistical challenges (UNCTAD, 2022). Although the pandemic's impact on trade was widespread, the effects were uneven across countries; some nations demonstrated relative resilience, while others experienced substantial losses. Even though the pandemic's impact on trade was widespread, the reported effects on different economies across the globe were mixed, as some countries managed to remain relatively resilient to the disruptions while others experienced substantial losses (Mena *et al*., 2021).

In recent years, numerous studies have examined the impact of the Covid-19 pandemic on economic and trade resilience. Although a significant number of these studies included African countries in their analysis, research that focuses exclusively on the impact of the Covid-19 pandemic on the trade resilience in Africa remains limited. A few of these studies will subsequently be discussed.

Diop *et al.* (2021) assessed economic vulnerability and resilience across different regions, including Africa, by using a composite index methodology. Their findings indicate that Africa exhibited high vulnerability and low resilience compared to other regions, with the continent recording the lowest resilience index score globally. Additionally, African economies also had a weaker capacity to recover from the economic shock of Covid-19 compared to other regions.

Luo *et al.* (2023), on the other, hand analysed the spatiotemporal heterogeneity of international trade network vulnerabilities during the pandemic to better understand the resilience of global production. Their findings support that of Diop *et al.* (2021), indicating that Sub-Saharan Africa (SSA) exhibited high trade vulnerability and low resilience during the Covid-19 pandemic (Luo *et al*., 2023). This suggests that African economies had a weaker capacity to recover from the economic shock of Covid-19 when compared to other than regions such as Europe[3]. The researchers also found that unlike many advanced economies that leaned towards globalisation during the pandemic, SSA experienced an increase in trade regionalisation, meaning that intra-African trade became more prominent (Luo *et al*., 2023). While this shift likely resulted from global supply chain disruptions, forcing African countries to rely more on regional trade partners, it does support the earlier work by Pretorius *et al.* (2017), which showed that regional integration in the SADC during the 2008 financial crisis enhanced resilience by enabling intra-regional trade to accelerate the region's return to its pre-shock growth trajectory. Their findings suggest that, through regional integration, intra-regional trade speeds up a region's return to its pre-shock growth trajectory (Pretorius *et al*., 2017).

[3] These findings align with earlier research by Ngouhouo and Nchofoung (2021), who assessed the economic resilience of Sub-Saharan African (SSA) countries between 2006 and 2015, concluding that very few demonstrated sustained economic resilience.

Bonadio *et al.* (2021) also investigated the role of global supply chains during the pandemic. The authors estimate that disruptions transmitted through global supply chains accounted for around one-quarter of the overall GDP decrease during the pandemic, based on a multi-sector quantitative model covering 64 nations. This aligns with findings from other studies, which suggest that global value chains frequently amplify disruptions (see for instance Kuźnar, 2024 and UNCTAD, 2022). The authors go on to suggest that the diversification of trade partners is a better strategy for improving resilience, compared to renationalising supply chains. Miroudot (2020), however, opposes this view by arguing that empirical evidence suggests that the diversification of trade partners may lead to a slower recovery.

Several studies have attempted to assess the impact of the Covid-19 pandemic on the trade resilience of African countries, but the number of published works in this area again remains limited. One such study, by Kassa (2020), focused more on the impact of Covid-19 on Africa. It highlights that the pandemic triggered a sharp contraction in the global economy, accompanied by an even more pronounced decline in international trade, with far-reaching consequences for livelihoods across the African continent. The researcher attributes the vulnerability of the regional economy to several structural challenges, including a high dependence on trade and commodities, a fragile food system, and limited fiscal capacity to absorb external shocks. The study emphasises the need for enhanced regional and international coordination to strengthen social safety nets, ensure the continued flow of essential goods, and alleviate the region's debt burden to create additional fiscal space. The research by Kassa (2020) concludes by recommending that African countries should revisit their industrial policies, while firms should re-evaluate their strategic approaches in response to emerging global uncertainties.

Another notable study that focuses on Africa exclusively and that highlights Africa's vulnerabilities during the Covid-19 pandemic is the comprehensive work by Banga *et al.* (2020). Their research revealed that Covid-19 had a profound impact on African trade, with projected declines of 8 percent in exports and 16 percent in imports in 2020, marking one of the sharpest contractions in the continent's trade in recent history. According to the researchers, the pandemic disrupted both supply and demand simultaneously, halting production, suppressing incomes, and critically affecting key sectors such as tourism, transportation, and retail. Policy responses such as lockdowns, border closures, and export restrictions further exacerbated the situation by increasing trade costs, delaying supply chains, and impeding access to essential goods. The study emphasised that Africa's heavy dependence on a narrow range of exports, primarily agricultural commodities and tourism, exposed it to significant vulnerabilities, resulting in sharp declines in trade volumes and foreign exchange earnings. Furthermore, Africa's participation in global value chains (GVCs), particularly as an upstream supplier of raw materials to European and Asian markets, was severely disrupted (see Banga *et al*., 2020).

The impact of the Covid-19 pandemic on trade resilience features as a central area of focus in this study. The findings discussed above showcase how the Covid-19 pandemic exposed severe vulnerabilities in the global trading system, particularly highlighting the fragility of African economies within international and regional trade networks. In particular, the crisis underscored Africa's overreliance on external markets and global supply chains, especially for essential goods such as pharmaceuticals.

When considering trade resilience, it is important to keep in mind that several key factors influence a country's ability to withstand and recover from disruptions to global trade. These factors are defined in the literature as the determinants of trade resilience and will subsequently be discussed.

2.3.4 The determinants of trade resilience

Trade resilience is shaped by the interaction of various structural, institutional, and contextual factors. Broad country-level factors, such as the economic structure of a country, diversity of exports, degree of integration into global and regional markets, dependence on specific sectors, and the quality of infrastructure, form the foundation in which a country's trade system operates. These characteristics influence the extent to which a country is exposed to external shocks, as well as its capacity to adapt and recover when disruptions occur.

Beyond these foundational elements, research by Mena *et al.* (2022) and Pretorius *et al.* (2017) highlights additional determinants of trade resilience that have been empirically examined. The research by Mena *et al.* (2022), in particular, revealed that no single factor was enough to ensure trade resilience during the first wave of the pandemic; rather, combinations of these factors determined a country's ability to withstand and recover from the disruption. These additional factors include logistics performance, economic and social globalisation, healthcare preparedness, government response, gross national income, Covid-19-related mortality, and regional integration.

This section will begin by discussing the country-level determinants of trade resilience highlighted in the broader literature, before turning to the specific factors identified by Mena *et al.* (2022) and Pretorius *et al.* (2017), which form the foundation of the fsQCA analysis undertaken in the subsequent chapters.

2.3.4.1 Country-level factors affecting trade resilience

Broad country-level factors provide the structural and institutional foundation on which a country's trade performance is built. These factors influence both the degree of exposure to external shocks as well as the capacity to effectively respond when a disruption occurs. Key factors include the diversity

of exports, the economic structure of a country, dependence on specific sectors, integration into regional and global markets, the quality of infrastructure, geographical location, and governance.

With regard to a country's economic structure, evidence from existing literature suggests that countries with more diversified economies and trade portfolios tend to experience less severe impacts relative to countries with more specialised economies. Briguglio *et al.* (2006) argue that countries that have a reliance on a focused range of exports may increase vulnerability to external shocks, resulting from a lack of diversification. Moreover, countries that have access to a greater diversity of export markets can shift trade to unaffected markets during a crisis (Kuźnar, 2024). This also translates to the composition of a country's economy. Countries that have a balanced mix of sectors, instead of relying on a single sector, may be better equipped to absorb shocks as contractions in one sector can be offset by stability in another. For example, an economy that is heavily reliant on tourism may experience severe disruptions when the sector is affected by a global crisis. In contrast, more diversified economies can reallocate labour and resources to other sectors, thereby mitigating the overall impact on trade (Briguglio *et al*., 2006).

Similarly, the diversification of supply chains and trade partners also influences trade resilience. Countries reliant on a narrow set of markets or long-distance trade routes are increasingly exposed to disruptions, whereas geographically diversified trade networks enable more stable trade during crises (Ahn & Tan, 2025; Notteboom *et al*., 2021). During the Covid-19 pandemic, geographically advantaged and well-integrated economies showed greater robustness, while landlocked countries or ones with limited infrastructure struggled with prolonged disruptions (Evenett, 2020).

Integration into global and regional markets plays a dual role in shaping trade resilience. On the one hand, deeper integration into regional and global markets can enhance resilience by providing access to alternative markets and enabling regional and global cooperation during crises. Regional integration, in particular, may facilitate stability during a crisis. On the other hand, high degrees of integration can also increase exposure to external shocks, thereby directly affecting trade resilience. The quality of infrastructure is another crucial factor influencing a country's ability to maintain and restore trade flows. Literature indicates that strong infrastructure positively contributes to all the stages of resilience, including resistance, recovery, and reorientation (Rimidis & Butkus, 2025). Inadequate infrastructure may, however, result in the opposite, causing bottlenecks that amplify the effects of an external shock and delaying recovery efforts.

Ensuring the movement of essential goods and services across borders in the face of a disruption is another important determinant of trade resilience. Christopher and Peck (2004) argue that the movement toward lean globalised supply chains has introduced various vulnerabilities to disruptions and that the inherent risks that are present in today's complex supply chains highlight the importance of prioritising resilience above efficiency, thereby mitigating risks through increased supply chain

resilience (Christopher & Peck, 2004). The ability of resilient trade systems to ensure the flow of goods and services during disruptions also promotes trust and confidence among businesses and consumers, thereby positively impacting long-term confidence within an economy.

Geographic location also plays a critical role in shaping a country's trade resilience. Coastal countries with direct access to seaports often recover more quickly from trade disruptions due to lower logistical costs and easier access to international markets. Landlocked countries, on the other hand, face higher transport costs and dependence on transit through neighbouring countries, which undermines resilience (Faye *et al*., 2004; UNCTAD, 2021).

Finally, governance and institutional quality significantly influence how effectively a country can respond to and recover from trade disruptions. Transparent, predictable, and efficient institutions foster investor and trade partner confidence, while adaptable policymaking enables governments to implement critical measures. Weak governance, in contrast, can undermine resilience resulting from inefficient public services, poor investor confidence, and economic instability (Afolabi, 2025). Taken together, these establish the foundational conditions that influence a country's exposure to shocks and its capacity to recover. Building on this broader context, the following sections examine the specific determinants of trade resilience identified in the empirical studies by Mena *et al.* (2022) and Pretorius *et al.* (2017).

2.3.4.2 Determinants of trade resilience as identified by Mena and Pretorius

The following sections will examine the determinants of trade resilience identified by Mena *et al.* (2022) and Pretorius *et al.* (2017). Each determinant will be discussed in detail to provide a clear understanding of its relevance and potential influence on trade resilience outcomes. This in-depth discussion is essential, as these determinants will be included in the trade and fsQCA analyses conducted in the subsequent chapters.

2.3.4.2.1 Logistics performance

Chow *et al.* (1994) describe logistics performance as a multi-dimensional concept influenced by various organisational goals. The researchers highlight that logistics performance can be viewed as a subset of overall firm performance and suggest that it should incorporate cost efficiency, customer satisfaction, profitability, flexibility, and service quality. Logistics and logistics performance has gained increasing importance in recent years, especially due to the growing complexity and interconnectedness of global supply chains (Arvis *et al*., 2014). Several studies have demonstrated a strong link between improved logistics performance and better trade outcomes, particularly in

developing countries where inadequate infrastructure often limits trade potential (Gani, 2017; Buvik & Takele, 2019). Research shows that efficient logistics systems can, for instance, help reduce lead times, lower transaction costs and improve service quality, thereby improving trade flows (Martí *et al.*, 2014). Mena *et al.* (2021) identify several factors contributing to a country's logistics performance, including the quality of trade and transport infrastructure, the efficiency of customs procedures, and the adoption of technology.

Within the context of trade resilience, logistics is essential for both robustness and recovery. A well-developed transport network can mitigate the impact of disruptions by maintaining processes and avoiding inefficiencies caused by shocks. Moreover, logistics plays a crucial role in recovery by facilitating the allocation of essential resources across the economy. Laari *et al*. (2024), for instance, note that at the firm level, resilience is promoted through increased responsiveness, enabling companies to quickly identify changes caused by disruptions and mobilise resources in response. Feo-Valero *et al.* (2024), however, highlight that logistics may be a significant source of vulnerability within supply chains, which can affect the flow of goods between the parties that form part of a GVC. The Suez Canal blockage in 2021, for example, caused by a container ship, the Ever Given, which ran aground in the canal, highlighted the fragility of global supply chains and the importance of resilient logistics infrastructure (Lee & Wong, 2021). Reports suggest that the disruption caused delays that affected 12 percent of global trade resulting in a significant backlog impacting cargo valued between 15 and 17 billion dollars (Lee & Wong, 2021).

Despite the critical role of logistics in shaping trade, literature on the subject remains limited. Gani (2017) notes that one reason for this gap is the shortage of reliable, published logistics data that can be used to systematically quantify its impact on trade. To address this, researchers often utilise data from the World Bank's Logistics Performance Index (LPI), which benchmarks trade and transport facilitation by assessing key logistics performance indicators, thereby identifying areas of inefficiency and guiding targeted improvements (Ojala & Çelebi, 2015). The LPI evaluates countries across six dimensions: customs, infrastructure, international shipments, logistics competence, tracking and tracing, and timeliness (The World Bank, 2025). A more detailed discussion on this variable and its data source will be provided in the methodology chapter (Chapter 3).

Logistics performance is included as a determinant of trade resilience due to its fundamental role in maintaining efficiency, adaptability, and stability in international trade. Given the increasing complexity of global supply chains and the frequency of disruptions, understanding logistics performance is essential for evaluating a country's ability to withstand and recover from trade shocks. The LPI provides a structured approach to benchmarking logistics efficiency, enabling the study to capture key aspects such as infrastructure, customs procedures, and supply chain reliability. By incorporating logistics performance, this study ensures that critical factors influencing trade resilience are systematically analysed.

2.3.4.2.2 Economic and social globalisation

Globalisation refers to the process of connecting people, economies, and ideas across continents through the flow of goods, capital, information, and culture (Gygli *et al*., 2019). It reduces national boundaries, integrates societies, and creates interdependence among nations. The process of globalisation has significantly shaped the modern world, fostering cross-border exchanges of goods, services, capital, and ideas (Yirmibeşoğlu, 2017). According to a WTO report (2021), countries that are more integrated into global markets often have access to diversified trade partners, which can help cushion the impact of economic shocks. The report goes on to state that this enables countries and companies to source goods from multiple regions, thereby reducing their reliance on a single source, and consequently providing alternative supply lines, which can be utilised in case of a disruption. Globalisation also promotes trade resilience through other areas, including the facilitation of global market access, the exchange of knowledge and technology transfers, and greater financial interdependence.

Globalisation and trade have faced their share of criticism. Kuznar (2024) notes that while trade can increase economic resilience by diversifying markets and goods, it can also create areas of susceptibility when economies grow unduly reliant on particular partners or industries. For instance, the 2011 Tohoku earthquake and tsunami in Japan severely disrupted global supply chains for electronics and automobiles around the world, illustrating how closely interconnected economies can be affected by external shocks (Fujimoto, 2011). Therefore, while globalisation enhances resilience through diversification, it also necessitates strategic management of dependencies and risks. Policymakers need to balance the benefits of economic integration with measures that promote self-sufficiency and adaptability to external challenges. Striking this balance may, however, prove challenging amid current uncertainties around globalisation.

To capture the multifaceted nature of globalisation, researchers increasingly rely on composite indices. Among these, the KOF Globalisation Index, developed by the Swiss Economic Institute, has become the most widely used measure (Haelg, 2020). Similarly, this study will utilise data from the KOF Globalisation index, which measures the economic, political, and social dimensions of a country and provides a score ranging from 0 to 100. Further details on this variable and its data source will be provided in the methodology chapter (Chapter 3).

Incorporating economic and social globalisation as a determinant of trade resilience in this study is essential due to the interconnected nature of modern economies. Globalisation has the ability to enhance trade resilience, through the diversification of trade partners, improved market access and sourcing alternative supply lines, and creates vulnerabilities when economies become overly dependent on specific partners or industries. This dual nature underscores the need to better understand how globalisation influences a country’s trade resilience.

2.3.4.2.3 Regional integration

As mentioned earlier in this chapter, regional integration is the process by which neighbouring states coordinate and harmonise policies, institutions, and economic activities to enhance trade, investment, and development within a region (Belassa, 1961). Increased regional integration efforts assist with economic recovery following a disruption (Pretorius *et al*., 2017). Findings from UNCTAD (2021), which examined whether RTAs contributed to trade resilience during the trade collapse caused by the pandemic, indicated that trade within RTAs was more resilient compared to trade outside of RTAs. This is supported by research by Brixiová *et al.* (2015), who found that enhanced intra-regional and intra-industry trade within the EAC following the 2008 global financial crisis had a stabilising effect, helping the region withstand the economic downturn. Stronger regional integration therefore helped stabilise the economy by promoting intra-regional trade and reducing reliance on global markets. This, however, is not always the case. In the same study by Brixiová *et al.* (2015), the SACU region demonstrated a comparatively weaker resilience following the 2008 financial crisis. This discrepancy is largely attributed to South Africa's extensive links to global financial markets, which exposed the entire SACU region to economic shocks originating outside Africa (Brixiová *et al*., 2015). The challenges faced by SACU in building resilience highlight a broader issue encountered by many developing countries, including those within the SADC region.

In Africa, progress in regional integration is commonly measured using the African regional integration index (ARII). The introduction of ARII marks a significant turning point in the measurement of regional integration progress on the African continent (Gor, 2017). ARII assesses how successfully each African nation and region integrates with its neighbours using 16 indicators categorised into five dimensions: trade integration, productive integration, macroeconomic integration, infrastructural integration, and free movement of people (African Union, UNECA & AfDB, 2019). More detail on this data variable and its source will be provided in the methodology chapter (Chapter 3).

By fostering deeper economic ties within the region, countries can reduce their reliance on distant trade partners and create more robust trade linkages that help cushion the impact of disruptions. In addition, the ARII serves as a critical tool for assessing the level of integration across African nations. By including regional integration as a determinant in this study, we aim to assess its role in cushioning the effects of external shocks and fostering a more resilient trade environment.

2.3.4.2.4 Healthcare preparedness

Healthcare preparedness refers to the process of improving a country's health system's ability to prevent, prepare for, respond to, and recover from biological emergency situations (Herstein *et al*., 2021). Since the Covid-19 pandemic, healthcare preparedness has received increased interest from

researchers and policymakers alike. Mena *et al*. (2021) explain that, although healthcare and economic performance may not appear closely linked at first glance, the pandemic revealed a strong interdependence between the two sectors, showing that countries with better healthcare preparedness experienced less severe economic and trade disruptions. Therefore, while it is evident that a strong healthcare system is crucial to absorbing shocks during a health crisis, accurately assessing its preparedness is essential to identify vulnerabilities and ensure a country's health security.

One of the most significant factors that undermined healthcare preparedness during the pandemic was the global shortage of medical supplies. This shortage stemmed from several interconnected issues. Herstein *et al.* (2021) note that many hospitals had adopted a *just-in-time* supply chain approach, where limited supplies were delivered only as needed rather than stockpiled, leaving a small buffer for sudden surges in demand. Fernandes *et al.* (2022) add that the world's heavy dependence on "highly globalized supply chains" further deepened vulnerabilities. Similarly, Gereffi (2021) emphasises that GVCs in the medical sector were primarily designed for profit maximisation and efficiency rather than resilience, which created rigidities during the crisis. As a result, in the early months of 2020, approximately 80 countries imposed temporary export restrictions on Covid-19-related products, severely affecting nations reliant on imports (Gereffi, 2021). In light of these challenges, Sundararaman *et al.* (2021) advocate for greater government investment in domestic manufacturing to strengthen health security and reduce external dependence.

Healthcare preparedness is frequently assessed using the Global Health Security (GHS) index, developed by the Nuclear Threat Initiative (NTI) and the John Hopkins Centre for Health Security (2021). The index serves as an essential tool for assessing countries' preparedness for health crises by providing a way to pinpoint areas of vulnerability, as well as opportunities for cross-sector collaboration and accomplishing common health objectives (Ravi *et al*., 2020; Mahajan, 2021). It measures countries' capacities to prevent, detect, and respond to infectious disease threats across six categories: prevention, detection and reporting, rapid response, health systems, compliance with international norms, and risk environment (Nuclear Threat Initiative; Johns Hopkins Center for Health Security, 2024). More detail on this data variable and its source will be provided in the methodology chapter (Chapter 3).

Including healthcare preparedness as a determinant of trade resilience is essential, particularly in light of the Covid-19 pandemic, which demonstrated the critical link between public health infrastructure and economic stability. A well-prepared healthcare system is essential for mitigating trade disruptions during global health crises, as it ensures the continuity of essential services and minimises the economic fallout from public health emergencies. This study will incorporate healthcare preparedness to evaluate its influence on trade resilience, focusing on its role in maintaining economic activity and facilitating recovery during health crises.

2.3.4.2.5 Government response

Within the context of Covid-19, government response refers to the set of health, social, and economic policies such as lockdowns, testing, vaccination, and fiscal support, implemented to contain the virus and manage its impacts (Hale *et al*., 2023). The relentless spread of the Covid-19 virus during the pandemic prompted extraordinarily diverse responses from governments globally, including travel restrictions, social welfare provisions, health measures etc. (Hale *et al*., 2020). Mena *et al.* (2021) note that, during Covid-19, governments had to address the challenge of the potential trade-offs that would have resulted from the implementation of the response measures with the desired outcomes of these measures .For example, while some measures were effective in slowing the rapid spread of the virus, such as national lockdowns, they also had a devastating impact on economic and trade-related functions.

A key factor in determining trade resilience during the Covid-19 pandemic was the extent to which governments implemented policies to support businesses and maintain trade flows. Tsatsaronis *et al.* (2022) note that fiscal policy by emerging economies played a key role in this response. The researchers note that the extent of the fiscal responses depended in part on the availability of a country's fiscal capacity, identifying constraints originating from existing pre-pandemic public debt. Additionally, low-to-middle-income countries rely heavily on external financing and tend to be more vulnerable to fluctuations in commodity prices and capital flows. These factors made these countries particularly susceptible to the economic fallout of the pandemic, especially as global trade and investment contracted (Tsatsaronis *et al*., 2022).

Government responses during the pandemic were systematically captured by the Oxford Covid-19 Government Response Tracker (OxCGRT), particularly from its stringency index, which quantifies the strictness of government policies such as lockdowns, travel bans, and fiscal measures. The index offers valuable insights into the relationship between government responses and economic activity for researchers and policymakers alike, to assist in determining the impact of the measures and strike a balance between health and economic demands (Hale *et al*., 2020). A more detailed discussion on this variable and its data source will be provided in the methodology chapter (Chapter 3).

Including government response as a determinant of trade resilience is crucial, as the Covid-19 pandemic underscored the decisive role of timely and effective policy measures in shaping economic outcomes. Strong government responses helped countries cushion the immediate economic shock, safeguard supply chains, and protect critical sectors from collapse. In contrast, delayed or overly restrictive measures often deepened trade disruptions and slowed recovery. This study will therefore assess government response as a key factor influencing trade resilience, highlighting its importance in ensuring stability, mitigating losses, and enabling a faster return to pre-crisis trade performance.

2.3.4.2.6 Gross national income

The levels of gross national income (GNI) also contribute to the effectiveness of countries to respond to economic and trade disruptions. For example, during the pandemic, higher-income countries, with greater fiscal capacity, were able to implement large-scale stimulus measures to mitigate the immediate impacts of the pandemic without having to take on significant additional debt (Makin & Layton, 2021). These countries benefited from their robust financial institutions, allowing them to adopt aggressive monetary measures such as quantitative easing and low-interest rates to sustain economic activity and stabilise markets (Tsatsaronis *et al*., 2022). In contrast, low-to-middle-income countries, constrained by limited fiscal and monetary flexibility, faced significant challenges in implementing their response to a similar degree. Limited access to affordable financing and high levels of pre-existing debt also reduced countries' ability to support their economies without risking severe debt accumulation (Tsatsaronis *et al*., 2022).

According to Mena *et al.* (2021), wealthier nations tend to have a greater ability to secure essential resources, such as medical equipment and vaccines, during emergencies. In contrast, many low-income economies struggled to access these critical supplies during the pandemic, as political influence and financial resources played a key role in procurement. The unequal distribution of affordable healthcare products resulted in the pandemic having a disproportionate impact across countries (Mena *et al*., 2021).

Including GNI as a determinant of trade resilience was important because it plays a significant role in determining a country's ability to respond to economic and trade disruptions. Higher-income countries, with greater fiscal capacity, were able to implement large-scale stimulus measures and adopt aggressive monetary policies, which helped sustain domestic demand, support firms, and maintain trade flows. In contrast, low-to-middle-income countries, constrained by limited fiscal and monetary flexibility, struggled to buffer their economies against the shock, leading to deeper contractions in trade and slower recovery. This disparity underscores the critical role of national income levels in shaping trade resilience during global crises (Makin & Layton, 2021).

2.3.4.2.7 Covid-19-related deaths

Even though the Covid-19 pandemic severely impacted economic and trade functions of countries globally, it was first and foremost a health crisis, which, as previously mentioned, cost the lives of over 7 million people and infected over 775 million in total (World Health Organisation, 2024). High infection rates forced governments to implement protective measures in the form of lockdowns, social distancing, and travel restrictions. These measures compounded, resulting in a slowdown of economic activities originating from a shortage of labour (UNCTAD, 2020). Although limited research

has examined the link between Covid-19-related deaths and trade resilience, Mena *et al.* (2021) found that countries severely affected by fatalities during the first wave (such as Italy, Belgium, Portugal, and France) adopted very strict protective measures, which, in turn, weakened their trade resilience. By contrast, countries that experienced relatively few fatalities (including New Zealand, South Korea, and Norway) were able to maintain stronger trade resilience.

Covid-19-related deaths had a significant impact on both public health and trade resilience, as countries with higher mortality rates implemented more stringent protective measures, which slowed down economic activity and disrupted trade (UNCTAD, 2020). Moreover, the increased losses suffered in various countries negatively affected their already strained healthcare systems. The human impact of the pandemic is systematically recorded in the World Health Organization's Covid-19 Dashboard, which provides internationally comparable data on infections and fatalities (World Health Organisation, 2024). This study will utilise this data during the empirical analysis. More detail on this data variable and its source will be provided in the methodology chapter.

Including Covid-19-related deaths as a determinant of trade resilience is important because the severity of fatalities directly influenced the stringency of government responses and the extent of economic disruption. Countries that experienced high death tolls were often compelled to impose strict lockdowns, mobility restrictions, and border closures, which disrupted supply chains, reduced production capacity, and weakened trade flows. In contrast, countries with lower fatality rates were able to adopt more targeted containment measures, allowing greater continuity of economic activity and trade. This variation highlights how the human toll of the pandemic became a critical factor shaping the robustness and recovery of trade resilience across countries (Mena *et al*., 2021).

2.4 Contextual framework

2.4.1 Overview of the SADC

This study examines the trade resilience of SADC member states during the Covid-19 pandemic. The SADC plays a pivotal role in Africa by fostering economic integration, promoting political stability, supporting infrastructure development, and enhancing regional cooperation. With a combined population of approximately 363 million people, the SADC represents the continent's third-largest regional economic community (REC) in terms of GDP (Moyo, 2024). Established to advance socio-economic development and sustainable growth through greater collaboration, productive and efficient systems, sound governance, and long-lasting peace and security (SADC, 2022), the bloc today consists of 16 member states with highly diverse economic structures.

