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Institutions, trade openness and poverty severity : empirical evidence for COMESA countries

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‘‘INSTITUTIONS, TRADE OPENNESS AND POVERTY SEVERITY: EMPIRICAL EVIDENCE FOR COMESA COUNTRIES’’

By

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Supervisor: Prof. Arcade NDORICIMPA

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DEDICATION

This dissertation is essentially dedicated to my Faithful Almighty God, my Lord and Redeemer and my fortress, in Whom I am wholly Gracious; to my beloved Parents as well, Pastor Laurent MUTABAZI and Ms Candide MVUYEKURE, who have sacrificed a lot so that I become what I am today; their care and support have been hence engraved in my heart. The dissertation is also dedicated to my siblings, Vérité AZABIWE and Sophonie KEZIMANA; Louise IGIRANEZA, Estella NIYOKWIZIGIRWA, Abigaïl BUNTUBWIMANA, Félicité BUZIMA, Anne NISHIMWE and her family, my cousins, my uncles, my aunties, my nephews and my nieces, Ange Bernice IRISHURA and Romy Allégresse NIYONZIMA for their kindness. The dissertation is dedicated to my friends, Herman NIYONZIMA with his family who made smooth my stay in Bujumbura, Dr Esaïe NTIDENDEREZA and Dr Denis Oscar CIZA who have both of them taught me hard work.

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Egide KWIZERIMANA

LIST OF TABLES

LIST OF GRAPHS

LIST OF ACRONYMS

ADB : African Development Bank

AR : Autoregressive

AUC : Africa Union Commission

BDI : Burundi

CC : Control of Corruption

CEPII : Centre d'Etudes Prospectives et d'Informations Internationales

COMESA : Common Market of Eastern and Southern Africa

COM : Comoros

DJI : Djibouti

DOLS : Dynamic Ordinary Least Squares

DRC : Democratic Republic of Congo

EAC : East African Community

Educ : Education

EGY : Egypt

ETH : Ethiopia

EU : European Union

FDI : Foreign Direct Investment

FGT : Foster-Greer-Torbecke

GATT : General Agreements on Tariff and Trade

GDP : Gross Domestic Product

GE : Government Effectiveness

GMM : Generalized Method of Moments

H.O : Hecksher-Ohlin

ICRG/PSR : International Country Risk Guide for Political Risk Services

ICT : Information and Communication Technology

IDE-JETRO : Institute of Developing Economies

IGAD : Inter-governmental Authority Development

IMF : International Monetary Fund

Infl : Inflation

Inst : Institutions

IOC : Indian Ocean Commission

KEN : Kenya

MDG : Madagascar

MDGs : Millennium Development Goals

MENA : Middle East and North Africa

MUS : Mauritius

MWI : Malawi

NEPAD : New Partnership for Africa's Development

Obs : Observations

OECD/OCDE : Organisation for Economic Co-operation and Development

OLS : Ordinary Least Squares

PD : Poverty Depth

PI : Poverty Incidence

PNUD/ UNDP : United Nations Development Programme

PPP : Purchasing Power Parity

PRSP : Poverty Reduction Strategy Papers

PS/Pov.Sev : Poverty Severity

PTA : Preferential Trade Agreements

PV : Political Stability and Absence of Violence

RCGVC-UIBE : Research Center for Global Value Chains at the University of International Business and Economics

RCT : Randomised Control Trials

RL : Rule of Law

RQ : Regulatory Quality

RWA : Rwanda

SA : South Asian

SAARC : South Asia Association for Regional Cooperation

SADC : Southern Africa Development Community

SAP : Structural Adjustment Programmes

SAR : Spatial Autoregressive

SDGs : Sustainable Development Goals

SDN : Sudan

Squar : Squared

SSA : Sub Saharan Africa

SST : Stolper-Samuelson Theorem

SWZ : Eswatini/Swaziland

Tarate : Tariffs rate

TO : Trade openness

UGA : Uganda

UK : United Kingdom

UN : United Nations

UN ESCAP : United Nations-Economic and Social Commission for Asia and the Pacific

UNCTAD : United Nations Conference for Trade and Development

UNESCO : United Nations for Educational Science and Culture Organisation

Unempl : Unemployment

US : The United States

USA : The United States of America

VA : Voice and Accountability

WBG : World Bank Group

WDI : World Development Indicators

WGI : World Governance Indicators

WITS : World Integrated Trade Solution

WP/S : Working Papers/Series

WTO : World Trade Organisation

ZMB : Zambia

ZBW : Zimbabwe

ABSTRACT

The study examines relationships among institutions, openness to trade and poverty severity in COMESA countries over 1995-2018 period. The study uses Pooled OLS, Fixed effects model and GMM techniques in panel data. Results show that institutions contribute to increase openness to trade. However, findings reveal that trade openness have ambiguous effects on poverty severity. Results indicate also that improvements in institutional quality is a major way for poverty alleviation in the region. This study comes with results uncovering an interesting pattern of reform complementarity: trade openness tends to reduce poverty severity in countries where institutions are strong, education levels high and tariffs rate low. Moreover, institutions in countries characterised by increased education levels tend substantially to reduce poverty severity. This study suggests policies to reduce poverty severity by setting efforts on improving institutional quality, increasing trade openness, education levels as well as lowering tariffs rate in COMESA Countries.

Key words: Institutions, trade openness, poverty severity

RESUME

L'étude se focalise sur l'investigation des relations entre la qualité des institutions, l'ouverture au commerce et la sévérité de la pauvreté dans les pays membres de COMESA sur la période allant du1995 à 2018. L'analyse empirique recourt aux techniques d'estimation de Moindres Carrées Ordinaires Groupées, Modèle à Effets fixes et Moments de Méthode Généralisée pour les données de panel. Il en résulte que les effets de la qualité des institutions contribuent à accroître l'ouverture commerciale. Cependant, les effets d'ouverture au commerce sur la sévérité de la pauvreté apparaissent ambigus et controversés. Les résultats montrent également que les effets de la qualité institutionnelle ne sont qu'un fil conduisant à la réduction de la sévérité de pauvreté aux pays membres de COMESA. Les résultats de cette étude révèlent donc un modèle intéressant de complémentarité des réformes: l'ouverture commerciale tend à réduire la sévérité de la pauvreté dans les pays où les institutions sont fortes, les niveaux d'éducation élevés et les taux des tarifs douaniers bas sur les produits commercialisables. En outre, les institutions dans les pays caractérisés par des niveaux d'éducation élevés ont tendance à réduire considérablement la sévérité de la pauvreté. Cette étude suggère des politiques de réduction de la sévérité de la pauvreté en conjuguant les efforts sur l'amélioration de la qualité institutionnelle, l'accroissement de l'ouverture commerciale et des niveaux d'éducation ainsi que la réduction des tarifs douaniers dans les pays membres de COMESA.

Mots clés: Institutions, ouverture au commerce, sévérité de pauvreté

TABLE OF CONTENTS

CHAPTER ONE. GENERAL INTRODUCTION

1.1. Background

Poverty is a great challenge for humankind worldwide especially in developing countries. Around 700 million people experience extreme poverty, and five millions of children starve or die of diseases due to lack of proven intervention (Banerjee, Duflo and Kremer, 2019). Children are vulnerable to the extent that they cannot even complete primary school. Odhiambo and Mahembe (2018) explore and argue that among 700 million world poor people, 80 percent are both[1] SSA and SA. Yet, more than 42 percent remain for SSA extremely poor people living on less than $1.90 per day.

Since World Bank Report (2020), Ketels (2017) and Sapolaore & Wacziarg (2012) describe underlying determinants of development notably trade, institutions and geography, Several African countries are addressing poverty throughout their policy agenda. Substantial poverty alleviation strategies do not lack in either international debate or Think Tank consortium. World Trade Organization (WTO) and World Bank (2018) indicate that trade facilitation in extreme poor countries is a major contributor for poverty eradication (development). Since poor people live mostly in rural areas, they also work in informal sector and suffer from life deprivation and effects from their countries fragility, conflicts and gender inequality. The role of institutions may well determine why nations fail (Acemoglu and Robinson, 2012; McCord and Sachs, 2013).

This has been debated since the New Institutional Economy that has ever since attracted the attention of many scholars to assess the effects of good institutions on economic development (Coase, 1998). Meanwhile, North (1991) has argued that institutions quality improves transaction costs, profitability and reliability of economic activities. Good institutions are pre-requisite for long term growth and increased productivity. Makochekanwa and Mashura (2017) further show the effects of institutions, technology, tastes and endowments on trade flows to achieve sustained economic growth in order to reduce poverty. Moreover, traditional theories of international trade assume gains in trade between countries through the specialization of their economies, investments in innovation and productivity growth, and the allocation of resources. Although Singh and Huang (2011) indicate that in the long run, trade openness policies are good for poverty reduction, others claim that trade openness is detrimental to the poor, and can even lead to increased inequality (Le Goff and Singh, 2014).

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[1] *Both **SSA: Sub Saharan Africa and SA: South Asian***

Institutions, Trade openness and Poverty Severity: Empirical Evidence for COMESA Countries

Economic benefits from trade openness do not cascade automatically to poor people; some empirical studies show that trade openness tends to reduce poverty in countries, where developed financial sector, high education level and strong institutions are (Adegbemi, & al., 2019). Indeed, the overarching goal of the World Bank of ending extreme poverty below 3 percent of world population by 2030 does not seem to be within reach for SSA countries. While poverty reduction programmes along with different development policies and strategies have been implemented in Africa, 42.1 percent of people in Sub-Saharan Africa countries are still living in extreme poverty (Mthuli, & al. 2017; Odhiambo and Mahembe, 2018).

In regard to this, COMESA (Common Market for Eastern and Southern Africa) comprising of more than a third of SSA countries, aims to use trade integration initiatives to improve the citizen's living standards and reach poverty alleviation within this economic area. COMESA was established in 1994 and is a regional economic community with 21 member states.. Although countries in the region are endowed with abundant natural resources, 12 of them are still ranked among low income countries, others in lower-middle-income countries, except Seychelles which is higher income country. The widespread poverty and underdevelopment in COMESA countries calls for poverty reduction strategies (COMESA, 2016).

Beyond MDGs by 2015, COMESA countries are pursuing SDGs (Sustainable Development Goals) by 2030 as well as the African Union's Agenda 2063 in their development plans (AUC, 2014, Norley and Rosenthal, 2019). To meet the SDGs, African countries require a sustained and inclusive economic growth of at least 7 percent per year. Increased growth can then lead to the reduction in the intensity or severity of poverty by diversifying sources of community's income, increasing job creation. Opening policies led to growth has been attracting poor people in Africa and South- Asian countries to reap from new opportunities offered by agriculture and services to reduce poverty.

Meanwhile, promoting exports and investments in the 1970s, has led them to greater development success in the Southern and Eastern Asian countries, due to their inclusive institutions; which can be a lesson for other developing countries (Boddin, 2016). COMESA policies can therefore foster poverty alleviation through promoting the pro-poor export sectors and integrating active poor people in potential activities within the value chain. Countries with better institutional quality are advantageous to gain more from trade integration and reduce poverty (WTO and WB, 2015). This study contributes to the literature by examining whether institutional quality can affect trade openness to exert influence on the severity of poverty in COMESA countries.

1.2. Problem statement

Despite tremendous progress made for fighting poverty, more than 80 percent of the world's population still live in conditions of extreme poverty and many of which are from Sub- Saharan Africa (SSA) (42.1 percent) (Odhiambo and Mahembe, 2018). Considering the $1.90 international poverty threshold, more than a third of the SSA poor people are from COMESA countries (Heshmati and Rashidghalam, 2018). The number of poor people in Africa reached about 280 million poor in 1990, increased to more than 330 million poor in 2012 and are estimated to be beyond 350 million today (World Bank, 2016a-b).

Following the growth miracles of the Asian Countries (Hong Kong, South Korea, Singapore, and Taiwan) since the 1960s, outward-oriented policies have been suggested to developing countries as a way out of poverty. However, a number of studies find mixed evidence of the effect of trade openness on poverty severity. While COMESA countries are endowed with abundant natural resources, they remain among the poorest in the world. Trade deficits are persistent because of deteriorating terms of trade. According to Ferreira (2018), deteriorating institutional environments (i.e deteriorated public services, higher armed/ethnic/religious conflicts, higher corruption and economic inequality, etc.) is the cause of state fragility and poverty. High poverty rates are mostly found in small fragile countries affected by armed conflicts. Therefore, the question that drives this study is: ‘‘what are the relationships among trade openness, institutional quality and poverty severity in COMESA Countries?’’

1.3. Study objectives

The general objective of the present study is to assess the relationships among institutions, trade openness and poverty severity in COMESA countries. This analysis intends to examine and stress the effectiveness of public policies through trade openness and institutional quality in the poverty eradication in COMESA countries.

We have three specific objectives that guide this research:

1. Explore the effect of institutions quality on trade openness in COMESA countries
2. Investigate the effect of trade openness on poverty severity in COMESA countries
3. Examine the effect of institutions quality on poverty severity in COMESA countries.

1.4. Justification of the Study

Based on existing economic literature and public policies in SDGs, the study aims at better understanding and emphasizing effects of the role of institutions and trade openness to alleviate poverty. Most studies have explored the impacts of trade openness or institutions on income poverty, rare of the literature has studied the impacts of openness or institutions on poverty severity. Previous studies considered channels by which openness to trade can move to affect poverty, but this literature contributes to the investigation of effects of either institutional quality or openness to trade on poverty severity. We apply each institutional quality indicator to investigate its effects on poverty severity and on trade.

In order to enrich mostly debates about policies orientation on both openness and institutions with their corresponding effects on poverty alleviation, we examine interaction effects between trade openness and institutions, trade and education as well as trade openness and tariffs rate on poverty severity or interaction effects between institutions and education on poverty severity. This help us determine good choice between complementary or substitute policies and the analysis refers on quantitative methods to provide great conviction to decision makers. The study examines further poverty severity by considering data computed on each poverty line set on its corresponding PPP in order to bypass the effects of single poverty line used for all study periods in most studies. After pooled OLS as a basic model, we use advanced analytical instruments such as fixed effect (within) regression with AR (1) disturbances via Xtregar Stata command and GMM techniques through Xtabond2 Stata command.

To the best of my knowledge, no such a study about relationships among institutions, trade openness and poverty severity in COMESA countries has ever been carried out and it is therefore important to look at the relationships among those important variables. The study is finally carried in the angle of the requirements for a Master's degree award in Economics at the University of Burundi. This analysis, once achieved, may as well contribute to the literature on poverty severity.

1.5. Brief Presentation of the Methodology

The study intends to run a balanced panel of 21 COMESA countries[2] over the period 1995-2018. The study uses Pooled OLS, Fixed effects model and dynamic panel data estimation approaches. To investigate the relationships between institutions, trade openness and poverty severity, data used were retrieved from respectively Worldwide Governance Indicators, World Development Indicators and PovCalNet World Bank database.

Since the Pooled OLS estimator may be biased, we employ fixed effects model and dynamic panel model. The study uses rule of thumb 2 in order to choose suitable estimation approach between difference and system GMM approaches through Xtabond2 STATA command.

1.6. Outline of the Dissertation

This dissertation is structured as follows:

Chapter One presents the background of the study, the problem statement, the justification, objectives of the study; methods and procedures used in the study are also briefly presented.

Chapter Two presents stylized facts of Quality of Institutions, Trade openness and poverty severity in COMESA countries.

Chapter Three reviews the literature, theoretical and empirical, concerning the effects of Institutional quality, trade openness on poverty severity. Chapter Four presents the methodology (details the various testing procedures) used in the study. In Chapter Five, the results are presented, interpreted and discussed. And the final Chapter Six concludes by giving a general conclusion of the study, policy implications, limitations of the study and challenges for further studies in the area.

[2] Burundi, Comoros, Djibouti, DRC, Egypt, Ethiopia, Eritrea, Eswatini, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Somalia, Tunisia, Uganda, Zambia and Zimbabwe

CHAPTER TWO. STYLIZED FACTS OF INSTITUTIONS, TRADE OPENNESS AND POVERTY SEVERITY IN COMESA COUNTRIES

2.1. Introduction

The Common Market of Eastern and Southern Africa (COMESA) is a regional economic community of 21 member states with suitable trade facilitation to reduce poverty and improve the welfare of people. Within the facilities framework of the Organisation of Africa's Unity, COMESA was established since 1981 as a Preferential Trade Area of Eastern and Southern Africa (PTA). The latter has soon evolved and been transformed into COMESA in December 1994 in order to take advantages yielded from an actual economic community. Pursuing its vision of getting fully integrated and internationally competitive region in Africa, COMESA region sets mission to provide great endeavours for sustainable economic and social progress achievement. This gets feasible through the growing co-operation and integration in many development fields such as trade, environment and natural resources, agriculture, customs and monetary affairs, ICT, energy, etc. (COMESA, 2018).

COMESA has taken a classical stage-by-stage gradual method of integration fixed by Balassa (1967). After the achievement of its integration programmes of PTA in 2000, a progress in the establishment of Customs union has processed in 2009, and COMESA is currently searching to launch a Common Market along with the eventual monetary union. Despite COMESA programmes to improve customs management and transport facilitation or to address other non-tariff barriers to trade and investment, the record is not promising due to disregarded timelines. The poor record can be explained by different actors and factors associated with restrictions of ability COMESA institutional framework and of power and interests interaction at national or regional level. Lack of sanction for non-compliance with COMESA agreements at regional level explains as well the poor record (COMESA, 2016).

However, COMESA's current strategies may now be spelled in ''***Economic prosperity through regional integration''*** with increasing regional trade in goods reaching US $235 billion up from US $3.1 billion in 2000, with population of over 520 million, With GDP of US $657.4 billion and 12 million squared kilometres of covered geographic area (COMESA, 2017). Somalia and Tunisia States are excluded from the above ranks for their recent adhesion into the region. Accordingly, various economic development programmes are implemented by COMESA region pursuing to alleviate poverty, misery and vulnerability from COMESA citizens.

In addition, COMESA woks both formally and informally in excellent linkages to other regional organisations. This is obvious in the overlapping membership in the East African Community (EAC), Inter-governmental Authority on Development (IGAD), Indian Ocean Commission (IOC) and the Southern Africa Development Community (SADC). Yet, such overlapping membership denotes the spaghetti bowl implying that a single country participates on the integration of many communities. Despite the need for some preferential trade agreements, but spaghetti Bowl is an obstacle to a successful regional economic integration. However, Tripartite arrangements of EAC, COMESA and SADC are processing to be settled. This aims at implementing trade performance (market integration and industrial development), infrastructure development and climate change mitigation (COMESA, 2018). The tripartite comprising 27 member States aims at crafting a single market by the consolidation of Free trade areas of COMESA-SADC and the EAC Customs Union in order to tackle the widespread poverty effects.

