



Faculty of Economics and Business

**External Capital and Innovation Strategies Shaping Export
Diversification in Developing Countries: An Empirical Exploration**

Ramsha Saleem

**Doctor of Philosophy
2025**

External Capital and Innovation Strategies Shaping Export
Diversification in Developing Countries: An Empirical Exploration

Ramsha Saleem

A thesis submitted

In fulfillment of the requirements for the degree of Doctor of Philosophy

(Economics)

Faculty of Economics and Business
UNIVERSITI MALAYSIA SARAWAK

2025

DECLARATION

I hereby declare solemnly that the work in this thesis has been performed in accordance with the rules and regulations of University of Malaysia Sarawak. The content of this thesis belongs, exclusively to the author. However, it is pertinent to mention that some permissible acknowledgements have been cited where it is necessary. Moreover, it is also to be declared that this thesis has neither been submitted nor accepted nor published for any other degree.

.....

Signature

Name: Ramsha Saleem

Matric No.: 20010213

Faculty of Economics and Business

Universiti Malaysia Sarawak

Date :

ACKNOWLEDGEMENT

First of all, I would like to express my heartfelt gratitude to God Almighty, the Creator and the Sustainer of mankind, who has enabled me to accomplish the task of my thesis. Countless salutations be showered upon the holy Prophet Muhammad (pbuh), who was sent, with all perfections, to show the right path to human beings through knowledge and wisdom.

At this paramount juncture of my educational journey, I must extend my heartiest tributes to my beloved (late) mother who had always been a constant source of my inspiration and encouragement in all the steps of my life. Besides, my family members deserve my special thanks, whose moral support, encouragement and prayers helped me in keeping my research work intact.

I gracefully acknowledge the main supervision of Professor Dr. Puah Chin Hong, Faculty of Business and Economics, Universiti Malaysia Sarawak. I feel greatly honored to realize the value of his vision explicitly at most academic level. I owe to his supervision which has made it possible to accomplish the uphill task of my thesis and degree. He always guided me with kindness, honesty, wisdom at every step of research towards achieving my goal. I am also grateful to my co-supervisors Professor Dr. Muhammad Affendy bin Arip and the associate Professor Dr. Jerome Kueh See Hui for their remarkable contributions in completing my thesis.

I am also very thankful to all my lovable well-wishers and friends who have been a constant source of encouragement throughout this journey.

ABSTRACT

The study investigates arguments regarding the impact of external resources and innovation strategies on export diversification along with finding the causality among export diversification, export growth, and economic development in developing countries. The sample is further divided into two sub-samples for in-depth inquiry. Generally, developing countries are not only striving to increase their exports but also remain engaged in diversifying them. An increase in export diversification requires funds to manage and maneuver the production scheme, to maintain a suitable and sustainable scenario. Developing countries suffer shortage of investment funds and lack the capacity to implement strategic plans in reaching the appropriate and productive outcome. Lack of capital potential in the domestic economy prompts a strong urge for external capital. The external capital is a unique strategy for external resources to meet with the investment challenges. Mostly, external resources take four forms which include foreign direct investment, remittances received, foreign aid, and external debt. Moreover, the strategic layout is captured through innovation strategies which include the technology choice index and patents filed by residents and non-residents in an economy. Hence, this study employed external capital resources and innovation strategies as crucial determinants of export diversification in the selected 65 developing countries for the period spanning from 1995 to 2021. Adopted estimation methods for this study are Cross-Sectional Auto Regressive Distributive Lag (CS-ARDL) model for mean outcome, whereby the effect of explanatory variables on quantiles of outcome variable is also estimated through Method of Moments Quantile Regression (MMQR). A few control variables are employed which include financial development, gross capital formation, market size, trade openness, and export growth. Three out of four external resources are significantly increasing export diversification in the

employed sample. Innovation strategies are also significantly increasing export diversification. Keeping in view the importance of export diversification, export growth, and the market size of an economy, a causal relationship exists among them. Causality is estimated through the Panel Vector Auto Regression (PVAR) method. Bidirectional causality holds between export growth and economic growth for the sample countries. Growth-led diversification is also evident among them. Overall, the new trade theory is tested which has multifaceted dimensions for the sample panel. Developing countries should make a policy design for increasing external capital inflow and enhance innovation strategies to increase export diversification.

Keywords: External Capital, Innovations, MMQR, PVAR

**Modal Luaran dan Strategi Inovasi Membentuk Kepelbagaian Eksport di Negara
Membangun: Penerokaan Empirikal**

ABSTRAK

Kajian ini menyiasat hujah mengenai kesan sumber luar dan strategi inovasi ke atas kepelbagaian eksport bersama-sama dengan mencari sebab musabab antara kepelbagaian eksport, pertumbuhan eksport, dan pembangunan ekonomi di negara membangun. Sampel dibahagikan lagi kepada dua sub-sampel untuk siasatan mendalam. Secara amnya, negara membangun bukan sahaja berusaha untuk meningkatkan eksport mereka tetapi juga terus terlibat dalam mempelbagaikannya. Peningkatan dalam kepelbagaian eksport memerlukan dana untuk mengurus dan menggerakkan skim pengeluaran, untuk mengekalkan senario yang sesuai dan mampan. Negara membangun mengalami kekurangan dana pelaburan dan kekurangan kapasiti untuk melaksanakan rancangan strategik dalam mencapai hasil yang sesuai dan produktif. Kekurangan potensi modal dalam ekonomi domestik mendorong dorongan kuat untuk modal luar. Modal luaran ialah strategi unik untuk sumber luaran untuk menghadapi cabaran pelaburan. Kebanyakannya, sumber luar terdiri daripada empat bentuk termasuk pelaburan langsung asing, kiriman wang yang diterima, bantuan asing dan hutang luar negeri. Selain itu, susun atur strategik ditangkap melalui strategi inovasi yang merangkumi indeks pilihan teknologi dan paten yang difailkan oleh pemastautin dan bukan pemastautin dalam sesebuah ekonomi. Oleh itu, kajian ini menggunakan sumber modal luaran dan strategi inovasi sebagai penentu penting kepelbagaian eksport di negara membangun terpilih untuk tempoh dari 1995 hingga 2021. Kaedah penganggaran yang diguna pakai untuk kajian ini adalah model Cross-Sectional Auto Regressive Distributive Lag (CS-ARDL) untuk hasil min, di mana kesan pembolehubah penerangan terhadap kuantiti pembolehubah hasil juga dianggarkan melalui Kaedah Regresi Kuantil Momen

(MMQR). Beberapa pembolehubah kawalan digunakan termasuk pembangunan kewangan, pembentukan modal kasar, saiz pasaran, keterbukaan perdagangan, dan pertumbuhan eksport. Tiga daripada empat sumber luar meningkatkan kepelbagaian eksport dengan ketara dalam sampel yang diambil bekerja. Strategi inovasi juga meningkatkan kepelbagaian eksport dengan ketara. Memandangkan kepentingan kepelbagaian eksport, pertumbuhan eksport, dan saiz pasaran sesebuah ekonomi, wujud hubungan sebab akibat di kalangan mereka. Kausalitas dianggarkan melalui kaedah Regresi Auto Vektor Panel (PVAR). Kausalitas dua hala berlaku antara pertumbuhan eksport dan pertumbuhan ekonomi bagi negara sampel. Kepelbagaian yang diterajui oleh pertumbuhan juga jelas di kalangan mereka. Secara keseluruhannya, teori perdagangan baharu diuji yang mempunyai dimensi pelbagai rupa untuk panel sampel. Negara membangun harus membuat reka bentuk dasar untuk meningkatkan aliran masuk modal luar dan meningkatkan strategi inovasi untuk meningkatkan kepelbagaian eksport.

Kata kunci: Modal Luaran, Inovasi, MMQR, PVAR

TABLE OF CONTENTS

	Page
DECLARATION	i
ACKNOWLEDGEMENT	ii
ABSTRACT	iii
<i>ABSTRAK</i>	v
TABLE OF CONTENTS	vii
LIST OF TABLES	xi
LIST OF FIGURES	xiii
LIST OF ABBREVIATIONS	xiv
CHAPTER 1 INTRODUCTION	1
1.1 Introduction	1
1.2 Overview	1
1.3 Background of the Study	6
1.4 Problem Statement	31
1.5 Research Questions	35
1.6 Objectives of the study	35
1.7 Significance of the study	36
1.8 Organization of the Study	37
CHAPTER 2 LITERATURE REVIEW	38

2.1	Introduction	38
2.1.1	Need for Export Diversification	39
2.1.2	Import Substitution versus Export Promotion	39
2.2	Multi-Perspective Theoretical Review	41
2.2.1	Traditional Trade Theories	41
2.2.2	Emergence of New Trade Theories	44
2.2.2.1	Prebisch Singer Hypothesis	44
2.2.2.2	The Product Cycle Theory	46
2.2.3	External Resource Theories	48
2.2.3.1	Self-Discovery Theory	48
2.2.3.2	Two Gap Theory	48
2.2.3.3	Debt Overhang Hypothesis	49
2.2.4	Theories of Innovation	49
2.2.4.1	Smith's Theory of Innovation	49
2.2.4.2	Schumpeter's Theory of Innovation	50
2.2.5	Theories of Economic Growth	51
2.2.5.1	Exports led Growth	51
2.2.5.2	Endogenous Growth Theory	52
2.3	Empirical Review	53
2.3.1	Geographical Factors and Export Diversification	55

2.3.2	Market Size and Export Diversification	56
2.3.3	Structural Factors and Export Diversification	56
2.3.4	Financial Capital and Export Diversification	57
2.3.5	Policy and Export Diversification	58
2.4	Methodological Trends	59
2.5	Conceptual Framework	61
2.6	Research Gap	67
CHAPTER 3	METHODOLOGY	69
3.1	Introduction	69
3.2	Data Description	69
3.3	Theoretical Framework and Description of Variables	70
3.3.1	Dependent variables	71
3.3.2	Independent variables	73
3.4	Empirical Models of the Study and Preliminary Tests	76
3.5	Methods to be Used / Estimation Techniques	79
3.5.1	Estimation Technique for Model 1	79
3.5.2	Estimation Technique for Model 2	88
3.6	Chapter Summary	89
CHAPTER 4	RESULTS AND DISCUSSIONS	90
4.1	Introduction	90

4.2	Descriptive Statistics & Correlation Analysis	90
4.3	Unit Root Tests	95
4.4	Results and discussion for Model 1	96
4.5	Results and discussion for Model 1	97
4.6	Results and Discussion for Model 2 (Objective 3)	124
4.7	Chapter Summary	131
CHAPTER 5	CONCLUSION AND POLICY IMPLICATIONS	132
5.1	Introduction	132
5.2	Conclusion and Main Findings	132
5.3	Policy Implications	134
5.4	Limitation of the Study	136
5.5	Future research	136
REFERENCES		138
APPENDICES		165

LIST OF TABLES

	Page
Table 1.1: Merchandized Exports by Product	10
Table 1.2: Origin to Destination of Merchandized Exports by Product	12
Table 3.1: Description of Variables	72
Table 4.1: Descriptive statistics	91
Table 4.2: Correlation Analysis	93
Table 4.3: Cross Sectional Dependence	94
Table 4.4: Results for Unitroot	95
Table 4.5: Result of CS-ARDL: Impact of FDI	96
Table 4.6: Result of MMQR for Full Sample: Impact of FDI	97
Table 4.7: Result of MMQR for UMI: Impact of FDI	97
Table 4.8: Result of MMQR for LMI: Impact of FDI	98
Table 4.9: Results of CS-ARDL: Impact of REM	101
Table 4.10: Result of MMQR for Full Sample: Impact of REM	102
Table 4.11: Result of MMQR for UMI: Impact of REM	102
Table 4.12: Result of MMQR for LMI: Impact of REM	103
Table 4.13: Results of CS-ARDL: Impact of AID	105
Table 4.14: Result of MMQR for Full Sample: Impact of AID	106
Table 4.15: Result of MMQR for UMI: Impact of AID	106
Table 4.16: Result of MMQR for LMI: Impact of AID	107
Table 4.17: Results of CS-ARDL: Impact of EXD	110
Table 4.18: Result of MMQR for Full Sample: Impact of EXD	111
Table 4.19: Result of MMQR for UMI: Impact of EXD	111

Table 4.20: Result of MMQR for LMI: Impact of EXD	112
Table 4.21: Results of CS-ARDL: Impact of TCI	115
Table 4.22: Result of MMQR for Full Sample: Impact of (TCI)	116
Table 4.23: Result of MMQR for UMI: Impact of (TCI)	116
Table 4.24: Result of MMQR for LMI: Impact of (TCI)	117
Table 4.25: Results of CS-ARDL: Impact of PAT	120
Table 4.26: Result of MMQR for Full Sample: Impact of (PAT)	121
Table 4.27: Result of MMQR for UMI: Impact of (PAT)	121
Table 4.28: Result of MMQR for LMI: Impact of (PAT)	122
Table 4.29: PVAR results	124
Table 4.30: Variance Decomposition Analysis	129

LIST OF FIGURES

	Page
Figure 1.1: Trend for Export Diversification (Di) for UMI and LMI.	20
Figure 1.2: Foreign Direct Investment (FDI) inflow in UMI and LMI.	22
Figure 1.3: Remittances (REM) received in UMI and LMI.	23
Figure 1.4: Foreign Aid (AID) received in UMI and LMI.	24
Figure 1.5: External Debt (EXD) received in UMI and LMI.	25
Figure 1.6: Technology Choice Index (TCI) for UMI and LMI.	27
Figure 1.7: Patents (PAT) filled in UMI and LMI.	28
Figure 1.8: Gross Domestic Product (GDP) per capita in UMI and LMI.	29
Figure 1.9: Export Growth (XG) % annual in UMI and LMI.	30
Figure 2.1: Flow chart A of Model 1.	63
Figure 2.2: Flow chart B of Model 1.	64
Figure 2.3: Flow Chart of Model 2.	66
Figure 4.1: Variance Decomposition Analysis for Full Sample.	126
Figure 4.2: Variance Decomposition Analysis for UMI.	127
Figure 4.3: Variance Decomposition Analysis for LMI.	127

LIST OF ABBREVIATIONS

Di	Export Diversification
FDI	Foreign Direct Investment
REM	Remittances Received
AID	Foreign AID
EXD	External Debt
HHI	Herfindahl-Hirschman Index
PAT	Patents
TCI	Technology Choice Index
GDP	Gross Domestic Product per Capita
TOP	Trade Openness
XG	Export Growth
GNI	Gross National Income
MMQR	Method of Moment Quantile Regression
PVAR	Panel Vector Auto Regression
ADF	Augmented Dicky Fuller
GCF	Gross Capital Formation
UMI	Upper Middle Income
LMI	Lower Middle Income
VAM	Value Added Manufacturing
LM	Labour in Manufacturing
L	Labour Force
FD	Financial Development Index

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter introduces the importance of export diversification and the most important factors affecting it. It also attains the attention to give an overview of exports by product group and aligns the inter-trade and intra-trade patterns between developed and developing countries. Section 1.2 provides a panoramic view of the crucial nature of export diversification. Section 1.3 focuses on the background of this study which solely paints the picture of diversification in exports for selected developing countries. Moreover, it also aligns the annual percentage change in exports and economic growth to the forefront sustained growth scenario. Section 1.4 elaborates the problem statement for this study. Section 1.5 provides the research question and objectives of the study while Section 1.6 discusses the significance of this study. Lastly, section 1.7 details the organization of this study.

1.2 Overview

Export diversification has emerged as a strategic innovative feature in the wake of globalization. It is an unavoidable imperative for a sustainable economic growth. Historically, the concept of diversification emerged from specialization and indeed, both are different phenomena. Traditional economists formed specialization with the belief that countries get a comparative advantage in the production of commodities for which they specialize. A similar concept was reinforced by Heckscher and Ohlin by introducing factor intensity to explain specialization (Megbowon et al., 2019; Sadiq, 2023; Ul-Haq et al.,

2025). The concept of specialization emphasized that countries must have to keep their focus on producing and exporting a narrow set of goods in which they could acquire efficiency. Although the specialization brought initial gains in productivity and trade efficiency, yet it exposed economies to significant external shocks, such as commodity price fluctuations and global demand contractions (Cadot et al., 2011; Cadot et al., 2013).

As a result, many nations, particularly those relying on a narrow range of goods, experienced economic volatility which led to stagnation (Kalaitzi & Chamberlain, 2020). In response, to meet with this challenge, modern trade theories deviated towards diversification and the concept of export diversification evolved as a counter-strategy to mitigate economic risks. Export diversification involves two concepts which are product diversification and market diversification. The former relates to expansion in the variety of goods and services while the latter relates to accessing to new avenues for selling commodities (Felbermayr & Kohler, 2010; Koch, 2021).

Indeed, export diversification and new varieties in exports ensured stability by helping developing countries come out and cope with deteriorated terms of trade by not relying on primary goods (Krugman, 1979). Another further step was taken by introducing the heterogeneous firms which also link with producing and selling new varieties (Melitz, 2003). However, the growth of exports in existing production is still valid for many developing countries to increase economic progress (Hummels & Klenow, 2005). In the recent past, a substantial chunk of literature analyzed diversification in exports and made its link with a few economic factors (Al-Marhubi, 2000; Elhiraika & Mbate, 2014; Golo, 2023; Li et al., 2022; Tang et al., 2022). The factors are mainly related to transforming the structure of the economy, enhancing investment and capital along with innovation advancement (Ngassam, 2023; Paul & Benito, 2018; Sweet & Eterovic, 2019).

Export diversification encourages industrial upgrading and innovation through learning-by-exporting effects, which improve long-term competitiveness. Therefore, while specialization initially offered a path to growth, diversification has become a more robust and adaptive economic strategy in today's volatile global economy (Vasilyeva et al., 2025; Young, 2023).

Logically, export diversification uncovers two principal mechanisms: the intensive margin and the extensive margin. These dimensions capture dynamic export expansion. The intensive margin refers to increasing the volume of existing export products in established sectors and markets. In contrast, the extensive margin involves either the introduction of new export products or penetration in new export markets, often reflecting enhanced production capabilities and industrial upgrade (Abegaz & Lahiri, 2020; Besedes & Blyde, 2010). Furthermore, the extensive margin is associated with greater economic resilience as it shifts production from low value added to high value added and reshapes the production and export basket (Mau, 2016; Persson, 2013). Formally, intensive margin indicates horizontal diversification whereas extensive margin reflects vertical diversification (Mania & Rieber, 2019). Indeed both margins are crucial to form diversification in exports but in developing countries extensive margin poorly affect economic factors (Jongwanich, 2020; Wadho & Chaudhry, 2019). Combining both indicators to assess diversification in the export basket is more sustainable for an economy. The purpose is fulfilled by a comprehensive index i.e. Herfindahl Hirschman Index (HHI). It encompasses each sector or product of an economy by counting the number of sectors in the economy. The HHI incorporates information from both intensive and extensive margins, also reflecting changes across both dimensions, making it more comprehensive than counting export products (Giri et al., 2019; Golo, 2023).

Export diversification has long been recognized as a pathway for economic resilience, which presumably requires product and sectoral upgrade. Thus, many countries have made efforts to fulfil the purpose. A few countries adopted trade policy measures to achieve it (Feenstra & Ma, 2014; Melitz, 2003; Mora & Olabisi, 2023). A few other countries suggested upgrading the infrastructure and achieving productivity enhancement for diversifying their exports (Cadot et al., 2011; Fosu & Abass, 2020). Furthermore, organizing the resources in an economy also plays a pivotal role in export diversification. These resources primarily involve financial resources, overwhelmingly determined by either its public sector, the private sector, or by combining both via intensification of financial flows (Agosin et al., 2012; Amurgo-Pacheco, 2007). Domestic resources coupled with foreign resources hold the reins of investment, production, and exports. Question arises, what ingredients form foreign or external resources? The gloomy performance of the private sector portrays a bleak picture of its contribution to economic growth in developing countries which may be because of inadequate investment backed by low and insufficient domestic savings (Agbola, 2013; Baidoo & Akoto, 2019; Nieminen, 2020). Smaller domestic savings, a low level of tax revenues, and excessive government expenses lead to hinder public sector performance. Thus, an inappropriate domestic capital supply hampers investment cum production, and exports in developing countries and tends them to rely on other channels. The potential channels prominently involve the external capital channel.

Notably, external capital is expressed in different forms which may include Foreign Direct Investment (FDI), Remittances inflow (REM), Foreign Aid received (AID), and External Debt (EXD). The overwhelming benefits of external capital include higher production and exports, upgrading exports, providing access to the global market, and facilitating the transfer of technology by filling the financing gap. Imported technologies

enhance knowledge, skills, and expertise while diversification of goods enhances exports (Hayat, 2019; Parteka & Tamberi, 2013). Arguably, external resources shrink the savings investment and foreign exchange gaps (Kastratović, 2020). Notwithstanding, the added potentials of external capital witness its steady flow in the developing world for the last three decades (Egyir et al., 2020). Despite all, the inflow of external capital is discussed in the literature under two camps. One camp discusses the positive spillovers of external resources whereas the other hints at relevant shortcomings which can be pointed towards ‘Dutch Disease’¹(Kojo, 2015; Pegg, 2010; Van der Ploeg & Venables, 2013).

Given the sound impact of external resources, many developing countries are creating an economically friendly environment through the influx of external capital (Adams et al., 2016; Amighini & Sanfilippo, 2014; Giri et al., 2019). Indeed, plenty of literature portrays the increased dependency of nations upon external capital in one or multiple forms, regardless of its origin. Positive impact of external capital on different measures of exports is seen in the literature of economics (Antonietti & Franco, 2021; Munemo, 2011; Saad, 2012; Saadi, 2020). There can be differences in the extent and magnitude of the impact of external capital on export diversification, which may be due to differences in level of economic development of economy, yet the export led growth hypothesis still holds (Kalaitzi & Chamberlain, 2020; Odhiambo, 2022). The export impact of external capital in developing countries is contingent upon the absorptive capacity of the economy which includes their sustained export and growth scenario, innovative trends, market size, and other policy related variables (Mosley, 2018; Sahoo & Dash, 2022; Shakib et al., 2023).

¹ Dutch disease is causal relationship between the increase in the economic development of a specific sector and a decline in other sectors at the expense of former.

Despite, external capital, there are many other drivers of export diversification which include policy related variables i.e. innovation practices (Sweet & Eterovic, 2019; Ul-Haq et al., 2025). These include value-added initiatives which can fascinatingly interlink export diversification with many economic challenges (Saviotti & Jun, 2020). The Addition of patents also proposed an incremental perspective towards export diversification. It reflects the technological efforts of an economy and further enhances exports. It is not clearly evident in previous studies; how patents translate into exports? It is consensus in general that the addition of patents contributes to high technology exports, but, this variable can add in diversifying exports at all levels as well (Alimov, 2019; Panda et al., 2020).

Usually it happens that limited to exporting low-productivity and low-value-added goods, export diversification policies of developing countries, attempt to defy their existing comparative advantage to promote economic transformation. (Lectard & Rougier, 2018; Mania, 2020). In a similar vein, an increase in manufacturing value added to rearrange the economy from low value added to high value added is captured through the Technology Choice Index (TCI) is also another form of innovation which makes transformation in production frontier by increasing manufactured products and increases resilience in exports. It highlights the economic structure of a country which endogenous to its factor endowment structure and continues technological innovations. It also reflects the favourable institutional and policy environment.

1.3 Background of the Study

The traditional paradigm of export-led growth, has long been a cornerstone of research in international trade. The concept has its roots in the traditional classical theories of Adam Smith and David Ricardo (Ricardo, 1821; Smith, 1776). Both schools of thought

advocated production specialization according to a nation's ability in production efficiency. They focused their argument on a limited range of specialized exports to generate static gains from trade. These gains and benefits produced immediate positive effects but the dynamic gains were not reaped. So, the proponents pointed out exploitation of economies of scale, enhanced productivity through focused learning, and the attraction of foreign investment into specialized sectors (Krugman, 1979; Posner, 1961; Prebisch, 1962; Singer, 1949).

Since, the blueprint of 'export led growth' cast serious doubt on this one-size-fits-all prescription in the mid twentieth century. Many countries of Africa, Asia and Latin America found themselves in the trap of declining terms of trade and price volatility (Afzal et al., 2024; Besedes & Blyde, 2010; Cimoli et al., 2010). Furthermore, prices of agriculture and resource-based exports fell relative to the prices of the manufactured goods they imported, suggesting growth retarding impacts of primary goods. This critical re-evaluation of conventional wisdom in international trade paved the way for an alteration by shifting the focus on resilient exports to promote export diversification.

There are many compelling rationales for this strategy. It creates broader export portfolio to serve as a powerful risk mitigation tool against a low value-added goods and their price shocks. More importantly, diversification is intrinsically linked to emergence of new export sectors, acquisition of new technologies, fostering production capabilities and enhancing managerial skills, creating positive spillovers for the entire economy (Antonietti & Franco, 2021; Kostanica, 2025; Martincus & Carballo, 2008). For developing nations, therefore, diversification is not only a defensive maneuver against external shocks but a proactive engine for building a more complex, resilient, and dynamic economic structure, capable of sustaining growth in the long run.

In a nutshell, a move towards a more diversified export structure is crucial for developing countries, resource-dependent economies. Export diversification is decisive in fostering economic growth. Many studies find a positive relationship between export diversification and economic growth, especially in the earlier stages of development (Herzer & Nowak-Lehmann D, 2006; Imbs & Wacziarg, 2003; Mau, 2016; Parteka, 2010; Parteka & Tamberi, 2013). A causal relationship also confirmed the positive impact of export diversification on growth (Gözgör & Can, 2017). Export diversification has a positive impact on sustainable and social development, creates investment and job opportunities and, enhances economic performance through the multiplier effect (Ferraz et al., 2021).

Precisely, export markets also helps to widen the domestic local markets and vice versa (Dennis & Shepherd, 2011; Ross, 2019). Dynamic gains reap the benefits of increasing economies of scale and higher capital accumulation becomes the doom making the way forward for industrialization. Therefore, the role of international trade and specifically exports has attained remarkable attention from researchers and policymakers (Sheng & Yang, 2016).

Perhaps, production, trade, and especially exports play a crucial role in advancing economic prosperity (Cieřlik & Parteka, 2021; Jolo et al., 2022). Basic economic theory refers to the foreign trade multiplier, which asserts the expansionary impact of export surplus. It works well when scarce resources of an economy are transferred to high productivity export production. Hence, diversification in production and exports is crucial for developing countries to meet various economic challenges (Giri et al., 2019; Saviotti & Jun, 2020). Lack of financial resources is the bottleneck in achieving a wider production base to expand the exports (Nieminen, 2020; Shakib et al., 2023). Narrow production base and concentrated export bundle do not witness sustainable growth targets (Goya, 2020;

Lectard & Rougier, 2018). It does neither have the potential to create employment opportunities nor does it mitigate the external vulnerability shocks. Therefore, a concentrated commodity base in products, with a focus on exporting primary goods and importing consumption goods, keeps developing countries at a lesser edge of export earnings.

Diversified exports are contributing in economic growth in many regions and countries of the world. It is apt to have expectations if the matter lies with resource based or developing countries. For these exceptions, export growth can also be in accordance with improving economic growth and export diversification. So, export growth can become a level playing phenomena for a sustained economic front. Export growth and export diversification are representatives of international integration. That's why slower pace of them has been overwhelmingly highlighted as one of the serious concerns of researchers and policymakers in economics (Osakwe, 2007; Shepherd, 2015).

The trade structure of countries can be well assessed through import and export facts. Further to it, the export structure of economies can be examined through products and markets where exports are the destinations. Both of the just discussed trade structures need diversification which accounts for export diversification in product and its destination. Product structure of exports is divided into five main categories which include all food items, agricultural raw materials, fuels, manufactured goods, ore metals, precious stones, and non-monetary gold (UNCTAD, 2022).

All the categories except manufactured goods sum up to primary goods. Product groups for merchandise exports are coded by the UN Comtrade database with a globally harmonized commodity description and coding system (HS). The database provides product

breakdown on the basis of the Standard International Trade Classification (SITC). This database provides product groups by converting raw data coded in HS.

Indeed, the crucial nature of export diversification provides an ignition to economic prosperity when production keeps shifting from primary products to manufacturing products. It is attainable by widening the present export basket or by causing shifts in export basket. A detailed description of exports by product group in developed and developing countries is provided in Table 1.1. It shows that a lesser export share is taken by manufacturing goods whereas the situation is reverse for developed countries where highest export share is attained by manufactured goods in merchandise exports. Although developing countries are transiting towards manufactured goods and it is evident that the difference between developed and developing countries seems narrowing in 2016 yet the difference again rises after the year 2020.

Table 1.1: Merchandized Exports by Product

Years	Origin to Destination	Primary Goods				Manufactured
		Food items (all)	Agriculture raw materials	Fuels	Ores, metals, precious stones	
1995	World	100	100	100	100	100
	Developed	67.9	67.9	68.6	69.3	67.9
	Developing	25.4	30.4	25.8	27.5	29.4
2000	World	100	100	100	100	100
	Developed	68.5	66.3	59.4	67.3	69.1
	Developing	26.7	31.5	20	27.3	28.5
2005	World	100	100	100	100	100
	Developed	68.7	61.9	66	60.5	66.1
	Developing	26.3	35.9	29.3	36.8	31.2
2010	World	100	100	100	100	100
	Developed	59.8	50.3	56.3	51.4	58.2

Table 1.1 continued

	Developing	35.1	47.5	39.5	46.8	38.5
2016	World	100	100	100	100	100
	Developed	58	49	48	48	58
	Developing	40	49	48	50	40
2020	World	100	100	100	100	100
	Developed	58	50	45	51	60
	Developing	42	50	53	49	40
2021	World	100	100	100	100	100
	Developed	59	53	51	48	61
	Developing	41	47	45	51	38

Note: Least developed countries are not included.

Source: Handbook of statistics by UNCTAD (1995, 2000, 2005, 2010, 2016, 2020 and 2022).

Developing countries mainly export ore and metals followed by agriculture produce, fuels and food items. Many developing countries are from African region and from middle-east which mainly export fuels. A large chunk of developing countries is from Latin America which are major exporters of food items and agriculture produce. Manufactured exports are provided by many Asian countries but they could acquire the least share in exports (UNCTAD, 2022). The share of export of manufacturing goods remains 60% to 70% for the developed countries whereas developing countries have 30% to 40% share in export of manufacturing goods over the data range from 1995 to 2021.

It is also worth mentioning that diversification in exports also require market diversification and the detailed description is provided in table 1.2. Market diversification elaborates the exports from origin to destination which involves combinations of export from developed to developing, developing to developing and developing to developed economies.

Table 1.2: Origin to Destination of Merchandized Exports by Product

Years	Origin to Destination	Primary Goods				Manufactured
		Food items (all)	Agriculture raw materials	Fuels	Ores, metals, precious stones	
1995	Developed to Developed	73.8	75.5	80.9	73.7	72.7
	Developed to Developing	19	23.1	12.8	22.9	24.5
	Developing to Developed	56.6	50.9	62.9	59.2	55
	Developing to Developing	39.9	48.4	35.9	39.4	43.8
2000	Developed to Developed	75.6	73.4	84.6	73.9	73.7
	Developed to Developing	20.3	24.8	10.5	20.6	23.7
	Developing to Developed	50.3	52.6	45.7	45.7	58.1
	Developing to Developing	49	42.3	77.1	49.3	40.7
2005	Developed to Developed	79.1	70.3	84.2	68.1	74
	Developed to Developing	17.1	27.7	11	28.8	23.3
	Developing to Developed	51.5	46.9	56.8	48.5	51.6
	Developing to Developing	44.2	52.1	42.7	50.8	46.8
2010	Developed to Developed	73.7	60	75.5	61.2	68.2
	Developed to Developing	22.7	38.1	19.9	36.6	28.5
	Developing to Developed	40.9	37.4	44.4	39.7	44.3
	Developing to Developing	54.9	61.4	55.3	59.7	53.5

Table 1.2 continued

2016	Developed to Developed	71	59	66	56	70
	Developed to Developing	27	40	27	42	28
	Developing to Developed	38	35	34	38	43
	Developing to Developing	59	64	65	61	55
2020	Developed to Developed	70	61	63	63	73
	Developed to Developing	30	39	34	37	27
	Developing to Developed	39	31	29	38	45
	Developing to Developing	60	68	69	61	55
	Developed to Developed	71	63	66	58	72
	Developed to Developing	29	36	28	40	28
	Developing to Developed	41	34	37	36	49
	Developing to Developing	59	66	62	64	51

Note: Least developed countries are not included.

Source: Handbook of statistics by UNCTAD (1995, 2000, 2005, 2010, 2016, 2020 and 2022).

Mutual export flow of major export groups in merchandise exports is provided in Table 1.2. Notably, 49% manufacturing products are exported from developing countries to developed countries whereas 72% of manufacturing goods are exported from developed-to-developed countries in 2021. Only 28% manufacturing goods are exported to developing countries from developed countries. 39% food items and fuel items each are exported from developing countries to developed countries but the share remains for 60% from developed-to-developed countries for both product groups in 2021. In the same year, 37% agricultural

goods and 36% ore and metals are exported from developing countries to developed countries whereby the rest of 63% and 64% of each product respectively, is exported from developing countries to developing countries. Generally, exports share of manufacturing goods from developed-to-developed countries remained more than 70% and less than 30% from developed to developing countries over the period from 1995 to 2021. The export of manufacturing goods remained 40% to 58% from developing to developed countries while the share ranges from 40% to 51% from developing countries to developing countries over the period 1995 to 2021.

Precisely, a larger export share in the world market can be acquired through a higher production base and diversification in production cum exports. After highlighting the importance of export diversification, it needs to be inquired as how to keep the pace optimal. Though, developed countries cope with many challenges but many developing countries seek to grow on the basis of endowed resources. Despite, physical resources, financial resources do contribute to meet the challenges. Lack of financial resources is reflected in a shortage of capital, which widens the savings investment gaps as well as import-export gaps. Thus, a lack of investment does not broaden the production base of developing countries, rather, it mitigates growth at all levels. Indeed, financial resources are the key requirement for investment and production. Developing countries seek financial resources to enhance and diversify export flow. Domestic resources especially in the form of capital become insufficient so they seek external resources in the form of external capital to confront with its domestic shortage.

External resources in the form of external capital can contribute to export diversification through multiple channels, which include increased investment in a wide range of production activities and provision of various sources of income. Therefore,

diversification in exports reduces the adverse effects of export instability, mitigates high terms of trade variations, and reduces the risks related to fluctuations in commodity demand and prices (Alper & Oguz, 2016; Mao & He, 2019). In recent years, however, developing countries are initiating and striving for expansion in production as their production and exports' structure is shifting from primary commodities to manufactured commodities. Many developing countries have started processing commodities that were previously exported in raw form into semi-finished and in some cases in finished products. Under the circumstances mentioned above, the accounts for value addition in developing countries and its pervasiveness in production process increase enormously. Here, the only question arises that of accounts for diversification in exports for developing countries.

The earlier studies left the question partially unanswered as these studies were previously interested in knowing the growth performance of export structure rather than exploring the well-founded relationship between concentration, and low growth (Elhiraika & Mbate, 2014; Kamuganga, 2012). Many researchers explored the relationship between exports/diversification in exports and economic growth to account export led growth (Odhiambo, 2022; Shakeel & Ahmed, 2021; Shihab et al., 2014). Furthermore, because of somewhat lesser diversification in the export of developing countries, various channels and determinants are explored which can potentially contribute to its expansion. A few studies captured infrastructure, an important reason to increase export diversification (Aditya & Acharyya, 2013; Lectard & Rougier, 2018). A few more researchers related export diversification with geographical location (Handoyo & Ibrahim, 2021; Zhu & Fu, 2013). A handful of studies considered development level and country size as a production cum export enhancing phenomenon (Ross, 2019).

Undoubtedly, diversification requires financial resources, which remain a serious constraint in developing countries (UNCTAD, 2022). A prominent channel can be the external capital to improve significantly the export diversification. Another prominent channel to increase export diversification can be the innovation strategies of a country. But little attention has been paid to explore the underlying determinants of export diversification. The subsequent investigation may provide the room for optimal policy suggestions which is possible through valuable research. So, it is imperative to investigate the main drivers of export diversification in the form of external capital resources for developing countries. As discussed earlier, export diversification requires funds for diversified production for which developing countries need resources but find them lacking at domestic level. It will further explore the causality relationship among key variables and it is well deserved to be explored for assessing the truthful nature of sustained growth in the form of export growth to cause economic growth and export diversification.

External resources mainly include foreign direct investment, remittances inflow, foreign aid received and external debt, may radically change to upgrade exports and mull over changes in the productive transformation of the country. To the best of my knowledge, less attention has been given paid to the aggregate effect of all external capital resources upon export diversification for developing countries.

Moreover, innovation practices include transformation towards manufacturing activities and patent additions in the economy. In other words, technology can be conceptualized to have an impact on economic activities and development which can be portrayed the best through innovations. The innovations improve human capabilities which can be measured through improvement in their knowledge, health, creativity and participation in their social, economic and political life. All the human capabilities are

translated into gains in productivity which indirectly leads productive transformation and causes changes in export structure of an economy (Iyoboyi & Na-Allah, 2014; Saviotti & Jun, 2020).

Arguing further, higher export base accelerates value addition initiatives and also fascinatingly improves the quality of manufactured goods. Thus, the productivity or diversity scheme of export sector in developing economies can be well evaluated if innovation variables are also introduced while studying export diversification. Logically, the developing countries follow standard trade theory and the basis of comparative advantage for production of goods. These countries mainly produce agriculture and natural resource-based products. The competitive global environment needs to transform economy towards value added manufacturing which means the deviation from comparative advantage and the term refers to ‘defied comparative advantage’.

The defiance can be captured through the Technology Choice Index (TCI). Declaring defying comparative advantage is itself a vibrant call of innovation. The index maneuvers the production scheme of the economy by highlighting the share of manufacturing value added in GDP. This intensity has a generic trend to reflect itself in the accumulation of innovation capabilities. Eventually, the transformed scheme of production expands the base of technological knowledge and exports take the diversifying trend. Innovation is a combined version of invention and development, adding new methods in the process of production (Bryan & Williams, 2021). Innovations to cause export diversification in middle-income developing countries is an unfulfilled side of the policy debate as yet. Innovations do enhance technological spillovers and literature of economics also takes number of patents as proxy of innovations (Chen & Steinwender, 2021). Thus, it is obligatory to investigate the impact of innovation strategies upon export diversification

Despite the crucial nature of export diversification and all its positive effects, developing countries are still focusing on concentrated exports. The role of export growth in enhancing economic growth cannot be ignored in this enclave. Many developing countries show their inability to enhance manufactured product exports due to resource dependence like fuel exports (Ahmad et al., 2018; Heresi, 2023). It is hereby necessary to include Export Growth (XG rate annual percentage), Economic Growth or market size in the form of Gross Domestic Product (GDP per capita) with export diversification. The preceding variable XG is the sign of sustained growth (Miyamoto & Nguyen, 2024). These three variables further explore the truthful nature of sustained growth component with economic growth and export diversification for developing countries.

Growth in exports has remained a positive externality for many resource based developing countries (Ahmad et al., 2018; Odhiambo, 2022). It encompasses productivity. Growth in output and employment increases if demand for the exported product rises. Growth of exports induces income growth through Keynesian multiplier (Leichenko, 2000). It also plays a crucial role in determining output growth in the economy, develops tertiary linkages in the framework. Despite growth in exports, the export industry results in increased investment in relevant other economic activities. Higher GDP again induces not only growth in exports but also ignites local demand, and the resultant increase in diversified export base becomes inevitable.

Export composition of many developing countries has been highly reliant upon export concentration and is mainly based upon primary goods. The huge reliance on primary products is a vital issue to be dealt with, as it has many potential macroeconomic consequences (Martincus & Carballo, 2008; Ul-Haq et al., 2025). So, diversification is currently important for developing countries' sustainable growth perspective. Export

diversification is plausibly a proliferating trade objective in the process of internationalization. Developing countries are striving to add in their export basket either through its growth or diversification since the 1980s. This strategy was adopted as an aftermath of export promotion schemes.