The economic landscape of the SADC region is both interesting and complex. Apart from South Africa, which is classified as an emerging market, SADC members are largely low- or lower-middle-income

economies that remain highly dependent on intra-regional trade and exports of primary commodities, leaving them particularly vulnerable to external shocks (Muntschick, 2020). Countries rich in natural resources such as Angola, the Democratic Republic of Congo, and Zambia dominate mineral and raw material exports, while South Africa, Namibia, and Botswana lead in industrial production. Agricultural exporters such as Malawi, Tanzania, and Zimbabwe rely on commodities such as tobacco and tea, while island states such as Mauritius and Seychelles depend heavily on tourism and services.

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The SADC continues to grapple with multiple developmental constraints that limit deeper integration and sustained growth. High levels of poverty, unemployment, and inequality remain pervasive, particularly in countries with weakly diversified economies. Infrastructure deficits in transport, energy, and digital connectivity further restrict competitiveness and hinder the development of regional value chains. Governance challenges, policy misalignment across member states, and limited institutional capacity add to these constraints (Tanyanyiwa & Hakuna, 2014), while external shocks such as climate change, global market volatility, and health crises like Covid-19 exacerbate structural vulnerabilities. A further concern is the region's overreliance on a narrow set of export markets, which heightens exposure to global demand shocks and underscores the importance of diversifying both products and destinations (Bronauer & Yoon, 2018).

To address these challenges, the SADC has developed comprehensive trade policies aimed at promoting regional integration through trade liberalisation (SADC, 2022). The cornerstone of these efforts is the SADC Protocol on Trade (1996, amended 2010), which lay the foundation for the Free Trade Area launched in 2008 (SADC, 2022). By that year, most customs duties were eliminated on goods traded within the bloc (approximately 85% at zero duty), while a common external tariff was introduced for non-member imports (SADC, 2022). More recently, the Protocol on Trade in Services, which entered into force in 2022, provides a framework for preferential trade in key service sectors such as finance, transport, and tourism. With phased negotiations and enforceable commitments, the protocol aims to harmonise standards, remove barriers, and enhance regulatory certainty, while aligning with global frameworks such as the WTO's GATS (SADC, 2022).

The SADC's trade patterns expose certain vulnerabilities. According to the SADC Statistics Bulletin (2021), total trade in 2019 amounted to US$348.4 billion, of which only US$69.1 billion occurred within the region (Chapter 4 will provide more recent trade data, but the trade pattern remains the same). South Africa remains the largest intra-regional trader, accounting for 38.46% of regional trade flows (United Nations Statistics Division, 2025). Intra-regional trade had been on a downward trend between 2018 and 2020, with total exports falling from about USD 49.2 billion in 2018 to USD 33.3 billion in 2020, and imports declining from USD 34.1 billion to USD 26.6 billion over the same period (International Trade Centre, 2025). On the export side, trade is dominated by raw materials, particularly mineral fuels, ores, copper, and precious stones and metals, which together consistently account for the largest share of intra-SADC exports (ITC Trade Map, 2024). Manufactured products

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such as machinery, vehicles, electrical equipment, and processed chemicals contribute a smaller but still notable portion of exports, while agricultural goods (including cereals, tobacco, and food preparations) remain limited in scale (International Trade Centre, 2025). On the import side, manufactured goods clearly dominate, led by machinery, vehicles, and electrical equipment, which collectively make up the bulk of intra-regional imports. Mineral fuels are the next largest import category, followed by agricultural products such as cereals and sugar (International Trade Council, 2023). These patterns reveal the continued reliance on extra-regional trade and the structural dependence on raw material exports.

Despite sustained efforts to enhance integration, SADC economies remain deeply dependent on global markets for both exports and imports. The Covid-19 pandemic exposed the fragility of this dependence by disrupting global supply chains and constraining external demand, thereby amplifying existing vulnerabilities. However, these disruptions also present an opportunity for the SADC to strengthen intra-regional trade and reduce reliance on external markets. By leveraging regional supply chains, deepening integration, and fostering trade diversification, member states can enhance resilience and lay the foundation for more stable and sustainable long-term growth.

2.5 Trade resilience and the SADC

The current body of literature on trade resilience within the SADC region remains relatively limited and is largely shaped by a small group of recurring authors (e.g., Pretorius *et al.,* 2017; 2021; 2022). Existing studies predominantly examine trade resilience in broad terms, with only a few explicitly addressing the implications of the Covid-19 pandemic on trade resilience. This narrow focus not only reveals a lack of diversity in academic perspectives but also underscores a critical gap in the literature. Consequently, there is a pressing need for more comprehensive and varied research to enhance the understanding of trade resilience dynamics in the SADC region, particularly within the context of global shocks such as the Covid-19 crisis.

The available literature on the trade resilience of the SADC reveals that although increased intra-regional trade positively impacted recovery in the SADC during the 2008 global financial crisis, it did not effectively absorb the initial shock (Pretorius *et al*., 2017). The study's findings suggest that even though regional integration may improve trade relations between developing countries, these countries are still susceptible to external shocks due to the increased regional value chains, regional export promotion and the sensitivity of FDIs to financial risk.

The study by Pretorius *et al*. (2021) contributed to the original research by showing that the economies that make up the SADC are increasingly vulnerable to external shocks due to a number of contributing factors, including reduced FDI and decreased export volumes that resulted from a drop in market

demand due to the original trade shock. The authors also note that an economy's reliance on export demand and FDIs may indicate vulnerability to external disruptions. Additionally, disruptions in developed countries also often spill over to developing countries that further result in external shocks, indicating just how vulnerable the SADC economies are, even to disruptions that occur outside its region.

In a more recent study, Pretorius *et al.* (2022) showed that the Covid-19 pandemic significantly disrupted international supply chains of the SADC through border closures and demand shocks. The study highlighted how supply chain efficiency, measured by various components of the LPI, correlated with the trade impacts during the pandemic. Results indicated that efficient customs, infrastructure, and logistics systems played a key role in mitigating trade disruptions. The findings underscore the need for the SADC to prioritise targeted improvements in infrastructure to build more resilient supply chains and support long-term regional development (Pretorius *et al.*, 2022).

2.6 Concluding remarks

While international trade remains a powerful source for economic growth, technological diffusion, and poverty reduction, the Covid-19 pandemic has significantly exposed the inherent vulnerabilities in global and regional supply chains, especially in developing regions such as the SADC.

Existing trade theories, spanning classical, neoclassical, and modern schools, offer important insights into the motivations for trade and the benefits of integration. However, they are limited in explaining how economies absorb and recover from systemic disruptions in trade. This gap in the literature has given rise to a growing field of research on trade resilience, where robustness and recovery are viewed as fundamental elements of a resilient trade system. Resilience, within this context, is shaped by a complex relationship of logistics infrastructure, economic capacity, institutional strength, healthcare preparedness, globalisation, and regional cooperation.

The chapter has highlighted that although the concept of trade resilience is gaining academic and policy traction globally, its application to the Southern African context remains limited. The SADC, despite making notable strides toward regional integration and trade liberalisation, continues to face significant challenges. These include overreliance on external markets, limited industrial diversification, and weak logistical and health infrastructure. The literature also reveals that intra-regional trade, while helpful in speeding up recovery, has not been sufficient in insulating the region from external shocks. This points to a need for a deeper understanding of the underlying factors that shape trade resilience in the SADC. Furthermore, existing studies often fail to account for the diverse vulnerabilities and capacities across its member states. This limitation impairs the development of nuanced and effective resilience strategies. The limited empirical work that does exist, particularly

post-Covid-19, suggests that key determinants such as logistics performance, healthcare preparedness, fiscal capacity, and regional integration play a significant role in shaping trade outcomes during crises. However, these findings remain uneven and insufficiently contextualised within the unique economic landscape of the SADC.

The limited research that previously focused on the SADC's trade resilience creates challenges for policymakers to develop targeted strategies to enhance resilience. Due to the absence of extensive research, the vulnerabilities in the SADC's trade structure become more difficult to address systematically. Without a comprehensive analysis of the SADC's specific trade resilience, initiatives aimed at fostering economic stability and self-sufficiency may lack the precision needed to achieve long-term impacts. Therefore, while the SADC's efforts to bolster intra-regional trade and diversify its economy are essential, the region would benefit greatly from dedicated research that examines its trade resilience in depth. Such research could inform more tailored policies that address the unique economic landscape of the SADC, helping the region build a more self-reliant trade framework that is better insulated from global disruptions. This study aims to fill this gap in research.

Chapter 3: Research methodology

3.1 Introduction

The Covid-19 pandemic brought about unprecedented global economic conditions, particularly impacting trade dynamics around the globe. Unlike previous periods of economic turbulence, the pandemic was marked by abrupt shifts in trade flows, heightened complexity and non-linearity in economic activity, and large-scale rapidly implemented policy interventions by governments around the world. These characteristics presented unique analytical challenges that traditional methods alone may not have fully captured. In light of these complexities, this study adopted a tailored methodological approach aimed at effectively addressing the research objectives.

This chapter outlines the methodological approach adopted in this study, which investigated the trade resilience of SADC countries within the context of the Covid-19 pandemic. Recognising the unpredictable and dynamic nature of the crisis, a mixed-method approach was selected, integrating both qualitative and quantitative techniques. The qualitative component is embedded within the literature review, which provides a contextual understanding of trade resilience, its determinants, and its relevance in the SADC region during the pandemic period. In particular, findings from the literature review informed the interpretation of fsQCA outcomes, enhancing our understanding of country-specific responses. The primary focus of this chapter, however, is on the quantitative analysis, which consists of three distinct parts designed to effectively achieve the study's objectives.

By employing this integrated approach, the study aimed to capture the nuanced and multifaceted nature of trade resilience during the pandemic. The following sections detail the specific components of the methodology and explain how each contributed to addressing the research questions.

3.2 Research methodology

3.2.1 Determining the impact of the Covid-19 pandemic on the trade flows of the SADC countries

To determine the impact of the Covid-19 pandemic on the trade flows of the SADC countries, this study adopted a quantitative descriptive research approach. This approach was deemed appropriate since it enabled the study to provide a statistical and factual examination of trade, emphasising the trade disruptions and trade patterns brought about by the pandemic, without inferring causality. To achieve this, the study relied on secondary data from the UN Comtrade database (United Nations Statistics Division, 2025). UN Comtrade data provides comprehensive, standardised, and internationally comparable trade statistics reported by countries worldwide. The Comtrade data includes key trade metrics, including total export and import volumes, trade balance, and trade growth

rates. The timeframe for the analysis covered an eight-year period from 2015 to 2022, to allow the study to cover trade flows before, during, and after the pandemic.

The analysis started with a descriptive analysis of SADC trade flows to highlight important trends and disruptions in trade. Graphs and time series plots were utilised to visualise trade flow trends over the selected period, highlighting shifts during the pandemic. Cross-country analyses were also performed to assess the impact of the pandemic across different SADC countries, identifying which countries experienced the most significant changes in trade flows.

3.2.2 Analysing the effects of the Covid-19 pandemic on the trade resilience of the SADC countries

Drawing on the research of Mena *et al.* (2022), the study employed a quantitative descriptive approach to analyse the effects of the Covid-19 pandemic on the trade resilience of the SADC countries. As previously mentioned, trade resilience, as defined by Mena *et al.* (2022), is the ability of a country to both resist disruptions to international trade and recover after disruptions occur (Mena *et al.*, 2021). Based on this definition, measuring the trade resilience of each of the SADC countries required us to measure both the robustness, i.e. a country's ability to withstand the effects of an external shock, and recovery (responsiveness), i.e. a country's ability to recover effectively from the disruption.

To execute this, the study measured the year-on-year monthly percentage change in the combined total of the country's merchandise imports and exports. The study used secondary data from the UN Comtrade database (United Nations Statistics Division, 2025) over a period of four years (2019-2022). The selection of this period was appropriate as 2019 represented a baseline year of *normal* trade activities, prior to the disruptions caused by the Covid-19 pandemic, while 2020 marked the onset of the pandemic, a year that saw significant disruptions in global trade. 2021 and 2022 were also included to capture longer-term recovery trends, offering a more comprehensive view of resilience. Using this period allowed us to analyse the extent to which the trade resilience of the SADC countries was affected by the Covid-19 pandemic, by comparing the trade data from a period in which massive trade disruptions occurred with that of pre-and post-pandemic trade conditions.

Time series plots were then employed to visualise the trajectory of trade flows and recovery patterns across countries. This facilitated cross-country comparisons and highlighted differences in robustness and recovery, enabling the identification of which countries demonstrated relatively stronger or weaker resilience. Given the variation in response patterns across the member states featured in the analysis, countries were first grouped according to the following trade resilience profiles: highly non-resilient, moderately resilient, robust and responsive, and unique cases. These profiles capture

variations in robustness and recovery, offering insight into the structural strengths and vulnerabilities that shaped each country's trade trajectory. In addition to this, a regional overview and country-specific trade profiles were also examined to contextualise the quantitative findings. This approach ensures that resilience outcomes are not interpreted in isolation, but rather in relation to each country's structural characteristics and sectoral dependencies.

3.2.3 The fsQCA analysis

The next step was to evaluate the relationship between the determinants of trade resilience using the fsQCA approach. The unprecedented impact on global economic activity, caused by the Covid-19 pandemic, created a unique research opportunity due to its rarity and profound global impact. Such large-scale public health crises are uncommon, providing a rare chance to study the immediate and long-term effects on economies and trade. Similarly, this study utilised the opportunity presented by the pandemic to evaluate the relationships between the determinants of trade resilience, thereby providing insight into the way the determinants interact with one another within the context of such an extraordinary event.

The methodology closely followed that of Mena *et al.* (2022), in which the research team investigated various combinations of factors that contributed to trade resilience during the Covid-19 pandemic. The methodology of this study was, however, slightly adapted through the inclusion of regional integration as a variable of trade resilience. The inclusion of this variable was motivated in a study by Pretorius *et al*. (2017), in which the researchers found that increased intra-regional integration had a positive effect on the economic recovery of developing economies following an external disruption. The study therefore underscored the importance of increased regional integration for economic resilience within the SADC. This research study used a configurational comparative method based on fuzzy-set qualitative comparative analysis (fsQCA) to evaluate the relationship between the determinants of trade resilience in the SADC countries. As previously mentioned, this design was chosen since fsQCA allows for the examination of complex causal relationships and the interaction of multiple determinants, identifying different pathways that lead to high or low trade resilience (Pappas & Woodside, 2021). Even though fsQCA is still in development, it has been proven as a powerful methodology to examine how different combinations of conditions contribute to an outcome.

The fsQCA was applied following the steps as outlined by Pappas and Woodside (2021), and Mena *et al.* (2022). The following subsections discuss the variables, data sources, and steps in the fsQCA analysis.

3.2.3.1 Variables and data

The study utilised country-level trade data from the various sources discussed below, based on the variables that were selected for the fsQCA analysis. The variables include trade resilience (dependent variable); logistics performance; healthcare preparedness; economic and social globalisation; government response; gross national income; and intra-regional trade (independent variables). The variables were selected based on the published works of Mena *et al.* (2022) and Pretorius *et al.* (2017). This selection of variables allowed for a comprehensive evaluation of the factors influencing trade resilience during the Covid-19 pandemic.

Trade resilience

Trade resilience was measured using the year-on-year monthly percentage change in the total value of a country's imports and exports. A positive percentage indicates an increase in trade volume compared to the same month in the previous year, while a negative percentage reflects a decline. This data, sourced from the UN Comtrade database (United Nations, 2025), covers the years 2019 to 2020, capturing pre-pandemic and pandemic periods to evaluate trade performance during a major global shock. We use the year-on-year (YoY) monthly percentage change to measure the effect of Covid-19 on trade flows since it allows us to:

- isolate the impact of the pandemic by comparing the same month in different years (e.g., March 2020 vs. March 2019), thereby accounting for normal seasonal patterns in trade;
- track short-term disruptions while still capturing broader trends, making it easier to observe sharp declines or recoveries due to the pandemic; and
- highlight volatility and abnormal fluctuations in trade volumes or values during the Covid-19 period relative to pre-pandemic conditions.

In essence, it provides a clear and timely view of how the pandemic affected trade on a monthly basis while controlling for typical seasonal variation.

Logistics performance

Logistics performance was assessed using the logistics performance index (LPI) developed by the World Bank (2024). The LPI is based on a global survey in which respondents, primarily logistics professionals, evaluate countries across six key indicators: customs procedures, quality of infrastructure, international shipments, logistics service quality, tracking and tracing, and timeliness

of shipments. Each indicator is scored, and a weighted average is calculated to produce an overall LPI score ranging from 1 (lowest performance) to 5 (highest performance). This metric offers critical insight into a country's capacity to manage trade flows, coordinate supply chains, and respond effectively to disruptions, including those triggered by the Covid-19 pandemic. A higher LPI score reflects stronger infrastructure, efficient customs processes, and reliable logistics services, all of which enhance trade resilience by ensuring continuity of imports and exports even under crisis conditions. The rationale for including this variable, as discussed previously (Chapter 2), is that robust logistics systems are essential for maintaining supply chain efficiency, mitigating trade shocks, and supporting faster recovery during global disruptions.

Economic and social globalisation

The economic and social globalisation index, part of the KOF globalisation index developed by the Swiss Economic Institute (2023), measures the extent of global interconnectedness in economic and social dimensions. Scores, ranging from 0 to 100, are calculated as a weighted average of sub-domain indicators such as trade flows, investment, migration, information exchange, cultural proximity, and personal contact. A higher score indicates deeper integration into international networks of trade, finance, and communication, which can both strengthen and weaken trade resilience during crises. On the one hand, greater interconnectedness allows countries to diversify markets, attract foreign investment, and access global supply chains, which can buffer shocks. On the other hand, strong global linkages also increase vulnerability to disruptions in supply chains, external demand shocks, or border closures, as seen during the Covid-19 pandemic. Therefore, the index provides a nuanced perspective on how integration into global networks shapes a country's ability to withstand and recover from external shocks.

Regional integration

Regional integration was evaluated using the African regional integration index (ARII) (African Union, UNECA & AfDB, 2019), a comprehensive tool designed to measure and assess the depth and quality of regional integration across African countries. The ARII combines 16 indicators, organised into five key dimensions: trade integration, which captures intra-regional trade flows and tariff reductions; infrastructure integration, which evaluates the connectivity of transport, energy, and ICT networks; regional investment, assessing cross-border capital flows and investment facilitation; financial integration, measuring the harmonisation of financial systems and access to regional financial markets; and social integration, which reflects the free movement of people, harmonised policies, and social cooperation. Unlike the globalisation index, which focuses on a country's engagement with

global networks, the ARII emphasises intra-regional dynamics, making it particularly relevant to understand how African countries, and SADC members in particular, can leverage regional linkages to enhance trade resilience during shocks such as the Covid-19 pandemic. Strong performance in ARII dimensions indicates that a country is better positioned to maintain regional trade flows, coordinate cross-border responses, and sustain economic activity even amid global disruptions.

Healthcare preparedness

Healthcare preparedness was measured using the Global Health Security (GHS) index (Nuclear Threat Initiative; Johns Hopkins Centre for Health Security, 2024). The GHS index is a comprehensive tool that evaluates the health security capacities of 195 countries, providing a standardised framework to compare preparedness for epidemics and pandemics. It was specifically designed to assist countries in preventing, detecting, and responding to infectious disease threats by highlighting gaps and strengths in national health systems. Scores are determined by a panel of experts who assess countries using a questionnaire of 140 questions organised across six categories: prevention of the emergence or release of pathogens, early detection and reporting, rapid response capabilities, robust health system, compliance with international norms, and risk environment. Each country receives a score ranging from 0 to 100, with higher scores indicating stronger preparedness and resilience to health crises. By incorporating the GHS index, this study captures the critical role of healthcare capacity in mitigating trade disruptions, maintaining economic activity, and supporting recovery during global health emergencies such as the Covid-19 pandemic.

Government response

Government response was measured using the Oxford Covid-19 Government Response Tracker (OxCGRT) stringency index (University of Oxford, 2024). The OxCGRT stringency index is a composite measure developed by researchers at the University of Oxford to systematically track and compare government interventions in response to the Covid-19 pandemic across countries and regions. The index is based on nine key indicators, including school and workplace closures, public event cancellations, restrictions on gatherings, public transport closures, stay-at-home requirements, internal movement restrictions, international travel controls, and public information campaigns. Each indicator is scored on an ordinal scale reflecting the intensity of government intervention, and the scores are aggregated and normalised to produce an overall value ranging from 0 to 100 (Hale *et al.*, 2023), with higher scores indicating stricter measures. By examining variations in government responses, this study evaluates how policy stringency influenced the robustness and recovery of trade

resilience, capturing the ways in which restrictive measures either mitigated the public health impact or exacerbated economic and trade disruptions during the pandemic.

Gross national income

Gross national income (GNI) per capita data for 2019 was sourced from the Africa Development Indicator dataset of the World Bank (2024). This baseline measure captures national income levels prior to the Covid-19 pandemic, providing essential context for understanding each country's economic capacity to respond to shocks. Higher GNI per capita indicates greater fiscal and monetary flexibility, enabling countries to implement stimulus measures, support businesses, and sustain trade flows during crises. Conversely, countries with lower GNI per capita often face limited policy space and financial constraints, which can exacerbate trade disruptions and slow recovery. By including this variable, the study evaluates how pre-existing income levels shaped trade resilience, reflecting the interaction between economic capacity, pandemic response measures, and the ability to absorb or recover from external shocks.

Covid-19-related deaths

Monthly reported Covid-19-related deaths were sourced from the World Health Organization's Covid-19 dashboard (World Health Organisation, 2024). This variable was included as a key measure of the severity of the pandemic's impact across countries, providing a more reliable and comparable indicator than infection rates, which can be influenced by differences in testing capacity and reporting standards. Covid-19-related deaths reflect not only the strain on healthcare systems but also the extent of labour market disruptions, reduced productivity, and broader economic consequences that directly affect trade flows. By incorporating this variable, the study assesses how the magnitude of the health crisis influenced trade resilience, highlighting the relationship between human losses, government interventions, and the ability of countries to sustain or recover trade activity during the pandemic. Higher death rates are therefore indicative of more severe disruptions, which can weaken both the robustness and recovery of trade resilience.

3.2.3.2 Steps in fsQCA

This study utilised a specialised software program available from http://fsqca.com/ to conduct the fuzzy-set qualitative comparative analysis (fsQCA). This software is specifically designed for fsQCA, enabling efficient calibration of data, generation of truth tables, and derivation of solutions. By

leveraging this tool, the study ensured the methodological precision required for analysing the complex causal relationships between the determinants of trade resilience in SADC countries during the Covid-19 pandemic. Below are the steps undertaken in the fsQCA analysis (See Figure *B-1* in Appendix B).

Step 1: Calibration and data

The first step in the analysis was to calibrate the data by converting the measures into *fuzzy sets*, where each case is assigned a membership score between 0 (full non-membership) and 1 (full membership) with intermediate values like 0.25, 0.5, and 0.75 representing partial membership. Fuzzy set membership indicates the degree to which a case belongs to a particular condition or characteristic (e.g. high healthcare preparedness). A score of 0 means full non-membership (the case does not belong to the set), while a score of 1 indicates full membership (the case fully belongs to the set). Intermediate values, such as 0.25, 0.5, and 0.75, capture partial membership, showing that a case is neither fully in nor fully out of the set but lies somewhere in-between. This step was guided by established calibration protocols outlined in Pappas and Woodside (2021) and refined based on the pandemic-specific contexts. Appendix A contains the descriptive statistics for the original measures of the variables, presented in Table A1, and the pairwise correlations between variables are shown in Table A2.

To ensure transparency and replicability, thresholds for each of the variables, defining full membership, full non-membership, and the crossover point (indicating maximum ambiguity), were set using both theoretical and empirical justifications from the literature. Where applicable, expert-informed thresholds were used. The measures for each variable were calibrated using monthly-specific thresholds to ensure that the calibration process accounts for variations in the variables over time rather than applying a single set of thresholds across all months. By doing so, the study captures month-to-month changes in the variables that contribute to trade resilience patterns and provides a more accurate representation of fluctuations in trade performance during the pandemic. The specific calibration information for each of the variables is presented in Table A3, Appendix A. Additionally, Appendix B contains the monthly calibration thresholds for all the variables in Table B1.

As part of the data preparation process, several countries (Comoros, Eswatini, Seychelles) were excluded from the fsQCA analysis due to missing data across one or more key variables. The reason why these countries do not have trade data for 2020 might be due to a combination of reporting delays, institutional constraints, and disruptions caused by the Covid-19 pandemic. Lockdowns, reduced staffing, and logistical challenges affected the ability of statistical agencies and customs authorities to compile and disseminate trade records in a timely manner, while in some cases, political instability further hindered data reporting. The inclusion of these countries in the dataset would have compromised the validity of their calibration and comparability across cases. To maintain the integrity

of the fsQCA dataset and ensure reliable results, these countries were therefore excluded. In particular, Comoros and Eswatini were removed from the analysis due to the absence of trade data for the year 2020, which is central to the study, as it marks the period during which the global trade disruption was most prominent.

Additionally, the trade resilience score (TRES), one of the core outcome variables in the analysis, depends on observing the performance of a country's trade sector during this specific disruption period. Without 2020 data, it becomes impossible to accurately assess how these countries' trade activities responded to the shock, making any conclusion about their resilience purely speculative. Imputation using trade data from earlier years, such as 2019, would also have been ineffective as it would not have reflected the disruption's effects and would therefore distort the TRES measurement, thereby leading to flawed calibration of the fuzzy sets and undermining the logic of fsQCA. Including Comoros and Eswatini under such circumstances would risk introducing inconsistencies or misinterpretations in the causality between variables. Similarly, Eswatini and Seychelles also had missing logistics performance data (LPI), for which imputation was again impossible due to a lack of data from previous years. Despite this unforeseen data limitation, it was still necessary to include the other SADC countries to ensure a robust and meaningful analysis of trade resilience within the region.

The variable DEATHS, used to measure the magnitude of the Covid-19 disruption, proved more difficult to calibrate for fsQCA because many countries reported zero or very few deaths in the early months of 2020, resulting in errors. This lack of variation, especially in January and February, made it challenging to meaningfully differentiate cases and establish consistent calibration thresholds. To overcome this data limitation, the fsQCA analysis focused only on the period from March to July, when the pandemic impact became more pronounced globally and the data exhibited greater variation, allowing for more reliable calibration. Additionally, values that remained at 0 during this period were manually adjusted to 0.01 to allow for calibration and to avoid issues associated with the presence of absolute zeros in fsQCA, which can complicate the identification of set membership scores.

Step 2: Necessary conditions analysis

The next step in the fsQCA analysis involved performing a necessary conditions analysis to determine whether any of the conditions (independent variables) were present when trade resilience (dependent variable) occurred. If a condition is determined to be necessary it means that the outcome, in this case trade resilience, cannot occur without it. This step helps to determine the conditions that must be included in the analysis and prevents excluding critical factors from the analysis. The software provides two output measures to do this, namely consistency and coverage. Consistency measures how often a condition is present when trade resilience occurs, while coverage measures how much of the outcome is explained by the necessary condition. For example, if a condition reports high consistency but low coverage, it means that the condition is required for trade resilience to occur but

does not explain much variance. If a condition reports high consistency and high coverage, it could be a dominant factor influencing trade resilience. For these conditions to be met, the analysis applied a consistency threshold of >0.90 and a relevance threshold of >0.60. These thresholds were again guided by Mena *et al.* (2022), given its relevance to this analysis.