2.2. Stylized facts of poverty severity in COMESA Countries

The most demanding concern in Africa remains poverty even in COMESA countries. Various poverty factors on households or aggregated level are responsible for poverty in a way that their effects tend to interact and reinforce one another leading to widespread poverty (Adasine, Akin-Olagunju and Salman, 2019). Widespread poverty and underdevelopment in COMESA region make an imperative necessity for economic development. Hence, inability conditions for poor people to attain the minimum living standards imply generally lack of basics needs especially food, health and education services, shelter, sanitation facilities, clean water and other necessities (Gerry and Bellarmine, 2014). Since poverty continues to be more region's number one development challenge than other Sub-Saharan Africa members. Money metric approach implying poverty incidence, poverty depth and poverty severity is one of the most today analyses in development economics. Poverty severity is therefore set as a driver target throughout this study on COMESA countries. Baseline assumptions show that beyond confirming poverty headcount ratio properties, the squared poverty gap indicates, in addition, the distributional changes within poor population. Poor are not poor at the same level, differences between poor people occur over time and space and persist (Banerji and Duflo, 2012 and Celidoni, 2011).

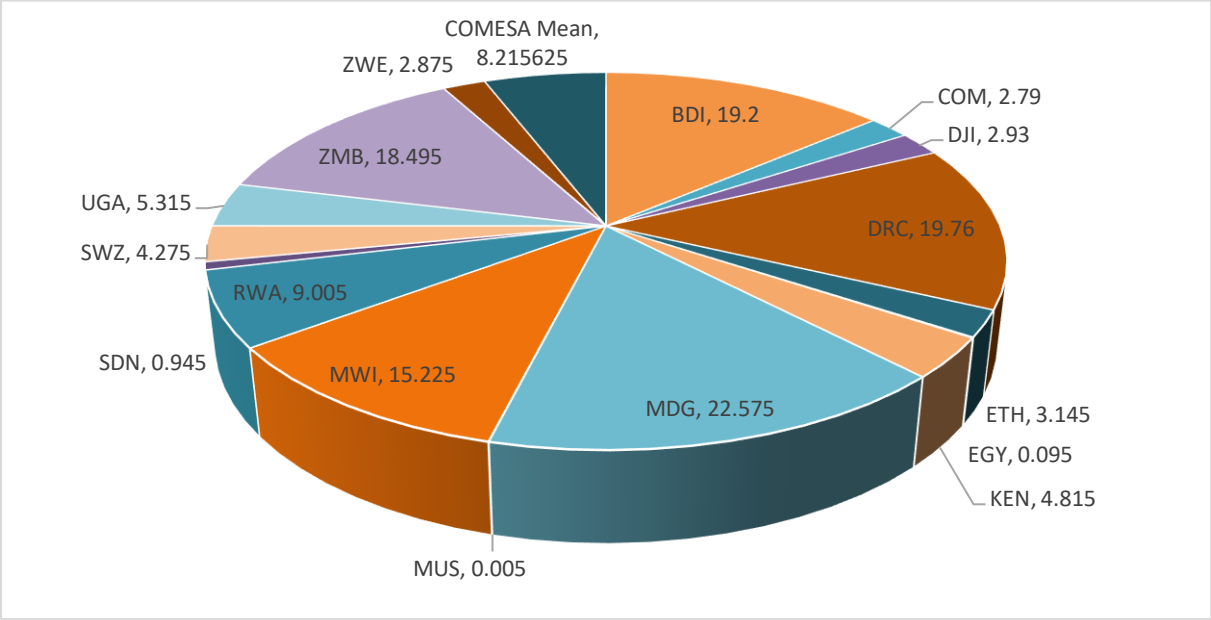
Capturing dynamics of poverty severity in COMESA countries, its averages shows the changes from 3.88 percent (1995) to 8.22 percent (2015) implying pervasion of poverty in the region. Table 1 and Graph 1 indicate six out 16 countries with high pronounced poverty levels (above the average) especially Madagascar (22.56), Democratic Republic of Congo (19.76), Burundi (19.2), Zambia (18.50), Malawi (15.23) and Rwanda (9.01). Yet, lower levels of poverty severity are observed in Mauritius (0.005), Egypt (0.095) and Sudan (0.95). Moreover, the recalibration of poverty threshold denotes that only higher potential progress in poverty reduction is made for Democratic Republic of Congo, while little progress is seen in countries like Madagascar, Burundi, Zambia, Malawi and Rwanda. In the latter countries, Poverty severity fluctuates moderately or almost invariantly and remains. This worsens population costs of life in COMESA countries over the period.

Table 1. Poverty severity in COMESA region under a PPP[3] by country, per time period

	Poverty severity for less than 1993 PPP US$ 1.08 a day		Poverty severity for less than 2005 PPP US$ 1.25 a day		Poverty severity for less than 2011 PPP US$ 1.90 a day
Country/time Period	1995-1999	2000-2004	2005-2009	2010-2014	2015-2018
BURUNDI	10.415	7.4	6.715	6.375	**19.2**
COMOROS	0.245	0.2	0.59	0.905	2.79
DJIBOUTI	0.355	0.41	1.79	2.3875	2.93
DR CONGO	20.765	28.07	27.3	15.33	**19.76**
EGYPT	0.025	0.02	0.01	0.01	0.095
ETHIOPIA	1.585	0.35	0.59	0.985	3.145
KENYA	0.705	1.62	3.235	2.365	4.815
MADAGASCAR	4.275	8.28	7.005	11.635	**22.575**
MURITIUS	0.01	0.01	0.005	0.01	0.005
MALAWI	2.33	3.74	7.77	8.57	**15.225**
RWANDA	9.005	6.26	5.335	5.702	**9.005**
SUDAN	0.96	0.6	0.67	0.303	0.945
ESWATINI	6.64	1.45	3.315	3.348	4.275
UGANDA	2.8	3.01	3.225	1.608	5.315
ZAMBIA	1.945	1.67	9.4	9.55	**18.495**
ZIMBABWE	0.01	0.01	0.875	0.165	2.875
Average	**3.879375**	**3.94375**	**4.864375**	**4.32803125**	**8.215625**
Source: Author, computed data as of PovCalNet world bank database 2019					

[3] *Purchasing Power Parity produced by International Comparison Program (independent Consortium)*

Graph1: Profile of poverty severity for 2015-2018 time period in COMESA



Source: Author, computed with data from PovCalNet World Bank database

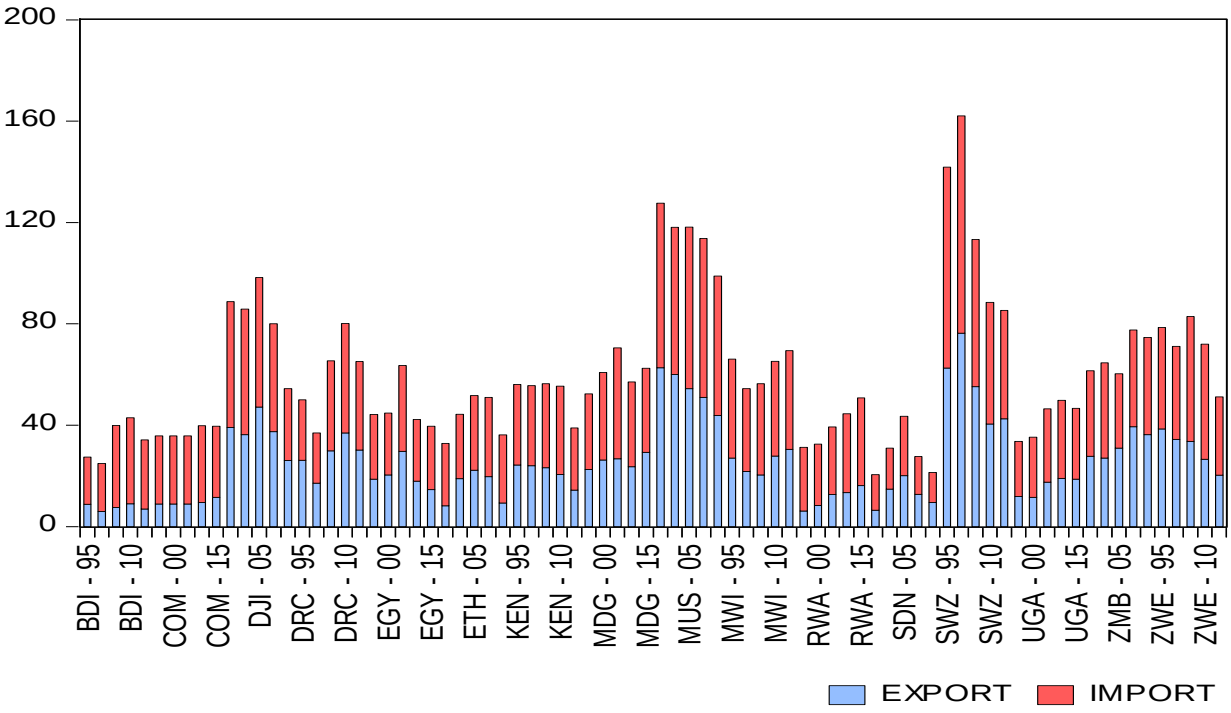
2.3. Some salient features of Trade openness in COMESA Countries

The need for COMESA establishment focuses on promoting the regional economic integration aiming at trade barriers alleviation. Heterogeneous economic characteristics are evident in COMESA countries, yet one of the similarities is that many of COMESA countries hinge on trade of third countries. Integration impediments persist, where 10 of 13 Southern African countries may adhere more than one regional economic community (overlapping membership). Moreover, Africa's exports are mainly made of commodities like oil, gold, coffee, maize bran, fruit, vegetables, sesame seeds, cattle and goats, bananas, avocado, honey, apples, and little services, etc. while imports have great potentialities in manufactures and services. However, COMESA countries present some tradable products: petroleum, sugar, palm oil, pharmaceutical, industrial machinery, mineral fuel, clothing, equipment, etc. (ADB[4], 2019).

Graph 2 indicates lower values of exports of goods and services as ratio to GDP than imports values as a ratio to GDP for example Burundi, Rwanda and Comoros. In addition, between 10% and 50% of exports values, many countries are classified there, except Mauritius and Eswatini which are higher above. Since imports values are higher for all countries where a trade deficit is shown for Burundi, Comoros and Rwanda with around 30 percent of imports as a ratio to GDP over the periods.

[4] (BAfD)-*African Development Bank Group report on East Africa*

Graph 2: Exports, Imports of Goods and Services as a ratio to GDP of COMESA



Source: Author, computed with data from WDI on World Bank database

While analysing trade profile within COMESA countries (**table 2 & Graph 3**), it is found that though exports promotion contributes eminently to boost economic growth, the exports are decreasing from 24.97% since 1995 to 22.49% for 2015 period. Global COMESA exports for the periods of analysis are ranked at 25.19% and 34.85% of global imports. Similar decreasing speed is observed for imports, from 34.31% for 1995 to 31.80% along 2015-2018 period.

Great imports of COMESA are specifically from EU, as well as China, South Africa, USA, COMESA region, etc. The decreasing values for exports and imports as a share to GDP indicates respectively 0.099 percentage points and 0.073 percentage points for 1995-2018. This is attributed to overlapping memberships, lack of reliance on commodity exports and of infrastructural shortcomings, burden debt, and weak institutions to advance regional integration and failure to mitigate political issues (Gerry and Bellarmine, 2014)[5].

[5] **Cited by Nwankwo, S. and Ibeh, K. (2018), Op.cit**

Accordingly, trade in goods all over COMESA countries has also downwards at the changes of 0.091percentage points against 0.205percentage points of trade in services from 1995 to 2018. The whole regional economic community is covered by much trade in Goods measured on 43.96% than services trade on 16.75%. Referring on the mean, trade performance in goods is more observed in Mauritius and Eswatini about 70% and 40% of trade in services for Mauritius. Malawi, Madagascar, Kenya, Zambia, Democratic Republic of Congo, Zimbabwe as well as Djibouti record about 40% in trade either goods or services. Ineffective open policies are evident for Burundi, Sudan and DRC's first periods due to their weak institutional quality failing to govern and reverse the marginal effects associated with opening economies. The sub-soil of DRC and Sudan is richly endowed with more natural resources especially golds, petroleum oils, petroleum gases, palm-oil, minerals, etc.

Graph 3: Services Trade, Goods Trade and total Trade as a share to GDP in COMESA

Source: Author, computed with data from WDI on World Bank database

Table 2: Global COMESA trade as a share of GDP for 1995-2015 time periods

COMESA trade (as a share to GDP) Changes for 1995-2015 time periods							1995-2015
Periods	1995-1999	2000-2004	2005-2009	2010-2014	2015-2018	Changes	Average
Goods trade	43.37	43.16	48.53	45.35	39.43	**-0.091**	**43.96%**
Services trade	17.60	17.83	17.98	16.34	14.00	**-0.205**	**16.75%**
Exports and Imports (as a share to GDP) Changes for 1995-2015 time periods							
Exports	24.97	25.74	27.51	25.29	22.49	**-0.099**	**25.19%**
Imports	34.31	34.13	37.61	36.42	31.80	**-0.073**	**34.85%**
Tot trade	59.27	59.87	65.12	61.57	54.29	**-0.083**	**60.023%**
Source: Author, computed with data from WDI on World Bank database							

2.4. Stylized facts of quality of institutions in COMESA region

Challenges for COMESA region have roots in both African countries and its development partners to create strong institutions. Governments intend to craft fortune and address the poverty eradication in order to reach prosperity, peace and happiness for poor population. COMESA institutional framework is made of most successful institutions especially: COMESA regional investment Agency, COMESA monetary institute, PTA Bank, Re-insurance agency, African trade insurance agency, COMESA court of justice, COMESA institutions, Governments of member states, etc (Mangeni, 2014). Yet, Bergh et al. 2014 and Kuncic, 2014 show indicators of institutional quality helping determine whether a country has strong or weak institutions. These institutions quality should foster openness, increase the economic growth and alleviate poverty. Institutions are held as game's rules in a society where the humanly devised constraints shape human interaction formally or informally.

i)Regulatory Quality is based on the investment profile. It measures the incidence of market-unfriendly policies such as price controls or inadequate bank supervision and perceptions of the burdens imposed by excessive regulation in areas such as foreign trade and business development.

ii) *Rule of Law* reflects laws and order. It includes several indicators which measure the extent to which agents have confidence in and abide by the rules of society. These include perceptions of the incidence of crime, the effectiveness and predictability of the judiciary and the enforceability of contracts. Together, these indicators measure the success of a society in developing an environment in which, fair and predictable rules form the basis for economic and social interactions and importantly, the extent to which property rights are protected'.

iii) *Control of Corruption* measures the perceptions of corruption, conventionally defined as the exercise of public power for private gain. The presence of corruption is often a manifestation of a lack of respect of both the corrupter (typically a private citizen or firm) and the corrupted (typically a public official or politician) for the rules which govern their interactions and hence stands for a failure of governance according to the above definition.

iv) *Voice and Accountability* measures the extent to which, country's citizens are able to partake of selecting their government, as well as freedom of expression, freedom of association, and a free media. It is specified as military in politics and democratic accountability.

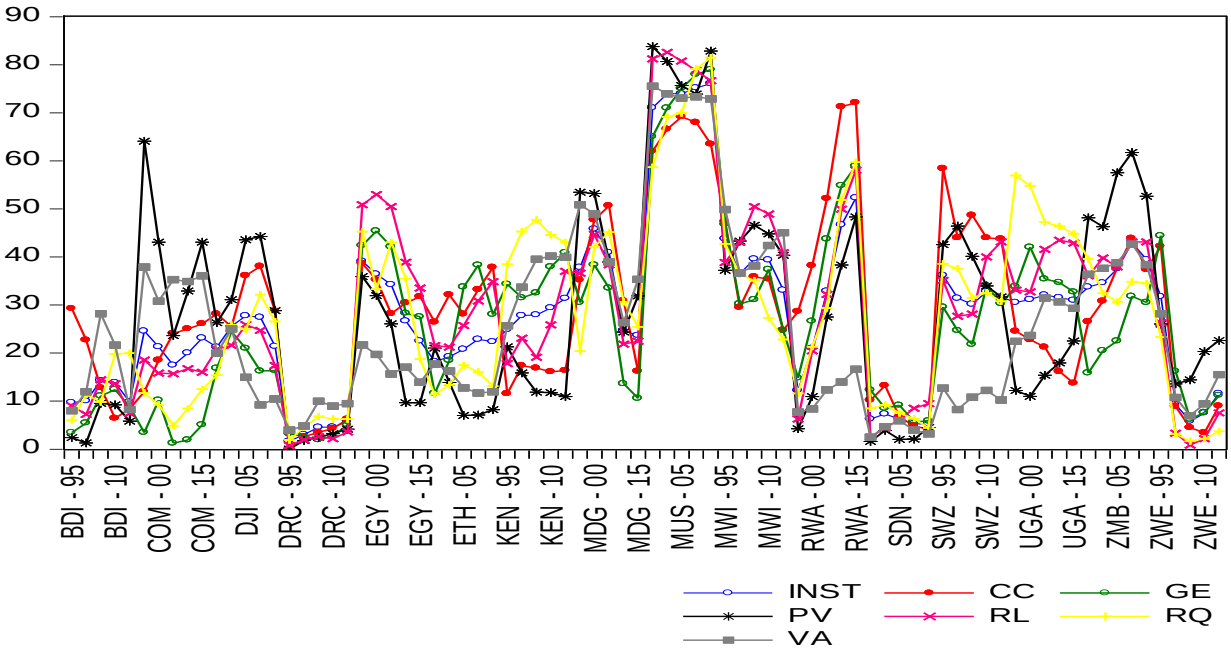
v) *Political Stability and Absence of Violence* measure 'perceptions of the likelihood that the government is unsteady or overthrown by unconstitutional or violent means, including domestic violence and terrorism. In a few words, there are government stability with neither external and internal conflicts, nor ethnic tensions.

vi) *Government Effectiveness* measures 'the bureaucratic quality' or quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

G**raph 4** shows countries, on one side, with higher quality of institutions with high percentiles. The upper level views Mauritius with distinctive scores around 80 percentiles for all indicators. Lower institutional quality is observed for Democratic Republic of Congo (DRC), Sudan, and Burundi with under 20 percentiles. Considering the mean percentile for each indicator on the other side, Rwanda shows higher percentile implying strong institutions except for voice and accountability, and political stability and violence absence. Zimbabwe has weak institutions except for political stability and violence absence. Otherwise, Comoros shows lower percentiles for both government effectiveness, and regulation quality but higher quality in political stability (65 percentiles as Zambia and Madagascar). Rule of law is shown high rank in Egypt and Kenya, Uganda and Malawi. Eswatini has good institutions except for voice and accountability which is moderate small.