Although, many developing countries have close similarities in their economic structure yet their level of development bifurcates them in two groups which are Upper Middle Income (UMI) and Lower Middle Income (LMI) countries. The bifurcation is made by World Bank (WB) on the basis of GNI (Gross National Income) per capita of an economy. According to World Bank 2024 classification lower middle-income economies have \$1,135 or less and upper middle-income economies are those with a GNI per capita between \$1,136 and \$4,495. These groups sometimes show different trends of production and exports. It is thought provoking that LMI countries are mainly relying upon their agricultural produce for exports which are usually prone to volatility. In fact, many developing countries keep exporting a concentrated commodity base and grow their export bundle through trade liberalization, witnessing rise in economic growth. These countries are taking advantage of their commodities globally while relying upon comparative advantage, fueled by natural resource endowments, cheap labor supply, and flexible industrial policies. Thus, export growth is also leading towards economic growth.

The experience of developing economies for the rise in economic growth was based upon traditional trade theory, documented by Adam Smith (Hartmann et al., 2017). Specialization reduces opportunity cost by realizing economies of scale enabling countries to export the comparatively advantageous commodity. It keeps helping developing countries to generate efficient resource allocation. The above-mentioned pattern prevailed till the end of 20th century. Somehow, there are reasons to believe that attainment of growth though

moving on similar path of comparative advantage may not sustain in 21th century (Oliveira et al., 2020). In a sense, recent decades have witnessed many changes in the patterns of international trade in developing countries. The adoption of outward oriented policies by these countries has pushed many of them in international markets. It is noteworthy that relying on comparative advantage by developing economy and exporting primary products may not affirm that country can get sustained growth. Arguably, the primary products exports suffer from low terms of trade and resultant volatilities poses further low growth potential (Bruno et al., 2015).

Contrary to, the process of internationalization of production by participating in global production networks and trade integration process at bilateral, regional and multilateral levels has developed new opportunities for product diversification (Tran et al., 2017). Now it is meaningful to say, that developing export capacity beyond the resource based sector is one of the main focuses of economic policy. The selected developing countries are middle income countries further divided into UMI and LMI. This section of the study also provides graphical illustration of external resources, innovation strategies and diversified export base along with sustained growth variables.

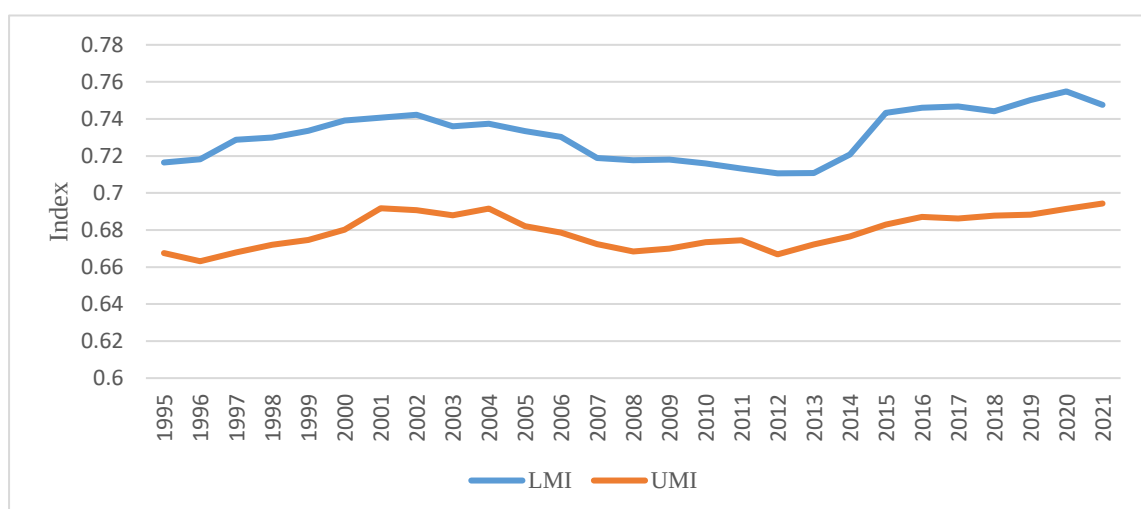


Figure 1.1: Trend for Export Diversification (Di) for UMI and LMI.

Source: UNCTAD (2022)

Figure 1.1 is showing the Herfidhal-Hirschman Index (HHI), used as a proxy for exports diversification (Di) for the sample developing countries disaggregated into two group i.e. UMI and LMI. It is providing a thought-provoking trend. It is mindful for remembrance that HHI (Di) ranges from 0 to 1. The movement towards 0 shows the level of higher diversification and vice versa. Many studies have used HHI as a proxy of export diversification (Al-Marhubi, 2000; Balavac & Pugh, 2016; Giri et al., 2019).

The UMI has an appropriate trend to ponder towards export diversification in the mid-1990s. An approximate and gradual ups and downs are observable for both group of countries. External financial resources of developing countries may be characterized through external financial capital resources is a predicament for positive influence upon diversified export base (Müller, 2021; Saleem et al., 2020).

These capital resources can further underscore the vitality of export diversification and thereafter enhances the performance in developing countries. Another reason which further stimulates the above-mentioned interconnections is the appropriate access to financial resources, facilitating the process of manufacturing which is the heart of diversified export bundle. It is never surprising that higher investment in manufacturing activity or any other transformation at economic front requires funds (Gamariel & Hove, 2019; Jana et al., 2020).

Developing countries lack investment funds mainly due to saving investment gap. Filling this gap requires financial and capital resources. This gap can be better filled by seeking external financial or capital resources. Potential benefits of external capital can also be realized at production and export level. It is mentioned above that diversified exports are more sustaining and additions to economic growth. As this study is focusing external capital resources to fill the saving investment gap with an outcome of export diversification but the

key contributions vary domestically, regionally and globally. A cursory look at these resources needs a graphical analysis before leading towards estimation. FDI is one of the key external resources to act as a capital inducement factor. It enhances investment in host economy and further propels growth and exports (Kastratović, 2020).

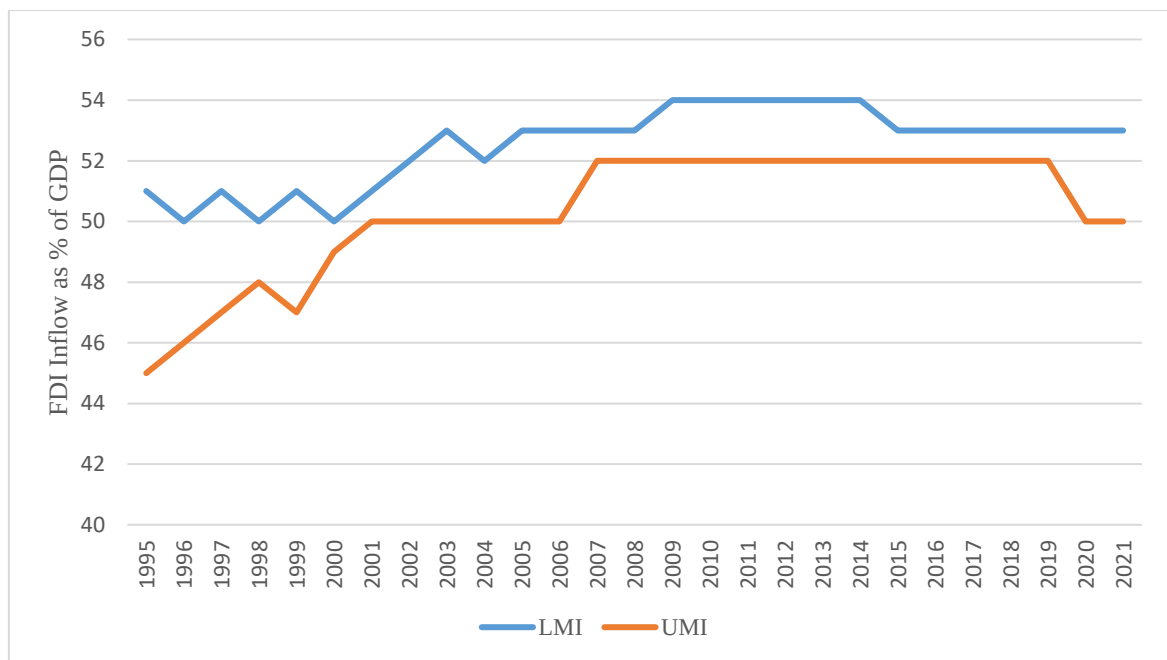


Figure 1.2: Foreign Direct Investment (FDI) inflow in UMI and LMI.

Source: WDI-WB (2022)

Figure 1.2 provides an annual figurative inflow of FDI in both groups of countries. It is important to note that FDI inflow is higher in LMI in comparison with UMI. FDI inflow rests at market seeking and cost discovery in host economy. It may perform and add in diversification of export if enclaving natural resource sector is not a condition (Osakwe et al., 2018a). It is concurrently agreed by many researchers that FDI exerts positive impacts on host economy (Egyir et al., 2020; Phuyal & Sunuwar, 2018). FDI is predominantly an important element of structural transformation in various economies and also reinstate the transfer of technology in developing countries (Liu et al., 2017; Megbowon et al., 2019). Contextualizing the developing economies FDI more often affects and opens the way for

international markets, improves local management capacities, facilitates the inflow of financial resources and inhibits poverty (Tiwari & Mutascu, 2011). FDI also add in economic transformation and export diversification is one of the element of this transmission (Antonietti & Franco, 2021; Zhou, 2020). Economic transformation foster sustainable development and FDI adds in it through market seeking, cost discovery and managerial practices (Eck & Huber, 2016; Hausmann, 2016).

Moreover, another external resource REM received also acts as a capital source in developing countries. It provides credit to domestic economy and its developmental impacts are widely accepted.

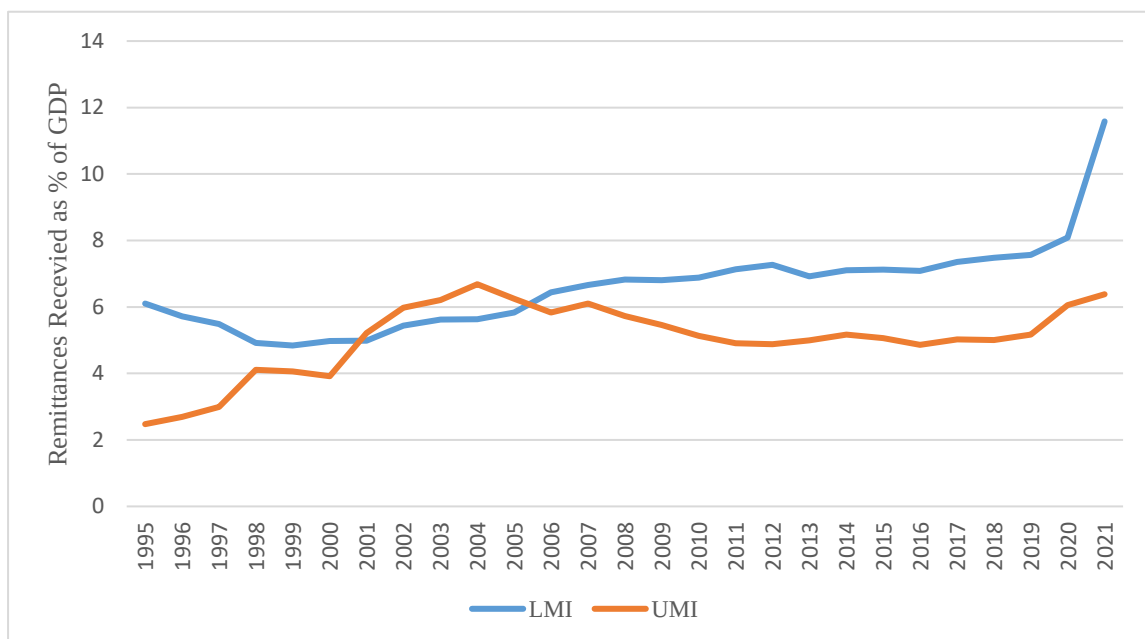


Figure 1.3: Remittances (REM) received in UMI and LMI.

Source: WDI-WB (2022)

REM as capital inflow is depicted in Figure 1.3 for both groups of countries. Its inflow has increased in last three decades and increased the interest of researchers to discuss the phenomenon in recipient country as it constitutes the vital source of foreign exchange. It has diversity in its implications through improvement in the well-being of receiving

families by increasing the health education and may be the investment. It is the way through which migrants add in the financial flow of their countries of origin by sending money to families (Abbas et al., 2023; Saadi, 2020). Truthfully, both sources (FDI and REM) affect external sector and helps diversifying exports in the economy through various channels. These channels may be investment oriented, self-discovery behavior of entrepreneur and lately may be the technology transfer towards manufacturing activity. Unusually, cost discovery marks an interrogation upon number of entrepreneurs engaged and amount of investment funds available to them.

Moving further, suggests to have cursory look at another external capital resource i.e. AID received. Many researchers pose dual effect of AID on economy. Sometime it exerts positive impact but sometime the effect becomes negative. The outcome could be growth, development or exports may be Di.

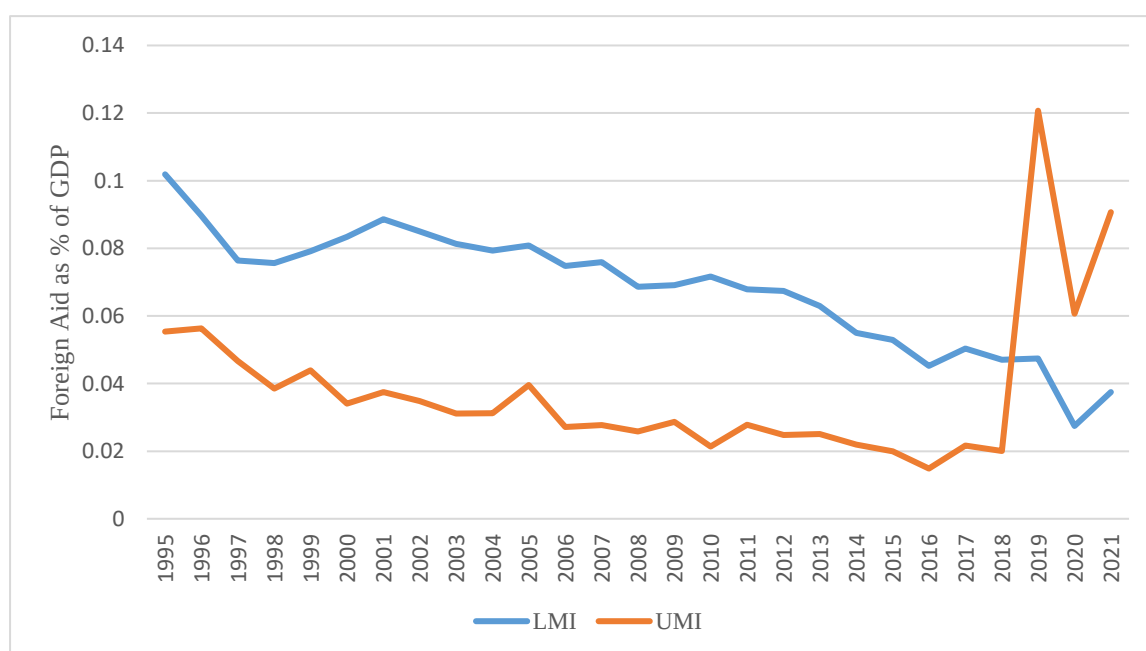


Figure 1.4: Foreign Aid (AID) received in UMI and LMI.

Source: WDI-WB (2022)

Figure 1.4 portrays that LMI remains at a higher trend of a receiving aid till the end of second decade of 21st century than UMI. AID facilitates the investment as well as research and development activities in the economy and acts as another crucial way for business to earn additional profits and thus increases competition. On the basis of above argument, it can be easily stated that external capital resources are linked with the diversification of export in a country, either positive or negative. As mentioned earlier, positive link among the underlying variables is expected upon outcome variable but sometimes negative association is expected.

Fourth, external capital resource is External Debt (EXD) and is also a key element of financial capital for a developing economy. Thereafter, it may necessitate in financing sectors of high value addition by pervasive re-allocative effect of resource movement among sectors from least productive to most productive so as to achieve optimal structural transformation cum diversified exports in the economy.

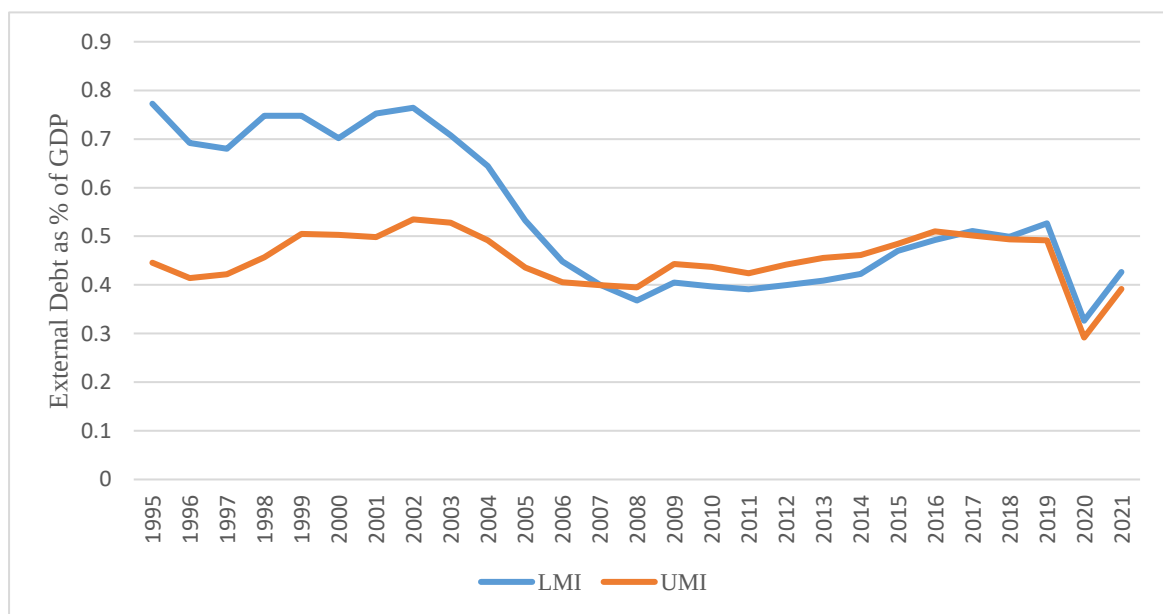


Figure 1.5: External Debt (EXD) received in UMI and LMI.

Source: WDI-WB (2022)

EXD more often adds in the investment schemes, can also be fruitful for export diversification. The implausibility will lead its trend of investing in already launched schemes and add in concentration of exports (Mamba et al., 2020). Figure 1.5 clearly indicates that LMI remains at higher receiving of EXD since 1995 till 2008 than UMI but the trend kept reversing till 2nd decade of 21st century. A sharp decline is evidence for both groups of countries in 2020. It is again unsurprising that LMI receives more external capital in the form of EXD than UMI. It is the most important support for countries at the time of need (Qureshi & Liaqat, 2020). It must be kept in mind that its inflow may not be export diversifying but export concentrating through uplifting previous investment schemes and expanding production.

Logically, despite discussing, external capital as drivers of Di the present study is also pointing towards another dimension which can trigger Di is innovation strategies. This side of picture primarily reflects technological advancement, its partial view is presented by TCI, which can provide new means to combine raw material and become an additional endeavor to promote Di. Technological advancement is a combination of physical capital and human capital which enhances innovations and spreads economy wide repercussions. Innovation strategies affect almost all macroeconomic targets in the economy.

The diversified exports need expansion and diversification in production base. Production base acts as a backward linkage for exports base to diversify. This adoption tends towards non-traditionally manufactured goods to move up the countries' technology and skills ladder. Manufacturing goods are more sustaining than other produce (Saleem et al., 2022). East Asian tigers have observed tremendous rise in sustainable export which are manufacturing products. Many others economies also got this trend which include Chile, Tunisia, Botswana and Mauritius, China and Brazil are also the glaring examples (Naudé &

Rossouw, 2011; Oliveira et al., 2020; Shah et al., 2023). This all is against standard trade theory and does not follow comparative advantage. Rather it brings forth defying comparative advantage and emergence of ‘new trade theory’. It is proposed that developing countries employ labor in value added manufacturing and reap the benefits in terms of production and export. To meet this, an index is proposed called Technology Choice Index (TCI) (Bruno et al., 2015). Higher value of TCI portrays higher defiance in comparative advantage.

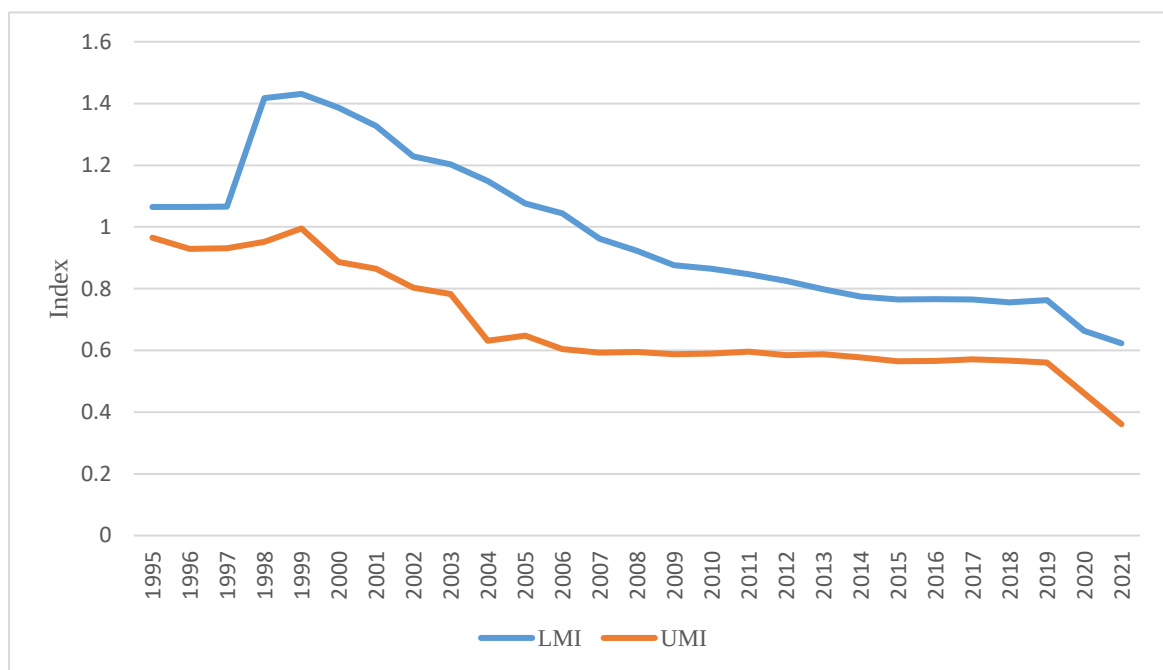


Figure 1.6: Technology Choice Index (TCI) for UMI and LMI.
Source: WDI-WB (2022)

Figure 1.6 displays defiance in comparative advantage by two groups of countries. Noteworthy advances in favor of defying comparative advantage are made by both groups but the mean values across the dataset for LMI are relatively larger than UMI. Undoubtedly, it closely connected to manufacturing activity but the re-transformation framework is possible through ‘kick start’. This term requires endeavoring transformation not possible without government intervention. TCI is the vibrant information of innovative activity in

the economy. It incorporates policy level changes considering fiscal policy, monetary policy and industrial policy. It is generally accepted that many developing countries adopted outward growth oriented policies and needed to add manufactured goods in their exports (Chakroun et al., 2021; McGregor, 2017). It is also worth noting that TCI is declining after Asian crises (2004) followed by financial crisis of the world (2007-08) and Covid-19 (2019 onwards). This vibrant innovative scheme can provide a vital effect size provided a well-founded relationship become true and exports also diversify. Generally, it is a productivity scheme need a well connection with commercial and trade policies.

This phenomenon has its roots in R&D activities which keep generating technological capabilities and patenting becomes a technology-oriented innovation process. Patents are quantifiable element to view the productive scheme of economy.

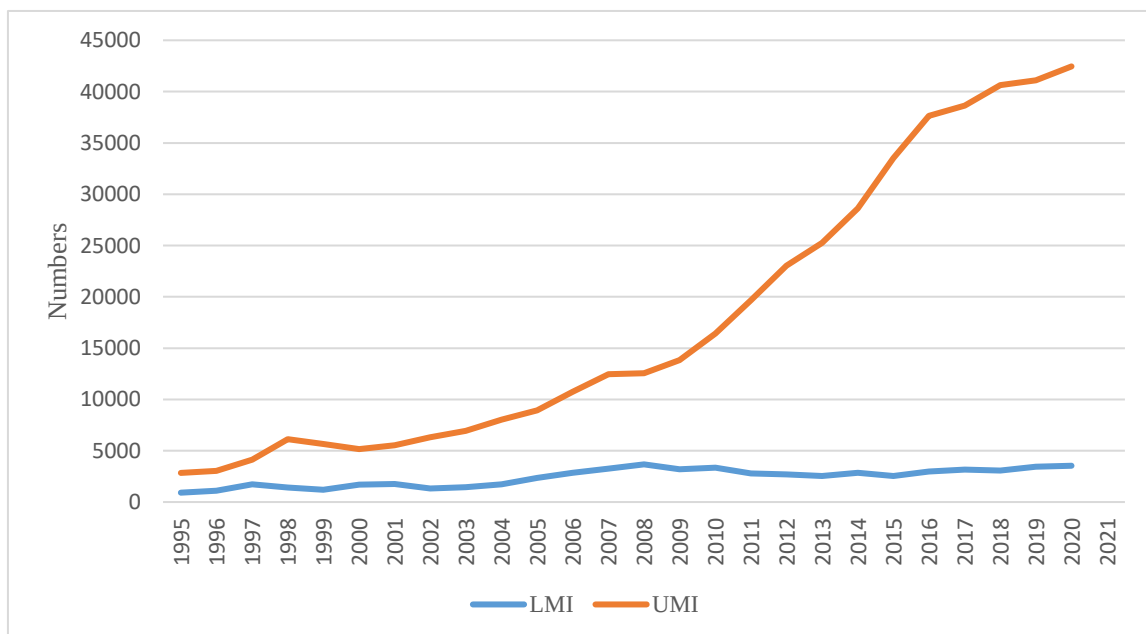


Figure 1.7: Patents (PAT) filled in UMI and LMI.

Source: WDI-WB (2022)

The Figure 1.7 portrays the view of PAT in LMI and UMI respectively. It shows the upsurge in number of patents filled in both group of countries which prism the remarkable

contribution of sample countries in showing their economic performance. For both income groups, there is significant rise in innovation practices and strategies measured through addition of patents. It is again crucial to note that number of patents filed in UMI group are almost double of LMI over the period of study (1995 to 2021). It appeals the current analysis to explore its relationship with Di.

Overall, any research in the field of economics should portray its developmental context. Several studies either based on micro-economic or macro-economic indicators ultimately find their avenues in growth of the economy. This research is also providing the scenario of economic growth based on Di of sample countries. So, it is pertinent to give graphical presentation of trend in economic growth for both sets of sample countries

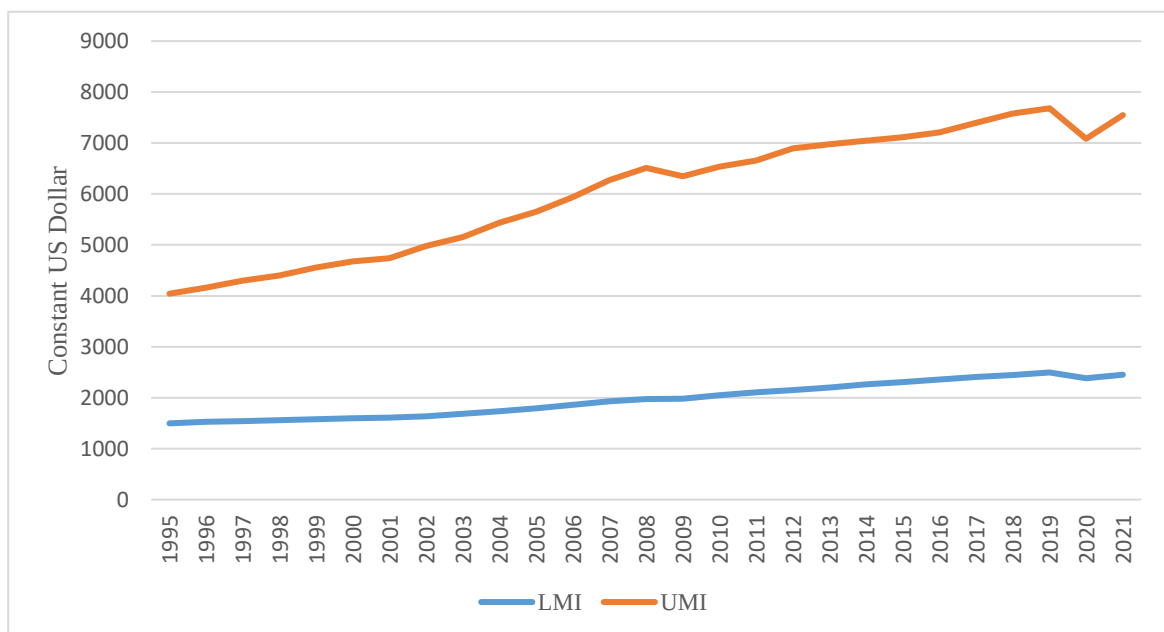


Figure 1.8: Gross Domestic Product (GDP) per capita in UMI and LMI.

Source: WDI-WB (2022)

The Figures 1.8 provides the growth trend in two groups of countries. The economic growth of countries kept rising for entire study period. It is also marked as country size. It adds in the market of goods and services. It is also an evidence that GDP of an economy

adds in diversified export base (Lectard & Rougier, 2018). It is commonly believed that any economy produces those commodities for which its domestic demand is high and local customer has taste and income for it (Ross, 2019). Precisely, market size has a close connection with process of internationalization and globalization and export diversification is a partial view of it.

Di is a long run sustaining factor of an economy. Before acquiring diversification in exports, developing countries do focus upon their trends in GDP and Export Growth (XG) (% annual). Both are also the sustaining factors and add in sustenance of a developing country. The growth outcome of Di has its own externalities which must be gauged through the lens of GDP and XG.

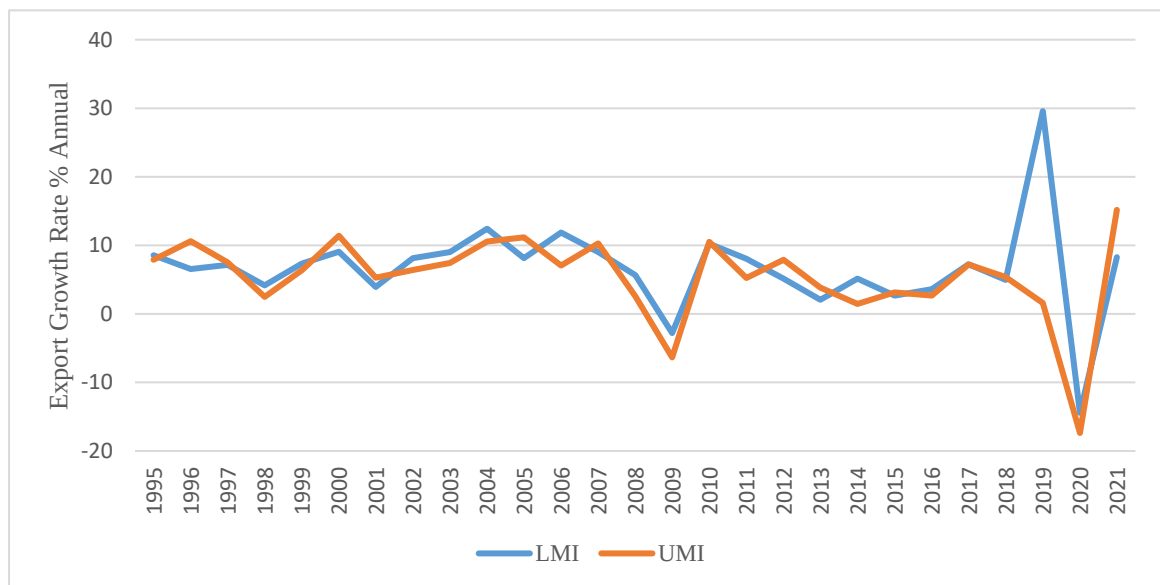


Figure 1.9: Export Growth (XG) % annual in UMI and LMI.

Source: WDI-WB (2022)

Every open economy, may be small or large acquires a bundle to export which can be manifested through total exports. The phenomenon can be better related with export growth. Many resource abundant countries follow their comparative advantage to produce and export. Putting differently, XG leads to economic growth. XG also realizes economies

of scale, exploitation of domestic resources and capacity utilization (Young, 2023). New production reinforcing a continuous upsurge in international trade is becoming a vital economic phenomenon. Since the mid of twentieth century global trade is rising as percentage of world GDP and the classical trade theories cannot be neglected stressing ‘export led growth’. It is revealed from Figure 1.9 that XG increased from 24% to 61% in 2008. The financial crisis of 2008 reduced it to 57% in 2016 but it again started rising till 2019. A further reduction has been seen in Covid-19 but the global community is striving for growth in global economy integration. The Figure 1.9 reveals a continuous up and down movement of graph for both groups of countries. However, LMI are taking the lead many times especially in 2020.

1.4 Problem Statement

A move towards export diversification is crucial for developing countries. It is decisive in fostering economic growth and combating global economic challenges. Many studies find a positive relationship between export diversification and economic growth, especially in the earlier stages of development (Herzer & Nowak-Lehmann D, 2006; Mau, 2016; Melitz, 2003). The positive impact of export diversification on growth has also been confirmed causally (Gözgör & Can, 2017; Ngassam, 2023). Positive relationship between diversification of production and growth at an early stage of development, is followed by a trend of re-concentration in the later development phases, the so-called “hump” or “inverted-U” shape (Imbs & Wacziarg, 2003). While the case for a re-concentration of exports is contested, there is a consensus that economies seem to diversify more at earlier development stages (Mau, 2016; Parteka, 2010; Parteka & Tamberi, 2013).

Before going into the details for knowing the relationship between growth and export diversification of an economy, it is pivotal to know the transition towards export diversification with its key elements.

Globally, there has been a reliance upon domestic factors to produce and export. Countries kept producing on the basis of comparative advantage and relied upon concentrated export. Many developing countries are resource dependent and remain primary produce exporters so are possessing the inability to increase diversification in exports (Liaqat, 2019). In other words, concentrated commodity base of developing countries was primarily linked with traditional trade theory which further augmented into classical and neoclassical trade theories with the recognition of comparative advantage. The momentum of mentioned theories revolved around factor endowment structure of developing economies. It exhibited a growth pattern of these countries reflecting the upgrading in sector of the economy marked as comparatively advantageous through initial endowments in 1950s, 1960s and stretched till 1970s. Moreover, primary products exports by these countries put volatilities in terms of trade that was a breakthrough of import substitution policies in developing countries. By mid 1980s, many developing countries ambushed in the debt crises which further led to policy rethinking. Consequently, export diversification seems to be an effective policy tool to rescue from volatilities. However, low and middle-income countries adapted export diversification policies rendering their industrial and commercial policies in the beginning of 1990s. It took a further boost through the wave of globalization till mid-1990s, so the selected period shows an adapted diversification of exports by the selected countries. The new trade theory is tested, which despite conventionally relevant policy explanatory variables, specifically considers the role of major

external capital flows and transformation of production towards manufacturing value added to influence export diversification.

The Reliance on primary exports for foreign exchange earnings became another challenging issue faced by them. So, in modern international competition, a country cannot solely depend on primary commodities for trade; however, a country needs to diversify its exports to remain competitive (Heresi, 2023). This phenomenon skeptically become the part of ‘new trade theory’.

There has been a long debate among researchers and policy makers for enhancing export diversification through various economic channels including infrastructure, investment, domestic capital, exchange rate and trade liberalization (Fonchamnyo & Akame, 2017; Nathoo et al., 2021; Nguyen, 2016; Omgba, 2014). They previous studies could dwell into the enhancing factors of export diversification but the interplay cloud not support developing especially middle-income countries. The main reason remained lack of investment funds in these countries, which disallow them to attain the various economic targets (Antonietti & Franco, 2021; Cieřlik & Parteka, 2021; Goh et al., 2017; Xiong & Sun, 2021). Thus, lack of export diversification stands as a challenge for developing countries.

Lack of domestic financial and capital resources let developing countries look for external resources especially external capital, which prominently include inflow of FDI, REM, AID and EXD. External resources augur well to mitigate vulnerabilities to external shocks and overwhelmingly contribute in diversification of exports. While some of the external resources possibly hinders the diversification of exports through Dutch-Disease effect (Krugman, 1987; Krugman, 1979). There is also an argument in the literature that ‘Dutch Disease’ is not a well-established fact over time and across some cross sections discussed previously (Van der Ploeg & Venables, 2013). The mentioned argument may not

be valid for all groups/panels of countries. It means, some of the external financial influxes promote the diversification pattern of exports while some may possibly taboo.

Despite this, innovation activities are also less explored in previous studies to account the outcome. Many of these countries are struggling with the challenge of expanding production and diversifying their export. Diversification can either be achieved through the value addition in products or through shifting production in other sectors. Diversification also provides an exposure to international markets, management and marketing practices (Lectard & Rougier, 2018; Mania, 2020).

Additionally, innovation practices may add in the diversification of exports as innovations provide an interesting premises of technological advancement. The novel production which is possible through movement from agriculture to value added manufacturing can be captured through technology choice index. Another vibrant yardstick for innovations is addition of patents (Chen & Steinwender, 2021; Mania & Rieber, 2019).

It is sometimes noteworthy that developing countries follow the export led growth pattern. Therefore, it is imperative to explore the ignition in export diversification trend through export growth or GDP. Thus, causality relationship among export diversification, export growth and GDP can provide a substantial policy suggestion for selected developing countries.

In short, this study is an endeavor to examine the premises of export diversification by examining its key novel drivers by using panel data of 65 middle-income developing (36 Lower Middle Income and 29 Upper Middle Income) countries for the period from 1995 to 2021. A further causality relationship among export diversification, export growth and GDP is also established for the sample countries.

1.5 Research Questions

- i. What is the impact of each external resource on Di for selected developing countries?
- ii. What is the impact of each innovation strategy on Di for selected developing countries?
- iii. How does causality relationship among three key variables Di, XG and GDP provide an insight for policy scenario of the sample countries?

1.6 Objectives of the study

General Objective

The general objective of this study is to investigate the impact of each external resource in the form of external capital and innovation practice upon Di in a balanced panel of 65 middle-income developing (36 Lower Middle Income and 29 Upper Middle Income) countries for the period from 1995 to 2021. The sample of countries is further segregated into UMI and LMI group containing fifty-four countries each. Di will also enclave a causality relationship with XG and GDP for the same sample and study period.

Specific Objectives

- i. To explore the impact of each external capital (FDI, REM, AID, EXD) on Di in developing countries.
- ii. To analyze the impact of each innovation strategy (TCI and PAT) on Di in developing countries.
- iii. To examine the causality relationship among Di, XG and GDP for sample developing countries in order to provide policy scenario.

1.7 Significance of the study

Export diversification remains an important objective for developing countries. Historically, the traditional model of "export-led growth" has emphasized the expansion of exports to attain higher growth trends. While, recent development in international trade emphasizing export diversification to mitigate external shocks.

This study contributes to the literature by empirically examining the impact of external capital resources namely foreign direct investment, remittances inflow, foreign aid, and external debt upon export diversification in selected developing countries. Given the persistent savings investment gap in these countries, the role of external capital become crucial as alternative investment sources that helps in diversification.

In parallel, the study investigates the role of innovation strategies captured through the Technology Choice Index and patents as drivers of export diversification. Innovation enhances the capacity of economies to move into new sectors, particularly in manufacturing, thereby fostering diversification.

Furthermore, by exploring the dynamic causal relationships among export diversification, export growth, and GDP, the study provides an integrated framework to understand how one variable causes the other. This is specifically relevant for developing countries, where exports remain a major driver of growth and diversification.