Step 3: Generating the truth table

The next step involved the application of the fsQCA algorithm to generate a truth table. The truth table lists all possible configurations of causal conditions (independent variables) for which the outcome (dependent variable) is either present or absent for each combination (Pappas & Woodside, 2021). The truth table therefore indicates which countries possess a characteristic or combination of characteristics that contribute to trade resilience.

Step 4: Simplifying the truth table

Step 4 involved sorting the truth table by frequency and consistency. Frequency indicates how often each combination of factors that related to trade resilience appears in the dataset, while consistency indicates how consistently a combination of factors that lead to trade resilience appears in the dataset. This was done by applying both a frequency and consistency threshold to determine which combinations of conditions reliably lead to the outcome (trade resilience). For the frequency threshold, configurations observed in at least one country were considered. For the consistency threshold, configurations with consistency scores below 0.80 were excluded, ensuring that only reliable relationships were retained.

Step 5: Obtaining the configurations/solutions

The final step in the fsQCA analysis involved identifying which configurations of conditions (referred to as solutions) were sufficient to achieve trade resilience, with the goal being to explain how different combinations of factors could lead to a resilient trade system. fsQCA generates three types of solutions using the Quine-McCluskey algorithm (for more detail on this see Pappas & Woodside, 2021). These solutions are categorised as complex, parsimonious, and intermediate. The complex solution includes all observed conditions exactly as they appear in the data, and provides an overview of the most detailed and data-specific configurations. The parsimonious solution, by contrast, incorporates all possible simplifying assumptions, including those that may not be theoretically plausible, and presents the most reduced set of conditions necessary to achieve the outcome. The intermediate solution strikes a balance between the two solutions by incorporating only those simplifying assumptions that are supported by theory or substantive knowledge (Pappas & Woodside, 2021). Intermediate solutions allow for the identification of meaningful causal configurations without relying on extreme simplification or overfitting. Since this option provides the most theoretically and methodologically consistent explanation of trade resilience, it will be the focus of this study and the

chosen option or solution. While the complex and parsimonious solutions provide valuable insights into the full and minimal expressions of the data, they are included in the appendix to maintain transparency and allow for comparison but have not been discussed in detail.

As part of generating the intermediate solution, the fsQCA software required us to specify directional expectations for each condition. This step involves indicating whether a condition is theoretically expected to be present, absent, or whether both scenarios are plausible in relation to the presence of the outcome (trade resilience). These assumptions guided the software to select only those combinations that align with the theoretical framework. For example, strong logistics performance (LPI) and robust health systems (GHS) were assumed to support trade resilience and were therefore marked as present. Conversely, for conditions such as economic globalisation (EGLOB), where both positive and negative effects on trade resilience were theoretically plausible, the setting 'both' was selected. This approach ensured that the intermediate solution reflected not only the structure of the data, but also incorporated theoretical reasoning, thereby enhancing the credibility, validity, and interpretability of the results. The directional expectations for the presence and absence of trade resilience are indicated in Tables A4 and 5A in Appendix A, respectively.

It is important to note that when the fsQCA software ran the standard analysis to generate the parsimonious and intermediate solutions for the month of May 2020, the software failed to generate the intermediate solutions. As the intermediate solutions for all other months in the analysis could be generated, this meant that there was a potential problem with the calibrated data for May 2020. After troubleshooting, it was concluded that the intermediate solution failed to generate the solutions due to a lack of consistent and sufficient configurations in the truth table, likely caused by the negatively skewed distributions of TRES and DEATHS for May 2020. The majority of values for TRES in May 2020 were strongly negative, resulting in very few cases being calibrated as having high membership scores. Similarly, DEATHS showed significantly skewed data due to a small number of outliers, thereby limiting the identification of reliable patterns. To address this data limitation issue, we first increased the consistency and frequency thresholds from >0.80 to >0.90 and >0.95 (on separate runs), and from 1 to 2, respectively, to confirm whether the negatively skewed data from DEATHS and TRES was in fact the problem. When running the standard analysis, the intermediate solutions again failed to generate an outcome (on several attempts even when using the variety of threshold settings), thereby suggesting that the input data was likely the problem as originally suspected. To address this problem, the data from DEATHS was then log transformed to smooth the distribution and eliminate the influence of the extreme outliers. The data was then recalibrated using new anchors based on the mean, 10^{th} and 90^{th} percentiles. The standard analysis was then run again using the original consistency and frequency thresholds, which successfully generated the intermediate solutions for May 2020.

Step 6: Analysis and interpretation of results

In the final step of the fsQCA analysis, the identified configurations were interpreted keeping the theoretical frameworks and regional contexts in mind. Configurations were mapped to specific SADC countries, enabling comparisons of how different pathways led to resilience. Results were contextualised to highlight actionable insights, such as the importance of targeted investments in logistics and regional cooperation for bolstering trade resilience.

3.2.3.3 Limitations of fsQCA

fsQCA has emerged as a valuable method for bridging qualitative and quantitative approaches. However, despite its growing popularity, fsQCA remains subjected to several important limitations that affect its robustness, validity and replicability.

One limitation of fsQCA that is frequently cited is its inherently subjective nature and its effect on the analysis procedure. The subjectivity in fsQCA most prominently features during the calibration process where raw data is transformed into fuzzy sets. The process requires researchers to determine three anchors, full membership, full non-membership, and a crossover point. While theory and empirical distributions often inform these choices, they are ultimately based on the researcher's judgement, which can introduce substantial risk of bias (Pappas & Woodside, 2021). According to Krogslund *et al.* (2015), even small changes to the calibration thresholds, of as little as 1 to 2 percent, can alter the outcomes produced by the fsQCA. Moreover, cases with a membership score of 0.5, indicating maximum ambiguity, are excluded from the analysis altogether, which may result in the loss of potentially valuable data in small samples (Pappas & Woodside, 2021).

Additionally, subjectivity in fsQCA extends to the specifications of consistency thresholds, frequency cutoffs, and model selection. These are not standardised decisions when it comes to the model, and it often depends on the researcher's theoretical background or intuition. Krogslund *et al.* (2015) note that slight modifications to the parameters (or variables) can produce significant variations of sufficient conditions, possibly leading to unreliable or contradictory findings. This sensitivity raises concerns regarding replicability. Adding to these limitations is fsQCA's exposure to confirmation bias, meaning that fsQCA may find configurations of variables unrelated to the outcome, due to its configurational logic to identify complex combinations of conditions. fsQCA may therefore identify combinations that do not meaningfully explain the outcome, highlighting the need for caution when interpreting results. Finally, the Boolean minimisation process, used to reduce complex combinations into simplified configurations, can result in multiple equally plausible solutions, depending on how counterfactuals are handled (Pappas & Woodside, 2021), thereby contributing to the interpretive complexity and ambiguity of results.

In summary, fsQCA's inherent subjectivity influences its fundamental procedures, including calibration and threshold determination. This, combined with parameter sensitivity, confirmation bias, and lack of logical consistency, reinforces that while fsQCA offers valuable insights into causal complexity, researchers must apply it with caution and transparency to mitigate these limitations effectively. Some of the limitations encountered in this study, particularly those related to calibration choices and sensitivity to parameter settings, reflect these well-documented challenges of fsQCA. These experiences serve as a testament to the need for careful application and transparent reporting when using this method.

3.3 Concluding remarks

This chapter has detailed the research methodology employed to examine the trade resilience of the SADC countries during the Covid-19 pandemic. To capture the complex nature of this unprecedented disruption, the study adopted a qualitative and quantitative approach. The quantitative elements were informed by the literature review, which provided a greater contextual understanding of trade resilience and its relevance to the SADC region. The quantitative methodology was structured around three core components aligned with the research objectives: Firstly, assessing the pandemic's impact on the trade flows of the SADC countries; secondly, evaluating trade resilience through a robustness and recovery framework; and thirdly, identifying causal relationships between the determinants of trade resilience using fsQCA.

The use of UN Comtrade data allowed for a robust descriptive analysis of trade patterns before, during, and after the pandemic, while the fsQCA approach provided insight into the complex relationships between the factors that influenced the trade resilience of SADC during the Covid-19 pandemic. The use of variables for the fsQCA analysis included logistics performance, healthcare preparedness, regional integration, government response, Covid-19-related deaths, economic and social globalisation, regional integration, and national income, and ensured a comprehensive evaluation of conditions shaping outcomes. The careful calibration of fuzzy sets and adherence to established methodological protocols further enhanced the reliability of the analysis.

This chapter also addressed the limitations of fsQCA, including its inherent subjectivity, exposure to confirmation bias, and the sensitivity of outcomes to differences in calibration settings. Despite these limitations, the chosen methodology continued to provide a rigorous and contextually grounded framework for understanding the trade resilience of SADC in the face of a systemic shock, such as Covid-19.

Chapter 4: Empirical results

4.1 Introduction

This chapter presents the empirical findings of the study, which examined the impact of the Covid-19 pandemic on the trade flows and trade resilience of the Southern African Development Community (SADC). The analysis is structured to address three of the study's main research objectives: Firstly, to determine the impact of the Covid-19 pandemic on the trade flows of the SADC countries; secondly, to analyse the effects of the Covid-19 pandemic on the trade resilience of the SADC countries; and thirdly, to evaluate the relationships between the determinants of trade resilience.

The chapter begins with a descriptive analysis of SADC trade flows over an eight-year period (2015-2022), to highlight key trends and disruptions in trade. This timeframe was deliberately chosen to provide a more accurate and meaningful picture of the pandemic's impact. By including several pre-pandemic years, the analysis establishes a robust baseline against which the disruption of the pandemic in 2020 can be measured, while also capturing the post-pandemic recovery phase. In contrast, using only short-term figures would risk overstating temporary fluctuations or underestimating longer-term structural effects. This is followed by an examination of trade resilience across the SADC region, identifying differences between each country's ability to resist and recover from the disruption. The final section presents the results of the fuzzy-set qualitative comparative analysis (fsQCA), which was utilised to evaluate the relationships between the various determinants of trade resilience and how they interact with one another within the context of a disruption as extensive as the Covid-19 pandemic.

4.2 Descriptive statistics

4.2.1 Determining the impact of the Covid-19 pandemic on trade flows of the SADC countries (2015-2022)

Building upon previous discussions of the Southern African Development Community (SADC), this section examines the region's trade dynamics before, during, and after the Covid-19 pandemic. The analysis focuses on key trade indicators, disruptions caused by the pandemic, and the subsequent recovery, providing a comparative perspective on intra-regional and international trade patterns.

Between 2015 and 2022, trade within the SADC region experienced notable fluctuations, largely shaped by global economic conditions and regional dynamics. These fluctuations were the result of several key events during the period, including rising trade tensions between the United States and China, increased volatility in commodity prices for minerals and agricultural products, the onset of the Covid-19 pandemic, and the start of the Russia-Ukraine war in 2022. From 2015 to 2018, trade

showed a general upward trend, likely driven by the recovery of global commodity prices and a steady demand from global partners outside the region. In 2018, trade peaked before slowing down again in 2019. This was followed by the onset of the Covid-19 pandemic in 2020, which significantly impacted trade within the region, leading to a 15% (over US$50 billion) overall decrease in total SADC trade compared to the previous year. In 2021 and 2022, trade rebounded, surpassing trade levels from earlier years.

By 2022, trade was at its highest point in the period, indicating a strong post-pandemic recovery. The systematic easing of Covid-19 restrictions globally allowed economic activity to resume, resulting in supply chains reopening and increased global demand. Additionally, increased global commodity prices improved the value of exports, particularly for minerals and fuel, leading to a boost in trade activity. The trend line in Figure 4-1 indicates that the region, despite Covid-19's impact, recorded overall growth in trade over the eight-year period.

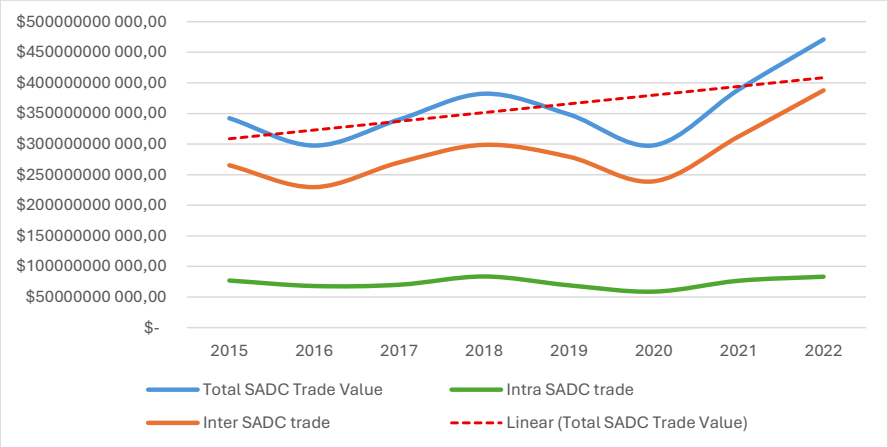


Figure 4-1: Total SADC trade, Total Intra-SADC trade, and Total Inter-SADC trade (2015-2022)

Source: Adapted from UN Comtrade Data (United Nations Statistics Division, 2025)

From Figure 4-1, it is evident that inter-regional trade consistently exceeded intra-regional trade throughout the period, underscoring the region's strong dependence on global markets and external partners. Moreover, the trajectory of inter-regional trade closely parallels that of total SADC trade, indicating that inter-regional commerce is the primary driver of the region's overall trade activity. In contrast, intra-regional trade exhibited minimal fluctuations, with only modest growth observed following the pandemic. This stagnation highlights the persistent challenges faced by the region in advancing regional trade development and deeper economic integration. This distinction between inter- and intra-regional trade patterns is further reflected in the region's overall import and export

performance. Figure 4-2 illustrates these trends, highlighting the balance and fluctuations in the SADC's trade flows over the same period.

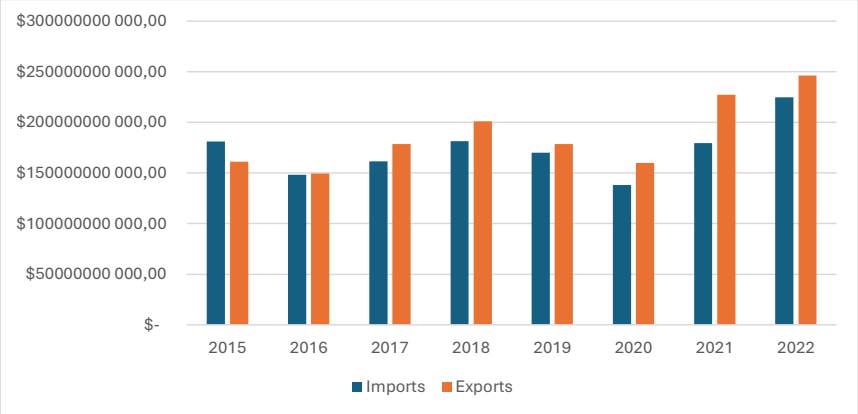


Figure 4-2: Total SADC imports vs exports (US$) (2015-2022)

Source: Adapted from UN Comtrade Data (United Nations Statistics Division, 2025)

Over the eight-year period, SADC exports consistently outperformed imports, resulting in a positive annual trade balance throughout, as indicated by the figure above. Notably, in 2021, the gap between imports and exports widened significantly reflecting a strong rebound in exports following the pandemic-induced decline.

The SADC trade landscape is characterised by several dominant economies that contribute the largest shares to intra-regional trade, notably South Africa, Angola, and Mozambique, while smaller economies such as Madagascar, Malawi, and Lesotho contribute more modestly. Annual inter-regional trade values from Table A-1 in Appendix A provide a detailed look at the varying trade performance of the different SADC countries during the Covid-19 period. As mentioned, between 2015 and 2018, inter-regional trade experienced steady growth, driven largely by rising global commodity prices and improved export demand. South Africa dominated trade within the region, with inter-regional trade peaking at US$ 158.1 billion in 2018. Angola and Mozambique also recorded strong growth during this period, reaching US$ 54.6 billion and US$ 11.9 billion in 2018, largely due to oil and gas exports. Zambia's trade increased similarly due to strong copper exports. Smaller economies, such as Madagascar, Malawi, and Lesotho, maintained relatively stable trade performance, while Botswana and Namibia recorded steady trade activity, reflecting their roles as key players within the region.

However, in 2019, inter-regional SADC trade contracted across member states further decreasing during the pandemic in 2020. The pandemic's impact was visible across nearly all SADC countries, as global supply chains were disrupted and commodity prices dropped. Notable decreases in trade

included Angola's trade volumes, which fell from US$ 48.3 billion in 2019 to US$ 30.7 billion in 2020, while South Africa experienced a substantial decline of US$ 18 billion. Mozambique, Botswana and Namibia, as well as other smaller economies in the region, also reported notable declines, highlighting the pandemic's broad impact on cross-border trade. By 2021 and 2022, trade values across the region rebounded, with several countries surpassing their pre-pandemic levels.

In terms of intra-regional trade, Table A-2 in Appendix A reveals a similar pattern to intra-regional trade, albeit on a smaller scale. South Africa once again led intra-regional trade, averaging over US$ 26 billion annually, between 2015 and 2019. As a result of the pandemic, intra-regional trade decreased among member states. For example, South Africa's trade decreased from US$ 26.6 billion in 2019, to US$ 21.3 billion, while Angolan trade dropped from US$ 1.1 billion to US$ 779 million. Smaller countries, like the Seychelles, which already had comparatively small trade volumes, saw a decrease in intra-SADC trade. The recovery phase from 2021 onwards saw intra-regional trade regain momentum as trade among key countries such as South Africa surpassed pre-pandemic levels. Botswana, Namibia and Zambia also recorded strong recovery, with Zambia's intra-regional trade growing to US$ 7.6 billion in 2022, well above 2019 values. Smaller member states, like Lesotho, also showed improvements to intra-regional trade levels, although recovery remained modest.

Given South Africa's dominant role in the SADC region, its trade activities significantly shape the overall trade performance of SADC member states. South Africa alone accounts for more than half of the region's total imports and exports, owing to its diversified manufacturing base and advanced infrastructure. Figures 4-3 and 4-4 illustrate how the trade landscape changes when South Africa's trade data is excluded, revealing a markedly different picture. Without South Africa, the SADC trade volumes during the pandemic dropped substantially, underscoring the heavy reliance of other SADC member countries on raw material exports and their dependence on South Africa for manufactured goods. Countries such as Namibia, Botswana, and Zimbabwe depend on South Africa for machinery, vehicles, and refined petroleum, while their own exports remain predominantly resource based. This contrast highlights South Africa's crucial role not only as a leading supplier but also as a key facilitator of trade within the region.

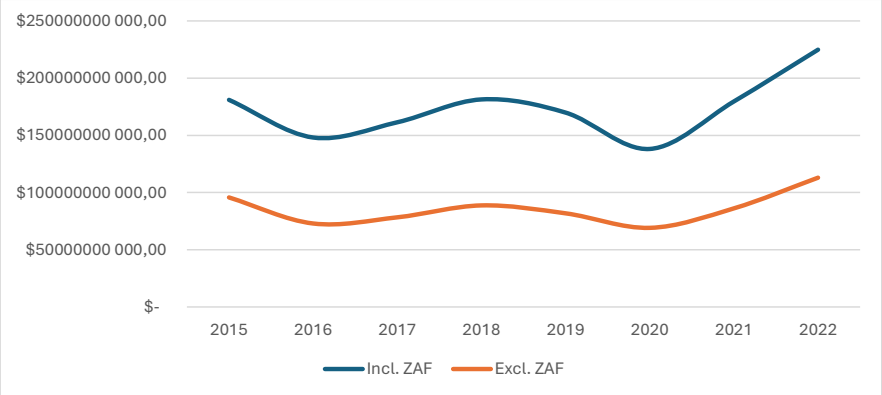


Figure 4-3: Total SADC imports, including ZAF vs excluding ZAF (US$) (2015-2022)

Source: Adapted from UN Comtrade Data (United Nations Statistics Division, 2025)

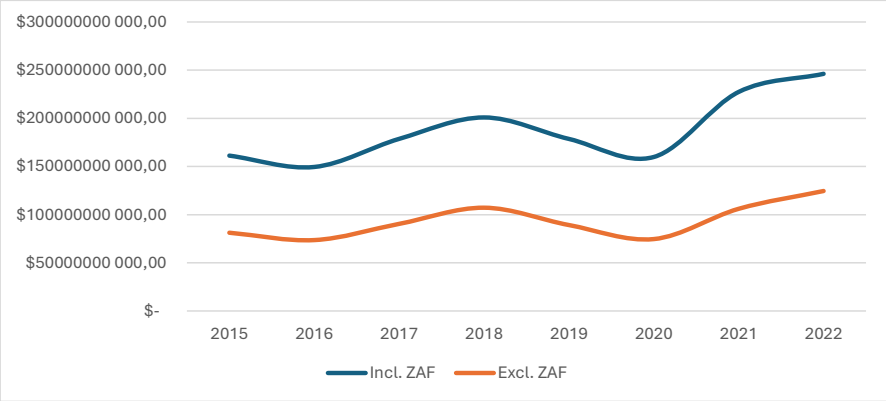


Figure 4-4: Total SADC Exports Including ZAF vs Excluding ZAF (US$) (2015-2022)

Source: Adapted from UN Comtrade Data (United Nations Statistics Division, 2025)

Building on the detailed examination of trade flows and patterns across the SADC region from 2015 to 2022, the next step involves exploring how the countries within the region demonstrated resilience in the face of the Covid-19 pandemic. Understanding trade resilience involves assessing not only the immediate disruptions but also each country's capacity to absorb shocks, adapt to changing circumstances, and recover trade volumes over time. The following section delves into these dynamics by analysing trade resilience across product categories and member states, providing insights into the varied responses and recovery trajectories within the region

4.3 Analysing the effects of the Covid-19 pandemic on the trade resilience of the SADC countries

The following presents the results of the resilience analysis of the SADC member states during the Covid-19 pandemic. The analysis is divided into two parts. The first section provides an overview of the resilience of the SADC region as a whole, grouping countries according to their trade resilience performance and identifying broad patterns in robustness and recovery across the region. The analysis aims to assess how trade resilience evolved over time in response to the disruption caused by the pandemic, and to identify commonalities and differences in recovery paths across the region. The second section offers a detailed country-level analysis, examining each member state individually, by considering not only the quantitative measures of robustness and recovery, but also the economic structures, sectoral dependencies, and other contextual factors that shaped each country's resilience during the pandemic. By combining a regional perspective with an in-depth country analysis, the section aims to capture both the shared dynamics affecting SADC trade and the unique circumstances influencing national outcomes.

4.3.1 Regional trade resilience overview

To effectively measure the degree to which each of the SADC countries was able to both withstand (robustness), and recover (recovery) from the disruption, caused by the Covid-19 pandemic, we use the year-on-year monthly percentage change in the combined total of the countries' merchandise imports and exports. Robustness measures the impact (or decline in total trade from the baseline), while recovery measures the number of months it took each country to recover to pre-pandemic trade levels.

Based on the information in Table 4-1, the countries that showed the weakest ability to withstand the trade shock include Angola, Madagascar, Mozambique, Namibia and Mauritius. These countries recorded the lowest average annual resilience values over 2020, indicating a lack of ability to absorb the trade shock caused by the pandemic. Angola recorded the lowest robustness score (-36.23) indicating a significant vulnerability. Given Angola's reliance on oil exports, the global oil price drops in early 2020 likely amplified the downturn. The countries that recorded the strongest robustness include Seychelles, Zimbabwe, and Zambia. Seychelles recorded the highest robustness value suggesting that the country adapted quickly or benefited from demand for unique goods during the pandemic. In terms of recovery, several countries recorded extended recovery periods, including Mauritius (23 months), Angola (21 months), Mozambique (15 months), and Madagascar (14 months). Mauritius recorded the slowest recovery, reflecting extended disruptions, likely linked to its reliance on tourism. Seychelles again led recovery during the period. It should, however, be noted that its erratic trade pattern suggests that the country's trade recovery was characterised by extreme volatility indicating that the country likely struggled to maintain its recovery trajectory throughout the year.

Zimbabwe, Tanzania, Malawi, Democratic Republic of Congo, and Lesotho all recovered to pre-pandemic levels within seven months, indicating relatively quick rebounds once the initial disruption eased.

Table 4-1: SADC robustness and responsiveness ranking

Country	Pre-Covid-19 baseline [1]	Robustness [2] (annual average)	Recovery (months to recover)	Ranking [3]
AGO	$ 4 136 262 813,54	-36,23	21 months	14
BWA	$ 997 528 134,67	-5,12	9 months	8
COD	$ 2 012 761 265,03	-9,41	7 months	6
LSO	$ 207 037 141,51	-12,51	7 months	7
MDG	$ 551 583 784,87	-20,64	14 months	11
MWI	$ 315 985 721,08	-7,39	7 months	5
MUS	$ 623 971 601,14	-16,26	23 months	13
MOZ	$ 1 040 472 636,61	-17,37	15 months	12
NAM	$ 911 976 461,80	-16,41	11 months	10
SYC	$ 188 518 483,92	45,48	4 months	1
ZAF	$ 14 780 925 425,03	-12,24	10 months	9
ZWE	$ 762 466 379,75	4,97	6 months	2
TZA	$ 1 171 536 326,39	-6,98	6 months	3
ZMB	$ 1 186 002 240,87	2,97	9 months	4

[1] Pre-Covid-19 baseline indicates the combined monthly average of a country's imports and exports from 2019. The baseline value is used to determine the number of months it took each country to recover to pre-Covid-19 levels, which is indicated in the 4th column. The number of months is calculated from the first month in which the value dropped below the baseline average up to and including the month in which the baseline value is surpassed.

[2] Robustness indicates the monthly average of the trade resilience values in Table A3, in Appendix A. Countries with high robustness values indicate a comparatively better ability to withstand the trade disruption compared to countries that have low robustness values.

[3] Countries are ranked according to their resilience based on their robustness and recovery.

To complement this perspective, the following will examine the trade resilience of the SADC member states at the country level. Given the variation in response patterns across the member states, featured in the analysis, countries were grouped within the following trade resilience profiles: Highly non-resilient, moderately resilient, robust and responsive, and unique cases. These profiles capture variations in robustness and recovery, offering insight into the structural strengths and vulnerabilities that shaped each country's trade trajectory.

Highly non-resilient countries

The countries that have been categorised in this profile experienced deep and extended reductions in trade volumes throughout most of 2020, with very limited signs of meaningful recovery. These economies demonstrated weak robustness and poor recovery, indicating possible systemic vulnerabilities impacting their overall trade resilience. The countries included in this group are Angola (AGO), Madagascar (MDG) and Mozambique (MOZ). Their year-on-year changes in trade from 2019 to 2020 can be seen in Figure 4-5 below.