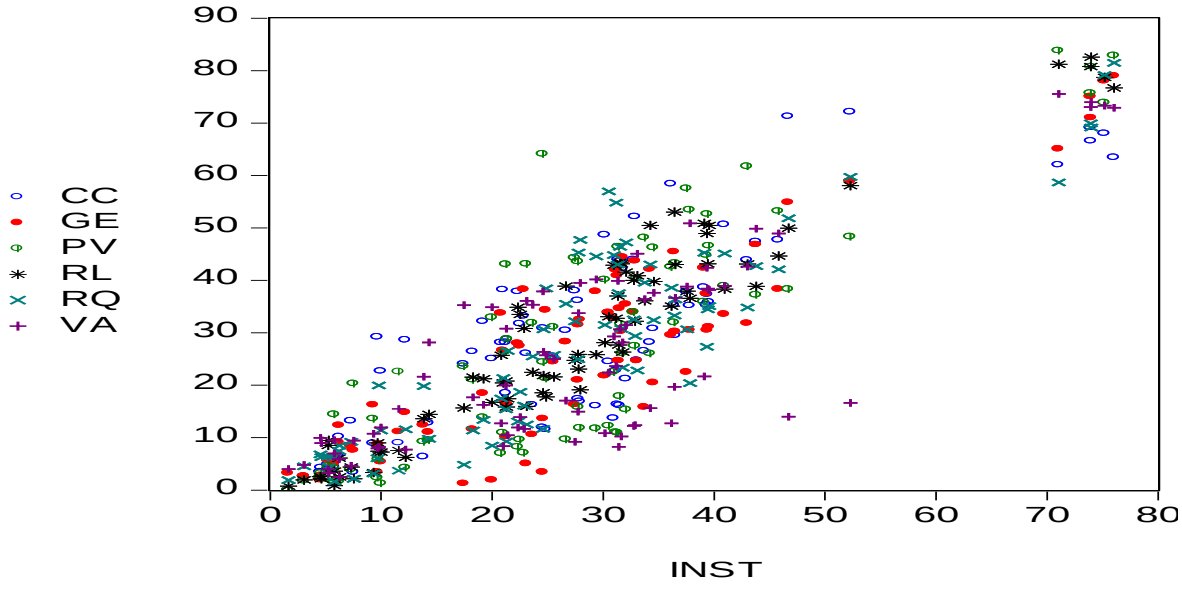
Moreover, the **graph 5** denotes the scatter of distribution of six governance indicators for institutional quality within COMESA countries. The distribution is viewed as less scattering since the plot shows linearly the bounded changes. The inner part of plot can be divided into three area, where each one embodies a distribution scatter of different countries. Percentile scores in higher right corner coordinates (70, 70) describe a country for strong institutions in all indicators (Mauritius, whose overall institution is also closer to 80 percentile). However, percentile scores in lower left corner coordinates (20, 20) represent countries with worse institutional quality in most of their indicators (DRC, Sudan, Burundi and Zimbabwe). Therefore, percentile scores in the middle coordinates show countries with weak or moderate institutions in most part of all their indicators (Comoros, Djibouti, Egypt, Ethiopia, Kenya, Madagascar, Malawi, Eswatini, Uganda, Rwanda and Zambia). The overall institution (Inst) denotes the average of six governance indicators per country and time periods.

Graph 4: Six indicators of institutional quality for COMESA countries



Source: Author, computed with data from WGI on World Bank database

Graph 5 : Scores scatter of Governance indicators for COMESA countries for 1995-2015



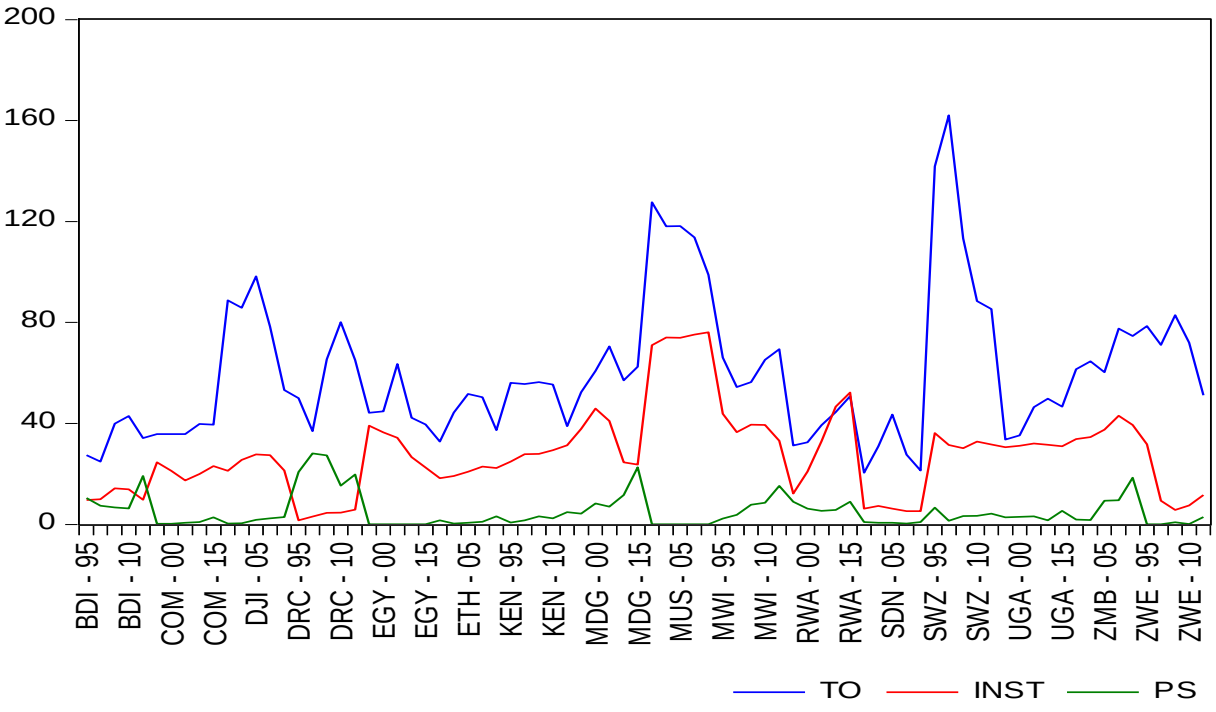
Source: Author, computed with data from WGI on World Bank database

COMESA countries need to craft and foster local institutions so that its population may reap benefits from economic policies in order to meet sustainable development goals.

Graph 6 completes the analysis by examining the outcomes from the joint chart of relationship between institutions, openness and poverty severity in COMESA countries during 1995-2015 time periods. The trends show that pronounced poverty severity in COMESA countries may be explained by adverse changes of institutional quality or/and openness. Viewing DRC, Madagascar, Burundi, Zambia, Malawi and Rwanda, one can remark weak institutional quality and ineffective open policies. Yet, widespread poverty shows peculiar heterogeneity occurring in Burundi, DRC and less in Madagascar for institutional quality. While poverty severity increases, institutions decrease else. It implies that if institutions through government policies do not deal with poverty in different poverty reduction strategies for instance opening policies, the poverty will otherwise deal with people with weak institutions.

Further, Mauritius has little poverty severity since it has higher quality of institutions and higher degree of openness- the ultimate mission of all countries militating for regional economic integration. Trends generally show that poverty severity disappears when openness increases consecutively to institutional quality for COMESA countries. Despite trends fluctuations, low level of poverty severity is also observed in countries with moderate weak institutions with fair openness to trade (Comoros, Egypt, Ethiopia, Kenya and Uganda).

Graph6: Trends change of trade, institutions, poverty severity in COMESA for 1995-2015



Source: Author, computed with data from WDI &WGI on World Bank database

2.5. Conclusion

In brief, analysing the relationship among institutions, trade openness and poverty severity in COMESA countries, countries with strong institutions are less poor and exhibit sequentially trade performance. Open economies, as opposed to closed ones, show good poverty reduction effects. Mauritius has strong institutional quality and higher opening policies (around 75 percent). Poverty severity is great in countries with weak institutions implying therefore openness to be controversial (DRC, Madagascar and Burundi).

Most challenges take a place in the dynamics of poverty severity in COMESA countries, whose variation neighbours 1.12% from 1995 to 2015 time periods. COMESA Trade in goods and in services represent respectively 43.96% and 16. 75% and decrease respectively on 0.091 and 0.205 for all the analysis's periods. Further, COMESA Exports and imports follow similar decreasing speed; they respectively represent 25.19% and 34.85% and decrease on 0.099 and 0.073 during the study periods. COMESA trade as ratio to GDP reaches about 60% mean performance level and diminishes of 0.083 percentage points for the whole study time periods, while COMESA governance is averaged on less than 40 percentile scores for all the periods. Complex fragility States characterize many of COMESA member States. Opening policies for poor countries cause damages in being exposed to external shocks. COMESA terms of trade therefore deteriorate because of immiserating growth and shortage of intermediate products Exporting domestic industries failed, since tariffs for manufactured products from developing to developed countries are raised (Bhagwati, 1958 and Linder, 1961)[6].

Hence, poverty reduction programmes in COMESA countries should be oriented to those people living in conditions of poverty severity in order to counteract the persistence of the citizens' vulnerability. So, higher promoting openness to trade and improving institutional policies are encouraged to craft productivity growth and make effective all kind of redistributions targeted to help poorer move out of poverty.

[6] ***Cited by Sen, S. (2010), Op.cit***

CHAPTER THREE. LITERATURE REVIEW ON THE RELATIONSHIPS BETWEEN INSTITUTIONS, OPENNESS AND POVERTY

3.1. Introduction

The need for the study arises from a mass of challenging economic literature associated with relationships between institutions, openness and poverty severity. The literature seems to be controversial among different scholars' perspectives in a try to offset poverty effects. Yet, focusing on poverty reduction, economic literature corroborates that better institutions can make trade performance of either home or host countries by enhancing openness and poverty alleviation effects. Opening policies can enhance sustainable economic growth and emphasize the role of Institutions in the region. We therefore review the proponent effects related to Quality of institutions, Trade openness and Poverty severity in COMESA countries.

3.2. Theoretical Literature on Relationships between institutions, trade openness and poverty severity

3.2.1. The Concept of Quality of Institutions

Since the New Institutional Economy has come into existence (Coase, 1998), researchers and scholars have paid more attention to the examination of the effects of good institutions on economic development. As explained by North (1993) and reported by Makochekanwa and Mashura (2017) "Institutions are rules of the game in a society or, more formally or informally are the humanly devised constraints that shape human interaction". Meantime, recent studies on institutions refer to a middle level where institutions are defined with regards to property rights protection, control of corruption and equitable law and regulation application (Edison, 2012). Mohan and Keane (2013) and Holmberg and Rothstein (2010) indicate further that there is a great role of institutions on the economic and political system nowadays.

On one side, basic and mainstream idea for many scholars tends to reflect a great number of written and unwritten constraints that can make up together, the societal context of decision making and people interaction. There exist formal institutions that hold legal system as written constraints such as constitution, contracts, laws, policies, rights and regulations which are strengthened by official authorities, whilst informal institutions so often include unwritten constraints notably social customs and traditions, social norms, moral values and religious beliefs shaping thoughts and behaviour in the society. The distribution of opportunities, assets and resources are structured by both formal and informal institutions within the community (Berman, 2013 and UN General Assembly, 2016).

Accordingly, Holmberg and Rothstein (2010) recalls the importance of institutions for alleviating poverty and economic inequalities where his analysis refers on the question "which institutions?". This arouses then Matthew and Adegboye (2014) to state theories of institutional development in a range of three parts considering their structural composition namely: economic, political and cultural institutional theories.

The first part intends that institutions are essentially crafted when it is efficient to create them. The economic institutions are mostly created by economic actors when the perceived social benefits of such creation significantly exceed the perceived transaction costs associated with their creation. The second part depends fundamentally on the redistribution of societal resources much more than economic efficiency. Those institutions are hereby managed by those that have political powers in a way that they can stay in power with a view of extracting economic rents (Adewole and Osabuohien, 2007). The last part denotes that a given society usually holds beliefs that can shape the collective actions of the constituting human agents.

On the other hand, the concept of institutions can further be analysed in terms of formal or informal institutions through its composite elements. Informal institutions consider six components of International Country Risk Guide index. Accordingly, the latter may include political Risk Services index (PRS) consisting of 12 components that measure dimensions of political and business environment faced by firms operating in a given country. Formal institutions consider six composite elements of institutions issued from worldwide governance indicators (Bergh & al. 2014, Kuncic, 2014, and Makochekanwa and Mashura, 2017). Quality of regulation implying no excessive regulation in areas such as foreign trade and business development; rule of law that determines effectiveness or predictability of contract enforcement and protection of property rights; corruption control and democratic accountability for voice and accountability; Bureaucratic quality or government effectiveness stressing that formulated and implemented policies are effective, and government stability to capture the political stability and violence absence measuring either internal or external conflicts and ethnic tensions.

3.2.2. Trade openness in the globalisation era

Yet globalisation is as famous as other economic concepts, everybody in the world esteem to have an opinion about it. Surprisingly, its definition is complex, which may cause confusion to find out what, it really designs. Globalisation seems to be the growing interplay and interconnectedness of different economies and nations across wide distances. Nonetheless, the remoteness of countries is overwhelmed by the search of interests of any partaker, whereas remoteness can be operationally taken into account through notably showcase regionalisation opportunities. Vujakovic (2010) indicates some contacted aspects of life (wealth, freedom, habits, education, health, etc) that are affected by globalisation throughout different spheres as economic, political and cultural related to KOF globalization Index. This outlook leads to a distinguished controversial literature of importance of each globalisation sphere.

As far as the study is concerned, dimension of economic globalisation is much more relevant in terms of trade globalisation rather than financial globalisation. Since it is wished to distinguish globalisation from any other international openness, the present case enfolds trade openness considering exports, imports, and a sum of exports and imports in percentage of GDP as a globalisation indicator. For instance, about 75percent of Mauritius's net flows of foreign trade is confined in the UE area. Its exports rank of 35percent and 40percent of imports are exchanged with its main partner- UK. It would be a mistake if that high degree of interdependence of EU member states was marked as globalisation, but the measure makes sure that regionalisation matters for EU countries. To avoid potential confusion, it is thus needed to consider a New Index of Globalisation (Hyeon-Seung and Cyn-Young, 2019). Meanwhile, for trading distant partners, a new globalisation index occurs in weighting every bilateral trade volumes with geographical distances in kilometres in accordance with the size of a country. It is used the city level data to assess the geographic distribution of population inside each country as suggested by CEPII (Mayer & Zignago, 2011). The distance may be farther for a large country with its neighbours than for a small country, what implies feasibility of new globalisation index to small countries. Major developing countries much deal trade and investment with developed nations like USA, UE, etc since it is theoretically assumed gains relative to international trade partners.

Globalisation and regionalisation started in 1980s through cross-border trade and financial (capital) flows between advanced and developing nations, and those phenomena are expected to be currently higher for developing countries (Asongu et.al 2020). In addition, globalisation has transformed the production style of goods and services by including supply networks amongst several countries around the globe in order to promote trade. Economies get freer to integrate global value chains at different geographical area and at any stage from design up to production and delivery stage till final consumers (BAfD, OCDE and PNUD, 2014).

Porter (1986) set obviously a value chain as decomposition of firms' activities within sequential elementary operations and identification of sources of potential competitive advantages. Globalisation is doubtless an easing tool of new provisioning networks and exports within integrated regions in order to implement great economies of scale. However, data on gross value of trade is suspected to be misleading, the phenomenon of Global value chains makes an imperative need for researchers and decision makers to set a based-statistics and analysis on value added in trade (World Bank, OECD, WTO, IDE-JETRO, and RCGVC-UIBE, 2017). Wang, & al. (2016) distinguish complex global value chains denoting complex trade flows in value added while simple global value chains indicate simple trade flows in value added. The magnitude of global value chains enhances a great interdependence of linked countries by such supply chain networks.

Ponte (2008) also overviewed a global value chain as a methodological tool developed since early 1990s to grasp dynamics of economic globalisation and international trade through a vertical dimension. That's a movement of goods & services from a producer to a consumer for reducing or exacerbating chronic poverty. Besides, the 2020 World Bank report describes some underlying determinants of the participation of economies in global value chains especially: institutional quality (through deeper preferential trade agreements adopted), factor endowment (low-skilled labor, foreign capital, natural resources abundance), market size (hinging on imported inputs and foreign trade for some countries) and geography (overcoming remoteness instead of interconnectedness promotion).

Afterwards, economic globalisation is different to regionalisation, in the way that the latter matches for maximising trade flows magnitude as a feature of (economic) regional integration with trade data boundaries on customs union. This leads to the examination of trade developments through trade creation within member States of the region rather than trade diversion along with the rest of world.

In order to sustain economic regional integration, economic literature recommends to run Imports data analysis to address the data registration lacuna at the Customs Union of country ***i*** and ***j***. Setting Regional integration squeezes into the exceptions of WTO/GATT principles, especially at the article XXIV of Most-Favoured-Nation (*Nagarajan, 1998)*. The aim of that article is to facilitate trade between constituent territories and ease or not raise trade barriers on the contracting third parties.

Comparatively, enhancement of international trade for poor nations is salient and advantageous in making gains from trade that imply standards of living improvement. Promoting regional trade and investments through liberalisation is therefore good at poverty reduction (UNCTAD, 2015). Trade liberalisation shows freer exchange of goods and services in terms of reducing tariffs and non-tariffs trade barriers whilst investment liberalisation shows resources movement through good environment. Since trade liberalisation enhances market size, it may therefore be yielded the proxy for a country's level of trade liberalisation and facilitation as trade openness or trade globalisation indicator (UN ESCAP, 2007). Strategies of economic development and growth include trade liberalisation as a component applicable to participation in global value chain, resources allocation, technological innovation and competition in order to reduce poverty.