The study has its core relevance with middle income countries, further classified into Upper-Middle-Income and Lower-Middle-Income group. The classification of countries enables a comparative perspective on how different economies utilize external capital and innovation to diversify their exports. The results will help in shaping targeted policy frameworks for these economies.

This research provides valuable empirical insights for policymakers, development practitioners, academicians and researchers. This study also serves as a reference for future research and teaching in the fields of international trade, development economics, and innovation policy paradigm.

1.8 Organization of the Study

Rest of the dissertation is organized as follows: chapter 2 elaborates the theoretical and empirical review of framework with subsequent conceptual framework and research gaps for this study. Chapter 3 is about the proposed data for dependent and core independent variables along with methodological content for each research objective. The chapter 4 provides the empirical findings for each objective and chapter 5 gives conclusions and policy recommendations respectively.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter aims at examining the theoretical and empirical perspective of relevant literature that exists to primarily relate the external resources, and innovations with Di in developing countries. It will further stimulate to encompass the theories of economic growth after a multi-perspective approach of theories related to external resources, innovations and trade theories. Innovations are themselves a partial approach towards economic uplift. The existing literature has supported theoretically and empirically that diversified export bundle improves overall economic performance of countries which is fueled by external resources and innovations. Diversifying export bundles give rise higher and stable economic growth so it is a catalyst for economic uplift and development.

Analysis at global, regional and national level confirms the empirical evidence of holding the correlation by contextualizing micro and macro factors such as initial GDP per capita, governance, macroeconomic fronts which includes value-added commodities, external resources and innovations.

Sections 2.2 and 2.3 cover the theoretical and empirical review of related literature respectively. Section 2.4 provides the conceptual framework of this research, constructed after the extensive review of related literature. Finally, section 2.5 gives the research gap for this dissertation. Before going into the details for theoretical, empirical and conceptual framework, it is crucial to discuss the need for export diversification and import substitution vs export promotion scenario.

2.1.1 Need for Export Diversification

It is sought that export diversification is desirable for quite a number of reasons. The fundamental reasons are both demand side and supply side factors. The former reasons presumably focus that developed countries are the primary consumers of primary commodities produced in developing countries. When the developed countries experience downturns demand then prices of primary commodities slash which germinates the export base of developing countries to diversify to cater the downturns. Variations in tastes and income are additional push factors to make diversification in export (Cieřlik & Parteka, 2021; Ross, 2019).

Supply side factors also effect exports e.g. unfavorable weather conditions create alarming vulnerabilities for agriculture producing countries. Nation's productive structure transforms if the input mix and production technology changes, causing positive change in foreign exchange earnings, especially if the nation focuses to transform the exports from traditional primary and agriculture product to industrial and manufacturing product (Elhiraika & Mbate, 2014; Parteka, 2020). Flexible productive structure can keep the export structure under various price elasticities of supply and target sustenance in the economy.

Export diversification broadly involves reduction in economic risk, advances growth opportunities, maintains resilience and enhances stability in the economy (Dennis & Shepherd, 2011; Prasad et al., 2025; Sekkat, 2016; Shepherd, 2015).

2.1.2 Import Substitution versus Export Promotion

Developing countries argued for protection during 1950s and 1960s due to declining trend for primary products and presence of market imperfections. Developing world also suffered a sharp decline in balance of payment in world market for their primary/agriculture and resource-based products (Dennis & Shepherd, 2011; Felipe et al., 2012). Many

developing countries realistically adopted import substitution policies to impede the rising unemployment and nurture local industry by adopting instruments like quotas, tariffs, subsidies, regulatory wages and price schemes along with multiple exchange rate regimes.

Developing countries possessed limited potential for expansion in exports to grow economically and the term was referred to as 'export pessimism'. Many developing countries felt trade alarmingly disadvantageous to them rather than an engine of growth. So, the import substitution was pursued to protect domestic industry and to enhance the economic growth (Riedel, 1984). The import substitution policy impeded the role of export diversification on economic growth in developing countries.

Perhaps, many developing countries possessed comparative advantage for producing primary goods, and the import substitution let them continue to produce and specialize in primary produce. In fact, they have lesser and limited skills cum shortage of capital which further taboo them to promote economic growth in the conducive, efficient and low cost environment (Appleyard & Field, 2014). Eventually, import substitution strategy could not facilitate the process of industrialization in most developing countries, also the high trade barriers distorted relative prices cause productivity gains to reduce (Mudenda et al., 2014).

Consequently, during 1980s export promotion was given priority contrary to the import substitution policy and many developing countries become 'export optimistic'. The intervention of emerging developing countries was seen in encouragement of exports by various means and the export development provided a surface to increase export diversification. Outward oriented policies recognized the demand for production efficiency, competition in world market and reduction in regulations.

2.2 Multi-Perspective Theoretical Review

It is crucial to understand foundation of theories of international trade before testing the phenomenon under study. Since, the main objective of this thesis is to study the impact of external capital and innovation strategies on export diversification and then the causality relationship among export diversification, export growth and GDP is established. Hence, (so) it is vital to present sufficient theoretical background before measuring it.

A group of theories can be found more or less useful in understanding the phenomenon under investigation. Initially, the standard theories of international trade were based on comparative advantage. This chapter will also discuss the new theories of trade as well as the theories that explain external resources, innovation spillovers and phenomenon of sustained growth.

Similarities in technology and factor endowments among countries cannot be explained under traditional trade theories (Amurgo-Pacheco, 2007). Put differently, the validity in implication of traditional trade theories such as law of comparative advantage and Heckscher-Ohlin theorem could no longer be contextualized in the underlying phenomenon to study diversified export base. Nevertheless, technology, innovations and their spillovers become the determinant and reason of trade between countries with similar factor endowments and the traditional trade theory transit to the new trade theory. Additionally, new trade theory is based on increasing returns to scale, imperfect competition and differentiated goods.

2.2.1 Traditional Trade Theories

Positive relationship between volume of trade and economic growth is portrayed in most international trade theories. These theories enclave classical comparative advantage model of David Ricardo, the neoclassical model of Heckscher and Ohlin and contemporary

endogenous growth models. Presumably all models pursue those different factors are responsible for trade enhancing, specifically exports. The ultimate target should be portrayed through improvement in output and welfare of the community. Eventually, many economists believed that increased level of trade by developing countries is quite desirable. Higher exports would make countries grow economically with sustainability and finally development occurs to achieve the gains from trade.

The question of the era why nations trade is unanswered by theory of absolute advantage (Smith, 1776). The Ricardian model further proposed comparative advantage in 1817 (Ricardo, 1821). Next, the theory of relative difference in factor endowments was proposed by Heckscher & Ohlin (Heckscher, 1919; Ohlin, 1935). In the Smith's view the primary reason of international trade is absolute advantage marked by differences in climatic conditions and other relevant factors. However, the involvement of climatic conditions could explain the trivial part of global trade theory especially the trade between developed and developing countries. This left out part, which included the trade among developed countries, was explained by Ricardo under the law of comparative advantage. Lower relative cost has been the basis of trade by Ricardian model. Thus, in the Ricardian world relative efficiency in production is the actual determinant of trade. Every country would find a low-cost product in which it has relative efficiency in production and then export.

At the grassroots level, labor is the factor of production which determines country's comparative advantage. Limitations of Ricardian model led to the emergence of Heckscher Ohlin theory which formulates those countries export those commodities which use its locally available relatively abundant productive factors. The empirical test of Heckscher-Ohlin theory encountered problems in verifying the hypothesis. It was found that difference in factor proportions are primarily responsible for comparative advantage in manufacturing

industry (Leontief, 1953). Thus, factor intensity reversal for United States exports was observed. However, intra-regional trade was also not explained by Heckscher-Ohlin model, the reason might be that, the region has homogenous factor proportions. Finally, it was stated that the model can explain the commodity composition of international trade, otherwise, it elaborates observed pattern of trade poorly (Bowen et al., 1987; Deardorff, 1982).

Overall, classical and neoclassical trade theories are based on the proposition that nations will specialize in the production of their comparatively advantageous product and trade will base on inter-industry trade. The inter-industry trade crucially affects production frontier in an economy. The transformed production from primary to manufacturing goods has links with exports stability. Relying on the notion of fixed technology and not pursuing technological change will stick developing countries in primary goods for which global demand keep declining. This notion prisms that phenomenon of diversified export base cannot be explained through classical and neoclassical theories of international trade.

Other aspects like monopolistic and oligopolistic market structure, dominance of large individual corporations to manipulate world prices and supplies are common characteristics of production process. Even if perfect competition prevails, it is realistic to say that risk is attached to it. If developing countries specialize in primary commodities, the risk in the form of unfavorable movement in terms of trade is borne rather triggering.

The initiation of argument was sharp downward trend in prices of primary commodities than manufacturing goods (Prebisch, 1962; Singer, 1950). Difference in tastes and preferences of trading countries also cause them to value products in their own different way. The Heckscher-Ohlin theory suggests no room for technology transfer and its spillovers. The shortcomings of static theories of international trade did not address the issue of exports

diversification so the emergence of dynamic theories of international trade needs to be discussed further.

2.2.2 Emergence of New Trade Theories

Adoption of diversification in exports for producing nontraditional manufactured goods to move up the country's technology and skills ladder has remained the goal of development strategy by many developing countries. Diversification in trade scenario brings forth the emergence of 'new trade theories.

2.2.2.1 Prebisch Singer Hypothesis

Generally the primary commodities suffer negative trend in long run (Prebisch, 1962; Singer, 1950). In addition, deterioration in terms of trade is observed between primary and manufactured products. The nations relying upon exports of primary goods and do not have means to produce manufactured goods suffer the losses in long run. The demand for manufactured goods is backed by income level in the country. Concisely, developing countries' export bundle mostly contain the primary products whilst their imports are heavily dependent upon manufactured goods. Likewise, downward trend in prices of primary commodities is also observed around the globe. There are always many producers of primary goods so it is greater likelihood of lack of differentiation in primary commodities production whereas the manufactured goods markets are less competitive and more diversified (Bloch & Sapsford, 1997).

The primary products are produced with low skills and less technology content, so results in lower growth spillovers. Exports diversification is a possible way out to all the above-mentioned inconsistencies, other way round export instability and negative demand shocks are inevitable. Placing the previous facts in context, the increased output variety means heterogeneity in the product which in turn indicates internal differentiation.

The increasing internal differentiation is due to product or industry life cycle advancement (Nelson et al., 2018). The internal differentiation permits the sectors to increase with the passage of time which can be bifurcated into low quality (LQ) and high quality (HQ). The former encompasses the inter-sector diversification while the later refers to both inter and intra-sector diversification. More interestingly, the macro-economic growth path of both situations vary uniquely and dramatically (Saviotti & Jun, 2020). The rate of employment remains higher in former diversification but wages which depend upon productivity and human capital remain constant. The productivity changes the value of goods, which, also does not vary, so the wages do not change while in high quality scenario, value of goods also changes. In the production of high quality goods the value of goods is high because of high productivity and increased quality of human capital used in it (Golo, 2023). In the former phase of low-quality production in spite of constant wages the income creation is high.

The productive efficiency and nature of consumption are responsible for contrast in both scenarios. Both diversifications pave the way for emergence of new sectors which indeed, are all not the same. Formerly, the sectors correspond with the production of basic necessities which are biological in nature and are profoundly important for human survival mainly including food, clothing and housing (Saviotti & Jun, 2020). After satisfying these needs the demand of other goods and services by economic agents start, when there is some disposable income left with consumers (Saviotti & Pyka, 2013).

Eventually the process of economic development can be interpreted when the granularity of phenomenon can be observed through a gradual process of movement from biological needs satisfaction to the consumer goods demand. The discussion on consumer goods at this stage is mostly central to the manufactured goods.

2.2.2.2 The Product Cycle Theory

This theory took hold after world war (WW) II and viewed a sequential process in international production. It combines trade theory with micro theory of product life cycle (Krugman, 1979; Vernon, 1992). It explains international trade in a way that production of new goods remains concentrated in the developed countries initially but moves to developing countries at later stage. The life cycle of product involves three stages. In stage 1, the innovating country acquires the export advantage by taking risk of producing new product through its technological skills and produces new product. The initial stage of production is based on differentiation with fairly inelastic demand. Hypothetical explanation of this theory recognized the role of external capital, when goods and services are related with income elasticity of demand because of being more technological (Petrochilos, 1999). In stage 2, the product moves to lower income countries where cost of labor is lower and manufacturing becomes possible at a reasonably lower cost, causing exports of innovating country to decline. At stage 3, technology for the goods became standardized and unskilled labor could have produced at even lowest cost. Predictably, the production location shifts to labor rich countries and even the innovating country becomes the importer of that product. Product life cycle theory implements dynamic comparative advantage and phenomenon of economies of scale (Mudenda et al., 2014). Stage 2 and 3 couples for FDI inflow to seek cost discovery in developing countries. FDI also becomes more explanatory for international trade, when an innovative product producer becomes net exporter. The decision to establish production in developing country also rest on availability of cheap labor (Kastratović, 2020).

Bearing in mind the context of new product, concept of productivity and creativity should be introduced which coevolves diversification and economic growth. Productivity either of labor or total factor affects growth capacity of an economy which in turn measures

the efficiency in an economy. Labor and total factor productivity measures efficiency coupling with value which may also be called creativity. So, creativity is the introduction of new products qualitatively different from preexisting ones. Be aware of the fact, it is considerable, that qualitative and quantitative differences make the way towards economic development. If a new product is introduced with qualitative changes is referred to as creativity whereas the production of output with decreasing inputs but keeping the quality of product unchanged is called efficiency. Both are the indications of diversification in production and exports.

Here the term creativity can be divided into two parts radical creativity which is strong creativity and more moderate creativity which can be called weak creativity. The former refers to the production of a completely new product profoundly giving rise a new sector which can be classified in a new statistical category while the later introduces the creation of a new model within the preexisting sector. The creation of new model in existing sector actually refers to the internal differentiation of the same sector (Poon, 2024; Saviotti & Jun, 2020).

The process of economic development involves both efficiency and creativity since industrial revolution and number of commodities for consumers were created giving rise to a large number of industrial sectors. Factually, both phenomenon (efficiency & creativity) added in the economic development globally. Thereafter discussing the details of theories of export diversification which cause the emergence of ‘new trade theory’, the plausible discussion on theories insisting to fuel the economy through external resources is pertinent.

2.2.3 External Resource Theories

2.2.3.1 Self-Discovery Theory

This theory reminds back the crucial work in development economics (Hausmann, 2016). Export diversification is the aftermath of entrepreneurial activities which undergoes the process of cost structure in economy. The basket of goods to be exported is influenced by entrepreneurs engaged in modern sector's production and cost discovery. Entrepreneurs try to minimize or overcome information asymmetry in market which becomes possible through low cost discovery and business is profitable. The individual entrepreneurs are indulged in experimental efforts and derive an industrial brand. Knowledge is acquired in cost discovery process and has its spillovers to relevant potential entrepreneurs and gradually upgrades the sector's technological level leading towards diversification and production. Cost discovery process also leads faster towards export diversification (Dasa & Chakrabortya, 2022).

2.2.3.2 Two Gap Theory

This theory primarily formulate two kind of gaps which developing countries usually suffer namely saving-investment gap and foreign exchange gap (Chenery, 1967). The latter gap presumes scarcity in foreign exchange. Scarce foreign exchange prisms inability of developing countries to finance the imports of machinery and necessary intermediate products to form the finished products. Almost all developing countries are under external debt pressure since 1990s for financing themselves. This theory exerts great pressure on the attainment of external debt and official development assistance to quicken the desirable purchases. It further asserts that national capital accumulation and foreign reserves also add in making the phenomenon viable (Adedoyin et al., 2016; Asiana & Nell, 2024).

2.2.3.3 Debt Overhang Hypothesis

The introduction of a theory for Debt Overhang (DOH) was very first time made in the literature in 1970s (Diamond & He, 2014). The work was further extended by Krugman (Krugman, 1987). This very hypothesis portrays a situation when amount of debt becomes large enough and the country is unable for refunding its borrowings which deteriorates the investment scenario of the country as the investors lose assurance against their investment. Thereafter, the high taxes are levied to meet the debt servicing commitment which further causes heavy drain upon investment and under-investment is realized. Businesses which are already in financial sufferings are unable to find new avenues for investment because the profits under such circumstances are uncertain. Undue reliance on external debt distorts the investment scenario making its chain with exports not to grow and eventually the growth process hinders the sustainable development particularly in developing countries.

2.2.4 Theories of Innovation

2.2.4.1 Smith's Theory of Innovation

Initially, the very concepts of invention, innovation and novelty did not more often appear in theories of economics. It was rather, the crucial aspects of innovation were marginalized for the economy. Linking the phenomenon of innovation to diversification and growth, it is pertinent to say that diversification of a commodity/sector or a system is a gradual process. The process of diversification is as old as the history of mankind is. Hunters become the settled agriculturalists and food production accompanied with nonfood activities like trading and administration (Acemoglu, 1997). Smithian Division of labor was the basis of this diversification. It broke down the production of pins into steps. Each worker had to carry out one step and had to pass the result to the next worker. According to Smith, wealth determination is also possible in the economy through division of labor, rather deep division

of labor creates new invention and such processes pave the way for innovation. Smith focused on planned activities and promoted the idea that inventions are the outcomes of curiosity in human minds. Inventions facilitate work to be performed more efficiently and permit production at lower labor cost. This theory mainly focused on physical capital (Zhang & Xiaofeng, 2023).

2.2.4.2 Schumpeter's Theory of Innovation

Classical economists excessively highlighted physical capital while revisiting the role of innovation in economic theory and in the process of diversification for production and exports (Schumpeter & Backhaus, 2003). Hereafter, the role played by intellect and skills was also incorporated in economic theory (Schumpeter & Backhaus, 2003). The skills play their role while incorporating innovations. So, innovation becomes the determinant for any change in economy which may be portrayed through R&D expenditures or addition of patents (Sweet & Eterovic, 2019).

Economy cannot remain in the state of equilibrium for a longer period of time but remains in the transitional phase at different equilibriums. Hicks adapted the non-equilibrium phase of economy to discuss economic growth (Hicks, 1981). It reinforces the Schumpeterian idea which incorporates innovation as an essential element for disequilibrium phenomenon without which realization of economic development does not occur.

The economic system which is generally represented by number of sectors, the output of one sector becomes the input of another sector called Leontief input output model (Leontief, 1953). This model implies for short run changes in the economy because it analyses structural change of quantitative nature without predicting the emergence of new sectors qualitatively different from already existing sectors. So, long run economic

development requires emergence of multisector model of economic growth (Pasinetti, 1993). Pasinetti portrayed the growth model in which population grows with a steady percentage taking consumer preferences constant.

Furthermore, it was analyzed that productivity and demand coefficient differed among different sectors which entails that structural change contributes to economic growth. Eventually, improvement in productivity, growing output variety encompassed the phenomenon of structural change. The technological change leads to the emergence of new sectors so the unemployed labor force can be reabsorbed which can pave the way to long term continuation of economic growth.

Bearing in mind the facts, Schumpeter believed that healthy economy does not remain in the state of equilibrium but it is the one that remain at disequilibrium due to technological innovation. Schumpeter is also known for business cycles theory and he also believed that ups and downs in the economy are the cause of innovations.

2.2.5 Theories of Economic Growth

2.2.5.1 Exports led Growth

Neo-classical economists strongly suggest that external sector/exports contribute positively and significantly to the growth of an economy and its development. The impact of export upon growth is a supply side phenomenon of Neo-classical approach (Feder, 1983). The model can be expressed in equation form to show that growth in exports enhances national income of an economy.

$$\frac{\dot{Y}}{Y} = \alpha \left(\frac{\dot{I}}{Y} \right) + \beta \left(\frac{\dot{L}}{L} \right) + \gamma \left(\frac{\dot{X}}{X} \right) \left(\frac{X}{Y} \right) \quad \text{Equation 2.1}$$

Where, Y, I, L and X are national income, investment, labor and exports respectively. The model shows that $EG \left(\frac{\dot{Y}}{Y} \right)$ is directly proportional to proportion of investment in national income $\left(\frac{I}{Y} \right)$, growth of labour force $\left(\frac{\dot{L}}{L} \right)$, exports growth $\left(\frac{\dot{X}}{X} \right)$ and the proportion of exports in national income $\left(\frac{X}{Y} \right)$. This model makes a fundamental underlying assumption of this model is that productivity in export sector is higher than non-export sector of an economy. This supplements growth in non-export sector through positive externalities at local or domestic level. Exporting firms become the part of international competitiveness as foreign firms compete at international level and keep trying to enhance quality of their product for achieving economies of scale. The underlying factors further translate into higher productivity and economic growth (Odhiambo, 2022).

2.2.5.2 Endogenous Growth Theory

The Endogenous growth theory centrally rests upon the technological progress in the economy (Lucas Jr, 1988; Romer, 1990). It further elaborates various growth options attainable in the form of physical capital and knowledge capital which can be translated into economic growth. Technology and knowledge are considered as economic goods while defining the long-term determinants of any developmental phenomenon in economics especially sustained growth. Technological knowledge is a responsible key factor to increase employment. These factors combine to increase economic growth.

Research and Development (R&D) is also another crucially responsible factor to pave the way for innovation and to accumulate further novelty in technological knowledge. In the mid-1980s examination on economic growth practiced a boom and the technical progress showed further endogeneity with the result from investment in research and development (Grossman & Helpman, 1994). Research and development give rise new type

of capital goods which brings forth a subsequent introduction of new sectors, making new capital goods different from previous. So, the diversification occurs both at inter and intra sectoral level. Finally, output variety increases with the due course of uplift in economic development.

Historically the high equilibrium productivity growth was also discussed in view of technical progress function indicating the contribution of more modern machines in productivity growth (Kaldor, 1957). The spillover effects are observed through investment in human capital which depends upon workers' education (Lucas Jr, 1988). Learning by doing efficiency is linked with the processes in which workers are engaged and economy is getting productivity gains. Thus, economy is gaining diversification in the production of goods which in turn affect the human capital accumulation (Akkas & Altiparmak, 2023). Furthermore, host country specific characteristics were highlighted in this theory and focus was made on effective management and proper channelizing of foreign resources to boost economic growth.

2.3 Empirical Review

Before going in the details for relating export diversification with sustainable economic front or vice versa the evaluation of literature for determinants of underlying phenomenon is required. External resources are the important injections in an economy and act as crutches to boost the structural transformation which can also be observed through diversified export base.

Export diversification is gauged in numerous ways to manifest the explanatory power of different measures and dimensions of it. To put in context, export diversification with its drivers and determinants is discussed in literature in a variety of ways. The major

underlying determinants of export diversification are grouped into geographical determinants, structural variables, economic policy variables, capital related variables, trade policy variables and innovations related variables.

The purpose of empirical review is fulfilled by systematic literature review (SLR). Systematic review articles can be generally classified as domain-based, theory-based and method-based (Paul & Criado, 2020). Domain-based reviews encompasses structured review that focuses on determinants of the outcome variable, broadly used methods and major theories (Mishra et al., 2021; Paul & Singh, 2017; Rebouças & Soares, 2021; Rosado-Serrano et al., 2018). Framework-based review contribute to advancing and developing theory (Lim et al., 2021; Paul & Benito, 2018). Theory-based review examines existing theories related to the research topic (Paul & Rosado-Serrano, 2019; Vrontis et al., 2020). The review papers have the purpose to develop a model or framework (Christofi et al., 2021; Christofi et al., 2019; Paul, 2020; Paul & Mas, 2020).

Multiple steps are involved in carrying out this SLR (Thorpe et al., 2005). The step wise procedure is presented in Appendix A2.

- Step I includes the definition of search and selection keys in the database.
- Step II relies on searching relevant papers in the database.
- Step III involves reading and the selection of titles and abstracts.
- Step IV specifies the selection of full papers after a careful reading. Lastly.
- Step V analyses the findings from selected papers.

The distribution of selected papers for review is reported with journals and authors in appendix A3. Scopus database was used to download scholarly articles related to export diversification. The keywords used include “*export diversification, export upgrading, extensive and intensive margins, export variety, export sophistication*”. The papers

considered in this review are indexed in Scopus and are Papers published in the English language and indexed in Scopus are considered. Book reviews, conference proceedings and working papers are not considered in this review. 79 research papers are reviewed to discuss and assess the drivers and determinants of Di.

Appendix A4 portrays an overview of the determinants of export diversification studied in the relevant literature and their impact assessment is also reported.

2.3.1 Geographical Factors and Export Diversification

Geographical factors significantly determine export diversification. Various studies on these factors are conducted unilaterally and the effect was estimated on the number of exported products at the extensive margin of trade. A study in developing countries marks a notable exception in investigating determinants of export diversification using a bilateral Theil index (Regolo, 2013). Typical determinants are geographical factors of classical gravity model such as distance to markets and trading partners or the countries being landlocked. These factors are expected to raise trade costs and increases export concentration (Dutt et al., 2013; Feenstra & Kee, 2008). On the other hand, a few factors facilitate trade which are common cultural factors, common language and sharing a common border reduces export concentration (Amighini & Sanfilippo, 2014; Beverelli et al., 2015; Regolo, 2013). Economic remoteness (distance weighted by GDP) and variety in differences of factor endowments among trading partners have an increasing effect on diversification (Agosin et al., 2012; Regolo, 2013).

2.3.2 Market Size and Export Diversification

The second group of variables are related to market size proxy through level of development and population size. The most discussed relationship is between development (usually measured by GDP per capita) and export diversification. Overall, GDP per capita influences export diversification positively in developed and developing countries (Parteka & Tamberi, 2013). Similarly, more populated countries tend to have larger markets and experience more diversified export structures (Lectard & Rougier, 2018). Though population size and growth can be influenced by numerous policy measures yet the impact may be realized in longer term. Many developing countries are resource scarce and earn resource rent from natural resources. Thus, resource endowment is also found to be relevant for export diversification. Countries with higher rents from natural resources are more concentrated in their product baskets (Bahar & Santos, 2018). Overall, these features significantly hinder export diversification in African countries. The African continent is fractionalized and distances to markets are large, and many countries depend on commodity exports by relying upon their natural resources.

2.3.3 Structural Factors and Export Diversification

The third group of drivers for export diversification encompasses structural factors. The foremost structural factor is productivity that positively influences export diversification and vice versa (Cieřlik & Parteka, 2021). Lower market entry cost and lesser production cost increases export diversification (Dennis & Shepherd, 2011). Moreover, better infrastructure has positive influence on export diversification in developing countries (Ramanayake & Lee, 2015). A handful of studies portrayed weaker influence of infrastructure on export diversification (Elhiraika & Mbate, 2014). Further of it, gross capital formation is an important element to influence investment and exports scheme of a

country. However, mixed results are found for gross capital formation to influence export diversification (Elhiraika & Mbate, 2014; Ul-Haq et al., 2025). Production and export structure also shape the export basket in a country. A higher share of manufacturing activities in the production structure of an economy is favorable for increasing production and export variety (Fonchamnyo & Akame, 2017; Tadesse & Fayissa, 2008). While, a higher share of agricultural production hinders diversification (Fonchamnyo & Akame, 2017; Parteka & Tamberi, 2013). Many countries are structurally transforming to increase share of services trade and resultantly increasing export diversification (Gnangnon, 2021b; Sawadogo et al., 2024).

2.3.4 Financial Capital and Export Diversification

Furthermore, forth group of variables include financial capital related variables which include domestic financial development and external capital resources. Financial development is measured through private sector credit to GDP ratio and is weakly influencing export diversification in developing countries (Nieminen, 2020; Tadesse & Fayissa, 2008). Foreign and external capital boosts exports in several ways including addition of capital for production of export, upgrading existing products for exports, facilitating transfer of technologies and providing access to sell exports. A few studies in the literature of economics could elaborate the partial view of export diversification depending upon external resources. The evidence on foreign direct investment (FDI) as a relevant determinant of export diversification is mixed and rather suggests no significant effect (Amighini & Sanfilippo, 2014). However a few studies painted the picture for positive influence of FDI on export diversification (Ahmad et al., 2018). Remittances received could influence export diversification positively in developing countries (Saadi, 2020). Meanwhile, the evidence on Aid for Trade (AfT) as a determinant is mixed. Foreign Aid

may improves export diversification by improving productive capacity. Meanwhile, the evidence on Aid for Trade (AfT) disbursements as a determinant is mixed. Positive impact of foreign aid is found with a larger effect on the extensive margin than on the intensive margin (Gnangnon, 2019a; Munemo, 2011; Nathoo et al., 2021). On the other hand, no significant impact is also seen as most aid is primarily invested in already well-performing activities (Fonchamnyo & Akame, 2017; Masunda, 2020; Osakwe, 2007). Another external resources is external debt which may influence export diversification in developing countries but a weaker evidence is found (Liaqat, 2019).

2.3.5 Policy and Export Diversification

Lastly, policy related drivers are investigated which include institutional settings, product standards, exchange rate, interest rate, inflation and innovations related variables. Institutional settings include governance related variables. Rule of law, institutional quality and control of corruption could increase export diversification in developing countries (Omgbu, 2014). Lower Product standard may hinder export diversification. Harmonized system has mitigated the impact of this variable yet its importance is highlighted in a study (Shepherd, 2015). Exchange rate seems to be a policy variable while studying export diversification. A weaker exchange rate increases export variety and makes exports more competitive at global level. However, multiple studies show that an exchange rate misalignment and its volatility has weaker impact on export diversification (Goya, 2020; Sekkat, 2016). On the other hand, higher prices and inflation hinder diversification (Dennis & Shepherd, 2011). Innovation related variables have multiple proxies which include deviation from comparative advantage measured through TCI and R&D expenditures and patents. The investigated studies did not provide evidence for research and development (R&D) to be significant and robust determinants of export diversification (Ul-Haq et al.,

2025; Young, 2023). TCL provides a maneuvering scheme for production base in the country. It makes the product diverts towards manufacturing goods and reshapes the entire production cum export diversification. It has a mix evidence of influencing export diversification in developing countries (Lectard & Rougier, 2018; Masunda, 2020; Regolo, 2013). Patents also influence the export basket and positively contribute in making it diversified (Sweet & Eterovic, 2019).

2.4 Methodological Trends

The methodologies employed in the prior studies are compiled in Appendix A5. It provides that single economy and panel data studies have been widely conducted. Many studies used instrumental variables methods which include 2SLS, 3SLS and SYSTEM GMM to address determinants of export diversification (Agosin et al., 2012; Bahar & Santos, 2018; Cadot et al., 2013; Cieřlik & Parteka, 2021; Dennis & Shepherd, 2011; Elhiraika & Mbate, 2014; Fosu & Abass, 2020; Gnangnon, 2021b; Lectard & Rougier, 2018; Mania & Rieber, 2019; Masunda, 2020; Mosley, 2018; Munemo, 2011; Nicita & Rollo, 2015; Omgba, 2014; Saadi, 2020; Sawadogo et al., 2024; Shakib et al., 2023; Shepherd, 2015).

Since export diversification has been used as an outcome variable, hence, the direction of causality between the variables is required to be analyzed and their cointegration needs to be examined. A few previous studies used these methodologies (Gözgör & Can, 2017; Ngassam, 2023; Sheng & Yang, 2016; Young, 2023). Gravity equation is also used by a few studies (Amighini & Sanfilippo, 2014; Caselli et al., 2020; Mau, 2016; Persson, 2013). Multiple regression, logistic regression and the multinomial logit (MNL) method of analysis have also been employed in the literature (Fonchamnyo & Akame, 2017).

Historically, the last three decades well portrayed the connection between growth and trade. The idea of trade growth nexus postulates the transitional phases. It originated from traditional trade theories particularly emphasizing upon export concentration backed by comparative advantage and factor endowment in countries. The original nexus suffered the criticism when concentration on primary goods by developing countries hindered growth and caused terms of trade to decline with acceleration of instability in income. To prevent in impediments in trade growth nexus, the countries start focusing on export composition under two effects ‘portfolio effect’ and ‘knowledge spillover effects.

However, many developing countries export similar products. Any meager increase in price of the product in one country hinders the product to compete at international level as the substitute of product will become readily available by the rivals. The very mechanism is an outcome of low-income elasticity of primary product at international level causing low growth spillovers to other sectors. Consequently, diversification in export basket become the prime target of policy orientation in developing countries as a common goal under portfolio effect.

The other mechanism which advocates positive impact of export diversification on economic scenario is dynamic knowledge spillover effects. This effect encounters novelty in production techniques, management and marketing practices. New production techniques of exporting products pervade to other industries in supplementary sectors via knowledge spillovers (Al-Marhubi, 2000). The externalities of knowledge spillovers cause better productivity gains through labor training and improvement in technological knowledge via international competitiveness. The desirable success of both effects propels optimal resource allocation in the country and improves economy (Hameed et al., 2012). Moreover, these

effects stimulate total factor productivity, create job opportunities and raises demand for intermediate products.

2.5 Conceptual Framework

Primitive and novel trade theories which include views of Mercantalists, Ricardian and Heckscherohlin respectively reveal that only few countries developed quickly by relying solely on exports of primary products. It is only because the diversified exports structure mitigates the vulnerability caused by demand shocks and price swings. The diversification in exports basket creates greater market opportunities at regional and global level. Notwithstanding, heavy dependence on a narrow line of primary products introduces the country with unfavorable supply side features of primary products. Also, commanding share of exports by one or two products make the country steadily exposed to external shocks. So, it is imperative to impede or at least mitigate such shocks for stabilizing export earnings which is clearly possible through variety in exports basket.

In recent years, developing countries are imitating to diversify vertically as they are shifting their production and exports structure from primary commodities to manufactured goods. Many developing countries have begun to process commodities which they used to export in raw form previously. The processing of commodities is in the form of semi-finished and in some cases in finished products.

Diversification in exports stabilizes export earnings against price volatility in the international market and drives economic growth through technology spillovers in the developing countries. The spillover effects of diversified export bundle benefit the other sectors of the economy (Handoyo & Ibrahim, 2021; Lederman & Maloney, 2012). Globally the countries have adopted export promotion policies based on structural transformation, for

which exports diversification is the base. The U-shaped relationship between per capita income and the degree of production concentration confirmed by an empirical study (Imbs & Wacziarg, 2003) which also set a base for observing quadratic relationship between diversification in exports and level of development (Cadot et al., 2013). Theoretically U-shaped relationship is the prominent feature of developed countries but this study is focusing middle income countries so the linear relationship may hold for sample countries.

On the theoretical grounds the debate upon underlying phenomenon of diversification in exports initiated by Krugman (Krugman, 1979), the pioneer in new theories of international trade considered the increasing returns to scale a turning point towards growth. The core strategies of development economics were also added in the domain of trade and development (Prebisch, 1962; Singer, 1950). The later argued that specialization based traditional international trade theories eventually lead developing countries towards ‘immesering’ growth. According to these economists the variety in economic structure of countries produce commercial exchange configuration among countries.

This configuration originates only because of difference in export bundle of industrial countries exporting high value-added products while the developing countries are mainly focusing on the exports of primary or labor-intensive goods, characterizing low-income elasticity, volatility in export earnings and terms of trade deterioration. The above-mentioned vulnerabilities can be condemned through diversification in export bundle. So the structural change pushed by change in composition of exports remain conducive for economic take off and essential technological spillovers remain inevitable to meet economic uplift (Botta, 2010; Cimoli et al., 2010).

Therefore, newly industrialized countries of Asia and some other developing countries introduced the mechanism of distortions into the comparative advantages theory of international trade specifically based on the specialization mechanism. The mainstream of distortions was realized through comparative advantage defying strategy, which conceptually changed the export structure of developing countries. The conceptual change in the export structure of developing countries need to address the dynamics and drivers of export diversification which mainly involve external resources FDI, REM, AID and EXD and innovation spillovers.

The models are also presented in flow charts:

Flow chart for Model 1 (Objective 1)

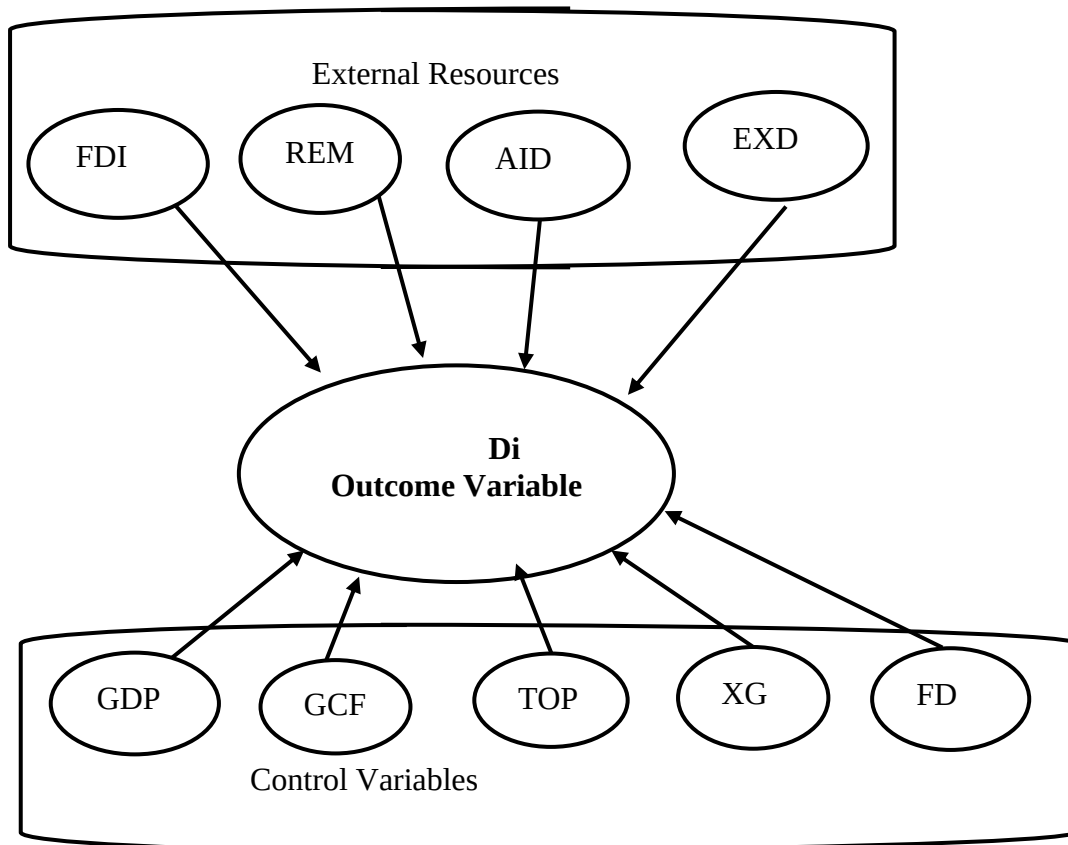


Figure 2.1: Flow chart A of Model 1.

Source: Author's compilation.