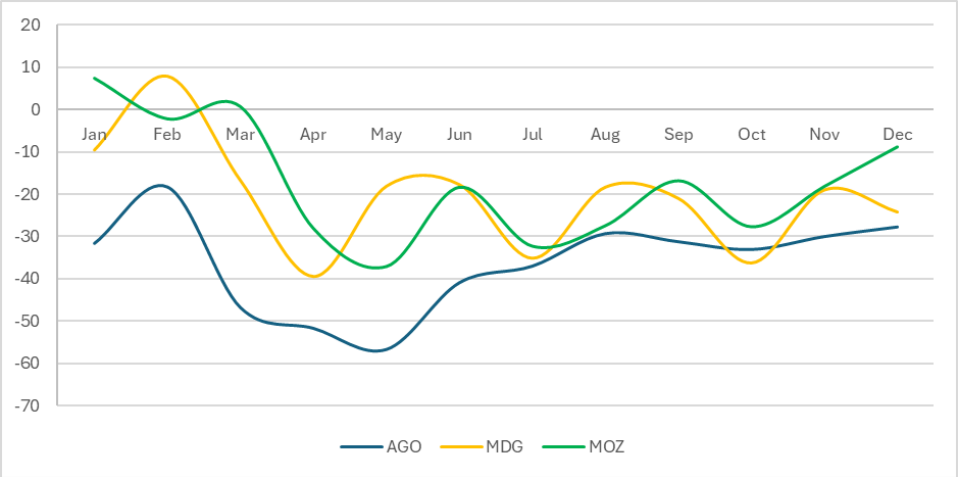


Figure 4-5: Year-on-year percentage change in trade: 2019-2020 (AGO; MDG; MOZ)

Source: Adapted from UN Comtrade Data (United Nations Statistics Division, 2025)

Angola suffered consistent negative trade performance throughout the year, with year-on-year monthly trade decreases exceeding -30% for most of the year, reaching a low of -56.7% in May. Although trade recovered slightly toward the end of 2020, it failed to return to pre-pandemic levels. Madagascar recorded mostly negative trade growth across the year with inconsistent periods of recovery. Similarly, Mozambique registered persistent negative trade changes, in nearly every month, with its steepest drop of -37% in May.

Moderately resilient countries

This group of countries exhibited a mixed pattern of significant contraction during the initial disruption from March to May 2020, followed by signs of stabilisation or partial recovery in the second half of the year. The countries can be considered to have experienced *partial trade resilience*, showing either robustness or responsiveness, but rarely both. The countries included in this group are the Democratic Republic of Congo (COD), Lesotho (LSO), Malawi (MWI), and Namibia (NAM). Their year-on-year changes in trade from 2019 to 2020 can be seen in Figure 4-6 below.

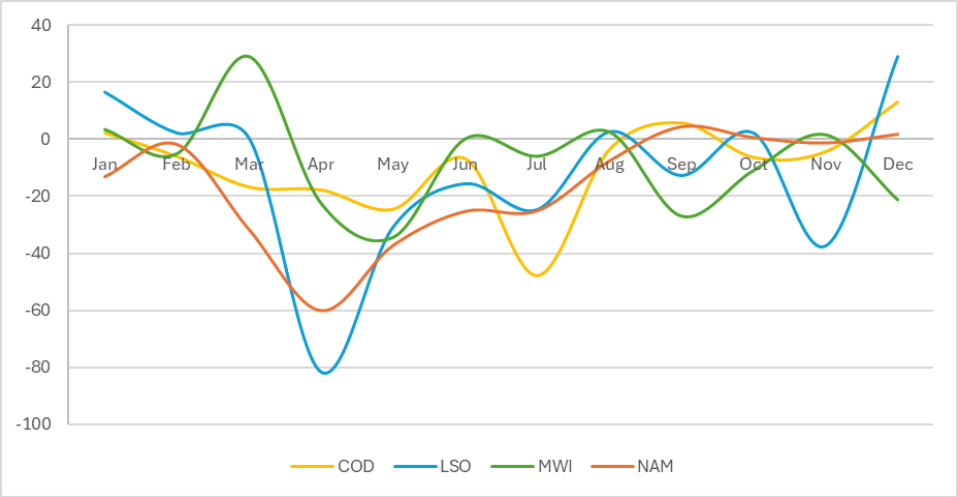


Figure 4-6: Year-on-year percentage change in trade: 2019-2020 (COD; LSO; MWI; NAM)

Source: Adapted from UN Comtrade Data (United Nations Statistics Division, 2025)

Namibia experienced a substantial trade decline in March, likely due to the implementation of a national lockdown, indicating a lack of robustness to the trade disruption caused by the pandemic. However, the country showed partial recovery from August 2020 onwards ending the year in a better economic position. Malawi displayed a volatile trade performance, including positive growth in March (+29.1%), which was followed by a sharp decrease over the next two months. The country, however, lacked sustained upward momentum to indicate strong resilience to the disruption. Lesotho experienced an especially steep decline in trade in April, likely resulting from the implementation of its own national lockdown, as well as that of South Africa, which surrounds Lesotho. Recovery remained largely uneven throughout the year, indicating a lack of responsiveness. Finally, the Democratic Republic of Congo experienced a less severe initial drop, compared to Lesotho and Namibia, but recorded a significant decrease in trade mid-year.

Robust and responsive

Despite the regional challenges that exist in the SADC, a few countries demonstrated either early robustness to the disruption or impressive responsiveness later in the year. These countries fit the profile of robust and responsive (to some extent), showing evidence of structural flexibility. The countries included in this group are South Africa (ZAF), Tanzania (TZA), Zambia (ZMB) and Zimbabwe (ZWE). Their year-on-year changes in trade from 2019 to 2020 can be seen in Figure 4-7 below.

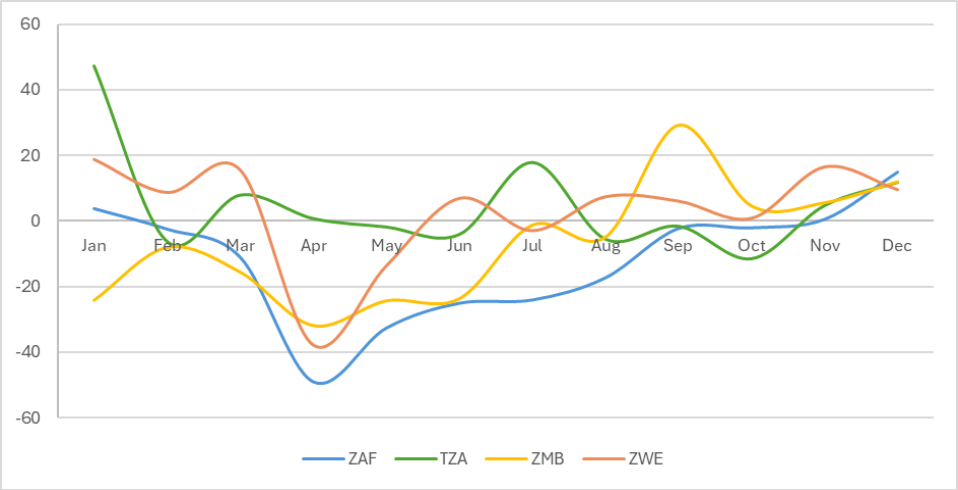


Figure 4-7: Year-on-year percentage change in trade: 2019-2020 (ZAF; TZA; ZMB; ZWE)

Source: Adapted from UN Comtrade Data (United Nations Statistics Division, 2025)

South Africa, the largest economy in the SADC region, was deeply affected by the lockdown measures implemented at the start of the year. In April 2020, South African trade recorded a year-on-year decrease of over USD 7 billion compared to April 2019. However, the country did manage to progressively increase trade volumes throughout the rest of 2020, indicating an ability to effectively respond to the disruption. Tanzania maintained relatively stable trade levels throughout the pandemic, following a significant drop from January 2020. Despite this, the country recorded positive trade growth over several months (e.g., January +47.4%, July +17.9%, December +11.8%) suggesting both robustness and responsiveness. Zambia exhibited a relatively robust trade performance with early growth at the start of the year. This was, however, followed by a decrease in trade activity in April 2020. In spite of this, the country recorded a consistent recovery pattern throughout the remainder of the year. Zimbabwe showed signs of initial trade robustness followed by a large decrease in trade activity in April 2020. Trade did, however, pick up steadily from there exhibiting sustained recovery efforts.

Unique cases

Within the SADC region, three countries exhibited unique trade performance patterns outside of the normal patterns of trade activity recorded by the other member states. The trade performance of these countries indicates unique trade environments and economic structures. The countries included in this group are Botswana (BWA), Mauritius (MUS) and Seychelles (SYC). Their year-on-year changes in trade from 2019 to 2020 can be seen in Figure 4-8 below.

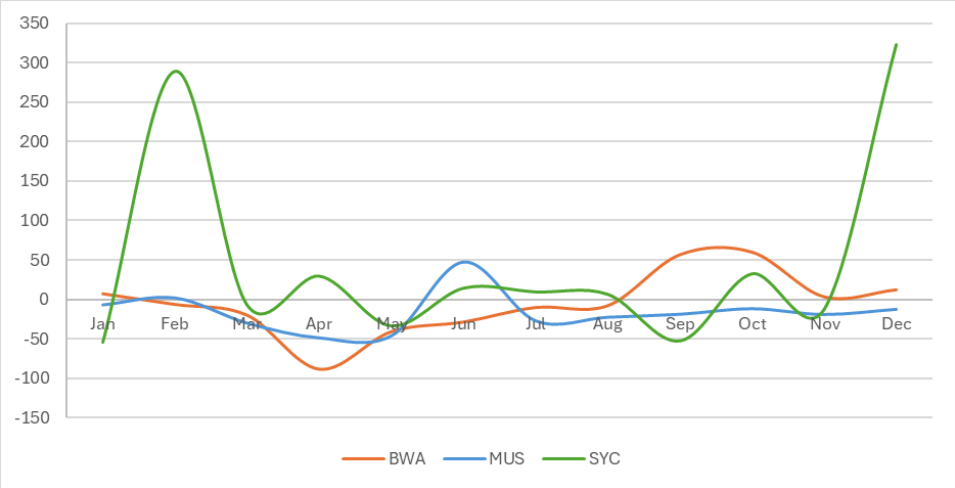


Figure 4-8: Year-on-year percentage change in trade: 2019-2020 (BWA; MUS; SYC)

Source: Adapted from UN Comtrade Data (United Nations Statistics Division, 2025)

Botswana's trade performance was characterised by a mixed resilience performance. The country recorded a severe trade decrease in April 2020 of -88.6% followed by several months of heavily suppressed negative trade growth, indicating low robustness. However, in September and October 2020, Botswana recorded a significant jump in trade activity, indicating high responsiveness, although delayed until the fourth quarter. The scale of the recovery suggests that trade surged once key sectors in the economy resumed their activities.

Mauritius experienced volatile trade performance, peaking in June 2020, before dropping to below pre-pandemic levels in the following months. The peak in trade followed a substantial relaxing of governmental protective measures in June 2020, after several months of significant stringency during the majority of the year. This indicates that Mauritius struggled to maintain upward momentum of trade activities after the surge in June, suggesting a shortage of trade resilience. The trade performance of Seychelles was categorised by volatile changes in trade activity marked by significant increases in trade during the start and end of 2020. For the most part, the country recorded positive trade growth,

only dipping below zero on several occasions. The significant surges in trade likely resulted from the fluctuation of stringency measures and travel restrictions, since the island economy heavily depends on tourism as its main economic driver.

4.3.2 Country-level analysis

While regional patterns provide a useful overview of how the SADC region's trade resilience evolved during the course of the pandemic, they can mask the additional factors influencing the individual trade resilience of the member states. The following analysis examines each member state individually, accounting for various factors that may have influenced their trade resilience, to provide a more accurate and nuanced understanding of each country's performance.

4.3.2.1 Angola

Angola's trade resilience performance during the pandemic was characterised by deep contractions in trade flows throughout the year. As indicated in Table 4-1, the country recorded one of the lowest trade resilience performances among the SADC members with a robustness score of -36.23 and a recovery period of 21 months, indicating a weak ability to resist the trade disruption and recover from it. The low robustness is closely tied to the country's heavy reliance on crude oil exports, which make up over 90% of export value (International Trade Centre, 2025). The collapse in global oil prices in early 2020, combined with a sharp decline in demand, had a severe impact on Angola's trade revenues, which was further exacerbated by the country's limited economic diversification as, unlike other SADC countries, Angola could not rely on other sectors to compensate for this decline.

Despite Angola's coastal position, reliance on long-distance maritime trade left the country further exposed to global shipping disruptions caused by decreased global demand in key markets such as Europe and Asia. On top of this, Angola ranks comparatively low in terms of both global and regional integration, ranking 193rd on the KOF Globalisation Index (Swiss Economic Institute, 2023) and 49th on the African Regional Integration Index (AU, ADB, UNECA, 2019). While the lack of global and regional integration may have had somewhat of an insulating effect on its economy, it may also have contributed to Angola's slow trade recovery.

Angola's trade resilience was further influenced by its lack of trade infrastructure (ranking among the lowest on the logistics performance index) (The World Bank, 2024) and restricted fiscal flexibility. Additionally, Angola's limited healthcare capacity, which ranked 170th on the GHS Index, may have further contributed to the country's drop in trade resilience amid a comparatively high number of confirmed infections (among SADC members) of over 107 000 (World Health Organisation, 2024).

4.3.2.2 Botswana

As indicated in Table 4.1, Botswana's trade performance during the pandemic reflected moderate disruptions in trade flows with a robustness score of -18.45 and a recovery period of 14 months. While the country did not experience as severe a contraction as some other SADC members, the shock was nonetheless significant. Botswana's reliance on the exports of diamonds and other precious stones, which make up close to 90% of total export value (ITC Trade Map, 2024), considerably influenced its robustness, as the global demand for luxury goods in key markets resulted in a substantial drop in April. Similar to Angola, Botswana's narrow export base compounded these effects as non-mineral exports were insufficient to compensate for the decline in trade.

Botswana's landlocked geography further exposed its vulnerability, due to its reliance on overland transport through neighbouring countries such as South Africa and Namibia. Disruptions to regional transport networks caused by national lockdowns and border delays meant that both exports and imports experienced delays. Botswana ranks moderately in terms of both globalisation and regional integration in Africa, holding the 126th and 34th positions, respectively (Swiss Economic Institute, 2023; AU, ADB, UNECA, 2019). This moderate level of integration may have cushioned the country from some external shocks while simultaneously affecting the speed of recovery through slower access to alternative markets. Additionally, Botswana's trade recovery was largely influenced by its well-developed transport infrastructure and strong fiscal capacity that allowed the government to support critical sectors. The combination of these factors may have significantly impacted recovery in the fourth quarter once key sectors were up and running.

Healthcare preparedness was moderate, with Botswana ranked 139th globally on the GHS index. Despite this, the country recorded over 330 000 infections (World Health Organisation, 2024), causing workforce disruptions and heightened uncertainty in trade operations. While strict government measures slowed economic activity, fiscal support and infrastructure strength were critical in sustaining the recovery process.

4.3.2.3 Democratic Republic of Congo

The trade resilience performance of the Democratic Republic of Congo (DRC) was marked by prolonged disruptions and slow recovery, with a robustness score of -28.74 and a recovery period of 19 months (see Table 4-1). The country's heavy dependence on raw materials and mineral exports, particularly copper and cobalt (International Trade Centre, 2025), made it highly vulnerable to the initial contraction in demand from vital markets. Even though commodity prices began recovering later in 2020, early drops had a significant impact on revenue streams, thereby possibly affecting the country's fiscal capacity to deal with the disruption.

Despite the DRC's vast natural resources, its poor infrastructure (ranked 143rd on the LPI) compounded the challenges caused by the pandemic. Transport bottlenecks, underdeveloped road networks, and reliance on transport through neighbouring countries for port access increased the country's exposure to regional and global disruptions. With regard to integration, the DRC is positioned among the lowest within the SADC region, ranking 185th in terms of globalisation and 48th in terms of African regional integration (Swiss Economic Institute, 2023; AU, ADB, UNECA, 2019). The lack of integration likely shielded the DRC from the initial impact of the disruption but may also have slowed recovery by limiting access to trade networks.

Healthcare preparedness was poor, with the country ranked 161st globally. Over 100 000 Covid-19 cases were reported (World Health Organisation, 2024), stretching already fragile health systems. Weak institutional capacity, ongoing conflict in parts of the country, and constrained fiscal resources further undermined recovery. Collectively, these factors highlight how structural dependence on a narrow set of commodities, poor infrastructure, and weak integration contribute to prolonged disruptions and low resilience.

4.3.2.4 Lesotho

Lesotho's trade resilience during the pandemic was influenced by the country's economic reliance on a small number of sectors and geographical constraints. The country recorded a robustness score of -12.51 and a recovery period of seven months (Table 4-1), placing it in the middle range among SADC members. Lesotho's exports are dominated by textiles (about 50% of total exports) and precious metals (around 32%), which were severely affected by declining global demand and disruptions to supply chains, particularly for goods destined for the United States (International Trade Centre, 2025).

As a landlocked state surrounded by South Africa, Lesotho relies entirely on overland routes for port access. Border closures and transport restrictions therefore directly disrupted trade flows. In terms of integration, the country ranked 168th globally and 29th regionally (Swiss Economic Institute, 2023; AU, AfDB, UNECA, 2019). While Lesotho's membership in the Southern African Customs Union (SACU) facilitates trade through the removal of tariffs, the overreliance on South Africa as both a major trade partner and transit route increased the country's vulnerability during the pandemic.

Lesotho's healthcare preparedness ranked 144th globally, indicating moderate to low capacity. However, reliance on South Africa's healthcare system and a relatively small caseload of around 34 000 infections (World Health Organisation, 2024) partially mitigated the burden. Fiscal capacity was limited, constraining the government's ability to provide significant stimulus, although the SACU framework offered indirect benefits through regional supply chain adjustments. Overall, Lesotho's

experience illustrates the challenges faced by small, geographically constrained economies that depend heavily on a narrow export base and a single transit partner.

4.3.2.5 Madagascar

Madagascar's trade resilience during the pandemic was largely influenced by a combination of factors, including commodity exposure and logistics constraints. The country recorded a robustness score of -20.64 and a recovery period of 14 months (see Table 411), positioning it among the least resilient of the SADC countries. Madagascar's export portfolio is heavily concentrated in textiles, minerals, and vanilla, with the country boasting as the world's largest exporter of the latter. Exports of these products contracted considerably in 2020 with textiles being hit the hardest by declining demand from vital markets such as Europe and the United States. Vanilla exports also decreased considerably due to logistics challenges and decreased production capacity (ITC Trade Map, 2024).

As an island economy, Madagascar depends on ocean transport, making it especially vulnerable to shipping disruptions. Port delays, reduced vessel frequency, and higher freight costs further constrained trade flows. Integration levels are low, with the country ranked 164th globally and 37th regionally (Swiss Economic Institute, 2023; AU, AfDB, UNECA, 2019). This, combined with distance from major markets, slowed recovery and limited access to alternative trade opportunities.

On the healthcare side, Madagascar ranked 86th globally in preparedness, a comparatively stronger position than many other SADC members. Nonetheless, government restrictions and limited fiscal space curtailed economic activity and undermined resilience. The country's case underscores how limited diversification, high transport dependence, and low integration combine to weaken resilience, even when healthcare systems are relatively better prepared.

4.3.2.6 Malawi

Malawi's trade resilience during the pandemic was marked by moderate declines in trade flows, with a robustness score of -7.31 and a recovery period of seven months (Table 4-1), reflecting a reasonable capacity to withstand disruption and recover. As a predominantly agricultural exporter, the country remained vulnerable to fluctuations in demand and logistical challenges, affecting its key exports of tobacco, tea, and sugar, which together constitute the bulk of national trade revenue (ITC Trade Map, 2024). The fall in demand, compounded by transport restrictions on major routes, significantly constrained Malawi's agricultural trade.

Geography further heightened these vulnerabilities, as Malawi relies on transit through Mozambique and Tanzania for access to seaports. Border closures and transport disruptions therefore amplified the negative effects of the slowdown, delaying recovery. In terms of integration, Malawi ranks 174th globally on the KOF Globalisation Index and 42nd on the African Regional Integration Index, indicating limited global exposure and modest regional participation (Swiss Economic Institute, 2023; AU, AfDB, UNECA, 2019). Healthcare preparedness was also weak, with the country ranked 154th globally and recording more than 89 000 Covid-19 cases in 2020 (World Health Organisation, 2024). This likely prompted stringent government measures, further restricting trade. Limited fiscal capacity also constrained Malawi's ability to provide stimulus support. Overall, Malawi's experience illustrates the compounded vulnerabilities of landlocked, agriculture-dependent economies, where limited diversification and constrained resources undermine resilience.

4.3.2.7 Mauritius

For Mauritius, the pandemic represented a severe external shock, primarily due to its dependence on tourism, which declined by over 70% in 2019 as a result of global travel restrictions and lockdowns (ITC Trade Map, 2024). The collapse of this sector is reflected in the country's prolonged recovery period of 23 months (Table 4-1), one of the longest among SADC members. Although exports of goods such as fish, textiles, and sugar, together accounting for roughly 52% of merchandise exports, are more diversified compared to some other SADC members, this diversification was insufficient to offset the losses from tourism.

As a small island state reliant on both air and sea transport, Mauritius was particularly exposed to global transport restrictions and delays. However, its relatively high levels of global integration (51st on the KOF Globalisation Index) and regional integration (5th on the African Regional Integration Index) provided some resilience through diversified trading partners (Swiss Economic Institute, 2023; AU, AfDB, UNECA, 2019). The country's advanced logistics infrastructure and strong financial sector also supported recovery efforts, though not enough to fully counter the collapse of tourism. Mauritius ranked 114th globally in healthcare preparedness, suggesting a moderate capacity to manage the more than 330 000 confirmed Covid-19 cases (World Health Organisation, 2024). While government restrictions dampened economic activity, a comparatively strong fiscal base enabled effective stimulus measures. The case of Mauritius demonstrates that even globally integrated small states remain highly vulnerable when economic activity is concentrated in a single sector.

4.3.2.8 Mozambique

Mozambique's trade resilience during the pandemic was characterised by severe volatility, with a robustness score of -17.37 and a recovery period of 15 months (Table 4-1). The economy's reliance on commodity exports, particularly aluminium, coal, and natural gas, left it highly exposed to price fluctuations. Disruptions in coal and gas exports led to export revenues falling by more than 60% compared to 2019, and limited diversification meant that other sectors were unable to compensate (International Trade Centre, 2025).

Although Mozambique benefits from a long coastline and port access, domestic infrastructure deficiencies, such as underdeveloped transport networks and limited trade capacity, worsened delays and weakened recovery. In terms of integration, the country ranked 144th globally and 14th regionally, reflecting modest global linkages but relatively stronger regional ties (Swiss Economic Institute, 2023; AU, AfDB, UNECA, 2019). Healthcare preparedness was ranked 153rd globally, and with more than 220 000 confirmed Covid-19 cases, the health crisis placed further strain on the economy. Strict government measures aimed at containing the virus restricted trade, while the country's very limited fiscal base left little scope for meaningful stimulus. Mozambique's case illustrates how resource dependence, coupled with weak infrastructure and low preparedness, can severely limit both robustness and recovery.

4.3.2.9 Namibia

Namibia's trade resilience during the pandemic reflected both its exposure to external demand and the benefits of relatively strong infrastructure. The country recorded a robustness score of -16.41 and a recovery period of 11 months (Table 4-1). Exports were dominated by copper, diamonds, gold, and other precious stones and metals, which together accounted for nearly half of total export revenue prior to 2020 (ITC Trade Map, 2024). The sharp decline in global demand during the pandemic severely impacted the mining sector, though the subsequent rebound in commodity prices helped shorten the duration of the disruption.

Unlike landlocked SADC members, Namibia benefited from its coastal position and modern port facilities at Walvis Bay, which helped sustain trade flows despite lower volumes. The country also ranks moderately in terms of integration, 116th globally and 25th regionally, allowing access to a wider set of markets (Swiss Economic Institute, 2023; AU, AfDB, UNECA, 2019). Namibia's healthcare preparedness ranking of 104th reflected a moderate capacity to manage the crisis, although the country still recorded more than 170 000 Covid-19 cases. Government restrictions weighed on trade, but a comparatively larger fiscal base enabled some stimulus measures. Nevertheless, Namibia's reliance on a narrow set of exports and its small domestic market limited robustness, while fiscal

constraints reduced the scope of its policy response. Namibia's case underlines how small, resource-dependent economies with comparatively good infrastructure can weather shocks, while remaining vulnerable to global demand cycles.

4.3.2.10 Seychelles

Seychelles was among the worst affected SADC economies during the Covid-19 pandemic, largely because of its overwhelming reliance on tourism. Similar to Mauritius, the country's economy depends heavily on this sector as a primary driver of economic activity. However, international travel restrictions and border closures caused tourism revenues to decline by more than 60% in 2019 (ITC Trade Map, 2024). Despite these challenges, Seychelles recorded a robustness score of 40.12, the highest among SADC countries. However, its trade resilience pattern, as shown in Figure 4-4, reveals significant fluctuations in trade flows throughout the year. The sharp surge early in 2020 was most likely due to an influx of imports as the nation prepared for the pandemic's anticipated effects.

As an island state, Seychelles faces structural constraints in terms of economic diversification. Beyond tourism, its limited export portfolio consists mainly of fisheries and a small number of service industries, which proved insufficient to offset losses when the tourism sector collapsed. This lack of diversification significantly weakened the country's overall trade resilience. Moreover, Seychelles' relatively high levels of global and regional interconnectedness, ranked 89th in global integration and 11th in regional integration (Swiss Economic Institute, 2023; AU, AfDB, UNECA, 2019), further heightened its exposure to external shocks.

Compounding these vulnerabilities, the country ranked poorly in healthcare preparedness at 133rd globally, restricting its ability to effectively manage rising Covid-19 cases. While government restrictions were necessary to contain the spread of the virus, they placed additional strain on tourism and trade. Nonetheless, Seychelles' moderate fiscal capacity allowed it to implement stimulus measures that provided some relief during this period.

4.3.2.11 South Africa

South Africa's trade resilience performance during the pandemic combined initial sharp contractions with a relatively faster rebound compared to many of the other SADC members. The country recorded a robustness score of -14.37 and recovery period of 10 months (see Table 4.1), marking it as one of the more resilient economies in the region. As the region's most diversified and industrialised economy, South Africa was affected by global supply chain disruptions caused by the pandemic, although its well-diversified export portfolio helped offset some of these losses. In particular, the

country's exports of minerals and agricultural goods proved to be vital to ensuring its trade resilience and promoting recovery efforts (ITC Trade Map, 2024).

Geographically, South Africa's extensive port infrastructure, diversified logistics systems and relatively deep financial markets effectively facilitated resilience. The country is ranked 60th in terms of global integration and 1st in terms of regional integration (Swiss Economic Institute, 2023 and AU, ADB, UNECA, 2019), reflecting its global trade reach and central role in regional value chains. Nevertheless, South Africa's recovery was slowed by domestic challenges, including energy shortages, high inequality, and fiscal constraints.

South Africa ranks 34th globally in healthcare preparedness, reflecting strong institutional capacity to manage the health crisis. Its substantial fiscal resources further enhanced resilience by enabling the implementation of stimulus packages. However, the country also recorded the highest number of confirmed infections in the region, over 4 million cases, which, combined with stringent government restrictions, significantly constrained workforce availability and economic activity. Overall, South Africa's experience illustrates how economic diversification, and strong integration can support resilience, while persistent domestic weaknesses can undermine the benefits of such structural advantages during a global crisis.

4.3.2.12 Tanzania

Tanzania's trade resilience during the pandemic was shaped by its relatively diversified export structure and policy response. The country recorded a robustness score of -6.98 and a recovery period of six months (Table 4.1), indicating a reasonably good ability to resist the trade shock caused by the pandemic and facilitate recovery effectively. Unlike many other SADC countries, Tanzania's trade resilience pattern was characterised by moderate declines throughout the year combined with relative stability. The country's vast natural resources, which include gold and agricultural products such as coffee and cashew nuts, significantly contributed to ensuring trade stability during the pandemic (ITC Trade Map, 2024). Its exports of gold, in particular, played a major role as prices increased in 2020, offsetting some of the losses in other sectors.