Moreover, the arising question to understand whether openness to trade is a consequence or cause of variation of widespread poverty remains notable in Sub-Saharan Africa countries. There are two types of trade. One type indicates that countries trade because they have competitive advantages. They export surplus after they meet the needs of their citizens. In these countries, the level of trade openness is low or medium. Another type denotes countries that trade because they do not have another way to survive. For instance, some countries in Sub-Saharan Africa cannot grow crops because their environment is too rough and their systems are too old-fashioned. Yet, they have raw materials to export diamonds, gold or oil, and import food and other necessary goods (Quang, 2019). A regime of greater trade liberalisation can theoretically make pertinent use of the most abundant factors of production leading to lower prices of labour-market, and so poverty is alleviated. Such a reduction of poverty in Africa by trade liberalisation, hinges on joint reforms of domestic institutions addressing some possible heterogeneity (political structures and institutions) in globalisation in order to reap gains from new opportunities (Le Goff and Singh, 2014 and Sindzingre 2005).

3.2.3. Theoretical effects of Quality of institutions on Trade openness

Notion of institutions has obtained a great deal of attention to increase openness to trade in recent decades regarding researchers' thoughts. Makochekanwa and Mashura (2017) state that institutions may structure incentives in human exchange and shape framework that facilitates economic transactions. Good institutions are therefore expected to reduce transaction costs and improve security of international exchanges. Acemoglu, Johnson and Robinson (2001) indicate that institutions matter a great deal for economic performance and developed countries have better institutions than developing ones. Meantime, Levchenko (2011) outline a theoretical model where trade openness crafts a race to the top with respect to institutional quality. When trading countries share a similar technology, they are asked for improving that technology in order to enter effectively global market.

Yet, relationship between globalization and institutions is not universally applicable to all sectors of an economy (Bergh et al. 2014). Recent contributions in the trade literature add that institutional sources of comparative advantage increase productivity in particular industries that are dependent on institutional provisions to facilitate production. Contracting imperfections lead to distortions of market factors, for instance labor, which therefore rewards differently across industries. Weak institutions may manifest themselves in lower measured productivity and in the institutionally intensive sector. Then, excessive regulations make resources prevented from moving along the most productive sectors and most efficient enterprises (Levchenko, 2006). It implies that institutional differences are then determinants of trade flows (complex or simple) in whether developed or developing nations.

3.2.3.1. Effects of institutions on global value chains

The intuitive outcome denotes that countries' institutions can affect their global value chains participation in order to improve exchanges of goods and services. It would be more surprising if the institutions of neighbouring countries were relevant for one's participation in global value chains, but they are somewhat important as well (Miranda and Wagner 2015). Countries with common language or common metropolis are designed to have greater businesses together in contract-intensive sectors than non-linked countries. The legal system which functions well, can ease contract completeness when equitable protected rights and contract enforcement interplay intensively at the level of industries.

Otherwise, the problem of information asymmetry arises when a product is more differentiated and touches contract intensity. Further financial institutions are also underlying to foster global value chains participation across factories.

This still makes a need for property right, transparency and anticorruption measures to counteract the uncertainty binding investors facing asymmetric information. For industries that are sensitive to quality of institutions, they participate highly in complex global value chains of countries with strong institutions (Dollar, Ge and Yu 2016). And countries with weak institutions foster their upstream integration in global value chains towards countries having strong institutions.

On contrary, informal institutions become beneficial to groups that less like global value chains participation. When it is difficult to formal institutions to reverse asymmetric information, informal institutions (social networks) arise. Yet, they are not perfect substitutes and no rule applied to what all agent in the economy share equally the information. Related consequences tend to the reduction of the participation in global value chains at industry level. For example, African economies are very little involved in global value chains. Countries with better institutions which participate in global value chains are therefore bordered by other countries with poor institutions (Dollar, 2016). In fact, a share of Africa in global value chains is smaller but increases over time, given that a decrease in trade flows costs implies salient factors boosting global value chains and maximum advantages.

The joint report of BAfD, OCDE and PNUD (2014) denotes that Africa has participated in global value chains in rather upstream integration than downstream integration. Among COMESA economies, two are around downstream integration processes. They are objectively ranked as tributary to global value Chains and as higher or upper middle income countries respectively Seychelles and Mauritius. Seychelles (being now classified in higher income nations) has developed its tourism sector with 69% of tourists in a country issued from unique biodiversity and great cultural wealth. Apart agro-food, hotel, transport, fishery sector, etc., the tourism sector contributes 20% as a share of GDP and 60% of income in currency (for 2009-13). Mauritius has also fostered trade (sugar) up to 120.5% as share to GDP, tourism and ICT sector since it capitalises peace and political stability or strong institutions.

Developing countries have to improve their institutions since domestic institutional quality and neighbouring institutional quality influence participation of industries in the global value chains. That influence may even come from deepening preferential trade agreements. Such agreements cover legal and regulation frameworks, harmonize customs procedures (tariff protection), and set rules of intellectual property rights (Osnago, Rocha and Ruta 2017). Global value chains are sensitive to contractual institutions notably contract enforceability. The institutional quality is generally a determinant of an industry's ability to fragment the processes of production over the international borders up to sustainable growth of partakers.

3.2.3.2. Effects of Institutional quality on trade-induced growth

Since growth is springboard to development, many countries try to improve their governance in order to reach a sustainable and inclusive growth through trade facilitation. Acemoglu *& al.*, (2005) and Aghion *& al.*, (2010) support the idea that institutions play a great role in bringing about the effects of trade openness to be feasible on economic growth. Inclusive institutions encourage economic activities whilst extractive ones can only pursue wealth without altruistic reinvestments (Acemoglu and Robinson, 2012; Hickey, 2015).

The international trade theory states further that magnitude of trade flows fashioned by HOS model basing on factors endowments can boost productivity growth in a country. HOS model implies to gain a within and cross-border redistribution from specialisation of economies in accordance with comparative advantages. This leads therefore to equalisation of prices and rewards production factors across the region and gets beneficial to all consumers. Yet, as a resource abundance is shown to correlate with lower quality of government in general, theory of resource curse may arise. It may well be the case that globalization aggravates problems like exacerbating rent-seeking and political corruption. Expectation of the association between globalization and institutional quality also depends both on the level of development and on the presence of natural resources (Anthonsen et al. 2012).

The economic growth theory states that presence of natural resources in developing countries is somehow advantageous to increase their economic growth through increasing exports (World Bank, 2020). Trade can effectively increase economic growth only by improving particular policies and sectors. Hallak and Levinsohn (2004) view that to address the suspected marginal effects of trade openness on growth, need implementing better institutional quality in order to enable promising business climate in favour to regional trade facilitation.

Suleiman and Suleiman-Nassor (2017) indicate strong share of international trade in low and lower-middle-income countries as tributary to human capital accumulation, macroeconomic stability, private sector development and rule of law. As claims Kim (2011), trade openness is more trivial in developing countries than developed countries. The cause is that low income countries are unable to take advantages on technology spillovers and knowledge accumulation. Meantime, Acemoglu & Robinson (2006) argue that trade-induced transfers of skill-biased technology increase income share of the middle countries. The latter improve their political power and ultimately generate better protected property rights.

Further arguments indicate that institutions play dual roles by first generating rents for some parties within the economy and secondly, source of comparative advantages in trade to increase the partakers' economic growth. Such a dual role implies consequences in an increase of openness by institutional quality with potential dependence on the technological similarity between trading countries (WTO and WBG, 2015 and Levchenko, 2011).

Otherwise, benefits of trade hinge on a large extent of national institutional settings. If there is ineffective trade policy in competition, communication and transportation infrastructures there occur distortions in the enforcement of contract. Process of resources reallocation will be misled in the less productive sector, and growth will be biased. Larger firms abuse the market power and thus follow failure and exit of some other firms. Trade openness increases therefore economic growth on medium or long term, but can additionally provoke higher income inequality (Neagu 2014, Haltiwanger, 2011, McMillan and Verduzco, 2011). Matthew and Adegboye (2014) corroborate a need for positive interaction among institutions, notably a more inclusive society and market with more incentive to production and innovation to tackle higher inequality levels caused by openness and improve living standards.

3.2.4. Theoretical effects of Trade openness on Poverty severity

3.2.4.1. Overview of the Effects nature of trade on poverty reduction

Theoretical arguments describe that Openness to trade has become a pre-requisite for accelerating development in most reform programs adopted by developing countries. Ezzat (2018) states poverty alleviation and achieving equitable income distribution to be fundamental objectives of development. Otherwise, effects of trade openness on poverty incidence and income inequalities within countries and across countries is mixed (Kelbore, 2015). The effects of trade openness on poverty is neither direct nor unambiguous. Trade can be effective in poverty alleviation strategies but it depends on a multidimensional set of economic and institutional factors (Alkire and Roche, 2011; Cicowiez and Conconi, 2008).

Meanwhile, trivial effects of trade on poverty were originated from Stolper-Samuelson theorem spelling that trade liberalization will raise the real income of the abundant factor (unskilled labor) in poor countries (Stolper & Samuelson, 1941). Trade liberalization is thus considered to enhance employment opportunities for the poor and enable them to earn income far better than they earn prior to trade openness. Otherwise, traditional trade theories further support that trade openness generates significant gains when productive resources are reallocated towards activities that are comparatively used with greater efficiency activities.

Bhagwati and Srinivasan (2002) expose moreover static and dynamic approach of freer trade on poverty reduction: Stolper-Samuelson theorem (simply static) argues that the abundant factor should see an increase in its real income when a country opens up to trade. Given that the abundant factor in developing countries is unskilled labor, the poor (unskilled) in developing countries have mostly to gain from trade. For a dynamic perspective, economic growth is critical to sustained poverty alleviation. Trade liberalization is thus argued to require increases in productivity throughout greater incentives for investment, benefit of scale and competition, and limitation on rent-seeking activities favoured by trade restrictions in order to reach an inclusive and sustained growth.

On contrary, the opponent view of openness, particularly trade liberalization, may harm the poorer actors in the economy. Some section of the society could remain in the extreme conditions of poverty (Le Goff and Singh, 2013). Accordingly, some approaches may explain the effects of trade openness on poverty alleviation. Meanwhile, labor in real world would no longer be as mobile as a trade liberalisation was accelerated. Too many barriers to entry and exit are mostly faced by firms and workers as well. Keeping comparative incomes for poor people may not hold as the likelihood of unemployment is more observed in traded-goods sectors than non-traded goods, while international competition is accrued. It implies for firms to either hire temporarily or lay out workers and develop informal sector jobs or increasing poverty due to wages differences in the activities' different sectors (Davis and Mishra, 2006, Goldberg and Pavenik, 2004).

In addition, the neo-classical theory targets to provide efficient allocation of scarce resources which can only be achieved by markets. It further makes a focus on capital accumulation and barriers elimination to trade as prerequisites for development (Majeed, 2010 and Saad-Filho, 2010). Hence, economists claim the positive relationship between trade openness and poverty alleviation to be conditional on the existence of supported institutions (Cicowiez and Conconi, 2008). Le Goff and Singh (2013) thus argue that effects of trade openness on poverty in Africa depends on complementary reforms. The latter enfold an institutional framework and trade reforms that need to be improved in order to raise the people's living standards. Such reforms help an individual take advantages of new business opportunities in developing countries. Developing economies ought to think relatedly trade and poverty and to develop actively the poor's participation in global value chains through some hand activities.

3.2.4.2. Analysis of effects of trade in Global value Chains on poverty

The global value chains development report (2019) highlights that two-thirds of world trade which cross a frontier at least along production processes, are measured in value chains. The latter is thus getting deeper effects on as poor as rich countries today. Chinese export of inputs for instance are composed by two-thirds of intermediate imports of information and communication technology (ICT) products from other industries of Asian countries, Europe and of North-America.

In a fine-to-alleviate way, poverty severity can be examined through a deeper analysis of complex trade flows in goods and services as value added. Although downstream integration can be encouraged for economies, countries partaking in global value chains at any integration step find also good fit to mitigate the severity of poverty. Ponte (2008) has well paid attention to both vertical and horizontal links to examine chronic poverty. Vertical dimension indicates value chain linking local well-being and livelihoods on forward or backward participation where economic production and exchange are complexed. Yet, horizontal dimension denotes how and under what/which conditions or ways, poor people inclusion/integration in globalisation are mediated. Moreover, classical literature on trade implies creation of growth, better jobs and higher incomes which, in turn, alleviate poverty.

The World Bank Report (2020) enlightens that global value chains support a poverty reduction and shared prosperity under channels like productivity gains and growth. These channels require adoption of technologies which save on labor to support job creation and boost growth of sectors of high labor shares. The diffusion of technologies and access to capital or inputs along the chain, are issued from hyper specialization of firms and sustainable firm-to-firm relationships. Ethiopia firms that participate in global value chains depict exemplarily more twice productive than similar firms in standard trade. Productivity gains in supply firms may result in the increasing labor demand (final) which leads to shift in the economy structure (Constantinescu, Mattoo and Ruta 2018).

Bigger productivity growth arises when firms transit out of exporting commodities like natural resources or agriculture (forward integration) into basic manufactured products like garments (backward integration) by using imported inputs (textiles). The increases in productivity lead to firm output's expansion and to increasing firm employment till structural transformation in low income countries. People are there moved to greater productive manufacturing and services activities.

Ferriera, Leite and Ravallion (2010) show that growth in global value chains participation is associated with the reduction of the people numbered in cross section countries as living under $5.50 per day (2011 international prices). The growth appears main driver for global poverty reduction since 1990 by transitioning openness to trade. Additionally, World Bank report (2020) explains that larger share of employees, in international firms within Mexico provinces, show greater poverty reduction along 1993-2013 from poorer to vulnerable households. More importing and exporting Firms try to check the ability of poorest households over the society to gain basic needs and capabilities baskets (access to financial resources, education, health, etc.) than firms that import only or export only.

The global value chain integration sometimes give incentives to people for migration within the region as powerful mechanism to reduce poverty. Higher incomes stimulate new demand for both domestic or imported goods and services leading to diversification of economy and increasing opportunities (McCaig and Pavcnik, 2015). More intensive global value chain participation implies greater poverty reduction through technological changes, regulatory institutions, social and environmental protection. The joint report of WTO, OECD, IDE-JETRO, RCGVC-UIBE and World Bank (2019) denotes that supply chain integration can facilitate economies to make higher GDP growth and create too many job opportunities for people in low income countries in order to lift them out of poverty. While integrated, poor people can be enabled by good governance to seize new business opportunities offered by developed economies.

3.2.5. Theoretical effects of Institutions on Poverty severity

Several endeavours have tried to investigate relationship between institutions and poverty, since developing countries face stuck persistent issue of poor governance and institution structure. Institutions whether political, economic or cultural affect generally poverty reduction though direct and indirect mediating determinants such as government policies and growth (Hafiz et al., 2016). Comparatively, poverty eradication effects of institutions can channel through average income opposed to income distribution (inequality), since average income is equated to growth. Most pertinence of income average over inequality can otherwise contrast with a decreasing function of inequality (elasticity) as a way out of poverty to growth (elasticity) (Tebaldi and Mohan 2010, Fosu, 2015). Free market and democracy influence economic development or freedom of choice as rationale direct effect of institution on the population welfare. The latter enables indirectly higher income and lower unemployment rate leading to individual's satisfaction by use of institutions (Gwarteney, J, Lawson R, and Hall J., 2013).

Yet, Acemoglu and Robinson (2012) argue that well-being conditions of citizens are determined by the interaction of state, market and community. A positive interaction among institutions should tend to show lower inequality levels and a more inclusive society. Such an interplay should indicate a market with more incentives for the production, innovation and academic preparation of its members. The degree of trust in the institutions can be a parameter of good standards of living of the citizens (Listhaugh and Ringdal (2007).

The impact of political, social, cultural or administrative institutions on poverty reduction is general. While law and order, corruption in government and contract repudiating fail to alleviate poverty, bureaucratic quality renders a better quality of institutions that reduce poverty (Chong and Calderon, 2000). Moreover, Acemoglu and Robinson (2012) denote that the different levels of wealth between nations can be explained by different incentives that the citizens, politicians and companies receive from institutions. Besides, Matthew and Adegboye (2014) and UN General Assembly report (2016) emphasize that economical institutions determine the wealth of nations under condition that political institutions shape economical ones. Political institutions are efficient if they can assure participation of individuals in the electoral process, providing them the faculty of renewing or removing its leaders.

On contrary, weak institutional components cause less satisfaction of population needs which can lead to poverty (Wood and Gough 2006). Rather than inclusive institutions, extractive institutions imply features of population despairs and their cumulative life deprivation. Afterwards, Spithoven (2019) denotes that a system of inclusive institutions that diffuse a market power and differentiate political from economic institutions is needed for optimal allocation of resources. Rule of law, checks and balances form together inclusive political institutions while inclusive economic institutions embody private property rights, exchange and contract of freedom relating to entry or exit freedom from a business.

Economic institutions stimulate education, new technologies in the creative destruction processes and efficiency in the increasing productivity. Yet, expropriations, forced labor, taxes and premiums in exchange for subsidies and social benefits are component of extractive economic institutions that imped innovation (technology frontiers) and productivity (Acemoglu, Robinson and verdier 2012). Such assumptions are associated with Games theory and cross- national regression which is accountable to the New Institutional Economics in the opposite of original institutional economics.

Perera and Lee (2013) argue finally that better quality of institutions encourage foreign direct investment, promote economic growth and poverty reduction. Good institutions can also increase efficiency and effectiveness of the delivery of social services to the poor. It is therefore important to adopt policies that specifically address income distribution to prevent any severity of poverty. As Kuncic (2014) emphasized the important role of institutions in economic and social activities, Quang (2019) firmly sustains improvement of the institutional quality in order to shape the location of global production and to increase poverty revert strategies of poor citizens.

3.3 Empirical Literature on Relationships between Institutions, Trade openness and Poverty

The empirical literature for the study focuses on the evidence of relationships between institutional quality, trade openness and poverty severity in COMESA countries. It examines different approaches in reference to what used in previous studies to enhance economic growth and reduction in poverty incidence or depth effects. Single and combined effects associated with whether quality of institutions or trade openness affect poverty severity in COMESA countries climax this study. It is thus pertinent to review empirical studies that have firstly examined similar relationships.