Flow chart for Model 1 (Objective 2)

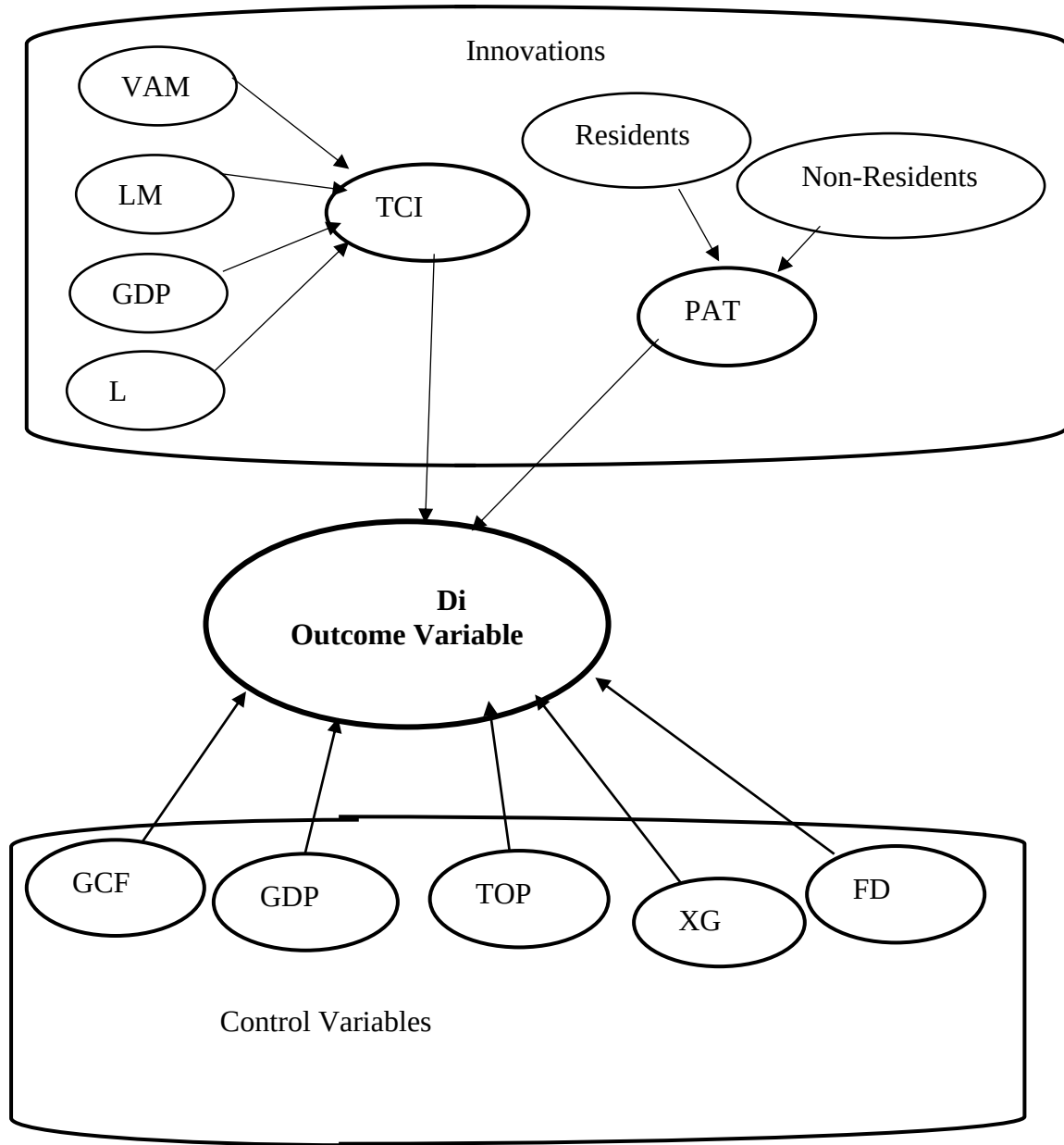


Figure 2.2: Flow chart B of Model 1.

Source: Author's compilation.

The selected external resources trigger the phenomenon to diversify exports whereas the fence of Dutch disease can also be expected from them. The innovation strategies are multi perspective involving entrepreneurial, organizational and product innovations. PAT as proxy of innovation is adapted in the framework of study whereas the plausible impact of

technological rearrangement captured through TCI is also been considered to test the ‘new trade theory’.

Bearing in mind, this thesis closely links ‘new trade theory’ and also introduces diversification in exports a vital factor for middle income developing countries which perpetuate for sustained economic growth. The capital is propelled to be the prime factor of heterogeneity in productivity gains of developing nations. Evidently, the firms in developing countries strive to operate under reduced trade costs and monopolistically competitive market structure which enhances product differentiation. However, the selection effects work which allocates the major market share to suitably more productive firms in a few developing countries, letting their productivity to increase at aggregate level.

The consensus is reached among economists for the notion that diversification in exports should take a prime importance in the literature of international trade (Aditya & Acharyya, 2013; Agosin, 2007; Handoyo & Ibrahim, 2021; Naudé & Rossouw, 2011; Sahoo & Dash, 2022). Despite this fact a little economic policy controversy arises in the arena of development economics and divides neo structural economists from mainstream economists. The former compels the active state intervention for diversification in exports to be realized whereas the latter confines the phenomenon to reduction in trade cost plausibly attainable through dynamic spillovers with the involvement of sustained growth. The active export led growth portrays the pragmatic influence of exports growth on economic growth. It will proliferate the pervasive effects of capability approach and taboos the negative externalities.

A nexus of diversification in exports and complexity defines the complexity of productive structure of a country (Felipe et al., 2012; Koch, 2021). Additionally, a mapping tool was proposed which helps to visualize the networks between goods. This network infers

the similarity of capabilities required to produce the export basket called ‘product space’. Some recent studies better performed in assessing the relationship between export diversification and economic growth (Mania & Rieber, 2019). Vertical fragmentation in the production process is a primary character of global economy in this era which allows the country, specialize in specific task in the commodity’s production process. It would be apt to say, a developing country does not doom to specialize in the production of particular good but adds in the production chain or in a specific segment of a production process.

Indeed, developing countries may be trapped in the low complexity labor intensive tasks as a result of enforced specialization in labor intensive arrangements accompanied by high import content. It is an apprehension that exports diversification which is the reflection of partial industrialization in the economy, may lock the economy into an ‘under industrialization trap’ which might be a fundamental of some developing countries.

Flow chart for Model 2 (Objective 3)

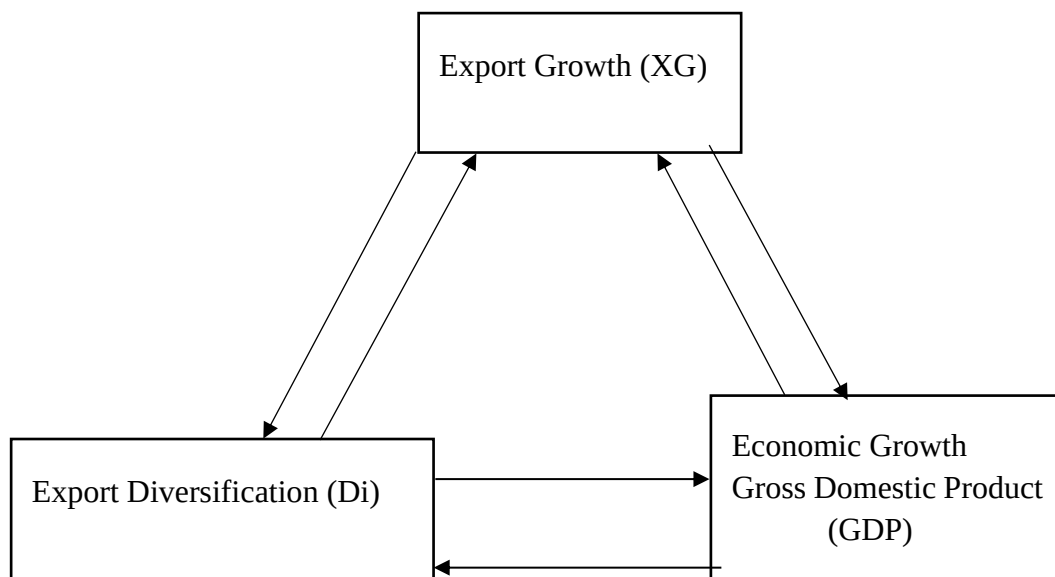


Figure 2.3: Flow Chart of Model 2.

Source: Author’s compilation.

Further to it, the triangle of export diversification and sustained growth aspects retrieves the traditional trade theory but also blends traditional and new trade theories. Diversification in exports, its multiple drivers and economic growth in developing countries give a partial view of picture. Testing this sustainable aspect of growth with ‘new trade theory’ can shed light on causality relationship among of export diversification, export growth and economic growth which otherwise would remain unnoticed.

The causality relationship will put further interrogations on the underlying concept of the study. The conceptual arrangements of this research indicate the achievement of sustainability. It is pertinent to add a window in the conceptual framework of this study that export growth is the path to achieve sustained economic growth.

2.6 Research Gap

Summing up the above literature for the nexus among diversification in exports, export growth, economic growth, innovations and key external capital, this research presumes a concrete consensus in the existing literature for middle-income countries. The alarming issue arises in middle income developing economies that diversification in exports is not conveniently achievable. Therefore, this research also aims to analyze the causality relationship among export growth, export diversification and economic growth. Despite assessing the impact of economic and policy drivers on export diversification in the context of middle-income developing countries divided into two panels namely UMI and LMI consisting of 29 and 36 countries in each sub sample respectively.

Getting focused on the above discussion, it is argued that there are multi research gaps the present study wishes to address:

Firstly, to the author's best knowledge, literature does not reveal any study which investigates the collective impact of four external resources i.e., FDI, REM, AID and EXD on export diversification. Although the external resource and export diversification relationship has been addressed in the literature but most of the researchers incorporated one or two factors and the phenomenon remained less explored for middle income countries.

Secondly, pre-existing studies in the literature did not consider external resources, innovations and export diversification nexus for particular focus on developing especially middle-income countries. Although the relationship between innovations and export diversification is observed through different proxies in the literature but the innovation strategies captured through TCI and PAT cumulatively remained less investigated by any previous study. Based on this evidence, the relationship of these variables to enhance export diversification for developing countries with such a large sample is a novelty of this research work.

Thirdly, the developmental context of international trade in the form of pronounced causality among export growth, market size and export diversification is also the prominent feature of this study.

Finally, the methodological aspect of the study is unique. It will adopt novel estimation methods for a balanced panel which has been less observed in the previous studies. This study will advance the research towards developmental aspect of international trade related research.

Hence, the contributions of present research study in the paradigm of international trade is multifold towards existing literature specifically with a large sample of developing countries further sliced into two groups i.e. UMI and LMI.

CHAPTER 3

METHODOLOGY

3.1 Introduction

The crucial step of any research study is to opt the suitable, viable and most appropriate methodology that permits the researcher to perform the research work in a systematic and purposeful way. This section contains description of variables, the data sources, model building, and elaboration of econometric techniques against each objective which aids to perform the empirical analysis.

3.2 Data Description

To test the hypotheses against objective 1, 2 and 3 (mentioned in chapter-1) through empirical analysis, secondary data of 65 developing economies is collected, which specifically include 29 UMI countries and 36 LMI countries. The investigation of empirical results is based on the annual data ranged over twenty-seven years spanning from 1995-2021. The data for variables of interest is extracted from multiple databases including world development indicator (WDI), UNCOMTRADE, UNCTAD etc.

The population for this study is “65 middle income developing nations”. Moreover, the outcome variable is $HHI=Di$ (export diversification) and the major determinants are inflow of four major external resources and two proxies of innovations. A few control variables are also employed. The middle-income countries are further divided into two groups. The pattern of aforementioned core variables of this study are graphically portrayed in chapter 1 (Figure 1.1 through 1.9).

All the variables have economic and policy implications from global, regional and individual country perspective. The countries under study can formulate their trade policy according to the results which will be provided after estimation. Furthermore, these trade policy formulations will also help these economies to hammer out their industrial, commercial and other economic policies. Additionally, the multilateral trade relations basing upon dynamic impacts of external resources (like FDI, REM, AID and EXD) and innovation strategies (TCI & PAT) will catalyze the spillover effects which will be presumably affecting and being affected by the sustenance in both groups of countries i.e. UMI and LMI.

3.3 Theoretical Framework and Description of Variables

This study is an endeavor to identify the impact of external resources, (FDI, REM, AID & EXD) along with innovation strategies (TCI & PAT) on $Di = HHI$. So far, the phenomenon to examine the causality relationship among Di , XG and GDP of selected developing economies is also observed. This section illustrates the selected variables of the study, their description, measurements, sources and notations. The variables are selected on the basis of less explored research area, highlighted in systematic literature review (Chapter 2). The theoretical underpinnings allow to test the ‘new trade theory’. The developing countries portray lesser diversification trend so the traditional trade theory for export led growth hypothesis is also tested. Economic growth remains the pivotal element to underscore the importance of Di .

3.3.1 Dependent variables

The core dependent variables in this study for objectives 1 & 2 is Di and further analysis for causality against objective 3 include export diversification (Di), Gross Domestic Product (GDP) per capita and export growth (XG) rate.

Export Diversification (Di=HHI)

The primary dependent variable (DV) of the study is export diversification proxy through Herfindahl-Hirschman Index (HHI) which is measured by SITC. Formally data for this variable is taken from UN COMTRADE database. It ranges from 0 to 1. The convergence toward 0 shows higher diversification and vice versa.

$$Di = HHI = \frac{\sqrt{\sum_{i=1}^n (x_i/X)^2} - \sqrt{1/n}}{1 - \sqrt{1/n}} \quad \text{Equation 3.1}$$

x_i represents the contribution of sector or product in exports. X represents total exports of economy and n shows total number of sectors or product groups. This variable is multiplied by 100 to reduce the skewness in data and it is adapted from a previous study (Aditya & Acharyya, 2013).

Export Growth (XG)

Another dependent variable is export growth (XG). One of the dependent variables (endogenous) used in PVAR (model-2) is export growth, it describes annual % growth rate for exported goods and services. It is also used as control variable. It is adopted from a previous study (Martincus & Carballo, 2008). It is primitive and relates to the traditional

trade theory but it is still valid to examine in the context of new trade theory. The data is collected from WDI 2022.

Gross Domestic Product (GDP)

It represents the market size of an economy and describes itself as a main variable for the studies related to international trade specifically exports. It is used by previous studies in the literature of economics (Feenstra & Kee, 2008; Feenstra & Ma, 2014; Felbermayr & Kohler, 2010; Lectard & Rougier, 2018; Mania, 2020).

Table 3.1: Description of Variables

Variable	Variable Description	Definition	Units	Source
Di=HHI	Export Diversification	Herfindahl-Hirschman Index	Normalized between 0 and 1	UNCTAD 2022
GDP	GDP per capita	Gross Domestic Product	Constant US Dollars	WDI 2022
PAT	Patents	Filed by residents, non-residents	Number	WDI 2022
GDP	Gross Domestic Product	Total value added of Gross Domestic Product	Constant US Dollars	WDI 2022
VAM	Manufacturing value added	Industries belonging to ISIC division 15-37	Current US Dollars	WDI 2022
L	Labor force	Total working labor above age 15	Number	WDI 2022
Lm	Labor Force in Manufacturing	Number of Labor involved in manufacturing	Number	WDI 2022
TOP	Trade Openness	Total Exports plus Imports as ratio of GDP	Index	WDI 2022
FDI	Foreign direct investment	Net inflows of investment	% of GDP	WDI 2022

Table 3.1 Continued

AID	Foreign aid	Net Official development assistance (ODA) received	% of GDP	WDI 2022
REM	Remittances	Personal Remittances received	% of GDP	WDI 2022
EXD	External debt	Total external debt acquired	% of GDP	WDI 2022
XG	Export Growth	Exports of goods and services	(annual growth) %	WDI 2022
FD	Financial Development	Depth, access and efficiency	Index	IMF Data 2022
GCF	Gross Capital Formation	Aggregate of gross additions to fixed assets	% of GDP	WDI 2021

Source: Author's compilation.

3.3.2 Independent variables

External resource inflow are independent variables (IVs) of the study which are measured by: Foreign Direct Investment (FDI), Remittances (REM), Foreign Aid (AID) and External Debt (EXD). Furthermore, innovation strategies are measured by Technology Choice Index (TCI) and Patents (PAT). The variables like per capita Gross Domestic Product (GDP), Financial Development Index (FD), Gross Capital Formation (GCF) and Trade Openness (TOP) are control variables. The aspect of sustenance is measured by Export Growth (XG) and is also used as control variable.

Foreign Direct Investment (FDI)

Foreign Direct Investment (FDI) refers to the net influxes of investment to attain a long-term management interest in the host economy. It sums the reinvestment of incomes, equity capital, other long run and short run capital depicted in the Balance of Payment (BOP). It is represented as net inflows (new investment influxes minus disinvestment). This

study measures FDI as percentage of GDP. A few previous studies also used it as a determinant of export diversification (Jana et al., 2020; Megbowon et al., 2019; Zhou, 2020).

Foreign Aid (AID)

Foreign Aid shows net Official Development Assistance (ODA) which comprises of disbursing loans given on concessional terms and grants by certified agencies of the affiliates by multifaceted institutes to encourage economic development and well-being in economies. This study measures foreign aid as percentage of GDP. A few other studies also used it for the determination of export diversification (Gnangnon, 2019a; Munemo, 2011).

Personal Remittances (REM)

Personal Remittances (REM) refers to personal transfers and recompense of workers. Personal transfers comprise all transfers in cash received by resident households from non-resident households. Hence, it includes all current transfers among resident and nonresident individuals of a country. Compensation of workers may consist of seasonal income, and other short-term employees who are working in a country where they are not resident. This study measures remittances as percentage of GDP. A handful of studies used this variable as the determinant of export diversification (Ahmed et al., 2021; Mamun & Kabir, 2023; Saadi, 2020).

External Debt (EXD)

External Debt is the total debt owed to foreigners returnable in currency, goods, or services. It is the summation of government and publicly assured long run debt, utilization of IMF credit along with short run debt, which is comprised of all debt containing an annual original maturity or less along with interest on long-term debt. The Data for this variable is

expressed as percentage of GDP. This variable is mostly used in the studies related to economic growth and economic transformation (Afzal et al., 2024; Qureshi & Liaqat, 2020).

Technology Choice Index (TCI)

This index mainly relies upon value added manufacturing. Although is always appealing to follow comparative advantage as it spurs growth. Accordingly, the development strategy intuitively the endowment structure, is indeed difficult to capture whether the development strategy follows the CAD or CAF category and the challenge is resolved with the use of proposed indicator TCI. This variable is used as the determinant of economic transformation by previous studies (Bruno et al., 2015; Mania & Rieber, 2019).

$$TCI_{it} = \frac{VAM_{it}/LM_{it}}{GDP_{it}/L_{it}} \quad \text{Equation 3.2}$$

Where VAM_{it} is the value addition of manufacturing industries of country i at time t ,

LM_{it} is the labor in the manufacturing industry of country i at time t ,

GDP_{it} is the total value added of country i at time t and

L_{it} is the total labour force of country i at time t

A higher value of TCI indicates CAD strategy by the country as it shows investment in capital intensive manufacturing.

Patents (PAT)

Patents per capita secured in a given year which is a predictor of technological innovation is a proxy for innovation strategies. It connects local innovation with the process of internationalization. Patents are used as an indicator of innovative schemes in an economy (Oliveira et al., 2020; Sweet & Eterovic, 2019; Ul-Haq et al., 2025).

Gross Capital Formation (GCF)

This variable is used as a proxy of capital and infrastructure of an economy. It is utilized by a few studies to determine the export diversification (Elhiraika & Mbate, 2014; Fonchamnyo & Akame, 2017; Ramanayake & Lee, 2015).

Financial Development Index (FD)

Empirical evidence suggests that financial development in the country can underscore its key importance in broadening the export basket. IMF database constructed a comprehensive index by linking and merging the depth, access and efficiency of financial institutions in a country. Many studies have used this measure over the other measures of financial development (Wang et al., 2025; Zhang et al., 2024).

Trade Openness (TOP)

Trade openness (TOP) is also used to comprehensively portray the extent of openness of the economy. It is also used in few other studies (Millogo et al., 2024; Wani, 2024; Yusuf et al., 2024).

3.4 Empirical Models of the Study and Preliminary Tests

Present study adopts multiple regression hierarchical model set for inspecting the long run effects of external resources, and innovation practices on export diversification aided with other control variables. An additional endeavor of exploring and analyzing the causality among export diversification, export growth and economic growth is also made.

Model 1: (Objectives 1 & 2)

The general form of model is as under:

$$D_{it} = \alpha_0 + \alpha_1 X_{it} + \varepsilon_{it} \quad \text{Equation 3.3}$$

Where D_{it} is the dependent variable and X_{it} represents independent variables and ε_{it} is the error term.

The specific models for external capital resource and innovations are given below:

$$D_{it} = \alpha_0 + \alpha_1 XCR_{it} + \alpha_2 FD_{it} + \alpha_3 GCF_{it} + \alpha_5 GDP_{it} + \alpha_4 TOP_{it} + \alpha_6 XG_{it} + \varepsilon_{it} \quad \text{Equation 3.4}$$

XCR_{it} represents external capital resources (FDI, REM, AID and EXD)

$$D_{it} = \alpha_0 + \alpha_1 INN_{it} + \alpha_2 FD_{it} + \alpha_3 GCF_{it} + \alpha_5 GDP_{it} + \alpha_4 TOP_{it} + \alpha_6 XG_{it} + \varepsilon_{it} \quad \text{Equation 3.5}$$

INN_{it} represents innovation strategies (TCI and PAT)

Where $i = 1, \dots, 65$ (further divided in sub samples) and $t = 1995, \dots, 2021$

Model 2: (Objective 3)

$$Y_{it} = \beta_1 Y_{it-1} + \beta_2 Y_{it-2} + \dots + \beta_{p-1} Y_{it-p+1} + \beta_p Y_{it-p} + \mu_{it} \quad \text{Equation 3.6}$$

Where $i = 1, \dots, 65$ (further divided in sub samples) and $t = 1995, \dots, 2021$

Where Y_{it} represents all endogenous variables (D_{it} , XG_{it} & GDP_{it})

The study is tilted towards examining the impact of external capital resources and innovation strategies for middle-income countries. It is explicitly discussed in chapter 1 and 2 that middle income countries are putting their efforts to diversify the exports. The trend of

export diversification took its foothold in mid 1990s. So, the time frame for the study spans from 1995 till 2021. Data availability is sometime a constraint in panel data discussion, for this reason sample is restricted to 65 middle-income countries.

Preliminary Tests

The sample is more than 20 in terms of number of years and cross sections, hence the interdependence may remain high among cross sections and alarms the presence of Cross Sectional Dependence (CSD) quite high (Zoundi, 2017).

Cross sectional Dependence

Developing countries are closely interconnected and their economic activities are also alike. Thus, interdependence in countries is possible in multiple ways and the evidence of cross-sectional dependency among them especially in exports cannot be ruled out. Cross correlation occurs quite frequently, possibly due to economic and policy, linkage omitted common factors and spatial spillover effects (Pesaran, 2006, 2021). It is vital to confirm the presence of CSD in panel data analysis to dwell further for knowing the stationary properties of data series. It helps in deciding to employ either first generation or second generation unit root tests. To fulfil the purpose various CSD tests which include Pesaran CD test, Breusch Pagan LM test, Pesaran scaled LM test and Bias corrected Scale LM test are applied (Baltagi et al., 2012; Breusch & Pagan, 1980; Pesaran, 2021). In the presence of CSD, the size properties of data do not allow first generation unit root tests (Banerjee et al., 2001).

In this case second generation unit root is more suitable and CIPS is applied (Pesaran, 2007). The cross-sectional averages are taken in it which are shown below.

$$CIPS = \frac{1}{N} \sum_{i=1}^N ti(N, T) \quad \text{Equation 3.7}$$

The CIPS is gaining popularity in literature of economics because it deals with CSD and heterogeneity.

3.5 Methods to be Used / Estimation Techniques

3.5.1 Estimation Technique for Model 1

Cross Sectional- Auto Regressive Distributive Lag (CS-ARDL) Model

The link among variables is examined by applying augmented version of traditional panel ARDL-PMG known as CS-ARDL (Chudik & Pesaran, 2015; Pesaran et al., 1999). The CS-ARDL framework includes short run and long run parameters of each variable concerned. This method has few advantages over the other methods which provide mean value of parameter for the outcome variable. Concisely, it provides robust estimates when variables are integrated of order $I(0)$ and $I(1)$, gives accurate estimates in presence of short run and long run CSD, also represents mean group estimation with heterogeneous slope coefficients. The CS-ARDL estimation method rules out estimates of each cross section with cross sectional averages, entailing unobserved common factors and then lags as proxies (Chudik et al., 2017). Moreover, it deals well with weak exogeneity which more specifically occurs due to lagged dependent variable in model. The baseline regression equation for the proposed model is described above in equation 3.3 to 3.5.

Robustness Check

Panel Quantile Regression (PQR)

The varying effects of variables of interest upon various points of conditional distribution of outcome variable motivated many researchers to apply quantile regression. The quantile regression technique provides useful information in the presence of heterogeneous effects which are not provided by mean regression technique. Panel data

quantile regression explicitly provides viable results in case of cross country heterogeneity and the distributional heterogeneity than the mean regression traditional ordinary least Square technique (Aguirre & Ibikunle, 2014; Akram et al., 2020). Introduction to quantile estimation through quantile regression permits the covariates to vary with a non-separable disturbance term.

Many empirical researchers use panel data for observing the heterogeneity in the variables which can better aid the solution or identification of the problem. These researchers also sometimes include fixed effects to calculate the unobserved heterogeneity. The growing popularity of panel quantile regression technique accounts for the inclusion of the additive fixed effect term. However, the inclusion of this term separates the disturbance term into various components by assuming that parameters of interest do not vary with fixed effects. As a result, it changes the interpretation of parameter of potential interest which contrasts with the cross section quantile regression. This study takes into account the non-separable disturbance property by using estimator of within group variation which aids in identification. Finally, the straightforward explanation of τ^{th} quantile of outcome variable capturing the impact of explanatory variables can be made to portray the estimate of quantile treatment effect. So, it gives unique solution for each quantile by covering whole distribution of dependent variable (Alam & Murad, 2020; Alper & Oguz, 2016).

Model 1 for this study provides the new techniques of panel quantile regression (PQR) aiming to get robust estimates for external resources and innovation strategies (Canay, 2011; Machado & Silva, 2019; Powell, 2016). The results for this research can provide policymakers the viable suggestions to hammer out policies for the development of diversified export basket in order to enhance the optimal resource allocation by following new trade theories coupled with external resources management and innovation theories.

This model is using the quantile estimation technique to estimate the distribution of Di_{it} which is an outcome variable for the given values of explanatory variables represented by X_{it} . The fixed effects are allowed to be added in mean panel data regression to aid the identification of within group variations (Gozgor et al., 2020; Lin & Moubarak, 2014). By considering the above-mentioned variables of model (1), panel version of multivariate model is presented in equations 3.3 to 3.5.

Various panel data regression models use additive fixed effects but this research study employs non additive fixed effects coupled with maintaining the non-separable disturbance term. The model is concisely represented to show the mechanism as under:

$$Di_{it} = X'_{it}\beta(U^*_{it}), \quad U^*_{it} \sim U(0,1) \quad \text{Equation 3.8}$$

Where X represents the set of explanatory variables, β is the vector of estimators and U represents the disturbance term.

The $X'_{it}\beta$ (τ th) increases in τ th and U^*_{it} shows proneness for Di_{it} and is a function of multiple disturbance terms (Doksum, 1974).

For making the comparison with other quantile estimations;

Suppose $U^*_{it} = f(\alpha_i, U_{it})$

When $U_{it} \sim U(0,1)$

Let the policy variable change from x_1 to x_2 the quantile function will represent the causal effect of this change on outcome variable Di_{it} by keeping τ th constant.

$$x_2'\beta(\tau th) - x_1'\beta(\tau th) \quad \text{Equation 3.9}$$

Finally, the structural quantile function becomes

$$S_{Di}(\tau th | x) = x'\beta(\tau th) \quad \text{Where } \tau th \in (0,1) \quad \text{Equation 3.10}$$

The above-mentioned standard quantile function can be estimated provided U^* and X are independent, otherwise the above function can be estimated for quantile regression but panel data quantile regression estimation will require condition of fixed effects for estimating above equation.

Several estimation procedures for panel data provide the impact of independent/policy variables on the expected mean of the outcome variable but neglects the impact of independent variables for the entire distribution of outcome variable. Additionally, the conventional regression estimates are also affected by the presence of outlier which can be better understood and recognized with the use of quantile regression analysis and the effect of explanatory variables can be captured upon outcome variable at various stages. Another advantage of this technique is that it mitigates the impact of unobserved heterogeneity in covariates.

These days, panel quantile regression (PQR) techniques are mostly applied in empirical economics and theoretical literature. This technique is a solution to the problem of unorganized heterogeneity and heterogeneous covariates effects. In the model 1 of current study, the panel data quantile regression methodology is applied to investigate the effect of external resources, and innovation strategies on export diversification (Di) at various levels of the conditional distribution of independent variables. This technique particularly divides the conditional distribution of outcome variable in different quantiles, and 50th quantile is

considered as median (Ummalla et al., 2019). Hence, τ th quantile represents the conditional distribution of outcome variable (Di_{it}) with the relevant independent variables (X_{it}), the equation is given below:

$$Q_t\left(\frac{Di_{it}}{X_{it}}\right) = \beta_t + U_t X_{it} + \beta_t \omega_{it} \quad \text{Equation 3.11}$$

Where ω_{it} is the vectors of unobserved variables. The minimization of absolute value of residuals can provide robust estimates for coefficients in Equation 3.11 which can be portrayed as under

$$Q_t(U_t) = \min_u \sum_{i=1}^n [|Di_{it} - U_t X_{it}|] \quad \text{Equation 3.12}$$

$$Q_t(U_t) = \min_u \left[\sum_{i: Di_{it} \geq U_t X_{it}}^n |Di_{it} - U_t X_{it}| + \sum_{i: Di_{it} < U_t X_{it}}^n (1 - \tau) |Di_{it} - U_t X_{it}| \right] \quad \text{Equation 3.13}$$

In the shrinkage methodology the impact of unrecognized factors in fixed effect regression could not be captured while estimating the vector of individual effects (Koenker, 2004). Consequently, the two-step framework for fixed effect panel data quantile regression was introduced (Canay, 2011).

Firstly, expected mean for vector of unobserved variables with their coefficients are estimated for calculating additive fixed effects. Secondly, estimated additive fixed effects are subtracted from the original explained variables and finally, the standard quantile

regression is employed. The empirical literature portrays estimation of panel data quantile regression with additive fixed effects (Canay, 2011; Koenker, 2004; Rosen, 2012). This may prove to difficulties while estimating fixed effects in panel framework.

If it is assumed that α_i is known, the quantile estimator with additive fixed effects will give estimates of outcome distribution and the entire structure of a given model will change.

$$(Di_{it} - \alpha_i)|X_{it} \quad \text{instead of} \quad Di_{it}|X_{it}$$

$(Di_{it} - \alpha_i)$ is undesirable as observations at the top of this distribution may lie at the bottom of Di_{it} . So, the impact of explanatory variable on outcome variable can not be viably captured rather the additive fixed effect quantile model alters the interpretation of standard quantile function and the model becomes.

$$Di_{it} = \alpha_i + X'_{it}\beta(U_{it}) \quad \text{Equation 3.14}$$

In the above model parameters vary i_{th} U_{it} not U_{it}^* which is the actual interest of using the quantile regression function to let the parameters of interest vary on the basis of non-separable disturbance term U_{it}^* . Here α_i is separated with the supposition that parameter of interest vary only with one part of disturbance term so the standard quantile regression function for additive fixed effects become as under

$$S_{Di}(\tau|x, \alpha_i) = \alpha_i + x'\tilde{\beta}\tilde{\tau} \quad \text{Equation 3.15}$$

There are numerous cases when researchers take the interest in knowing the viable impact of policy variable on outcome variable. To overcome this disadvantage, the panel data quantile regression with non-additive fixed effect was introduced. The prominent advantage of this method is that estimating additive fixed effects α_i separately in the underlying model are not required. It provides estimates of the distribution of outcome variable Di_{it} in this model given X_{it} instead of $(Di_{it} - \alpha_i)$ given X_{it} . Henceforth, the consistent point estimates can be provided even in case of small T.

Furthermore, the instrumental quantile regression is developed (Powell, 2016). The model is developed by relying on the conditional restriction with the probability that the outcome variable is lesser than the quantile function is same for all X_{it} and equates with τ . The probability varies by individual and even within individual panel data quantile regression so the model is specified as under:

$$P(Di_{it} \leq X_{it}\beta(\tau)|Z_{it}) = \tau \quad \text{Equation 3.16}$$

From equation 3.15 it is shown parameters are different from previous equation of standard quantile function 3.10, so it is the panel data quantile regression providing point estimates, now the estimators with instrumental variables are $Z_i = (Z_{i1} \dots Z_{iT})$ assumes that explanatory variables are exogenous $Z_i = X_i$ and the original equation $Di_{it} = X'_{it}\beta(U_{it}^*)$ contains U_{it}^* which is functionally related to many disturbance terms so the model becomes $Di_{it} = X'_{it}\beta(\varepsilon_{it}^*)$ and ε^* can be mapped with U^* and the equation becomes

$$E[1(U_{it}^* \leq \tau) - 1(U_{is}^* \leq \tau)|Z_i] = 0 \text{ for all } s, t \quad \text{Equation 3.17}$$

The above equation has a stronger assumption of stationarity $U_{it}^*|Z_i \sim U_{is}^*|Z_i$ and the assumption allows $\varepsilon_{it}^* = \alpha_t + c_t \times \varepsilon_{it}^*$ so for each $\tau \in (0,1)$ the moment conditions become

$$E\{1/2T^2 \sum_t \sum_s (Z_{it} - Z_{is}) [1(Di_{it} \leq X'_{it}\beta(\tau)) - 1(Di_{is} \leq X'_{is}\beta(\tau))]\} = 0 \quad \text{Equation 3.18}$$

$$E\left[1\left(Di_{it} \leq X'_{it}\beta(\tau)\right) - \tau\right] = 0 \quad \text{Equation 3.19}$$

Equation 3.19 shows estimation for comparison of within individual effects and the Di contains a probability of being smaller than quantile function. So

$$E\{1/T \sum_t (Z_{it} - \bar{Z}_i)[1(Di_{it} \leq X'_{it}\beta(\tau))]\} = 0 \quad \text{Equation 3.20}$$

Now equation 3.20 holds with quantile regression and instrumental variable quantile regression. With the addition of instrumental variable quantile regression, it is assumed that

$P(Di_{it} \leq X'_{it}\beta(\tau)) = \tau$ and $P(Di_{it} \leq X_{it}\beta(\tau)|Z_{it}) = \tau$ so the GMM estimation for sample moments is

$$\begin{aligned} \hat{g}(b) &= \frac{1}{N} \sum_{i=1}^N g_i(b) \text{ along with } g_i(b) \\ &= \frac{1}{T} \left\{ \sum_{t=1}^T (Z_{it} - \bar{Z}_i) [1(Di_{it} \leq X'_{it} b)] \right\} \end{aligned} \quad \text{Equation 3.21}$$

When time fixed effects are included the equations 3.20 and 3.21 imply that

$$P(Di_{it} \leq X_{it}\beta(\tau)) = \tau \quad \text{Equation 3.22}$$

Resultantly, the parameter set becomes

$$B = \{b | \tau - \frac{1}{N} < \frac{1}{N} \sum_{i=1}^N 1(Di_{it} \leq X'_{it}b) \leq \tau \quad \text{Equation 3.23}$$

By imposing a constraint on parameter B, its simply means $Di_{it} \leq X'_{it}b$ holds for $100 \tau^{th}$ in each time period.

For some weighting matrix $\hat{B}$. The Markov Chain Monte Carlo (MCMC) method is also applied for estimating the model. Method of moment quantile regression (MMQR) is introduced which is based on the conditional location-scale model (Machado & Silva, 2019). Resultantly, the primary advantages of this technique are its usefulness in models with individual effects and endogenous explanatory variables along with treating the heterogeneity and endogeneity with the incorporation of asymmetric links in the model. Moreover, the residuals are normalized to satisfy the moment conditions and are orthogonal to explanatory variables.

Finally, the empirical analysis for model 1 utilizes the latest methodology of PQR (Canay, 2011; Machado & Silva, 2019; Powell, 2016). Previously, the application of this methodologies is observed in the empirical analysis (Alhassan et al., 2020; Ummalla et al., 2019).

3.5.2 Estimation Technique for Model 2

Panel Vector Auto Regressive (PVAR) Model

This model is used for estimation against objective 3 reported in chapter 1. The specific form of the model is as under:

We use a PVAR model in a given Generalized Method of Moments (GMM) framework (Abrigo & Love, 2016). This method is an extension of traditional model introduced by Sim (Sims, 1980). The VAR framework treats multiple variables as endogenous. Following equation shows PVAR model of order p ;

$$Y_{it} = \beta_1 Y_{it-1} + \beta_2 Y_{it-2} + \dots + \beta_{p-1} Y_{it-p+1} + \beta_p Y_{it-p} + \mu_{it} \quad \text{Equation 3.24}$$

$i = 1, \dots, N$ (Number of countries 65 further divided into sub samples)

and

$t = 1995, \dots, 2021$ (Years)

The endogenous variables for this model are as follow;

$$Y_{it} = D_{it}, XG_{it}, GDP_{it}$$

Y_{it} is the vector of endogenous variables. $\beta_1, \beta_2, \dots, \beta_p$ are the coefficients to be

estimated with $(k \times k)$ matrices. μ_{it} is $(1 \times k)$ vector of idiosyncratic errors. The vector of error term can be specified as follows

$$E(\varepsilon_{it}) = 0, E(\varepsilon_{it}' \varepsilon_{it}) = \sum, \text{ and } E(\varepsilon_{it}' \varepsilon_{is}) = 0 \text{ for all } t > s \quad \text{Equation 3.25}$$

In the estimation of PVAR model, firstly the optimal lag order is selected on the basis of some selection criterion. Secondly, orthogonal deviations are used because regressors are correlated with fixed effects due to lags of outcome variables. The established

procedure permits to use GMM estimation method by employing instruments i.e. lagged values of explanatory variables. Thirdly, the impulse Response Function (IRF) are computed to find, how shock to one variable affects other variables. The stability of IRF is also computed i.e. all moduli of companion matrix obtain values strictly less than one.

$$\bar{B} = \begin{bmatrix} B_1 & B_2 & \cdots & B_{p-1} & B_p \\ I_k & O_k & \cdots & O_k & O_k \\ O_k & I_k & \ddots & O_k & O_k \\ \vdots & \vdots & \cdots & \vdots & \vdots \\ O_k & O_k & \cdots & I_k & O_k \end{bmatrix} \quad \text{Equation 3.26}$$

Stability of PVAR assures the proper specification of model and constancy of PVAR parameters, over time. The non- constancy is a serious challenge in the issues of economics.

3.6 Chapter Summary

This chapter describes variables, and models adapted on the basis of empirical and theoretical frame work built in chapter 2. Variables are portraying external resources in the form of external capital and innovation strategies affecting Di i.e. outcome variable in model 1. The outcome variable has its relevance with shock absorbing scenario of an economy. Thus, two other variables are also taken to know the endogeneity of model 2. Estimation technique for model 1 is CS-ARDL and the robustness is checked through MMQR method. Whereas model 2 has employed PVAR estimation method to examine the causality relationship among Di, XG and GDP for sample panels.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter reveals the outcomes related to analysis of data and discussions upon findings of study. The analysis is based on a balanced panel of 65 middle income countries for the period 1995-2021. Estimation methods demonstrate the impact of explanatory variables upon outcome variables. The presentation of findings is primarily based upon and related to impact of external resources and innovation strategies on diversified export basket of sample countries. A further triangle of fundamental components for sample countries is made

After introduction of this chapter, section 4.2 provides descriptive statistics, correlation analysis and cross-sectional dependence. Section 4.3 provides results of unit root tests for employed data. Moreover, section 4.4 provides results for model 1 pertaining to impact of external resources and innovation strategies upon export diversification followed by section 4.5 provides an insight in examining the causality relationship among export diversification, export growth and economic growth in model 2.