Tanzania's geographic position also contributed to its trade resilience as coastal access and use of its ports allowed for trade to continue amid a global slowdown in shipping capacity. The country also serves as a critical transit hub for various landlocked neighbours, making it strategically important for regional trade flows. In terms of integration, Tanzania ranks 165th on the KOF Globalisation Index and 28th on the African Regional Integration Index (Swiss Economic Institute, 2023 and AU, ADB, UNECA, 2019), reflecting moderate participation in global and regional systems.

Tanzania ranked 101st on the GHS Index, indicating moderate healthcare preparedness. Unlike most SADC members, the government avoided strict national lockdowns, a controversial decision that nonetheless sustained economic activity and cross-border trade. However, limited fiscal resources restricted stimulus measures. Combined with relatively low infection rates, the country's resilience was strengthened by its diversified exports and strategic location, though structural weaknesses such as limited infrastructure and low fiscal capacity remained constraints.

4.3.2.11 Zambia

Zambia's trade resilience during the pandemic was characterised by a drop in trade early in 2020 followed by sustained recovery thereafter. The country registered a robustness score of 2.97 and recovery period of nine months (Table 4.1). The country's exports of copper, which account for more than 70% of Zambia's export earnings, dropped early in 2020 due to a decline in demand (ITC Trade Map, 2024). Copper exports did, however, rebound later in the year as demand in major markets such as Europe and China increased Zambia's low diversification, and dependence on a single commodity exposed the country to shifting global demand patterns.

As a landlocked country, Zambia relies heavily on transit routes through Tanzania and South Africa, both of which experienced logistical disruptions during the pandemic. This, combined with Zambia's lower position in terms of its global and regional integration rankings (Swiss Economic Institute, 2023 and AU, ADB, UNECA, 2019), added to the drop in trade earlier in the year and may have limited recovery efforts later on. Its relatively strong trade links within SADC provided some stability, particularly through copper exports to neighbouring countries.

Zambia ranks 152nd globally in healthcare preparedness, reflecting low capacity to manage the crisis. Over 340 000 confirmed cases strained the health system, while government restrictions slowed trade flows. Fiscal space was extremely limited due to high debt burdens predating the pandemic, constraining stimulus efforts. While copper exports provided a foundation for recovery, Zambia's case demonstrates how commodity dependence and weak fiscal capacity undermine resilience, reinforcing the need for diversification.

4.3.2.11 Zimbabwe

Zimbabwe's trade resilience during the pandemic was underscored by low robustness and effective recovery. Despite the country's comparatively high robustness score of 4.97, trade experienced a deep drop early in the year, which was followed by sustained recovery (see Table 4.1). Zimbabwe's exports are concentrated primarily in gold, platinum, nickel, and tobacco, all of which were affected

by declining global demand during the pandemic (ITC Trade Map, 2024). Tobacco, in particular, was heavily affected while exports of nickel and gold recovered strongly during the second half of the year, offsetting some of these losses.

Zimbabwe's pre-existing challenges with regard to its poor infrastructure and logistics systems contributed to the country's limited ability to absorb the trade shock. Although the county benefits from geographic proximity to South Africa and Mozambique, which provide key transport corridors, recurring border closures and transport delays constrained trade flows. Zimbabwe ranks 134th in terms of global integration and 12th in terms of regional integration (Swiss Economic Institute, 2023 and AU, ADB, UNECA, 2019), reflecting low participation in global trade while actively involved in regional networks.

Healthcare preparedness ranks comparatively high for Zimbabwe among SADC members at 92nd globally, suggesting moderate capacity to handle the health crisis. Nevertheless, policy responses were constrained by limited fiscal capacity and weak investor confidence, which slowed recovery efforts. Zimbabwe's case demonstrates how dependence on a narrow set of exports, combined with structural imbalances and constrained fiscal resources, can exacerbate vulnerability in times of global crisis, even when short-term recovery is achievable.

4.3.2 Discussion of the trade resilience analysis

The year-on-year trade performance analysis of the SADC member states during the Covid-19 pandemic reveals significant differences in the abilities of the countries to withstand and recover from the trade disruption caused by the pandemic. Countries categorised as highly non-resilient, such as Angola, Madagascar, and Mozambique, faced persistent trade declines throughout the year, with very limited recovery within the same year, suggesting weak robustness and responsiveness to external shocks. In contrast, moderately resilient countries, such as Namibia, Malawi, Lesotho, and the DRC, experienced sharp initial contractions in trade, managing partial or uneven recovery, indicating some capacity to stabilise trade flows, though not consistently throughout the year.

Countries identified as robust and responsive, namely South Africa, Tanzania, Zambia, and Zimbabwe, demonstrated a stronger ability to either maintain trade levels early in the crisis or recover progressively throughout the rest of the year. These patterns point to more adaptive trade structures or policy environments capable of supporting resilience. Finally, with regard to the unique cases, the countries exhibited irregular trade patterns not aligned with the broader regional trends, likely due to their specific economic structures or sectoral dependencies.

The country-level analysis highlights the varied degrees of trade resilience within the SADC region during the Covid-19 pandemic, revealing a number of common patterns in how countries experienced

and recovered from the trade shock. The most notable factor influencing robustness was the degree of export diversification. Countries with more diversified economies and trade partners tended to experience less severe impacts compared to smaller or more specialised economies. South Africa and Tanzania, for example, benefitted from a more diversified export portfolio allowing them to offset losses from other sectors. In contrast, many countries such as Angola, Mozambique, and Botswana, where a disproportionate share of exports are tied to a single commodity, experienced some of the steepest contractions. This, combined with lengthy recovery periods, supports the arguments from researchers such as Briguglio *et al.* (2006) that an over-reliance on a single commodity or lack of diversification creates vulnerabilities to external shocks.

Tourism-dependent economies such as Mauritius and Seychelles were among the hardest hit. The collapse in international travel exposed the risks of a dependence on services, where recovery was tied to factors largely outside of domestic control. This, combined with their dependence on ocean transport, deepened the drop in trade. Other geographical constraints also played a crucial role in influencing trade resilience, as landlocked countries such as Malawi, Zambia, and Lesotho faced greater vulnerability due to their reliance on transit through neighbouring countries, where border closures and transport delays impacted the ability to maintain trade. Coastal countries, on the other hand, demonstrated greater robustness, though this advantage was severely limited in some cases where domestic logistics systems were weak (e.g., Mozambique and Angola). This, combined with poor infrastructure in various cases, exacerbated the trade disruption, echoing the sentiment that inadequate infrastructure can intensify the effects of a trade shock (Rimidis & Butkus, 2025).

During the pandemic, integration contributed toward sustaining trade flows while also increasing exposure to the shock caused by the pandemic. Highly integrated economies such as South Africa and Mauritius benefitted from diversified market access that supported recovery, but their exposure also meant greater vulnerability to the effects of the disruption. On the other hand, countries with limited integration, like the DRC, were somewhat insulated at first but lacked the access to facilitate rapid recovery. These results reinforce the need for a balanced approach to enabling trade robustness and recovery.

The existing structural weaknesses and limited fiscal capacity of most countries in the region negatively contributed to trade resilience, as countries were not adequately equipped to respond to the crisis and maintain trade and economic performance. Countries with high levels of pre-existing debt were especially exposed to the long term effects of the crisis, due to their inability to effectively jump start economic functions.

Across the SADC region, healthcare preparedness during the Covid-19 pandemic was generally low to moderate, with significant variation shaping resilience outcomes. South Africa ranked comparatively high (34th globally), supporting its ability to sustain essential services despite

widespread infections, while countries such as Zambia (152nd) and Malawi (154th) were far less equipped to manage the health crisis, leading to more severe workforce and institutional pressures. Government responses also shaped trade trajectories: stricter measures, such as the lockdowns in South Africa and Zimbabwe, constrained trade activity, while Tanzania's less restrictive approach allowed for greater continuity in economic operations despite its only moderate healthcare capacity. Fiscal space was equally critical, as countries with stronger bases, including South Africa and Mauritius, were able to implement large-scale support measures, whereas Malawi and Zambia struggled to stimulate recovery due to weak fiscal capacity and high pre-existing debt. The human cost of the pandemic further compounded trade disruption, with countries experiencing higher infection and mortality rates facing deeper challenges in sustaining production and trade flows.

The SADC experience reinforces the findings from the trade resilience literature that resilience is shaped by a complex interplay of structural, institutional, and contextual factors (Briguglio *et al*., 2006; Christopher & Peck, 2004; Rimidis & Butkus, 2025). Core characteristics, such as export diversification, economic structure, and geographic location, determine baseline robustness, while integration into global and regional markets, infrastructure quality, and governance influence the ability to adapt and recover (Arvis *et al*., 2014; Faye *et al*., 2004; UNCTAD, 2021). For example, countries with diversified exports and broader market access, such as South Africa and Tanzania, were better able to reallocate resources and stabilise trade flows, whereas those dependent on a single commodity or sector, such as Angola and Mozambique, experienced prolonged contractions. Similarly, higher fiscal and institutional capacity enabled countries such as Mauritius to implement effective support measures, while weaker states faced extended disruptions. Overall, the SADC cases illustrate that trade resilience is multidimensional, relying on both structural foundations and the ability to respond to context-specific shocks.

Logistics performance, healthcare preparedness, government response, gross national income, and Covid-19-related deaths further influence resilience by affecting the ability to sustain supply chains, maintain essential services, and implement timely policy interventions (Mena *et al*., 2021; Pretorius *et al*., 2017; Hale *et al*., 2020; Herstein *et al*., 2021; Tsatsaronis *et al*., 2022). The SADC experience during the Covid-19 pandemic shows that economies with narrow commodity dependence, weak infrastructure, and limited integration struggled to sustain trade, while those with diversified exports, stronger integration, and greater fiscal capacity recovered more quickly.

4.4 Evaluating the relationships between the determinants of trade resilience using the fsQCA method

To effectively evaluate the relationships between the determinants of trade resilience, within the context of the Covid-19 pandemic, this study utilises the fsQCA method, which allows for the inspection of complex causal relationships and the interaction of multiple determinants, identifying different pathways that lead to high or low trade resilience. The determinants used for the fsQCA analysis include trade resilience (TRES), logistics performance (LPI), healthcare preparedness (GHS), economic and social globalisation (EGLOB and SGLOB), regional integration (ARII), government response (GOVR), gross national income (GNI), and Covid-19-related deaths (DEATHS). These determinants were analysed over five key months (March, April, May, June, and July 2020), representing the initial disruption, peak impact, and early recovery phases of the pandemic in the SADC region.

4.4.1 Calibration and necessary conditions analysis (NCA)

As discussed in the methodology chapter, the steps involved in the fsQCA analysis required the calibration of the raw data by converting the raw measures into *fuzzy sets*, where each case is assigned a membership score between 0 and 1. The scoring represents the degree to which the measures contribute to trade resilience. The next step involved performing the necessary conditions analysis (NCA) over the selected period to determine whether any of the conditions (independent variables) were present when trade resilience occurred. The results of the analysis indicate the following: For March 2020, the analysis indicates that none of the conditions, apart from healthcare preparedness (GHS), meet the consistency threshold of >0.90, and none of the conditions meet the coverage threshold of >0.60. Although healthcare preparedness (GHS) meets the consistency threshold, it does not do the same for coverage, meaning that even though it is required for trade resilience to occur, it does not explain enough of the outcome cases to be included. For April 2020, the results show that none of the conditions meet either the consistency or coverage thresholds. The same results were determined for the month of June 2020. For May, the results of the analysis indicate consistency scores of 1.0 for three of the conditions: Covid-19-related deaths (DEATHS), logistics performance (LPI), and healthcare preparedness (GHS). The coverage scores of all of these conditions (DEATHS, LPI, and GHS), however, failed to meet the coverage threshold, despite strong sufficiency among these three. Similarly, the results for July 2020 show consistency scores above the threshold of >0.90 for Covid-19-related deaths (DEATHS) and logistics performance (LPI). Again, the coverage for these conditions failed to meet the required threshold and therefore does not qualify.

The NCA results across the five months of analysis indicate several important things. Firstly, the analysis shows that none of the conditions by themselves are sufficient and empirically relevant to

lead to trade resilience, which means that trade resilience is not driven by any single factor and likely a combination of these conditions. Secondly, the findings align with the core assumptions of fsQCA, which are that configurations of conditions and not individual conditions themselves are the main drivers of causality. Finally, these results also show that the influence of conditions change over time and that trade resilience varies across time periods, with different economic conditions. These findings complement the literature on trade resilience of Mena *et al.* (2022), and Pretorius *et al.* (2017), who found that no single factor was enough to ensure trade resilience during the first wave of the pandemic; rather, combinations of these factors determined a country's ability to withstand and recover from the disruption.

4.4.2 Analysis of sufficiency for the presence and absence of trade resilience

The main analysis involved evaluating the relationships between the determinants of trade resilience, to determine the different configurations of conditions that are sufficient for the presence or absence of trade resilience. This was done by generating a truth table for each month of the analysis, which lists all possible combinations or conditions for trade resilience. A consistency threshold of >0.80 and a frequency threshold of 1.0 were then applied to remove combinations of conditions that do not strongly lead to trade resilience (refer to the methodology chapter for specific details regarding these thresholds). The truth tables that were generated for each month have been included in Appendix A (Tables A-10 to A-14). Finally, the standard analysis in the fsQCA package was then applied to calculate the complex, intermediate, and parsimonious solutions in order to determine which combinations of factors were most effective at leading to trade resilience. As discussed in the methodology chapter, this step only focused on the results from the intermediate solutions for each month due to its ability to incorporate only the assumptions that are supported by theory or substantive knowledge. The results from the standard analysis are included in Tables A-4 and A-5 in Appendix A. Results from the parsimonious and complex solutions are included in Tables A-6 to A-9 in Appendix A.

4.4.2.1 Analysis of sufficiency for the presence of trade resilience

The results reveal several recurring patterns of configurations sufficient for the presence of trade resilience across the period of the analysis. At first glance, it is clear that strong logistics performance (LPI), combined with a robust healthcare preparedness (GHS), plays a central role in the resilience configurations across the period of analysis. In all five months of analysis, almost every solution path for achieving trade resilience includes the combination of logistics performance and healthcare preparedness (LPI*GHS), often in conjunction with low Covid-19-related death rates (~DEATHS).

This suggests that countries with efficient transport networks and capable health systems, especially when facing a more manageable public health burden, were better positioned to sustain trade flows despite the broader disruption. While this outcome may appear intuitive, since lower death rates likely reduced the urgency for stringent government measures (thereby allowing trade related services to operate with fewer disruptions), the fsQCA results empirically support this relationship, highlighting that the interaction between systemic preparedness and lower deaths was a consistent and effective configuration for maintaining trade resilience.

In May 2020, the configuration combining logistics performance (LPI), healthcare preparedness (GHS), and the negation of economic globalisation (~EGLOB), covered 66.9% of cases across the period of analysis, suggesting being less integrated in the broader global economic network actually resulted in more robust trade flows during the disruption. Similarly, in June 2020, two of the three configuration paths share this pattern of combining high logistics performance (LPI) and healthcare preparedness (GHS) with the negation of economic globalisation (~EGLOB), underscoring that some insulation from global economic linkages helped to maintain trade resilience when global supply chains were under stress. This corresponds with findings from Kuznar (2024), who noted that an over-reliance on specific industries or global partners, resulting from increased globalisation, could create vulnerabilities within an economy. However, the inclusion of the negation of economic globalisation (~EGLOB) in prominent configurations in both March and July 2020 supports the traditional schools of thought surrounding globalisation's ability to facilitate trade resilience through greater diversity of trade partners from which to source supplies during a disruption. The empirical evidence therefore highlights the nuance surrounding globalisation and trade resilience.

With regard to the role of regional integration, findings from the analysis suggest that increased integration functions more as a secondary source of trade resilience, rather than a general facilitator. The recurring negation of regional integration (~ARII) in April in 2020, alongside the negation of social globalisation (~SGLOB), suggests that cutting off both global and regional connections, during a disruption, could support trade resilience by limiting potential spillovers from neighbouring countries. This pattern of *insulation*, however, only persists when the overall disruption is less severe, or largely mitigated by domestic capacities. In the analysis, the negation of regional integration (~ARII) is consistently paired with either low death rates (~DEATHS), and/or less stringent government response measures (~GOVR), or with the presence of high logistics performance (LPI) and strong healthcare preparedness (GHS). This means that countries did not have to rely on regional integration to support trade activity when the overall health impact from the pandemic was limited, or when governments could avoid implementing particularly strict protective measures, or when the country possessed efficient logistics and healthcare systems to effectively maintain resilience. The findings therefore suggest that countries only lean on regional functions when domestic systems are overwhelmed or when the disruption is critical.

Another important dynamic is the conditional role of government response (GOVR). As discussed in the literature, government intervention, aimed at slowing the spread of the Covid-19 virus, more often than not resulted in a severe decline in trade and economic activities. Results from the fsQCA analysis largely support this notion. During the earlier months, the negation of government response (~GOVR) is often included in configurations that reliably facilitate trade resilience, which suggests that the implementation of less stringent protective measures enabled resilience. One prominent pathway that appears in both March and July 2020 (indicated below), combines the negation of government response with the presence of strong logistics and healthcare services, global and regional networks, as well as high national income.

~GOVR*LPI*GHS*EGLOB*SGLOB*GNI*ARII

This indicates that countries could sustain trade during the pandemic provided they had efficient domestic services in both logistics and healthcare, and avoided implementing severe protection measures, such as national lockdowns. The inclusion of economic and social globalisation (EGLOB, SGLOB) and regional integration (ARII) also indicates that countries could facilitate trade activity while maintaining global and regional networks.

4.4.2.2 Analysis of sufficiency for the absence of trade resilience

The results from the analysis of sufficiency for the absence of trade resilience reveal several recurring configurations that highlight two broad vulnerability pathways. The first pathway revolves around the interaction between high mortality rates, stringent government response, and increased global integration, while the second is defined by weak domestic capacity, specifically in terms of logistics and healthcare preparedness.

Across multiple months, specifically March, May, June and July 2020, configurations frequently include high Covid-19-related death rates (DEATHS) and/or strict government response (GOVR), in combination with increased economic and social globalisation (EGLOB and SGLOB). In March and June 2020, the configuration GOVR*DEATHS*EGLOB consistently leads to the absence of trade resilience. This configuration aligns closely with the chain of events experienced by many countries during the initial stages of the pandemic, where high infection/mortality rates prompted governments to implement increasingly stringent protective measures. While these measures were often necessary from a public health perspective, they had ripple effects that impacted economic and trade systems, particularly in countries that were deeply integrated in the global economy. Another example of this can be seen in April 2020, in the configuration ~DEATHS*EGLOB, which suggests that even in the absence of high mortality rates, i.e. a significant disruption, being globally integrated was enough to negatively affect trade resilience.

Similarly, in May 2020, the combination GOVR*~DEATHS*EGLOB suggests that even in cases of lower mortality, stringent policy responses in globally integrated economies disrupted trade activity. These configurations highlight that deep integration in global economic networks, when combined with high death rates or firm government controls, tend to amplify trade disruptions. This pattern continues into July 2020, where configurations such as ~GOVR*DEATHS*~SGLOB*~ARII and DEATHS*~EGLOB*~SGLOB*GNI suggest that severe public health shocks, even in the absence of stringent government response, were enough to undermine trade resilience. Interestingly, these configurations also point out that trade resilience was negatively impacted by the absence of both global and regional integration, directly opposing pathways from earlier months. During this time, many governments started shifting gears from pure containment toward economic recovery, introducing policies aimed at lifting protective measures with the goal of jump-starting economic activity. The results from the analysis suggest that countries with persistently weak global and regional linkages would have struggled to effectively facilitate recovery through the rebound in global demand and renewed flow of goods.

The second pathway tied to the absence of trade resilience is focused on weak domestic capacity. The configuration, ~LPI*~GHS*~EGLOB*~SGLOB*~GNI*~ARII, appears in both March and May 2020, indicating that the absence of efficient logistics performance and health systems negatively impacted trade resilience. Moreover, the absence of DEATHS and GOVR from this pathway suggests that even in the absence of high mortality rates or firm protective measures, countries that combined weak logistics performance (LPI) and poor healthcare preparedness (GHS) with low economic and social globalisation (EGLOB and SGLOB), low national income (GNI), and weak regional integration (ARII), were unable to maintain trade resilience. The configuration therefore suggests that countries with inefficient transport systems and/or weak healthcare systems, lacked the infrastructure to ensure the flow of goods. At the same time, the isolation from global and regional markets meant that they could not draw on external networks to compensate for the domestic shortfalls. Low national income further constrained any ability to invest in recovery efforts.

4.4.3 Discussion of fsQCA results

The sufficiency analysis provides critical insights into the complex and configuration-based nature of trade resilience in the SADC region during the Covid-19 pandemic. The findings directly address the study's main research question by confirming that trade resilience is not driven by any single factor, but rather by combinations of domestic preparedness, integration levels, and policy responses that interact differently over time.

4.4.3.1 The presence of trade resilience

The presence of trade resilience among SADC countries was most consistently associated with the combination of strong logistics performance (LPI) and robust healthcare preparedness (GHS), particularly during periods when the health crisis was more manageable, and mortality rates were relatively low (~DEATHS). This combination reflects the central role of efficient transport networks and capable health systems in absorbing shocks and sustaining trade flows.

Importantly, the role of global and regional integration emerged as context dependent. During the months of May and June, isolation from global economic networks supported resilience, likely by insulating countries from widespread supply chain breakdowns. In other months (March and July 2020), economic and social globalisation reappear in pathways that lead to resilience, underscoring their importance in facilitating trade through diversified supply chains. This nuance reflects the dual nature of globalisation in its relationship with trade resilience.

In contrast, regional integration (ARII) appeared to play a more conditional role. Its absence, particularly in April 2020, points to a short-term benefit of insulating from regional spillover effects during times of limited disruption or when combined with efficient internal systems. However, SADC members tended to lean on regional integration during times of critical disruption or weaker domestic capacity, reinforcing regional integration's role as a secondary contributor to resilience.

Over the period of analysis, government response showed to have a generally negative effect on trade resilience, aligning with our initial expectations. The persistent negation of government response in the early months indicates that the implementation of less stringent measures often supported resilience, particularly when combined with strong logistics, and healthcare preparedness. Moreover, configurations associated with the absence of trade resilience indicate that strict government policies, especially when combined with high morality and increased global interdependence, significantly impacted trade resilience. While state intervention was necessary to manage the growing public health crisis, the results suggest that overly strict measures likely undermined trade continuity, especially when isolated from strong domestic infrastructure. This, in turn, suggests that a more balanced approach to restrictive measures was conducive to maintaining trade flows.

4.4.3.2 The absence of trade resilience

The absence of trade resilience followed two dominant pathways.

The first stemmed from the compounding interaction between high mortality rates, firm government response, and deep global interdependence. These configurations mirror the global sequence of events where high infection rates prompted restrictive policies, which, when combined with deep

global integration, produced significant disruptions to trade. Results also indicate that even in the absence of high mortality rates, stringent government response within highly globalised contexts was enough to undermine resilience, highlighting the amplifying effects of strict government intervention.

The second pathway, tied to weak domestic capacity, indicates that countries lacking internal infrastructure and links to global and regional networks, were especially vulnerable. Importantly, the pathway does not include high death rates or strict government response, suggesting that trade resilience can be negatively impacted in the absence of external shocks when internal systems are inefficient. Notably, in July, the absences of globalisation and regional integration begin to appear in configurations contributing to the absence of trade resilience, suggesting that integration becomes crucial when promoting recovery.

In summary, trade resilience was shaped by the way in which domestic preparedness, external exposure, and policy responses aligned under different conditions. Strong internal systems were critically important but not always sufficient, especially when countries were exposed to global economic volatility or lacked external partnerships during recovery. The findings reinforce the need for balanced resilience strategies, combining robust internal systems, measured government intervention, and adaptable access to global and regional trade networks.

Summary of pathways

The resilience and non-resilience pathways can be summarised as follows.

1. Resilience pathways most often combined:
   - High LPI + High GHS + Low DEATHS ± Selective Globalisation
   - Moderate GOVR + Strong Domestic Capacity + Flexible Integration

2. Non-resilience pathways typically involved:
   - High DEATHS + Stringent GOVR + Deep Global Integration
   - Weak LPI + Weak GHS + Low Integration + Low GNI

4.4.3.3 Link to literature

The findings from the fsQCA analysis reinforce and extend prior studies on trade resilience. The persistent role of logistics performance and healthcare preparedness echoes the conclusions of Mena *et al.* (2022) and Pretorius *et al.* (2017), who found that strong domestic systems form the foundation of resilience. However, this study adds nuance by showing that their effectiveness depends on contextual factors such as integration levels and policy choices. The dual role of globalisation, as both a vulnerability enhancer and asset during recovery periods, aligns with Kuznar (2024) but provides new empirical evidence from a regional African perspective. Similarly, the finding that overly stringent government responses can undermine resilience supports earlier work on the economic trade-offs of policy measures (Mena *et al*., 2021), while demonstrating that these effects are amplified when combined with deep global exposure. Finally, the conditional value of regional integration revealed in this analysis offers an important contribution to future SADC policies and trade strategies, suggesting that regional networks become vital when domestic capacity is overwhelmed, but less critical when domestic systems are strong.

4.4.3.4 Policy implications

For policymakers, the findings from the analysis suggest that resilient planning should prioritise investments focused on improving logistics and healthcare infrastructure, while adopting flexible integration strategies that can shift between insulating the economy from external shocks, and increasing connectivity with global networks. Avoiding overly strict protective measures when domestic systems are strong, while maintaining external links for recovery purposes, appears to be critically important to sustaining trade flows during a crisis.

4.5 Conclusion

The analysis of trade resilience across SADC countries during the Covid-19 pandemic reveals clear differences in the ability of member states to absorb and recover from the shock. Highly non-resilience countries, such as Angola, Madagascar, and Mozambique, faced prolonged trade contractions due to narrow export bases, weak logistics, and limited integration. In contrast, South Africa, Tanzania, Zambia, and Zimbabwe demonstrated stronger resilience, supported by diversified exports, robust infrastructure, strategic geographic positions, and higher fiscal and institutional capacity, consistent with findings from Briguglio *et al.* (2006) and Arvis *et al.* (2010).

The fsQCA analysis highlighted that logistics performance (LPI) and healthcare preparedness (GHS) were central to sustaining trade, while the impact of global and regional integration, as well as

government response, largely depended on context. Overly stringent policies, especially in countries with high mortality or deep global integration, often undermined resilience, while balanced response measures and strong domestic systems promoted recovery.

These results confirm that trade resilience is multidimensional, emerging from the interaction of structural foundations, domestic preparedness, integration, and policy choices. For policymakers, this underscores the need to strengthen logistics and healthcare systems, adopt flexible integration strategies, and ensure the implementation of measured government interventions that support trade continuity.

Chapter 5: Conclusion

5.1 Introduction

This chapter presents the conclusions of the study, synthesising the key insights drawn from the analysis focused on the trade resilience of the SADC region during the Covid-19 pandemic. The study set out to achieve three main research objectives: firstly, to determine the impact of the Covid-19 pandemic on the SADC member states; secondly, to analyse the effects of the Covid-19 pandemic on the trade resilience of the SADC countries; and thirdly, to evaluate the relationships between the determinants of trade resilience, using fuzzy-set qualitative comparative analysis (fsQCA). This chapter first summarises the main findings corresponding to each research objective. It then discusses the limitations of the study, identifies avenues for future research, and highlights the study's key contributions. The chapter concludes with reflections on how the findings enhance our understanding of trade resilience in the face of global disruptions such as the Covid-19 pandemic.