3.3.1. Empirical literature of institutional quality effects on trade openness

Former Studies find mainly accounted for the emphasis of the role of institutions on trade. Through a study of 157 countries for 1962-1998, Yu (2010) shows that the more a country is democratic, the more exports are crafted by improved products quality associated with the protected intellectual property rights.

Besides, conducting an empirical study on the Economic and Monetary Community of Central African States, Avom and Fankem (2014) denote that the poor integration of that region in the world economy is caused by their low institutional quality in terms of control of corruption. Similar findings about less corruption or more corruption control as leading to growing exports, are confirmed by Lavallé (2006) on 143 exporting and 142 importing countries for 1984-2002 period. Moreover, Anderson and Marcouiller (2002) first use the gravity model to exhibit the significant institutions' effects of trading countries. They find that better institutions lead to larger trade volumes on bilateral trade. For the time being, contrasts may appear when focusing on predictions of factor proportions theory and institutional comparative advantage with regards to how factor rewards change as a result of trade openness between a developed country and a developing one. While running an empirical study of US exports to 48 countries with more than a half of higher income nations, they find low domestic institutional quality (corruption and non-perfect enforcement of contract) diminishing bilateral trade which leads to uncertainty and risks in worldwide transactions.

On contrary, Makochekanwa and Mashura (2017) provide evidence in COMESA countries for 2000-2015 through gravity trade model with random effects. Their findings show the presence of corruption significantly reducing exports and improvements in government effectiveness is associated with increased exports.

It implies that presence of corruption adds more to the costs of exporters and that the possibility of bribery and kickbacks increase the cost of doing business, and thus reduce productivity. In the evidence that runs a gravity model for 145 countries in 2000, Duc & al. (2008) examine the influence of democracy and corruption fight within the international trade. Their findings reveal that two countries with less corruption are relatively less open than countries with higher corruption but countries with more corruption are the first to exhibit more exchanges between themselves.

Otherwise, two democratic countries do not trade more one another although a democratic country is more open and trades with all countries without paying attention on their diet. Similar conclusions are before exhibited throughout the study of NIYONGABO (2004) for 170 countries along 1970-2000 time period, where good governance as measured in regulatory quality and bureaucratic quality exerts complementary effects in the open policies application. Yet democratic accountability is uselessly complement for opening policies.

In conducting a study on Middle East and North Africa (MENA) region, deterioration in institutional quality is found to cause low performance in manufactured exports and foreign direct investment (Sekkat and Moen, 2004). The mainstream way of thinking about this issue is associated with assumptions that a developed country is relatively capital abundant. The developed country has better institutions whose factors are allocated more efficiently. In the capital-scarce South, the factor proportions model predicts that returns to capital decrease and returns to labor increase while opening trade with the capital abundant North (Levchenko, 2006). However, some studies conclude that the quality of institutions has a direct positive and sensitive effect on trade, but Rodrick, & al. (2002) conclude that institutions may also indirectly affect trade through their impact on variables that explain trade such as investment and productivity.

Recently, economic institutions have a more significant effect on development than social and political institutions. It is thus possible for countries with better institutional quality to gain an advantage to reap benefits from trade integration and geography (Davis, 2010, Das and Basu, 2010). Ngwenya (2015) further concludes that weak institutions and poor policies are among key factors hindering growth of agricultural trade in COMESA region. This passes through limiting market access and demand driven intra-regional trade expansion.

Otherwise, the relation of institutions-openness seems to exhibit reciprocal effects. The study of Bergh et al. (2014) set over 100 countries for 1992-2010 shows in developing countries that effects of globalization on institutional quality cannot itself mitigate adverse effects of resource curse. They find a positive effect of openness on institutional quality.

But this hasn't been so far examined to demonstrate how the effect varies with the level of development and resource abundance. In fact, regressions including 81 to 125 countries indicate that openness in 1985 is associated with improved governance in 2000 and 2001. A correlation is moreover found between resource abundance and lower quality of government (Anthonsen et al. 2012). Bhattacharyya (2012) on contrary, in panel data covering 65 and 103 countries for 1980-2000 refers on time extent finds a positive effect of openness on property rights and that more open economies exhibit less corruption. Moreover, while some studies all intend to find a positive relationship between openness and institutional quality, controversies may persist due to panel dataset used and to interpretation as well (Nicolini and Paccagnini, 2011).

Otherwise, the effects may become ambiguous: once Institutions can be controlled, trade becomes insignificant and exhibits negative sign in income equation, although trade has a too positive effect on quality of institutions (Rodrick, & al. 2002). When trade produces insignificant and unusual effects, some studies opt to use interaction term implying complementary reforms of trade openness and institutions in order to achieve the economic performance. In the evidence for a sample of 23 Sub-Saharan Africa countries during 1996-2011 periods, Akpan and Atan (2016) run the pooled OLS and dynamic GMM estimation techniques. They find the negative relationship of trade openness on economic growth to be reversed by such an interaction with institutions. Moreover, testing with a dynamic panel data of 23 OECD countries for the period 1990-2010, the effects of institutions has salient role in the trade openness-growth nexus (Zouhaier and Fatma, 2015). Sub-Sahara African countries need therefore developing by both opening up their economies in order to attract investment or capital flows and improving institutional environment, which in turn enables to raise the people's welfare.

Instead of verifying reciprocal effects or globalisation effects on institutional quality, this study explores effects of institutions (six institution's indicators) on trade openness in anticipating potential adverse relation by interactive term of stage of development (in poverty severity). The study runs estimations of pooled OLS, fixed effect and difference GMM approaches to examine such effects in COMESA countries.

3.3.2. Empirical literature of effects of trade openness on Poverty severity

As Citizens are experiencing a widespread life deprivation, people mind is aroused for either trading or else. Poverty creates jobs in a number of professions (Gans, 1972). Some empirical studies conclude that trade openness has influenced income inequality or poverty negatively (Bucciferro, 2010; Castilho & al., 2012). Yet, other studies find that trade openness is affected by income inequality or poverty positively (Khan and Bashir, 2013). Accordingly, studies of Bayar and Sezgin (2017) for 11 Latin American countries along the period of 2001-2013 deploy an evidence through a panel data analysis under cross-sectional dependency. They find that openness to trade and financial openness contribute to a decrease of inequality and poverty in the long run. Otherwise, inequality influences positively poverty which may hamper great gains from trade openness in the detriment of poor countries. Poor communities do not usually have business skills to break into global economy.

In fact, the economic growth is springboard to poverty reduction. On a hand, different studies indeed support channels relevance to reduce poverty in either developing or developed countries. Cicowiez, and Conconi (2008), winters and Martuscelli (2014) examine channels (for instance growth) through which, trade openness affects poverty. They confirm, on a side positive relationship between trade openness and economic growth within whether developed or developing countries. When Majeed (2010) sets a panel data for 18 Asian countries to study the effects of trade openness on economic growth, his study supports positive and significant relationship.

Afterward, Dava (2012) analyses and obtains positive relationship between trade liberalization and economic growth in Southern African Development Community (SADC). Le Goff and Singh (2013) examine therefore 30 African countries for 1981-2010 with pooled cross-country and time series data. They find improvements in trade facilitation to be associated with reductions in tariffs and non-tariff barriers in order to support the accelerating economic growth in Africa. For the time being, a proponent evidence on 58 countries for 1984-2012 verifies through OLS and GMM regressions a pro-poor impact from GDP per capita growth in poverty reduction. Poverty reduction is likely to go hand in hand with growth (Cepparulo, Cuestas and Intartaglia 2016). Moreover, conducting a research, by use of vector error correction model, on the impact of trade liberalization on poverty in Turkey, Ozcan and Kar (2016) find that trade liberalization is hoped to lift up the economic growth, income per capita, and reduce the poverty.

The study in a panel for 83 countries for 1970-1989 using the endogenous threshold analysis was carried out. Girma, Henry, Kneller and Milner (2003) have examined heterogeneity between trade openness and productivity growth. They find that the threshold in the effect of openness on growth depends on the level of natural barriers. Yet, when Zahonogo (2016) tests dynamic growth model for Sub-Saharan Africa countries, he finds that trade opening may well in the long-term influence growth. But in unlinear way, the effect depends upon the level of trade liberalisation. Therefore, complementary fiscal and monetary policies to improve institutional quality are needful to smooth out the non-linear effects. Well, Nursini (2017) also confirms an importance of trade openness for an increasing economic growth in Indonesia.

Oostendorp and Quang (2011) add that Openness to trade requires skilled labor from enhanced education due to foreign technology increase in industries patterns. The quality of domestic absorptive capacity of social and economic institutions may be so imputed to poverty rise. Throughout an investigation for 41 developed and upper mid-developed countries analysed through a dynamic spatial autoregression (SAR), Pietrucha, Zelazny, Kozlowska and Sojka (2018) demonstrate substantial technological channels. They show that trade (imports) and investment (FDI) are channels of technology transfer to yield to total factor productivity spill-overs or externalities.

Since openness leads to poverty reduction through growth channel, the latter passes on the employment mechanism. For 1980-2014 periods, an investigation is carried out Jordan by using heteroscedasticity-corrected ordinary least squares and Okun'law econometric estimations. Findings show that the reduction of unemployed people and rise of turns to the poor issued from productivity growth may address the poverty concern (Awad-Warrad and Muhtaseb 2017). Investigating on globalisation (trade and financial openness, and migration) in Nigeria in the new democratic era for the period of 1999-2011, Aigeheyisi (2013) uses OLS technique. His results show that the globalisation effect is more significant on economic growth than human development index. Therefore, trade openness generates necessary jobs and income for larger numbers of poor people in developing countries. It enhances consumption or production because exports are typically labor intensive (Lim and McNelis, 2014, and cali, Hollweg and Bulmer, 2015).

Different studies used growth channel and have thus diverged on the linkage assessment. Trade openness tends to increase poverty in developing countries due to agriculture-based economy. The reason is deficit trade balance (high basic imports) or high imported skilled labor for factories machinery use.

Along with the investigation for 34 African countries along 1960-2003 period, Vlastou (2010) uses a panel dynamic ordinary least squares (DOLS). He finds a significant negative effect of trade openness on economic growth. Otherwise this finding is therefore reversed in the use of instrumental variable technique for Sub-Saharan Africa by Brückner and Lederman (2012). Potential doubts are rising from outwards oriented trade policies effectiveness for African countries. Regardless of the channel that are yet used to help reduce poverty, trade openness can guarantee the accelerating economic growth. This may not be sufficient to alleviate poverty even in the long run without having supportive complementary policies by government efforts (Ezzat, 2018).

On the other hand, few studies confirm the relationship between international trade and poverty reduction. Deardorff (2001) mentions that the way of specialization according to the Neo-Classical theory enhances rich countries to grow up increasingly and deepens the intensity of poverty in poor countries. In the evidence of 21 African countries for 2005-2014 period, Adegbemi, & al. (2019) deploy descriptive statistics, pooled OLS technique, panel unit root and co-integration tests. They find significant negative effects of trade liberalisation on poverty level proxied by Human development index, and more significant positive effect on economic growth. Their study considers incentives for production and human capacity buildouts in the export-oriented sector through south-to-south cooperation by means of social and economic policies. Such policies aim at mitigating adverse effects from lowering trade barriers.

Yet, Huchet-Bourdon *et al.* (2011) have used a monopolistic competition trade model. They find that countries with higher quality of products grow more rapidly because of trade openness. Countries with low quality of products face hindrances of growth and increases in the intensity of poverty because of trade openness. Trabelsi and Liouane (2013) analyse the relationship between trade liberalization, growth and poverty by using panel data for 106 developing countries. They find yet that while trade liberalization benefits for accelerating growth, it does not help reduce breadth poverty. Le Goff and Singh (2013) conclude that despite significant improvements in trade openness in Africa, Africa is still the poorest continent in the world. Lee (2014) thus expresses implicitly that trade openness raises the intensity of poverty through increasing inequality in developing countries.

While analysing poverty alleviation on 13 Middle East and North Africa (MENA) countries for 1995-2015 years, Ezzat (2018) uses a System-GMM method and finds statistically significant and positive effects of trade openness on multidimensional poverty. His explanations note that the depth of poverty may restrict the ability to gain from benefits granted by governments as well as the benefits from trade openness in developing countries.

As far as Labour market channel is concerned, Heckscher-Ohlin (HO) model first mentions effects of trade openness on income (Dava, 2012). Through the study of labor demand functions in Bangladesh in manufacturing industries, the model confirms that trade openness brings long-term gains. Yet, the model involves then short-term adjustment costs on the intensity of the poverty that needs carefully managing (Raihan, 2008). The study finds that trade liberalisation creates jobs/ employment more in the export-oriented factories than in the import-oriented factories, whereas the relationship is insignificant for most of industries.

Further analyses of Agénor (2004) and Liang (2006) in particular with endogenous threshold regression method have been made on 25 Chinese provinces for 1986-2002 period. They consider trade openness as proxy for globalization index. Findings show that less globalization, with regard to the model generated threshold, leads to poverty increase whereas more globalization leads to a decline of poverty.

Rather than descriptive analysis and channels use to alleviate poverty, this study intends to investigate on short run, through pooled OLS, fixed effect and System GMM estimations, whether implementing substantial policies (education, tariffs rate and institutional quality) either direct or complementary enables to bring about beneficial effects of openness on people living in poverty severity.

3.3.3. Empirical literature on effects of institutional quality on Poverty severity

Though United Nations endeavour to eradicate poverty, it is still greatly challenging for institutions with more poor population. Pertinent use of institutions or governance in poverty reduction programmes is marked so helpful whether in Asian developing countries or in UK. Domestic and local governments or further global rules and regulation institutions are best-off strategies to reduce poverty (Scholte and Jan Aart, 2010, and Rizk, 2012). Hafiz et al. (2016) run OLS, fixed and random, and Arrelano Bond techniques for the periods 1996-2012 in six SAARC economies. Results denote therefore positive and significant impact of governance and institutions on poverty reduction. Institutions craft and influence government policies, which in turn influence growth and distributional incomes which may then affect the pace of poverty reduction.

However, Chong and Caldéron (2000) have investigated the effect of five alternative measures of institutions on the degree, severity, and incidence of poverty. Findings reveal that the higher the quality and efficiency of country's institutions are, the lower the level, incidence, and severity of poverty get. Furthermore, Tebaldi and Mohan (2010) conclude on a negative relationship between institutions and poverty using the Instrumental Variable method for 53 countries across several regions. They suggest that control of corruption, regulatory quality, rule of law, and government effectiveness have a stronger negative impact on poverty compared to voice and accountability.

Perera and Lee. (2013) run a system-GMM estimation for nine developing Asian countries along 1985-2009 period. They find improvements in government stability, law and order in the way to reduce poverty. But improvements in the level of corruption, democratic accountability, and bureaucratic quality appear to increase poverty levels. Thus, poor institutional quality has a detrimental effect on income distribution. Corruption can alter the composition of social spending to benefit the rich at the expenses of the poor, leading to higher inequality (Andres et al. 2013). This happens when studies conclude on a positive relationship between institutions and income inequality. Chong and Gradstein (2007) have shown that weak institutional quality leads to higher income inequality. Countries with bad institutions in quality fail to cope with human needs until poor population are overwhelmed by the most deteriorating conditions of life. This worsens their income distribution and the poor get more and more impoverished.

On contrary, Quang (2019) runs random and fixed effect, system-GMM and pooled mean techniques in his study on a balanced panel data for 45 Sub-Saharan African countries for 1980-2013 periods. He finds that institutional quality is a key factor for economic development in any situation. This emphasizes that institutional quality plays a vital role in boosting the economy and elevating standards of living of people.

During the investigation for a sample of 58 countries along 1984-2012, Cepparulo, Cuestas and Intartaglia (2016) run OLS regressions for panels and GMM regression. They find that institutional quality influences financial development through interaction processes to affect significantly and positively the poverty alleviation. The estimates depict that the development of institutional framework has yet significant and positive effects on poverty alleviation. This denotes that the interaction of institutions and the stage of development (income) provides a powerful explanation of the effects of institutional quality on poverty reduction.

In addition, through a cross-country analysis of 80 countries for 1984-2001, Son and Kakwani (2007) present that there is no association between rules of law (from Kauffmann indexes) and pro-poor growth. Yet, Rukare (2008) marks that throughout his analysis of Ugandan Justice, law and order, and justice system are efficient despite the non-protected interest of poor. The scholar concludes that developing countries like Uganda ought to take deliberate measures in order to enable the justice reforms work in accordance with the poor's core and harmonize favourably the most of vulnerable communities. Besides, there is robust conclusion in an evidence of Sub-Saharan African countries for 1984-2004 periods in cross-country panel regressions. Findings show that the improvement in institutions measured in property rights protection, regulation quality, economic management institutions, and institutions for social insurance and for conflict management is expected to reduce poverty in statistically significant way (Ali, 2005; Tupy, 2005 and Asongu et al., 2014). Many analysis conclude that the positive effect of better institutions in the poverty alleviation of developed countries can also be noted in developing countries that improve their governance. This study examines relationship between institutions and poverty severity by pooled OLS, fixed effect and GMM estimation approaches in low and lower-middle-income countries to reduce poverty severity by considering complement effect of education instead of stage of development

3.4. Conclusion

Concisely, Economic literature in this chapter support theoretical bases that show effects of institutions on openness to trade, institutions' effects on poverty severity and effects of trade openness on poverty severity. The literature reviews what proponents support to describe what countries with better institutional quality find good fit to enhance trade openness and do contribute to poverty reduction effects. Openness to trade helps reduce poverty effects. Since controversies and ambiguity associated with institutions or openness arise, tendency to reduce poverty suggests to take into account potential mediating determinants such as complementary government policies or reforms of countries. Thus, quality of institutions contribute to alleviate effects of poverty. This study refers on limits and suggestions of former studies that have investigated those potential effects of institutions on trade, effects of trade on poverty and institutions' effects on poverty for many countries in order to set its contribution. This study examines single and combined effects on the relationship between six composite indicators of institution or overall institution, openness and poverty severity estimated on basis of recalibration of poverty line .Yet this review isn't exhaustive, this study captures the severity of poverty in COMESA and deploys pooled OLS, Fixed effect and dynamic panel data model with Roodman GMM regressions to contribute to the economic literature.