4.2 Descriptive Statistics & Correlation Analysis

It describes data in a summarized form which can be conveniently interpreted. This summary statistic includes mean, standard deviation, minimum and maximum values for relevant variables in a specified timeframe i.e. 1995-2021. Summary statistic is followed by correlation analysis. It evaluates data statistically. There may arise positive, negative, partial or no correlation between any two explanatory variables. This method is adopted before applying estimation method, to avoid multi-collinearity problem in data set

Table 4.1: Descriptive statistics

Variables	Mean	SD	Min	Max
Di	69.864	11.967	36.711	93.610
FDI	3.564	4.608	-37.173	55.070
REM	5.876	7.917	-59.036	72.877
AID	0.035	0.049	-0.040	0.533
EXD	0.524	0.381	-0.001	3.408
TCI	0.805	0.506	0.093	4.499
PAT	2591.770	6989.389	1.000	59915
FD	0.231	0.131	0.000	0.777
GCF	25.963	12.952	-26.625	172.947
GDP	2.735	4.946	-19.748	81.355
TOP	4.212	0.462	2.750	5.564
XG	4.475	49.346	-467.675	329.054
UMI				
Di	66.464	12.937	36.711	93.610
FDI	4.362	5.001	-5.088	55.070
REM	5.885	9.322	-59.036	72.877
AID	0.022	0.045	-0.040	0.517
EXD	0.494	0.345	-0.001	3.408
TCI	0.649	0.368	0.102	4.041
PAT	3780.724	8240.705	1	45517
FD	0.273	0.152	0.000	0.777
GCF	25.515	14.678	1.157	172.947
GDP	2.981	5.917	-19.748	81.355
TOP	4.232	0.453	2.750	5.363
XG	8.513	45.363	-274.734	305.683
LMI				
Di	72.602	10.348	43.630	89.871
FDI	2.922	4.158	-37.173	43.912
REM	5.868	6.576	-2.825	32.686
AID	0.044	0.050	-0.004	0.533
EXD	0.549	0.407	0.001	2.840
TCI	0.927	0.562	0.093	4.499
PAT	1944.079	6697.527	2	59915
FD	0.196	0.097	0.003	0.585
GCF	26.325	11.367	-26.625	69.473
GDP	2.537	3.989	-18.324	19.939
TOP	4.197	0.469	2.794	5.564
XG	1.334	52.042	-467.675	329.053

Table 4.1 portrays the statistical properties of employed variables. Considering full sample and sub samples it is reasonable to note that smallest mean value is observed for AID in UMI followed by full sample and LMI. Highest standard deviation for PAT lies in UMI followed by full sample and LMI respectively. Lowest min value is observed for XG in full sample followed by LMI and UMI. Similarly, highest max value is observed for PAT in full sample followed by UMI and LMI. Amongst the external capital variables lowest minimum value is acquired by REM followed by FDI, AID and EXD in full sample and similar pattern is observed for UMI. A (litter) little difference is observed for LMI when FDI has the least minimum value followed by REM, AID and EXD with a similar pattern for maximum values.

Di is primarily an index² ranging its value between 0 and 100. It has maximum value for LMI followed by full sample and UMI. Likewise, standard deviation for Di is also highest for UMI followed by full sample and LMI. In the similar vein, min and max values for Di are highest and lowest for LMI but UMI and full sample get alike positions. Next, GCF has third lowest mean value for UMI followed by full sample and LMI. TOP has fifth lowest mean value followed by GDP, XG and FD for full sample. Pattern gets a bit change for UMI and LMI when fifth lowest value is taken by XG followed by TOP, GDP and FD. Second highest standard deviation is observed for XG followed by GCF and Di, min and max values for UMI but full sample and LMI attained approximately similar values. EXD has lowest mean value for UMI, full sample and LMI are in same ways. TCI acquired the ninth minimum mean value for LMI but the position becomes eighth for LMI and UMI.

² Value of Di converging towards zero shows higher level of diversification whereas its value trending towards higher value shows lesser diversification and higher level of concentration

Concisely, Highest to lowest mean value for full sample is evidence for PAT, Di, GCF, REM, XG, TOP, FDI, GDP, TCI, EXD, FD and AID. PAT has the highest spread shown by standard deviation in full sample and sub samples followed by XG, GDP, REM, FDI and AID. Higher standard deviation than mean values are characterized by non-normal distribution of data and is reported in a few studies (Tiwari & Mutascu, 2011; Tiwari et al., 2022).

XG and GDP are also concerned with causality relationship and are employed with Di in VAR model whereas the rest of the variables are qualifying for MMQR (for robustness check) estimation technique (Anser et al., 2022). The OLS estimation may provide biased estimates provided variables are not normally distributed (Cheng et al., 2021). The OLS estimate portray partial view of relationship between outcome and explanatory variables. Thus, quantile regression is adopted as an estimation method in model 1.

Table 4.2: Correlation Analysis

	Di	FDI	REM	AID	EXD	TCI	PAT	FD	GCF	GDP	TOP	XG
Di	1											
FDI	0.113	1										
REM	0.008	0.064	1									
AID	0.183	0.058	0.336	1								
EXD	0.113	0.113	0.163	0.314	1							
TCI	0.073	-0.100	-0.125	0.148	0.159	1						
PAT	-0.422	-0.098	-0.194	-0.237	-0.193	-0.054	1					
FD	-0.552	-0.069	-0.126	-0.370	-0.106	-0.218	0.555	1				
GCF	0.090	0.215	0.011	0.136	-0.033	-0.220	-0.011	-0.019	1			
GDP	-0.344	0.010	-0.201	-0.423	-0.082	-0.312	0.297	0.508	-0.107	1		
TOP	0.034	0.344	0.176	0.234	0.286	-0.082	-0.235	-0.108	0.304	-0.149	1	
XG	0.030	0.087	0.041	0.099	-0.038	0.004	-0.018	-0.060	-0.005	0.000	0.114	1

Table 4.2 paints the picture for correlation analysis for employed variables. Highest correlation is observed between FD and Di. Though, moderate but higher values of

correlation also lie between FD and AID, TOP and AID, FD and GDP. Moreover, FDI and TCI also have moderate correlation. The correlation between any of the two variables is not exceeding 0.7 and does not possess multicollinearity (Anser et al., 2022).

Table 4.3: Cross Sectional Dependence

Variable	CD-test	p-value	Corr	abs(corr)
Di	10.910	0.000	0.046	0.351
FDI	28.590	0.000	0.121	0.251
REM	32.530	0.000	0.137	0.450
AID	62.260	0.000	0.263	0.410
EXD	27.140	0.000	0.115	0.473
TCI	33.480	0.000	0.148	0.590
PAT	7.630	0.000	0.034	0.452
FD	112.890	0.000	0.492	0.581
GCF	16.520	0.000	0.072	0.313
TOP	27.040	0.000	0.114	0.393
GDP	67.640	0.000	0.295	0.318
XG	52.140	0.000	0.227	0.330

Cross Sectional dependence is a vital issue to address the macro panel data analysis. It is important that a shock in one country spreads across other countries. Therefore, control for CSD is important for providing unbiased results. Henceforth, Breusch Pagan LM test is performed to confirm the presence of CSD and the results are reported in Table 4.3 confirm the presence of CSD in the dataset.

The further step in the panel data analysis is to test stationarity of variables. For the purpose, second generation unit root tests are performed and are reported in Table 4.4 The results illustrate that few variables are stationary at level or $I(0)$, while a few are stationary at first differencing, $I(1)$. None of the variables is $I(2)$.

4.3 Unit Root Tests

The unit root is applied to the time related data before applying any estimation method. It is applied to check the stationarity of series. It is important to note that series stationary so as to avoid spurious regression. The results are reported in Table 4.4.

Table 4.4: Results for Unitroot

	CIPS			CADF		
	Level		First Difference	Level		First Difference
Variables	t-cal	t-tab	t-cal	t-cal	t-tab	t-cal
Di	-2.340	-2.150		-2.340	-2.080	
FDI	-3.280	-2.150		-2.683	-2.080	
REM	-2.067	-2.150	-4.376	-2.051	-2.080	-.4131
AID	-2.946	-2.150		-2.342	-2.080	
EXD	-1.998	-2.150	-4.323	-1.812	-2.080	-3.123
TCI	-2.270	-2.150		-2.203	-2.080	
PAT	-1.578	-2.150	-3.943	-1.814	-2.080	-3.057
FD	-2.428	-2.150		-2.225	-2.080	
GCF	-2.120	-2.150	-4.465	-2.499	-2.080	
GDP	-3.676	-2.150		-2.749	-2.080	
TOP	-1.701	-2.150	-4.471	-1.816	-2.080	-3.342
XG	-4.048	-2.150		-2.871	-2.080	

Table 4.4 describes the results for panel unit root obtained through CIPS and CADF. Results against their P-Values suggest that all the variables are stationary at level I(0) except REM, EXD, PAT and TOP. Thus, the regression is performed by taking the variables in their appropriate level form.

4.4 Results and discussion for Model 1

Table 4.5: Result of CS-ARDL: Impact of FDI

	Full Sample		UMI		LMI	
Variables	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Long Run						
FDI	-0.113**	0.055	-0.573*	0.333	-0.100**	0.047
FD	-6.917*	3.856	-15.839*	9.099	-11.930*	6.771
GCF	0.022	0.025	0.211	0.325	0.020	0.037
GDP	0.069*	0.037	-0.333*	0.198	0.016	0.025
TOP	-1.804***	0.585	4.428	4.797	-2.764***	0.892
XG	0.005	0.011	0.090	0.071	-0.018**	0.009
C	26.109***	1.716	54.172***	16.583	45.589***	4.578
Short Run						
Di	-0.665***	0.045	0.210***	0.066	-0.818***	0.058
FDI	-0.159***	0.073	-0.138**	0.064	-0.191**	0.087
FD	-10.753	6.154	-10.055	7.075	-21.567	14.126
GCF	0.036	0.043	-0.066	0.099	0.058	0.068
GDP	0.092*	0.049	-0.087	0.103	0.035	0.052
TOP	-2.998***	0.938	0.618	2.085	-4.936***	1.672
XG	0.007	0.016	0.028	0.037	-0.031*	0.017
ECM	-1.665***	0.045	-0.790***	0.066	-1.818***	0.058
C	46.715***	3.655	54.990***	9.223	84.205***	9.063
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1						

4.5 Results and discussion for Model 1

Table 4.6: Result of MMQR for Full Sample: Impact of FDI

			Quantiles										
Var	Location	Scale	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
FDI	0.192*** (0.052)	-0.199*** (0.033)	0.620*** (0.094)	0.503*** (0.078)	0.393*** (0.066)	0.311*** (0.058)	0.246*** (0.054)	0.181*** (0.052)	0.117** (0.052)	0.050 (0.054)	-0.022 (0.059)	-0.107 (0.067)	-0.207*** (0.079)
FD	-51.619*** (2.156)	7.298*** (1.345)	-67.326*** (3.871)	-63.055*** (3.224)	-59.002*** (2.703)	-55.990*** (2.402)	-53.615*** (2.237)	-51.222*** (2.154)	-48.871*** (2.158)	-46.426*** (2.244)	-43.763*** (2.430)	-40.645*** (2.760)	-36.965*** (3.255)
GCF	0.058** (0.027)	0.003 (0.017)	0.051 (0.047)	0.053 (0.040)	0.055 (0.033)	0.056* (0.030)	0.057** (0.028)	0.058** (0.027)	0.059** (0.027)	0.060** (0.028)	0.061** (0.030)	0.063* (0.034)	0.064 (0.040)
GDP	-0.185*** (0.055)	-0.011 (0.034)	-0.162* (0.097)	-0.169** (0.081)	-0.174** (0.068)	-0.179*** (0.061)	-0.182*** (0.057)	-0.186*** (0.054)	-0.189*** (0.054)	-0.193*** (0.057)	-0.196*** (0.062)	-0.201*** (0.070)	-0.206** (0.082)
TOP	-1.694*** (0.614)	1.790*** (0.383)	-5.546*** (1.099)	-4.498*** (0.917)	-3.504*** (0.769)	-2.766*** (0.684)	-2.183*** (0.637)	-1.596*** (0.613)	-1.020* (0.614)	-0.420 (0.639)	0.233 (0.692)	0.997 (0.786)	1.900** (0.925)
XG	0.001 (0.006)	-0.007** (0.004)	0.017* (0.010)	0.013 (0.008)	0.009 (0.007)	0.006 (0.006)	0.003 (0.006)	0.001 (0.006)	-0.001 (0.006)	-0.004 (0.006)	-0.007 (0.006)	-0.010 (0.007)	-0.013 (0.009)
C	86.980*** (2.526)	-0.809 (1.577)	88.720*** (4.489)	88.247*** (3.758)	87.798*** (3.159)	87.464*** (2.810)	87.201*** (2.618)	86.936*** (2.516)	86.676*** (2.518)	86.405*** (2.626)	86.110** (2.852)	85.764*** (3.230)	85.356*** (3.783)
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

Table 4.7: Result of MMQR for UMI: Impact of FDI

			Quantiles										
Var	Location	Scale	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
FDI	0.115 (0.070)	-0.254*** (0.044)	0.679*** (0.137)	0.509*** (0.107)	0.388*** (0.091)	0.273*** (0.080)	0.183** (0.074)	0.092 (0.070)	0.031 (0.069)	-0.051 (0.072)	-0.162** (0.080)	-0.290*** (0.092)	-0.385*** (0.103)
FD	-47.398*** (3.180)	8.751*** (2.010)	-66.791*** (6.088)	- 60.936*** (4.840)	- 56.769*** (4.109)	- 52.824*** (3.626)	- 49.728*** (3.332)	- 46.596*** (3.156)	- 44.501*** (3.136)	- 41.690*** (3.266)	- 37.841*** (3.588)	- 33.441*** (4.143)	- 30.194*** (4.657)
GCF	0.080 (0.075)	0.070 (0.048)	-0.076 (0.140)	-0.029 (0.114)	0.005 (0.098)	0.036 (0.085)	0.061 (0.079)	0.086 (0.075)	0.103 (0.075)	0.126 (0.077)	0.156* (0.085)	0.192* (0.098)	0.218** (0.111)
GDP	-0.223*** (0.071)	-0.046 (0.045)	-0.121 (0.132)	-0.152 (0.107)	-0.174* (0.092)	-0.195** (0.081)	-0.211*** (0.074)	-0.228*** (0.071)	-0.239*** (0.070)	-0.253*** (0.073)	-0.274*** (0.080)	-0.297*** (0.093)	-0.314*** (0.104)
TOP	-1.006 (1.052)	3.681*** (0.665)	-9.165*** (2.050)	-6.702*** (1.609)	-4.949*** (1.358)	-3.289*** (1.204)	-1.986* (1.106)	-0.669 (1.045)	0.212 (1.037)	1.395 (1.086)	3.015** (1.192)	4.866*** (1.373)	6.232*** (1.543)

Table 4.7 continued

XG	0.030*** (0.009)	-0.001 (0.005)	0.032** (0.016)	0.032** (0.013)	0.031*** (0.011)	0.031*** (0.010)	0.030*** (0.009)	0.030*** (0.009)	0.030*** (0.009)	0.029*** (0.009)	0.029*** (0.010)	0.028** (0.011)	0.028** (0.013)
C	81.303*** (4.344)	-10.365*** (2.746)	104.275*** (8.275)	97.338*** (6.601)	92.403*** (5.610)	87.730*** (4.947)	84.062*** (4.545)	80.353*** (4.307)	77.872*** (4.281)	74.542*** (4.456)	69.982*** (4.896)	64.770*** (5.652)	60.925*** (6.351)
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

Table 4.8: Result of MMQR for LMI: Impact of FDI

			Quantiles										
Var	Location	Scale	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
FDI	0.359*** (0.095)	-0.289*** (0.060)	1.010*** (0.192)	0.822*** (0.154)	0.641*** (0.125)	0.518*** (0.109)	0.433*** (0.101)	0.341*** (0.095)	0.239** (0.093)	0.144 (0.095)	0.040 (0.101)	-0.083 (0.114)	-0.183 (0.127)
FD	-48.806*** (3.541)	8.656*** (2.226)	-68.351*** (7.054)	-62.690*** (5.687)	-57.276*** (4.632)	-53.578*** (4.040)	-51.027*** (3.730)	-48.271*** (3.525)	-45.204*** (3.439)	-42.364*** (3.508)	-39.234*** (3.753)	-35.563*** (4.221)	-32.542*** (4.719)
GCF	0.018 (0.028)	-0.019 (0.018)	0.061 (0.054)	0.048 (0.045)	0.036 (0.036)	0.028 (0.032)	0.023 (0.029)	0.016 (0.028)	0.010 (0.027)	0.003 (0.028)	-0.004 (0.030)	-0.012 (0.033)	-0.019 (0.037)
GDP	-0.101 (0.090)	0.032 (0.056)	-0.172 (0.174)	-0.152 (0.143)	-0.132 (0.117)	-0.119 (0.102)	-0.109 (0.095)	-0.099 (0.089)	-0.088 (0.087)	-0.078 (0.089)	-0.066 (0.095)	-0.053 (0.107)	-0.042 (0.120)
TOP	-2.474*** (0.800)	0.570 (0.503)	-3.761** (1.555)	-3.388*** (1.277)	-3.032*** (1.044)	-2.788*** (0.913)	-2.620*** (0.843)	-2.439*** (0.793)	-2.237*** (0.773)	-2.050*** (0.790)	-1.843** (0.847)	-1.602* (0.954)	-1.403 (1.067)
XG	-0.013*** (0.007)	-0.009** (0.004)	0.007 (0.014)	0.001 (0.011)	-0.005 (0.009)	-0.009 (0.008)	-0.011 (0.007)	-0.014** (0.007)	-0.017** (0.007)	-0.020*** (0.007)	-0.023*** (0.007)	-0.027*** (0.008)	-0.030*** (0.009)
C	91.128*** (3.241)	4.407** (2.038)	81.178*** (6.310)	84.060*** (5.175)	86.816*** (4.228)	88.699*** (3.699)	89.997*** (3.417)	91.400*** (3.214)	92.962*** (3.132)	94.407*** (3.201)	96.001*** (3.432)	97.869*** (3.869)	99.407*** (4.328)
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

The impact of key external resources in the form of external capital is assumed to enhance export diversification. Impact of FDI on Di is reported in table 4.5 to 4.8. The results are reported for each panel separately by CS-ARDL and MMQR. FDI for developing countries usually practice at managerial level by imparting its impact on creating linkages for importing capital content for exports (Sahoo & Dash, 2022). Thus, indirectly contributes to enhance economy's output (Chaudhury et al., 2020; Wu et al., 2020). Considering its impact upon Di also provides a clear picture in the employed sample. Indeed, the coefficient of FDI has significant enhancing effect on Di in table 4.5 and it is lending credence to the hypothesis that Di can be promoted through FDI in the selected sample of countries. The FDI has significant influence on Di for full sample and upper middle-income countries for higher quantiles. There is a complimentary association between Di and FDI for middle income countries through direct and indirect ways. When foreign investors invest in developing countries and foreign subsidiaries are set up, it initiates export to affiliates in parent economy or any other country. It enlarges international networks of related enterprise in host economy, which can further widen the base for investment and exports.

FDI inflow has several positive spillover effects in host economy which include infrastructure facilities, technology transfer and managerial skills. These spillovers cause further improvements in competitiveness of exports and the market for exports can sustain globally. These findings have similarities with earlier studies (Megbowon et al., 2019; Xiong & Sun, 2021).

FD enhances Di in all panels with their mean outcome in table 4.5 and similar is observed for all panels at almost all quantiles in Table 4.6 to 4.8. FD of a country has a crucial role in export upgrading and widening diversification in exports. The findings are in line with another study (Shakib et al., 2023). GCF is a proxy of capital in an economy and

the role of GCF in full sample is seen but it is increasing export concentration. This finding is in line with another study. GDP has always been an increasing driver of export diversification and the similar is observed in table 4.5 to 4.8 for full sample and UMI. The findings are in line with a few other studies (Elhiraika & Mbate, 2014; Girma et al., 2015).

The extent of economy's integration with global market is reflected by TOP. It is interesting to note that TOP has remarkably increased Di and the evidence is seen in table 4.5 to 4.8. More integrated economies have higher chances to diversify their exports. Similar is reported by some other studies. The valid fact of XG to affect the economic outcomes cannot be neglected for middle income countries. XG enhances Di for LMI and is reported in tables 4.5 and 4.8. LMI are usually concerned with their installed capacity of investment, production and exports. Thus, the reliance upon XG leads them towards Di. This phenomena is clearly given for growth enhancing effects by a few studies (Martincus & Carballo, 2008; Ramanayake & Lee, 2015). Here, XG has significantly increased Di for a sub sample of LMI. The impact of FDI upon Di reminds product cycle model which highlighted the prominent role of FDI for export upgrade.

Hypothetical explanation of this theory recognized the role of external capital because of interconnectedness, when goods and services are related with income elasticity of demand (Petrochilos, 1999). In next phase, the product moves to lower income countries where cost of labor is lower and manufacturing become possible at a reasonably lower cost, causing exports of innovating country to decline. Thereafter, technology for the good became standardized and unskilled labor could have produced at even lowest cost. Expectedly, the production location shifts to labor rich countries and even the innovating country becomes the importer of that product. Product life cycle theory implements dynamic comparative advantage and phenomenon of economies of scale (Mudenda et al., 2014).

Table 4.9: Results of CS-ARDL: Impact of REM

	Full Sample		UMI		LMI	
Variables	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Long Run						
REM	-4.174*	2.494	-2.084*	1.228	-7.552	6.958
FD	9.280*	5.061	-4.499	7.330	-15.208	7.781
GCF	-0.048*	0.029	-0.072**	0.032	0.108	0.069
GDP	0.006	0.041	-0.019	0.062	44.686***	13.469
TOP	0.053	0.821	0.398	1.228	-2.285**	1.019
XG	0.034*	0.019	0.028*	0.016	0.023**	0.010
C	58.385***	14.646	44.686***	13.469	44.686***	13.469
Short Run						
DI	-0.689***	0.043	-0.809***	0.086	44.686***	13.469
REM	-6.538	4.321	-2.530	1.608	-12.650	11.789
FD	17.607*	9.398	-2.700	12.167	-21.613	13.975
GCF	-0.091*	0.047	-0.124*	0.064	0.180	0.134
GDP	-0.024	0.069	0.017	0.091	44.686***	13.469
TOP	0.415	1.318	1.298	2.529	-4.181**	2.047
XG	0.053*	0.028	0.040	0.029	0.046**	0.020
ECM	-1.689***	0.043	-1.809***	0.086	-1.801***	13.469
C	106.423***	27.568	97.370***	27.042	44.686***	13.469
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1						

Table 4.10: Result of MMQR for Full Sample: Impact of REM

			Quantiles										
Var	Location	Scale	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
REM	-0.095*** (0.032)	-0.161*** (0.021)	0.245*** (0.064)	0.164*** (0.054)	0.069 (0.044)	0.002 (0.038)	-0.053 (0.035)	-0.109*** (0.032)	-0.158*** (0.031)	-0.206*** (0.032)	-0.257*** (0.033)	-0.333*** (0.039)	-0.419*** (0.047)
FD	-52.225*** (2.311)	7.592*** (1.522)	-68.280*** (4.498)	-64.448*** (3.820)	-59.951*** (3.119)	-56.799*** (2.717)	-54.221*** (2.460)	-51.539*** (2.282)	-49.256*** (2.221)	-46.984*** (2.259)	-44.589*** (2.384)	-40.987*** (2.763)	-36.893*** (3.326)
GCF	0.067** (0.027)	-0.002 (0.018)	0.070* (0.053)	0.069 (0.045)	0.068* (0.037)	0.068** (0.032)	0.067** (0.029)	0.067** (0.027)	0.066** (0.026)	0.066** (0.027)	0.065** (0.028)	0.064** (0.033)	0.063 (0.039)
GDP	-0.149*** (0.052)	-0.001 (0.034)	-0.146 (0.100)	-0.147* (0.085)	-0.148** (0.070)	-0.148** (0.061)	-0.149*** (0.055)	-0.149*** (0.051)	-0.149*** (0.050)	-0.150*** (0.051)	-0.150*** (0.054)	-0.151** (0.061)	-0.151** (0.074)
TOP	-0.960 (0.620)	1.804*** (0.408)	-4.774*** (1.203)	-3.864*** (1.024)	-2.796*** (0.836)	-2.046*** (0.728)	-1.434** (0.659)	-0.797 (0.611)	-0.254 (0.595)	0.286 (0.605)	0.855 (0.639)	1.711** (0.739)	2.683*** (0.889)
XG	0.002 (0.006)	-0.009** (0.004)	0.021* (0.011)	0.017* (0.009)	0.012 (0.008)	0.008 (0.007)	0.005 (0.006)	0.002 (0.006)	-0.001 (0.005)	-0.004 (0.006)	-0.007 (0.006)	-0.011 (0.007)	-0.016* (0.008)
C	84.943*** (2.549)	-0.640 (1.679)	86.296*** (4.918)	85.973*** (4.204)	85.594*** (3.444)	85.328*** (2.995)	85.111*** (2.707)	84.885*** (2.511)	84.693*** (2.448)	84.502*** (2.487)	84.300*** (2.634)	83.996*** (3.021)	83.651*** (3.627)
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

Table 4.11: Result of MMQR for UMI: Impact of REM

			Quantiles										
Var	Location	Scale	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
REM	0.060 (0.072)	-0.171*** (0.057)	0.419*** (0.106)	0.318*** (0.076)	0.239*** (0.064)	0.167*** (0.061)	0.106 (0.064)	0.047 (0.073)	0.003 (0.082)	-0.057 (0.097)	-0.124 (0.114)	-0.199 (0.136)	-0.282* (0.162)
FD	-46.987*** (4.600)	7.225** (3.674)	-62.124*** (6.626)	-57.855*** (4.907)	-54.537*** (4.101)	-51.493*** (3.877)	-48.901*** (4.137)	-46.421*** (4.715)	-44.555*** (5.304)	-42.012*** (6.254)	-39.190*** (7.411)	-36.020*** (8.811)	-32.532*** (10.453)
GCF	0.116 (0.104)	-0.009 (0.083)	0.134 (0.146)	0.129 (0.111)	0.125 (0.092)	0.122 (0.087)	0.119 (0.094)	0.116 (0.107)	0.113 (0.121)	0.110 (0.143)	0.107 (0.170)	0.103 (0.202)	0.099 (0.238)
GDP	-0.237** (0.094)	0.014 (0.075)	-0.266** (0.133)	-0.258** (0.101)	-0.251*** (0.084)	-0.245*** (0.080)	-0.240*** (0.085)	-0.236** (0.098)	-0.232** (0.110)	-0.227* (0.130)	-0.222 (0.154)	-0.215 (0.184)	-0.209 (0.217)
TOP	-1.228 (1.576)	4.266*** (1.259)	-10.164*** (2.356)	-7.644*** (1.675)	-5.685*** (1.408)	-3.888*** (1.331)	-2.358* (1.409)	-0.894 (1.590)	0.208 (1.781)	1.709 (2.099)	3.375 (2.477)	5.246* (2.946)	7.305** (3.520)
XG	0.033*** (0.012)	-0.009 (0.009)	0.051*** (0.016)	0.046*** (0.012)	0.042*** (0.010)	0.038*** (0.010)	0.035*** (0.010)	0.032*** (0.012)	0.030** (0.014)	0.027* (0.016)	0.023 (0.019)	0.020 (0.023)	0.015 (0.027)
C	81.401*** (6.256)	-10.714** (4.996)	103.846*** (9.066)	97.517*** (6.658)	92.597*** (5.575)	88.083*** (5.268)	84.239*** (5.606)	80.562*** (6.369)	77.796*** (7.155)	74.024*** (8.435)	69.841*** (9.984)	65.140*** (11.871)	59.968*** (14.108)
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

Table 4.12: Result of MMQR for LMI: Impact of REM

			Quantiles										
Var	Location	Scale	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
REM	-0.271*** (0.038)	-0.142*** (0.026)	0.074 (0.095)	-0.045 (0.070)	-0.135** (0.054)	-0.195*** (0.046)	-0.247*** (0.040)	-0.292*** (0.036)	-0.336*** (0.034)	-0.379*** (0.033)	-0.414*** (0.034)	-0.478*** (0.038)	-0.539*** (0.045)
FD	-49.834*** (3.786)	10.582*** (2.648)	75.455*** (9.307)	66.640*** (7.008)	-59.937*** (5.471)	-55.519*** (4.654)	-51.635*** (4.030)	-48.282*** (3.616)	-45.050*** (3.364)	-41.826*** (3.279)	-39.208*** (3.370)	-34.477*** (3.835)	-29.979*** (4.491)
GCF	0.037 (0.029)	-0.014 (0.020)	0.072 (0.068)	0.060 (0.052)	0.051 (0.042)	0.045 (0.035)	0.040 (0.031)	0.035 (0.027)	0.031 (0.025)	0.027 (0.025)	0.023 (0.025)	0.017 (0.029)	0.011 (0.034)
GDP	-0.073 (0.091)	0.000 (0.064)	-0.073 (0.214)	-0.073 (0.166)	-0.073 (0.132)	-0.073 (0.112)	-0.073 (0.097)	-0.073 (0.087)	-0.073 (0.080)	-0.073 (0.079)	-0.073 (0.081)	-0.073 (0.091)	-0.073 (0.108)
TOP	-1.046 (0.722)	-0.098 (0.505)	-0.808 (1.705)	-0.890 (1.322)	-0.952 (1.051)	-0.993 (0.890)	-1.029 (0.769)	-1.060 (0.688)	-1.090* (0.639)	-1.120* (0.625)	-1.144* (0.642)	-1.188 (0.727)	-1.230 (0.857)
XG	-0.008 (0.007)	-0.009* (0.005)	0.013 (0.016)	0.005 (0.013)	0.000 (0.010)	-0.004 (0.008)	-0.007 (0.007)	-0.010 (0.007)	-0.012** (0.006)	-0.015** (0.006)	-0.017*** (0.006)	-0.021*** (0.007)	-0.025*** (0.008)
C	87.393*** (3.051)	6.565*** (2.134)	71.498*** (7.325)	76.967*** (5.611)	81.125*** (4.435)	83.866*** (3.762)	86.275*** (3.254)	88.356*** (2.913)	90.360*** (2.706)	92.361*** (2.644)	93.984*** (2.714)	96.920*** (3.082)	99.710*** (3.629)
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

Table 4.9 to 4.12 is revealing the impact of REM on Di for full sample and sub-samples in sample middle income countries. The variable REM is found to have a significant increasing effect on Di in all panels and the robustness of results is also providing same insight. The basic theoretical grounds of ‘self-discovery’ for its effect on Di remains valid for full sample and UMI. The robustness check also confirms the increase in Di for middle and higher quantiles of full sample and UMI. All quantiles of LMI gives an indication of significant increasing effect of REM on Di.

Remittances sent home by migrants increases scope of investment especially if investment is made by a distinct idea. Investment by migrants or their families expands business and offers higher monetary returns. Indeed, the rationale for migrants to invest in a new line of production casts higher economic returns (Ajide & Osinubi, 2024). Following the theoretical approach ‘self-discovery’ increasing the number of entrepreneurs by increasing the number of persons engaged in cost discovery to utilize income inflow of income from abroad increases Di. Productive investment through cost discovery triggers Di through experimentation and spillovers in self-discovery.

Index for FD portrays the financial landscape of the economy which shows increase in export concentration for full sample in table 4.9 but the results for MMQR show a similarity for full sample and sub-samples. The variable FD is significantly increasing Di for all quantiles in table 4.10 to 4.12. Similar is also reported by another study (Islam et al., 2024). GCF shows the infrastructure of a country and it usually has a weaker strength in middle income countries. Thus, GCF is significantly increasing export concentration in full sample and sub-samples.

The variable GDP shows market size in this study. It is a fact that countries produce those products for which their local demand is high (Ross, 2019). Larger market size

produces larger output and provides many positive benefits to the economy. The impact of GDP on Di portrays its statistically significant effect shown in table 4.10 and 4.11. Moreover, TOP is significantly increasing Di in LMI while the results for MMQR portray that lower quantiles in full sample and UMI are depicting significant increase in Di due to Openness in trade.

Export Growth (XG) is an important sustaining element for growth in developing countries and it is significantly increasing export concentration shown in table 4.9. It indicates a key element i.e. export base which validates the importance of existing exports rather than encouraging new varieties. The results are similar in lines with another study (Balkani, 2024).

Table 4.13: Results of CS-ARDL: Impact of AID

	Full Sample		UMI		LMI	
Variables	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Long Run						
AID	-207.577*	124.652	-430.056*	252.315	57.574**	29.095
FD	-9.263**	3.655	9.378	7.076	-11.640***	4.178
GCF	0.004	0.031	-0.113**	0.048	-0.025	0.026
GDP	0.048*	0.028	0.005	0.045	0.114**	0.047
TOP	-1.600*	0.889	-4.293*	2.514	-0.164	0.964
XG	0.018**	0.009	0.028**	0.013	0.013**	0.006
C	61.668***	12.080	54.298***	9.377	32.406***	4.139
Short Run						
Di	-0.799***	0.045	-0.859***	0.096	-0.712***	0.047
AID	-329.428	222.790	-689.309	441.033	91.822**	46.085
FD	-13.222**	6.059	10.930	10.526	-18.969***	6.675
GCF	-0.008	0.051	-0.209**	0.089	-0.040	0.045
GDP	0.076	0.049	0.005	0.072	0.201**	0.093
TOP	-3.043**	1.484	-5.499	3.459	0.127	1.660
XG	0.032**	0.016	0.039*	0.022	0.022**	0.010
ECM	-1.799***	0.045	-1.859***	0.096	-1.712***	0.047
C	117.753***	23.254	103.284***	18.161	54.982***	7.046
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1						

Table 4.14: Result of MMQR for Full Sample: Impact of AID

			Quantiles										
Var	Location	Scale	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
AID	-1.352 (4.423)	-11.504*** (2.893)	22.929*** (8.358)	16.761** (7.061)	10.287* (5.841)	5.549 (5.110)	1.931 (4.690)	-2.074 (4.392)	-5.648 (4.309)	-9.542** (4.429)	-13.483*** (4.756)	-18.651*** (5.445)	-24.361*** (6.453)
FD	-51.849*** (2.335)	6.130*** (1.527)	- 64.788*** (4.413)	-61.501*** (3.728)	-58.051*** (3.082)	-55.526*** (2.696)	-53.598*** (2.475)	-51.464*** (2.318)	-49.560*** (2.274)	-47.485*** (2.337)	-45.384*** (2.509)	-42.631*** (2.873)	-39.587*** (3.407)
GCF	0.065** (0.026)	-0.003 (0.017)	0.070 (0.049)	0.069* (0.041)	0.067* (0.034)	0.066** (0.030)	0.065** (0.027)	0.065** (0.026)	0.064** (0.025)	0.063** (0.026)	0.062** (0.028)	0.061* (0.032)	0.060 (0.038)
GDP	-0.162** (0.053)	-0.001 (0.035)	-0.160 (0.100)	-0.160* (0.084)	-0.161** (0.070)	-0.161*** (0.061)	-0.162*** (0.056)	-0.162*** (0.053)	-0.162*** (0.052)	-0.163*** (0.053)	-0.163*** (0.057)	-0.163** (0.065)	-0.164** (0.077)
TOP	-1.165* (0.606)	1.553*** (0.397)	-4.443*** (1.146)	-3.610*** (0.968)	-2.736*** (0.800)	-2.097*** (0.700)	-1.608** (0.643)	-1.068* (0.602)	-0.585 (0.591)	-0.060 (0.607)	0.472 (0.652)	1.170 (0.746)	1.941** (0.885)
XG	0.003 (0.006)	-0.009** (0.004)	0.023** (0.010)	0.018** (0.009)	0.013* (0.007)	0.009 (0.006)	0.006 (0.006)	0.003 (0.005)	0.000 (0.005)	-0.003 (0.006)	-0.007 (0.006)	-0.011 (0.007)	-0.015* (0.008)
C	85.291*** (2.511)	0.306 (1.642)	84.645*** (4.727)	84.809*** (4.000)	84.981*** (3.316)	85.107*** (2.902)	85.203*** (2.659)	85.310*** (2.489)	85.405*** (2.443)	85.508*** (2.513)	85.613*** (2.700)	85.750*** (3.088)	85.902*** (3.644)
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

Table 4.15: Result of MMQR for UMI: Impact of AID

			Quantiles										
Var	Location	Scale	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
AID	-3.157 (6.821)	-21.999*** (4.285)	46.433*** (13.878)	31.638*** (10.708)	20.456** (9.111)	10.157 (7.904)	2.346 (7.202)	-5.194 (6.768)	-10.480 (6.658)	-18.032*** (6.827)	-26.055*** (7.298)	-36.190*** (8.278)	-46.550*** (9.754)
FD	-47.702*** (3.147)	8.160*** (1.977)	-66.096*** (6.333)	-60.608*** (4.929)	-56.461*** (4.196)	-52.640*** (3.639)	-49.743*** (3.315)	-46.947*** (3.115)	-44.986*** (3.066)	-42.185*** (3.144)	-39.209*** (3.361)	-35.450*** (3.809)	-31.608*** (4.473)
GCF	0.107 (0.069)	0.015 (0.044)	0.073 (0.133)	0.083 (0.109)	0.091 (0.092)	0.098 (0.080)	0.104 (0.073)	0.109 (0.069)	0.112* (0.067)	0.118* (0.069)	0.123* (0.074)	0.130 (0.084)	0.137 (0.097)
GDP	-0.212*** (0.066)	-0.010 (0.041)	-0.190 (0.126)	-0.197* (0.103)	-0.202** (0.087)	-0.206*** (0.075)	-0.210*** (0.069)	-0.213*** (0.065)	-0.216*** (0.064)	-0.219*** (0.065)	-0.223*** (0.070)	-0.227*** (0.079)	-0.232** (0.092)
TOP	-0.862 (1.048)	3.869*** (0.658)	-9.582*** (2.197)	-6.980*** (1.644)	-5.014*** (1.401)	-3.203*** (1.219)	-1.829*** (1.109)	-0.503 (1.040)	0.426 (1.022)	1.754* (1.053)	3.165*** (1.126)	4.947*** (1.273)	6.769*** (1.510)
XG	0.030*** (0.008)	-0.008* (0.005)	0.049*** (0.015)	0.043*** (0.012)	0.039*** (0.010)	0.035*** (0.009)	0.032*** (0.008)	0.029*** (0.007)	0.027*** (0.007)	0.024*** (0.008)	0.021*** (0.008)	0.018** (0.009)	0.014 (0.011)
C	80.642*** (4.252)	-10.314*** (2.671)	103.892*** (8.548)	96.955*** (6.655)	91.713*** (5.667)	86.884*** (4.915)	83.222*** (4.476)	79.687*** (4.206)	77.209*** (4.139)	73.668*** (4.247)	69.907*** (4.540)	65.155*** (5.143)	60.298*** (6.036)
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

Table 4.16: Result of MMQR for LMI: Impact of AID

			Quantiles										
Var	Location	Scale	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
AID	0.786 (5.805)	-9.211** (3.724)	21.653* (11.846)	14.673 (9.391)	9.755 (7.822)	6.017 (6.818)	3.042 (6.181)	-0.118 (5.701)	-3.031 (5.485)	-5.936 (5.516)	-9.190 (5.839)	-13.431** (6.645)	-16.442** (7.387)
FD	-49.237*** (3.881)	6.800*** (2.490)	- 64.641** * (7.946)	- 59.489*** (6.291)	- 55.858*** (5.228)	- 53.099*** (4.555)	- 50.902*** (4.132)	- 48.570*** (3.813)	- 46.419*** (3.669)	- 44.275*** (3.690)	- 41.873*** (3.905)	- 38.742*** (4.444)	- 36.519*** (4.931)
GCF	0.017 (0.027)	-0.009 (0.017)	0.037 (0.055)	0.030 (0.043)	0.026 (0.036)	0.022 (0.032)	0.020 (0.029)	0.017 (0.026)	0.014 (0.025)	0.011 (0.026)	0.008 (0.027)	0.004 (0.031)	0.001 (0.034)
GDP	-0.039 (0.089)	0.000 (0.057)	-0.038 (0.181)	-0.038 (0.144)	-0.038 (0.120)	-0.038 (0.105)	-0.039 (0.095)	-0.039 (0.087)	-0.039 (0.084)	-0.039 (0.085)	-0.039 (0.090)	-0.039 (0.102)	-0.039 (0.114)
TOP	-1.399** (0.710)	-0.009 (0.456)	-1.379 (1.439)	-1.385 (1.144)	-1.390 (0.957)	-1.394* (0.835)	-1.396* (0.756)	-1.400** (0.697)	-1.402** (0.670)	-1.405** (0.674)	-1.408** (0.714)	-1.412* (0.812)	-1.415 (0.905)
XG	-0.011 (0.007)	-0.009** (0.004)	0.010 (0.014)	0.003 (0.011)	-0.002 (0.009)	-0.006 (0.008)	-0.009 (0.007)	-0.012* (0.007)	-0.015** (0.006)	-0.018*** (0.006)	-0.021*** (0.007)	-0.025*** (0.008)	-0.028*** (0.009)
C	87.566*** (2.978)	6.645*** (1.910)	72.512** * (6.104)	77.547*** (4.829)	81.095*** (4.016)	83.791*** (3.500)	85.938*** (3.175)	88.217*** (2.929)	90.319*** (2.817)	92.415*** (2.832)	94.762*** (2.998)	97.822*** (3.415)	99.994*** (3.795)
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

Impact of AID upon Di is portrayed in Table 4.13 to 4.16 and it has a crucial nature for developing countries. It has significant developmental context and also paints a picture when the target is Di. Table 4.13 provides an insight for AID to increase Di for full sample and UMI. It is also providing the same picture for middle and higher quantiles for sample in table 4.14. It has significant positive effect in higher quantiles of UMI and LMI. It is argued in literature that AID provides an investment base to the economy and increases productive capacities including infrastructure expansion which expands diversification (Hendy & Zaki, 2021).

