A SURVIVAL ANALYSIS OF EXPORT SPELLS IN MALAWI: THE ROLE OF AGGLOMERATION ECONOMIES

MASTER OF ARTS (ECONOMICS) THESIS

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UNIVERSITY OF MALAWI

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A SURVIVAL ANALYSIS OF EXPORT SPELLS IN MALAWI: THE ROLE OF AGGLOMERATION ECONOMIES

MA(ECONOMICS) THESIS

By

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Bsoc.Sc (Economics)

Submitted to the Department of Economics, School of Law, Economics, and Government, in partial fulfilment of the requirements for a Master of Arts Degree in Economics

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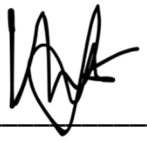
DECLARATION

I, the undersigned, hereby declare that this thesis/dissertation is my original work which has not been submitted to any other institution for similar purposes. Where other people's work has been used acknowledgments have been made.

Tadala Banda

Full Legal Name



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08/01/2024

Date

CERTIFICATE OF APPROVAL

The undersigned certifies that this thesis represents the student's work and effort and has been submitted with my approval.

Signature:_____Date: _____

Dr. Farai Chigaru, PhD (Lecturer)

Supervisor

DEDICATION

To my parents, I love you.

ACKNOWLEDGEMENT

I thank the almighty God for his favour and strength that enabled me to complete this program. I am tremendously grateful to my parents for their love, prayers, caring, and sacrifices for educating and preparing me for the future. I am extending my heartfelt thanks to my sisters and brother for their love, and continuing support to complete my postgraduate studies at the University of Malawi.

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My completion of this project could not have been accomplished without the support of my classmates; we deserve a trip for a roller-coaster. Finally, I want to thank one and all the people at the University of Malawi I have made remembrances. We may never devote any time together as we did at school but as memories fade to stardust, in my life they will remain imprinted.

ABSTRACT

Poverty is increasing in Sub-Saharan Africa at a dire rate. It is projected that 90% of the poor will exist in Sub-Saharan Africa by 2030. Developing countries have long since adopted export-led growth strategies to enhance economic growth, consequently alleviating poverty. However, exports in developing countries continue being marginalized; exacerbated by the 2019 COVID-19 pandemic. Literature posits that short export spells are one of the leading causes of low trade volumes in developing countries. Using Malawi as a case study, the study establishes the duration of exports and identifies its determinants. The focus is on the role of agglomeration economies. Export data between Malawi and 117 trading partners for 20 years (2003-2022) is used. First, the Kaplan-Meier method is used to establish the duration of exports in Malawi. Secondly, a multivariate parametric inverse Gaussian frailty survival model, with a proportional hazard Weibull distribution is used to analyse the role of the agglomeration economies on the survival of exports. For Malawi's exports, the first-year survival rate is 38%, and the median duration of Malawi's exports is 1 year. The survival time for 25 percent and 50 percent of Malawi's exports is just one year, while the survival time for 75 percent of the exports is just two years. Further, the findings from the frailty survival regression show that overall agglomeration economies significantly improve export survival for Malawi. This study provides that export duration in Malawi is short-lived, but agglomeration economies significantly improve the export survival for Malawi. The short duration of export spells provides a critical need for policies that enhance export longevity, and the beneficial role of importer's agglomeration economies.

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ABBREVIATIONS

CEPII	Centre for Prospective Studies and International Information
COMESA	Common Market for Eastern and Southern Africa
COMTRADE	Commodity Trade Statistics
DFQF	Duty-Free and Quota access
EBA	Everything but Arms
ECA	Europe and Central Asia
EU	European Union
GDP	Gross Domestic Product
GOM	Government of Malawi
GSP	Generalized Scheme of Preferences
HHI	Herfindahl-Hirschman Index
ITC	International Trade Centre
KM	Kaplan Meier
LDC	Least Developed Countries
MBS	Malawi Bureau of Standards
NAM	North American Countries
NES-I	National Export Strategy-I
OECD	Organization for Economic Co-operation and Development
PCA	Principal Component Analysis
ROW	Rest of the World
SADC	Southern Africa Development Community
SSA	Sub-Saharan Africa
UNCTAD	United Nations Centre for Trade and Development
WTO	World Trade Organization

CHAPTER ONE

INTRODUCTION

1.1 Background

Increasing export activities is one of the most preferred policy options for governments. Exports play a prominent role in a country's development agenda but not all exports thrive. Mainstream traditional theories of Absolute Advantage, Comparative advantage, and Heckscher-Ohlin assume that trade will persist once established and for this reason often focus on either trade creation or extensive margin (Socrates et al., 2020a). An extensive margin is where a country expands exports by introducing a new product (Besedeš & Prusa, 2006a). In contrast, intensive margin entails maintaining and increasing existing exports with existing partners, hence export spells (Socrates et al., 2020). Export spell is the number of years/months a country exports nonzero values of a product to a trading partner (Socrates et al., 2020b). Many, particularly in developing countries experience short-lived spells as provided by Reddy and Sasidharan (2023) subsequently hindering the realization of their full potential.

Malawi's trade aspirations are as ambitious as the National Export Strategy II envisions. The Malawi Vision 2063 highlights trade as one of the cornerstones for achieving middle-income status. However, despite these trade hopes, Malawi's exports display a failure to reach the global successes seen in both developed or other developing nations. Prospects for market diversification for all products exported from the country in 2022 represented the share of 3%, according to ITC (January 2024) according to ITC the share of global imports reaching 3% as against ITC. A perusal of the breakdown as far as Malawi's export shares varied between developed and developing countries. The share of such exports that these developed countries individually occupied was as follows: Belgium 16.98%, United States 5.25%, United Kingdom 3.65%, and Germany 3.23%. Other key export destinations for Malawi were developing countries themselves, namely Tanzania 9.42%, Kenya 6.89%,

South Africa 6.45%, Zimbabwe 5.33%, Zambia 4.36%, and India 4.04%. It suggests, therefore, a balancing of trade flows between the developed and the developing nations.

Based on this prospect, Malawi's export growth to partner is less than the partner import growth from the world for the countries United Republic of Tanzania, Zimbabwe, and India while Malawi's export growth to partner is more than the partner import growth from the world for countries Belgium, Kenya, South Africa, Zimbabwe, Zambia, United Kingdom, and Germany.

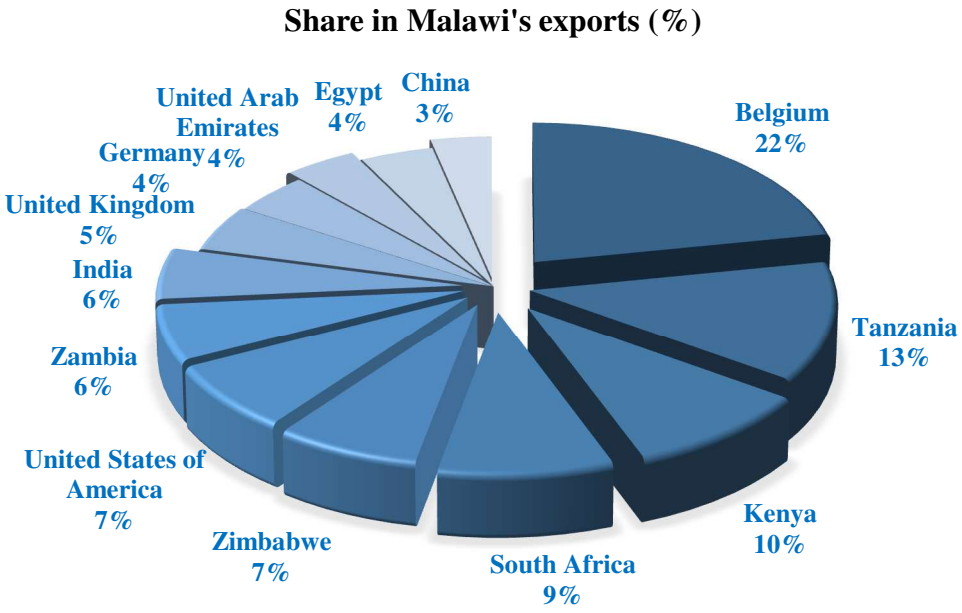

Figure 1: Share of Partner Countries in Malawi's Exports, 2022

Source: Authors' calculation using ITC data (January 2024)

The pie chart shows the share of Malawi's exports to various countries in 2022. Belgium is the largest destination, accounting for 22% of exports, followed by Tanzania at 13%, and Kenya at 10%. South Africa receives 9% of the exports, while Zimbabwe and the United States each receive 7%. Zambia and India each take 6%, and the United Kingdom receives 5%. Germany, the United Arab Emirates, and Egypt each account for 4%, while China has 3%. The basket that constitutes exports in Malawi is mainly concentrated in a few products, most Agricultural and Agro-processed products. ITC (2024) provides Tobacco and manufactured tobacco (45.53%), Oil seeds and oleaginous fruit (13.27%), Coffee, tea, mate

and spices (8.93%), edible vegetables and certain roots and tubers (6.08%), Residues and waste from food industries (3.37%) as the top five products in value for the share of the country's cluster exports in 2022. As of 2023, ITC (2024) provides that Malawi's main trade agreements include; the European Union Generalized Scheme of Preferences (EU-GSP), AGOA, SADC, COMESA, and the AfCFTA.

Malawi's exports predominantly enjoy preferential market access on Duty-Free and Quota access (DFQF) as provided in the National Export Strategy II for 2021-2026 into the European Union (EU) under the Everything but Arms (EBA) initiative, the United States of America (USA) under the AGOA, the African sub-continent, mainly through its membership to the SADC and the COMESA. Malawi also benefits from preferential market access under the Generalized Scheme of Preferences (GSP) and as an LDC from several countries (GOM, 2020).

The duration of these exports from Malawi is not sorely influenced by factors within the exporting country but also, by the economic dynamics in the destination partner countries. While agglomeration refers to the spatial concentration of economic activities in a particular geographical area, agglomeration economies as defined by Abdel-Rahman (1990) refer to the benefits arising from the geographic concentration of economic activity that plays such a crucial role in this context. In essence, it is Krugman's (1991) core-periphery model that provides a theoretical basis that links export survival and agglomeration economies. This model shows that manufacturing is concentrated in the core where the market is large, while, the periphery concentrates on agricultural activities.

This spatial division helps to optimize the transport costs, workforce access and benefits from vertical and horizontal linkages as provided by Brice and Socrates (2022). There are three types of Agglomeration Economies as provided namely; Localization economies where the benefits are accrued from geographic concentration of suppliers and customers within a specific industry; Urbanization economies where there is a general advantage of population concentration beyond specific industries; and, Marshallian Economies where knowledge spillovers and specialized labour markets foster rapid innovation, learning, and

skills development (Allen and Donaldson, 2020). As a result of these Agglomeration economies, export activities and productivity increase in the ‘core’ because of consumers’ preferences for variety and a larger market. Cities have become more important in the formation of the core, and even crucial for trade such that countries with a sustainable ‘core’ tend to be more productive and subsequently import and export more products (Glaeser, 2010). In essence, the interplay between the core-periphery model and Agglomeration economies underscores the importance of geographic concentration in influencing export dynamics and economic productivity.

1.2 Problem Statement

Malawi's export duration patterns and the factors influencing the survival remain unclear, which is a significant gap in understanding the country's trade dynamics. Existing studies have clearly shown that export spells in many Least Developed Countries (LDCs) are short lived with exports typically lasting only one to two years (Besedeš & Prusa, 2006b; Nicita et al., 2013). Specifically, nearly half of the exports from LDCs to the United States do not survive beyond two years, a pattern similarly observed in several other developing economies (Martincus & Carballo, 2008; Nitsch, 2009). This pattern of short export spells has been further evidenced in studies on Peru, Chile, Zambia, and Cote D'Ivoire (Álvarez & Fuentes, 2009; Banda & Simumba, 2013; Brice & Socrates, 2022a).

While these studies give general trends, there is a limited specific case of Malawi, particularly its export survival patterns and the underlying determinants. The limited export survival in Malawi is likely to make it difficult for the country to stabilize its foreign earnings and attract sustainable FDI which is an essential factor that is important for long-term economic development. Besides, the short duration of exports limits the creation of jobs, reduces the resilience of the economy, and limits the ability of the country to diversify its export base. In addition, the short duration of exports limits the creation of jobs, reduces the resilience of the economy, and limits the ability of the country to diversify its export base. Despite the growing body of literature examining export survival, much of the focus has been on internal country factors such as real GDP, political risk, market access, trade agreements, and exchange rate volatility (Carrère & Strauss-Kahn, 2017; Gullstrand & Persson, 2015; Kamuganga, 2012). However, external factors, especially agglomeration economies of the partner country remain relatively unexplained. Because of the increased market opportunities when firms locate together in industry clusters, and having enjoyed lower transaction costs with possibly better trade networks, one is likely to infer that an agglomeration economy is likely to impact positively on reducing the chances and risks of export failure events.

This study aims to address this critical gap by focusing on external determinates, specifically agglomeration economies, and its effect on the survival of Malawi's exports,

by shifting emphasis beyond internal variables, this research seeks to provide some new perception into the factors driving export spells in Malawi potentially rewriting the narrative on export survival in the context of developing countries. This is particularly topical in the wake of renewed aspirations for improved trade performance by Malawi, as outlined in Malawi Vision 2063. The perception of the external determinants of export survival shall provide valued policy insight in guiding economic strategies toward pursuing long-term success of exports.

1.3 Objectives of the Study

1.3.1 Main Objective

To examine the duration of Malawi's exports.

1.3.2 Specific Objectives

a) To examine the role of agglomeration economies in influencing the duration of Malawi's exports.

b) To assess the role of institutional quality in influencing the duration of Malawi's exports.

1.4 Hypotheses of the Study

From the objectives, the following are the testable hypotheses according to theory:

H_{01}: Agglomeration economies play a significant role in influencing the duration of Malawi's exports.

H_{01}: Institutional quality plays a significant role in influencing the duration of Malawi's exports.

1.5 Research Questions

- Do agglomeration economies have an effect on export spells for Malawi?
- Does institutional quality play a significant role in export spells for Malawi?

1.6 Significance of the Study

With the implementation of AfCFTA, understanding the role of Agglomeration economies in intra-African trade becomes increasingly important. This study aims to provide valuable insights for policymakers in Malawi aiming to boost and sustain Malawi's exports through intensive margin. Specifically, this will assist the country in progressing export duration thereby enhancing long-run economic growth and strengthening current trade relations to meet the UN Agenda 2030, SDG 17.11 of strengthening the means of implementation and revitalizing the global partnership for sustainable development by significantly increasing the exports of developing countries, in particular, to double the least developed countries share of global exports. Further, by identifying the factors that contribute to longer-lasting export relationships, the findings can guide policy interventions aimed at fostering spatial clustering of businesses and supporting industries with high agglomeration potential which can ultimately lead to increased export sustainability and consequently economic growth thereby contributing to the wealth and self-reliance envisioned in the Malawi Vision 2063. Lastly, the study adds to the existing body of empirical knowledge by employing survival analysis in the context of Malawi thereby providing valuable resources for scholars in trade dynamics and Agglomeration economies.