CHAPTER FOUR. METHODOLOGY

4.1. Introduction

The main goal of this study is to examine whether the quality of institutions influences how trade can affect poverty severity in COMESA countries. It is explored throughout the measure of the effects of institutional quality, openness to trade and poverty severity. The analysis deals with a pooled OLS, fixed effect (within), and dynamic panel data estimation approaches in order to control for country-specific effects and potential endogeneity that may hamper the results.

4.2. Design of the Study

The study runs a balanced panel data of 21 COMESA countries covering 1995- 2018 time periods. Data are grouped in five years average to minimize noise fluctuations of missing data. A great focus is held to low and lower-middle-income countries (developing world) in which, Seychelles is excluded for it is ranked among higher income countries. Somalia and Tunisia are also excluded due to their non-notable integration effects, since they adhered COMESA region in 2018. Further concern of poverty severity missing data on Povcalnet World Bank database pushes the scholar to drop Eritrea and Libya from consideration.

Empirical evidence is carried by use of some estimation approaches like Pooled OLS, fixed effect (within) and dynamic panel data model. Since OLS estimation can show the estimator bias or omitted variables, Hausman specification test can help determine the best model to deal with this problem. The Breusch and Pagan Lagrangian multiplier test (Breusch and Pagan 1980), Hausman test (Hausman 1978), Kaiser (2014) are a good way of determining the best model. On contrary, if Hausman and Breusch-Pagan tests fail to reject the null hypothesis, one resorts to run the pooled OLS model. Yet, Pooled ordinary least squares approach with robust standards errors in panel model, fixed and random effects estimators are usually employed.

Moreover, one of the need for Generalized Method of Moments technique aims at addressing the unobserved heterogeneity, a potential endogeneity and heteroscedasticity (Greene 2008; Bellemare et al. 2015). The dynamic panel data Method uses lags of the dependent variables as explanatory variables. Lagged values of the dependent variables are therefore used as instruments to control this endogenous relationship. Xtabond2 STATA command of Roodman (2006) is applied here for difference GMM or system-GMM estimators with one-step option for homoscedastic weight matrix estimation. Option of Xtabond uses lags in differences as instruments of endogenous variables whereas xtabond2 uses thus lags in levels by minimizing the information loses.

Indeed, simulation studies have shown very modest efficient gains from twostep estimates, even while heteroscedasticity is present (Mileva, 2007). Sargan and Hansen tests are used to test for the validity of instruments. Further, when the null hypothesis of validity of instruments is rejected (**p-values < 0.05)**, it is advised to include in the STATA command the options such as collapse, noleveleq, nodiffsaragan, orthogonal, robust and small options in order to reduce the number of instruments (Labra and Torrecilas, 2018).

4.3. Conceptual framework of the study

The concept of poverty has known a great documentation in either Agenda of international institutions or Think Tank consortium during the 1990s. In the international conference entitled "*Indian Economy in the Era of Financial Globalisation*", Deaton (2004), Sindzingre and Biswas (2006) design economic development as poverty reduction rather than economic growth. Yet, Onyimadu (2015) indicates economic development as inclusive and sustained economic growth by excluding some exogenous economic factors. Sen (1982) set a framework of equity analysis in a society participating of Smith philosophy in 1776. Poverty measurement exerts the role to stress the degree of poverty and identify whom are considered to be poor in a society by gender, race, age, etc. Many poverty analyses depict different conditions to be poor, rather than taking into account how or why the conditions come into existence. Social differences, distributional concerns and issues are in the heart of poverty analysis. Institutions such formal or informal processes govern the social relations and power structures which affect people's opportunities to have access to resources (Helen, 2012). The poverty concept is formally described on basis of two approaches, either unidimensional (monetary) or multidimensional measure of equity. The two approaches are explained throughout three schools aspects debating on poverty: Welfarist school, Basic Needs school and Capability school. Each aspect with its own recommendations to mitigate poverty.

Welfarist school explains lessons of economic welfare that are based on the utility maximisation of individual consumption. The well-being is unobservable and preferences of individuals are not constant. This leads to principles either of invisible hand of classical analysis for general equilibrium or no market State intervention. The production of goods is guided by unknown individuals' preferences. Lonely wished policies are those increasing productivity, employment, income, etc. to reduce poverty. Welfarist school is actually an income approach to poverty or money-metric approach implying extreme poverty based on income/consumption expenses.

Basic Needs school denotes what is lacking in the life of poor people. The lacks are described as small subset of identified goods and services deemed to address basic needs. Yet, it is not easy to determine basic needs of individuals since needs are unlimited, but basic needs is not a welfare approach (Asselin and Dauphin, 2001). It is likely to be ranged in multidimensional poverty approach. This school comes second in importance since 1900_s with Rowntree's studies of 1970_s. Policies supporting basic needs satisfaction for poor are made as public services like education, healthy, hygiene, while increases in income fail to improve their nutrition or healthy. Poor distribution of resources surround therefore many households or community.

Capability school under Sen's vision stresses human abilities or capabilities whose lacks lead to multidimensional approach implying a human poverty. Some basic needs which are made in terms of access, are now capability or liberty exertion to make choice amongst achievements. This aspect is rooted in rejected welfarist paradigm of individuals' utility.

In addition, more research has found mainstream the monetary approach of poverty used since 19^{th} and 20^{th} with Rowntree's works in London and NewYork respectively. With a shortfall in consumption (income) to some poverty threshold, monetary approach of poverty can be analysed in terms of perspective: absolute, relative and subjective or objective.

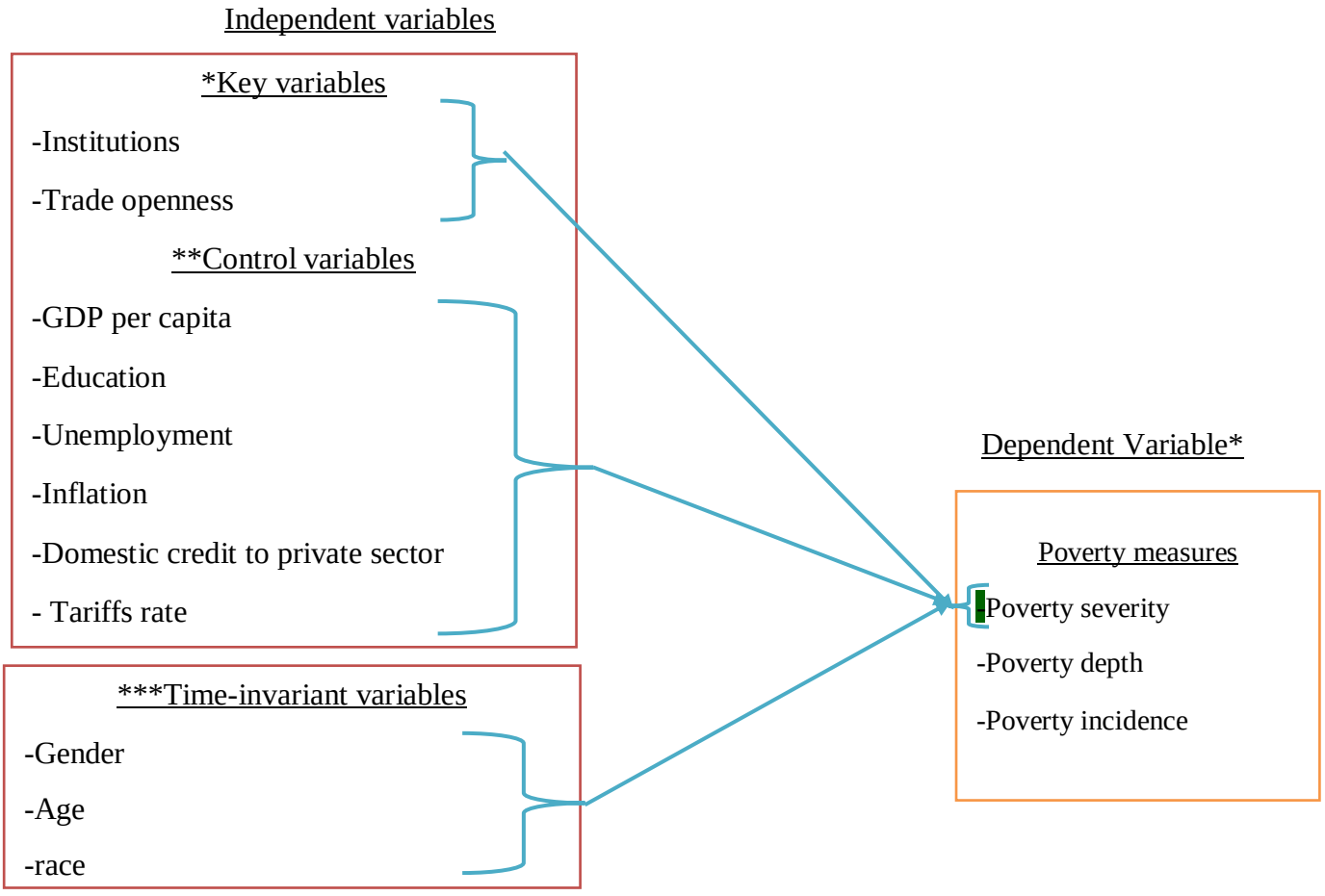
Absolute poverty refers to the incapacity to address what is thought to be the absolute minimum requirements of the human survival. The identification of households facing absolute poverty shows that absolute poor people earn less than national or international threshold. International poverty line per day recalibrates since 1990 with $US1 and $US1.25 in 2005 till $US1.90 in 2015. Yet, $1.08 per day, instead of $US1, has been largely approved to be a poverty line of extreme poverty until it is incorporated in the Millennium Development Goals (World Bank, 2008).

Relative poverty considers a position of households or individuals within the distribution of population over time. This views a status of each individual in relation to other individuals in the communities or other social groups according to the present context (inequality in community). A difference between local, national and international poverty measure helps determine a meaningful comparison of relative poverty (Bteille, Andre, 2003).

Poverty is also viewed as objective when the observable and measurable indicators refer to material or non-material dimensions. In contrast, it is subjective when describing psychological elements and perceptions of poverty. The individuals' judgements refer to the experience of their life that enlightens a decision making process.

After poverty is absolute, relative, objective and subjective perspective, over time and space considerations of poverty analysis denote the concept of poverty dynamics (Helen, 2012). This indicates whether people move out poverty, stay or become poor in short-term or long-term which may thus lead to vulnerability of poor. Vulnerability indicates a state where people's likelihood systems are exposed to sensitive shocks without any resilience over time. The shocks do not only affect individuals (unemployment, health, education, etc.). They may be widespread across a community through macroeconomic aspects relating to supply and demand shocks notably: oil price hikes (tramp), sudden fall and rise in a demand or supply of any commodity, imposing new tariff barriers in export countries, fall in domestic tariff barriers and change in prices for larger companies partaking of crafting domestic economy income. Transfer mechanism of shocks between countries refers to increasing international trade in goods and services. Accordingly, domestic institutions are encouraged to exert their role in mitigating openness shortcomings in order to reduce poverty (Mosley, 2004 and Aghion et al., 2010).

Graph 7. Conceptual framework of the study on poverty severity



4.4. Theoretical framework of the Study and Simulation of poverty

Since classical school of thoughts, many theories contributed to the understanding of the poverty. Yet, no single theory can be enough in itself to explain poverty (Davis and Miguel, 2014). Theories of poverty can be broadly ranged into two main parts: ***cultural and structural***. *Cultural theories* (orthodox theory) known as classical and neoclassical theories explaining poverty in the traits of the poor themselves (valuational, attitudinal, and behavioral patterns). *Structural theories* known as Keynesian and Marxist theories as well as eclectic theory of social exclusion and social capital. These explain poverty in terms of the life conditions of the poor: unemployment, underemployment, poor education, and poor health (David, 1970).

C**lassical Poverty theory** asserts that the state of poverty is accountable to individuals' outcomes because of their foundation on laissez-faire principles. Rank et al. (2003) calls that individual deficiencies are due to low level of education or competitive markets failures. This behaviour implies the non-intervention of the State and pervades individuals' mind along 19th century. Therefore, the classical theory admits the implementation of time limited aid and solution tied to work requirements and appropriate support (e.g. for child care) by encouraging better education completion rather than cash transfers (Davis and Miguel, 2014).

Neoclassical poverty theory acts beyond individual's control and can provide explanations to poverty especially with markets failures. Through supply and demand curves, Alfred Marshall (1890) has explained the introduction of market-based economic system in order to set a price. Markets failures such as externalities, moral hazard and adverse selection are viewed to aggravate the poverty in case of vulnerability to shocks like price hicks, recession, sickness, etc. (Davis, 2007). This theory overemphasizes monetary aspects but limits also the role of government by an aversion to distribution policies focusing on the mean income. Ulimwengu (2008) claims to diversify income sources (in terms of assets holding, either private or social) and investment in different form of capital for instance human capital in order to increase wages and employment among the poor.

However, Banerjee and Duflo (2012) consider adverse incentives, labor market inequality and lack of access to market of credit as generating poverty. Overlapping with the Keynesian and Liberal approaches, Sachs (2005) and Davis & Miguel (2014) distinguish lower level of capital than income in perpetuating poverty for developing countries. Emphases are on the lack of human capital throughout immigration and demographics (health, skills and education), institutional capital (rule of law, security, etc.), business capital (machinery and buildings), infrastructure (transport, power and sanitation) and knowledge capital (information and communication-ICT) to craft productivity.

Meanwhile, **Keynesian or liberal Poverty theory** indicates further the role of government in providing public goods and economic stability through macroeconomic focus (fiscal for instance). Unemployment is considered main cause of poverty and is generally involuntary. This theory suggests that growth via the famous multipliers can promote economic development and considers that private capital or investment follow to boost pro-growth activities. **Liberal-Keynesian theory** includes macroeconomic factors underlying poverty such as inflation and high sovereign debts which is not covered by taxation (Granville and Mallick, 2006).

Marxian or radical Poverty theory further argues the role of class and group discrimination as political issues to explain poverty. The role of States in market regulation matters for poverty struggle through setting minimum wages and anti-discrimination law. The need for capitalism to have surplus of labor lowers the wages of laborers and increases competition. Yet, the minimum wage is set in order to escape from poverty. Low wages hinder individuals from saving which, in turn, provokes a higher likelihood of falling into poverty as consequences of perpetual poverty (Pemberton & al. 2013).

In addition, an **eclectic approach of social exclusion and social capital** can explain how poverty is generated. Within social exclusion paradigm, inequality is found central and not confined to income inequality alone. It may also be defined in terms of limited opportunities for the poor and of a broader concept of the material resources available in society (Hills and Stewart, 2005). Besides, social capital involves network-based processes that generate economic outcomes through norms and trust. Such processes are able to generate either negative and positive externalities, or inequality in a society (Jefferson, 2012). Low levels of social capital can keep people impoverished throughout channels notably:

- fear of losing social networks hinders individuals from moving elsewhere for work, since their jobless state is aggravated.
- Second, disconnection from social networks (depreciation of social capital) after long unemployment is a cause for persistent poverty. This increases the cost and decreases the likelihood of finding a job.

It is claimed to be aware of wage system or labor market outcomes. Yet, another system like political and institutional framework has to be factored on income-based in the general theory of poverty. Analysis of distribution of resources other than income alone denotes the liberal-Keynesian theory. The key role of capital formation (through public investment for instance education) to address poverty requires substantial government expenditures and must be designed for the nature of poverty in each country. This study is therefore carried in accordance with Liberal-Keynesian poverty theory.

4.4.1. Foster-Greer-Thorbecke (FGT) Poverty model

Keynesian or liberal poverty theory, in this study, is applied to an income-based mathematical equation originated from Foster-Greer-Thorbecke –FGT (2010) class of decomposable poverty measures. In this approach, the poverty measure which is chosen, enables to capture a range of judgements on the poverty significance or poverty extent, and then gets easy to handle and interpret (Funing, Hua and Qi, 2007). Foster-Greer-Thorbecke (FGT) approaach is ever since appropriate for poverty analysis and has desirable properties. **Poverty headcount ratio or poverty incidence index** means the number of people below the poverty line that is divided by total population (of sampling), and it is defined as follows:

$$PI = \frac{1}{N}\sum_{i=1}^{N} I(y_i < z) = \frac{1}{N}\sum_{i=1}^{q} 1 = \frac{N_p}{N} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(1)$$

Where N is the number of total population; $I(.)$= an indicator functioning and taking a value of 1 (poor) if the bracketed expression is true, and 0 (non poor) otherwise; y_i= welfare indicator (consumption per capita); Z= poverty threshold and N_p= number of poor in population or q=the number of households or individuals below the poverty threshold .

If the government intervenes to address poverty incidence as the poverty measure, the policy of poverty alleviation will be favourable to some poor people near the poverty line, who most easily break away from the poverty. It is attractive to implement policy helping some poor citizens near the poverty line, but some poor people far from the poverty line need more assistance.

P**overty depth** describes the degree of poverty which is the average, over all people, of the proportionate gaps between poor people's living standards and the poverty line (as a proportion of the poverty line). The mathematical expression of poverty depth (PD) is:

$$PD = \frac{1}{N}\sum_{i=1}^{N}\left(\frac{z-y_i}{z}\right)I(z-y_i) = \frac{1}{N}\sum_{i=1}^{q}\left(\frac{z-y_i}{z}\right) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(2)$$

This measure indicates average shortfall of poor people, which gives good understanding of depth of poverty. PD also shows how much would be transferred to poor people to take them up to poverty line and it is thus possible to derive from the index, the minimum cost for eradicating poverty with transfers. However, depth poverty measure ignores problem of income distribution within the poor people and ignores inequality within the poor people.

Poverty severity (PS) is similar to poverty depth but since it is squared, it gives higher weight of the largest poverty depth and captures differences of income levels among poor people (inequality among the poor). Its equation is as follows:

$$PS = \frac{1}{N}\sum_{i=1}^{q}\left(\frac{z-y_i}{z}\right)^2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

Particle need of poverty severity arises since poverty depth inadequately captures the distributional changes within the poor. Poverty severity is more appropriate in the implementation of a cash transfer policy from individuals just below the poverty threshold. Otherwise, the only limit is that it is not widely used because of its lack for intuitive appeal and its difficulties to be interpreted. General mathematical expression of FGT class of a poverty measure is:

$$PS_a = \int_0^z \left[\frac{z-y_i}{z}\right]^a f(x)dx \qquad a \geq 0 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.(4)$$

Where y_i is the income per capita, f(x) is its density (roughly the proportion of the population having income y_i), z denotes the poverty threshold, and a is a non-negative parameter for poverty aversion. The parameter (α) is considered as weight attached to extreme poverty. The higher this value is, the greater the aversion for deep poverty arises (Martina Celidoni, 2011).