5.2 Summary of key findings

The purpose of the study was to explore how the trade resilience of the SADC countries was influenced by the Covid-19 pandemic, drawing on both theoretical insights and empirical evidence. To achieve this, the study addressed a set of research questions that guided the structure and scope of the literature review and the empirical analysis. This section is organised into two subsections: the first summarises the key findings from the literature review, while the second outlines the main empirical results.

5.2.1 Insights from the literature review

The purpose of the literature review was to provide a theoretical foundation for the study by addressing the following research questions: (1) What does the existing literature reveal about trade resilience and its key determinants? and (2) What does the literature reveal about the trade resilience of African countries? The section that follows presents a summary of the main findings in response to these questions, emphasising key conceptual developments, critical determinants of resilience, and the specific challenges faced within the African context.

The literature reviewed in this study highlights the growing academic and policy relevance of trade resilience in an increasingly interdependent, volatile, and complex global environment. While international trade remains a key driver of economic growth, poverty reduction, and technological diffusion, the Covid-19 pandemic exposed major vulnerabilities in global and regional supply chains.

Classical, neoclassical, and contemporary trade theories provide valuable insights into the drivers of international trade. These theoretical perspectives illustrate that trade is not only economically beneficial but also structurally embedded within the global economy. Evidence from the literature suggests that although the expansion of global value chains and the spread of preferential trade agreements have facilitated deeper global integration, this interconnectedness has simultaneously heightened exposure to external shocks, underscoring the need for stronger resilience in trade systems.

In the wake of the Covid-19 pandemic, interest in the concept of resilience has grown significantly among scholars and policymakers, giving rise to a distinct body of literature on economic and trade resilience. Much of this literature emphasises two core dimensions of resilience: robustness and recovery. These are increasingly associated with structural and institutional factors such as logistics performance, globalisation, regional integration, and government capacity. Research frequently highlights the delicate balance between maintaining efficiency and ensuring economic stability, particularly in vulnerable economies predisposed to external shocks. This underscores the importance of adaptive strategies that strengthen resilience without undermining efficiency.

Evidence from studies focusing on trade resilience during the Covid-19 pandemic indicates that the disruption's effects varied across the globe. Sub-Saharan Africa, and the SADC region in particular, exhibited high vulnerability and limited recovery capacity compared to other regions. While the SADC has made progress in regional integration and trade liberalisation, its overreliance on global markets and constrained fiscal space severely limited its ability to absorb and recover from the shock. The literature also highlights that although intra-regional integration can enhance trade creation, economies of scale, and regional cooperation, thereby aiding recovery after disruptions, efforts in the SADC have thus far proven insufficient in shielding the region from external shocks.

Within the reviewed literature, several determinants of trade resilience are consistently identified. Among the most critical are logistics performance, economic and social globalisation, regional integration, healthcare preparedness, and gross national income. Within the context of the pandemic, Covid-19-related deaths also emerge as a key determinant of trade resilience. Each of these factors influences the ability of countries to maintain trade flows during disruptions and restore them in the aftermath.

Although the concept of trade resilience has gained significant recognition globally, its application to the SADC region remains underdeveloped. The region continues to face structural challenges such as overdependence on external markets, inadequate infrastructure, and fragmented policy implementation. These weaknesses have undermined its ability to withstand trade shocks and maintain trade performance. Despite this, the literature specifically addressing trade resilience in the SADC remains limited, highlighting a critical research gap that this study seeks to address.

5.2.2 Key findings from the empirical analysis

The empirical component of this study sought to examine the effects of the pandemic on the SADC member states. This phase of the research was guided by the following research questions: (1) What was the impact of the Covid-19 pandemic on the trade flows of the SADC countries? (2) What were the effects of the Covid-19 pandemic on the trade resilience of the SADC countries? and (3) What configurations of factors may have led to trade resilience? The following subsections summarise the key findings derived from the analysis.

5.2.2.1 Trade flow analysis

The analysis indicates that the Covid-19 pandemic had a severe negative impact on trade flows across the SADC region. Prior to 2020, the region experienced a general increase in trade growth up to 2018, after which growth slowed. The onset of the pandemic disrupted both imports and exports, leading to a 15% drop in total SADC trade. Trade, however, rebounded in 2021 and 2022 due to factors including increased economic activity, stabilisation of global commodity prices, and stronger global demand. The analysis also underscored SADC's dependence on global markets, as extra-regional trade consistently outperformed intra-regional trade, confirming its role as the main driver of trade activity. Similarly, findings show that exports consistently outperformed imports over the eight-year period of analysis, producing a positive annual trade balance. The gap between exports and imports was most prominent in 2021, as exports rebounded more significantly than imports did.

The analysis also confirmed South Africa as the dominant economy in the region, accounting for more than half of the SADC's imports and exports and serving as a central trade hub. Other major contributors include Angola and Mozambique, with their oil and gas exports, and Zambia with its copper exports. Smaller economies such as Madagascar, Malawi, and Lesotho played comparatively modest roles. With regard to Covid-19's impact, nearly all member states experienced sharp trade declines in 2020. South Africa recorded the largest drop of US$18 billion, followed by Angola with US$17.6 billion. Intra-regional trade also fell, from US$26.6 billion in 2019 to US$21.3 billion in 2020. Ultimately, the pandemic had a widespread impact on the region's trade flows, although the severity of the shock varied across countries.

5.2.2.2 Trade resilience analysis

Trade resilience, measured through robustness and recovery indicators, showed significant heterogeneity across the region. Patterns of resilience varied substantially according to structural factors such as diversification, geography, and institutional capacity. Countries identified as highly

non-resilient include Angola, Madagascar, and Mozambique, all of which recorded deep and persistent trade contractions throughout 2020 with limited recovery, largely due to dependence on single commodities and weak diversification. Countries such as Namibia, Malawi, Lesotho, and the DRC experienced sharp early declines followed by uneven recovery, reflecting their structural vulnerabilities and geographic disadvantages.

Countries demonstrating stronger resilience include South Africa, Tanzania, Zambia, and Zimbabwe. Tanzania and Zambia benefitted from rising gold and copper prices, while Zimbabwe and South Africa, despite steep initial drops, recovered more effectively, illustrating structural adaptability. The trade resilience patterns of Seychelles, Mauritius, and Botswana diverged from typical trajectories. Seychelles displayed volatile resilience due to its reliance on tourism and narrow trade structure, while Mauritius experienced slow recovery for similar reasons.

The country-level analysis reinforced these findings, highlighting the importance of export diversification, integration levels, and governance. Export diversification was shown to be a crucial influencing factor on trade resilience as countries with more diversified economies, such as South Africa and Tanzania, proved comparatively more resilient, while those reliant on a few commodities, such as Angola, Mozambique, and Botswana, showed weak robustness and extended recovery periods. Mauritius and Seychelles reflected similar risks due to dependence on single sectors.

Geographic constraints and integration also shaped resilience. Landlocked countries were particularly vulnerable to border closures and transport delays due to reliance on transit through neighbours for port access. Findings further suggest that while lower levels of integration may have insulated some countries from the initial shock, they may also have also contributed to slower recovery.

5.2.2.3 fsQCA analysis

The fsQCA analysis generated several important insights into the determinants of trade resilience among SADC countries during the Covid-19 pandemic. Results from the necessary conditions analysis found that no condition on its own sufficiently led to resilience. This confirms that resilience in the SADC trade system is not driven by a single factor and instead by a combination of factors, complementing findings from the works of Mena *et al*. (2022) and Pretorius *et al.* (2017).

The sufficiency analysis identified multiple distinct pathways leading to, and away from, resilience. The first resilience pathway combined high logistics performance with strong healthcare systems and globalisation, though the latter's influence was shown to be context-specific, as globalisation both increased exposure to the shock and facilitated recovery. The second pathway combined moderate government response with strong domestic capacity (logistics and healthcare) and flexible integration.

Here, government response proved crucial, as less stringent measures effectively contributed to resilience.

Pathways associated with non-resilience mirrored global events during the pandemic. The first combined high mortality rates with stringent government responses and deep globalisation, reflecting conditions faced by many countries. The second combined weak logistics and healthcare systems with low integration and national income. This pathway proved particularly relevant to many SADC members, which have historically struggled with logistics efficiency and healthcare provision amid low income levels, while simultaneously increasing participation in global markets.

5.3 Linkage of findings to research objectives

The empirical analysis directly addresses the study's research objectives. In relation to Objective 1, the Covid-19 pandemic triggered a sharp decline in SADC trade flows, with total trade falling by 15% in 2020. The impact was particularly pronounced in countries such as South Africa, Angola, and Mozambique, while recovery from 2021 to 2022 was supported by rising global demand and stabilising commodity prices. For Objective 2, the assessment of trade resilience revealed heterogeneous patterns among the SADC member states. Highly non-resilient countries (Angola, Madagascar, Mozambique) experienced prolonged contractions; moderately resilient countries (Namibia, Malawi, Lesotho, DRC) showed uneven recovery; and robust, responsive countries (South Africa, Tanzania, Zambia, Zimbabwe) demonstrated adaptive structures that enabled faster rebounds. Regarding Objective 3, the fsQCA analysis showed that no single factor alone ensured resilience. Instead, multiple configurations, such as strong logistics performance, healthcare preparedness, diversified exports, and flexible integration contributed to positive trade outcomes, while combinations of weak infrastructure, low income, and stringent government responses were associated with non-resilience. Collectively, these findings underscore that trade resilience in the SADC is multidimensional, shaped by both structural foundations and contextual responses to external shocks.

5.4 Contribution of the study

5.4.1. Contribution to trade theory literature

The findings from this study can be linked to several aspects of trade theory. Classical trade theories, such as those of Smith (1776) and Ricardo (1817, emphasise specialisation and comparative advantage, with countries expected to export goods that they can produce more efficiently. Evidence from countries such as Angola and Botswana, which remain heavily reliant on single commodities

such as oil and diamonds, supports this view, but also highlights a resilience gap. When global demand for these commodities collapsed during the Covid-19 pandemic, so did their trade performance. By contrast, South Africa and Tanzania, which have more diversified export structures, extended Ricardo's logic by demonstrating that comparative advantage across multiple sectors can cushion economies against systemic shocks.

Neoclassical trade theories, such as the Heckscher-Ohlin model (Heckscher, 1919; Ohlin, 1967), explain trade flows in terms of differences in factor endowments, whether in labour, capital, or natural resources. While countries such as Angola, Mozambique, and Zambia, which are endowed with abundant natural resources, appear to follow this model, their experience during the pandemic also illustrate the inherent risks of dependence on a single resource, which increases exposure to external shocks. Furthermore, Mauritius and Seychelles, which have service-oriented economies and rely heavily on tourism, suffered disproportionately, suggesting that endowments in services may be especially fragile during global crises. These findings extend the Heckscher-Ohlin perspective by showing that resilience is not only factor endowments by themselves, but about how those endowments are leveraged through supporting capacities such as logistics, healthcare systems, and regional integration (Mena *et al*., 2021; Pretorius *et al*., 2017).

Contemporary trade theories offer further explanatory power. The new trade theory (Krugman, 1985) emphasises the role of economies of scale and product differentiation in shaping trade patterns. South Africa, which serves as a regional hub with scale advantages and a diverse product base, exhibited stronger resilience, supporting the idea that scale and diversity can provide a buffer against global disruptions. Similarly, the new trade theory, particularly Melitz's (2003) firm heterogeneity framework, helps explain the experiences of Zimbabwe and Zambia, where firm-level adaptability, domestic flexibility, and logistics innovation contributed to sustaining trade flows. Finally, the global value chain (GVC) theory highlights the role of international production networks in sustaining trade (Gereffi, 2021). The fsQCA results reveal that integration into global and regional value chains had a dual effect, facilitating recovery opportunities while also increasing exposure during downturns. This nuance contributes to GVC theory by showing that, within the SADC context, regional integration can serve as a substitute for global exposure during crises, offering an alternative path to trade resilience.

5.4.2 Contribution to trade resilience literature

As highlighted in Chapter 2, while numerous studies have examined the impact of the Covid-19 pandemic on economic and trade resilience, research that focuses specifically on African countries, particularly within the SADC region, remains limited. Existing studies, including those by Mena *et al.* (2022) and Pretorius *et al.* (2017), have contributed to understanding the determinants of trade

resilience at a macro-level, yet few provide a detailed country-level analysis of how trade resilience manifested during the pandemic across SADC member states.

This study makes several notable contributions to the literature on trade resilience in Africa, and the SADC specifically. Drawing on insights from Chapter 2, trade resilience is understood as the outcome of structural, institutional, and contextual factors that shape a country's exposure to shocks and its capacity to recover (Briguglio *et al*., 2006; Rimidis & Butkus, 2025; Christopher & Peck, 2004). Core country-level characteristics, including export diversification, economic structure, sectoral composition, regional and global integration, infrastructure quality, geographic location, and governance, form the foundation for resilience (Arvis *et al*., 2014; Faye *et al*., 2004; UNCTAD, 2022). Countries with access to diverse export markets and balanced economic structures are better able to reallocate resources in response to disruptions, thereby mitigating the impacts of shocks (Briguglio *et al*., 2006; Kuźnar, 2024). Integration into regional and global markets provides alternative trade channels but can also increase exposure to external shocks (Brixiová *et al*., 2015; Notteboom *et al*., 2021). Additional factors such as logistics performance, healthcare preparedness, government response, gross national income, and Covid-19-related deaths, further shape resilience by influencing the capacity to sustain supply chains, maintain essential services, and implement timely interventions (Mena *et al*., 2022; Pretorius *et al*., 2017; Hale *et al*., 2020; Herstein *et al*., 2021; Tsatsaronis *et al*., 2022).

The empirical findings of this study align with these insights. Countries with narrow commodity dependence, weak logistics systems, limited integration, and constrained fiscal and institutional capacity struggled to sustain trade flows. In contrast, economies with diversified exports, strategic geographic positions, robust infrastructure, strong regional integration, and greater fiscal and institutional capacity were able to recover more rapidly. Importantly, while previous studies identified the determinants of trade resilience, they primarily focused on macro-level configurations. This study extends that work by providing a detailed country-level analysis of trade impacts, resilience patterns, and key determinants during the Covid-19 pandemic in the SADC region.

In doing so, the study advances several conceptual contributions. Firstly, it demonstrates the multidimensional nature of trade resilience, which is that resilience is not solely determined by economic structure, such as export diversification or factor endowments, but also depends on institutional, health, and policy capacities, including logistics performance, healthcare preparedness, and government interventions. Secondly, it highlights the conditional role of integration, which, unlike traditional trade theory, often treats integration as universally beneficial. The findings show, however, that integration can either amplify shocks or support recovery, depending on timing and domestic capacity. Thirdly, the study underscores the policy-trade nexus, showing that resilience is heavily shaped by government decisions, including the stringency and flexibility of lockdown measures, thereby extending trade theory into governance and crisis management. Finally, by situating these

findings within the SADC context, the study removes the analysis from Eurocentric frameworks, demonstrating that in low and middle income economies, structural vulnerabilities such as landlocked geography, fiscal constraints, and limited healthcare capacity are critical determinants of resilience outcomes.

5.4.3 Contribution to the empirical and fsQCA literature

This study makes several important contributions to the literature on the application of fuzzy-set qualitative comparative analysis (fsQCA) within the context of trade resilience. Firstly, by employing fsQCA, the study introduces a configurational perspective that moves beyond traditional linear or single-variable approaches. This methodological innovation highlights how multiple, context-dependent combinations of factors, such as logistics performance, healthcare preparedness, and government response, interact to facilitate resilience within the SADC region, providing a more nuanced understanding of the mechanisms that support or undermine trade continuity during crises.

Secondly, the inclusion of regional integration as a key determinant represents a novel contribution, as this factor has not been extensively considered in previous fsQCA studies on trade resilience. Its inclusion allowed the study to generate unique insights into how regional networks interact with domestic capacities to influence resilience outcomes, demonstrating that integration can either buffer or amplify the effects of external shocks depending on the broader context.

Thirdly, the study provides a comparative, month-by-month analysis during the initial phase of the Covid-19 trade shock, capturing short-term resilience dynamics that are often overlooked in studies relying on annual or aggregate data. This offers valuable insights into the evolution of resilience and highlights the importance of timing and sequence in policy and institutional responses.

Finally, the study's findings have significant practical implications for policymakers across the SADC region. By identifying specific configurations of conditions that strengthen resilience, the analysis provides actionable guidance for designing strategies capable of responding effectively to both immediate trade shocks and longer-term structural challenges. This configurational approach enhances the evidence base for policymaking, emphasising that trade resilience emerges from the interplay of multiple factors rather than from isolated interventions.

5.4 Research limitations

While this study aimed to provide meaningful insights into the impact of the Covid-19 pandemic on the trade resilience of the SADC countries, it is important to acknowledge the limitations that may have influenced its scope, interpretation, and findings. This section outlines the key methodological, data-related, and analytical challenges encountered during the research process.

5.4.1 Data limitations

During the course of the empirical analysis, various data limitations had to be addressed to ensure the accuracy of the results and their interpretation. Firstly, country-level data was not consistently available across all SADC members for the analysis period, which directly affected the assessment of the region's trade flows and resilience patterns. For example, UN Comtrade data for South Africa's imports and exports in December 2020 was missing, which directly influenced the trade resilience calculations. Similar gaps were present for several other SADC countries during different parts of the analysis period. Where possible, missing data was supplemented using interpolation.

Additionally, country-level data for several indicators used in the fsQCA analysis was unavailable for Comoros, Seychelles, and Eswatini. Consequently, these countries were excluded from the fsQCA analysis to preserve dataset integrity and ensure reliable results. Moreover, some indicators, such as logistics performance and healthcare preparedness, relied on index-based measures that are not updated annually, resulting in the use of static values for certain periods.

While every effort was made to mitigate the impact of these limitations, the inherent constraints of secondary data remain an important consideration when interpreting the findings of this study.

5.4.2 Scope, external validity and generalizability

One of the limitations of this study concerns its scope, which was focused on the trade resilience of the SADC region. While the study aimed to identify the determinants of trade resilience within the region, the analysis was limited to a specific set of factors, guided by existing literature and data availability. As a result, potentially influential variables, such as political stability or digital infrastructure, were omitted, which may have influenced the outcomes.

Additionally, the research was restricted to the SADC region and its member states, thereby limiting the broader applicability of the findings to other developing regions. Finally, the study concentrated exclusively on the disruption to trade caused by the Covid-19 pandemic. As such, the findings may not necessarily apply to other types of trade disruptions such as geopolitical conflicts, financial crises,

or climate-related disasters, which often exhibit different transmission mechanisms and impacts on trade. The unprecedented nature of the pandemic provided a unique opportunity to analyse trade flows and resilience in the face of such a large-scale shock. However, the results may not be transferable to smaller or qualitatively different disruptions or crises.

5.4.3 Researcher bias and interpretation

Another limitation concerns the potential for researcher bias in the selection and interpretation of data and analytical outcomes. As previously discussed, fsQCA is inherently subjective, particularly in procedures such as calibration and threshold determination. While care was taken to base these decisions on existing literature and established precedents, the subjective nature of the method still introduces the possibility of bias. Similarly, the interpretation of results may be influenced by theoretical orientation and underlying assumptions, thereby introducing subtle analytical bias.

5.5 Future research

While this study provides a foundational exploration of trade resilience in the SADC region during the Covid-19 pandemic, several avenues exist for future research. Firstly, future studies could expand the scope beyond SADC to examine other African regional economic communities (RECs) or emerging markets globally, allowing for comparative analyses that illuminate regional differences in resilience. Secondly, incorporating a broader set of variables may yield a more nuanced understanding of the complex and multidimensional nature of trade resilience. Thirdly, a longitudinal fsQCA approach could track how resilience and its determinants evolve over time, capturing periods before, during, and after a disruption to reveal how resilience develops, deteriorates, and stabilises. Fourthly, country-level case studies could provide richer insights into the specific drivers of resilience within individual economies. Finally, future research could undertake comparative analyses of different types of trade disruptions, for example, contrasting the 2008/2009 global financial crisis with the Covid-19 pandemic, to identify how the determinants of resilience vary across crises of different origins and characteristics. Additionally, as trade shocks increasingly arise from compounding factors such as climate change, geopolitical tensions, and digital disruptions, future studies could examine how resilience strategies adapt to overlapping and multifaceted crises across different regions.

5.6 Policy recommendations

The findings of this study highlight that trade resilience in the SADC region is shaped by a combination of structural, institutional, and contextual factors. Based on these insights, several policy measures can be proposed to enhance resilience and mitigate vulnerabilities exposed during the Covid-19 pandemic.

Strengthen export diversification

Countries heavily reliant on single commodities, such as Angola and Botswana, exhibited low trade resilience during the pandemic. Policymakers should prioritise strategies that promote diversification of export sectors, including value addition and the industrialisation of primary commodities, investment in emerging sectors such as manufacturing and digital services, and targeted support for small and medium-sized enterprises (SMEs) to expand production and access new markets.

Enhance logistics and infrastructure capacity

Robust logistics and infrastructure were critical determinants of resilience, as observed in South Africa and Tanzania. Governments should invest in modern transport networks, including roads, railways, and ports, and upgrade customs and border procedures to minimise delays during crises. The digitalisation of trade documentation and supply chain management can further improve efficiency and ensure continuity of trade under disruptive conditions.

Improve healthcare preparedness

Healthcare capacity emerged as a key factor affecting trade sustainability. Strengthening pandemic preparedness through robust testing, vaccination, and emergency response systems is essential. Cross-border coordination on health measures can help maintain trade continuity, while integrating public health considerations into broader trade and economic planning can enhance resilience during future health crises.

Promote flexible and context-sensitive policy interventions

Government responses, such as lockdowns, significantly influenced trade outcomes. Policies should be calibrated to balance public health protection with the maintenance of essential trade flows. Developing contingency plans that allow rapid adjustments, along with institutional capacity to coordinate cross-sectoral responses, will support timely and effective interventions during crises.

Strengthen regional integration and cooperation

Regional integration can either buffer or amplify external shocks depending on domestic capacities. Strengthening intra-SADC trade facilitation mechanisms, promoting regional stockpiling of essential

goods, and harmonising standards, tariffs, and border procedures can reduce dependency on extra-regional markets and enhance resilience during disruptions.

Build financial and fiscal resilience

Limited fiscal space constrained many countries' responses. Establishing trade contingency funds, fostering public-private partnerships for infrastructure investment, and strengthening macroeconomic frameworks to buffer external shocks can provide critical support during crises, ensuring countries can maintain trade flows even under severe disruptions.

Collectively, these recommendations emphasise a multidimensional approach to enhancing trade resilience, integrating structural diversification, institutional capacity building, regional cooperation, and adaptive policy measures to better prepare the SADC region for future external shocks.

5.7. Broader implications of the study

The findings of this study have important implications that extend beyond the SADC region, offering lessons for other developing regions facing similar structural vulnerabilities and exposure to global shocks. The multidimensional nature of trade resilience identified within the SADC context, encompassing economic diversification, logistics performance, healthcare preparedness, government policy, and regional integration, provides a holistic framework for other regions seeking to strengthen trade continuity during crises. Developing economies with narrow export bases, limited fiscal space, and constrained institutional capacity can draw lessons from the SADC experience by prioritising investments in infrastructure, healthcare systems, and mechanisms to diversify trade partners and commodities.

For global trade policymakers, the study underscores the importance of tailoring resilience strategies to local contexts rather than adopting one-size-fits-all approaches. The dual role of integration, revealed in the study, that global networks can simultaneously increase exposure to shocks and facilitate recovery, highlights the need for balanced, flexible trade policies that enable countries to adjust integration based on risk and domestic capacity. Furthermore, the SADC experience demonstrates the value of regional cooperation in mitigating external shocks through coordinated policies, shared logistics corridors, and intra-regional trade facilitation, which can buffer countries against global disruptions.

Finally, the study contributes to the broader discourse on trade resilience by showing that effective crisis management requires the interaction between structural foundations, adaptive policy responses, and regional and global networks. Policymakers worldwide can apply these insights to design resilience strategies that are proactive, context-specific, and capable of addressing both immediate shocks, such as pandemics or financial crises, and long-term structural challenges, such

as climate change, geopolitical tensions, or digital disruptions. In this sense, the SADC region serves as a valuable case study for understanding how developing regions can build sustainable and adaptive trade systems in an increasingly volatile global economy.

5.8 Concluding remarks

This study set out to analyse the impact of the Covid-19 pandemic on the trade flows and resilience of the SADC countries, while also identifying the configurations of determinants that shape trade resilience. By building on existing theoretical and empirical work, the study contributes to the broader literature on trade resilience, with a particular focus on the African regional context, which has historically been underrepresented in research.

The findings highlight the unprecedented impact of the Covid-19 pandemic on the SADC region, leading to a significant decline in trade flows across member states. The effects revealed substantial variation in the capacities of member countries to withstand and recover from the pandemic-induced shock. Economies with more diversified trade portfolios, such as South Africa and Tanzania, exhibited comparatively greater robustness and recovery potential, whereas countries with limited export bases displayed weaker resilience. This uneven performance underscores the persistent structural and institutional differences within the region.

Results from the fsQCA analysis confirmed that no single determinant alone was sufficient to ensure trade resilience. Rather, resilience emerged from specific combinations of factors, highlighting the context-dependent nature of trade stability. The analysis identified several significant pathways influencing both the presence and absence of trade resilience during the pandemic. These pathways demonstrate that trade resilience depends not only on inherent domestic capacities but also on broader external factors, whose influence varies across contexts. Importantly, the inclusion of regional integration as a variable revealed that deeper regional interconnectedness affected resilience differently depending on the country and situation.

From a policy perspective, the results emphasise the need for SADC members to design and implement comprehensive resilience strategies that extend beyond short-term crisis management to address long-term structural vulnerabilities. Strengthening domestic infrastructure, including logistics and healthcare systems, promoting diversified trade portfolios, and enhancing regional cooperation are essential steps toward ensuring robust and sustainable trade systems. These areas should serve as foundational priorities for building resilient regional trade networks.

While this study provides critical insights into the trade resilience of the SADC region, it also lays the groundwork for further research on resilience in African trade systems. Future studies could examine resilience within the context of other global shocks, such as climate change, geopolitical instability,

and energy crises, which increasingly threaten trade networks. Additionally, research focused on the nuances of regional trade during major crises could offer invaluable guidance for policymakers seeking to enhance intra-regional economic stability.

The SADC experience demonstrates that trade resilience in developing regions depends on a combination of structural diversification, institutional capacity, and adaptive policy responses, highlighting the critical role of regional cooperation in buffering against global shocks. For global trade policymakers, this underscores the importance of context-specific strategies that balance integration with domestic capacity to sustain trade during crises.

In conclusion, the Covid-19 pandemic has underscored the vital importance of trade resilience for the SADC region. By identifying both vulnerabilities and the factors that contribute to resilience, this dissertation provides actionable lessons for policymakers, researchers, and regional stakeholders. Building resilient trade systems is not only essential for withstanding future crises but also for supporting inclusive and sustainable long-term growth.