1.7 Organization of the Paper

This paper has been structured as follows; the first chapter provides the introduction, which includes the background, the problem statement, objectives, and the study's justification. The second chapter presents the context of the paper by discussing the overview of Malawi's export sector, policies, and strategies implemented. The theoretical and empirical literature review is undertaken in the third chapter. The fourth chapter presents the method employed in the study, which also includes the sources of data used. Chapter five presents the empirical findings of the study, and a discussion is made. Lastly, chapter six summarizes the study, policy implications, and limitations and concludes the study.

CHAPTER TWO

OVERVIEW

2.1 Introduction

This chapter provides a framework for the current state of export affairs in Malawi. In particular, it brings out the trend of exports, identifies the leading commodities exported from the country, and sheds light on the prevailing challenges that have among other factors contributed to limiting the performance of the sector. The chapter also brings out the inquiries into the agreements the Government of Malawi has entered regarding these exporting activities.

2.2 Trends in Exports

Malawi's export sector has witnessed different policy regimes ever since the attainment of independence in 1964. These include the import substitution regime (1964-79), the structural adjustment and export promotion regime (1980-1993), and the liberalization regime (1994-2000) (Chirwa, 2002). The sector has, as of 2021, been guided by the National Trade policy that was enacted in April 2016 by then the Ministry of Industry, Trade and Tourism. Since the implementation of the liberalization policy in 1994, a year later Malawi became a member of the World Trade Organization (WTO) and two regional trade blocs, SADC and COMESA. Furthermore, in 2020, Malawi became a member state of the African Growth and Opportunity Act (AGOA) and Everything but Arms (EBA), whereas at the continental level, in 2018 it became a member of the African Continental Free Trade Area (AfCFTA).

However, despite these interregional trade agreements, Malawi's export performance has been below par as per Figure 2 below. As demonstrated in the figure, the share of exports to GDP for Malawi has stuck around 25% throughout recent years with the highest value of 33.7% in 2014 and the lowest value of 17.63% in 2006. On top of this, the growth of

exports on average has been below 20%, and the recent years of 2006, 2011, and 2022 have had growth rates of exports that are lower than 1%. Questions keep on being raised relentlessly as to whether these trade agreements are working and what it is that hinders the potential of Malawi's exports.

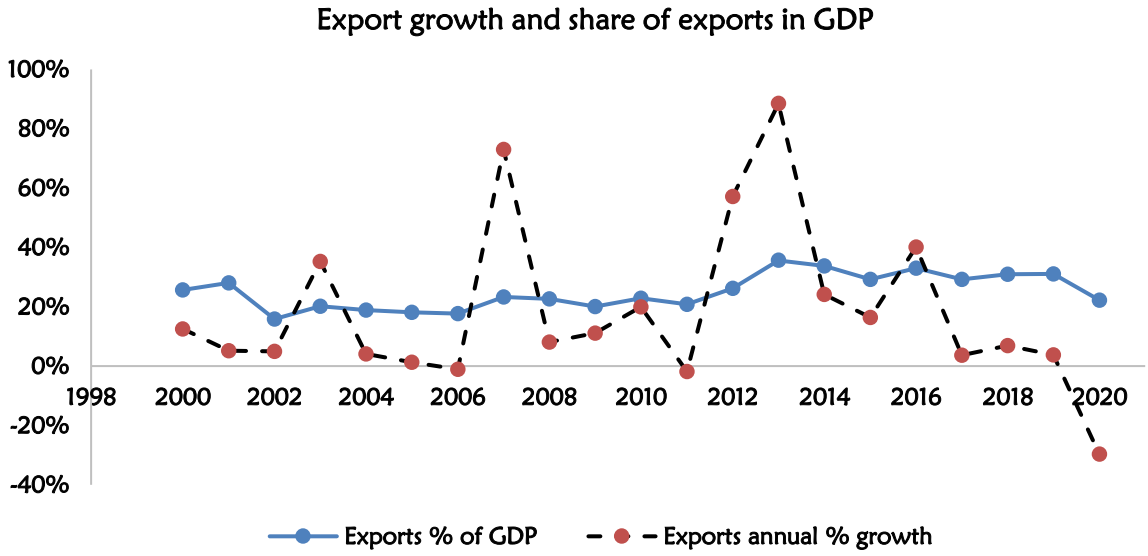

Figure 2: Percent export growth rate versus export share of GDP for Malawi

Source: Author's computation from WITS data (2024)

Figure 2 presents export diversification in Malawi. From the figure, it is evident that over the past years since the year 2020, the index of export concentration (Herfindahl-Hirschman) for Malawi has been reducing.

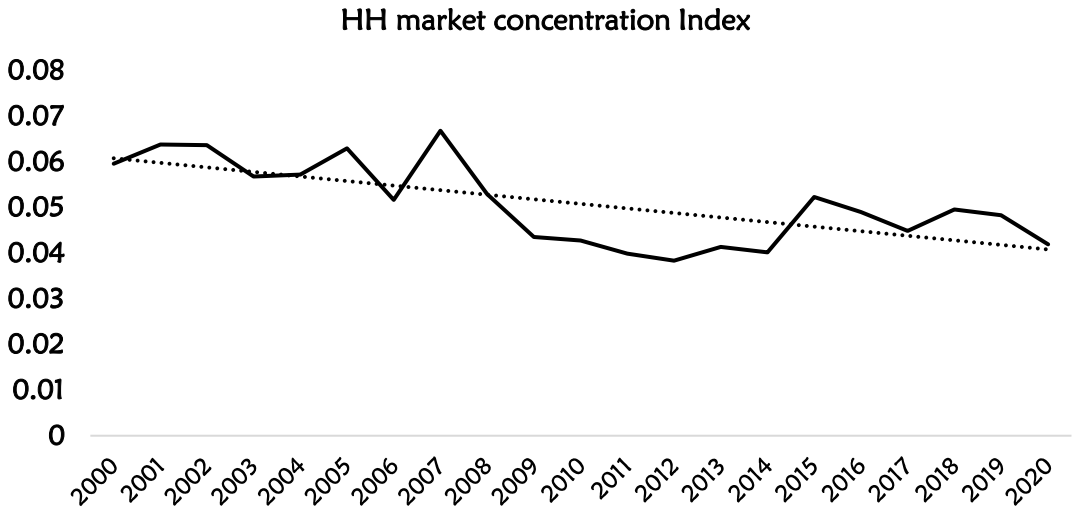

Figure 3: Herfindahl-Hirschman Index for Malawi

Source: Authors using UNCTAD data (2024)

The index measures market concentration whereby in the context of export concentration, the index reflects the extent to which a country's exports are diversified across different products or markets. A decreasing HHI across the years as shown in Figure 3 suggests that Malawi's exports are becoming more diversified. A lower HHI implies that the country is

not excessively dependent on a small number of its products or markets for its exports which suggests a potential for increased trade opportunities (Lawless et al., 2019).

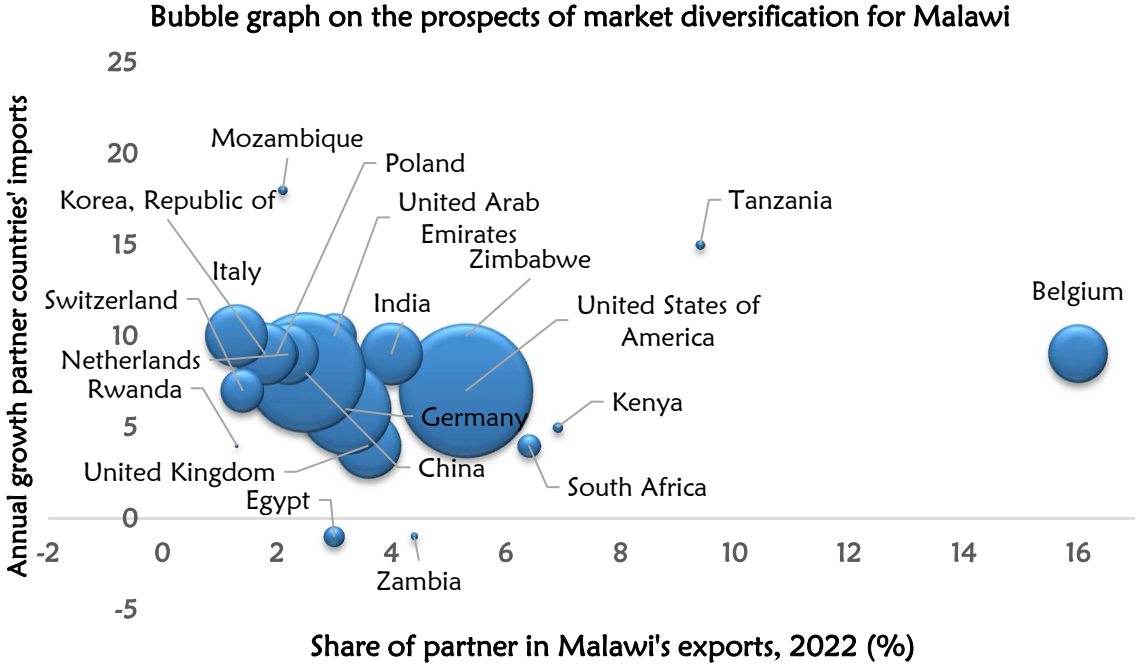

Figure 4: Malawi's prospect for market diversification on its products exported in 2022

Source: Author's computation using UN-Trade data (2024)

Figure 4 shows the prospect of export market growth in different regions of the world. The bubble size as shown is proportional to the share in world imports of the partner countries. The figure shows that the United States of America (USA) has a share in world imports of 13.31%, China has a share in the world imports of 10.71%, and Germany has a share in the world imports of 6.19%. These countries as represented by the large bubbles indicate a larger market size or a greater potential for the products in the market. What this entails is that expanding Malawi's products into these markets could have a more significant impact on the overall export volumes and revenue. Countries like Tanzania, Kenya, Mozambique, and Kenya presented by the smaller bubbles indicate markets with comparatively limited potential or smaller sizes for Malawi's products.

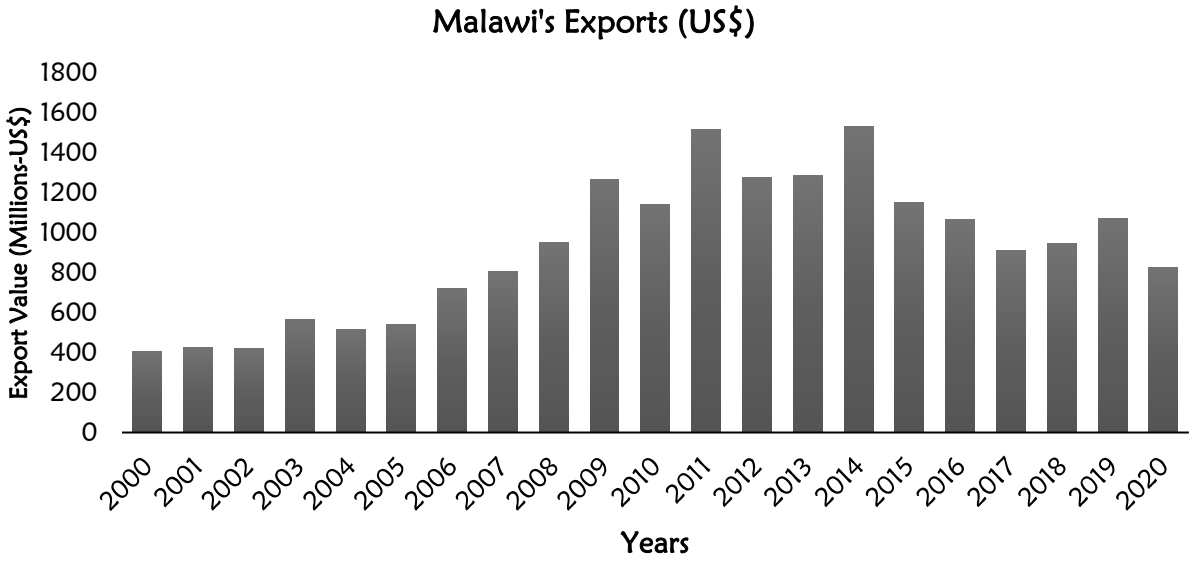

Figure 5: Total Value of Exports 2000-2020

Source: Authors using ITC Trade Map data (2024)

According to Figure 5, the country experienced progressive levels of export revenue between the year 2009 and 2016. The value of exports for the country increased from US$1,268 million in 2009 to US$1,517 million in 2011, and then US$1,532 million in 2014. Nevertheless, the expansion of the exports exhibited significant volatility during the first years of the period under consideration, mirroring the overall economic instability that characterized the global economy in the first decade of the twenty-first century.

2.3 Main exports from Malawi.

Malawi's main exports cover a wide range of products with somehow prominent contributions from various sectors as Figure 6 depicts. In 2022, the total value exported for all the products amounted to US$940,876. The leading export product was Tobacco and manufactured tobacco substitutes maintaining a significant value of US$428,337. On top of that, Oil and seeds and oleaginous fruits, miscellaneous grains, seeds, and fruit had a substantial value of US$124,812. The export values of Coffee, tea, maté and spices, edible vegetables and certain roots & tubers, and residues and waste from the food industries; prepared animal fodder has maintained a significant position over the years. The machinery

and mechanical appliances, nuclear reactors, boilers machinery and mechanical appliances, too, have seen remarkable growth at US$ 26,935 in the year 2022. However, Malawi has still been exporting substantial quantities in value for such products as sugar and sugar confectionery, Fertilizers, Wood and articles of wood; wood charcoal and Cereals.

2.4 Malawi's trade performance.

Table 1 shows the merchandise of exports from Malawi to the world from 2010 to 2020. Total merchandise of export in 2020 was US$781,981 while the total of imports was US$2,730,273 thus representing a trade deficit of US$1,948,292. Trade in services for year 2020 was registered at US$441,709 for exports and US$584,381 for imports thus representing a trade deficit of US$142,672. The total trade deficit for goods and services in 2020 was registered at US$2,090,964 which is almost times two than in year 2010.