If α=0, 1, and 2, then *P*a respectively defines the head-count index, the poverty depth index, and the poverty severity index. In case if α=2, then equation (4) becomes:

$$PS_2 = \frac{1}{N}\sum_{i=1}^{q}\left(\frac{z-y_i}{z}\right)^2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(5)$$

Where N is the number of total population.

PS_2 is the poverty severity index which measures the quantity of needful resources to eliminate poverty and this measure is therefore sensitive to the poorer. It thus satisfies Sen's transfer axiom to increase welfare of the poor.

4.4.2. Axioms on poverty severity analysis

P**overty severity index** is expressed as function of the squared coefficient of variation of income among the poor countries ($CV^2{}_p = PS_2$) or income distribution. There are axioms that emphasize the FGT decomposable class notably focus, continuity, monotonicity and transfer axioms (Lorenzo and Liberati, 2005, and Benoit Decerf, 2017).

i)***Continuity***: For any $z \epsilon Z, P$is continuous on K (vector of attributes= resources/income). This is nontrivial in empirical applications to meet errors' measurement from having abusive impacts on poverty judgements.

ii)***Focus***: For any $(X,z);(Y,z) \epsilon K * Z$ if for each h such as $x_{hl} \geq z_l\,, y_{hl} = x_{hl} + \delta\ ;\ \delta > 0$, or $y_{il} = x_{il} \forall i\ \neq h, y_{ij} = x_{ij};\ \forall j \neq l, \forall i$; thus $P\ (X,z) = P(Y,z)$. The index is not sensitive to income level of non-poor individuals. This axiom requires that giving to individual more of an attribute (l) with respect to which that individual isn't poor, will not change the poverty index, although that individual is poor with regards to other attributes.

iii)***Pigou-Dalton Transfer***: results of Amartya Sen's argument on poverty index sensitive to inequality within poor individuals. Since matrix Y yields to matrix X, this axiom requires the progressive transfer of attribute l from one individual to another if for individuals g, h: $y_{gl} < y_{hl} < z_l\ ;\ x_{gl} = y_{gl} + \delta \leq y_{hl}, x_{hl} = y_{hl} - \delta \geq y_{gl}, \delta > 0$; and

$y_{il} = x_{il} \forall i\ \neq g, h, y_{ij} = x_{ij};\ \forall j \neq l\ and\ \forall i$

For emphasis, transfer principle indicates that, ceteris paribus, a transfer of attribute (income) from a poor person below the poverty line to rich people must enhance the poverty index. Since the principle accounts better for poverty severity in one-dimensional framework, the multi-dimensional framework demands to consider inequalities within poverty dimensions but not between poverty dimensions (Nicole Rippin, 2010). Poverty index decreases thus with progressive transfer and increases with regressive transfer.

iv) ***Monotonicity***: For any $(X,z);(Y,z) \epsilon K * Z$ if for each

$h, x_{hl} =\ y_{hl} + \delta\ ; where\ y_{hl} \leq z_l\,, \delta > 0$; or $y_{il} = x_{il}\ \forall i\ \neq h, y_{ij} = x_{ij};\ \forall j \neq l, \forall i$;

then $P\ (X,z) \geq P(Y,z)$.

This axiom denotes that poverty index to decrease if, other things equal, the condition of the poor individual *h* improves according to the attribute *l*. Monotonicity follows intuitively transfer and continuity axioms.

4.5. Empirical Model specification and data sources

The study runs, first of all, Keynesian model similar to the neoclassical's, where economic growth is ultimately considered as effective channel to end up poverty. This is hence justifies government intervention in monetary policy, tax, etc. Neoclassical authors encourage education to help individuals get more efficient in the marketplace in order to make unskilled labor scarcer and raise their income (Jung and Smith, 2007).

Regression analysis considered in estimation refers to resources (income) -based equation.

$$LnY = LnP_S = LnF\ (X) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

The equation establishes the elasticity of poverty severity (Y or P_S) as dependent variable to be explained by independent variables mainly institutions and trade openness as key variables (X). As from (6) equation, the Keynesian poverty model is specified as follows:

$$LnY_{it} = B_0 + B_1 Inst_{it} + B_2 LnTO_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

where the subscripts i and t represent country and time period, respectively; Ps is the log of a poverty severity, $Inst$ reflects institutional quality , TO is a log of measure of trade openness, B_0 is the intercept and ε_{it} the error term. B_1 and B_2 are estimation parameters enabling to discover what kind of effect applied on poverty severity.

Meanwhile, the study examines three objectives formulated into two different equations: trade openness equation and poverty severity equation.

Since adverse effects between Institutions ($Inst$), Trade openness (TO) and Poverty severity (Ps) arise, Chang et al. (2009), Arestis and Caner (2010) and Cepparulo, & al. (2016) argue to address that causation effects by introducing interaction terms ($Inst * TO$). This helps vary some countries features to reverse such concerns. Here are models with interaction terms:

$$LnTO_{it} = d_0 + d_1 Inst_{it} + d_2 LnPs_{it} + d_3 Ln(Inst * Ps)_{it} + d_4 LnZ_{it} + \lambda_{it} \ldots\ldots\ldots\ldots\ldots (8)$$

$$LnPs_{it} = \mathrm{B}_0 + B_1 Inst_{it} + B_2 LnTO_{it} + B_3 Ln(Inst * TO)_{it} + B_4 LnZ_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots (9)$$

where, Z reflects the matrix of control variables corresponding to the level of unemployment, inflation, domestic credit to private sector, income per capita, education, tariff rate, $d_1\ or\ B_1$, $d_2\ orB_2$,$d_3\ orB_3$ and $d_4\ orB_4$ are parameters of estimation. $d_0\ or\ B_0$ are intercepts, $\lambda_{it}\ \ and\ \varepsilon_{it}$ are error terms and have similar properties.

For trade openness equation (8), here are theoretical expectations of signs of coefficients: positive signs are expected on the coefficients associated with institutions, domestic credit to private sector, per capita income, and education in order to enhance openness to trade in COMESA countries. Yet, we expect to have negative signs of the coefficients associated with poverty severity, unemployment, inflation, tariffs rate and interaction term of institutions and poverty severity in order to weaken trade performance in COMESA region.

In the Equation of poverty severity (9), we expect theoretically negative signs of coefficients variables like institutions, trade openness, domestic credit to private sector, per capita income, education and interaction terms of institutions and education as well as trade openness and institutions in order to counteract poverty severity effects in COMESA countries. Besides, unemployment, inflation and tariffs rate are thus expected to show positive signs of their associated coefficients in a way to aggravate poverty severity effects in the region.

For emphasis, the coefficient associated with interactive terms may take negative sign to design complementarity between interaction terms. When the sign becomes positive, the interactive terms are substitutes, while neither complementary nor substitute for the nullity of the coefficient. (*Inst*Ps*) institutions and poverty severity; (*Inst*TO*) institutions and openness: GE*TO, CC*TO, PV*TO, RQ*TO, RL*TO, VA*TO, TO*educ (trade and education), TO*Tarate (trade and tariffs rate) and (*Inst*educ*) institutions and education.

Table 3: List of variables used and their expected signs/effects for equations 8&9

Variables	**Trade Openness equation (8)**	**Poverty severity equation (9)**	**Arguments support**
Openness (TO)	-	Negative/Positive	See Le Goff and Singh (2014)
Poverty severity (Ps)	Negative	-	See Anthonsen et al. (2012)
Per capita GDP	Positive/Negative	Negative/Positive	See Osei, Sare and Ibrahim (2019) and Ezzat (2018)
DCPS	Positive	Negative	See Cepparulo, Cuestas and Intartaglia (2016)
Educ	Positive	Negative	See Ezzat (2018) and Hafiz et al. (2016)
Infl	Negative	Positive	See Le Goff and Singh (2013)
Unempl	Negative	Positive	See Awad-Warrad and Muhtaseb (2017), Ezzat (2018) and Agenor (2004)
Tarate	Negative	Negative/Positive	See Mitra (2016), Le Goff and Singh (2013)
Inst	Positive	Negative	See Acemoglu and Robinson (2012) and Tebaldi and Mohan (2010)
GE	Positive	Negative	Idem
PV	Positive	Negative	Idem

RQ	Positive	Negative	Idem
RL	Positive	Negative	Idem
VA	Positive	Negative	Idem
CC	Positive	Negative/Positive	See Avom and Frabkem (2014) and Andres et al.(2013)
Inst*PS	Negative/Positive/0	-	See Anthonsen et al. (2012)
Inst*TO	-	Negative/Positive/0	See Le Goff and Singh (2014)
TO*Educ	-	Negative/Positive/0	Idem
TO*Tarate	-	Negative/Positive/0	Idem
Inst*educ	-	Negative/Positive/0	-

4.5.1. Econometric models

The study uses panel data of 21 COMESA countries observed for the period 1995-2018. The standard static panel data model is formulated:

$$Y_{it} = a_i + \sum_{k=1}^{K} B x'_{it} + \varepsilon_{it} \quad (10)$$

Where Y_{it} is the dependent variable (study focus), x'_{it} is the K-dimensional row vector of explanatory variables without a constant term, a_i is intercept which may capture individual fixed effects, B is (K x 1) vector, the slopes, independent of i and t, ε_{it} the error term, dependent of i and t. Three estimation approaches are used in this study; pooled OLS, fixed and random effects, as well as dynamic panel data model. For the latter, difference-Generalised Method of Moments (GMM) and system-GMM are used (Roodman, 2009).

A. Pooled OLS Model

Panel data analysis or cross-sectional regressions over time offers a possibility to control for the individual fixed effects and individual heterogeneity. Considering a linear regression model where individual (*i=1….N*) is observed at some time period (*t=1…T*), there is a standard specification of panel data model:

$$Y_{it} = a_i + \sum_{k=1}^{K} B x'_{it} + \varepsilon_{it} \quad (10)$$

Where Y_{it} is the dependent variable, x'_{it} is the K-dimensional row vector of time-varying predictor variables, where B is K-dimensional column of parameters, a_i is intercept and ε_{it} the error term. In application of OLS model, all observations for all periods are treated as single sample, and consistent estimators (a_i, B) yield.

Most critical assumptions of a linear regression is the exogeneity assumption: $E(x'_{it}\varepsilon_{it}) = 0$. Their implications are that the unconditional mean of error term is zero (linearity), where ($E(\varepsilon_{it}) = 0$) or ($E(a_i) = 0$); as well as non-correlation between error term and the explanatory variables (independence), where ($E(x'_{it}\varepsilon_{it}) = 0$).

The OLS estimator is hence guaranteed to be unbiased and consistency (Brüderl and Ludwig, 2015). On contrary, OLS estimator can be inconsistent, since it cannot address heterogeneity effects and if there appears an endogeneity problem from omitted variables.

B. Fixed effect model

The fixed panel data model is: $Y_{it} = a_i + \sum_{k=1}^{K} B x'_{it} + \varepsilon_{it}$………………………(11); k=1, 2…K regressors; i=1,2…N individuals; a_i denotes the individual fixed effects and ε_{it} the disturbance terms, B is a K-dimensional column vector of parameters; Y_{it} is the dependent variable, x'_{it} is the K-dimensional row vector of time-varying predictor variables.

In the fixed effects model, the individual-specific effect is a random variable that is allowed to be correlated with the explanatory variables. In the presence of correlation of the unobserved characteristics with some explanatory variables the random effect estimator leads to biased and inconsistent estimates of the parameters. To eliminate this correlation it is possible to use a traditional method called "within estimator or fixed effect estimator" which consists in transforming the data into deviations from individual means.

From the equation (12) standing for the error components model, comes the individual-specific means over t: $\overline{Y_i} = a_i + \sum_{k=1}^{K} B \overline{x_i} + \overline{\varepsilon_i}$……………………………………………..(12)

The within transformation is used to eliminate the unobserved heterogeneity effects as follows:

(11)-(12): $Y_{it} - \overline{Y_i} = \sum_{k=1}^{K} (B x_{it}' - \overline{x_i}) + (\varepsilon_{it} - \overline{\varepsilon_i})$

Where $\ddot{Y}_{it} = Y_{it} - \overline{Y_i}$, $\ddot{x'}_{it} = x'_{it} - \overline{x_i}$ and $\ddot{\varepsilon}_{it} = \varepsilon_{it} - \overline{\varepsilon_i}$;

The fixed effect model becomes:

$$\ddot{Y}_{it} = B \ddot{x'}_{it} + \ddot{\varepsilon}_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (13)$$

Note that intercept a_i representing unobserved individual specific effect cancels (because $a_i - a_i = 0$). In this case, even if a correlation between unobserved characteristics and some explanatory variables exists, the within estimator may provide unbiased and consistent results. Furthermore, a call of unobserved heterogeneity denotes that individual specific effects may be equal, so the individual effect equality test justifies it through a pooled panel model based on the comparison of the tests of Fisher calculated and Fisher statistic. $F^* = \frac{(RSS_P - RSS_{WI})/(N-1)}{(RSS_{WI})/(NT-N-K)}$

Where RSS_P is the residual squared sum of a pooled panel model, RSS_{WI} is the residual squared sum of within estimation model, K number of variables coefficients. T observation of time period t, N observations of individual i and NT observations of all individuals and time periods.

As far as Fixed effect assumptions are concerned, they allow arbitrary correlation between a_i and x_{it}. The fixed effect estimator can be consistent even if $E(x_{it}a_i) \neq 0$. A fixed effect analysis achieves this purpose explicitly (Wooldridge, 2010). However, the fixed effect estimator is consistent if $E(x'_{is}\varepsilon_{it}) = 0$, for all s and t=1, …T, strict exogeneity assumption; covariates in each time of period are uncorrelated with the idiosyncratic error in each time of period. Wooldridge (2010) furthered FE assumptions:

– no multicollinearity for full rank of the matrix of the transformed regressors

– homoscedasticity when idiosyncratic errors have constant variance across t

– no autocorrelation i.e. idiosyncratic errors are serially uncorrelated

C. Random effect model

Unlike the fixed effect model, the unobserved individual effects are random and not correlated with the explanatory variables in the model. One of the advantages of the random effects model is to be able to accommodate time invariant variables.

$$Y_{it} = a_i + \sum_{k=1}^{K} B x'_{it} + \varepsilon_{it} \quad \ldots\ldots (14)$$

Assumptions show on a hand usually normal distribution for a_i, where the latter are i.i.d. random effects: $E(x'_{it}\, a_i) = 0$. On the other hand, there is strict exogeneity assumptions, where $E(x'_{is}\, \varepsilon_{it}) = 0$ for all s, t=1, 2…T;

Moreover, the random effect estimation is concerned, the Generalized Least Squares (GLS) estimator is the most feasible or reliable ($\hat{B}$) (Brüderl and Ludwig, 2015).

$$\hat{B} = (X'\Omega^{-1}X)^{-1}(X'\Omega^{-1}Y) \quad \ldots\ldots (15)$$

Where $\Omega^{-1} = \frac{1}{\sigma_\varepsilon}\left[I - \frac{\theta}{T} ii'\right]$ and $\theta = 1 - \frac{\sigma_\varepsilon}{\sqrt{\sigma_\varepsilon^2 + T\sigma_\alpha^2}}$

The conversion of $X_{it}\ (or\ X)$ and $Y_{it}\ (or\ Y)$ leads to GLS estimator as weighted average of between and within estimators: $\hat{B}_{GLS} = \Delta\hat{B}_{BE} + (I - \Delta)\hat{B}_{WI}$

The $\hat{B}_{BE}$ and $\hat{B}_{WI}$ show that the Random Effect model may be mixed by Between and Within estimators via transformation.

Where Δ is the weight:

$$\Delta = \varphi T\left[\sum_{i=1}^{N} X_i' Q X_i + \varphi T \sum_{i=1}^{N} (X_{i.} - \bar{X}_{..})(X_{i.} - \bar{X}_{..})'\right]^{-1}\left[\sum (X_{i.} - \bar{X}_{..})(X_{i.} - \bar{X}_{..})'\right]$$

Since $\varphi = \frac{\sigma_\varepsilon}{\sqrt{\sigma_\varepsilon^2 + T\sigma_\alpha^2}}$,

the GLS estimator is therefore formalized:

$$\hat{B}_{GLS} = [\frac{1}{T}\sum X_i^{'} Q X_i + \varphi \sum (X_{i.} - \bar{X}_{..})(X_{i.} - \bar{X}_{..})^{'}]^{-1}[\frac{1}{T}\sum X_i^{'} Q Y_i + \varphi \sum (X_{i.} - \bar{X}_{..})(Y_{i.} - \bar{Y}_{..})^{'}] \quad \ldots\ldots(16)$$

If $\varphi = 1$, the model reduces to a pooled model estimator but if $\varphi = 0$, it becomes a fixed effects model (within estimator). To test for the existence of random effects, the Breusch-Pagan Lagrange Multiplier test is used with the null hypothesis that the variance of the individual effects is zero. The test follows a chi-square distribution with one degree of freedom (Baltagi, 2005). Note that Random Effect estimates are between Pooled OLS and Fixed Effect in the bivariate case. However, the model further assumes no correlation between country's error term and predictor variables, which justifies the role of time invariant variables to be considered as explanatory variables. Time invariant variables are no longer absorbed by fixed effects. There is no endogeneity concern if individual effects are not correlated with any regressors.

D. Dynamic panel Data analysis Method

The use of this methodology is motivated by its ability to take into account non observable country specific effects and included lagged dependent variables among the explanatory variables. Moreover, the panel data model runs an estimation for 16 countries over 1995-2018 time periods. To reverse the problem of some missing data on some periods, we use data set on the averages of five years with regard to the recalibration of international poverty threshold, i.e. (1995-1999), (2000-2004), (2005-2009), (2010-2014), (2015-2018). There are five data entries for whichever country or variable in the sample. These data averages intend to minimize the noise issued from missing data on some time series of the study (Bergh et al., 2014).

To eliminate unobserved country specific effects and control potential endogeneity problem rise, two estimators are considered: the difference-GMM and System-GMM estimators. The standard dynamic panel model is written as:

$$y_{it} = \gamma y_{it-1} + B_1 \acute{X}_{it} + a_i + \varepsilon_{it} \quad \ldots\ldots(17)$$

Where, y_{it-1} is the lagged dependent variable; $\gamma > 0$, is the autoregressive parameter in AR(1); $\acute{X}_{it}$ is the vector of independent variables; and the heterogeneity effects a_i and the error term $\varepsilon_{it} \sim N(0, \sigma^2{}_{\varepsilon})$.