Theoretically, it is argued that many developing countries face huge budget deficit and inadequate domestic resource accumulation resulting in savings investment gap. It is also argued in two gap theory that numerous economies would experience economic downturn in their quest to bridge the gap except to rely on external financial capital maybe AID. A proper channelizing of AID causes greater production and exports remain the visible reflection of domestic production which specifically relates to manufacturing sector (Saltarelli et al., 2020). Higher AID has spillovers of greater liberalization in trade policy which can promote Di (Sepehrdoust et al., 2019). AID closely associates with productive scheme to expand range of production and does provide expansion and upgrading in exports (Gnangnon, 2019a). It is also argued in literature that AID has an association with depreciation of real exchange rate in the host country and depreciation in real exchange rate links to higher Di (Gnangnon, 2021a).

FD has remarkably pronounced effects on Di in this model shown in table 4.13 for full sample and LMI. Robustness check provides the same results for full sample and sub-samples. FD is a comprehensive measure of financial scheme in a country, and embeds positive effects on many economic aspects. Results of this study are in line with another

study (Riaz et al., 2024; Wang et al., 2025). GFC is a proxy of infrastructure and capital in the economy which depicts a unique situation for Di in full sample and sub-samples. It is increasing export concentration in all panels which alarms that developing countries do not acquire suitable infrastructure for Di. This result is similar with another study (Golo, 2023). GDP is increasing Di for full sample and UMI in results for MMQR. Higher market size has higher aspects of greater investment, production and exports. Similarly, more open economies have higher trends to enhance Di. Openness in the economy has higher probability to import capital content for exports, so it remains imperative for developing countries to increase TOP for increase in Di. The variable XG has higher effects upon export concentration in all samples in their mean outcome reported in table 4.13. The robustness shows a different situation for LMI when almost all the quantiles are showing that XG is affecting Di significantly.

Table 4.17: Results of CS-ARDL: Impact of EXD

	Full Sample		UMI		LMI	
Variables	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Long Run						
EXD	2.454*	1.425	-51.421*	28.115	1.901**	0.955
FD	-1.471	4.020	-33.410	68.706	-1.615	6.611
GCF	0.070*	0.037	-0.065	0.248	0.058**	0.027
GDP	-0.021	0.034	-0.242	0.149	0.059*	0.032
TOP	-1.609**	0.725	35.249*	17.807	-2.127*	0.980
XG	0.021*	0.012	-0.216*	0.122	0.015*	0.009
C	30.491**	3.391	-90.643	239.115	42.531***	5.077
Short Run						
Di	-0.701***	0.053	0.726***	0.064	-0.706***	0.038
EXD	2.842	2.152	-4.673*	2.723	3.297**	1.618
FD	-1.036	7.352	12.575*	6.364	-1.251	10.350
GCF	0.111*	0.063	0.063*	0.037	0.097**	0.048
GDP	-0.045	0.058	-1.376	2.080	-3.424**	1.692
TOP	-2.911**	1.306	-0.019	0.020	0.105*	0.057
XG	0.038**	0.019	-0.004	0.017	0.025	0.016
ECM	-1.701***	0.053	-0.274***	0.064	-1.706***	0.038
C	57.643***	6.976	-89.056***	19.760	72.121***	8.823
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1						

Table 4.18: Result of MMQR for Full Sample: Impact of EXD

			Quantiles										
Var	Location	Scale	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
EXD	2.474*** (0.630)	-2.151*** (0.389)	7.082*** (1.130)	6.003*** (0.979)	4.685*** (0.806)	3.811*** (0.716)	3.071*** (0.660)	2.371*** (0.629)	1.659*** (0.625)	0.950 (0.644)	0.175 (0.692)	-0.735 (0.782)	-1.801* (0.918)
FD	-51.169*** (2.140)	6.724*** (1.320)	-65.573*** (3.834)	-62.201*** (3.321)	-58.080*** (2.734)	-55.350*** (2.428)	-53.036*** (2.239)	-50.848*** (2.135)	-48.623*** (2.120)	-46.406*** (2.184)	-43.984*** (2.347)	-41.138*** (2.653)	-37.808*** (3.112)
GCF	0.082*** (0.026)	-0.019 (0.016)	0.122*** (0.046)	0.113*** (0.040)	0.102*** (0.033)	0.094*** (0.029)	0.088*** (0.027)	0.082*** (0.026)	0.075*** (0.025)	0.069*** (0.026)	0.063** (0.028)	0.055* (0.032)	0.045 (0.037)
GDP	-0.144*** (0.051)	-0.029 (0.032)	-0.082 (0.092)	-0.097 (0.079)	-0.114* (0.066)	-0.126** (0.058)	-0.136** (0.054)	-0.146*** (0.051)	-0.155*** (0.051)	-0.165*** (0.052)	-0.176*** (0.056)	-0.188*** (0.064)	-0.202*** (0.074)
TOP	-1.880*** (0.613)	1.881*** (0.378)	-5.910*** (1.098)	-4.966*** (0.950)	-3.813*** (0.783)	-3.050*** (0.695)	-2.402*** (0.641)	-1.790*** (0.611)	-1.168* (0.607)	-0.547 (0.625)	0.130 (0.672)	0.927 (0.759)	1.858** (0.890)
XG	0.004 (0.005)	-0.008** (0.003)	0.022** (0.009)	0.018** (0.008)	0.013* (0.007)	0.009 (0.006)	0.006 (0.005)	0.004 (0.005)	0.001 (0.005)	-0.002 (0.005)	-0.005 (0.006)	-0.008 (0.006)	-0.012 (0.007)
C	86.313*** (2.424)	-0.030 (1.496)	86.376*** (4.345)	86.361*** (3.741)	86.343*** (3.091)	86.331*** (2.745)	86.321*** (2.531)	86.311*** (2.413)	86.301*** (2.391)	86.292*** (2.469)	86.281*** (2.659)	86.268*** (2.993)	86.254*** (3.490)
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

Table 4.19: Result of MMQR for UMI: Impact of EXD

			Quantiles										
Var	Location	Scale	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
EXD	-0.4127 (1.4400)	-4.6027*** (0.8948)	9.2518*** (2.7392)	7.0485*** (2.2703)	4.7944** (1.9443)	2.3454 (1.6589)	0.7021 (1.5163)	-0.8562 (1.4273)	-1.9319 (1.4036)	-3.4492** (1.4447)	-5.4091*** (1.5674)	-7.7629*** (1.7942)	-9.6178*** (2.0258)
FD	-47.4657*** (3.3037)	10.0127*** (2.0529)	-68.4900*** (6.2686)	-63.6969*** (5.2054)	-58.7932*** (4.4588)	-53.4657*** (3.8038)	-49.8909*** (3.4764)	-46.5011*** (3.2726)	-44.1610*** (3.2186)	-40.8603*** (3.3126)	-36.5967*** (3.5940)	-31.4761*** (4.1132)	-27.4411*** (4.6423)
GCF	0.1047 (0.0703)	-0.0178 (0.0437)	0.1422 (0.1276)	0.1336 (0.1105)	0.1249 (0.0946)	0.1154 (0.0804)	0.1090 (0.0734)	0.1030 (0.0695)	0.0988 (0.0685)	0.0929 (0.0697)	0.0853 (0.0754)	0.0762 (0.0871)	0.0690 (0.0990)
GDP	-0.2205*** (0.0637)	-0.0712* (0.0396)	-0.0710 (0.1163)	-0.1051 (0.1002)	-0.1399 (0.0858)	-0.1778** (0.0729)	-0.2033*** (0.0666)	-0.2274*** (0.0630)	-0.2440*** (0.0621)	-0.2675*** (0.0633)	-0.2978*** (0.0685)	-0.3342*** (0.0790)	-0.3629*** (0.0897)
TOP	-0.8112 (1.1400)	4.6348*** (0.7083)	-10.5430*** (2.2287)	-8.3244*** (1.8008)	-6.0545*** (1.5422)	-3.5885*** (1.3195)	-1.9337 (1.2065)	-0.3646 (1.1320)	0.7185 (1.1113)	2.2464** (1.1520)	4.2200*** (1.2520)	6.5902*** (1.4247)	8.4580*** (1.6024)
XG	0.0308*** (0.0087)	-0.0039 (0.0054)	0.0389** (0.0158)	0.0371*** (0.0136)	0.0352*** (0.0117)	0.0331*** (0.0099)	0.0317*** (0.0091)	0.0304*** (0.0086)	0.0295*** (0.0085)	0.0282** (0.0086)	0.0266*** (0.0093)	0.0246** (0.0108)	0.0231* (0.0122)
C	80.5757*** (4.4095)	-11.3899*** (2.7400)	104.4917*** (8.2976)	99.0393*** (6.9391)	93.4612*** (5.9456)	87.4009*** (5.0690)	83.3344*** (4.6315)	79.4783*** (4.3627)	76.8164*** (4.2926)	73.0616*** (4.4125)	68.2116*** (4.7859)	62.3868*** (5.4813)	57.7967*** (6.1867)
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

Table 4.20: Result of MMQR for LMI: Impact of EXD

Var	Location	Scale	Quantiles										
			0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
EXD	3.217*** (0.736)	-1.020** (0.452)	5.542*** (1.437)	4.776*** (1.153)	4.221*** (0.966)	3.832*** (0.857)	3.499*** (0.782)	3.137*** (0.728)	2.778*** (0.705)	2.444*** (0.715)	2.084*** (0.758)	1.644** (0.852)	1.331 (0.935)
FD	-47.346*** (3.470)	6.908*** (2.130)	-63.095*** (6.798)	-57.908*** (5.464)	-54.148*** (4.551)	-51.514*** (4.040)	-49.256*** (3.691)	-46.804*** (3.440)	- (44.374*** (3.331))	- (42.110*** (3.375))	- (39.670*** (3.576))	- (36.692*** (4.018))	- (34.575*** (4.407))
GCF	0.040 (0.027)	-0.023 (0.017)	0.093* (0.053)	0.076* (0.043)	0.063* (0.036)	0.054* (0.032)	0.047 (0.029)	0.039 (0.027)	0.030 (0.026)	0.023 (0.027)	0.015 (0.028)	0.005 (0.032)	-0.003 (0.035)
GDP	-0.010 (0.087)	-0.010 (0.053)	0.013 (0.169)	0.006 (0.136)	0.000 (0.114)	-0.004 (0.101)	-0.007 (0.092)	-0.011 (0.086)	-0.014 (0.083)	-0.017 (0.084)	-0.021 (0.089)	-0.025 (0.100)	-0.028 (0.110)
TOP	-2.380*** (0.724)	0.087 (0.444)	-2.578* (1.408)	-2.513** (1.129)	-2.465*** (0.950)	-2.432*** (0.843)	-2.404*** (0.769)	-2.373*** (0.714)	-2.343*** (0.692)	-2.314*** (0.702)	-2.284*** (0.746)	-2.246*** (0.837)	-2.220** (0.920)
XG	-0.010 (0.006)	-0.010** (0.004)	0.012 (0.012)	0.005 (0.010)	0.000 (0.008)	-0.004 (0.007)	-0.007 (0.007)	-0.010* (0.006)	-0.014** (0.006)	-0.017*** (0.006)	-0.020*** (0.007)	-0.025*** (0.007)	-0.027*** (0.008)
C	88.903*** (2.918)	6.811*** (1.791)	73.375*** (5.719)	78.489*** (4.591)	82.196*** (3.831)	84.793*** (3.401)	87.020*** (3.107)	89.437*** (2.894)	91.833*** (2.801)	94.066*** (2.838)	96.471*** (0.837)	99.407*** (3.383)	101.495** * (3.717)
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

Fourth external resource is EXD in this study and the impact of EXD upon Di is reported in Table 4.17 to 4.20. Here, EXD significantly increases export concentration for full sample and LMI in its mean outcome through CS-ARDL in table 4.17. It becomes a little different when the results are obtained for quantiles through MMQR. There is a significant increase in Di due to EXD at higher quantiles. These results are in line with another study (Egyir et al., 2020). It is unfortunate that many developing countries borrow funds which do not attribute to investment but consumption remains accommodated.

Theoretically and empirically it implies that economies with more EXD do not endeavor towards Di and does not have the potency to essentially induce in the production to add in new export lines and reshape the export scenario (Qambrani et al., 2024). It serves the survival objective in export concentration. Thus, developing economies that contract more level of external debt are at the advantage of export concentration. The inverse relationship augurs the importance of export concentration in developing economies indicating that these funds are used for productive investment activities and saves these economies from suffering inefficiencies and instability in already existing export lines (Mieno & Demachi, 2024). Importance of external debt for export concentration also favors the argument that developing economies portray their shallow domestic debt markets and external debt could increase export concentration. Theoretical underpinning of Debt overhang hypothesis favors these results (Afzal et al., 2024). EXD also lubricates industrial production but it sometimes increase exports in number but not in value (Akanbi et al., 2022; Edo & Oigiangbe, 2024). FD is also increasing Di in almost all quantiles for full sample and sub-samples. It has higher strength to expand and diversify exports in developing countries. GCF does not go in favour of Di rather it has the potential to impart the effects upon export concentration. Lower strength in capital and infrastructure of developing

countries does not allow the increase in Di. GDP has more strength to increase Di. It escalates production, investment and exports in the country. The results are robust for sample and UMI in table 4.19 and 4.20. The variable TOP is also increasing Di for full sample in table 4.17 and many quantiles of all panels are also showing the pronounced effects of TOP upon Di. Export base of developing countries is also increasing Di and it has significant effects in LMI. Developing countries usually have lesser investment and diversification and remain contingent upon resource based produce to face many economic challenges.

Table 4.21: Results of CS-ARDL: Impact of TCI

	Full Sample		UMI		LMI	
Variables	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Long Run						
TCI	-21.790**	10.999	-19.819*	11.296	-14.898*	6.671
FD	25.507	21.764	23.043	23.626	-34.173	16.153
GCF	-0.295	0.222	-0.311*	0.185	-0.012	0.096
GDP	-0.180**	0.077	-0.130	0.254	0.012	0.062
TOP	-6.391***	2.355	-3.886*	2.058	-6.343***	2.288
XG	.110	0.091	0.077**	0.035	-0.019*	0.011
C	101.701***	14.172	166.180***	53.625	143.963***	20.196
Short Run						
Di	0.352***	0.041	0.160***	0.056	0.199***	0.043
TCI	-5.993**	3.230	-13.161	9.686	-10.260**	4.754
FD	-4.278	6.95	0.560	7.232	-19.604*	10.106
GCF	-0.022*	0.046	-0.151	0.092	-0.019	0.066
GDP	-0.018	0.024	0.076	0.057	0.000	0.046
TOP	-4.423***	1.316	-13.161	9.686	-4.167**	1.690
XG	0.018**	0.010	0.042**	0.021	-0.013*	0.007
ECM	-0.648***	0.0406	-0.840***	0.056	-0.801***	0.043
C	74.491***	10.916	89.466***	7.535	110.078***	15.810
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1						

Model 1 (Objective 2)

Table 4.22: Result of MMQR for Full Sample: Impact of (TCI)

			Quantiles										
Var	Location	Scale	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
TCI	-1.197*** (0.412)	-1.451*** (0.259)	1.958** (0.774)	1.026 (0.637)	0.251 (0.533)	-0.335 (0.471)	-0.835* (0.432)	-1.279*** (0.411)	-1.803*** (0.404)	-2.234*** (0.414)	-2.746*** (0.443)	-3.378*** (0.504)	-4.090*** (0.587)
FD	-50.942*** (2.112)	4.868*** (1.325)	-61.527*** (3.947)	-58.400*** (3.248)	-55.799*** (2.728)	-53.833*** (2.410)	-52.156*** (2.211)	-50.668*** (2.100)	-48.908*** (2.065)	-47.462*** (2.119)	-45.743*** (2.269)	-43.622*** (2.573)	-41.235*** (3.001)
GCF	0.035 (0.026)	-0.009 (0.017)	0.055 (0.049)	0.049 (0.040)	0.045 (0.034)	0.041 (0.030)	0.038 (0.028)	0.035 (0.026)	0.031 (0.026)	0.029 (0.026)	0.025 (0.028)	0.021 (0.032)	0.017 (0.037)
GDP	-0.164*** (0.053)	-0.013 (0.033)	-0.135 (0.099)	-0.143* (0.082)	-0.150** (0.069)	-0.156** (0.061)	-0.160*** (0.056)	-0.164*** (0.053)	-0.169*** (0.052)	-0.173*** (0.053)	-0.178*** (0.057)	-0.184*** (0.065)	-0.190** (0.076)
TOP	-0.652 (0.579)	0.746** (0.363)	-2.274** (1.078)	-1.795** (0.888)	-1.396* (0.747)	-1.095* (0.661)	-0.838 (0.605)	-0.610 (0.575)	-0.340 (0.565)	-0.119 (0.580)	0.145 (0.622)	0.470 (0.704)	0.835 (0.822)
XG	0.004 (0.006)	-0.010*** (0.004)	0.026** (0.011)	0.019** (0.009)	0.014* (0.007)	0.010 (0.007)	0.006 (0.006)	0.003 (0.006)	0.000 (0.006)	-0.003 (0.006)	-0.007 (0.006)	-0.011 (0.007)	-0.016** (0.008)
C	84.849*** (2.599)	4.851*** (1.631)	74.303*** (4.845)	77.419*** (3.987)	80.010*** (3.358)	81.969*** (2.968)	83.640*** (2.720)	85.123*** (2.583)	86.876*** (2.540)	88.317*** (2.606)	90.030*** (2.794)	92.143*** (3.161)	94.521*** (3.695)
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

Table 4.23: Result of MMQR for UMI: Impact of (TCI)

			Quantiles										
Var	Location	Scale	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
TCI	-3.059** (1.282)	1.349* (0.809)	-5.987** (2.371)	-5.133*** (1.952)	-4.483*** (1.670)	-3.916*** (1.469)	-3.419** (1.340)	-3.019** (1.278)	-2.647** (1.259)	-2.184* (1.291)	-1.649 (1.395)	-1.000 (1.603)	-0.426 (1.836)
FD	-45.387*** (2.991)	7.274*** (1.887)	-61.176*** (5.618)	-56.572*** (4.589)	-53.068*** (3.903)	-50.009*** (3.429)	-47.330*** (3.134)	-45.175*** (2.986)	43.166*** (2.948)	40.670*** (3.030)	37.789*** (3.264)	34.290*** (3.762)	31.192*** (4.302)
GCF	0.002 (0.070)	0.044 (0.044)	-0.094 (0.130)	-0.066 (0.107)	-0.044 (0.092)	-0.026 (0.081)	-0.009 (0.073)	0.004 (0.070)	0.016 (0.069)	0.031 (0.071)	0.049 (0.076)	0.070 (0.088)	0.089 (0.101)
GDP	-0.212*** (0.064)	-0.043 (0.040)	-0.119 (0.117)	-0.146 (0.097)	-0.166** (0.083)	-0.184** (0.073)	-0.200*** (0.066)	-0.213*** (0.063)	-0.225*** (0.062)	-0.239*** (0.064)	-0.256*** (0.069)	-0.277*** (0.079)	-0.295*** (0.091)
TOP	1.322 (1.021)	2.870*** (0.644)	-4.908** (1.927)	-3.091** (1.570)	-1.709 (1.333)	-0.502 (1.171)	0.555 (1.071)	1.406 (1.020)	2.198** (1.007)	3.183*** (1.036)	4.320*** (1.115)	5.701*** (1.287)	6.923*** (1.471)
XG	0.032*** (0.008)	-0.007 (0.005)	0.047*** (0.014)	0.043*** (0.012)	0.039*** (0.010)	0.036*** (0.009)	0.034*** (0.008)	0.032*** (0.008)	0.030*** (0.007)	0.028*** (0.008)	0.025*** (0.008)	0.022** (0.009)	0.019* (0.011)

Table 4.23 Continued

	75.849*** (4.339)	- 8.063*** (2.737)	93.351*** (8.102)	88.247*** (6.638)	84.363*** (5.656)	80.972*** (4.971)	78.003*** (4.541)	75.614*** (4.327)	73.387*** (4.269)	70.620*** (4.387)	67.427*** (4.729)	63.548*** (5.444)	60.114*** (6.223)
C													
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

Table 4.24: Result of MMQR for LMI: Impact of (TCI)

			Quantiles										
Var	Location	Scale	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
TCI	-1.836*** (0.536)	-2.226*** (0.368)	3.200*** (1.194)	1.612* (0.964)	0.366 (0.770)	-0.604 (0.651)	-1.289** (0.584)	-2.159*** (0.521)	-2.821*** (0.487)	-3.516*** (0.482)	-4.206*** (0.499)	-5.177*** (0.571)	-6.008*** (0.660)
FD	-53.235*** (3.716)	1.968 (2.548)	57.686*** (8.171)	56.283*** (6.550)	55.181*** (5.364)	54.324*** (4.540)	53.718*** (4.042)	52.949*** (3.562)	52.364*** (3.352)	-51.749*** (3.309)	-51.139*** (3.452)	-50.281*** (3.923)	-49.547*** (4.509)
GCF	0.001 (0.030)	-0.032 (0.021)	0.073 (0.067)	0.050 (0.053)	0.033 (0.044)	0.019 (0.037)	0.009 (0.033)	-0.004 (0.029)	-0.013 (0.027)	-0.023 (0.027)	-0.033 (0.028)	-0.047 (0.032)	-0.059 (0.037)
GDP	-0.038 (0.095)	-0.009 (0.065)	-0.017 (0.208)	-0.024 (0.167)	-0.029 (0.137)	-0.033 (0.116)	-0.036 (0.103)	-0.040 (0.091)	-0.042 (0.085)	-0.045 (0.084)	-0.048 (0.088)	-0.052 (0.100)	-0.056 (0.115)
TOP	-1.882** (0.765)	-0.738 (0.525)	-0.212 (1.684)	-0.739 (1.350)	-1.152 (1.105)	-1.473 (0.935)	-1.700** (0.833)	-1.989*** (0.734)	-2.208*** (0.691)	-2.439*** (0.682)	-2.668*** (0.711)	-2.989*** (0.808)	-3.265*** (0.929)
XG	-0.010 (0.007)	-0.009* (0.005)	0.010 (0.016)	0.004 (0.013)	-0.001 (0.010)	-0.005 (0.009)	-0.008 (0.008)	-0.012* (0.007)	-0.014** (0.006)	-0.017*** (0.006)	-0.020*** (0.007)	-0.024*** (0.008)	-0.027*** (0.009)
C	92.530*** (3.663)	12.859*** (2.512)	63.437*** (8.130)	72.611*** (6.543)	79.808*** (5.277)	85.413*** (4.463)	89.372*** (3.994)	94.398*** (3.546)	98.223*** (3.320)	102.237*** (3.282)	106.225*** (3.409)	111.835*** (3.894)	116.634*** (4.497)
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

The results for impact of innovations in the form of TCI upon D_i are reported in Tables 4.21 to 4.24. It is evident that TCI is significantly increasing D_i in the CS-ARDL model for full sample and sub samples in the long run results and similar is found for MMRQ results for middle to higher quantiles. These results are slightly contradictory from another study (Mania & Rieber, 2019). Additionally, negative coefficient even though insignificant for full sample and sub-samples at many quantiles is unsurprising for those who do not provide very favorable arguments in favor of comparative advantage or in other words do not accomplish ‘standard trade theory’. More importantly, magnitude of coefficient is also increasing slightly with same sign (negative). TCI indicates emergence of manufactured products in the basket of merchandise exports with the persuasion to yonder PPF and comparative advantage. These results align with another study (Lectard & Rougier, 2018). TCI assumes a substantial investment in capital intensive goods, more specifically manufactured goods for which middle-income countries lack resources. The situation gets attention of a phrase “kick start” given in a study (Bruno et al., 2015). It indicates government intervention when production efforts are deviating from intensity of resources. TCI does indicate forced transition and reshape of PPF to enhance productive capacity in manufactured or capital-intensive goods. The phenomenon may not cause diversification in entire export basket rather remain sector specific for optimality. Lower quantiles of D_i show higher diversification and TCI is adding in these quantiles with a relative magnitude.

Adopting TCI and its core impact on D_i in full sample and sub samples diverts the attention towards dynamic comparative advantage. The theoretical junction stresses the application of ‘new trade theory’ with a wider policy scope (Fine & Van Waeyenberge, 2013). The peripheral argument also stresses upon productivity enhancement with more employment in manufacturing sector. The economies specifically middle income countries

undergo transitional phases and adjust beyond natural comparative advantage (Acharyya & Kar, 2014). Higher trends to adopt TCI make rapid adjustment towards reallocation of local factors of production. This strategy also mitigates terms of trade deterioration. Interventions are the structural requirements for building TCI and inducing regulatory framework provided the bottlenecks are reduced or removed (Cirera & Winters, 2015).

The middle-income countries are sometimes not acquiring well established financial markets and financial development remains a constraint to improve Di. These results are in favour of LMI but UMI are the exceptions. GCF is a proxy of capital formation which is significantly increasing Di for full sample and the results are in line with another study (Liaqat, 2019). More open economies are more tilted towards Di for all samples which indicates that the free trade paves the way for Di. These results are alike with another study (Martincus & Carballo, 2008). XG is also significantly increasing Di in a sub sample of LMI. Higher XG indicates that traditional trade theory is the building block towards new trade theory.

Table 4.25: Results of CS-ARDL: Impact of PAT

	Full Sample		UMI		LMI	
Variables	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Long Run						
PAT	-0.070*	0.038	0.047	0.056	-0.007	0.010
FD	-49.581**	23.928	-2.767	26.651	-34.900	17.324
GCF	0.333	0.226	0.074	0.115	0.192*	0.106
GDP	0.219*	0.115	-0.217*	0.119	0.067	0.101
TOP	-5.276	3.233	2.538*	1.485	-8.055**	3.889
XG	-0.020	0.045	0.080	0.050	-0.030	0.037
C	94.834***	13.136	61.045***	9.273	141.149***	24.037
Short Run						
Di	0.408***	0.043	0.258***	0.064	0.206***	0.044
PAT	-0.053	0.036	0.023	0.028	-0.007	0.008
FD	-16.083***	5.943	-7.613	15.043	-21.211**	9.991
GCF	0.034	0.053	0.028	0.068	0.095	0.076
GDP	0.068	0.047	-0.119	0.078	0.039	0.058
TOP	-2.288*	1.356	1.820	1.299	-5.621**	2.230
XG	-0.009	0.017	0.043	0.033	-0.020	0.021
ECM	-0.592***	0.043	-0.742***	0.064	-0.794***	0.044***
C	94.834***	13.136	45.975***	6.782	99.658***	13.023
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1						

Table 4.26: Result of MMQR for Full Sample: Impact of (PAT)

			Quantiles										
Var	Location	Scale	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
PAT	-0.000*** (0.000)	0.000 * (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000 *** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000 *** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.002** (0.000)	-0.002* (0.000)
FD	-44.091*** (2.563)	6.460*** (1.572)	-57.225*** (4.426)	-54.523*** (3.908)	-50.700*** (3.256)	-48.034*** (2.889)	-45.937*** (2.678)	-43.920*** (2.563)	-41.687*** (2.542)	-39.334*** (2.636)	-36.876*** (2.848)	-34.516*** (3.154)	-31.491*** (3.678)
GCF	0.075*** (0.025)	-0.026* (0.016)	0.128*** (0.044)	0.117*** (0.039)	0.101*** (0.032)	0.090*** (0.029)	0.082*** (0.026)	0.074*** (0.025)	0.065*** (0.025)	0.055** (0.026)	0.045 (0.028)	0.036 (0.031)	0.024 (0.036)
GDP	-0.149*** (0.0523)	-0.004 (0.032)	-0.141 (0.090)	-0.142* (0.080)	-0.144** (0.066)	-0.146** (0.059)	-0.147*** (0.055)	-0.148*** (0.052)	-0.149*** (0.052)	-0.150*** (0.054)	-0.152*** (0.058)	-0.153** (0.064)	-0.155** (0.074)
TOP	-2.006*** (0.574)	1.747*** (0.352)	-5.559*** (0.991)	-4.828*** (0.876)	-3.794*** (0.730)	-3.073*** (0.647)	-2.506*** (0.600)	-1.960*** (0.575)	-1.356** (0.570)	-0.720 (0.591)	-0.055 (0.638)	0.584 (0.706)	1.402* (0.827)
XG	0.003 (0.005)	-0.009*** (0.003)	0.022** (0.009)	0.018** (0.008)	0.013* (0.007)	0.009 (0.006)	0.006 (0.006)	0.003 (0.005)	0.000 (0.005)	-0.003 (0.005)	-0.007 (0.006)	-0.010 (0.007)	-0.014* (0.008)
C	87.387*** 2.367	-0.577 (1.452)	88.560*** (4.085)	88.319*** (3.604)	87.978*** (3.001)	87.739*** (2.665)	87.552*** (2.472)	87.372*** (2.361)	87.172*** (2.337)	86.962*** (2.426)	86.743*** (2.632)	86.532*** (2.915)	86.262*** (3.369)
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

Table 4.27: Result of MMQR for UMI: Impact of (PAT)

			Quantiles										
Var	Location	Scale	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
PAT	0.000* (0.000)	0.000*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	0.000** (0.000)	-0.001 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000* (0.000)
FD	-38.926*** (4.064)	1.763 (2.534)	-42.330*** (6.887)	-41.749*** (6.219)	-41.024*** (5.464)	-40.164*** (4.712)	-39.345*** (4.212)	-38.806*** (4.038)	-38.361*** (4.004)	-37.769*** (4.116)	-37.081*** (4.451)	-36.245*** (5.093)	-35.307*** (6.020)
GCF	0.212** (0.083)	0.054 (0.052)	0.107 (0.141)	0.125 (0.127)	0.147 (0.112)	0.174* (0.097)	0.199** (0.086)	0.215*** (0.083)	0.229*** (0.082)	0.247*** (0.084)	0.268*** (0.091)	0.294*** (0.104)	0.323*** (0.123)
GDP	-0.207*** (0.069)	-0.077** (0.043)	-0.059 (0.118)	-0.084 (0.106)	-0.116 (0.093)	-0.153* (0.081)	-0.189*** (0.072)	-0.212*** (0.069)	-0.231*** (0.068)	-0.257*** (0.070)	-0.287*** (0.076)	-0.323*** (0.087)	-0.364*** (0.103)
TOP	-2.727** (1.117)	4.579*** (0.697)	-11.566*** (2.039)	-10.057*** (1.678)	-8.175*** (1.496)	-5.942*** (1.329)	-3.816*** (1.187)	-2.416** (1.112)	-1.260 (1.108)	0.277 (1.151)	2.063* (1.233)	4.235*** (1.418)	6.671*** (1.674)
XG	0.020 (0.013)	-0.015** (0.008)	0.050** (0.021)	0.045** (0.019)	0.038** (0.017)	0.031** (0.015)	0.024*** (0.013)	0.019 (0.012)	0.015 (0.012)	0.010 (0.013)	0.004 (0.014)	-0.004 (0.016)	-0.012 (0.019)
C	84.437*** (4.351)	-13.186*** (2.713)	109.889*** (7.722)	105.545*** (6.558)	100.126*** (5.826)	93.695*** (5.128)	87.573*** (4.577)	83.542*** (4.321)	80.213*** (4.298)	75.789*** (4.453)	70.645*** (4.785)	64.390*** (5.488)	57.378*** (6.474)
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

Table 4.28: Result of MMQR for LMI: Impact of (PAT)

			Quantiles										
Var	Location	Scale	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
PAT	-0.000*** (0.000)	0.000 * (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.001 *** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001 *** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.002** (0.000)	-0.002* (0.000)
FD	-46.091*** (2.663)	6.560*** (1.672)	-57.225*** (4.426)	-54.523*** (3.908)	-50.700*** (3.206)	-58.034*** (2.819)	-55.937*** (2.678)	-53.920*** (2.543)	-49.687*** (2.542)	-45.334*** (2.636)	-36.876*** (2.848)	-34.516*** (3.154)	-31.491*** (3.678)
GCF	0.075*** (0.035)	-0.036* (0.014)	0.128*** (0.044)	0.127*** (0.039)	0.121*** (0.032)	0.098*** (0.029)	0.092*** (0.028)	0.084*** (0.027)	0.065*** (0.025)	0.055** (0.029)	0.049 (0.028)	0.039 (0.031)	0.026 (0.036)
GDP	-0.159*** (0.053)	-0.006 (0.033)	-0.141 (0.090)	-0.142* (0.081)	-0.144** (0.067)	-0.145** (0.059)	-0.147*** (0.056)	-0.149*** (0.052)	-0.150*** (0.052)	-0.152*** (0.055)	-0.168*** (0.058)	-0.163** (0.065)	-0.156** (0.075)
TOP	-2.016*** (0.576)	1.757*** (0.354)	-5.569*** (0.991)	-4.898*** (0.876)	-3.994*** (0.730)	-3.173*** (0.647)	-2.806*** (0.630)	-1.960*** (0.575)	-1.756** (0.574)	-0.720 (0.591)	-0.055 (0.648)	0.584 (0.726)	1.402* (0.827)
XG	0.015 (0.005)	-0.013*** (0.013)	0.025** (0.019)	0.029** (0.018)	0.023* (0.017)	0.029 (0.016)	0.026 (0.009)	0.013 (0.008)	0.009 (0.006)	-0.008 (0.006)	-0.007 (0.008)	-0.010 (0.007)	-0.014* (0.008)
C	87.466*** 2.487	-0.581 (1.454)	88.560*** (4.085)	88.319*** (3.604)	87.978*** (3.071)	87.429*** (2.665)	87.562*** (2.572)	87.312*** (2.381)	87.102*** (2.367)	85.822*** (2.456)	86.743*** (2.642)	86.632*** (2.945)	86.392*** (3.389)
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1													

Innovations are the combination of input and output enabling alterations at PPF through newly emerged productive schemes, managerial and business practices. Innovations are a vibrant view of imperfect competition and a reasonable imitation (Linder, 1961). A systematic and schematic linkage can better explain indicators of innovations i.e. input and output indicators separately. Patents filed by residents and non-residents are the suitable proxy of innovations for this study (Bryan & Williams, 2021). Significant contribution of PAT for Di is observed for full sample in the long run results for CS-ARDL.

It is a comprehensive view of innovations and the same results are also been reported in a similar study (Oliveira et al., 2020). Here, Schumpeter's theory of innovations hold for sample panel of countries indicating that higher pace of innovations have higher probability for diversification in manufacturing goods. Market size is also significantly increasing Di for UMI which suggests that higher market size has higher probability to diversify exports bundle and the results are in line with another study. Open economies are also increasing Di for all samples which suggests that opening exports and imports under free trade can improve diversification in exports.

4.6 Results and Discussion for Model 2 (Objective 3)

Table 4.29: PVAR results

Full Sample			
Dependent variables	Di	XG	GDP
Di	-----	-37.069 (17.146)***	-13.861 (7.298)**
XG	-0.005 (0.004)**	-----	0.004 (0.005)*
GDP	-0.006 (0.003)***	0.135 (0.003)*	-----
Upper-Middle Income (UMI)			
Di	-----	15.041(4.012)*	-7.207 (2.002)***
XG	11.021 (0.987)**	-----	-0.001 (0.020)
GDP	0.508 (0.080)**	0.109 (0.007)***	-----
Lower-Middle Income			
Di	-----	-6.002 (1.901)**	-4.050 (1.044)***
XG	0.078 (0.014)***	-----	-0.007 (0.005)***
GDP	0.007 (0.003)**	0.005 (0.003)**	-----

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Results of PVAR estimation method are reported in Table 4.29 for full sample of middle-income countries, UMI and LMI. Significance of export led growth is affirmed for full sample and both sub samples. It provides an insight into a fact that countries either striving to exploit their available resources or managing through novel means are significantly improving GDP through XG. Economic growth in middle income countries is increasing due to their natural resource-based produce either agriculture, oil-based products or partly through manufacturing or services sector (Gnangnon, 2021b).

In addition to intuitive appeal and remarkable predictive power of XG in explaining economic growth the natural resource potential of these economies is authentic. These results are in line with a few panel data based studies (Ahmad et al., 2018; Kalaitzi & Chamberlain, 2020). The growth led export hypothesis could gain attention when full

sample is split into sub samples. Although full sample of middle income developing countries has identification for this hypothesis yet the sub samples are providing reverse evidence and the results are in line with couple of studies conducted at UAE and 13 transition economies (Çetintaş & Barişik, 2009; Kalaitzi & Cleeve, 2018). The former studies employed data set for a few countries to form panel but this study used a large data set encompassing many middle-income countries. The bidirectional causality is observed for only full sample. The data is further sliced into groups and a cursory look gives an indication of few more insights. A rise in GDP in sub samples is significantly affecting Di, which seems more mindful. Diversified production base, potentially improves Di, having multifaceted benefits for an economy. The full sample is providing significant impact of GDP upon Di and the full samples are blossoming to prosper through economic growth led export diversification. It also is quite obvious in descriptive statistics in Table 4.1 that diversification for all panels is not high so, still less strengthened Di could impart significant impact upon GDP. The fact also aligns that drivers of Di provide a more strength to GDP and the situation remains somehow different for middle income countries than high income countries (Mora & Olabisi, 2021). Thus, unidirectional hypothesis is affirmed for economic growth led export diversification in sub samples.

Moving further, the results for export growth led export diversification and export diversification led export growth rate are also reported in Table 4.29. The variable XG is significantly increasing Di for full sample and this causality is bidirectional. Increase in XG is significantly possible by increase in export concentration when many resource dependent countries remain contingent upon resource based products. A formal indication for fundamental relationship i.e. causality from Di to GDP is providing evidence in full sample and sub-samples. This result is in line with a panel data study and a country specific study

(Matezo et al., 2021; Young, 2023). Also, economic growth led export diversification did provide significance for full sample but sub-samples are not giving the details with significant addition.

It gets a remarkable attention when XG, GDP and international integration is modeled in middle income countries. XG remains an igniting factor for economic growth rate in developing/middle income countries. More so, XG and GDP leads to Di. Generally, unidirectional and bidirectional causality among XG, GDP and Di provide a novel direction towards policy insight in developing countries.

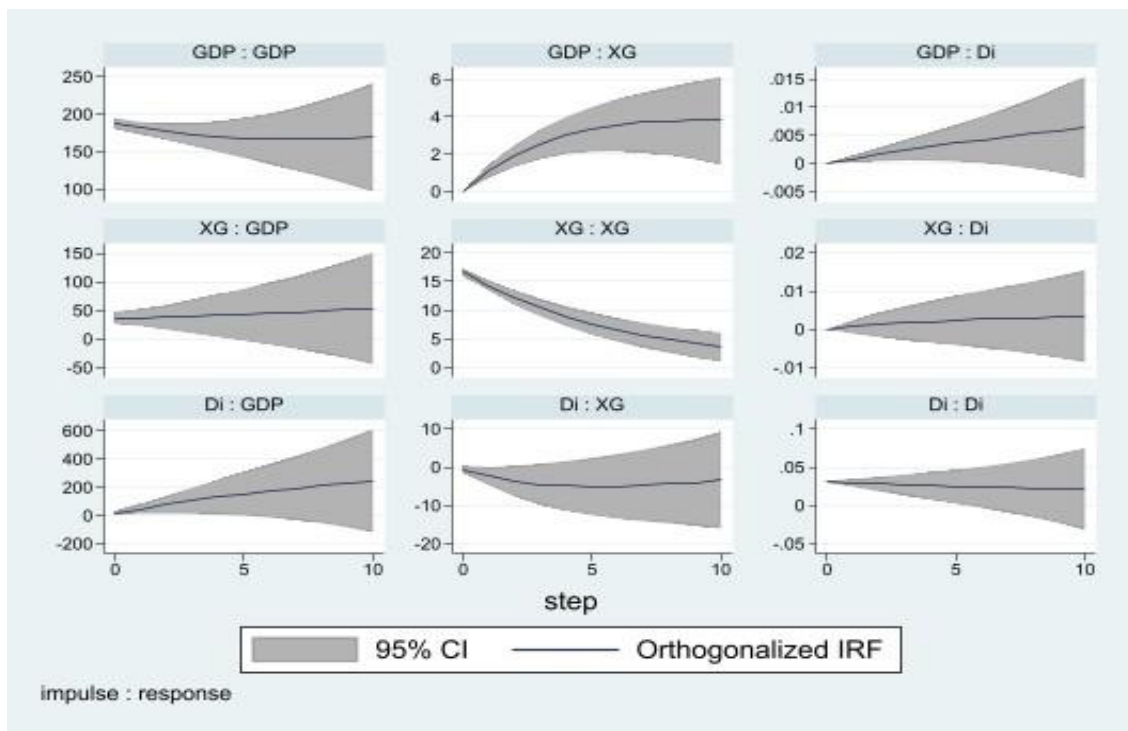


Figure 4.1: Variance Decomposition Analysis for Full Sample.