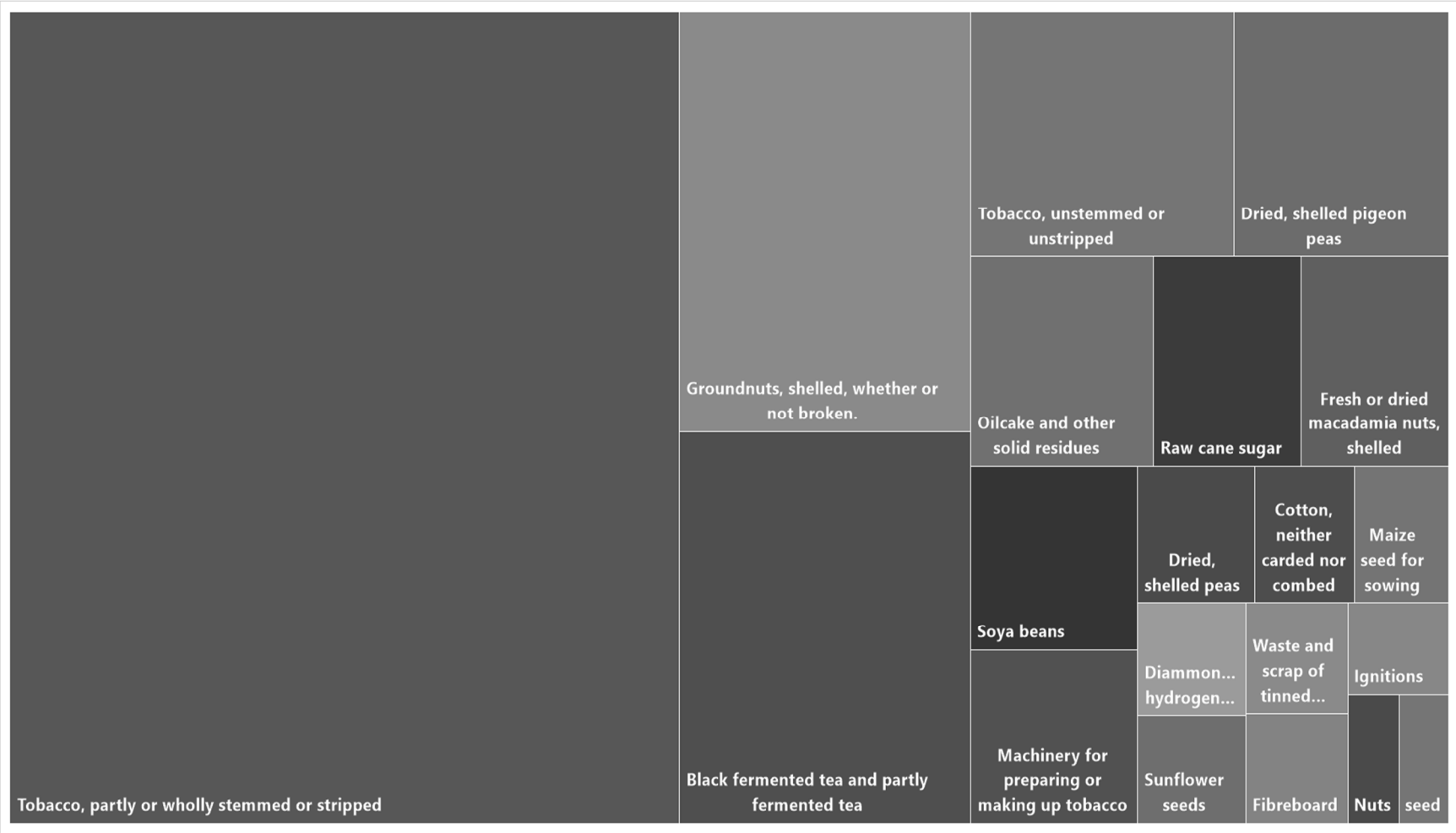

Figure 6: Malawi's tree map of exported products in 2022

Source: ITC calculations using UN COMTRADE and ITC data (2024)

Table 1: Trade performance data for Malawi

US$ '000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Export of Goods	1,108,529	1,431,901	1,286,728	1,181,511	1,432,127	1,106,631	1,035,099	889,126	879,825	912,983	781,981
Export of Services	80,093	86,309	105,267	111,025	109,398	116,294	113,931	201,295	228,881	373,057	441,709
Total Exports	**1,188,622**	**1,518,210**	**1,391,995**	**1,292,536**	**1,541,525**	**1,222,925**	**1,149,030**	**1,090,421**	**1,108,706**	**1,286,040**	**1,223,690**
Import of Goods	2,164,502	2,445,134	2,674,844	2,783,972	2,801,281	2,348,475	2,231,866	2,562,126	2,707,070	2,941,148	2,730,273
Import of services	239,904	249,805	227,444	245,082	268,765	292,633	249,070	361,433	389,147	458,761	584,381
Total Imports	**2,404,406**	**2,694,939**	**2,902,288**	**3,029,054**	**3,070,046**	**2,641,108**	**2,480,936**	**2,923,559**	**3,096,217**	**3,399,909**	**3,314,654**
Trade Deficit	**-1,215,784**	**-1,176,729**	**-1,510,293**	**-1,736,518**	**-1,528,521**	**-1,418,183**	**-1,331,906**	**-1,833,138**	**-1,987,511**	**-2,113,869**	**-2,090,964**

Source: Author's calculation using ITC data (January 2024)

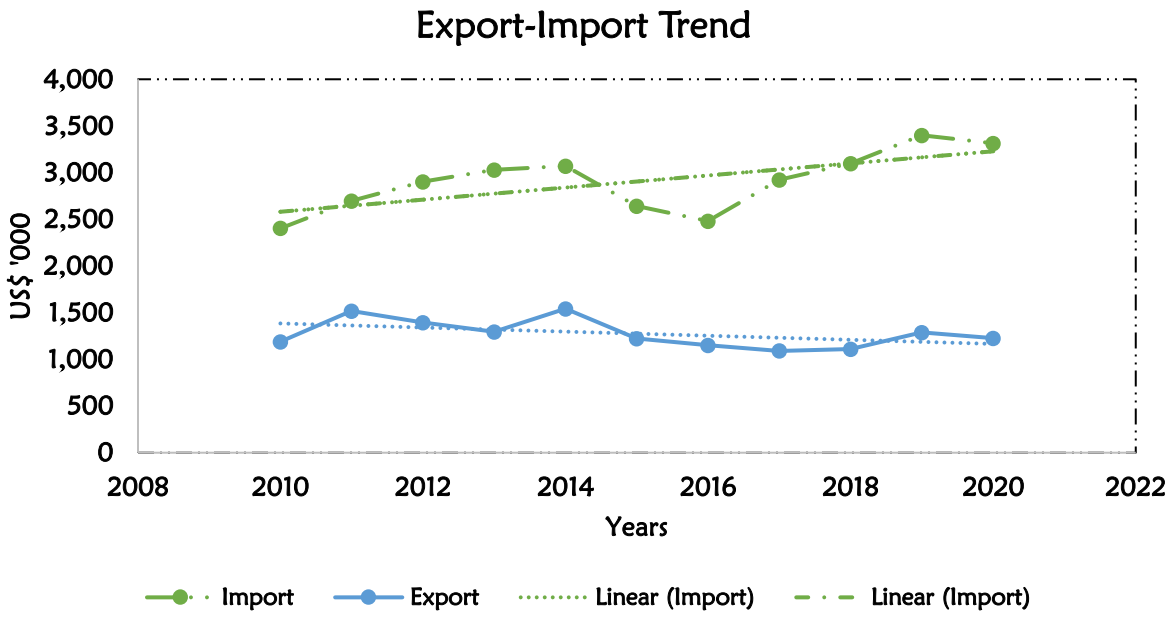

Figure 7: Trends in exports and imports for Malawi

Source: Author's analysis using ITC data (January 2024)

Figure 7 shows an upward opening trade deficit for Malawi between 2010 and 2022. The figure means that, over the years, there is a structural chronic imbalance of trade in Malawi because the country's imports are always outcompeting its exports. From the graph, it is clearly reflected that the trade gap between exports and imports keeps increasing over the years. This trajectory simply means that, in leaning heavier on imported goods and services than it exports, it has traditionally translated into chronic deficits in Malawi's trade relations.

2.5 Malawi Trade Strategies

In response to Malawi's persistent trade deficits, the Government developed the first National Export Strategy (NES-I) in 2013. The initiative emerged against the backdrop of more than two decades of the deteriorating balance of trade, primarily attributed to a sustained decline in exports and a continual rise in import values. While trade deficit was escalating NES-I focused on increasing more in exports and also focused more on import substitution strategies accordingly. However, its implantation despite well-though-out did

not meet the ambitious expectation/target it upheld for itself; by NES-I 2013-2018 large targets were missed, pointing towards colossal failures on each dimension. Nevertheless, the strategy did yield some notable achievements, including the establishment of the Malawi Bureau of Standards (MBS), the creation of the Export Development Fund, and an enhancement in Malawi's standing in the World Bank Ease of Doing Business Report (GOM, 2020) as Table 2 portrays.

Table 2: Malawi's performance in doing business

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
No. of countries	183	183	182	185	189	189	189	190	190	190	190
Rank	132	141	145	157	171	164	141	133	110	111	109

Source: World Bank

The country has as of now a successor document for the period 2021-2026 (NES II). The overall vision of the NES II aspires to make Malawi a competitive, compliant, diversified, and sustainable source of goods and services to the regional and global marketplace and to increase exports as a percentage of GDP to 20% from the current 14.6%. Its objectives include; increasing the contribution of exports to the economic and social transformation of Malawi; promoting diversification of products and markets; enhance the international competitiveness of Malawi's industries; enterprises and products so that they can compete and win at regional and global marketplace; and build policy coherence and institutional alignment to make exports happen from Malawi (GOM, 2020).

2.6 Malawi's Trade Agreements

The country has also extensively engaged with the international market and global trade through its forms of handling preferences, such as an extensive network of export agreements, to foster economic collaborations with many countries and regional groups. At present, Malawi has a network of 32 preferential trade agreements. According to ITC (2024), Malawi has had relations with CU, Botswana-Malawi (in force since 1956), followed by Japan for GSP countries (in force since 1971), Norway for LDCs (in force

since 1971), and New Zealand for LDCs (in force since 1972). Continuing through the years, Malawi established agreements with the European Union for LDCs (in force since 1971), Switzerland for GSP Countries (in force since 1972), and the United States for GSP countries (in force since 1976).

Further, Malawi has solidified trade ties with the United States for AGOA countries (in force since 2000), China for LDCs (in force since 2001), Korea for LDCs (in force since 2000), and Turkey for LDCs (in force since 2002). In recent years, the country signed agreements with Chinese Taipei for LDCs (in force since 2003), Iceland for GSP countries (LDCs) (in force since 2002), Kyrgyzstan for LDCs (in force since 2006), Malawi-South Africa (in force since 1991), Tajikistan for LDCs (in force since 2003), and India for LDCs (in force since 2008).

More recently, Malawi has signed agreements with Morocco for African LDCs that have been in force since 2001; Kazakhstan of EAEU for LDCs, that have been in force since 2016; Montenegro for LDCs, that has been in force since 2016; and Armenia for LDCs, that has been in force since 2015, and the Comprehensive Preferences Agreement, DCTS, is set to be in force from 2023.

Table 3:: Malawi trade agreements over the study period

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
No. of exporting countries	127	123	114	120	111	114	115	109	117	111	117

Source: Data from WITS (2024)

These agreements, which consider industries and regions, form the basis for strengthening the connections that underlie Malawi's international trade. The Zimbabwe-Malawi Trade Agreement has been in operation since 1995. Table 3 shows that, as of 2020, Malawi is trading with 117 export countries under the referenced trade agreements above.

2.7 Summary

This chapter has presented an overview of the trading landscape of Malawi, its historical policy regimes, the trend in export diversification over the years, and the contribution of the trade agreements. Despite these efforts, however, the country still experiences a persistent trade deficit, and such challenges have been the drive behind resourceful efforts to come up with strategy documents like the National Export Strategy. Nevertheless, the country's participation in the global network of 32 trade agreements just shows the diligent interest in participating in world economic integration. Overall, it can be said that the results and the discussion of this chapter offer the foundation for a much clearer understanding of the economic dynamics of Malawi and provide, therefore, useful policy advice for the authorities and any other stakeholder groups interested in enhancing the trade performance and sustainability for this country.

CHAPTER THREE

LITERATURE REVIEW

3.1 Introduction

This chapter provides the literature review as the study's main foundation. The first part of the chapter explains the theoretical literature about the survival of exports. The final part explains the empirical literature on the duration of exports and the determinants of export survival in the context of other countries.

3.2 Theoretical Review

3.2.1 The Gravity Model

Tinbergen (1962) was the first to use gravity to explain trade flows. The traditional gravity model draws its analogy with Newton's law of gravitation. This means that the number of goods, labour, or other factors of production supplies at the origin i, Y_i, is attracted to the demand for goods (Anderson, 2011) or services at the destination j, E_j, However, the potential flow decreases as the distance between them increases (Anderson, 2011), d_{ij}. By applying the analogy,

$$X_{ij} = Y_i E_j / d_{ij}^2 \quad (1)$$

Gives that predicted movement of goods and services between country i and j, X_{ij}. However, the aforementioned analogy only applies to the treatment of trade flows for goods and services that are generic, while the values of bilateral trade are usually aggregated goods and services. A frictionless gravity model is applied more naturally to disaggregated goods because the analysis is likely to differ markedly by product characteristics (Anderson, 2011). Hence the extension to disaggregated goods, which is usually indexed by k, is provided as follows:

$$X_{ij}^k = \frac{Y_i^k E_j^k}{Y^k} = s_i^k b_j^k Y^k \quad (2)$$

Where, $s_i^k = {Y_i^k}/{Y^k}$ is the country i's share of the world's sales of goods class k, and $b_j^k = E_j^k/Y^k$ is the country j share of the world's spending on k, equal to Y^k, the world's sales of k. In the aggregate gravity application, it is common to use mass variables for both origin and destination typically represented by Gross Domestic Product (GDP). As Anderson (2011) postulates, a more possible direction for aggregate modeling is to convert trade to the same values added basis as GDP.

3.2.2 The Core-Peripheral Model

The Core-Peripheral model is one of the economic models which, in most cases, tends to describe regions as having a hierarchical structure both in a single county and across countries. The model bases its argument on one important fact: the division of regions into either core or periphery by means of their level of development, industrialization, and connectivity.

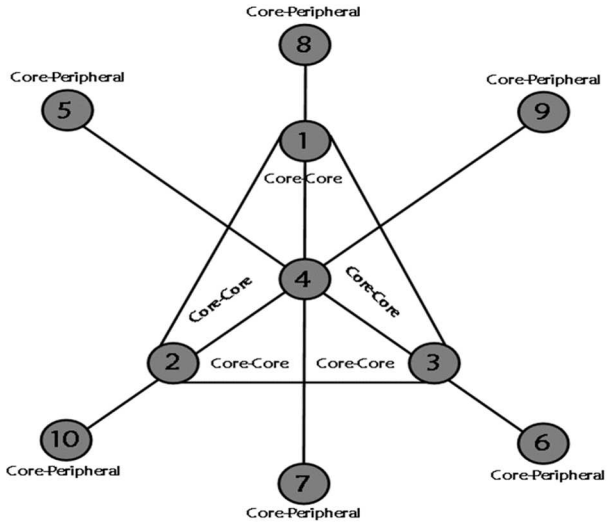

Figure 8: Core- Peripheral Model on Conglomeration

Source: The Palgrave Encyclopedia

In the model which was developed by Krugman (1991), the core represents the most developed and economically advanced regions, while the periphery comprises of less developed and often more remote regions. As provided in the Krugman's theory, the

increase in income in the core development region partly comes partly at the expense of the peripheral region (Klimczuk & Klimczuk-Kochańska, 2023), as standard international exchange models provide that market integration can result in losses for some countries while lead to an increase in the income of most countries involved in the exchange (Klimczuk & Klimczuk-Kochańska, 2023). Krugman's model introduces two opposing forces which are centripetal and centrifugal. Centripetal forces such as agglomeration, market size, mobility of workers, and positive externalities results in a cumulative-circular, divergent, and asymmetric development model (Andrzej & Klimczuk-Kochańska, 2019). On the other hand, centrifugal forces which include immobile factors such as natural resources, competition, and adverse external effects can lead to significant interregional differences (Andrzej & Klimczuk-Kochańska, 2019).