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Appendix A

Table A-1: Total Annual Inter-regional SADC Trade per Country (US$) 2015-2022

	2015	2016	2017	2018	2019	2020	2021	2022
AGO	$ 52 854 869 360,16	$ 40 114 434 902,70	$ 48 021 949 153,46	$ 54 614 622 318,65	$ 48 289 622 283,19	$ 30 693 110 051,48	$ 44 279 291 887,58	$ 67 501 336 603,93
BWA	$ 5 948 709 443,11	$ 6 721 667 595,00	$ 6 587 123 408,51	$ 7 504 090 818,51	$ 6 579 419 280,04	$ 5 797 581 231,09	$ 9 800 673 729,52	$ 9 534 172 966,88
COM	$ 211 302 907,25	$ 204 780 887,24	$ 262 172 682,06	$ 233 043 437,03	$ 231 050 380,99	$ 232 358 047,10	$ 331 784 896,85	$ -
COD	$ 7 879 383 365,51	$ 6 336 179 263,14	$ 9 239 489 345,58	$ 13 244 869 522,96	$ 13 980 514 940,95	$ 15 294 556 716,94	$ 20 668 804 677,31	$ 20 961 704 070,10
LSO	$ 767 061 214,88	$ 607 062 293,05	$ 1 947 664 395,38	$ 986 590 099,42	$ 931 072 531,07	$ 868 893 117,64	$ 894 872 904,08	$ 755 721 176,64
MDG	$ 4 617 373 162,56	$ 4 775 555 921,07	$ 6 093 278 791,41	$ 6 531 099 580,81	$ 6 029 377 996,26	$ 4 797 643 028,39	$ 6 528 431 481,01	$ 8 565 918 964,36
MWI	$ 2 301 706 928,99	$ 2 274 081 829,64	$ 2 528 601 366,40	$ 2 619 754 110,44	$ 2 882 535 025,70	$ 2 432 101 629,21	$ 3 020 705 335,93	$ 1 886 332 994,36
MUS	$ 6 079 609 032,00	$ 5 938 223 723,86	$ 6 349 195 262,12	$ 6 587 164 046,96	$ 6 486 622 950,50	$ 5 017 296 632,25	$ 5 886 184 395,24	$ 7 266 398 319,12
MOZ	$ 7 671 859 420,61	$ 6 044 269 963,95	$ 7 627 952 034,55	$ 9 572 467 482,81	$ 8 974 089 735,40	$ 6 943 537 483,68	$ 10 409 606 244,61	$ 18 648 165 053,96
NAM	$ 4 295 571 258,00	$ 4 891 003 596,00	$ 5 291 176 193,49	$ 8 077 970 745,44	$ 5 364 643 547,34	$ 4 589 195 628,88	$ 5 600 750 536,07	$ 7 657 937 665,76
SYC	$ 1 304 210 157,14	$ 1 866 545 324,94	$ 6 470 259 906,62	$ 2 451 069 372,58	$ 2 127 484 178,32	$ 2 916 278 395,22	$ 2 084 757 463,63	$ 2 564 348 309,75
ZAF	$ 139 227 713 898,88	$ 126 819 855 255,28	$ 144 903 696 563,34	$ 158 174 196 278,51	$ 150 830 933 004,25	$ 132 847 533 273,37	$ 185 649 277 289,47	$ 199 906 222 838,44
ZWE	$ 3 843 023 557,64	$ 3 268 215 144,93	$ 3 328 695 260,95	$ 4 764 646 455,26	$ 4 187 596 475,86	$ 3 820 466 857,56	$ 5 997 735 042,73	$ 7 490 812 832,40
SWZ	$ 699 482 424,34	$ 659 295 960,98	$ 648 130 237,24	$ 744 349 419,59	$ 838 456 570,19	$ 832 861 525,71	$ 913 680 921,80	$ 865 659 314,77
TZA	$ 18 675 091 160,00	$ 10 812 449 520,00	$ 10 284 172 798,12	$ 10 670 733 815,93	$ 12 133 474 943,51	$ 12 663 283 876,49	$ 15 304 496 081,91	$ 20 256 678 439,83
ZMB	$ 8 926 945 976,18	$ 8 281 490 259,62	$ 10 407 345 577,01	$ 11 937 331 323,76	$ 9 457 857 560,15	$ 9 377 882 122,15	$ 12 997 175 968,47	$ 13 914 433 403,00

Table A-2: Total Annual Intra-regional SADC Trade per Country (US$) 2015-2022

	2015	2016	2017	2018	2019	2020	2021	2022
AGO	$ 2 619 324 648,66	$ 2 290 775 117,49	$ 2 345 245 434,14	$ 2 057 007 075,38	$ 1 104 473 001,41	$ 779 321 130,54	$ 1 571 797 989,95	$ 1 576 550 349,66
BWA	$ 8 429 044 230,03	$ 6 701 759 806,00	$ 4 715 083 155,01	$ 5 674 186 989,17	$ 5 390 918 335,95	$ 5 184 016 610,01	$ 6 136 987 174,67	$ 6 995 555 175,70
COM	$ 19 047 306,74	$ 23 316 914,76	$ 17 228 477,21	$ 21 784 235,01	$ 21 497 770,82	$ 17 913 328,96	$ 28 924 049,93	$ -
COD	$ 8 873 680 785,23	$ 6 348 451 648,00	$ 8 859 326 874,78	$ 14 689 808 095,84	$ 8 226 586 167,69	$ 5 873 732 671,16	$ 7 957 623 058,67	$ 6 117 309 036,58
LSO	$ 1 260 096 582,77	$ 1 412 814 539,91	$ 435 184 581,05	$ 1 520 412 522,08	$ 1 553 319 942,35	$ 1 248 994 569,22	$ 1 721 610 983,04	$ 2 013 371 947,76
MDG	$ 445 358 430,74	$ 459 885 514,28	$ 534 314 189,82	$ 662 879 329,33	$ 588 606 158,63	$ 440 936 713,67	$ 668 291 169,50	$ 768 222 348,06
MWI	$ 1 039 829 546,35	$ 1 002 275 253,51	$ 861 421 645,52	$ 904 274 731,76	$ 908 744 505,71	$ 1 017 724 306,11	$ 1 061 990 851,16	$ 599 672 311,12
MUS	$ 859 825 185,00	$ 913 518 732,75	$ 1 022 910 890,66	$ 1 069 835 738,09	$ 990 929 931,08	$ 750 166 598,30	$ 932 839 106,25	$ 1 231 445 017,83
MOZ	$ 3 466 505 859,94	$ 2 603 151 855,04	$ 2 868 239 749,40	$ 4 193 807 135,40	$ 3 511 581 903,90	$ 3 290 479 647,25	$ 4 052 961 115,42	$ 4 321 693 499,53
NAM	$ 8 029 877 544,00	$ 6 645 886 339,00	$ 6 716 387 585,79	$ 7 699 265 396,16	$ 5 574 701 306,95	$ 4 316 585 875,23	$ 5 193 536 829,69	$ 5 965 885 372,25
SYC	$ 148 139 810,19	$ 150 176 890,73	$ 142 848 452,87	$ 144 152 792,02	$ 134 602 363,35	$ 89 802 849,74	$ 397 303 314,32	$ 160 262 999,22
ZAF	$ 26 075 183 311,31	$ 24 241 877 516,54	$ 26 416 403 100,75	$ 28 140 199 956,70	$ 26 602 546 257,64	$ 21 322 389 764,53	$ 29 111 564 928,03	$ 33 590 381 708,96
ZWE	$ 5 620 498 730,15	$ 5 408 572 687,83	$ 5 113 789 319,96	$ 5 722 822 417,22	$ 4 879 233 852,32	$ 6 206 256 385,97	$ 7 579 819 448,31	$ 7 699 105 253,99
SWZ	$ 2 629 425 857,94	$ 2 593 605 653,63	$ 2 764 654 864,50	$ 2 955 628 039,68	$ 2 995 615 828,80	$ 2 524 525 743,29	$ 3 277 646 773,52	$ 3 248 729 654,77
TZA	$ 1 885 108 094,00	$ 1 805 561 665,00	$ 1 659 347 506,65	$ 1 552 155 646,75	$ 1 924 960 973,12	$ 1 929 649 658,94	$ 1 959 630 938,37	$ 2 222 614 944,36
ZMB	$ 5 570 658 288,19	$ 5 385 583 886,05	$ 5 622 981 297,50	$ 6 580 046 790,08	$ 4 754 769 483,70	$ 3 832 012 349,93	$ 4 997 375 339,54	$ 6 732 255 012,95

Table A-3: Trade resilience scores per country (Jan 2020 – Dec 2020)

Country	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
AGO	-31,65	-18,30	-46,86	-51,77	-56,78	-40,96	-37,02	-29,33	-31,25	-33,10	-30,03	-27,77
BWA	7,39	-6,23	-19,84	-88,62	-40,82	-28,58	-10,10	-7,78	57,01	60,28	3,46	12,44
COD	2,29	-6,01	-16,73	-17,78	-24,54	-6,79	-47,88	-3,60	5,75	-6,32	-4,35	13,09
LSO	16,45	2,14	0,37	-81,54	-30,75	-15,60	-24,68	2,58	-12,72	2,14	-37,39	28,90
MDG	-9,50	8,01	-16,75	-39,53	-18,11	-17,71	-35,21	-18,32	-21,01	-36,32	-18,97	-24,23
MWI	3,56	-4,93	29,14	-22,37	-34,28	0,31	-5,83	2,71	-26,85	-10,82	1,70	-21,06
MUS	-7,06	1,74	-30,03	-48,64	-46,05	47,15	-27,11	-22,61	-18,88	-11,84	-19,15	-12,59
MOZ	7,53	-2,10	0,80	-28,12	-37,13	-18,33	-32,32	-27,43	-16,79	-27,69	-18,13	-8,74
NAM	-13,14	-1,85	-31,71	-60,18	-37,28	-25,33	-25,12	-7,66	4,37	0,58	-1,32	1,74
SYC	-54,17	289,27	-7,03	29,67	-33,35	14,41	9,66	6,60	-52,46	32,58	-12,45	323,05
ZAF	3,75	-2,50	-11,04	-48,98	-32,62	-25,04	-24,06	-17,31	-2,31	-2,09	0,49	14,86
TZA	47,40	-6,26	7,92	0,74	-1,83	-4,12	17,91	-5,56	-1,60	-11,52	4,73	11,82
ZMB	-24,27	-8,16	-15,68	-31,96	-24,43	-23,77	-1,33	-5,03	29,07	4,51	5,47	11,86
ZWE	18,83	8,70	15,57	-37,95	-13,78	6,90	-2,97	7,38	6,06	0,81	16,51	9,57

Table A-4: Sufficient configurations for the presence of trade resilience: Intermediate solutions

Month	Solution configuration	raw coverage	unique coverage	consistency
March	~DEATHS*LPI*GHS*~GNI	0.306291	0	0.920398
	~DEATHS*LPI*GHS*~EGLOB	0.309603	0.0033112	0.949238
	~GOVR*LPI*GHS*EGLOB*SGLOB*GNI*ARII	0.375828	0.304636	0.949791
April	~DEATHS*~SGLOB*~ARII	0.213213	0	0.940397
	~GOVR*~DEATHS*~ARII	0.214715	0	0.953333
	LPI*GHS*~SGLOB*~ARII	0.471471	0.0975977	0.850949
	~GOVR*LPI*GHS*~ARII	0.391892	0.0165166	0.84466
May	LPI*GHS*~EGLOB	0.669368	0.669368	0.75365
June	~GOVR*~DEATHS*~EGLOB	0.211246	0.132219	0.952055
	LPI*GHS*~EGLOB*SGLOB*GNI	0.352584	0.101824	0.846715
	GOVR*LPI*GHS*~EGLOB*GNI*ARII	0.316109	0.0714286	0.87395
July	GOVR*LPI*GHS*~GNI	0.269355	0	0.81068
	GOVR*LPI*GHS*~SGLOB	0.291935	0.0145162	0.617747
	~GOVR*LPI*GHS*EGLOB*SGLOB*GNI*ARII	0.348387	0.253226	0.802974

Key: GOVR: Government response; DEATHS: Monthly Covid-19 related deaths; LPI: Logistics performance; GHS: Healthcare preparedness; GNI: Gross national income; EGLOB: Economic globalization; SGLOB: Social globalization; ARII: Regional integration; "~" indicates the negation of the factor (e.g., ~GOVR indicates "Not stringent government response")

[1] Raw Coverage indicates how much of the outcome is explained by the configuration

[2] Unique Coverage indicates how much of the outcome is explained only by the specific configuration

[3] Consistency indicates how often the configuration sufficiently leads to the outcome (>0.80 indicate sufficiency)

Table A-5: Sufficient configurations for the absence of trade resilience: Intermediate solutions

Month	Solution configuration	raw coverage	unique coverage	consistency
March	GOVR*DEATHS*~ARII	0.353448	0.12069	0.766355
	GOVR*DEATHS*EGLOB	0.382184	0.25	0.818461
	DEATHS*~EGLOB*~SGLOB*GNI	0.283046	0.0804597	0.817427
	EGLOB*~SGLOB*GNI*~ARII	0.175287	0.0833333	0.743902
	~LPI*~GHS*~EGLOB*~SGLOB*~GNI*~ARII	0.114943	0.0517241	0.808081
April	~DEATHS*EGLOB	0.225552	0.0520505	0.888199
	~GOVR*EGLOB*SGLOB	0.25552	0.044164	0.743119
	~GOVR*EGLOB*ARII	0.206625	0	0.642157
May	GOVR*~DEATHS*EGLOB	0.291362	0.263543	0.908676
	~LPI*~GHS*~EGLOB*~SGLOB*~GNI*~ARII	0.122987	0.0951684	0.848485
June	GOVR*DEATHS*EGLOB	0.311527	0.20405	0.766284
	DEATHS*EGLOB*~SGLOB*~ARII	0.186916	0.0794393	0.722892
July	~GOVR*DEATHS*~SGLOB*~ARII	0.325	0	0.995496
	~GOVR1DEATHS*~EGLOB*~SGLOB	0.280882	0.0235294	0.931707
	DEATHS*~SGLOB*GNI*~ARII	0.366176	0.0029411	0.996
	DEATHS*~EGLOB*~SGLOB*GNI	0.295588	0	0.934884

Key: GOVR: Government response; DEATHS: Monthly Covid-19 related deaths; LPI: Logistics performance; GHS: Healthcare preparedness; GNI: Gross national income; EGLOB: Economic globalization; SGLOB: Social globalization; ARII: Regional integration; "~" indicates the negation of the factor (e.g., ~GOVR indicates "Not stringent government response")

[1] Raw Coverage indicates how much of the outcome is explained by the configuration

[2] Unique Coverage indicates how much of the outcome is explained only by the specific configuration

[3] Consistency indicates how often the configuration sufficiently leads to the outcome (>0.80 indicate sufficiency)

Table A-6: Sufficient configurations for the presence of trade resilience: Complex solutions

Month	Solution configuration	Raw coverage	Unique coverage	Consistency
March	~GOVR*~DEATHS*LPI*GHS*~EGLOB*~SGLOB*~GNI*~ARII	0.208609	0.150662	0.976744
	~GOVR*DEATHS*LPI*GHS*EGLOB*SGLOB*GNI*ARII	0.375828	0.317881	0.965957
April	~GOVR*~DEATHS*~LPI*~GHS*~EGLOB*~SGLOB*~GNI*~ARII	0.141141	0.0975976	1
	~GOVR*DEATHS*LPI*GHS*~EGLOB*~SGLOB*~GNI*~ARII	0.285285	0.162162	0.989583
	~GOVR*DEATHS*LPI*GHS*EGLOB*~SGLOB*GNI*~ARII	0.187688	0.0795796	0.892857
May	GOVR*~DEATHS*EGLOB	0.291362	0.263543	0.90867
	~LPI*~GHS*~EGLOB*~SGLOB*G~GNI*~ARII	0.122987	0.0951684	0.848485
June	~GOVR*~DEATHS*~LPI*~GHS*~EGLOB*~SGLOB*~GNI*~ARII	0.12766	0.107903	0.965517
	~GOVR*DEATHS*LPI*GHS*~EGLOB*SGLOB*GNI*~ARII	0.258359	0.100304	0.817308
	GOVR*DEATHS*LPI*GHS*~EGLOB*~SGLOB*GNI*ARII	0.284194	0.12614	0.882076
July	GOVR*DEATHS*LPI*GHS*~EGLOB*~SGLOB*~GNI*~ARII	0.25	0.172581	0.824468
	~GOVR*DEATHS*LPI*GHS*EGLOB*SGLOB*GNI*ARII	0.348387	0.270968	0.802974

[1] the negation of GOVR (i.e. ~GOVR) is present in nearly all configurations suggesting that weaker or delayed government responses were often linked with resilient trade outcomes.

[2] recurring conditions such as GHS (strong health systems); LPI (logistics performance); and GNI (national income) suggests these may be core factors in trade resilience, especially when combined with global integration (EGLOB, SGLOB) in later months.

Table A-7: Sufficient configurations for the presence of trade resilience: Parsimonious solutions

Month	Solution configuration	Raw coverage	Unique coverage	Consistency
March	LPI*~GNI	0.410596	0	0.928839
	GHS*~GNI	0.460265	0	0.936027
	~GOVR*SGLOB	0.43543	0.0198675	0.724518
	~DEATHS*LPI*~EGLOB	0.309603	0	0.949238
	~DEATHS*GHS*~EGLOB	0.359271	0	0.955947
	~GOVR*DEATHS*EGLOB	0.407285	0	0.907749
	~GOVR*EGLOB*ARII	0.399007	0	0.892593
	LPI*~EGLOB*~SGLOB*~ARII	0.438742	0	0.920139
	~GOVR*LPI*~EGLOB*~ARII	0.293046	0	0.889447
	GHS*~EGLOB*~SGLOB*~ARII	0.47351	0	0.925566
	~GOVR*GHS*~EGLOB*~ARII	0.31457	0	0.896226
April	~SGLOB*~ARII	0.603604	0.105105	0.853503
	~GOVR*~ARII	0.516516	0.018018	0.811321
May	DEATHS*~SGLOB	0.528363	0	0.739229
	DEATHS*~EGLOB	0.65154	0	0.862661
	LPI*~SGLOB	0.529984	0	0.726667
	LPI*~EGLOB	0.669368	0	0.75365
	GHS*~SGLOB	0.568882	0	0.706237
	GHS*~EGLOB	0.708266	0	0.727121
June	~GOVR*~EGLOB	0.503039	0.120061	0.873351
	~EGLOB*GNI	0.521277	0.138298	0.765625
July	GOVR*~GNI	0.269355	0	0.726087
	GOVR*~SGLOB	0.291935	0	0.563863
	DEATHS*~GNI	0.274194	0	0.569491
	LPI*~GNI	0.283871	0	0.659176
	GHS*~GNI	0.3	0	0.626263
	~GOVR*SGLOB	0.540323	0.106452	0.780886
	~GOVR*EGLOB*ARII	0.395161	0	0.822148
	DEATHS*~EGLOB*~SGLOB**~ARII	0.301613	0	0.638225
	LPI*~EGLOB*~SGLOB*~ARII	0.31129	0	0.670139

	GHS*~EGLOB*~SGLOB*~ARII	0.327419	0	0.656958

[1] in early months (March) resilience seems to have been driven by less severe economic conditions i.e. the absence of DEATHS and GOVR, and sufficient internal capacity (e.g., good health systems and logistics performance)

[2] the March configuration ~DEATHS*GHS*~EGLOB recorded the highest consistency indicating that this combination was sufficient for trade resilience in nearly all the cases where it appeared. Despite no unique coverage (overlap with other solutions) it shows that strong health systems and lower exposure to the pandemic helped countries weather the trade disruption.

Table A-8: Sufficient configurations for the absence of trade resilience: Complex solutions

Month	Solution configuration	Raw coverage	Unique coverage	Consistency
March	~GOVR*~DEATHS*~LPI*~GHS*~EGLOB*~SGLOB*~GNI*~ARII	0.114943	0.0818965	0.851064
	~GOVR*~DEATHS*LPI*GHS*EGLOB*~SGLOB*GNI*~ARII	0.150862	0.0833333	0.963303
	~GOVR*DEATHS*LPI*GHS*~EGLOB*~SGLOB*GNI*ARII	0.16954	0.0962643	0.819444
	GOVR*DEATHS*LPI*GHS*~EGLOB*SGLOB*GNI*~ARII	0.25	0.176724	0.865672
	GOVR*DEATHS*LPI*GHS*EGLOB*SGLOB*GNI*ARII	0.320402	0.25431	0.906504
April	~GOVR*~DEATHS*LPI*GHS*EGLOB*SGLOB*GNI*ARII	0.16877	0.16877	0.946903
May	~GOVR*~DEATHS*~LPI*~GHS*~EGLOB*~SGLOB*~GNI*~ARII	0.115666	0.0951683	0.840425
	GOVR*~DEATHS*LPI*GHS*EGLOB*SGLOB*GNI*ARII	0.278184	0.257687	0.904762
June	~GOVR*DEATHS*LPI*GHS*EGLOB*~SGLOB*GNI*~ARII	0.182243	0.0794393	0.841727
	GOVR*DEATHS*LPI*GHS*EGLOB*SGLOB*GNI*ARII	0.29595	0.193146	0.92233
July	~GOVR*DEATHS*LPI*GHS*EGLOB*~SGLOB*GNI*~ARII	0.2	0.0970588	0.992701
	~GOVR*DEATHS*LPI*GHS*~EGLOB*~SGLOB*GNI*ARII	0.217647	0.114706	0.91358

[1] the negation of GOVR (i.e. ~GOVR) is present in nearly all configurations suggesting that weaker or delayed government responses were often linked with resilient trade outcomes.

[2] recurring conditions such as GHS (strong health systems); LPI (logistics performance); and GNI (national income) suggests these may be core factors in trade resilience, especially when combined with global integration (EGLOB, SGLOB) in later months.

Table A-9: Sufficient configurations for the absence of trade resilience: Parsimonious solutions

Month	Solution configuration	Raw coverage	Unique coverage	Consistency
March	GOVR	0.619253	0.393678	0.669255
	~SGLOB*GNI	0.385057	0.130747	0.858974
	~GHS	0.232759	0.0560344	0.81407
	~LPI	0.227012	0	0.714932
April	~DEATHS*LPI	0.250789	0	0.913793
	~DEATHS*GHS	0.266561	0	0.889474
	~DEATHS*EGLOB	0.225552	0	0.888199
	~DEATHS*SGLOB	0.231861	0	0.880239
	~GOVR*SGLOB	0.321766	0.102524	0.784615
	~DEATHS*GNI	0.260252	0.0015773	0.846154
	~DEATHS*ARII	0.239748		0.883721
	~GOVR*EGLOB*ARII	0.206625		0.642157
May	GOVR*~DEATHS	0.440703	0.0922402	0.909366
	~GHS	0.250366	0	0.859297
	~LPI	0.243045	0	0.751131
	~DEATHS*~ARII	0.434846	0	0.813699
	~DEATHS*~GNI	0.178624	0	0.757764
	~DEATHS*~SGLOB	0.317716	0	0.791971
	~DEATHS*~EGLOB	0.34407	0	0.753205
	~GOVR*~ARII	0.459736	0.0600293	0.708804
	~GOVR*~GNI	0.244509	0	0.729258
June	EGLOB*~ARII	0.297508	0.0327103	0.805907
	EGLOB*~SGLOB	0.194704	0	0.722543
	GOVR*EGLOB	0.319315	0	0.764925
	GOVR*SGLOB	0.383178	0.0093457	0.789701
	~GOVR*DEATHS*~SGLOB	0.242991	0	0.699552
	~GOVR*LPI*~SGLOB	0.252336	0	0.707424
	~GOVR*GHS*~SGLOB	0.258567	0	0.694561
	~SGLOB*GNI*~ARII	0.26324	0.0031152	0.605735
	~GOVR*~SGLOB*GNI	0.258567	0	0.709402
July	~SGLOB*GNI	0.438235	0.1	0.955128

~GOVR*DEATHS*~SGLOB	0.377941	0	0.94834
~GOVR*LPI*~SGLOB	0.386765	0	0.949459
~GOVR*GHS*~SGLOB	0.401471	0	0.95122

[1] in early months (March) resilience seems to have been driven by less severe economic conditions i.e. the absence of DEATHS and GOVR, and sufficient internal capacity (e.g., good health systems and logistics performance)

[2] the March configuration ~DEATHS*GHS*~EGLOB recorded the highest consistency indicating that this combination was sufficient for trade resilience in nearly all the cases where it appeared. Despite no unique coverage (overlap with other solutions) it shows that strong health systems and lower exposure to the pandemic helped countries weather the trade disruption.