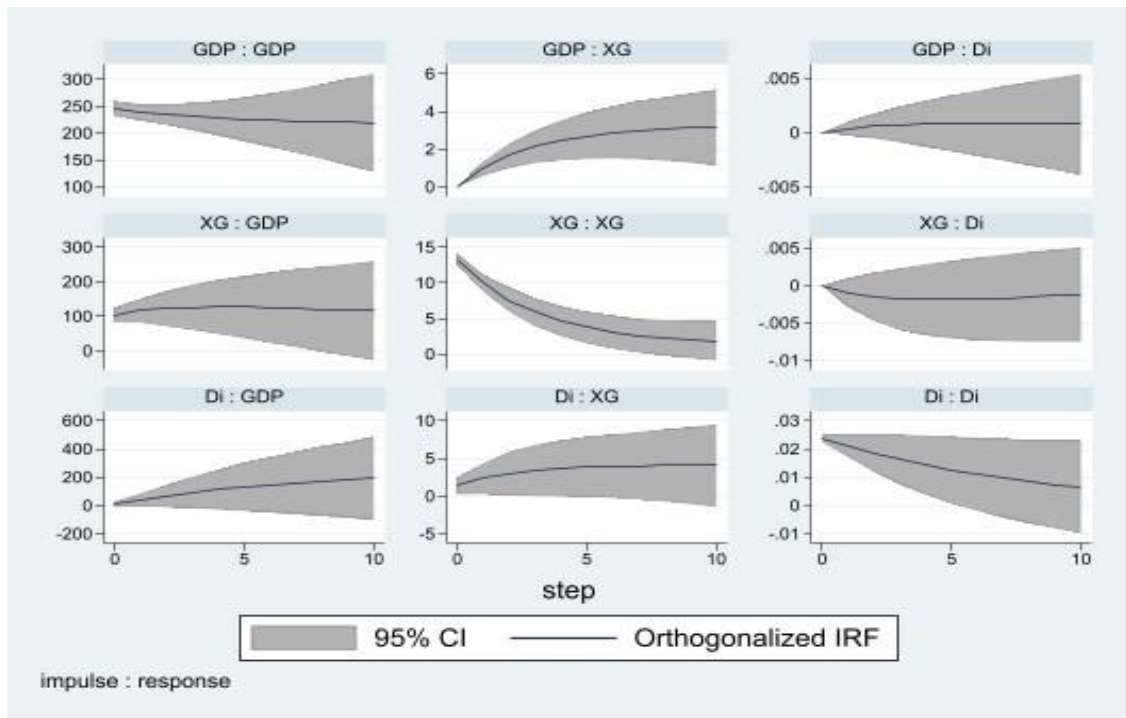


Figure 4.2: Variance Decomposition Analysis for UMI.

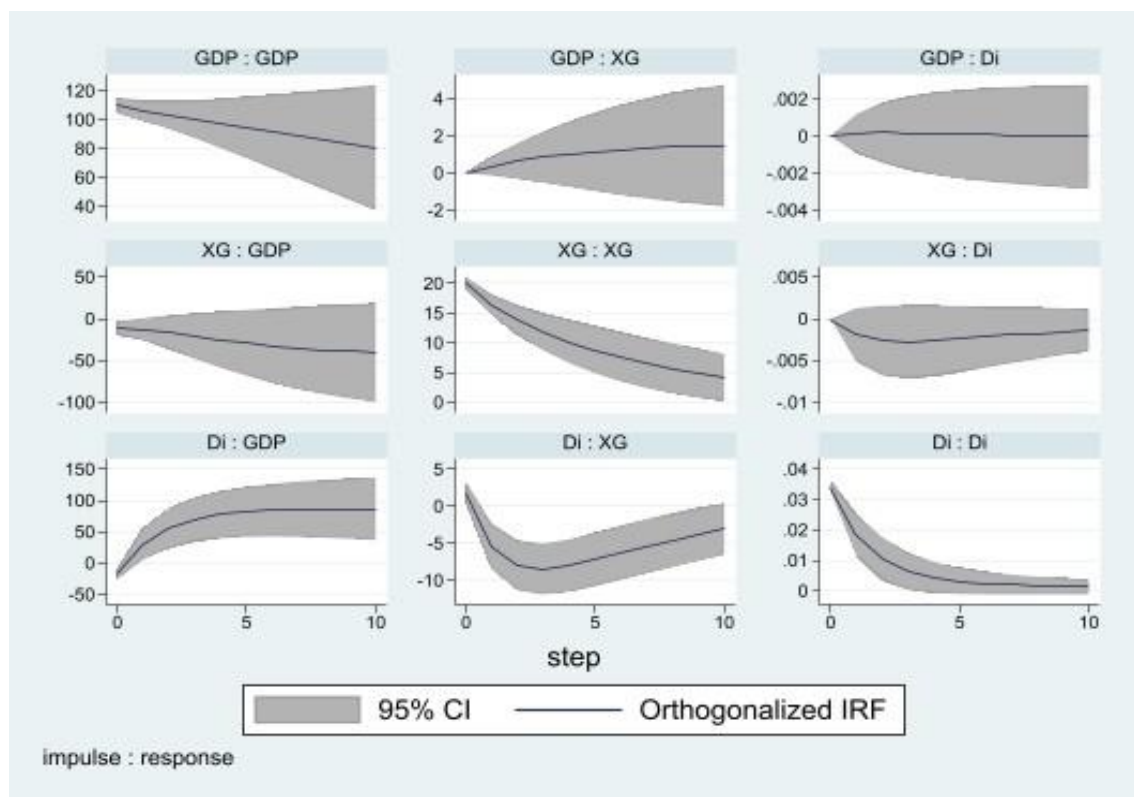


Figure 4.3: Variance Decomposition Analysis for LMI.

Figures 4.1, 4.2, and 4.3 present the impulse response function (IRF) of PVAR estimates for full sample, UMI and LMI respectively. Part (a) of fig 4.1 shows the response of GDP to itself for full sample and depicts that one time period shock in GDP initially reduces it but stabilizes at a lower level in next time periods. Similar pattern is observed for part (a) of Figure 4.2 for UMI but it is different for LMI as it kept reducing itself in the entire sample period. Part (b) of Figure 4.1, 4.2, and 4.3 exhibit impact of XG on GDP for full sample, UMI and LMI respectively. The crux of matter clearly indicates that XG marginally increases GDP in full sample initially but stabilizes at a bit lower level in parts (b) of fig 4.1. It is somehow different at initial level for sub-samples as XG reduces GDP initially, and stabilizes afterwards. The scenario of UMI and LMI show that stability lies at a slightly higher level in next periods. Part (c) of Figure 4.1, 4.2, and 4.3 show that Di increases GDP which means export concentration initially increase GDP and successively achieves Di. Again, the scenario of LMI shows a continuous increase in GDP but with a least magnitude and a lesser pace. Part (d) of Figure 4.1, 4.2, and 4.3 display effect of GDP on XG which portray a good increasing trend at initial stage but stabilizes at a somewhat lower level in all panels. Part (e) of Figure 4.1, 4.2, and 4.3 show a similar pattern of XG response to itself and the pattern of movement is similar for all panels depicting a reduction in the initial period and then a stable movement at a lower level in future periods. Part (f) of Figure 4.1, 4.2, and 4.3 provide an insight into Di for reducing XG which are dramatically different for all samples. Di reduces XG in beginning for full sample but the concentration increases XG for UMI and then a stable level is observed for next periods.

LMI countries are again an exception giving a straight and stable position in all periods. Part (g) of all Figures lament a unidirectional causality from GDP to Di. After reduction in beginning period GDP leads to Di, it stabilizes in next periods for full sample

and UMI. The case is reverse for LMI. An increase in GDP keeps increasing concentration in this panel i.e., LMI. Part (h) of all Figures provide an increase is Di due to XG but the intensity is remarkably lower for LMI countries. Furthermore, a bit lower increase shows a stable trend in next periods. The XG keeps adding in concentration and then takes a turn to increase Di.

Table 4.30: Variance Decomposition Analysis

Variance Decomposition Analysis – Full Sample									
	Di			XG			GDP		
	Di	XG	GDP	Di	XG	GDP	Di	XG	GDP
1	1	0	0	0.001	0.999	0	0.006	0.038	0.956
2	0.999	0.000	0.000	0.012	0.986	0.002	0.035	0.038	0.927
3	0.998	0.001	0.001	0.029	0.964	0.007	0.078	0.038	0.884
4	0.996	0.001	0.002	0.049	0.937	0.014	0.129	0.038	0.834
5	0.994	0.002	0.004	0.069	0.908	0.023	0.183	0.037	0.780
6	0.991	0.003	0.006	0.088	0.881	0.032	0.237	0.037	0.726
7	0.987	0.004	0.009	0.104	0.855	0.041	0.289	0.036	0.675
8	0.983	0.005	0.012	0.117	0.832	0.050	0.337	0.035	0.628
9	0.978	0.006	0.016	0.128	0.812	0.060	0.381	0.035	0.585
10	0.973	0.007	0.019	0.135	0.796	0.069	0.420	0.034	0.546
Variance Decomposition Analysis – Upper Middle-Income Countries									
	Di			XG			GDP		
	Di	XG	GDP	Di	XG	GDP	Di	XG	GDP
1	1	0	0	0.010	0.990	0	0.001	0.153	0.846
2	0.999	0.001	0.000	0.025	0.972	0.003	0.012	0.170	0.818
3	0.997	0.002	0.000	0.045	0.945	0.010	0.028	0.181	0.790
4	0.995	0.004	0.001	0.068	0.912	0.020	0.049	0.188	0.763
5	0.994	0.005	0.001	0.092	0.876	0.032	0.072	0.190	0.738
6	0.992	0.007	0.001	0.116	0.840	0.045	0.096	0.191	0.714
7	0.991	0.008	0.001	0.139	0.803	0.058	0.120	0.189	0.691
8	0.989	0.009	0.002	0.160	0.769	0.071	0.143	0.186	0.671

Table 4.30 continued

9	0.988	0.010	0.002	0.180	0.737	0.083	0.166	0.182	0.652
10	0.988	0.010	0.002	0.198	0.707	0.095	0.187	0.178	0.635
Variance Decomposition Analysis – Lower Middle-Income Countries									
	Di			XG			GDP		
	Di	XG	GDP	Di	XG	GDP	Di	XG	GDP
1	1	0	0	0.009	0.991	0	0.026	0.010	0.964
2	0.998	0.002	0.000	0.046	0.954	0.000	0.051	0.012	0.938
3	0.993	0.006	0.000	0.100	0.899	0.001	0.112	0.014	0.873
4	0.989	0.011	0.001	0.143	0.856	0.001	0.170	0.018	0.812
5	0.985	0.015	0.000	0.172	0.826	0.002	0.216	0.023	0.761
6	0.982	0.018	0.001	0.192	0.805	0.002	0.252	0.028	0.720
7	0.979	0.021	0.000	0.205	0.792	0.003	0.280	0.034	0.686
8	0.977	0.023	0.000	0.213	0.783	0.004	0.303	0.039	0.658
9	0.976	0.024	0.001	0.218	0.776	0.005	0.322	0.045	0.633
10	0.974	0.026	0.000	0.221	0.772	0.006	0.338	0.050	0.613

Results for variance decomposition analysis are reported in Table 4.29. It is remarkable to note that contribution of Di to itself is enormously high for full sample followed by UMI sub samples. Impact of Di upon XG and GDP is at a varying magnitude. Concentration in exports does increase XG and GDP significantly for all panels, Intensity of this causality relationship is almost similar with a trivial difference for full sample. Higher trend is reported for sub-samples, when export concentration increases XG more than GDP. Although Di has unidirectional causality towards GDP, but the rate of increase is trivial. Furthermore, XG has unidirectional causality towards GDP for all panels. XG has a causal increase towards Di for all panels but the increase is meager. XG is significantly affecting GDP than Di. Similarly, GDP is increasing XG with a varying magnitude for full sample and sub samples. The intensity of variation is trivial with an up and down swing in different

periods, GDP has a reducing trend towards XG but at a very slow pace for all sample. The GDP has unidirectional causality towards Di for all panel but the increase is quite meager for full sample and LMI whereby a better change is an evidence for UMI panel.

4.7 Chapter Summary

This chapter provides the picture of results obtained through estimation methods and their discussions. Two models are constructed, keeping in view the objectives of study. Model 1 provides impact of each external resources and each innovation strategy upon Di separately. The applied estimation technique is CS-ARDL and the robustness is checked by MMQR. The key external resource affects the outcome variable with varying degrees and magnitudes.

The innovations also provide a view of significant impact on Di. The outcome variable provides a sustained picture of an economy. Furthermore, causality relationship has endogenous nature so, PVAR model is built for its estimation. It can be easily possible that XG leads to higher economic trends accounted through GDP of an economy. Crucial nature of these variables for middle income countries is proved because either of the two variables can lead the economy towards Di for sub samples.

CHAPTER 5

CONCLUSION AND POLICY IMPLICATIONS

5.1 Introduction

The study examines the impact of external resources in the form of external capital i.e. FDI, REM, AID and EXD and innovation strategies represented by TCI and PAT in selected developing countries. The selection of countries remains restricted to middle income countries for the period 1995-2001. Selected sample is further sliced into sub-samples UMI & LMI. Enhancement in diversification of export is further checked through a causality relationship among Di, XG and GDP.

5.2 Conclusion and Main Findings

In order to examine the impact of external resources and innovations on Di, Financial development, capital of the country, size of the market, openness to trade and growth in exports are taken as control variables. For estimation purpose, CS_ARDL is applied and the robustness is checked through MMQR for inquiring the above said impact. Findings in model 1 indicate that external resource in the form of external capital add in export concentration/diversification. Results of CS-ARDL MMQR show that FDI, REM AID, FD, GDP and TOP are the core factors to increase Di. Since, XG has an initiation towards economic uplift and its role is observed in causality relationship.

The variable FDI enhances Di in host sample countries. However, the magnitude of enhancement varies with development level. FDI is more effectively enhancing Di in UMI which is because of their absorptive capacity. FDI makes host country more export and investment oriented which further dwells Di. Developed countries invest in developing

countries and seek many potential benefits related to cost, labour and resources. Here, product cycle model holds for effect of FDI on Di in developing countries.

This study also identifies REM as a determinants of Di. There exists a clear potential to invest in a sizeable fraction to realize the positive spillover effects of Di. Migrants either send money to family for investment or themselves become the investors with a novel production idea. New scheme of production does provide potential benefits to the economy. Now, the Self-discovery theory has foothold for developing countries.

It is also identified in this study that AID has potentially increased Di in developing countries. Many developing countries rely on AID for production and investment. It happens because of their budget deficit and lesser resource potential to increase production of manufacturing goods. Two gap theory is relevant in this case, for developing countries to increase Di through AID.

It is noteworthy that EXD has the potential to increase export concentration. Less developed domestic debt markets frequently depend upon external source of borrowing to meet their financial obligations, so their debt portfolio is dominated by external borrowing. There may perhaps, be a vicious cycle between EXD and Di and reminds debt overhang hypothesis to hold.

Di enhancing impact of TCI and PAT has brought to limelight the vital nature of innovations in middle income countries. It colludes that manufacturing sector has its dominance in sample countries. Perhaps, these countries are striving to induce Di through innovations. More so, new trade theory has a partial view for sample countries and the Schumpeter's theory of innovation has evidence for these countries.

Generally, middle income countries are more tilted towards XG so Model 2 is also constructed against objective 3 to know the causality among Di, XG and GDP. The causality

directions also show the same picture in model 2. The variable XG has unidirectional causality for GDP in all panels. The bidirectional causality between XG and GDP is proved for full sample, but variation is observed for sub samples in growth led export hypothesis. This again gives an indication of holding traditional trade theory. Interestingly, increase in XG or GDP signify their role to increase Di for full samples but exception for UMI and LMI. The variables significantly affect concentrating export basket at first for all samples but diversification is observed at later stages.

5.3 Policy Implications

Overall, the estimated significant and enhancing effect of FDI, REM, AID, FD, GDP and TOP is portrayed for Di. Overall, external resources are providing the partial view of increasing Di, as three out of four resources are the route to Di, but the remaining one source is showing the alternative (export concentration) significant relationship with outcome variable. Policy implications do suggest middle income countries to move on the path of Di. Lack of productive capacity disallows enhancement in Di and sometimes it is the lack of standard quality products, also not permitting to compete in international market. Exploring more to increase value added products can also increase Di. Thus, enhancing and taking fruitful measures to invite FDI is a strong policy tool for these countries. Efforts to attract more FDI can increase competitiveness in economies. Country specific regulations for FDI, REM and AID need to attain a special attention of regulatory bodies.

Innovations show institutional and organizational arrangement of a country which are proxied through TCI and patents filing in the country. TCI is the alternate of import substitution policies which can further put the economy on path of sustainable development. Indeed, TCI is increasing Di in this study. Favourable policies need to be aligned for

enhancing TCI but the initial alignment with endowed factor must remain a pre-requisite. TCI is a translation of defying comparative advantage and did provide well founded, pronounced effect on Di. TCI should be given a further well-established reorganization of economy for which middle income and especially LMI sometimes lack push and pull factors. These countries are sometimes stick to standard trade theory whereby UMI are seemingly in transitional phase in moving from traditional to new trade theory. Higher achievement of Di is more sustaining for an economy but the required strength at its sustenance level is a necessary condition.

Moreover, filling patents are the general view of investment projects in the economy. The variable PAT is significantly increasing Di for middle income countries. Government in these countries should promote infrastructure for more innovations. Sample countries need to align policies in favour of production and investment which can further stimulate TCI and patents filing in sample countries. Furthermore, strengthening FD and GCF in sample countries will be helpful for moving beyond their production frontier. Higher GDP necessarily increases Di, so higher economic growth tends its trend towards diversification in exports.

Causality in model 2 also suggest to improve sustained growth to move towards new trade theory. Motivation of objective 3 is the blend of new trade theory and standard trade theory when middle income countries are the sample of study. The results affirmed the bidirectional causality between exports and growth in LMI. It is seen that growth is mainly led by exports in these countries. The diversified export base is reinforcing exports and growth in UMI. Enhancing XG and GDP is a necessary condition for these countries to realize a sufficient condition of achieving higher Di which again affects sustained growth. It tells a story of focusing XG and GDP. Middle income countries are warned for diversified

export basket before attaining an optimal standard for XG and GDP. The LMI have low potential to increase Di but UMI can better adopt Di increasing strategies.

5.4 Limitation of the Study

The results reported in this study are not manifesting the general stance to each economy used as a sample in this study. The varying degree of results is perhaps, the outcome of varying degree of industrialization in sample countries. Bifurcation of countries on the basis of industrialization can provide a clear picture for the profile of Di in sample countries. Another clarity can be envisaged if the similar is revised on the basis of regional arrangements of countries by conducting regional studies. Different regions in the globe are endowed with variety of resources. An available resources-based study can further dig to explore the varying degree of Di in sample countries.

5.5 Future research

The key hypothesis of study remains to consider external resources and innovation factors on Di in selected developing middle income countries. Moreover, a causal relationship is also addressed by considering XG, GDP and Di. A well-founded explanation is given for all panels. The limited nature of study did not identify channels to interlink explanatory variables with outcome variable. The macroeconomic variables representing structure of economy can be addressed in future research. The diversified export base always requires optimal industrial and capital structure of economy. Domestic investment and capital level of economy along with human capital to add as proxy of innovation may address the outcome variable through various channels. These variables can be significant contributors in Di especially when regional natural resource endowment is addressed. Future research can extend this study by adding a few other important control variables like

domestic financial development, government consumption and human development index for these group of countries. Quality of institutions can also be added as a control variable to find the optimality of this variable to affect Di. Addressing the varying degree of domestic economy structure can be a fruitful contribution in future research.

REFERENCES

- Abbas, S. A., Selvanathan, S., & Selvanathan, E. A. (2023). Structural transformation, urbanization, and remittances in developing countries: A panel VAR analysis. *Economic Analysis and Policy*, 79, 55-69.
- Abegaz, M., & Lahiri, S. (2020). Entry and survival in the export market: Spillovers from foreign and outward-looking domestic firms in Ethiopia. *The European Journal of Development Research*, 32(4), 847-872.
- Abrigo, M. R., & Love, I. (2016). Estimation of panel vector autoregression in Stata. *The Stata Journal*, 16(3), 778-804.
- Acemoglu, D. (1997). Training and innovation in an imperfect labour market. *The Review of Economic Studies*, 64(3), 445-464.
- Acharyya, R., & Kar, S. (2014). *International trade and economic development*. Oxford University Press.
- Adams, R., Jeanrenaud, S., Bessant, J., Denyer, D., & Overy, P. (2016). Sustainability-oriented innovation: A systematic review. *International Journal of Management Reviews*, 18(2), 180-205.
- Adedoyin, L. I., Babalola, B. M., Otekunri, A. O., & Adeoti, J. O. (2016). External debt and economic growth: Evidence from Nigeria. *Acta Universitatis Danubius. Œconomica*, 12(6).
- Aditya, A., & Acharyya, R. (2013). Export diversification, composition, and economic growth: Evidence from cross-country analysis. *The Journal of International Trade & Economic Development*, 22(7), 959-992.

- Afzal, M., Memon, A. K., & Khatri, M. B. (2024). Constraints on Economic Development in South Asia: Escalating External Debt and Diminishing Exports. *International Research Journal of Management and Social Sciences*, 5(1), 176-192.
- Agbola, F. W. (2013). Does human capital constrain the impact of foreign direct investment and remittances on economic growth in Ghana? *Applied Economics*, 45(19), 2853-2862.
- Agosin, M. R. (2007). *Export diversification and growth in emerging economies*.
- Agosin, M. R., Alvarez, R., & Bravo-Ortega, C. (2012). Determinants of export diversification around the world: 1962–2000. *The World Economy*, 35(3), 295-315.
- Aguirre, M., & Ibikunle, G. (2014). Determinants of renewable energy growth: A global sample analysis. *Energy Policy*, 69, 374-384.
- Ahmad, F., Draz, M. U., & Yang, S.-C. (2018). Causality nexus of exports, FDI and economic growth of the ASEAN5 economies: evidence from panel data analysis. *The Journal of International Trade & Economic Development*, 27(6), 685-700.
- Ahmed, J., Mughal, M., & Martínez-Zarzoso, I. (2021). Sending money home: Transaction cost and remittances to developing countries. *The World Economy*, 44(8), 2433-2459.
- Ajide, F. M., & Osinubi, T. T. (2024). Upgrading economic complexity in Africa: The role of remittances and financial development. *Global Business and Economics Review*, 30(3), 359-382.
- Akanbi, A., Uwaleke, U. J., & Ibrahim, U. A. (2022). Effect of external debt service on economic growth in Nigeria. *Journal of Service Science and Management*, 15(4), 437-451.

- Akkas, E., & Altiparmak, S. O. (2023). Innovation, Technology Transfer, and Endogenous Growth in the GCC Countries. In *Social Change in the Gulf Region: Multidisciplinary Perspectives* (pp. 397-413). Springer Nature Singapore Singapore.
- Akram, R., Majeed, M. T., Fareed, Z., Khalid, F., & Ye, C. (2020). Asymmetric effects of energy efficiency and renewable energy on carbon emissions of BRICS economies: evidence from nonlinear panel autoregressive distributed lag model. *Environmental Science and Pollution Research*, 27(15), 18254-18268.
- Al-Marhubi, F. (2000). Export diversification and growth: an empirical investigation. *Applied economics letters*, 7(9), 559-562.
- Alam, M. M., & Murad, M. W. (2020). The impacts of economic growth, trade openness and technological progress on renewable energy use in organization for economic co-operation and development countries. *Renewable Energy*, 145, 382-390.
- Alhassan, A., Usman, O., Ike, G. N., & Sarkodie, S. A. (2020). Impact assessment of trade on environmental performance: accounting for the role of government integrity and economic development in 79 countries. *Heliyon*, 6(9), e05046.
- Alimov, A. (2019). Intellectual property rights reform and the cost of corporate debt. *Journal of International Money and Finance*, 91, 195-211.
- Alper, A., & Oguz, O. (2016). The role of renewable energy consumption in economic growth: Evidence from asymmetric causality. *Renewable and Sustainable Energy Reviews*, 60, 953-959.
- Amighini, A., & Sanfilippo, M. (2014). Impact of South–South FDI and trade on the export upgrading of African economies. *World Development*, 64, 1-17.
- Amurgo-Pacheco, A. (2007). *Patterns of export diversification in developing countries* (Vol. 4473). World Bank Publications.

- Anser, M. K., Adeleye, B. N., Tabash, M. I., & Tiwari, A. K. (2022). Services trade–ICT–tourism nexus in selected Asian countries: new evidence from panel data techniques. *Current Issues in Tourism*, 25(15), 2388-2403.
- Antonietti, R., & Franco, C. (2021). From FDI to economic complexity: a panel Granger causality analysis. *Structural change and economic dynamics*, 56, 225-239.
- Appleyard, D. R., & Field, A. J. (2014). *International economics*. McGraw-Hill.
- Asiama, R. K. A., & Nell, K. (2024). Can foreign aid influence the level of industrialization in African countries? *Cogent Economics & Finance*, 12(1), 2331369.
- Bahar, D., & Santos, M. A. (2018). One more resource curse: Dutch disease and export concentration. *Journal of Development Economics*, 132, 102-114.
- Baidoo, S. T., & Akoto, L. (2019). Does trust in financial institutions drive formal saving? Empirical evidence from Ghana. *International social science journal*, 69(231), 63-78.
- Balavac, M., & Pugh, G. (2016). The link between trade openness, export diversification, institutions and output volatility in transition countries. *Economic Systems*, 40(2), 273-287.
- Balkani, A. O. (2024). The Phenomenon of Export Diversification in Export Success and the Case of Turkiye. *Journal of Management & Economics Research*, 22(3).
- Baltagi, B. H., Feng, Q., & Kao, C. (2012). A Lagrange Multiplier test for cross-sectional dependence in a fixed effects panel data model. *Journal of Econometrics*, 170(1), 164-177.
- Banerjee, D., O'Shea, E., Doyle, J., & Goossens, M. (2001). Signatures of very long period waves in the polar coronal holes. *Astronomy & Astrophysics*, 380(2), L39-L42.
- Besedes, T., & Blyde, J. (2010). What drives export survival? An analysis of export duration in Latin America. *Inter-American Development Bank, mimeo*, 1, 1-43.

- Beverelli, C., Neumueller, S., & Teh, R. (2015). Export diversification effects of the WTO trade facilitation agreement. *World Development*, 76, 293-310.
- Bloch, H., & Sapsford, D. (1997). Some estimates of Prebisch and Singer effects on the terms of trade between primary producers and manufacturers. *World Development*, 25(11), 1873-1884.
- Botta, A. (2010). Economic development, structural change and natural resource booms: a structuralist perspective. *Metroeconomica*, 61(3), 510-539.
- Bowen, H. P., Leamer, E. E., & Sveikauskas, L. (1987). Multicountry, Multifactor Tests of the Heckscher-Ohlin-Vanek Model. *American economic review*, 77, 791-809.
- Breusch, T. S., & Pagan, A. R. (1980). The Lagrange multiplier test and its applications to model specification in econometrics. *The Review of Economic Studies*, 47(1), 239-253.
- Bruno, R. L., Douarin, E., Korosteleva, J., & Radosevic, S. (2015). Technology choices and growth: testing new structural economics in transition economies. *Journal of Economic Policy Reform*, 18(2), 131-152.
- Bryan, K. A., & Williams, H. L. (2021). Innovation: market failures and public policies. In *Handbook of industrial organization* (Vol. 5, pp. 281-388). Elsevier.
- Cadot, O., Carrère, C., & Strauss-Kahn, V. (2011). Export diversification: what's behind the hump? *Review of Economics and Statistics*, 93(2), 590-605.
- Cadot, O., Carrere, C., & Strauss-Kahn, V. (2013). Trade diversification, income, and growth: what do we know? *Journal of Economic Surveys*, 27(4), 790-812.
- Canay, I. A. (2011). A simple approach to quantile regression for panel data. *The econometrics journal*, 14(3), 368-386.
- Caselli, F., Koren, M., Lisicky, M., & Tenreyro, S. (2020). Diversification through trade. *The quarterly journal of economics*, 135(1), 449-502.

- Çetintaş, H., & Barişik, S. (2009). Export, import and economic growth: The case of transition economies. *Transition Studies Review*, 15, 636-649.
- Chakroun, M., Chrid, N., & Saafi, S. (2021). Does export upgrading really matter to economic growth? Evidence from panel data for high-, middle-and low-income countries. *International Journal of Finance & Economics*, 26(4), 5584-5609.
- Chaudhury, S., Nanda, N., & Tyagi, B. (2020). Impact of FDI on Economic Growth in South Asia: Does Nature of FDI Matters? *Review of Market Integration*, 12(1-2), 51-69.
- Chen, C., & Steinwender, C. (2021). Import competition, heterogeneous preferences of managers, and productivity. *Journal of International Economics*, 133, 103533.
- Chenery, H. B. (1967). Foreign assistance and economic development. In *Capital movements and economic development* (pp. 268-292). Springer.
- Cheng, C., Ren, X., Dong, K., Dong, X., & Wang, Z. (2021). How does technological innovation mitigate CO2 emissions in OECD countries? Heterogeneous analysis using panel quantile regression. *Journal of Environmental Management*, 280, 111818.
- Christofi, M., Vrontis, D., & Cadogan, J. W. (2021). Micro-foundational ambidexterity and multinational enterprises: a systematic review and a conceptual framework. *International business review*, 30(1), 101625.
- Christofi, M., Vrontis, D., Thrassou, A., & Shams, S. R. (2019). Triggering technological innovation through cross-border mergers and acquisitions: A micro-foundational perspective. *Technological Forecasting and Social Change*, 146, 148-166.
- Chudik, A., Mohaddes, K., Pesaran, M. H., & Raissi, M. (2017). Is there a debt-threshold effect on output growth? *Review of Economics and Statistics*, 99(1), 135-150.

- Chudik, A., & Pesaran, M. H. (2015). Common correlated effects estimation of heterogeneous dynamic panel data models with weakly exogenous regressors. *Journal of Econometrics*, 188(2), 393-420.
- Cieřlik, A., & Parteka, A. (2021). Relative productivity, country size and export diversification. *Structural change and economic dynamics*, 57, 28-44.
- Cimoli, M., Porcile, G., & Rovira, S. (2010). Structural change and the BOP-constraint: why did Latin America fail to converge? *Cambridge Journal of Economics*, 34(2), 389-411.
- Cirera, X., & Winters, L. A. (2015). Aid for Trade and structural transformation in Sub-Saharan Africa.
- Cook, N. P., & Jones, J. C. (2015). The African growth and opportunity act (AGOA) and export diversification. *The Journal of International Trade & Economic Development*, 24(7), 947-967.
- Dasa, M., & Chakrabortya, D. K. (2022). Does Remittances Inflow in India Have Dutch Disease Effects? ARDL Cointegration Approach. *Iranian Economic Review*(Articles in Press).
- Deardorff, A. V. (1982). The general validity of the Heckscher-Ohlin theorem. *The American Economic Review*, 72(4), 683-694.
- Dennis, A., & Shepherd, B. (2011). Trade facilitation and export diversification. *The World Economy*, 34(1), 101-122.
- Diamond, D. W., & He, Z. (2014). A theory of debt maturity: the long and short of debt overhang. *The Journal of Finance*, 69(2), 719-762.
- Doksum, K. (1974). Empirical probability plots and statistical inference for nonlinear models in the two-sample case. *The annals of statistics*, 267-277.

- Dutt, P., Mihov, I., & Van Zandt, T. (2013). The effect of WTO on the extensive and the intensive margins of trade. *Journal of International Economics*, 91(2), 204-219.
- Eck, K., & Huber, S. (2016). Product sophistication and spillovers from foreign direct investment. *Canadian Journal of Economics/Revue canadienne d'économie*, 49(4), 1658-1684.
- Edo, S., & Oigiangbe, O. (2024). External debt vulnerability in developing countries: the economic and policy perspectives. *Journal of Financial Economic Policy*.
- Egyir, J., Sakyi, D., & Baidoo, S. T. (2020). How does capital flows affect the impact of trade on economic growth in Africa? *The Journal of International Trade & Economic Development*, 29(3), 353-372.
- Elhiraika, A. B., & Mbate, M. M. (2014). Assessing the determinants of export diversification in Africa. *Applied Econometrics and International Development*, 14(1), 147-160.
- Feder, G. (1983). On exports and economic growth. *Journal of development economics*, 12(1-2), 59-73.
- Feenstra, R., & Kee, H. L. (2008). Export variety and country productivity: Estimating the monopolistic competition model with endogenous productivity. *Journal of International Economics*, 74(2), 500-518.
- Feenstra, R. C., & Ma, H. (2014). Trade facilitation and the extensive margin of exports. *The Japanese Economic Review*, 65, 158-177.
- Felbermayr, G., & Kohler, W. (2010). Modelling the extensive margin of world trade: New evidence on GATT and WTO membership. *The World Economy*, 33(11), 1430-1469.
- Felipe, J., Kumar, U., Abdon, A., & Bacate, M. (2012). Product complexity and economic development. *Structural change and economic dynamics*, 23(1), 36-68.

- Ferraz, D., Falguera, F. P., Mariano, E. B., & Hartmann, D. (2021). Linking economic complexity, diversification, and industrial policy with sustainable development: A structured literature review. *Sustainability*, 13(3), 1265.
- Fine, B., & Van Waeyenberge, E. (2013). A paradigm shift that never was: Justin Lin's new structural economics. *Competition & change*, 17(4), 355-371.
- Fonchamnyo, D. C., & Akame, A. R. (2017). Determinants of export diversification in Sub-Saharan Africa region: a fractionalized logit estimation model. *Journal of Economics Finance*, 41(2), 330-342.
- Fosu, A. K., & Abass, A. F. (2020). Domestic credit and export diversification: Africa from a global perspective. In *Contemporary issues and prospects in business development in Africa* (pp. 6-25). Routledge.
- Gamariel, G., & Hove, S. (2019). Foreign direct investment and export competitiveness in Africa: Investigating the channels. *Journal of African Trade*, 6(1), 30-46.
- Giri, R., Quayyum, M. S. N., & Yin, R. (2019). *Understanding export diversification: Key drivers and policy implications*. International Monetary Fund.
- Girma, S., Gong, Y., Görg, H., & Lancheros, S. (2015). Estimating direct and indirect effects of foreign direct investment on firm productivity in the presence of interactions between firms. *Journal of International Economics*, 95(1), 157-169.
- Gnangnon, S. K. (2019a). Aid for trade and recipient countries' export structure: does trade policy liberalisation matter? *Arthaniti: Journal of Economic Theory and Practice*, 18(1), 56-85.
- Gnangnon, S. K. (2019b). Does the impact of aid for trade on export product diversification depend on structural economic policies in recipient-countries? *Economic Issues*, 24(1), 59-87.

- Gnangnon, S. K. (2021a). Economic complexity and poverty in developing countries. *Economic Affairs*, 41(3), 416-429.
- Gnangnon, S. K. (2021b). Manufacturing exports and services export diversification. *The International Trade Journal*, 35(3), 221-242.
- Goh, S. K., Sam, C. Y., & McNown, R. (2017). Re-examining foreign direct investment, exports, and economic growth in Asian economies using a bootstrap ARDL test for cointegration. *Journal of Asian Economics*, 51, 12-22.
- Golo, Y. N. (2023). Foreign direct investment, human capital and export diversification in Africa: A panel smooth transition regression (PSTR) model analysis. *The Journal of International Trade & Economic Development*, 1-26.
- Goya, D. (2020). The exchange rate and export variety: A cross-country analysis with long panel estimators. *International Review of Economics & Finance*, 70, 649-665.
- Gözgör, G., & Can, M. J. R. o. D. E. (2017). Causal linkages among the product diversification of exports, economic globalization and economic growth. 21(3), 888-908.
- Gozgor, G., Mahalik, M. K., Demir, E., & Padhan, H. (2020). The impact of economic globalization on renewable energy in the OECD countries. *Energy Policy*, 139, 111365.
- Grossman, G. M., & Helpman, E. (1994). Endogenous innovation in the theory of growth. *Journal of Economic Perspectives*, 8(1), 23-44.
- Hameed, I., Iqbal, A., & Devi, K. (2012). Relationship between exports and economic growth of Pakistan. *European Journal of Social Sciences*, 32(3), 453-460.
- Handoyo, R. D., & Ibrahim, K. H. (2021). Determinants of Export Diversification in Developing Countries. *Industrial Engineering & Management Systems*, 20(4), 720-731.

- Hartmann, D., Guevara, M. R., Jara-Figueroa, C., Aristarán, M., & Hidalgo, C. A. (2017). Linking economic complexity, institutions, and income inequality. *World Development*, 93, 75-93.
- Hausmann, R. (2016). Economic development and the accumulation of know-how. *Welsh Economic Review*, 24, 13-16.
- Hayat, A. (2019). Foreign direct investments, institutional quality, and economic growth. *The Journal of International Trade & Economic Development*, 28(5), 561-579.
- Heckscher, E. F. (1919). *The effect of foreign trade on the distribution of income*.
- Hendy, R., & Zaki, C. (2021). Trade facilitation and firms exports: Evidence from customs data. *International Review of Economics & Finance*, 75, 197-209.
- Heresi, R. (2023). Reallocation and productivity in resource-rich economies. *Journal of international Economics*, 145, 103843.
- Herzer, D., & Nowak-Lehmann D, F. J. A. e. (2006). What does export diversification do for growth? An econometric analysis. 38(15), 1825-1838.
- Hicks, J. (1981). The mainspring of economic growth. *The American Economic Review*, 71(6), 23-29.
- Hummels, D., & Klenow, P. J. (2005). The variety and quality of a nation's exports. *American economic review*, 95(3), 704-723.
- Imbs, J., & Wacziarg, R. (2003). Stages of diversification. *American economic review*, 93(1), 63-86.
- Islam, S. N., Islam, M. S., Islam, M. R., & Alam, M. A. (2024). The effect of financial development, tariff, and RTA on exports. *Journal of Economic Integration*, 39(1), 107-150.