The model postulates that these regions, where the agglomeration effects take place due to factors like market size and workers' mobility, are likely to exhibit sustained and robust export performance since these may face cumulative-circular development, thus offering a favorable environment for long-term export activities. In this respect, the interaction of centripetal (agglomeration) and centrifugal forces, along with factors like economies of scale and transport cost, becomes crucial for understanding the sustainability of exports between different regions.

3.2.3 The Institutional Theory

Institutional theory in regard to international trade gives the most useful insights into understanding and explaining patterns, behavior, and outcomes of the global trading system. As well understood, the theory emphasizes the role of institutions, which are the formal and informal rules, norms, and structures that shape social interactions (Chowdhury, 2015). Trade agreements and treaties, among other formal institutions, shape the pattern of trade and ultimately settle the rules for the members. In respect of that, this set of rules defined by the formal institutions, such as tariff structures, quotas, and trade facilitation measures, will be the ultimate factor to determine whether export between countries will be easier or not. These include rules of origin, tariff structures, quotas, and trade facilitation measures that, taken together, determine how easy or how difficult it is to sustain exports

between countries. In particular, trade tariffs have been a formal institutional mechanism that directly affects the flow of trade. Importing-country tariffs reduce trade costs, thereby increasing competitiveness and shifting the probability of longer export spells. On the other hand, high tariffs raise costs, reduce market access, and disincentivize export longevity because they make international trade less competitive.

As Parrinello (2002) noted, the survival of exportation depends on the national regulatory framework of the home country regarding export and import and its custom regimes. These institutions tend to play a crucial role in shaping trade by determining entry requirements, standards, and procedures for goods and services, such that differences in these formal rules can create trade barriers or contribute to smoother trade operations and potentially lead to longer export engagements.

On the other hand, the informal institution, cultural norm, and trust also play significant roles in influencing trade. There is a possibility that countries or regions sharing cultural values might be more engaged in trade, resulting in building up more trust, while differences in cultural practices might act as a barrier to trade (Hodgson, 2019). Hence, established networks and relations norms within the international business community enhance the longevity of trade partnerships. Further, it can be provided that institution voids such as corruption can greatly hinder international trade. Countries with weak institutional frameworks may face challenges, especially in enforcing contracts and property rights thereby leading to increased costs of doing transactions and risks for traders. The presence or the absence of legal and contractual protections can greatly affect the survival of exports. Hence, institutional voids such as weak legal systems or inadequate contract enforcement may increase the risk of export failures.

3.2.4 Heckscher-Ohlin Theory

The Heckscher-Ohlin theorem states that countries export those commodities that require, for their production, relatively intensive use of those productive factors found locally in relative abundance (Jones, 2008). The theory provides the framework for understanding the relationship between the factor endowments, comparative advantage, and trade patterns

among countries. Heckscher-Ohlin theory suggests that countries have different factor endowments including labour and capital. In the context of export spells, it applies that the survival of exports may be influenced by the availability and efficiency of these factors. Countries that have abundant and efficient factors that are crucial for producing exported goods are much more likely to have more sustained exports.

Moreover, the theory asserts that "the theory thus predicts that countries will export those goods that reflect its relative factor endowments ". The theory continues to say that in a country that is endowed in more skilful labour and capital whereas comparatively facing scarcity of unskilled labour, such a country will export goods that involve intensive use of skilled labour and capita and import goods from elsewhere made more using intense unskilled labour input. In this context, sustained exports may be associated with countries specializing in the production of the goods that leverage their abundant factors and, the notion is if a country can maintain its comparative advantage, it is more likely to see prolonged export durations.

3.3 Empirical Literature Review

An extensive body of literature exploring export survival has developed in the wake-call of Besedeš and Prusa's influential work in 2006. Their utilization of the Cox Proportional Hazard model on US import data revealed that exports to the US market tend to have a relatively short span with homogenous products experiencing a shorter period as compared to heterogeneous ones. In this study, it was established that the initial volume of exports at the beginning of a spell emerges as a crucial factor for sustained trade relationships. The same results were found by Besedeš (2008) in the USA, Nitsch (2009) in Germany, and Brenton et al., (2010) in developing countries.

The studies that have followed have mostly adopted the use of discrete-time models, such as the probit and logit models, after Hess & Persson (2011) asserted their natural simplicity over continuous-time models in predicting export survival. Türkcan & Saygılı (2018) employed a probit model with random effects to examine the impact of trade agreements

on export survival in Turkey, while Türkcan & Saygılı (2018) extended this model to evaluate the influence of Global Production Chains on export survival.

According to the results, product diversification matters more than market diversification for survival and economic factors, with the export value having a beneficial influence on survival probability and real exchange rates increasing the risk significantly. Moreover, the trade costs were found to reduce the probability of surviving while common language and sharing borders were significantly shown to improve survival. Carrère & Strauss-Kahn (2017) focused on export experience in the Organization for OECD market and revealed that previous exporters' experience of destinations outside the OECD increases the survival rate. Similarly, Lawless et al., (2019) examined the experience effects as part of firms in Ireland diversifying their products.

Differentiated goods are more likely to survive in export markets than homogeneous products Fugazza & Molina, (2016). Even with competition in these homogeneous goods markets, developing countries often benefit from some comparative advantages, generating longer durations of spells in these products. Using Chinese data, Zhu et al. (2019) examined firm survival in global value chains and found that participation in global value chains lowers the probability of export survival, especially for firms producing differentiated products. Pradhan & Das (2015) examined the duration of manufacturing exports in India, by incorporating region-specific variables into their analysis. Their results revealed that the median trade duration varies based on the location of firms with those in high-income per capita regions experiencing lower survival rates probably due to diversified and sophisticated consumption behavior. In addition, regions with large local markets were associated with increased export survival rates.

Although a few studies have investigated some of the factors that affect the duration of export of goods (Banda & Simumba, 2013; Kinuthia, 2014; Chacha & Edwards, 2017; Lemessa et al., 2018; Mohammed, 2018; Abegaz & Lahiri, 2020; Socrates et al., 2020a). (Kamuganga, 2012) examined the “impact of intra-regional trade cooperation on export survival in Africa and abroad”. The effect of agglomeration on trade, this relationship has

been shallowly studied by (Arguello et al., 2020a). Their study uses firm-product-destination dynamics in Colombia to interpret the relationship between the agglomeration of the exporting country and the length of export flows. This triple interaction between firms, products, and destinations shows the presence and strength of agglomeration increases trade flow survival. The protectionist effect is lower the stronger agglomeration is measured, thus the results are significant.

The beneficial impact of agglomeration on the lifetime of exports is particularly connected to flow-specific spillovers, implying that the advantages of clustering are not universal but rather depend on the nature of the products exported and the export destinations. Moreover, the study finds that the impact of agglomeration is more pronounced when firms export the same products to the same markets (product-destination exporting). This alignment clearly shows that common characteristics and interactions between those exporters in a certain cluster magnify the positive effects on export survival.

Within this context, some of these studies have highlighted the role of agglomeration in export survival and productivity gains particularly for differentiated products whereas other studies have shown that it may pose vulnerability to export constituents or generate modest impacts on new-firm survival by regions. International agglomeration can lead to export market entry and further improve productivity after entry (Greenaway & Kneller, 2008). Export spillovers and industry diversity generally tend to influence exporting positively (Farole & Winkler, 2014), but the size and direction of the effects are location- and sector-specific; firm-level determinants of exporting tend to matter more for firms located in non-core regions, while regional determinants and agglomeration economies play a larger role in core ones (Farole & Winkler, 2014). (Ito et al., 2015) also argued that the agglomeration of exporters in China has a negative impact on the productivity gap among non-exporters, but it almost certainly encourages export participation, with spillovers generated by both foreign and indigenous Chinese exporters. Finally, Prim et al., (2016) suggest that regional clusters distinctly affect export performance and innovation for firms, as an integral part of their innovations, but there is a lack of evidence supporting export performance and product or process innovations.

In general, some of the studies indicate exporting enhancement of survival through agglomeration, while others suggest that the effect of agglomeration economies can be a source of vulnerability for fragile export industries or have limited effects on new firm survival in certain regions. This study seeks to fill the existing gap in the literature on export spells in Malawi and the role of agglomeration in landlocked countries.

3.4 Summary

The chapter provides a selective review of the main economic models as well as some of the relevant empirical research that establishes a broad base for the study of export survival. The chapter on the theoretical review examines trade models such as the gravity model, core-periphery model, institutional theory, and Heckscher-Ohlin theory. They indicate the determinants of trade flow, agglomeration, and institutional influences on trade, as well as the sources of comparative advantage. In the empirical literature review, studies on export survival were considered with a focus on the following topics; initial export volumes, product diversification, market diversification, trade agreements, and global production chains. In a nutshell, the chapter details the theory and evidence to conform to the understanding of the determinants of survival responses in exports.

CHAPTER FOUR

METHODOLOGY

4.1 Introduction

This chapter outlines the methodology that the study will adopt. Section 4.2 provides the data description and sources that will be used. Section 4.3 provides the conceptual framework outlining the pathways of export spells. Section 4.5 provides the model that will be used to estimate the stated objectives, and section 4.6 describes the variables of interest used for the study.

4.2 Data description

This study will use duration data on exports. This is an annual country-product data from the UN Comtrade Database on exports from Malawi. The study will convert the annual trade data into export spells for a period of 20 years (2003-2022), this data is at the 6-digit level classification of the Harmonized Commodity Description and Coding System (HS). Further, mirror data from the importing countries that will be extracted from the UNCTAD/WITS database will be used instead of exporters' records (direct data) because they are more reliable, especially in developing countries (Brenton., et al 2010). However, the use of mirror data may introduce discrepancies due to underreporting or misreporting by importing countries. Despite this limitation, mirror data is considered as more reliable than direct export data from developing countries like Malawi, which often lack accurate tracking system.

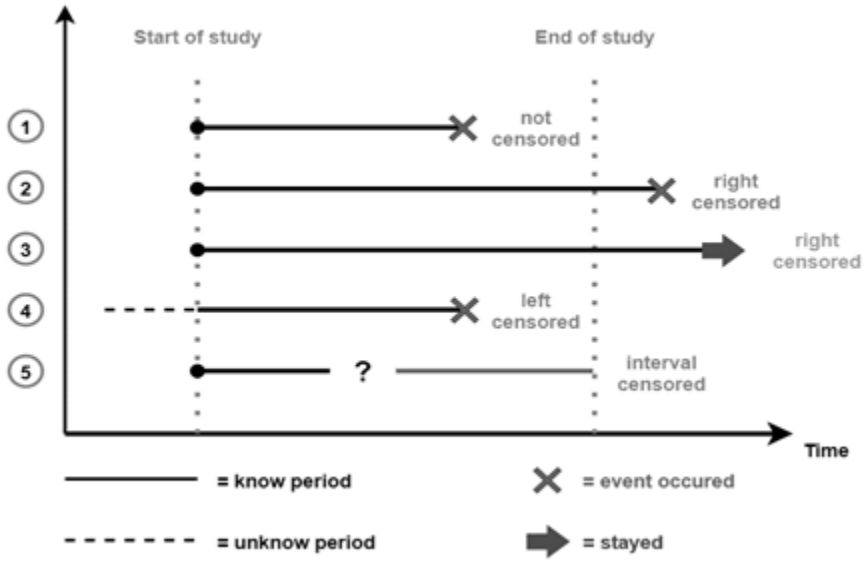

Figure 9: Duration data

Source: Authors

The illustration provided above which depicts the concept of duration data serves to explain the idea of export spells. The study begins in the year 2002 (start of the study) and completes in the year 2022 (end of the study). On export spells, some of the available data will require left-censoring and/or right-censoring. As Nicita., et al (2013) portrays, left censoring as depicted by concept number 4 on the graph requires that we exclude all the spells that are observed in 2002 from the analysis as we do not know how long these exports had been in existence prior to 2002. Hence, the study will convert trade data into export spells from 2003 to 2022.

Similarly, with regard to right censoring as depicted by concept number 3 on the graph, we do not know how the exports that are observed in the final year would continue to exist (Nicita et al., 2013) as opposed to the illustration provided by concept number 2. In the case of right censoring, the estimation technique of survival methods that this study will adopt always takes care of this right censoring. Further, when there is an interval between spells that is just one year as portrayed by concept number 5 on the graph, this study will

follow Banda and Simumba's (2013) recommendation of correcting the measurement error by merging spells with a one-year gap as there is a high probability of misreporting i.e. trade is not reported for that year (Nicita et al., 2013).

4.3 Conceptual framework

The economic theories that were previously stated can be reduced to an export survival framework as shown in Figure 10. Export survival time which is the central focus of the study represents the duration of export spells. Agglomeration which is the percentage of the urban population in the destination country is hypothesized to influence the survival time of export spells, implying that higher agglomeration may lead to longer export spells (Arguello., et al 2020). Geographical factors as the gravity model portrays especially distance to destination capitals influence the survival time of exports as longer distances entail higher transportation costs and proximity to destination capitals enhances market accessibility.

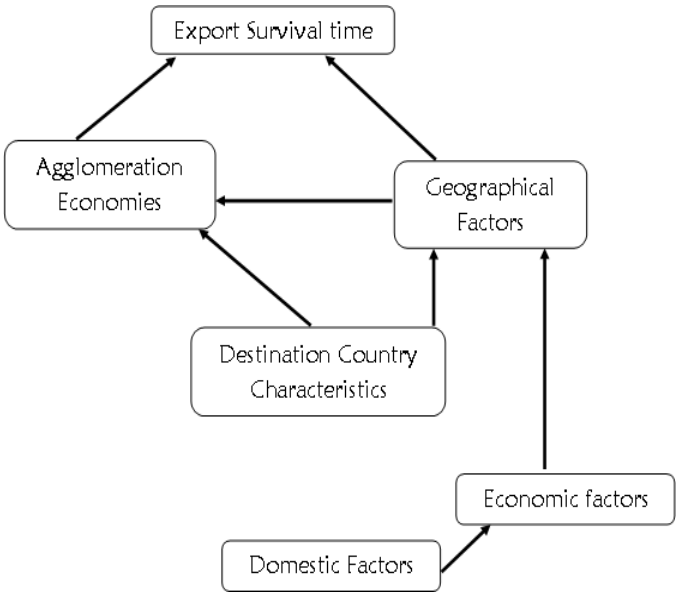

Figure 10: Export Survival Framework

Source: Authors

Country characteristics such as Real GDP, institutional quality, landlocked status, and population density influence both agglomeration economies and geographical factors. These factors collectively influence the urbanization patterns and transportation dynamics therefore ultimately impacting the export survival time for the country. Economic factors influence geographical factors as financial development in a destination country can prompt more economic activities and urbanization whose pull can move people toward the urban areas.