Table A-10: Truth Table for March

GOVR	DEATHS	LPI	GHS	EGLOB	SGLOB	GNI	ARII	n	TRES	RAW consistency	PRI consistency
0	0	1	1	0	0	0	0	1	1	0.976744	0.958333
0	1	1	1	1	1	1	1	2	1	0.965957	0.930435
0	0	0	0	0	0	0	0	1	0	0.659574	0.111111
0	1	1	1	0	0	1	1	1	0	0.631945	0.329114
1	1	1	1	0	1	1	0	1	0	0.562189	0.153846
1	1	1	1	1	1	1	1	2	0	0.434959	0.141975
0	0	1	1	1	0	1	0	1	0	0.422018	0.0597014

Table A-11: Truth Table for April

GOVR	DEATHS	LPI	GHS	EGLOB	SGLOB	GNI	ARII	n	TRES	RAW consistency	PRI consistency
0	0	0	0	0	0	0	0	1	1	1	1
0	1	1	1	0	0	0	0	1	1	0.989583	0.985075
0	1	1	1	1	0	1	0	1	1	0.892857	0.7
0	1	1	1	0	0	1	1	1	0	0.646342	0.46789
1	1	1	1	0	1	1	0	1	0	0.633803	0.1875
1	1	1	1	1	1	1	1	3	0	0.568421	0.33871
0	0	1	1	1	1	1	1	1	0	0.548673	0.105263

Table A-12: Truth Table for May

GOVR	DEATHS	LPI	GHS	EGLOB	SGLOB	GNI	ARII	n	TRES	RAW consistency	PRI consistency
0	1	1	1	0	0	0	0	1	0	0.570588	0
0	1	1	1	1	1	1	1	3	0	0.451852	0.317972
0	1	1	1	1	0	1	0	1	0	0.422819	0
0	1	1	1	0	0	1	1	1	0	0.420732	0
0	1	0	0	0	0	0	0	1	0	0.272727	0
1	1	1	1	0	1	1	0	1	0	0.193878	0
1	1	1	1	1	1	1	1	2	0	0.185714	0

Table A-13: Truth Table for June

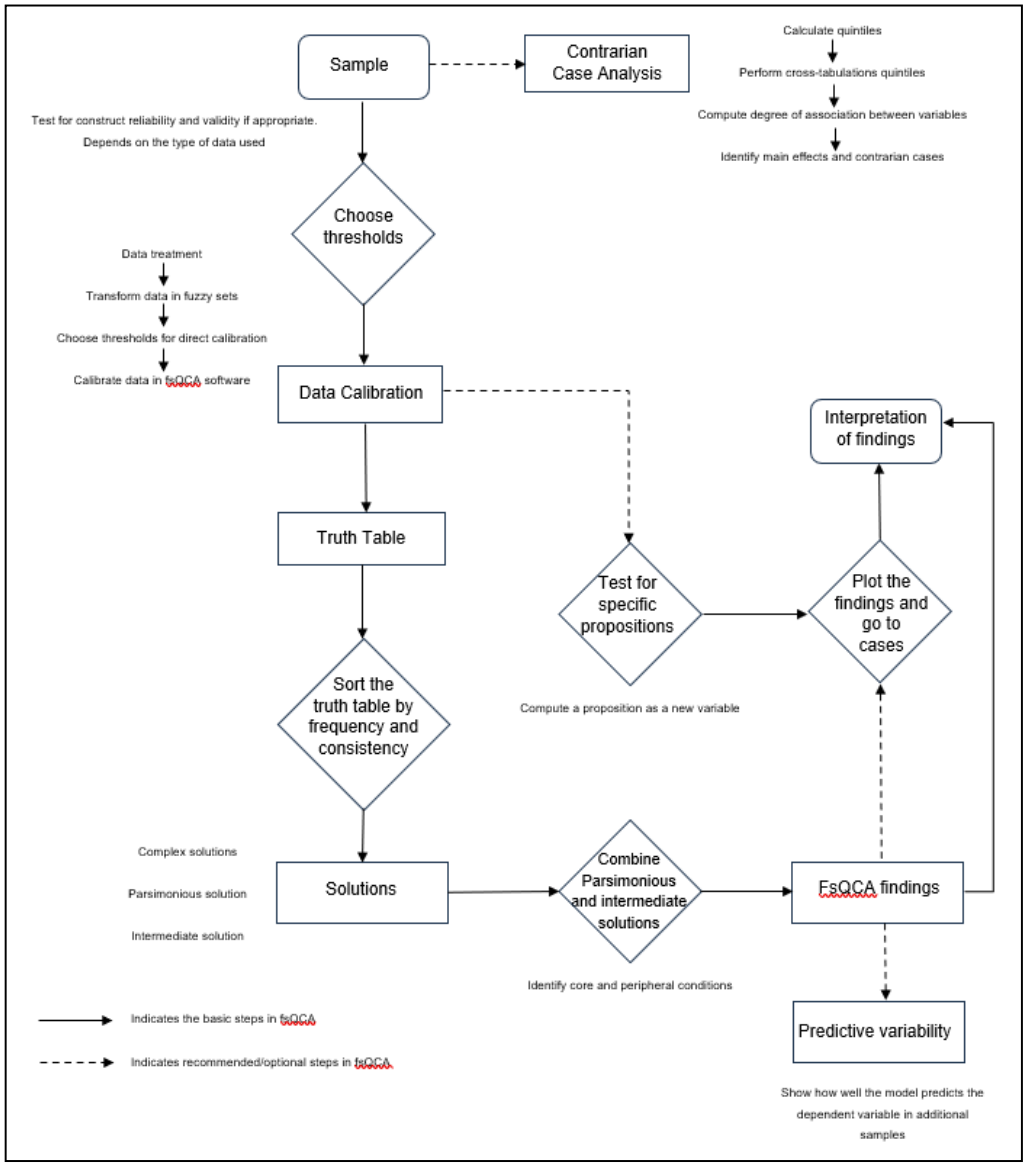
GOVR	DEATHS	LPI	GHS	EGLOB	SGLOB	GNI	ARII	n	TRES	RAW consistency	PRI consistency
0	0	0	0	0	0	0	0	1	1	0.965517	0.953125
1	1	1	1	0	0	1	1	1	1	0.882076	0.782609
0	1	1	1	0	1	1	0	1	1	0.817308	0.441177
1	1	1	1	0	0	0	0	1	0	0.64878	0.552795
0	1	1	1	1	1	1	1	3	0	0.621951	0.423256
0	1	1	1	1	0	1	0	1	0	0.517986	0.247191
1	1	1	1	1	1	1	1	1	0	0.470874	0.128

Table A-14: Truth Table for July

GOVR	DEATHS	LPI	GHS	EGLOB	SGLOB	GNI	ARII	n	TRES	RAW consistency	PRI consistency
1	1	1	1	0	0	0	0	1	1	0.824468	0.507463
0	1	1	1	1	1	1	1	2	1	0.802974	0.751174
1	1	1	1	0	1	1	0	1	0	0.736559	0.546296
0	1	1	1	0	0	1	1	1	0	0.722222	0.0425532
0	0	0	0	0	0	0	0	1	0	0.697674	0
1	1	1	1	1	1	1	1	2	0	0.525692	0.390863
0	1	1	1	1	0	1	0	1	0	0.459854	0.0133333

Appendix B

Figure B-1: Basic steps in fsQCA



Source: Constructed by author – adapted from Pappas & Woodside (2021)

Table B-1: Descriptive statistics

Outcome/ Conditions	Original measures	Month	Mean	Std. Dev	Min	Max	N.
TRES	Year-on-year monthly % change in total trade volume (Jan 2020 to Dec 2020)	March	-46.86	20.78	-46.86	29.14	13
		April	-42.82	24.77	-88.62	0.74	
		May	-30.65	14.36	-56.78	-1.83	
		June	-11.68	21.95	-40.96	47.15	
		July	-19.67	18.12	-47.88	17.91	
LPI	Logistics Performance Index	-	2.05	0.33	2.05	3.38	13
GNI	GNI per capita in USD	-	2110	3662.804	490	12440	13
GOVR	Oxford Covid-19 Government response Tracker (OXCGRT) Stringency Index	March	25.20	18.48	47.22	91.67	13
		April	74.61	12.95	52.78	90.74	
		May	67.74	14.17	41.67	87.96	
		June	61.01	17.08	28.70	80.56	
		July	59.30	17.82	22.22	80.56	
DEATHS	Number of monthly Covid-19 related deaths	March	0	0.78	0	2	13
		April	25.08	61.84	0	216	
		May	48.54	153.21	0	557	
		June	319.46	1104.62	0	3995	
		July	387.56	1237.56	0	4503	
EGLOB	KOF Economic Globalization Index	-	44.51	13.08	34.72	82.68	13
SGLOB	KOF Social Globalization Index	-	33.60	14.58	26.87	74.97	13
GHS	Global Health Security Index	-	25.20	10.83	11.80	54.80	13
ARII	African Regional Integration Index	-	0.23	0.12	0.12	0.67	13

Table B-2: Pairwise correlation of raw measures in the analysis

Measures	1	2	3	4	5	6	7	8	9
1.TRES	1								
2.SGLOB	-0.004	1							
3.LPI	0.012	0.561***	1						
4.GOVR	-0.381***	-0.024	-0.117	1					
5.GNI	-0.061	0.916***	0.506***	-0.072	1				
6.GHS	-0.033	0.496***	0.581***	0.043	0.407***	1			
7.EGLOB	-0.151*	0.687***	0.318***	-0.074	0.720***	0.169**	1		
8.DEATHS	-0.163**	0.247***	0.510***	0.135*	0.176**	0.434***	0.055	1	
9.ARII	-0.036	0.575***	0.715***	0.096	0.401***	0.762***	0.379***	0.557***	1

Notes: *p<0.10, **p<0.05, ***p<0.01

Table B-3: Calibration details

Outcome/ Conditions	Original measures	Corresponding fuzzy set	Method of calibration	Anchors [1]
TRES	Year-on-year monthly % change in total trade volume (Jan 2020 to Dec 2020)	The set of countries that exhibited above average trade resilience during the pandemic	Direct (based on distributional properties) [2]	e.g. April: Excl. -58.498 Cross. -37.95 Incl. -3.26
LPI	Logistics Performance Index	The set of countries with high logistics performance	Direct (using World Bank set thresholds for 'level of logistics friendliness')	e.g. April: Excl. 2.38 Cross. 2.88 Incl. 3.41
GNI	GNI per capita	The set of high-income countries	Direct (using World Bank set thresholds defining income levels)	e.g. April: Excl. 1036 Cross. 4045 Incl. 12535
GOVR	Oxford Covid-19 Government response Tracker (OXCGRT) Stringency Index	The set of countries that exhibited above average government response	Direct (based on distributional properties) [2]	e.g. April: Excl. 57.222 Cross. 78.7 Incl. 87.96
DEATHS	Number of monthly Covid-19 related deaths	The set of countries that experienced an above average distribution impact	Direct (based on distributional properties) [2]	e.g. April: Excl. 0.01 Cross. 25.08 Incl. 111.20
EGLOB	KOF Economic Globalization Index	The set of economically globalized countries	Direct (based on precedence) [3]	e.g. April: Excl. 37.32 Cross. 52.69 Incl. 55.30
SGLOB	KOF Social Globalization Index	The set of socially globalized countries	Direct (based on precedence) [3]	e.g. April: Excl. 33.60 Cross. 44.81 Incl. 62.03
GHS	Global Health Security Index	The set of countries with well-prepared health systems	Direct (using ghsindex.org thresholds for level of preparedness)	e.g. April: Excl. 33.50 Cross. 40.20 Incl. 66.50
ARII	African Regional Integration Index	The set of countries that have above average regional integration	Direct (based on distributional properties) [2]	e.g. April: Excl. 0.23 Cross. 0.32 Incl. 0.42

[1] Incl. indicates the anchor of full membership, Cross. the point of maximum ambiguity (i.e. 0.5), and Excl. the anchor of full non-membership.

[2] Thresholds based on distributional properties, in this case the 10^{th} and 90^{th} percentiles of the measures being the anchors for full non-membership and full membership respectively, and the crossover point being the mean. Since the measures vary by month the thresholds are recalibrated for every month.

[3] Following Mena et al (2022) thresholds are set using quantiles of the distribution with the top and bottom quantiles indicating full membership and non-full membership respectively, and the median as the crossover point.

Table B-4: Directional expectations for the presence of trade resilience (TRES)

Condition	Interpretation	Directional expectation	Justification
GOVR	Government response to Covid-19	Absent	Stringent government response (e.g., lockdowns) may have disrupted trade activities
DEATHS	Covid-19 related deaths	Absent	Lower deaths = lower disruption = more resilient trade
LPI	Logistics performance	Present	Strong logistics supports trade continuity
GHS	Health security	Present	Better health systems reduce the effect of the disruption
EGLOB	Economic globalization	Both	Can help with diversification or increase exposure to shocks
SGLOB	Social Globalization	Present	Enhances information flow and coordination
GNI	Gross national income	Present	Wealthier countries have more capacity to buffer trade shocks and respond to disruptions
ARII	Regional Integration	Present	Regional integration provides alternative trade routes and policy coordination during shocks

Table B-5: Directional expectations for the absence of trade resilience (~TRES)

Condition	Interpretation	Directional expectation	Justification
GOVR	Government response to Covid-19	Present	Strict government restrictions may disrupt trade flows
DEATHS	Covid-19 related deaths	Present	Higher deaths likely reflect greater health and economic disruptions
LPI	Logistics performance	Absent	Poor logistics hinder trade operations
GHS	Health security	Present	Weak health systems lead to extended disruptions
EGLOB	Economic globalization	Both	Overexposure to global networks may cause vulnerability, but so may isolation
SGLOB	Social Globalization	Absent	Less information exchange and coordination weaken response
GNI	Gross national income	Absent	Low-income countries have fewer resources to deal with the disruption
ARII	Regional Integration	Absent	Poor regional coordination limits adaptive capacity in trade flows

Table B-6: Monthly calibration thresholds per country

Country Code	Month	TRES	GOVR	DEATHS	LPI	GHS	EGLOB	SGLOB	GNI	ARII
AGO	Jan	-31.65	0	0.01	2.05	25.2	44,51	33,60	$ 2,110	0,23
AGO	Feb	-18.30	5.56	0.01	2.05	25.2	44,51	33,60	$ 2,110	0,23
AGO	Mar	-46.86	90.74	0.01	2.05	25.2	44,51	33,60	$ 2,110	0,23
AGO	Apr	-51.77	78.7	0.01	2.05	25.2	44,51	33,60	$ 2,110	0,23
AGO	May	-56.78	77.78	4	2.05	25.2	44,51	33,60	$ 2,110	0,23
AGO	Jun	-40.96	75.93	6	2.05	25.2	44,51	33,60	$ 2,110	0,23
AGO	Jul	-37.02	79.17	29	2.05	25.2	44,51	33,60	$ 2,110	0,23
AGO	Aug	-29.33	76.39	68	2.05	25.2	44,51	33,60	$ 2,110	0,23
AGO	Sep	-31.25	75	62	2.05	25.2	44,51	33,60	$ 2,110	0,23
AGO	Oct	-33.10	65.74	101	2.05	25.2	44,51	33,60	$ 2,110	0,23
AGO	Nov	-30.03	57.41	75	2.05	25.2	44,51	33,60	$ 2,110	0,23
AGO	Dec	-27.77	65.74	55	2.05	25.2	44,51	33,60	$ 2,110	0,23
BWA	Jan	7.39	13.89	0.01	2.67	31.1	54,99	62,03	$ 7,520	0,33
BWA	Feb	-6.23	13.89	0.01	2.67	31.1	54,99	62,03	$ 7,520	0,33
BWA	Mar	-19.84	61.11	1	2.67	31.1	54,99	62,03	$ 7,520	0,33
BWA	Apr	-88.62	86.11	0.01	2.67	31.1	54,99	62,03	$ 7,520	0,33
BWA	May	-40.82	61.11	0.01	2.67	31.1	54,99	62,03	$ 7,520	0,33
BWA	Jun	-28.58	57.41	0.01	2.67	31.1	54,99	62,03	$ 7,520	0,33
BWA	Jul	-10.10	64.35	0.01	2.67	31.1	54,99	62,03	$ 7,520	0,33
BWA	Aug	-7.78	52.78	5	2.67	31.1	54,99	62,03	$ 7,520	0,33
BWA	Sep	57.01	63.89	7	2.67	31.1	54,99	62,03	$ 7,520	0,33
BWA	Oct	60.28	52.78	12	2.67	31.1	54,99	62,03	$ 7,520	0,33
BWA	Nov	3.46	50.93	8	2.67	31.1	54,99	62,03	$ 7,520	0,33
BWA	Dec	12.44	56.48	6	2.67	31.1	54,99	62,03	$ 7,520	0,33
DRC	Jan	2.29	0	0.01	2.43	11.8	34,72	26,87	$ 490	0,19
DRC	Feb	-6.01	2.78	0.01	2.43	11.8	34,72	26,87	$ 490	0,19
DRC	Mar	-16.73	77.78	0.01	2.43	11.8	34,72	26,87	$ 490	0,19
DRC	Apr	-17.78	80.56	216	2.43	11.8	34,72	26,87	$ 490	0,19
DRC	May	-24.54	80.56	43	2.43	11.8	34,72	26,87	$ 490	0,19
DRC	Jun	-6.79	80.56	87	2.43	11.8	34,72	26,87	$ 490	0,19
DRC	Jul	-47.88	55.56	44	2.43	11.8	34,72	26,87	$ 490	0,19
DRC	Aug	-3.60	46.3	55	2.43	11.8	34,72	26,87	$ 490	0,19
DRC	Sep	5.75	43.52	8	2.43	11.8	34,72	26,87	$ 490	0,19
DRC	Oct	-6.32	22.22	34	2.43	11.8	34,72	26,87	$ 490	0,19
DRC	Nov	-4.35	22.22	28	2.43	11.8	34,72	26,87	$ 490	0,19
DRC	Dec	13.09	26.85	64	2.43	11.8	34,72	26,87	$ 490	0,19
LSO	Jan	16.45	0	0.01	2.28	20.6	55,15	47,68	$ 1,310	0,03
LSO	Feb	2.14	0	0.01	2.28	20.6	55,15	47,68	$ 1,310	0,03
LSO	Mar	0.37	90.74	0.01	2.28	20.6	55,15	47,68	$ 1,310	0,03
LSO	Apr	-81.54	90.74	0.01	2.28	20.6	55,15	47,68	$ 1,310	0,03
LSO	May	-30.75	62.04	0.01	2.28	20.6	55,15	47,68	$ 1,310	0,03

LSO	Jun	-15.60	54.63	0.01	2.28	20.6	55,15	47,68	$ 1,310	0,03
LSO	Jul	-24.68	71.3	29	2.28	20.6	55,15	47,68	$ 1,310	0,03
LSO	Aug	2.58	71.3	20	2.28	20.6	55,15	47,68	$ 1,310	0,03
LSO	Sep	-12.72	59.26	4	2.28	20.6	55,15	47,68	$ 1,310	0,03
LSO	Oct	2.14	47.22	8	2.28	20.6	55,15	47,68	$ 1,310	0,03
LSO	Nov	-37.39	47.22	1	2.28	20.6	55,15	47,68	$ 1,310	0,03
LSO	Dec	28.90	36.11	2	2.28	20.6	55,15	47,68	$ 1,310	0,03
MDG	Jan	-9.50	0	0.01	2.39	40.1	47,78	34,53	$ 490	0,29
MDG	Feb	8.01	0	0.01	2.39	40.1	47,78	34,53	$ 490	0,29
MDG	Mar	-16.75	91.67	0.01	2.39	40.1	47,78	34,53	$ 490	0,29
MDG	Apr	-39.53	67.59	0.01	2.39	40.1	47,78	34,53	$ 490	0,29
MDG	May	-18.11	70.37	6	2.39	40.1	47,78	34,53	$ 490	0,29
MDG	Jun	-17.71	68.98	10	2.39	40.1	47,78	34,53	$ 490	0,29
MDG	Jul	-35.21	68.98	62	2.39	40.1	47,78	34,53	$ 490	0,29
MDG	Aug	-18.32	60.19	112	2.39	40.1	47,78	34,53	$ 490	0,29
MDG	Sep	-21.01	58.33	39	2.39	40.1	47,78	34,53	$ 490	0,29
MDG	Oct	-36.32	37.04	15	2.39	40.1	47,78	34,53	$ 490	0,29
MDG	Nov	-18.97	37.04	7	2.39	40.1	47,78	34,53	$ 490	0,29
MDG	Dec	-24.23	38.89	10	2.39	40.1	47,78	34,53	$ 490	0,29
MWI	Jan	3.56	0	0.01	2.59	28	41,01	38,82	$ 540	0,30
MWI	Feb	-4.93	5.56	0.01	2.59	28	41,01	38,82	$ 540	0,30
MWI	Mar	29.14	52.78	0.01	2.59	28	41,01	38,82	$ 540	0,30
MWI	Apr	-22.37	60.19	3	2.59	28	41,01	38,82	$ 540	0,30
MWI	May	-34.28	60.19	1	2.59	28	41,01	38,82	$ 540	0,30
MWI	Jun	0.31	60.19	9	2.59	28	41,01	38,82	$ 540	0,30
MWI	Jul	-5.83	60.19	81	2.59	28	41,01	38,82	$ 540	0,30
MWI	Aug	2.71	64.81	80	2.59	28	41,01	38,82	$ 540	0,30
MWI	Sep	-26.85	54.63	5	2.59	28	41,01	38,82	$ 540	0,30
MWI	Oct	-10.82	50.93	4	2.59	28	41,01	38,82	$ 540	0,30
MWI	Nov	1.70	50.93	2	2.59	28	41,01	38,82	$ 540	0,30
MWI	Dec	-21.06	50.93	3	2.59	28	41,01	38,82	$ 540	0,30
MUS	Jan	-7.06	0	0.01	2.73	34.9	82,68	74,97	$ 12,440	0,37
MUS	Feb	1.74	0	0.01	2.73	34.9	82,68	74,97	$ 12,440	0,37
MUS	Mar	-30.03	82.41	2	2.73	34.9	82,68	74,97	$ 12,440	0,37
MUS	Apr	-48.64	82.41	7	2.73	34.9	82,68	74,97	$ 12,440	0,37
MUS	May	-46.05	69.44	1	2.73	34.9	82,68	74,97	$ 12,440	0,37
MUS	Jun	47.15	33.33	0.01	2.73	34.9	82,68	74,97	$ 12,440	0,37
MUS	Jul	-27.11	22.22	0.01	2.73	34.9	82,68	74,97	$ 12,440	0,37
MUS	Aug	-22.61	22.22	0.01	2.73	34.9	82,68	74,97	$ 12,440	0,37
MUS	Sep	-18.88	22.22	0.01	2.73	34.9	82,68	74,97	$ 12,440	0,37
MUS	Oct	-11.84	16.67	0.01	2.73	34.9	82,68	74,97	$ 12,440	0,37
MUS	Nov	-19.15	16.67	0.01	2.73	34.9	82,68	74,97	$ 12,440	0,37
MUS	Dec	-12.59	16.67	0.01	2.73	34.9	82,68	74,97	$ 12,440	0,37
MOZ	Jan	7.53	0	0.01	2.40	28.1	62,88	32,30	$ 500	0,42
MOZ	Feb	-2.10	8.33	0.01	2.40	28.1	62,88	32,30	$ 500	0,42

MOZ	Mar	0.80	47.22	0.01	2.40	28.1	62,88	32,30	$ 500	0,42
MOZ	Apr	-28.12	56.48	0.01	2.40	28.1	62,88	32,30	$ 500	0,42
MOZ	May	-37.13	75	2	2.40	28.1	62,88	32,30	$ 500	0,42
MOZ	Jun	-18.33	80.56	3	2.40	28.1	62,88	32,30	$ 500	0,42
MOZ	Jul	-32.32	57.41	6	2.40	28.1	62,88	32,30	$ 500	0,42
MOZ	Aug	-27.43	74.07	11	2.40	28.1	62,88	32,30	$ 500	0,42
MOZ	Sep	-16.79	74.07	32	2.40	28.1	62,88	32,30	$ 500	0,42
MOZ	Oct	-27.69	56.48	31	2.40	28.1	62,88	32,30	$ 500	0,42
MOZ	Nov	-18.13	56.48	44	2.40	28.1	62,88	32,30	$ 500	0,42
MOZ	Dec	-8.74	50	30	2.40	28.1	62,88	32,30	$ 500	0,42
NAM	Jan	-13.14	0	0.01	2.52	35.6	52,70	53,81	$ 4,870	0,34
NAM	Feb	-1.85	0	0.01	2.52	35.6	52,70	53,81	$ 4,870	0,34
NAM	Mar	-31.71	66.67	0.01	2.52	35.6	52,70	53,81	$ 4,870	0,34
NAM	Apr	-60.18	73.15	0.01	2.52	35.6	52,70	53,81	$ 4,870	0,34
NAM	May	-37.28	66.67	0.01	2.52	35.6	52,70	53,81	$ 4,870	0,34
NAM	Jun	-25.33	51.85	0.01	2.52	35.6	52,70	53,81	$ 4,870	0,34
NAM	Jul	-25.12	50	7	2.52	35.6	52,70	53,81	$ 4,870	0,34
NAM	Aug	-7.66	61.11	71	2.52	35.6	52,70	53,81	$ 4,870	0,34
NAM	Sep	4.37	60.19	52	2.52	35.6	52,70	53,81	$ 4,870	0,34
NAM	Oct	0.58	37.96	12	2.52	35.6	52,70	53,81	$ 4,870	0,34
NAM	Nov	-1.32	37.96	19	2.52	35.6	52,70	53,81	$ 4,870	0,34
NAM	Dec	1.74	38.89	34	2.52	35.6	52,70	53,81	$ 4,870	0,34
ZAF	Jan	3.75	2.78	0.01	3.38	54.8	55,30	73,07	$ 6,570	0,67
ZAF	Feb	-2.50	2.78	0.01	3.38	54.8	55,30	64,48	$ 6,570	0,67
ZAF	Mar	-11.04	87.96	1	3.38	54.8	55,30	64,48	$ 6,570	0,67
ZAF	Apr	-48.98	87.96	85	3.38	54.8	55,30	64,48	$ 6,570	0,67
ZAF	May	-32.62	84.26	557	3.38	54.8	55,30	64,48	$ 6,570	0,67
ZAF	Jun	-25.04	76.85	3995	3.38	54.8	55,30	64,48	$ 6,570	0,67
ZAF	Jul	-24.06	78.7	4503	3.38	54.8	55,30	64,48	$ 6,570	0,67
ZAF	Aug	-17.31	72.22	7326	3.38	54.8	55,30	64,48	$ 6,570	0,67
ZAF	Sep	-2.31	57.41	2395	3.38	54.8	55,30	64,48	$ 6,570	0,67
ZAF	Oct	-2.09	48.15	1479	3.38	54.8	55,30	64,48	$ 6,570	0,67
ZAF	Nov	0.49	48.15	1098	3.38	54.8	55,30	64,48	$ 6,570	0,67
ZAF	Dec	-100.00	45.37	5082	3.38	54.8	55,30	64,48	$ 6,570	0,67
TZA	Jan	47.40	2.78	0.01	2.64	36.4	35,68	33,60	$ 1,050	0,29
TZA	Feb	-6.26	2.78	0.01	2.64	36.4	35,68	33,60	$ 1,050	0,29
TZA	Mar	7.92	47.22	0.01	2.64	36.4	35,68	33,60	$ 1,050	0,29
TZA	Apr	0.74	52.78	10	2.64	36.4	35,68	33,60	$ 1,050	0,29
TZA	May	-1.83	41.67	11	2.64	36.4	35,68	33,60	$ 1,050	0,29
TZA	Jun	-4.12	28.7	0.01	2.64	36.4	35,68	33,60	$ 1,050	0,29
TZA	Jul	17.91	31.48	0.01	2.64	36.4	35,68	33,60	$ 1,050	0,29
TZA	Aug	-5.56	28.7	0.01	2.64	36.4	35,68	33,60	$ 1,050	0,29
TZA	Sep	-1.60	12.04	0.01	2.64	36.4	35,68	33,60	$ 1,050	0,29
TZA	Oct	-11.52	17.59	0.01	2.64	36.4	35,68	33,60	$ 1,050	0,29

TZA	Nov	4.73	17.59	0.01	2.64	36.4	35,68	33,60	$ 1,050	0,29
TZA	Dec	11.82	6.48	0.01	2.64	36.4	35,68	33,60	$ 1,050	0,29
ZMB	Jan	-24.27	0	0.01	2.53	20.3	54,76	44,81	$ 1,380	0,33
ZMB	Feb	-8.16	16.67	0.01	2.53	20.3	54,76	44,81	$ 1,380	0,33
ZMB	Mar	-15.68	47.22	0.01	2.53	20.3	54,76	44,81	$ 1,380	0,33
ZMB	Apr	-31.96	65.28	5	2.53	20.3	54,76	44,81	$ 1,380	0,33
ZMB	May	-24.43	43.52	4	2.53	20.3	54,76	44,81	$ 1,380	0,33
ZMB	Jun	-23.77	50.93	15	2.53	20.3	54,76	44,81	$ 1,380	0,33
ZMB	Jul	-1.33	50.93	116	2.53	20.3	54,76	44,81	$ 1,380	0,33
ZMB	Aug	-5.03	49.07	145	2.53	20.3	54,76	44,81	$ 1,380	0,33
ZMB	Sep	29.07	41.67	48	2.53	20.3	54,76	44,81	$ 1,380	0,33
ZMB	Oct	4.51	41.67	15	2.53	20.3	54,76	44,81	$ 1,380	0,33
ZMB	Nov	5.47	47.22	9	2.53	20.3	54,76	44,81	$ 1,380	0,33
ZMB	Dec	11.86	50.93	25	2.53	20.3	54,76	44,81	$ 1,380	0,33
ZWE	Jan	18.83	8.33	0.01	2.12	38.2	37,32	47,84	$ 2,170	0,40
ZWE	Feb	8.70	8.33	6	2.12	38.2	37,32	47,84	$ 2,170	0,40
ZWE	Mar	15.57	87.96	2	2.12	38.2	37,32	47,84	$ 2,170	0,40
ZWE	Apr	-37.95	87.96	0.01	2.12	38.2	37,32	47,84	$ 2,170	0,40
ZWE	May	-13.78	87.96	2	2.12	38.2	37,32	47,84	$ 2,170	0,40
ZWE	Jun	6.90	73.15	28	2.12	38.2	37,32	47,84	$ 2,170	0,40
ZWE	Jul	-2.97	80.56	160	2.12	38.2	37,32	47,84	$ 2,170	0,40
ZWE	Aug	7.38	80.56	30	2.12	38.2	37,32	47,84	$ 2,170	0,40
ZWE	Sep	6.06	76.85	9	2.12	38.2	37,32	47,84	$ 2,170	0,40
ZWE	Oct	0.81	71.3	38	2.12	38.2	37,32	47,84	$ 2,170	0,40
ZWE	Nov	16.51	67.59	66	2.12	38.2	37,32	47,84	$ 2,170	0,40
ZWE	Dec	9.57	69.44	852	2.12	38.2	37,32	47,84	$ 2,170	0,40