- Iyoboyi, M., & Na-Allah, A. (2014). ICT-driven growth and diversification: the case of Nigeria's entertainment industry. *Journal of Economics*, 2(4), 255-268.
- Jana, S. S., Sahu, T. N., & Pandey, K. D. (2020). How far is FDI relevant to India's foreign trade growth? An empirical investigation. *Journal of Economic Structures*, 9, 1-19.
- Jolo, A. M., Ari, I., & Koç, M. (2022). Driving factors of economic diversification in resource-rich countries via panel data evidence. *Sustainability*, 14(5), 2797.
- Jongwanich, J. (2020). Export diversification, margins and economic growth at industrial level: Evidence from Thailand. *The World Economy*, 43(10), 2674-2722.
- Kalaitzi, A. S., & Chamberlain, T. W. (2020). Merchandise exports and economic growth: multivariate time series analysis for the United Arab Emirates. *Journal of Applied Economics*, 23(1), 163-182.
- Kalaitzi, A. S., & Cleeve, E. (2018). Export-led growth in the UAE: multivariate causality between primary exports, manufactured exports and economic growth. *Eurasian Business Review*, 8(3), 341-365.
- Kaldor, N. (1957). A model of economic growth. *The Economic Journal*, 67(268), 591-624.
- Kamuganga, D. N. (2012). *What drives Africa's export diversification?*
- Kastratović, R. (2020). The impact of foreign direct investment on host country exports: A meta-analysis. *The World Economy*, 43(12), 3142-3183.
- Kim, Y. R. (2019). Does aid for trade diversify the export structure of recipient countries? *The World Economy*, 42(9), 2684-2722.
- Koch, P. (2021). Economic complexity and growth: Can value-added exports better explain the link? *Economics letters*, 198, 109682.
- Koenker, R. (2004). Quantile regression for longitudinal data. *Journal of Multivariate Analysis*, 91(1), 74-89.

- Kojo, N. C. (2015). Demystifying Dutch Disease. *Journal of International Commerce, Economics and Policy*, 6(02), 1550010.
- Kostanica, F. (2025). Quantifying Export Diversification in Kosovo: Methods, Indices, and Sectoral Insights. *Zagreb International Review of Economics & Business*, 28(1), 257-275.
- Kramarz, F., Martin, J., & Mejean, I. (2020). Volatility in the small and in the large: The lack of diversification in international trade. *Journal of International Economics*, 122, 103276.
- Krugman, P. (1987). The narrow moving band, the Dutch disease, and the competitive consequences of Mrs. Thatcher: Notes on trade in the presence of dynamic scale economies. *Journal of development economics*, 27(1-2), 41-55.
- Krugman, P. R. (1979). Increasing returns, monopolistic competition, and international trade. *Journal of international Economics*, 9(4), 469-479.
- Lectard, P., & Rougier, E. J. W. D. (2018). Can developing countries gain from defying comparative advantage? Distance to comparative advantage, export diversification and sophistication, and the dynamics of specialization. *102*, 90-110.
- Lederman, D., & Maloney, W. (2012). *Does what you export matter?: In search of empirical guidance for industrial policies*. World Bank Publications.
- Leichenko, R. M. (2000). Exports, employment, and production: A causal assessment of US states and regions. *Economic Geography*, 76(4), 303-325.
- Leontief, W. (1953). Domestic production and foreign trade; the American capital position re-examined. *Proceedings of the American philosophical Society*, 97(4), 332-349.

- Li, D., Wang, X., Xu, Y., & Ren, Y. (2022). Analysis of export diversification and impact of globalisation on income inequality: evidence from Asian countries. *Global Economic Review*, 51(3), 195-215.
- Liaqat, Z. (2019). Does government debt crowd out capital formation? A dynamic approach using panel VAR. *Economics letters*, 178, 86-90.
- Lim, W. M., Yap, S.-F., & Makkar, M. (2021). Home sharing in marketing and tourism at a tipping point: What do we know, how do we know, and where should we be heading? *Journal of Business Research*, 122, 534-566.
- Lin, B., & Moubarak, M. (2014). Renewable energy consumption–economic growth nexus for China. *Renewable and Sustainable Energy Reviews*, 40, 111-117.
- Linder, S. B. (1961). *An essay on trade and transformation*. Almqvist & Wiksell Stockholm.
- Liu, Y., Hao, Y., & Gao, Y. (2017). The environmental consequences of domestic and foreign investment: Evidence from China. *Energy Policy*, 108, 271-280.
- Lucas Jr, R. E. J. J. o. m. e. (1988). On the mechanics of economic development. 22(1), 3-42.
- Machado, J. A., & Silva, J. S. (2019). Quantiles via moments. *Journal of econometrics*, 213(1), 145-173.
- Mamba, E., Gniniguè, M., & Ali, E. (2020). Effect of foreign direct investment on structural transformation in West African Economic and Monetary Union (WAEMU) countries. *Cogent economics finance*, 8(1), 1783910.
- Mamun, A., & Kabir, M. (2023). The remittance, foreign direct investment, export, and economic growth in Bangladesh: a time series analysis. *Arab Economic and Business Journal*, 15(1), 4.

- Mania, E. (2020). Export diversification and CO2 emissions: an augmented environmental Kuznets curve. *Journal of International Development*, 32(2), 168-185.
- Mania, E., & Rieber, A. (2019). Product export diversification and sustainable economic growth in developing countries. *Structural change and economic dynamics*, 51, 138-151.
- Mao, X., & He, C. (2019). Export expansion and regional diversification: Learning from the changing geography of China's exports. *The Professional Geographer*, 71(4), 692-702.
- Martincus, C. V., & Carballo, J. (2008). Is export promotion effective in developing countries? Firm-level evidence on the intensive and the extensive margins of exports. *Journal of International Economics*, 76(1), 89-106.
- Masunda, S. (2020). Export diversification effects of aid for trade in sub-Saharan Africa. *Journal of African Trade*, 7(1), 29-36.
- Matezo, E., Makengo, B., & Muhole, A. (2021). The influence of export diversification on economic growth: A case of Southern African development community (SADC). *American Journal of Industrial and Business Management*, 11(07), 829-845.
- Mau, K. J. R. o. W. E. (2016). Export diversification and income differences reconsidered: The extensive product margin in theory and application. 152(2), 351-381.
- McGregor, T. (2017). Commodity price shocks, growth and structural transformation in low-income countries. *The Quarterly Review of Economics and Finance*, 65, 285-303.
- Megbowon, E., Mlambo, C., Adekunle, B., & finance. (2019). Impact of china's outward fdi on sub-saharan africa's industrialization: Evidence from 26 countries. *Cogent economics finance*, 7(1), 1681054.
- Melitz, M. J. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica*, 71(6), 1695-1725.

- Mieno, F., & Demachi, K. (2024). Macroeconomic imbalance, external debt, and the financial system in Laos. *Asian Economic Policy Review*, 19(2), 295-318.
- Millogo, A., TONDÉ, W. D., & TROJETTE, I. (2024). The impact of trade openness on export diversification in low-income countries: the role of institutional quality. *Lettres, Sciences sociales et humaines*, 40(2), 182-212.
- Minondo, A. (2011). Does comparative advantage explain countries' diversification level? *Review of World Economics*, 147, 507-526.
- Mishra, R., Singh, R. K., & Koles, B. (2021). Consumer decision-making in Omnichannel retailing: Literature review and future research agenda. *International Journal of Consumer Studies*, 45(2), 147-174.
- Miyamoto, W., & Nguyen, T. L. (2024). International input–output linkages and changing business cycle volatility. *Journal of international Economics*, 147, 103869.
- Mora, J., & Olabisi, M. (2021). Economic development and the margins of trade: Are the least developed countries different? *Economic Inquiry*, 59(2), 600-621.
- Mora, J., & Olabisi, M. (2023). Economic development and export diversification: The role of trade costs. *International Economics*, 173, 102-118.
- Mosley, P. (2018). Why has export diversification been so hard to achieve in Africa? *The World Economy*, 41(4), 1025-1044.
- Mudenda, C., Choga, I., & Chigamba, C. (2014). The role of export diversification on economic growth in South Africa. *Mediterranean Journal of Social Sciences*, 5(9), 705-705.
- Müller, P. (2021). Impacts of inward FDIs and ICT penetration on the industrialisation of Sub-Saharan African countries. *Structural change and economic dynamics*, 56, 265-279.

- Munemo, J. (2011). Foreign aid and export diversification in developing countries. *The Journal of International Trade Economic Development*, 20(3), 339-355.
- Nathoo, R., Salim, R., Ancharaz, V., & Kabir, M. (2021). Does aid for trade diversify sub-Saharan Africa's exports at the intensive and extensive margins? *Applied Economics*, 53(55), 6412-6425.
- Naudé, W., & Rossouw, R. (2011). Export diversification and economic performance: evidence from Brazil, China, India and South Africa. *Economic Change and Restructuring*, 44(1), 99-134.
- Nelson, R. R., Dosi, G., Helfat, C. E., Pyka, A., Saviotti, P. P., Lee, K., Winter, S. G., Dopfer, K., & Malerba, F. (2018). Modern evolutionary economics: An overview.
- Ngassam, S. B. (2023). Exports Diversification in Africa: The Role of Infrastructures. *Journal of the Knowledge Economy*, 1-33.
- Nguyen, D. X. (2016). Trade liberalization and export sophistication in Vietnam. *The Journal of International Trade & Economic Development*, 25(8), 1071-1089.
- Nicita, A., & Rollo, V. (2015). Market access conditions and sub-Saharan Africa's exports diversification. *World Development*, 68, 254-263.
- Nieminen, M. (2020). Multidimensional financial development, exporter behavior and export diversification. *Economic Modelling*, 93, 1-12.
- Odhiambo, N. M. (2022). Is export-led growth hypothesis still valid for sub-Saharan African countries? New evidence from panel data analysis. *European Journal of Management and Business Economics*, 31(1), 77-93.
- Ohlin, B. (1935). *Interregional and international trade*. Harvard University Press, Cambridge.

- Oliveira, H. C. d., Jegu, E., & Santos, V. E. (2020). Dynamics and determinants of export diversification in Brazil from 2003 to 2013. *Economia e Sociedade*, 29, 29-51.
- Ongba, L. D. (2014). Institutional foundations of export diversification patterns in oil-producing countries. *Journal of Comparative Economics*, 42(4), 1052-1064.
- Osakwe, P. N. (2007). EXPORT DIVERSIFICATION AND THE DILEMMA OF AFRICAN DEVELOPMENT *Applied Econometrics and International Development*, Vol.7(2).
- Osakwe, P. N., Santos-Paulino, A. U., & Dogan, B. (2018a). Trade dependence, liberalization, and exports diversification in developing countries. *Journal of African Trade*, 5(1-2), 19-34.
- Osakwe, P. N., Santos-Paulino, A. U., & Dogan, B. (2018b). Trade dependence, liberalization, and exports diversification in developing countries. *Journal of African Trade*, 5(1), 19-34.
- Panda, S., Sharma, R., & Park, W. G. (2020). Patent protection, technological efforts, and exports: An empirical investigation. *The Journal of Developing Areas*, 54(2).
- Parteka, A. (2010). Employment and export specialisation along the development path: some robust evidence. *Review of World Economics*, 145, 615-640.
- Parteka, A. (2020). What drives cross-country differences in export variety? A bilateral panel approach. *Economic Modelling*, 92, 48-56.
- Parteka, A., & Tamberi, M. (2013). What determines export diversification in the development process? Empirical assessment. *The World Economy*, 36(6), 807-826.
- Pasinetti, L. (1993). *Structural economic dynamics*. Cambridge University Press.
- Paul, J. (2020). Marketing in emerging markets: A review, theoretical synthesis and extension. *International Journal of Emerging Markets*, 15(3), 446-468.

- Paul, J., & Benito, G. R. (2018). A review of research on outward foreign direct investment from emerging countries, including China: what do we know, how do we know and where should we be heading? *Asia Pacific Business Review*, 24(1), 90-115.
- Paul, J., & Criado, A. R. (2020). The art of writing literature review: What do we know and what do we need to know? *International business review*, 29(4), 101717.
- Paul, J., & Mas, E. (2020). Toward a 7-P framework for international marketing. *Journal of Strategic Marketing*, 28(8), 681-701.
- Paul, J., & Rosado-Serrano, A. (2019). Gradual internationalization vs born-global/international new venture models: A review and research agenda. *International Marketing Review*, 36(6), 830-858.
- Paul, J., & Singh, G. (2017). The 45 years of foreign direct investment research: Approaches, advances and analytical areas. *The World Economy*, 40(11), 2512-2527.
- Pegg, S. (2010). Is there a Dutch disease in Botswana? *Resources Policy*, 35(1), 14-19.
- Persson, M. (2013). Trade facilitation and the extensive margin. *The Journal of International Trade & Economic Development*, 22(5), 658-693.
- Persson, M., & Wilhelmsson, F. (2016). EU trade preferences and export diversification. *The World Economy*, 39(1), 16-53.
- Pesaran, M. H. (2006). Estimation and inference in large heterogeneous panels with a multifactor error structure. *Econometrica*, 74(4), 967-1012.
- Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of applied econometrics*, 22(2), 265-312.
- Pesaran, M. H. (2021). General diagnostic tests for cross-sectional dependence in panels. *Empirical economics*, 60(1), 13-50.

- Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American statistical Association*, 94(446), 621-634.
- Petrochilos, G. A. (1999). The Hellenic contribution to economic thought. *Global Business and Economics Review*, 1(2), 215-246.
- Phuyal, R. K., & Sunuwar, S. (2018). A sectoral analysis of foreign direct investment on the economic growth of Nepal. *Journal of Business and Social Sciences Research*, 3(1), 1-14.
- Piras, R. (2023). Remittances, economic complexity, and new firms' creation: empirical evidence from a large sample of countries. *Economic Change and Restructuring*, 56(4), 2557-2600.
- Poon, J. P. (2024). Regional capability, evolutionary economic geography and global production networks. *Regional Studies*, 1-4.
- Posner, M. V. (1961). International trade and technical change. *Oxford economic papers*, 13(3), 323-341.
- Powell, D. (2016). Quantile regression with nonadditive fixed effects. *Quantile Treatment Effects*, 1(28), 1-33.
- Prasad, A., Subramani, K., Refass, S., Saidi, N., Salem, F., & Shepherd, B. (2025). Global Economic Diversification Index 2025: Navigating Economic Diversification in a De-Globalized World. *Available at SSRN 5206032*.
- Prebisch, R. (1962). The economic development of Latin America and its principal problems. *Economic Bulletin for Latin America*.

- Qambrani, S. A., Ahmed, I., & Basit, A. (2024). Measuring the Impact of External Debt on the Macroeconomic Indicators of Asian Countries. *Journal of Entrepreneurship, Management, and Innovation*, 6(2), 197-225.
- Qureshi, I., & Liaqat, Z. (2020). The long-term consequences of external debt: Revisiting the evidence and inspecting the mechanism using panel VARs. *Journal of macroeconomics*, 63, 103184.
- Ramanayake, S. S., & Lee, K. (2015). Does openness lead to sustained economic growth? Export growth versus other variables as determinants of economic growth. *Journal of the Asia Pacific Economy*, 20(3), 345-368.
- Rebouças, R., & Soares, A. M. (2021). Voluntary simplicity: A literature review and research agenda. *International Journal of Consumer Studies*, 45(3), 303-319.
- Regolo, J. (2013). Export diversification: How much does the choice of the trading partner matter? *Journal of International Economics*, 91(2), 329-342.
- Riaz, K., Siddique, H. M. A., & Audi, M. (2024). Impact of Financial Development on Export Performance: Evidence from South Asia. *Bulletin of Business and Economics (BBE)*, 13(3), 539-546.
- Ricardo, D. (1821). *On the principles of political economy*. J. Murray London.
- Riedel, J. (1984). Trade as the engine of growth in developing countries, revisited. *The Economic Journal*, 94(373), 56-73.
- Romer, P. M. J. J. o. p. E. (1990). Endogenous technological change. 98(5, Part 2), S71-S102.
- Rosado-Serrano, A., Paul, J., & Dikova, D. (2018). International franchising: A literature review and research agenda. *Journal of Business Research*, 85, 238-257.

- Rosen, A. M. (2012). Set identification via quantile restrictions in short panels. *Journal of econometrics*, 166(1), 127-137.
- Ross, M. L. (2019). What do we know about export diversification in oil-producing countries? *The Extractive Industries and Society*, 6(3), 792-806.
- Saad, W. (2012). Causality between economic growth, export, and external debt servicing: the case of Lebanon. *International Journal of Economics and Finance*, 4(11), 134-143.
- Saadi, M. J. T. J. o. D. S. (2020). Remittance inflows and export complexity: New evidence from developing and emerging countries. 56(12), 2266-2292.
- Sadiq, A. B. (2023). Exploring Product Diversification Opportunities in Pakistan for Export Growth. *Forman Journal of Economic Studies*, 19(1), 47-75.
- Sahoo, P., & Dash, R. K. (2022). Does FDI have differential impacts on exports? Evidence from developing countries. *International Economics*, 172, 227-237.
- Saleem, H., Shabbir, M. S., & Bilal khan, M. (2020). The short-run and long-run dynamics among FDI, trade openness and economic growth: using a bootstrap ARDL test for co-integration in selected South Asian countries. *South Asian Journal of Business Studies*, 9(2), 279-295.
- Saleem, R., Nasreen, S., & Azam, S. (2022). Role of financial inclusion and export diversification in determining green growth: evidence from SAARC economies. *Environmental Science and Pollution Research*, 29(40), 60327-60340.
- Saltarelli, F., Cimini, V., Tacchella, A., Zaccaria, A., & Cristelli, M. (2020). Is export a probe for domestic production? *Frontiers in Physics*, 8, 180.
- Saviotti, P.-P., & Jun, B. (2020). Diversification, structural change, and economic development. *Journal of Evolutionary Economics*, 30(5), 1301-1335.

- Saviotti, P. P., & Pyka, A. (2013). From necessities to imaginary worlds: Structural change, product quality and economic development. *Technological Forecasting and Social Change*, 80(8), 1499-1512.
- Sawadogo, B., Fouopi Djiogap, C., Ouedraogo, I., & Takpara, M. M. (2024). An empirical assessment of the role of trade in services in export product diversification in Sub-Saharan Africa. *Journal of Productivity Analysis*, 61(3), 229-257.
- Schumpeter, J., & Backhaus, U. (2003). The theory of economic development. In *Joseph Alois Schumpeter* (pp. 61-116). Springer.
- Sekkat, K. (2016). Exchange rate misalignment and export diversification in developing countries. *The Quarterly Review of Economics Finance*, 59, 1-14.
- Sepehrdoust, H., Davarikish, R., & Setarehie, M. (2019). The knowledge-based products and economic complexity in developing countries. *Heliyon*, 5(12).
- Shah, S. F. A., Ullah, M., Aftab, M., & Khan, M. Q. (2023). Export diversification potential and structural transformation in Pakistan: A product space perspective. *Journal of Applied Economics and Business Studies*, 7(1), 81-96.
- Shakeel, M., & Ahmed, A. (2021). Economic growth, exports, and role of energy conservation: evidence from panel co-integration-based causality models in South Asia. *Energy & Environment*, 32(1), 3-24.
- Shakib, M., Sohag, K., Hassan, M. K., & Vasilyeva, R. (2023). Finance and export diversifications Nexus in Russian regions: Role of trade globalization and regional potential. *Emerging Markets Review*, 57, 101059.
- Sheng, L., & Yang, D. T. (2016). Expanding export variety: The role of institutional reforms in developing countries. *Journal of Development Economics*, 118, 45-58.

- Shepherd, B. (2015). Product standards and export diversification. *Journal of Economic Integration*, 300-333.
- Shihab, R. A., Soufan, T., & Abdul-Khaliq, S. (2014). The causal relationship between exports and economic growth in Jordan. *International Journal of Business and Social Science*, 5(3), 302-308.
- Sims, C.-I. A. (1980). ECONOMETRICA. *Econometrica*, 48(1), 1-48.
- Singer, H. W. (1949). Economic progress in underdeveloped countries. *Social Research*, 1-11.
- Singer, H. W. (1950). The Distribution of Trade between Investigating and Borrowing Countries. *American economic review*, 40, 531-548.
- Smith, A. (1776). An inquiry into the nature and causes of the wealth of nations: Volume One. In. London: printed for W. Strahan; and T. Cadell, 1776.
- Sweet, C., & Eterovic, D. (2019). Do patent rights matter? 40 years of innovation, complexity and productivity. *World Development*, 115, 78-93.
- Tadesse, B., & Fayissa, B. (2008). The impact of African growth and opportunity act (Agoa) on US imports from Sub-Saharan Africa (SSA). *Journal of International Development: The Journal of the Development Studies Association*, 20(7), 920-941.
- Tang, T., Cuesta, L., Tillaguango, B., Alvarado, R., Rehman, A., Bravo-Benavides, D., & Zárate, N. (2022). Causal link between technological innovation and inequality moderated by public spending, manufacturing, agricultural employment, and export diversification. *Sustainability*, 14(14), 8474.
- Thorpe, R., Holt, R., Macpherson, A., & Pittaway, L. (2005). Using knowledge within small and medium-sized firms: A systematic review of the evidence. *International Journal of Management Reviews*, 7(4), 257-281.

- Tiwari, A. K., & Mutascu, M. (2011). Economic growth and FDI in Asia: A panel-data approach. *Economic analysis policy*, 41(2), 173-187.
- Tiwari, A. K., Nasreen, S., & Anwar, M. A. (2022). Impact of equity market development on renewable energy consumption: do the role of FDI, trade openness and economic growth matter in Asian economies? *Journal of Cleaner Production*, 334, 130244.
- Tran, T. A.-D., Phi, M. H., Diaw, D. J. T. J. o. I. T., & Development, E. (2017). Export diversification and real exchange rate in emerging Latin America and Asia: A South–North vs. South-South decomposition. 26(6), 649-676.
- Tran, T. A.-D., Phi, M. H., & Thai, L. (2020). Global value chains and the missing link between exchange rates and export diversification. *International Economics*, 164, 194-205.
- Ul-Haq, J., Visas, H., Krivins, A., Remeikienė, R., & Hye, Q. M. A. (2025). The drivers of export product diversification in China: does natural resource endowments matter? *Technological and Economic Development of Economy*, 1–22-21–22.
- Ummalla, M., Samal, A., & Goyari, P. (2019). Nexus among the hydropower energy consumption, economic growth, and CO2 emissions: evidence from BRICS countries. *Environmental Science and Pollution Research*, 26(34), 35010-35022.
- UNCTAD. (2022). *UNCTAD Handbook of Statistics 2021*. UN.
- Van der Ploeg, F., & Venables, A. J. (2013). Absorbing a windfall of foreign exchange: Dutch disease dynamics. *Journal of development economics*, 103, 229-243.
- Vasilyeva, R., Urazbaeva, A., & Voytenkov, V. (2025). Determinants of export diversification: The case of Russian regions. *Eastern European Economics*, 63(2), 260-296.

- Vernon, R. (1992). International investment and international trade in the product cycle. In *International economic policies and their theoretical foundations* (pp. 415-435). Elsevier.
- Vrontis, D., Christofi, M., & Katsikeas, C. S. (2020). An assessment of the literature on cause-related marketing: Implications for international competitiveness and marketing research. *International Marketing Review*, 37(5), 977-1012.
- Wadho, W., & Chaudhry, A. (2019). Identifying and understanding high growth firms in the Pakistani textile and apparel sectors. *The Lahore Journal of Economics*, 24(2), 73-92.
- Wang, Z., Ali, K., & Ullah, S. (2025). Revisiting natural resources and financial development nexus in China under the lens of time-frequency approach. *Natural Resources Forum*,
- Wani, N. U. H. (2024). Export diversification in ASEAN and SAARC regions: exploring trends patterns and determinants through empirical investigation. In *Policy Solutions for Economic Growth in a Developing Country: Perspectives on Afghanistan's Trade and Development* (pp. 83-103). Emerald Publishing Limited.
- Wu, W., Yuan, L., Wang, X., Cao, X., & Zhou, S. (2020). Does FDI drive economic growth? Evidence from city data in China. *Emerging Markets Finance and Trade*, 56(11), 2594-2607.
- Xiong, T., & Sun, H. (2021). Structure and dynamics of global capital and international trade: Analysis of the relationship between exports and foreign direct investment (FDI) from 2001 to 2006. *International Journal of Finance & Economics*, 26(1), 542-559.
- Young, A. O. (2023). Intensive and Extensive Margins of Export Diversification as Strategies for Sustainable Economic Growth: Evidence from the Nigerian Economy. *Foreign Trade Review*, 00157325221145397.

- Yusuf, J. A., Lawal, Y. D., & Araoye, S. O. (2024). Trade Openness and Agricultural Export Performance in Nigeria: An Econometric Approach. *Journal of Agriculture, Aquaculture, and Animal Science*, 1(1), 5-13.
- Zhang, M., Tian, Y., & Khan, M. K. (2024). Time series approach to examine the impact of economic uncertainty, economic growth and financial development on human health. *Natural Resources Forum*,
- Zhang, W., & Xiaofeng, L. (2023). The impact of internet on innovation of manufacturing export enterprises: Internal mechanism and micro evidence. *Journal of Innovation & Knowledge*, 8(3), 100377.
- Zhou, C. (2020). The effects of outward FDI and export on firm productivity in emerging markets: Evidence from matching approach. *Economics letters*, 195, 109462.
- Zhu, S., & Fu, X. (2013). Drivers of export upgrading. *World Development*, 51, 221-233.
- Zoundi, Z. (2017). CO2 emissions, renewable energy and the Environmental Kuznets Curve, a panel cointegration approach. *Renewable and Sustainable Energy Reviews*, 72, 1067-1075.

APPENDICES

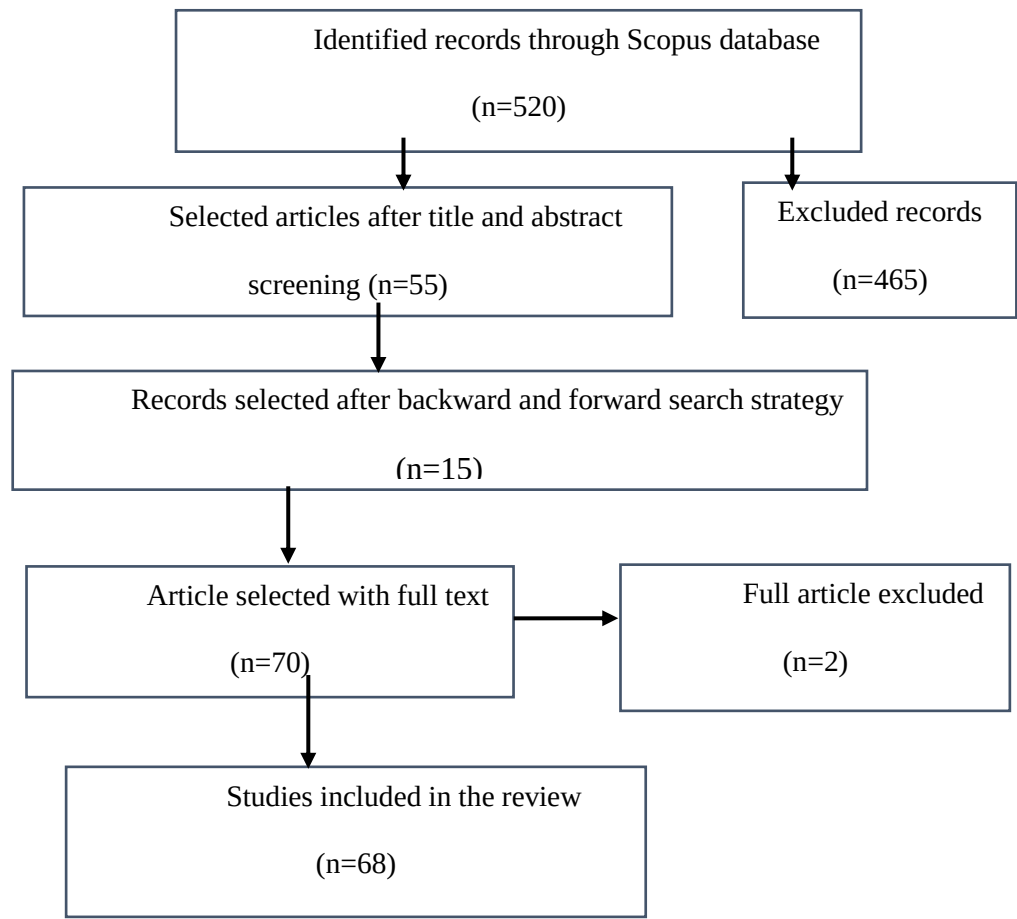
APPENDIX A1

List of countries:

Lower-Middle Income (LMI)	Upper-Middle Income (UMI)
Algeria Angola Bangladesh Bhutan Bolivia Cabo Verde Cambodia Congo, Dem. Rep. Egypt, Arab Rep. El Salvador Ghana Haiti Honduras India Indonesia Iran, Islamic Rep. Kenya Kyrgyz Republic Lao PDR Mongolia Morocco Nepal Nicaragua Nigeria Pakistan Papua New Guinea Philippines Samoa Sri Lanka Tanzania Tunisia Ukraine Uzbekistan Vietnam Zambia Zimbabwe	Albania Argentina Armenia Azerbaijan Belarus Bosnia and Herzegovina Botswana Brazil Bulgaria Colombia Costa Rica Dominican Republic Ecuador Georgia Guatemala Guyana Jamaica Jordan Kazakhstan Lebanon Mexico Paraguay Peru Russian Federation South Africa Thailand Tonga Turkiye Turkmenistan

APPENDIX A2

Flowchart Diagram for selection of records:



APPENDIX A3

Distribution of selected papers with journals and authors:

Journals	Publisher	No of Articles	References
The World Economy	Wiley Online Library	7	(Agosin et al., 2012; Dennis & Shepherd, 2011; Felbermayr & Kohler, 2010; Kim, 2019; Mosley, 2018; Parteka & Tamberi, 2013; Persson & Wilhelmsson, 2016)
World Development	Elsevier	4	(Amighini & Sanfilippo, 2014; Lectard & Rougier, 2018; Nicita & Rollo, 2015; Sweet & Eterovic, 2019)
Journal of Development Economics	Elsevier	2	(Bahar & Santos, 2018; Sheng & Yang, 2016)
Journal of Productivity Analysis	Springer	1	(Sawadogo et al., 2024)
The Review of Economics and Statistics	MIT Press	1	(Cadot et al., 2011)
Journal of Economic Surveys	Wiley Online Library	1	(Cadot et al., 2013)

The Quarterly Journal of Economics	Oxford Academic	1	(Caselli et al., 2020)
Structural Change and Economic Dynamics	Elsevier	4	(Antonietti & Franco, 2021; Cieřlik & Parteka, 2021; Felipe et al., 2012; Mania & Rieber, 2019)
The Journal of International Trade & Economic Development	Taylor and Francis	5	(Cook & Jones, 2015; Golo, 2023; Munemo, 2011; Nguyen, 2016; Persson, 2013)
Journal of International Economics	Elsevier	5	(Dutt et al., 2013; Feenstra & Kee, 2008; Kramarz et al., 2020; Martincus & Carballo, 2008; Regolo, 2013)
Applied Econometrics and International Development	Euro-American Association of Economic Development Studies	2	(Elhiraika & Mbate, 2014; Osakwe, 2007)
International Review of Economics & Finance	Elsevier	1	(Goya, 2020)
Review of Development Economics	Wiley Online Library	2	(Gözgör & Can, 2017; Parteka, 2010)

Applied Economics	Taylor and Francis	2	(Herzer & Nowak-Lehmann D, 2006; Nathoo et al., 2021)
Journal of African trade	Elsevier	2	(Masunda, 2020; Osakwe et al., 2018b)
Economic Modelling	Elsevier	2	(Nieminen, 2020; Parteka, 2020)
Journal of Comparative Economics	Elsevier	1	(Omgba, 2014)
International Economics	Elsevier	2	(Mora & Olabisi, 2023; Tran et al., 2020)
Review of World Economics	Springer	3	(Mau, 2016; Minondo, 2011; Parteka, 2010)
The Quarterly Review of Economics and Finance	Springer	1	(Sekkat, 2016)
Journal of economic Integration	Sejong University	1	(Shepherd, 2015)
Journal of Economics	Springer	1	(Iyoboyi & Na-Allah, 2014)
American Economic Review	American Economic Association	1	(Imbs & Wacziarg, 2003)
The international Trade Journal	Taylor and Francis	2	(Gnangnon, 2021b; Tran et al., 2017)

Economic Issues	Peterson Institute for International Economics	1	(Gnangnon, 2019b)
Applied Economics Letters	Taylor and Francis	1	(Al-Marhubi, 2000)
Foreign Trade Review	Sage	1	(Young, 2023)
Sustainability	MDPI	1	(Jolo et al., 2022)
Emerging Markets Review	Elsevier	1	(Shakib et al., 2023)
Journal of Evolutionary Economics	Springer	1	(Saviotti & Jun, 2020)
Journal of The Knowledge Economy	Springer	1	(Ngassam, 2023)
Economic Change and Restructuring	Springer	2	(Naudé & Rossouw, 2011; Piras, 2023)
Economic Letters	Elsevier	1	(Koch, 2021)
Journal of Applied Economics	Taylor and Francis	1	(Shah et al., 2023)
Journal of Economic Theory and Practice	Sage	1	(Gnangnon, 2019a)
Structural Economic Dynamics	Cambridge University Press	1	(Pasinetti, 1993)
Journal of Economics Finance	Springer	1	(Fonchamnyo & Akame, 2017)
Economic Systems	Elsevier	1	(Balavac & Pugh, 2016)

APPENDIX A4

Determinants of Export Diversification:

Determinant	Evidence	Studies
Geographical		
Common Language	+	(Dutt et al., 2013; Feenstra & Ma, 2014; Felbermayr & Kohler, 2010; Persson, 2013; Regolo, 2013)
Differences in Endowments	+	(Agosin et al., 2012; Regolo, 2013)
Distance	-	(Amurgo-Pacheco, 2007; Dennis & Shepherd, 2011; Dutt et al., 2013; Feenstra & Kee, 2008; Feenstra & Ma, 2014; Mao & He, 2019; Osakwe et al., 2018b; Parteka & Tamberi, 2013; Persson, 2013; Regolo, 2013)
Landlocked	-	(Amighini & Sanfilippo, 2014; Persson, 2013)
Market Size		
GDP Per Capita	+	(Amighini & Sanfilippo, 2014; Amurgo-Pacheco, 2007; Cadot et al., 2011; Cadot et al., 2013; Cieřlik & Parteka, 2021; Dennis & Shepherd, 2011; Elhiraika & Mbate, 2014; Feenstra & Ma, 2014; Giri et al., 2019; Gnangnon, 2019a; Jolo et al., 2022; Mau, 2016; Osakwe et al., 2018b; Persson, 2013; Persson & Wilhelmsson, 2016)
Population	+	(Cadot et al., 2011; Elhiraika & Mbate, 2014; Feenstra & Ma, 2014; Lectard & Rougier, 2018; Mania & Rieber, 2019; Parteka & Tamberi, 2013)
Natural Resource Endowments	+	(Bahar & Santos, 2018; Mania & Rieber, 2019)

Structural		
Productivity	+	(Cieřlik & Parteka, 2021; Osakwe, 2007; Saviotti & Jun, 2020)
Entry Cost	-	(Dennis & Shepherd, 2011)
Infrastructure	+	(Cadot et al., 2011; Elhiraika & Mbate, 2014; Fosu & Abass, 2020; Giri et al., 2019; Lectard & Rougier, 2018; Ngassam, 2023; Osakwe et al., 2018b)
Gross Capital Formation	+	(Elhiraika & Mbate, 2014; Felipe et al., 2012; Fonchamnyo & Akame, 2017)
Manufacturing	+	(Amighini & Sanfilippo, 2014; Fonchamnyo & Akame, 2017; Gnanngnon, 2021b)
Agriculture	–	(Fonchamnyo & Akame, 2017; Parteka & Tamberi, 2013; Pasinetti, 1993)
Services	+	(Iyoboyi & Na-Allah, 2014; Sawadogo et al., 2024)
Trade Openness	+ / 0	(Agosin et al., 2012; Fosu & Abass, 2020; Giri et al., 2019; Gnanngnon, 2019a; Lectard & Rougier, 2018; Tadesse & Fayissa, 2008)
Financial Capital		
Financial Development	+ / 0	(Agosin et al., 2012; Giri et al., 2019; Gnanngnon, 2019a; Jolo et al., 2022; Nieminen, 2020; Shakib et al., 2023)
FDI	+ / 0	(Amighini & Sanfilippo, 2014; Antonietti & Franco, 2021; Fonchamnyo & Akame, 2017; Giri et al., 2019; Jolo et al., 2022; Lectard & Rougier, 2018; Mania, 2020; Munemo, 2011)

Remittances	+	(Saadi, 2020)
Foreign Aid	+	(Gnangnon, 2019a; Kim, 2019; Munemo, 2011; Nathoo et al., 2021; Osakwe, 2007)
Policy		
Institutional	+	(Balavac & Pugh, 2016; Fosu & Abass, 2020; Giri et al., 2019; Gnangnon, 2019a; Jolo et al., 2022; Lectard & Rougier, 2018; Mosley, 2018; Nathoo et al., 2021; Osakwe, 2007; Parteka & Tamberi, 2013; Sheng & Yang, 2016)
Human Capital	+	(Agosin et al., 2012; Cadot et al., 2011; Elhiraika & Mbate, 2014; Fosu & Abass, 2020; Gnangnon, 2019a; Jolo et al., 2022; Lectard & Rougier, 2018; Osakwe et al., 2018b; Parteka & Tamberi, 2013)
Product Standard	+	(Shepherd, 2015)
Exchange Rate/Misalignment/Volatility	+/-	(Agosin et al., 2012; Amurgo-Pacheco, 2007; Elhiraika & Mbate, 2014; Giri et al., 2019; Goya, 2020; Nicita & Rollo, 2015; Sekkat, 2016; Tadesse & Fayissa, 2008)
Inflation	0/-	(Amighini & Sanfilippo, 2014; Giri et al., 2019)
Export Growth	+/-	(Martincus & Carballo, 2008)
Innovations		
R&D Expenditures	0	(Parteka & Tamberi, 2013)
TCI	+	(Lectard & Rougier, 2018)
Patents	+	(Sweet & Eterovic, 2019; Ul-Haq et al., 2025)

APPENDIX A5

Methodologies used:

Methodology used	Articles	References
Instrumental Variable (IV)/GMM/SYSTEM GMM	38	(Agosin et al., 2012; Al-Marhubi, 2000; Bahar & Santos, 2018; Balavac & Pugh, 2016; Cadot et al., 2011; Cadot et al., 2013; Cieřlik & Parteka, 2021; Cook & Jones, 2015; Elhiraika & Mbate, 2014; Felipe et al., 2012; Fosu & Abass, 2020; Gnangnon, 2019a, 2021b; Golo, 2023; Imbs & Wacziarg, 2003; Iyoboyi & Na-Allah, 2014; Kim, 2019; Lectard & Rougier, 2018; Mania & Rieber, 2019; Martincus & Carballo, 2008; Mosley, 2018; Munemo, 2011; Nicita & Rollo, 2015; Omgba, 2014; Osakwe, 2007; Parteka & Tamberi, 2013; Piras, 2023; Regolo, 2013; Saadi, 2020; Sawadogo et al., 2024; Sekkat, 2016; Shakib et al., 2023; Shepherd, 2015; Sweet & Eterovic, 2019; Tran et al., 2017)
Co-integration and causality approach	10	(Antonietti & Franco, 2021; Gözgör & Can, 2017; Herzer & Nowak-Lehmann D, 2006; Masunda, 2020; Ngassam,

		2023; Nguyen, 2016; Shah et al., 2023; Sheng & Yang, 2016; Tran et al., 2017; Young, 2023)
Gravity Model	11	(Amighini & Sanfilippo, 2014; Caselli et al., 2020; Dutt et al., 2013; Feenstra & Kee, 2008; Feenstra & Ma, 2014; Goya, 2020; Kramarz et al., 2020; Mau, 2016; Persson, 2013; Persson & Wilhelmsson, 2016; Regolo, 2013)
Feasibly Generalized Least Square (FGLS)	1	(Jolo et al., 2022)
Auto Regressive Distributive Lag (ARDL) Model	2	(Iyoboyi & Na-Allah, 2014; Naudé & Rossouw, 2011)
Fixed Effect Model	1	(Koch, 2021)
Multiple regression; Multinomial logit (MLN) for penal data	1	(Fonchamnyo & Akame, 2017)
Cross Sectional Regression (IV)	4	(Kostanica, 2025; Melitz, 2003; Pasinetti, 1993; Saviotti & Jun, 2020)
Fixed Effect-Driscoll-Kraay standard errors (FE-DKSE)	1	(Ul-Haq et al., 2025)