On the domestic front, a higher level of agglomeration within Malawi may be associated with a more developed financial sector. Furthermore, the real GDP demonstrates the overall economic condition of Malawi which can affect the financial development and trade affairs as well. A situation where environmental openings are sound in perspective to economic situations; the growing economy has a possibility to widen the access to credit that may affect the financial developments and tariff rates in the outlook of international trade affairs.

4.4 Analytical framework

This study adopts the use of a parametric frailty survival model and Kaplan Meier Analysis as is standard in survival analysis. The use of the frailty survival model and Kaplan-Meier analysis in the survival analysis of export spells proves to be crucial for comprehensive insights into the duration and dynamics of these trade phenomena. In particular, the frailty model is appropriate for analysing time-to-event data in a survival analysis framework. It handles censored data well, it incorporates time-varying covariates effectively and it also adapts modules well to non-proportional hazards permitting one to elaborate on how various factors influence the hazard rate over time (Peterson., et al 2018).

This is further corroborated by Kaplan-Meier analysis, which shows survival probability as a function of time in the form of an event-free curve, thus allowing comparison between the various groups' survival functions and identification of important points in time where events occurred (Refaat, 2021). This non-parametric approach is particularly valuable for dealing with right-censored data, thus providing a much more effective way of gaining insight into the distribution and patterns survival times of the export spells in Malawi. Both the Proportional Hazards Model together with the Kaplan-Meier analysis sets a strong and inclusive framework to unravel the intricacies of export spell survival.

4.5 Model specification

As stipulated, this study will use specialized survival models to analyze the duration data because they fit its unique characteristics. These models handle time-varying factors and censored observations effectively, estimating how the chance of an export ending (hazard) changes over time.

4.5.1 Kaplan-Meier Analysis

The Kaplan-Meier (KM) estimator will provide a non-parametric approach to analyze export survival patterns. In general, it estimates a survivor function, in this regard it will represent the likelihood that an export remains active beyond a given time point. It is calculated as:

$$\hat{S}(t) = \prod_{i|t_i<t} \frac{n_i - d_i}{n_i} \quad (3)$$

In this context, n_i will be the number of export spells at risk at time t_i, and d_i will be completed export spells of duration t_i, given that the spell has actually reached its duration t_i. The KM analysis aims to establish the export duration pattern of Malawi exports, where the duration variable will be treated as a discrete variable because the data is available on a yearly basis (interval-censored data). Notably, the time interval in the data set is of a one year, hence the interval boundaries are the positive integers $i = 1,2,3, \ldots$, and the interval i is $(i-1, i)$.

4.5.2 Parametric Frailty Survival Model

In order to realize the role of agglomeration economies on export spells for Malawi, a parametric frailty model will be fitted. The frailty model is expressed by a hazard function denoted by $h(t)$ as adopted from Socrates, Moyi, and Gathiaka (2020). If we let $P(t \leq T < t + \Delta t | T \geq t)$ be the probability of an export flow that is to be terminated in the interval $(t, t + \Delta t)$, given that the export flow lasted until time t, then the hazard function is obtained by taking the limit of this probability for Δt as follows:

$$h(t) = \lim_{\Delta t \to 0} P(t \leq T < t + \Delta t | T \geq t)/\Delta t = f(t)/S(t) \quad (4)$$

The hazard rate $h(t)$ represents the conditional likelihood of an export ending at t years given it reached t years without termination. And, independent variables influence the distribution of export durations in various ways, depending on the chosen statistical model. As outlined by Nicita, Shirotori, and Klok (2013), the proportional hazards regression is a semiparametric approach where no parametric form of the baseline function is specified, yet the effects of the independent variables are parameterized to alter the baseline survival function in a way that the independent variables multiplicatively shift the baseline hazard function. For this study the Proportional hazard regression is then specified as follows:

$$h_i(t) = h_0(t) \exp(X'_{it}\delta + D'_1\vartheta) \quad (5)$$

$$h(t|X_i) = h_0(t) exp(X'_{ik}\phi) \quad (6)$$

Where $h_0(t)$ is the baseline hazard rate which according to the model specification is not influenced by any independent variable, and $h_0(t)$ is each sample's hazard rate that is a product of a function of the independent variables and the aforementioned baseline hazard rate, the X_i' is the matrix of covariate which are usually time non-varying. The above the function can be written as:

$$exp(X_{ik}'\phi) = \frac{h(t|X_i)}{h_0(t)} \tag{7}$$

However, it should be said that one issue with using the hazard function is the assumption of proportional hazards. The assumptions assumes that when using regression with time-invariant covariates, the ratio of hazards for any two observations is the same across time periods. In view of the violation of the proportional hazard assumption, this study will adopt a modified proportional hazards function that include time-interaction terms for time-dependent explanatory variables. A simplified proportional hazard function with a set of covariates can be presented as follows:

$$h_i\,(t) = h_0(t)\exp(X'_{it}\delta + D'_1\vartheta + X'_{it}(t)\varphi) \tag{8}$$

Where the hazard rate at time t in this instance depends on the value of X'_{it}. δ and φ are the coefficients of time-fixed and time-varying covariates respectively while ϑ is the coefficient of dummy covariates and $h_0(t)$ is the baseline hazard rate. To account for heterogeneity and subsequent endogeneity, a frailty model is fitted which includes in the hazard function the value of an additional unmeasured covariate, which is called the frailty. The hazard function with frailty Z is specified as:

$$\lambda\big(t\big|Z(t)\big) = Z\lambda_0(t)\exp(X'_{it}\delta + D'_1\vartheta + X'_{it}(t)\Phi) \tag{9}$$

$$\lambda(t|Z(t)) = Z\lambda_0(t)ex\,p(X_{it}'\phi) \tag{10}$$

The frailty term Z is a latent random variable assumed to follow a non-negative distribution. Common choices for the distribution of Z in frailty models are the gamma and inverse Gaussian distributions, which help avoid imposing inappropriate assumptions on the frailty. Model selection is guided by the Akaike Information Criterion (AIC), with the distribution yielding the smallest AIC value being preferred.

4.6 Variable Description

This section explains the variables utilized in the study. In addition, it provides the rationale behind the selection of these variables which encompasses macroeconomic factors, market access, spatial distribution, and institutional factors.

4.6.1 Agglomeration

In this study, the concept of agglomeration will be examined in connection with the core-peripheral model. As captured by Arguello., et al (2020) agglomeration is represented by the urban population percentage as a percentage of the total population. Agglomeration economies for all the importing partner countries will be analyzed.

4.6.2 Gravity Covariates

In this study, the variables that are used in standard gravity specification are distance to destination capitals, real GDP of the importing country, contiguity as a dummy, common language as a dummy, and colonial relationships as a dummy. As provided by Fugazza and Molina (2016) the rationale is that these gravity variables not only affect trade volumes, but also the occurrence of trade and hence its duration.

4.6.3 Exchange Rate

The exchange rate is considered in the study to reflect the effect of foreign prices on the survival of Malawi's exports. A decline in the exchange rate among the importing partners is anticipated to reduce Malawi's ability to maintain its exports. The real exchange rate will be used in this study.

4.6.4 Population Density

The size of international markets influences the sustainability of export survival as higher population density often corresponds to larger markets. Countries that attract exports from exporters due to higher population density can offer access to larger pools of consumers, potentially boosting the demand for products. The scale of the market and intensity of demand have the likelihood to influence successful and sustained export durations. The population density of the partner country will be used in this study.

4.6.5 Financial Development

Financial development enhances access to financing for exporters. Exporting activities often demand relatively huge suppliers of financial resources for international marketing, and managing associated risks emanating from international trade. Financially developed countries are expected to provide good access to credit as well as other financial incentives that would influence the survival of exports. The percentage of domestic credit to the private sector will be used to capture financial development.

4.6. 6 Trade Tariffs

Trade tariffs tend to hold a direct influence on the cost of exporting goods, as higher tariffs may increase the expenses involved in international trade, thereby reducing the competitiveness of exports and potentially shortening their longevity. On the other hand, lower tariffs in foreign markets can ease market entry for firms, enabling them to compete effectively and enhancing the likelihood of longer export survival. The anticipated effect of trade tariffs on export longevity can be described as twofold: higher tariffs in the importing country can be expected to negatively impact the duration of export spells, while lower tariffs can have a positive effect.

4.6.7 Institutional Quality

The quality of institutions influences the legal environment under which firms operate. The presence of a legal framework and the mechanisms to enforce contracts are the two most fundamental aspects of international trade. Institutional quality and business rationalization can be seen as important for high-quality institutions guaranteeing a more secure business environment, whereby uncertainties associated with contract enforcement and legal disputes are reduced, therefore affecting the survival of exports.

4.7 Summary

The chapter outlined the methodology beginning with an introduction and followed by data sources and methodology, conceptual framework, empirical framework, model specification, and variable description. The conceptual framework introduces economic theories where the outcome is based on the export survival time relying on agglomeration,

geographical factors, and country characteristics. The empirical framework includes the parametric frailty survival model and Kaplan-Meier Analysis based on which comprehensive insights regarding the dynamics of export spells have been provided.

CHAPTER FIVE

RESULTS AND DISCUSSION

5.1Introduction

This chapter now presents the empirical findings of the study, starting with an overview of the data in Section 5.2, followed by descriptive statistics in Section 5.3. Section 5.4 discusses the core findings that focus on export survival in Malawi, followed by the survivor functions equality test in Section 5.6 and the results of the parametric frailty survival model in Section 5.7. The chapter then concludes with a detailed discussion to give insight into the outcomes of the study.

5.2 Data description

In analysing the exports, mirror data from the importing countries was used instead of the exporter's records because they are more reliable, especially in the case for developing countries. For example, if Malawi continuously exported tobacco to Belgium from 2003 to 2022, it would form one spell that is uninterrupted and lasting twenty (20) years. However, if there was a break in exports, say in 2010, then the spell would be considered to have lasted for 7 years. Thus, the export spells, whether lasting for 20 years or 7 years, are now regarded as duration data within the export spell analysis. The institutional quality index was created by utilizing the Principal Component Analysis (PCA) on all six governance indicators from the World Bank development indicators database and a robustness check was done using the institutional quality data from the Mo Ibrahim Foundation database. These six governance indicators are Control of Corruption (COR), Government Effectiveness (GOE), Political Stability and Absence of Violence (PSV), Regulatory Quality (REQ), Rule of Law (ROL), and Voice & accountability (VOA).

Table 4: Principal Component Analysis results

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	5.221	4.890	0.870	0.870
Comp2	0.331	0.027	0.055	0.925
Comp3	0.305	0.227	0.051	0.976
Comp4	0.078	0.039	0.013	0.989
Comp5	0.039	0.014	0.006	0.996
Comp6	0.025	.	0.004	1.000

Note: Critical value: >1%.

Source: Authors' estimation

Table 4 provides the results with the Eigenvalues of the correlation matrix which is ordered from the largest to smallest number. As shown, the first principal component has a variance (eigenvalue) of 5.221 explaining 87% of the total variance (proportion). The second principal component explains 5.5% of the total variance followed by 5.1%, 1.3%, 0.6%, and 0.4% respectively. The results show that largely component 1 and 2 explains 92.5% of the total variance. The corresponding principal components (eigenvectors) showing the correlation between components and variables are provided in Table 5.

Table 5: Principal Component (Eigenvectors)-Correlation between component and variables

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6	Unexplained
COR	0.422	-0.194	-0.176	0.697	-0.389	0.341	0
GOE	0.420	-0.344	-0.205	-0.103	0.765	0.260	0
PSV	0.371	0.848	-0.368	-0.051	0.068	0.013	0
REQ	0.424	-0.204	-0.031	-0.699	-0.497	0.206	0
ROL	0.430	-0.193	-0.057	0.083	-0.030	-0.876	0
VOA	0.377	0.215	0.887	0.075	0.108	0.084	0

Source: Authors' estimation

To compute the institution quality index, the analysis rotates the factors from Tables 4 and 5 using an orthogonal varimax approach and then generates the index. Data on some of the covariates were obtained from the World Development Indicators database, while data on the gravity variables were taken from the CEPII database.

5.3 Descriptive results

Table 6 provides the descriptive statistics of the study. In the case of export spells, it indicates that the country, on average, engages in exporting its products continuously for about 4 consecutive years within 20 years. Further, some exported products may be exported intermittently over multiple linked spells. For example, an exporter may export a product to an importer, cease exporting, and then resume exporting the same product to the same importer at some later year. Because these spells may be linked, the study includes a dummy variable to capture multiple spells for a given exporter-importer-product triplet as a control. Only about 3 percent of the spells of the study have multiple spells.

Table 6: Descriptive statistics of duration variable

Duration Variables	Products	Mean	Std. Dev.	p1	p99	Skew.	Kurt.
Export Spell	8772	4.109	4.851	1	20	1.789	5.407

Source: Authors' estimation

Conversely, as Table 7 shows, the average for Agglomeration (Importer) at 63% implies that, on average, the urban population forms around 63% of the total population in the exporting countries. This observation suggests that there might be higher economic activity levels in urban areas as suggested by the Core-Periphery model.

Table 7: Descriptive statistics of covariates

Variable	Obs	Mean	Std. Dev.	Min	Max
Agglomeration	2320	63.478	23.315	8.908	100
Financial Development	2320	68.145	48.866	5.238	216.308
Log Exchange Rate	2320	3.447	2.74	-1.085	9.56
Trade Tariffs	2320	6.402	4.575	0.2	20.2
Population Density	2320	137.584	127.397	14.857	406.185
Log GDP	2320	25.59	2.095	20.481	30.867
Institutional Quality	2320	0	1	-1.721	2.05
Log Distance	2320	8.776	0.252	8.374	9.037
Contiguity	2320	0.043	0.203	0	1
Common Language	2320	0.314	0.464	0	1
Colony	2320	0.014	0.119	0	1

Source: Authors' estimation

5.4 Preliminary results

Figure 11 presents the distribution of the value of Malawi's exports at a product level. Overall, 96.64% of Malawi's products are below USD 1,000 in value. The value of 2.20% of exports from Malawi does not exceed USD 5,000 while 0.07% of the exports does not exceed USD 100,000. Only about 0.03% of products exported from Malawi exceed 100,000. As Kamuganga (2012) provides that all exports from the SSA are expected to be below USD 100,000 at the product level, Malawi surpasses this limit by a mere 0.03% of its total exports.

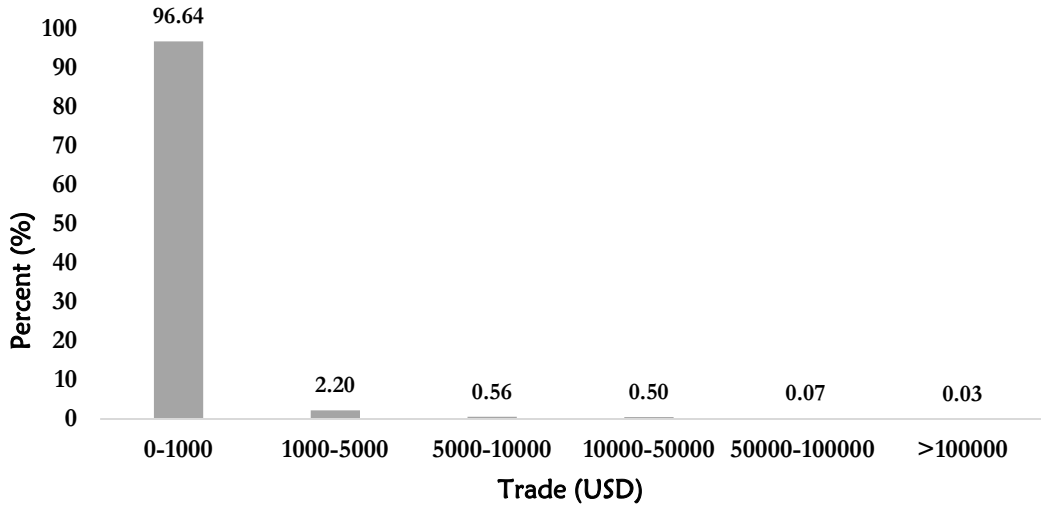

Figure 11: Histogram of Export Values from Malawi in USD

Source: Own elaboration

Table 8 provides the summary statistics of Malawi's export survival during the period under analysis. An incident rate of 0.313 for Malawi implies that, on average, approximately 31% of export failures happen per year.

Table 8: ***Export termination rate***

	Total analysis time at risk	**Incidence rate**	**Number of subjects**	**|------ Survival time ------|**		
				25%	**50%**	**75%**
Total	11,389	.3133119	8772	1	1	2

Source: Authors' estimation

Further, it is observed that the export duration at the 25th percentile is just 1 year, while the medium (50th percentile) spell length is also 1, indicating that half of the exports from Malawi did not last longer than the first year during the examined period. The export duration at the 75th percentile is 2 years meaning that almost 75% of Malawi's exports did not survive past 2 years under the period under analysis.

5.5 Survival Analysis findings

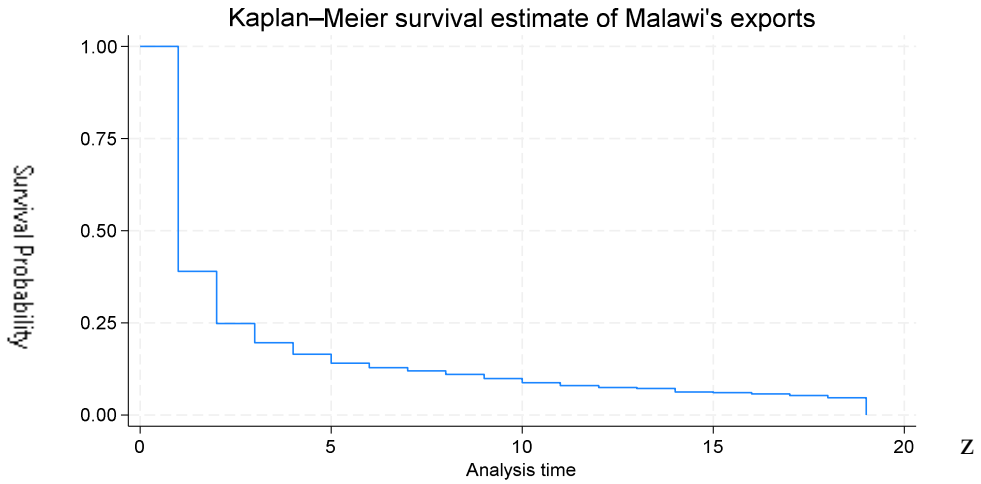

Figure 12: Survival function of Malawi's export

Source: Own Computation

The survival of Malawi's exports is elaborated using the Kaplan-Meier Analysis to analyze the hazard rate at each different point in time under the analysis period. From Figure 12 and Table 9, the survival rate of exports from Malawi after the initial first year of trading is 39% and then 25% in the second year, 19% and 16% in the third and fourth year respectively. This survival rate is primary driven by agricultural products, such as tobacco and tea. As confirmed by the Kaplan Meier survivor function as shown in table 5, the survival rate of Malawi's exports is less than 10% after the 9th year of analysis. This suggests that Malawi's exports survive longer in their first year than the African average of 36% as established by (Kamuganga, 2012).

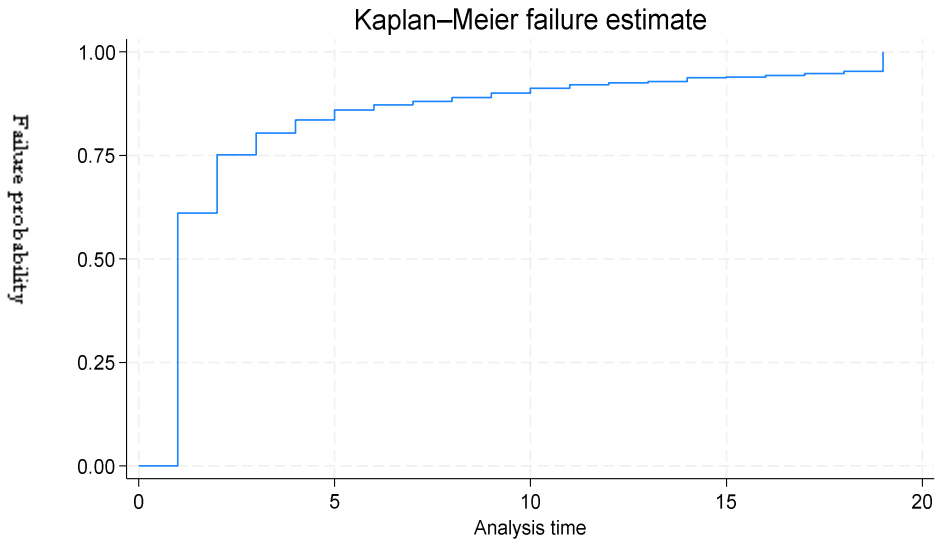

Figure 13: Failure function of Malawi's export

Source: Own Computation

Table 9: Kaplan Meier survivor function (10-year analysis)

Time	Survivor rate	Std. error	[95% conf. int.]		Margin Rate (%)
1	0.3894	0.0089	0.3720	0.4068	--
2	0.2484	0.0079	0.2331	0.2640	14.10
3	0.1964	0.0072	0.1824	0.2107	5.20
4	0.1645	0.0068	0.1515	0.1780	3.19
5	0.1406	0.0063	0.1285	0.1533	2.39
6	0.1284	0.0061	0.1167	0.1406	1.22
7	0.1197	0.0059	0.1084	0.1316	<1
8	0.1104	0.0057	0.0996	0.1219	<1
9	0.0992	0.0054	0.0888	0.1102	1.12
10	0.0879	0.0052	0.0781	0.0983	1.13

Source: Own Computation

As opposed to the Kaplan Meier survivor function and estimates, figure 13 and Table 10 provide that 61% of Malawi's exports fail in the initial first year of trading. In comparison

with Kenya, where between 20% and 60% of exports die within the first year of trading (Socrates et al., 2020c), this rate for Malawi is quite higher but lower than the African average, which is 65% as specified by Kamuganga (2012), signifying that Malawi could be doing better in terms of export survival as compared to other developing countries.

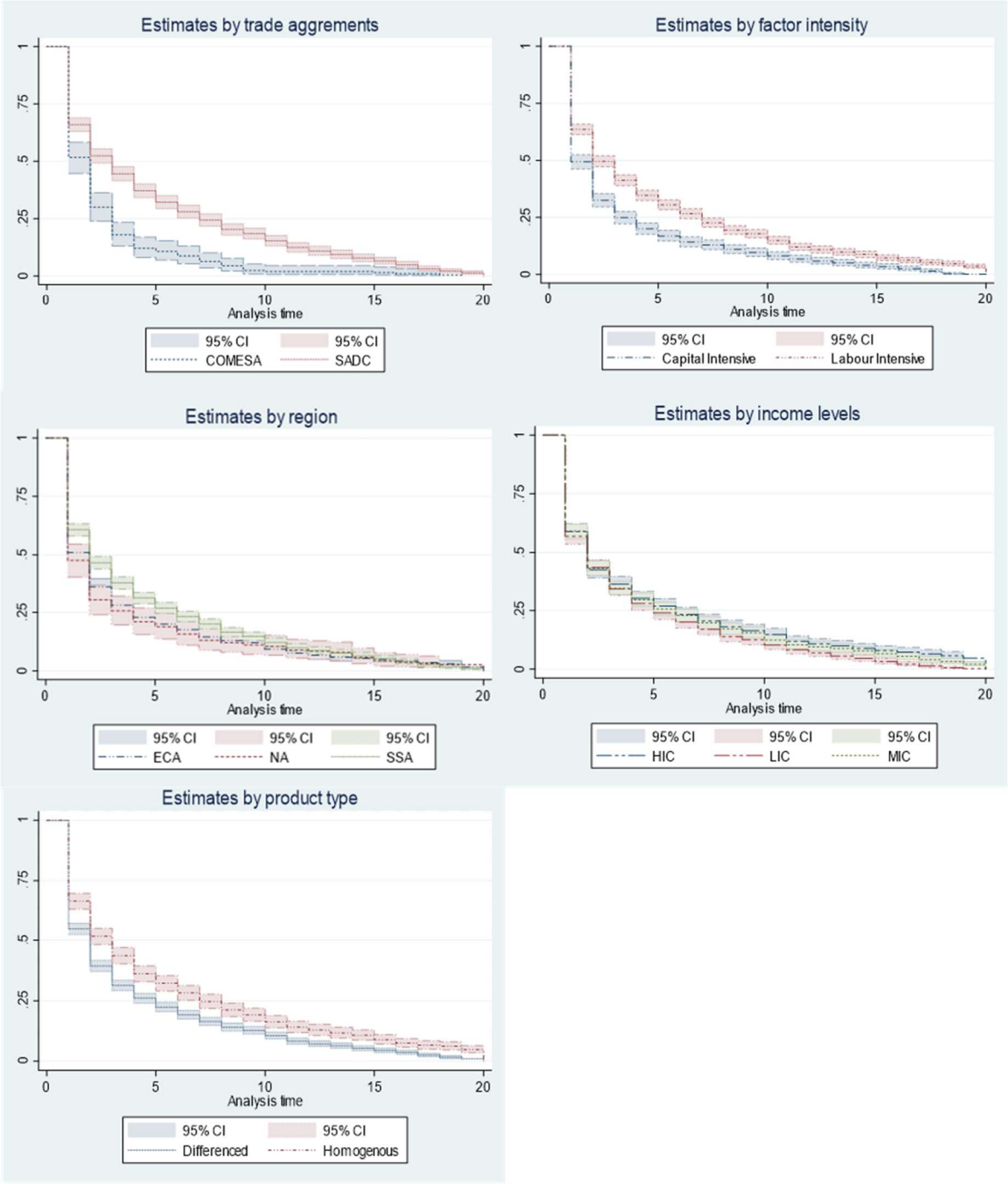

Figure 14: Survival of Malawi's export by region, product type, factor intensity, and agreement

Source: Own Computation

Figure 14 and Table 11 show the survival of Malawi's exports by region, trade agreement, product type, and factor intensity. The results show that exports from Malawi have a higher survival after the initial first year of trading in Sub-Saharan African (SSA) countries (61%) followed by Europe and Central Asia (ECA) countries (51%), and then North America (47%). In terms of trade agreements, Malawi has a higher survival rate after the first year of trading in the SADC (66%) market than in COMESA (51%). Regarding the type of product and factor intensity of the export products, homogenous and labour-intensive products have a higher survival rate than differentiated and capital-intensive products. This can be attributed to the fact that the country's top export products as presented in section 2.2 are agricultural and less mechanized goods.

Table 10: Kaplan Meier failure function (10-year analysis)

Source: Own Computation

Time	Failure rate	Std. error	[95% conf. int.]		Margin Rate (%)
1	0.6106	0.0089	0.5932	0.6280	--
2	0.7516	0.0079	0.7360	0.7669	-14.10
3	0.8036	0.0072	0.7893	0.8176	-5.20
4	0.8355	0.0068	0.8220	0.8485	-3.19
5	0.8594	0.0063	0.8467	0.8715	-2.39
6	0.8716	0.0061	0.8594	0.8833	-1.22
7	0.8803	0.0059	0.8664	0.8916	>-1
8	0.8896	0.0057	0.8781	0.9004	>-1
9	0.9008	0.0054	0.8898	0.9112	-1.12
10	0.9121	0.0052	0.9017	0.9219	-1.13

In terms of income levels of countries, the study unveils not much of a significant difference in the survival of Malawi's exports between High-Income countries (HIC), Middle-Income countries (MIC), and Low-Income Countries (LIC). In specifics, during the initial year of trading, MICs have the highest survival rate of 59.14% followed by HICs with a survival rate of 58.85%, and the LICs at 56.92%. These findings contrast with many studies that typically show higher export survival rates for HICs, followed by MICs, and then LICs.

Table 11: Survival function by region, product type, factor intensity, and agreement

Source: Own Computation

Variables		Time	Survivor Function	Std. error	[95% conf. int.]	
Region	SSA	1	0.6071	0.0133	0.5805	0.6327
	ECA	1	0.5098	0.0187	0.4726	0.5457
	NA	1	0.4764	0.0361	0.4041	0.5451
Trade Agreement	SADC	1	0.6597	0.0150	0.6294	0.6881
	COMESA	1	0.5169	0.0347	0.4468	0.5825
Product Type	Homogenous	1	0.6622	0.0164	0.6289	0.6933
	Differentiated	1	0.5470	0.0117	0.5238	0.5696
Factor Intensity	Labour-Intensive	1	0.6358	0.0118	0.6122	0.6584
	Capital Intensive	1	0.4939	0.0159	0.4623	0.5247

5.6 Test equality of the survivor functions

One of the established goals for the above analysis is to compare the survival functions of two or more groups for Malawi's exports. A need to test the equality of the survivor functions is carried out to determine if these survival curves are statistically equivalent or different. This study adopted a Log-Rank test as a statistical procedure to determine the significance of the survival functions.

Table 12: Equality of survivor functions: Log-rank test

Variable Categories	Observed events	Expected events	Chi-squared statistics
Capital Intensive	984	804.300	chi2(1) = 84.27
Labour Intensive	1664	1843.700	Pr>chi2 = 0.0000
ECA	716	670.13	chi2(1) = 84.27
NA	191	174.58	Pr>chi2 = 0.0042
SSA	1344	1406.29	
COMESA	207	136.74	chi2(1) = 58.72
SADC	999	1069.26	Pr>chi2 = 0.0000
Differentiated	1819	1675.17	chi2(1) = 48.58
Homogenous	829	972.83	Pr>chi2 = 0.0000

Source: Own Computation

The Log-rank test evaluates the survival distributions among two or more groups by examining the variance between observed and anticipated events at each time interval. It generates Chi-squared statistics, as presented in Table 12. Here, the null hypothesis posits no variance between survival functions, contrasting with the alternative hypothesis suggesting differences in at least one survival function. Typically, if the p-value is less than 0.05, we reject the null hypothesis, concluding that the survival functions are indeed statistically different. And since the p-values for all the grouped functions are less than the standard level of significance it implies that the groups used to compare the survival functions are statistically different from each other across all the variable categories.

5.7 Parametric Frailty Survival Model

To account for country-level heterogeneity and improve the accuracy of survival analyses by accounting for unobserved factors that influence the risk of export failure, the study fitted a frailty survival model using a proportional hazard regression approach. Frailty models aim to incorporate this heterogeneity by introducing a random effect which is known as a frailty term which captures the unobserved differences in risk amount in individual countries. The existence of outliers in the covariates was analyzed using the box plots and curing was done using the winsorizing method. The model was run based on different assumptions for the underlying proportional hazard parametric distributions. Of these, the best fitting model was when the baseline distribution was Weibull and the frailty

distribution inverse Gaussian as can be seen from the information criterion selection from the table below.

Table 13: Model comparison with different proportional hazard (survival) distributions

Survival Distribution	Parameterization	AIC	BIC
Exponential Proportion Hazard	Gamma	2986.017	3069.584
Weibull Proportional Hazard	Gamma	--*	--*
Gompertz Proportional Hazard	Gamma	2928.275	3016.758
Exponential Proportion Hazard	Inverse-Gaussian	2954.262	3032.914
Weibull Proportional Hazard	Inverse-Gaussian	2874.559	2963.082
Gompertz Proportional Hazard	Inverse-Gaussian	2952.556	3041.039

**Convergence not achieved*

However, it can also be shown that a weibull model with Gamma frailty did not converge suggesting that the model did not adequately capture the underlying distribution of the data.

Table 14: Results of multivariable parametric inverse Gaussian frailty survival regression with proportional hazard Weibull distribution

Variables	Hazard Ratio	Std. Err.	z	p-value	95% LCL	95% UCL
Spatial distribution						
Agglomeration	.9955**	.0019	-2.26	.024	.9916	.9994
Population Density	.9992**	.0181	-2.12	.034	.9984	.9999
Export Cost						
Distance	1.6011**	.2930	2.57	.010	1.1186	2.2919
Macroeconomic factors						
Real GDP	.9110***	.2039	-4.17	.000	.8719	.9518
Exchange Rate	1.0470***	.0177	2.72	.007	1.0129	1.0822
Financial Development	.9999	.0009	-0.15	.883	.9979	1.0018
Trade Tariffs	1.0376***	.0115	3.32	.001	1.015	1.060
Institutional quality						
Institutions	.8687***	.0402	-3.04	.002	.7932	.9513
Market Access						
Colony	1.4712	.5862	0.97	.333	.6738	3.2123
Common Language	.8472*	.0833	-1.68	.092	.6986	1.0274
Contiguity	.6914	.1583	-1.61	.107	.4414	1.0830
Multispells						
Multiple spells	.1104***	.0309	-7.86	.000	.0638	.1913
Interactions						
Institutions_Agglomeration	.9980***	.0007	-2.99	.000	.9967	9993
Institutions_GDP	.9946***	.0018	-3.02	.003	.9911	.9981
Agglomeration_GDP	.9998***	.0001	-2.79	.005	.9997	.9999
Intercept						
Baseline Hazard	.0087	.0286	-1.45	.148	.0000	5.388
Ln_p	.6057	.0380	15.95	.000	.5133	.6801
lnthata	1.5376	.2253	6.82	.000	1.0960	1.9792
Mean dependent var	5.453			SD dependent var		5.5312
Number of obs	2248			Chi-square		115.015
Prob > ch2	0.000			Akaike (AIC)		2874.599

*** *p<.01, ** p<.05, * p<.1*

5.8 Findings of the study

From the estimated inverse Gaussian frailty survival regression with a proportional hazards Weibull distribution, the coefficients of Ln_p and lntheta provide important insights into the dynamics of export durations and the effect of unobserved heterogeneity. The coefficient of 0.6057 for Ln_p implies that the logarithm of the Weibull shape parameter p is positive. Since Ln_p is 0.6057, the shape parameter p itself is exp (0.6057) ≈ 1.832, and because p>1, this suggests that the hazard rate of export failure increases over time inferring that, for Malawi, the likelihood that a given export spell will end becomes higher as the duration of the spell increases. This implies that longer-lasting export relationships are more prone to termination as compared to shorter ones.

lnthata (Log of the Frailty Variance θ) on the other hand has a coefficient of 1.5375. For ln(θ) indicates that the natural logarithm of the frailty variance θ is positive. Since ln(θ)=1.5375, the frailty variance θ itself is exp (1.5375) ≈ 4.65. A larger value of θ indicates significant unobserved heterogeneity among the export spells. Implying that there are substantial differences in the risk of export failure that are not explained by the observed covariates in a model. Some export spells are inherently more likely to end sooner than others due to unmeasured factors. However, the insignificance of ln(θ) suggests that the variance of the frailty term (unobserved heterogeneity) may not be significantly different from zero. In other words, there is no strong evidence to suggest that unobserved factors are playing a substantial role in influencing the duration of export spells hence the dependency within countries is negligible.

After controlling for the between frailty, the results of the inverse Gaussian frailty survival regression with the proportional hazard Weibull distribution reveals that agglomeration, population density, distance, real GDP, exchange rate, trade tariffs, institutions, and common language significantly affect the export's survival.

5.9 Results of multivariable frailty survival regression model based on regions

Having established through the Kaplan-Meier in section 5.5 that the survival of exports for Malawi differs across regions namely, Sub-Saharan Africa (SSA), Europe and Central Asia

(ECA), and North America (NAM), hence to gather more insight into these differences in export survival for Malawi, the study further examines the factors that influence of export survival within these specific parameters.

Table 15: Parametric frailty survival regression model based on regions

	Model 1	Model 2	Model 3	Model 4
Variables	**S.S.A**	**N.A.M**	**EC.A**	**R.O.W**
Spatial distribution				
Agglomeration	.991**	1.020	1.018***	.995
	(.004)	(.024)	(.004)	(.184)
Population Density	1.001	.992***	.998***	.999*
	(.002)	(.002)	(.000)	(.000)
Export Cost				
Distance	2.144***	1.426	1.317	2.443**
	(.395)	(.305)	(.462)	(.870)
Macroeconomic factors				
Real GDP	1.142	1.650	1.090	1.207
	(.220)	(.532)	(.295)	(.276)
Exchange Rate	1.051**	1.124***	1.014	1.000***
	(.026)	(.061)	(.028)	(.000)
Financial Development	.989*	.995***	1.007***	1.001
	(.006)	(.002)	(.002)	(.002)
Trade Tariffs	1.007	1.026	.948**	1.111
	(.020)	(.029)	(.020)	(.078)
Institutional quality				
Institutions	.967	.994	1.281***	.768***
	(.052)	(.098)	(.115)	(.057)
Market Access				
Colony	---	---	---	1.454
	---	---	---	(.577)
Common Language	.447***	.623**	.367***	1.16
	(.060)	(.128)	(.071)	(.241)
Contiguity	1.075	---	---	---
	(.155)	---	---	---
Interactions				
Institution & Agglomeration	.998	1.000	1.004**	.997***
	(.002)	(.001)	(.002)	(001)
Institution & GDP	.998	1.000	1.011***	.989***
	(.002)	(.004)	(004)	(.003)
Agglomeration & GDP	1.000	1.001	1.001***	.999
	(.000)	(.001)	(.000)	(.000)
Multispells				
Multiple spells	.150***	.199*	.237***	.140
	(.083)	(.171)	(.100)	(.120)
Intercept				
Baseline Hazard	.142	.011	1.052	2.39
	(.022)	(.017)	(.740)	(108)
ln_p	---	---	---	.658***
				(.053)
lntheta	-.046	.177	.504	1.917
	(.335)	(.504)	(.558)	(.344)
Mean dependent var	7.427	11.686	7.794	6.075
Number of obs	313	470	532	933
Prob > chi2	0.000	0.000	0.000	0.000
Chi-square	106.385	67.486	64.778	62.719

**** p<.01, ** p<.05, * p<.1*

Standard errors are in parentheses.

Note: SSA refers to Sub-Saharan Africa; NAM refers to North America; ECA refers to Europe and Central Asia; ROW refers to rest of the world.

Overall, the study unveils that distance and exchange rate increases the risk of export failure for Malawi, financial development, institutions, and agglomeration are also considered to increase the risk of export failure specifically for ECA countries. The harm that the exchange rate has shown on the survival of Malawi's exports reflects how the country is highly vulnerable to international shocks. The joint effect of agglomeration, institutions, and real GDP has also an increasing effect on ECA countries. Meanwhile, population density is considered to decrease the risk of failure for NAM, ECA, and ROW countries. Institutions greatly increase export survival in ROW countries only, implying how the clarity of rules in the international market makes it easy for importers to engage in trade with Malawi.

The literature on trade economics indicates that trade between African nations is very minimal. This is primarily due to the focus of exports being directed towards other regions worldwide. In particular, countries in Sub-Saharan Africa with shared languages tend to have stronger export ties as the results show, which consequently increases the survival of exports from Malawi and similarly for North American, and Europe & Central Asian countries. Normally, having a common language with all trading partners enhances the survival of Malawi's exports, and the interaction between institutions with GDP and agglomeration reduces the risk of failure of the ROW countries.

5.10 Discussion of the results

Firstly, the findings established that export spells for Malawi's exports are short-lived, the study confirms previous findings which conclude that trade duration is short for developing countries. For Malawi, the 39% survival rate of exports after the initial year suggests that Malawi's exports survive longer in their first year than the African average, of 36% as established by (Kamuganga, 2012), while 61% of Malawi's exports fail in the initial first year of trading, in comparison with Kenya where between 20% and 60% of export cease within the first year of trading (Socrates et al., 2020b), this hazard rate for Malawi is quite higher but lower than the African average, which is 65% as specified by (Kamuganga, 2012). The survival rates of Malawi's exports provide some critical insights into the country's trade dynamics and alignment with existing policies. For example, the relatively

higher survival rates in Sub-Saharan African (SSA) markets and trade agreements such as SADC (66%) reflect the benefits of Malawi's participation in regional trade agreements and the efforts to enhance regional integration. This aligns with Malawi's trade policies, which prioritizes regional market access and partnerships under frameworks like SADC and COMESA to boost export performance.

Secondly, the survival of Malawi's export survival as emphasized by factor intensity unveiled that, labour-intensive products have a higher survival rate than differentiated and capital-intensive products. This can be attributed to the fact that Malawi's top export products as offered by UN Comtrade and ITC data, are agricultural and less mechanized goods. The findings that homogeneous and labour-intensive products, predominantly agricultural and less mechanized, exhibit higher survival rates is consistent with Malawi's policy focus on agriculture-led growth and export diversification. These policies encourage investment in sectors where the country has comparative advantages, such as tobacco, tea, and sugar, which are labour-intensive and less capital-intensive. Further, in terms of income levels of countries, the study unveils not much of a significant difference in the survival of Malawi's exports between High-Income countries (HIC), Middle-Income countries (MIC), and Low-Income Countries (LIC) as during the initial year of trading, MICs have been found to have the highest survival rate of 59.14% followed by HICs with a survival rate of 58.85% and LICs at 56.92%. These findings contrast with many studies that typically show higher export survival rates for HICs, followed by MICs, and then LICs.

Thirdly, the study unveils that agglomeration economies reduce the risk of export failure by approximately 0.45 percentage points (HR=0.9955) lower than localized economies, indicating a decreased hazard of export failure in spatially clustered economic activities. This finding aligns with the core-periphery model and the concept of agglomeration economies, which suggests that the agglomeration benefits export activities, although Malawi is a landlocked country, these results however, are consistent with recent findings conducted on open economies conducted by (Arguello et al., 2020a), (Brice & Socrates, 2022b), (Greenaway & Kneller, 2008) and (Thia, 2016).

(Arguello et al., 2020a) found that the agglomeration of exporters in Colombia increases trade flow survival rates, especially for similar product destination activities and differentiated products. (Greenaway & Kneller, 2008) revealed the likelihood of entering export markets and providing additional productivity benefits. (Pan et al., 2022) showed that high high-tech industry agglomeration significantly positively affects export industry product upgrading, mediated by innovation and openness. (Malmberg et al., 2000) indicated that traditional scale economies and urbanization economies have a greater impact on export performance than localization economies. (Ito et al., 2015) unveiled that there is a productivity agglomerative advantage on which most incumbent exporters gain huge credit for export participations are smaller in scale and significance.

Fourth, the following have influenced the survival of exports: The population density can be said to influence the survival of exports where areas that have a dense population on the side of the importing countries are linked to a risk of failure for exports by about 0.08 percentage points less (HR=0.9992) than in less-populated areas. This suggests that higher population density in partner countries slightly decreases the risk of export failure from Malawi due to the existence of large markets in these areas. Distance impacts export survival, as proximity to partner capitals is associated with a lower risk of export failure, while greater distances increase the hazard by approximately 60.11 percentage points (HR=1.6011) per additional log of a kilometre. This highlights the challenges posed by distance and transportation infrastructures on the survival of Malawi's exports.

The real GDP of importing countries reduces the risk of export failure by approximately 8.9 percentage points (HR= for every one percentage point increase in the value of the real GDP, emphasizing the importance of larger economies in sustaining export spells due to factors like market size and demand. Exchange rates influence export survival negatively, with higher rates increasing the risk of failure by approximately 4.7 percentage points (HR=1.0470) for every one-percentage-point increase. This finding supports the Balassa-Samuelson hypothesis indicating that exchange rate fluctuations affect importer's competitiveness in international trade.

Higher importing-country tariff rate increases the rate of export failure-an increased hazard of 3.76 percentage points following each one-percentage-point tariff increase, as indicated by HR = 1.0376. This is indicative of the adverse impact that higher tariffs have on the duration and success of Malawi's export activities. This would imply that within a country importing, robust institutions would have a lowered risk of failure in export. In the estimation, Malawi's HR is calculated to be 0.8687; thus, good institutional environments characterized by good governance, rule of law, and regulatory quality, therefore, support exports to be successful and of a longer lifespan.

Where exports go to partner countries having the same primary or official language, the risk of failure is about 15.29 percentage points less than where this is not so. It therefore means that linguistic similarities explain the success and survival of export activities between Malawi and the partner countries. So are the interactions of institutions and agglomeration, and the real GDP. The combined interaction of institutions and agglomeration decreases the hazard of failure by about 0.2 percentage points (HR=0.9980). The interaction term between institutions and real GDP reveals that, from a combined effect perspective, the export failure risk diminishes marginally by 0.9946. A high institutional framework, when coupled with higher levels of real GDP, diminishes the risk of export failure to 0.99898, though from a combined influence perspective, there is a minimal but significant effect due to agglomeration and real GDP.

Lastly, on regions, the study unveils that distance and exchange rate increase the risk of export failure (HR=1.051 for SSA, HR=1.124 for NAM) for Malawi, financial development (HR=1.007), institutions (HR=1.281), and agglomeration (HR=1.018) are also considered to increase the risk of export failure specifically for ECA countries. The harm that the exchange rate has shown on the survival of Malawi's exports reflects how Malawi is highly vulnerable to international shocks. The joint effect of agglomeration, institutions, and real GDP has also an increasing hazard effect from ECA countries on Malawi’s exports. Meanwhile, population density is considered to decrease the risk of failure for NAM (HR=0.992), ECA(HR=0.998), and ROW (HR=0.999) countries.

Institutions greatly increase export survival in ROW countries only (HR=0.768), implying how the clarity of rules in the international market makes it easy for importers to engage in trade with Malawi. The literature on trade economics indicates that trade between African nations is very minimal. This is primarily due to the focus of exports being directed towards other regions worldwide. In particular, countries in Sub-Saharan Africa with shared languages tend to have stronger export ties as the results show, which consequently increases the survival of exports from Malawi and similarly for North American Europe and Central Asian countries. Normally, having a common language with trading partners enhances the survival of Malawi's exports, and the interaction between institutions with GDP and agglomeration reduces the risk of failure in the ROW countries.

The findings of the study proffer different pass-through effects on many spheres such as trade policies, economic strategies, regional integration, and even social and institutional development. First, the policy and institutional development: the findings may influence the Government of Malawi to refine trade policies by putting a focus on export survival rates, especially in sectors where the country enjoys comparative advantages like agriculture and labour-intensive products. The study also shows that strong institutions reduce the risks of export failure. This may lead to investments in governance, the legal framework, and regulatory systems. Maybe because looking at it from a sub-regional perspective, knowing about Sub-Saharan African countries enjoying relatively better survival rates vis-vis agreements such as SADC and COMESA could serve as fuel towards further efforts deeper into the region for improved streamlining of trade facilitation processes.

This might also be because higher survival rates were found in both labour-intensive and homogeneous product groups, which may lead to an impetus toward more diversification within these product categories to hedge risks while maintaining revenues generated from such exports. Identification of the MICs with higher survival rates could help exporters determine a priority in market orientation strategies. On the other hand, it could encourage businesses to invest in sectors with proven export resilience, like agriculture and labour-intensive industries. Insights into determinants like distance, tariff, and exchange rate fluctuation may help entrepreneurs in building strategies against such risk factors.

Hence, the findings of the study have the potential to inform a wide range of stakeholders, government agencies, businesses, policymakers, and development partners about strategies to enhance export survival, improve the trade dynamics, and align trade policies with economic development goals. The actionable insights on agglomeration economies, institutional quality, and other factors provide a robust and concrete framework for fostering long-term growth and stability in Malawi's export sector.

CHAPTER 6

CONCLUSION AND POLICY IMPLICATIONS

6.1 Introduction

This chapter provides the conclusions and policy implications. Section 6.2 gives that study's recommendations, while section 6.3 gives the study's limitation and areas for further research.

6.2 Conclusion and Recommendations

The study's main objective was to determine the duration of Malawi's export. The specific objectives included to examine the role of agglomeration economies in influencing the duration of Malawi's export and to assess the role of institutional quality in influencing the duration of Malawi's exports. The findings established that export spells for Malawi's export are short-lived, the study confirms previous findings which conclude that trade duration is short for developing countries. Further, the study reveals that the survival time for 25 percent and 50 percent of Malawi's export is just one year, while the survival time for the 75 percent of exports is just two years.

On top of that, the study unveils that, higher institutions in the importer country are associated with a lower risk of export failure for Malawi, this suggests that there's a favourable institutions environment in the importer's countries for Malawi's exports. The prosperity of the successful and long-lived exports from Malawi is contributed by the strong governance, rule of law, and regulatory framework conditions of the institutional environment of a host country. It is further established that overall agglomeration economies significantly improve the export survival of Malawi. The hazard ratio showed that within an agglomeration economy, the export failure rate is low, based on the concept of the core-peripheral model, supported by the benefit of spatial clustering in export activities. Such findings are in tandem with earlier works undertaken by Arguello et al., (2020); Brice & Socrates, (2022); Greenaway & Kneller, 2008 and Thia (2016). The

findings of agglomeration economies have serious policy implications. Accordingly, the improvement of export survival may require conscious efforts to achieve agglomeration economies through strategic industrial clustering initiatives. Promotion policies for EPZs could provide incentives for such firms to exploit knowledge spillovers and scale economies. On the other hand, the findings provide scope for spatially targeted policies directed at sectors where clustering has greater potential, mainly agriculture/agro-processing, which will no doubt continue to dominate Malawi's export portfolio for the foreseeable future. Applying these methods will help Malawi enhance the survivability and sustainability of exports, hence their contribution to growth and diversification.

The findings on other factors provides that higher population density in exporters' countries is associated with a slightly lower risk of export failure. Furthermore, increased distance between Malawi and partner capitals correlates with a higher risk of export failure. The Real GDP of importing countries reduces the risk of failure for Malawi's exports, where changes in real GDP are of substantial significance in the likelihood of export spells for the countries. A higher exchange rate increases the risk of export failure, which is a reflecting of the effect of competitiveness in international trade. Higher trade tariffs on imports in importer countries are associated with a greater risk of export failure for Malawi while favorable institutions in importer countries decrease the risk of export failure for Malawi, indicating a conducive institutional environment.

Further, having a common language with partner countries lowers the risk of export failure, facilitating export success for Malawi. Interactions between institutions, agglomeration, and real GDP collectively influence export spell duration, with joint effects observed in reducing the risk of failure. Government intervention can come in different ways in order to enhance export sustainability. Firstly, the government need to capitalize on agglomeration economies and enhance export competitiveness, this could involve in trade facilitation measures, and promotion of regional trade agreements. Secondly, improve transportation infrastructure and connectivity to reduce trade costs by enhancing supply chain efficiency, and facilitate market access for Malawians exports. Thirdly, the government need to provide incentives for export-oriented industries, market access

support, and fostering innovations and technological adoption in order to reduce the dependence on a few primary products and expand into a higher value-added products and new markets, and in order to increase enhance strategies that increases the survival of Malawi's exports, it is important for policy makers to increase interaction with the North American and European partners, and championing for better terms of trading with the rest of the world partners. These targeted government interventions will help the country to achieve its export related sustainable goals.

6.3 Study limitations and areas of future research

The study used aggregated data on all exports from all exports in analysing the survival rates which is likely to conceal significant differences among individual products. However, based on these findings, the study recommends future studies to examine this topic from a micro-level viewpoint. Specifically, by examining how agglomeration may impact different firms and industries separately, as these effects may vary significantly between sectors like manufacturing, services, and high-tech industries in Malawi. This recommendation is advantageous as firms are the key economic entities sorely participating in international trade, henceforth they can provide more valuable insights for trade policy through detailed firm-level analysis.

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APPENDIX

Table A.1: Variable description and data sources

Variable	*Description*	*Sources*
Export spell	*Harmonized Commodity Description and Coding System-6-digit product level data*	*World Integrated Trade Solution (WITS) database (2024)*
Agglomeration	*The proportion of the partner country's population in core areas.*	*WDI database (2024).*
Distance	*Log Distance in km between the exporter and partners capitals.*	*CEPII database (2024)*
Real GDP	*Value of real GDP of the partner country.*	*WDI database (2024)*
Contiguity	*Dummy variable, equals 1 if country is landlocked and 0, otherwise.*	*CEPII database (2024)*
Common language	*Dummy variable, equals 1 if partner has the same common official language and 0, otherwise.*	*CEPII database (2024)*
Colony	*Dummy variable, equals 1 if pairs in a colonial relationship and 0, otherwise.*	*CEPII database (2024)*
Population density	*Population density of the partner country*	*WDI database (2024)*
Exchange rate	*Official Exchange rates in US$ of importer*	*WDI database (2024)*
Financial development	*Percentage of domestic credit to the private sector.*	*WDI database (2024)*
Trade tariffs	*Tariffs rates in the importer country.*	*WDI database (2024)*
Institutional quality	*A computed variable from the principal component analysis.*	*Author's computation*

Table A.2: List of trading partners used

Angola, Andorra, United Arab Emirates, Armenia, Australia, Austria, Burundi, Belgium, Bangladesh, Bulgaria, Belarus, Brazil, Botswana, Canada, Switzerland, China, Cote d'Ivoire, Cameroon, Congo (Republic), Czech Republic, Germany, Denmark, Dominican Republic, Algeria., Egypt (Arab Republic), Eritrea, Spain, Ethiopia (excluding Eritrea), Finland, Fiji, France, Gabon, United Kingdom, Georgia, Ghana, Guinea, Gambia (The), Greece, Hong Kong (China), Croatia, Hungary, Indonesia, India, Ireland, Iran (Islamic Republic), Iceland, Israel, Italy, Jordan, Japan, Kazakhstan, Kenya, Cambodia, Korea (Republic), Kuwait, Lao PDR, Lebanon, Liberia, Latin America & Caribbean, Sri Lanka, Lesotho, Lithuania, Luxembourg, Morocco, Moldova, Madagascar, Mexico, Malta, Mozambique, Mauritania, Mauritius, Malaysia, North America, Namibia, Nigeria, Netherlands, Norway, Oman, Pakistan, Philippines, Poland, Korea (Democratic Republic), Portugal, Paraguay, Qatar, Romania, Russian Federation, Rwanda, South Asia, Saudi Arabia, Senegal, Serbia (FR Serbia/Montenegro), Singapore, Sierra Leone, Sudan, Suriname, Sweden, Eswatini, Seychelles, Thailand, Tunisia, Turkey, Tanzania, Uganda, Ukraine, United States, Uzbekistan, Vietnam, South Africa, Congo (Democratic Republic), Zambia, and Zimbabwe.

Table A.3: Regression results: Results of multivariable parametric inverse Gaussian frailty survival regression with proportional hazard Weibull distribution

Variables	*Hazard Ratio*	*Std. Err.*	*z*	*P-value*	*95% LCL*	*95% UCL*
Spatial distribution						
Agglomeration	*0.9955***	*0.0019*	*-2.26*	*0.024*	*0.9916*	*0.9994*
Population Density	*0.9992***	*0.0181*	*-2.12*	*0.034*	*0.9984*	*0.9999*
Export Cost						
Distance	*1.6011***	*0.2930*	*2.57*	*0.010*	*1.1186*	*2.2919*
Macroeconomic factors						
Real GDP	*0.9110****	*0.2039*	*-4.17*	*0.000*	*0.8719*	*0.9518*
Exchange Rate	*1.0470****	*0.0177*	*2.72*	*0.007*	*1.0129*	*1.0822*
Financial Development	*0.9999*	*0.0009*	*-0.15*	*0.883*	*.9979*	*1.0018*
Trade Tariffs	*1.0376****	*0.0115*	*3.32*	*0.001*	*1.015*	*1.060*
Institutional quality						
Institutions	*0.8687****	*0.0402*	*-3.04*	*0.002*	*0.7932*	*0.9513*
Market Access						
Colony	*1.4712*	*0.5862*	*0.97*	*0.333*	*0.6738*	*3.2123*
Common Language	*0.8472**	*0.0833*	*-1.68*	*0.092*	*0.6986*	*1.0274*
Contiguity	*0.6914*	*0.1583*	*-1.61*	*0.107*	*0.4414*	*1.0830*
Multispells						
Multiple spells	*0.1104****	*0.0309*	*-7.86*	*0.000*	*0.0638*	*0.1913*
Interactions						
Institutions & *Agglomeration*	*0.9980****	*0.0007*	*-2.99*	*0.000*	*0.9967*	*0.9993*
Institutions & *GDP*	*0.9946****	*0.0018*	*-3.02*	*0.003*	*0.9911*	*0.9981*
Agglomeration & *GDP*	*0.9998****	*0.0001*	*-2.79*	*0.005*	*0.9997*	*0.9999*
Intercept						
Baseline Hazard	*0.0087*	*.0286*	*-1.45*	*.148*	*.0000*	*5.388*
Ln_p	*0.6057*	*.0380*	*15.95*	*0.000*	*0.5133*	*0.6801*
lnthata	*1.5376*	*.2253*	*6.82*	*0.000*	*1.0960*	*1.9792*
Mean dependent var	*5.453*			*SD dependent var*		*5.5312*
Number of obs	*2248*			*Chi-square*		*115.015*
Prob > ch2	*0.000*			*Akaike (AIC)*		*2874.599*

Table A.3: Regression results: Parametric frailty survival regression model based on regions

Variables	*Model 1 S.S.A*	*Model 2 N.A.M*	*Model 3 E.C.A*	*Model 4 R.O.W*
Spatial distribution				
Agglomeration	*0.991***	*1.020*	*1.018****	*0.995*
	(0.004)	*(0.024)*	*(0.004)*	*(0.184*
Population Density	*1.001*	*0.992****	*.998****	*0.999**
	(0.002)	*(0.002)*	*(0.000)*	*(0.000)*
Export Cost				
Distance	*2.144****	*1.426*	*1.317*	*2.443***
	(0.395)	*(0.305)*	*(0.462)*	*(0.870)*
Macroeconomic factors				
Real GDP	*1.142*	*1.650*	*1.090*	*1.207*
	(0.220)	*(0.532)*	*(0.295)*	*(0.276)*
Exchange Rate	*1.051***	*1.124****	*1.014*	*1.000****
	(0.026)	*(0.061)*	*(0.028)*	*(0.000)*
Financial Development	*0.989**	*0.995****	*1.007****	*1.001*
	(.006)	*(0.002)*	*(0.002)*	*(0.002)*
Trade Tariffs	*1.007*	*1.026*	*0.948***	*1.111*
	(0.020)	*(0.029)*	*(0.020)*	*(0.078)*
Institutional quality				
Institutions	*0.967*	*0.994*	*1.281****	*0.768****
	(0.052)	*(0.098)*	*(0.115)*	*(0.057)*
Market Access				
Colony	---	---	---	*1.454*
	---	---	---	*(.577)*
Common Language	*0.447****	*0.623***	*0.367****	*1.16*
	(0.060)	*(0.128)*	*(0.071)*	*(0.241)*
Contiguity	*1.075*	---	---	---
	(0.155)	---	---	---
Interactions				
Institution & *Agglomeration*	*0.998*	*1.000*	*1.004***	*.997****
	(0.002)	*(0.001)*	*(0.002)*	*(0.001)*
Institution & *GDP*	*0.998*	*1.000*	*1.011****	*0.989****
	(0.002)	*(0.004)*	*(0.004)*	*(.003)*
Agglomeration & *GDP*	*1.000*	*1.001*	*1.001****	*.999*
	(0.000)	*(0.001)*	*(0.000)*	*(0.000)*
Multispells				
Multiple spells	*.150****	*0.199**	*0.237****	*0.140*
	(0.083)	*(0.171)*	*(0.100)*	*(0.120)*
Intercept				
Baseline Hazard	*0.142*	*0.011*	*1.052*	*2.39*
	(0.022)	*(.017)*	*(.740)*	*(108)*
Ln_p	*0.210****	*0.402****	*0.164****	*0.658****
	(0.056)	*(0.093)*	*(0.03)*	*(.053)*
lntheta	*-0.046*	*.177*	*.504*	*1.917*
	(0.335)	*(0.504)*	*(0.558)*	*(0.344)*
Mean dependent var	*7.427*	*11.686*	*7.794*	*6.075*
Number of obs	*313*	*470*	*532*	*933*
Prob > chi2	*0.000*	*0.000*	*0.000*	*0.000*
Chi-square	*106.385*	*67.486*	*64.778*	*62.719*

Table A.3: List of importing markets for a product exported by Malawi in 2022