If the lagged dependent variable (or explanatory variable) correlates with the error term, or if two error terms correlate when dealing with structural equation modelling, there occurs an endogeneity concern. The bias of the latter can therefore cause inconsistent estimates, which potentially leads to wrong inferences, misleading conclusions and incorrect theoretical interpretations (Subhan et al., 2018). Endogeneity bias can have different origins such as:

- There is an omitted variable that is correlated with some regressors.
- If the dependent variable and at least one of the regressors are determined simultaneously in a system.
- If there is measurement error in at least one of the regressors.

To address such an endogeneity bias, three techniques can be used: for survey data, Two-stage least squares (2SLS) and Three-stage least squares (3SLS) models are often used. When there is a dynamic endogeneity bias, one resorts to Generalised Method of Moments (GMM) model. The latter is generally used for dynamic panel data despite the sources of endogeneity bias, but was developed by Arellano-Bond (1991) and Blundell-Bond (1998).

To deal with that bias, the techniques of dynamic panel data estimation use lags of the dependent variables as explanatory variables. Lagged values of the dependent variables are therefore used as instruments to control this endogenous relationship. These instruments are often called 'internal instruments' as they are used from the existing econometric model (Roodman, 2009). The GMM model removes endogeneity by internal transformation of data which refers to a statistical process where a past value of a variable is subtracted from its present value (Roodman, 2009). Such transformation methods are known as first-difference transformation (one-step GMM) and one-step system GMM (or as GMM estimators). In this way, the number of observations is reduced and this process (internal transformation) enhances the efficiency of the GMM model (Wooldridge, 2012).

Otherwise, the use of Difference GMM and System GMM estimators is governed by two special rules of Thumbs:

- Rule of thumb1 shows that when T is acutely short and the autoregressive model parameter of the lagged dependent variable is close to random walk ($\gamma < 1$), system GMM is used (Blundell-Bond, 1998).
- Rule of thumb2 indicates the comparison of the autoregressive model parameter, while the model is initially estimated by pooled OLS and Fixed effects methods. If the difference GMM estimator is close to or is below the fixed effects estimator, GMM-System is preferred, otherwise Difference-GMM estimation is used (Bond et al., 2001).

***Difference-Generalized Method of Moments technique (Arellano-Bond, 1991)**

This technique uses the lagged levels of explanatory variables as instruments and the first difference eliminates heterogeneity effects:

$$\Delta y_{it} = \gamma \Delta y_{it-1} + B_1 \Delta \acute{X}_{it} + \Delta \varepsilon_{it} \quad (18)$$

Difference GMM estimation gets imperfection up to deal with endogeneity bias. To mitigate it, the estimator is extended to System-GMM of Arellano-Bover (1995), and Blundell-Bond (1998), and may be applied to large N and short T, with subscript $it - j > 0$; $j \geq 2$,for an overall intention in valid over-identifying restrictions of instruments and no serial autocorrelation matters.

****System-Generalized Method of Moments (Blundell-Bond, 1998)**

This aims at reducing potential bias and inaccuracy associated with Difference-GMM estimator. The System-GMM estimator controls for unobserved country-specific effects and meets the error measurement problem, and it is a consistent parameter estimate for lagged dependent variable. The System-GMM equation is developed by use of regressions (17 and 18):

$$\begin{cases} y_{it} = \gamma y_{it-1} + B_1 \acute{X}_{it} + a_i + \varepsilon_{it} \\ \Delta y_{it} = \gamma \Delta y_{it-1} + B_1 \Delta \acute{X}_{it} + \Delta \varepsilon_{it} \end{cases}$$

The consistency of GMM estimators can be assessed by Sargan/Hansen test of over-identifying restrictions test for overall validity of instruments and by no second-order serial correlation test of the rejection of null hypothesis.

4.5.2 Method and data collection

Measurement of poverty for the study is broader in terms of depicting its underlying determinants and dynamics. This intends to design useful policy contribution in poverty reduction and alleviation matters. Over space and time, measurement can permit comparisons of policies effects or other interventions exploration. Many researches deal with mixed methods of qualitative and quantitative to minimise one's weaknesses (Kanbur, 2003).

However, it is not refuted that some elements of poverty analysis are mostly appropriate with qualitative or quantitative separately. Besides, due to less robustness issued from its small sample sizes of qualitative method in terms of increasingly difficult of verification and replication, so quantitative method on basis of its substantial representativeness denotes that are desirable the possibility for replication and of designing spatially and temporally comparable methods.

Poverty analysis employs therefore quantitative methods because the measures of economic poverty are dominant (Helen, 2012). The perception of the methods is objective and reliable, where quantitative methods lastly seem higher convincing to policy makers.

Data set provides a range of socio-politico-economic information that affecting determinants of poverty on the aggregated level. A few variables are indicators or proxies of current phenomenon captured in this study. Recall that no else survey is done, all useful data are retrieved from different online web sites. The study intends to assess the severity of poverty in COMESA countries for 1995-2018 throughout a panel data model.

In addition, as far as data analysis it is concerned, required computational tools for estimation rely on either Stata13.1 or Eviews8.1. They are good fit for robust estimation and all variables appear through the table below:

Table 4. List of variables to be used in different regressions

Variables/Dimensions	**Definition of variables**	**Data Sources**
Log Ps / (Poverty severity)	*Poverty severity is the squared poverty gap index that averages the squares of the poverty gaps relative to the international poverty lines $US1.08 (in 1990), $ US1.25 (in 2005) and $ US1.90 (in 2015).*	Povcalnet (World Bank database)
TO /(Openness)	*Trade openness may be defined in terms of an approach based on data of trade magnitude (Chaledéron et al. 2005). The analysis refers to the impact of Globalisation on poverty, where trade is the sum of exports and imports of goods and services as a share of GDP.*	World Development Indicators (WDI-World Bank)
Inst /(Institutions)	*Proxy for Kauffmann indicators score of institutional quality indicating lower(0) to higher(100) levels (in percentile rank) of the quality of formal institutions*	Worldwide Governance Indicators
Log per capita GDP	*Overall income per capita to control for economic development*	WDI-World Bank
Log Educ /(Education)	*Measure of human capital level based on primary school completion rate*	UNESCO
Log DCPS/(Domestic Credit to private sector)	*Proxy variable for financial development measured by Domestic credit to private sector as a share of GDP*	WDI-World Bank
Log Unempl /(Unemployment)	*Measure of country's jobless or job seeking people as a share of total labor force to control for macroeconomic instability*	WDI-World Bank (international labor organisation)
Log Infl /(Inflation)	*Measure of the growth of consumer price index as a change in prices of a purchased*	WDI-World Bank

	basket of goods and services to control for macroeconomic instability	
Log Tarate/(tariff rate)	*Proxy for a public policy referring to a simple mean applied tariff for all products subjected to all traded goods' calculated tariffs as a share to GDP*	World Integrated Trade solution (WITS) (World Bank database)

Source: Author

4.6. Conclusion

Succinctly, amongst methods and procedures introduced in this chapter, the study uses both pooled ordinary least squared (OLS), fixed effect and generalized method of moments (GMM) estimates to control potential individual fixed effects and endogeneity. Test of pooled OLS for cross-section regression permits to control individual country specific effects or unobserved heterogeneity with robust standards errors providing robust estimates. OLS test assumes that cross-sectional individuals are independently and identically distributed and serially uncorrelated as well.

The Hausman specification tests the presence of fixed effects or Random Effect and chooses one of the two estimation approaches. Throughout three fixed effect estimations, the study uses fixed effect (within) estimation. The latter is designed to remove such unobserved individual effects and permits exploration of relationship between regressors and regressand per country. To avoid potential heteroscedasticity and serial correlation, the within (FE) estimate uses the AR(1) disturbances.

Generalized Method of Moments technique is used to mitigate potential endogeneity and to control for unobserved country specific characteristics. Estimates refer on Arellano and Bond (1991), with Arellano and Bover (1995) and Blundell-Bond (1998). Roodman (2009) performs Difference-GMM and GMM system estimates and applies them for a large number of cross-sectional units (16) and short number of time series observations (5) as well. Sargan/Hansen test provides consistent estimates to valid instruments related to poverty severity effects of trade openness and of institutions, and to effects of institutions on trade for COMESA countries.

CHAPTER FIVE. PRESENTATION AND DISCUSSION OF RESULTS

5.1. Introduction

The need for empirical analysis for such a case study arises to investigate the theoretical literature accuracy under the used theory judgement. As far as the literature on institutions, openness and poverty in concerned, there are effects either of institutional quality on trade and on poverty or of trade openness on poverty. In fact, this study relies on the empirical verification of theory of relationships between institutions, trade openness and poverty severity for COMESA countries. Since it can occur self-control of some variables, the literature permits a set of control variables in which are some interacting terms that make vary some country characteristics to minimize their concerns (Cepparulo et al. 2016).

The empirical results get as reliable as the role of econometric analyses are robust to set out the actual effects of independent variables on dependent variable and thus judge the theory. The estimation approaches used are Pooled Ordinary Least Squares (Pooled OLS) and fixed effects estimators, and Generalized Method of Moments estimator to stress out those relationships. Otherwise, results of the above three tests are only presented and interpreted throughout this chapter.

5.2. Results presentation and interpretation

5.2.1. Pooled Ordinary Least Squares test Results

Here are presented the results provided by Pooled OLS estimation from Openness equation

Table 5. Pooled OLS regression results for dependent variable as TO (Openness to trade)

Panels	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LPs	0.044*	0.034	0.049**	0.043**	0.037*	0.043*	0.048*	0.216***
	(1.96)	(1.51)	(2.06)	(2.02)	(1.76)	(1.82)	(1.99)	(3.07)
LGdpca	0.021	-0.013	0.044	-0.015	0.054	0.017	0.061	-0.030
	(0.29)	(-0.18)	(0.58)	(0.23)	(0.70)	(0.23)	(0.80)	(-0.41)
Leduc	0.052	0.150	0.018	0.107	0.010	0.066	0.033	0.123
	(0.39)	(1.08)	(0.13)	(0.84)	(0.08)	(0.47)	(0.24)	(0.93)
LDCPS	0.090	0.112	0.088	0.160**	0.126	0.114	0.154**	0.128*
	(1.21)	(1.50)	(1.07)	(2.43)	(1.58)	(1.45)	(2.08)	(1.74)
LInfl	-0.010	-0.006	-0.025	0.027	0.004	-0.018	0.011	-0.042
	(-0.20)	(-0.12)	(-0.46)	(0.58)	(0.08)	(-0.34)	(0.21)	(-0.85)
LUnempl	0.178**	0.194***	0.195***	0.147***	0.167***	0.183***	0.166***	0.224***
	(3.15)	(3.35)	(3.25)	(2.72)	(1.79)	(3.07)	(2.80)	(3.90)
LTarate	0.008	-0.040	-0.023	-0.011	-0.016	-0.032	-0.018	0.014
	(0.09)	(-0.46)	(-0.26)	(-0.14)	(-0.17)	(-0.35)	(-0.20)	(0.17)

Institut	0.011*** (3.82)							0.010*** (3.66)
CC		0.008*** (3.45)						
GE			0.008*** (2.76)					
PV				0.009*** (4.90)				
RQ					0.006** (2.27)			
RL						0.007** (2.45)		
VA							0.006** (2.63)	
Linst*Ps								-0.049** (-2.57)
Constant	2.769*** (4.41)	2.684*** (3.21)	2.940*** (4.47)	2.662*** (4.46)	2.818*** (4.23)	2.893*** (4.39)	2.597*** (3.93)	2.679*** (4.42)
F-Stat Prob>F	7.52 (0.0000)	7.01 (0.0000)	6.19 (0.0000)	9.32 (0.0000)	5.71 (0.0000)	6.07 (0.0000)	6.06 (0.0000)	7.94 (0.0000)
R-squared	0.4587	0.4413	0.4109	0.5123	0.3916	0.4063	0.4056	0.5052
Obs	80	80	80	80	80	80	80	80
*Note: Values in brackets indicate student statistics; while *, ** and *** show significance level at 10, 5 and 1 percent*								

From Table 5, F-test indicates that overall the model is statistically significant. The explanatory variables taken together explain the dependent variable at the nullity of F-stat probability for whatever panel considered (panel 1-8). The outcome variable (trade openness) is jointly explained by a bulk of regressors especially the institutional quality variables.

Regarding the individual significance of coefficients, the results show that institutions variables (institution average and institution composite elements, i.e control of corruption, government effectiveness, political stability and violence absence, regulatory quality, rule of law, voice and accountability) are all positively associated with trade openness and statistically significant either at 1 or 5 percent. In addition, poverty severity affects positively trade openness at 5 and 10 significant level, while the coefficient of unemployment is significant at 1 percent for all the cases. For example, if the quality of corruption control increases of 1 percent, openness to trade increases of 0.008 percent in COMESA countries.

The estimation results show that the coefficients of other regressors are statistically insignificant, except for the domestic credit to private sector representing the financial development. Its coefficient is positive and statistically significant at 5 and 10 percent.

The coefficient of the interaction term between institution and poverty severity (Linst*Ps) is negative and statistically significant at 5 percent. This implies that the effects of institutions would be good to foster trade openness, if the level of poverty severity was lowered (-0.049).

Table 6. Pooled OLS regression results from Poverty Severity equation.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LTO	1.146***	0.886	1.139**	1.246**	0.879	1.023***	1.103***	1.046***
	(1.96)	(1.51)	(2.06)	(2.02)	(1.56)	(1.82)	(1.99)	(1.86)
LGdpca	-0.598	-0.627*	-0.625*	-0.545	-0.645*	-0.584	-0.684*	-0.249
	(-1.64)	(-1.71)	(-1.75)	(-1.47)	(-1.75)	(-1.59)	(-1.90)	(-0.67)
Leduc	-0.252	-0.293	-0.101	-0.353	-0.251	-0.269	-0.159	1.038
	(-0.37)	(-0.42)	(-0.15)	(-0.52)	(-0.36)	(-0.39)	(-0.24)	(1.29)
LDCPS	-1.287***	-1.444***	-1.076***	-1.441***	-1.434***	-1.297***	-1.312***	-1.075***
	(-3.65)	(-4.21)	(-2.84)	(-4.43)	(-4.02)	(-3.61)	(-3.93)	(-3.11)
LInfl	-0.200	-0.245	-0.102	-0.268	-0.245	-0.177	-0.226	0.012
	(-0.79)	(-0.96)	(-0.39)	(-1.07)	(-0.96)	(-0.68)	(-0.91)	(0.05)
LUnempl	-0.421	-0.370	-0.484	-0.384	-0.362	-0.412	-0.383	-0.558*
	(-1.39)	(-1.17)	(-1.60)	(-1.28)	(-1.20)	(-1.36)	(-1.29)	(-1.90)
LTarate	-0.716	-0.585	-0.742	-0.655	-0.603	-0.669	-0.756	-0.659
	(-1.61)	(-1.33)	(-1.61)	(-1.51)	(-1.31)	(-1.52)	(-1.64)	(-1.55)
Inst	-0.020							0.087**
	(-1.27)							(2.06)
CC		-0.002						
		(-0.15)						
GE			-0.028*					
			(-1.82)					
PV				-0.016				
				(-1.31)				
RQ					-0.002			
					(-0.17)			
RL						-0.014		
						(-1.07)		
VA							-0.021*	
							(-1.71)	
Inst*educ								-0.0013***
								(-2.73)
Constant	7.641**	8.624**	6.800*	7.524**	8.605**	7.800**	8.121**	-0.733
	(2.20)	(2.50)	(1.96)	(2.16)	(2.49)	(2.24)	(2.42)	(-0.16)
F-Stat	9.26	8.87	9.75	9.29	8.87	9.15	9.59	9.81
Prob>F	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
R-squar	0.5107	0.4997	0.5236	0.5114	0.4998	0.5075	0.5193	0.5578
Obs	80	80	80	80	80	80	80	80

*Note: Values in brackets indicate student statistics; while *, ** and *** show significance level at 10, 5 and 1 percent*

Results from Pooled OLS regression in table 6 show that openness to trade is positively associated with poverty severity at 5 or 10 percent level. When trade openness increases by 1 percent, poverty severity increases by 1.138 percent. The sign is not expected but similar result was found as many economists corroborate that more open economies fair better in aggregate than do closed ones in the long term, but some fear that more openness may harm poorer actors in the economy in the shorter term.

In the longer term, some people may be left behind in poverty. Despite tremendous opening endeavours, Africa remains the poorest continent of the world Le Goff and Singh (2014). As far as institutional quality is concerned, results show that government effectiveness and, voice and accountability (measured in percentile) affect negatively poverty severity at 10 percent level. When government effectiveness increases of 1 percent, the poverty severity decreases of 0.028 percent.

The interaction term between education and institutional quality is negative and statistical significant at 1 percent level. It indicates that institutions quality would exert good effect on poverty severity if the level of education was higher in COMESA countries (-0.0013). Among the control variables, the coefficients of domestic credit to private sector, per capita GDP and unemployment rate are statistically significant at 1 or 10 percent, and they all exert a negative effect on poverty severity. For example, when per capita GDP increases by 1 percent poverty severity decreases by 0.627percent. Tariffs rate is not therefore significant.

Table 7. Pooled OLS regression results from Poverty severity equation with Trade interaction terms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
LTO	2.030*** (2.99)	1.523** (2.05)	2.164*** (3.55)	1.986*** (2.73)	1.633** (2.44)	1.781*** (2.77)	1.650*** (2.83)	3.288*** (3.39)	3.134*** (3.55)
LGdpca	-0.326 (-0.89)	-0.455 (-1.17)	-0.289 (-0.83)	-0.325 (-0.85)	-0.486 (-1.33)	-0.324 (-0.87)	-0.461 (-1.31)	-0.372 (-1.04)	-0.237 (-0.65)
Leduc	-0.607 (-0.91)	-0.579 (-0.80)	-0.510 (-0.81)	-0.676 (-0.98)	-0.411 (-0.61)	-0.566 (-0.84)	-0.362 (-0.56)	1.028 (1.32)	-0.928 (-1.37)
LDCPS	-1.154*** (-3.46)	-1.352*** (-4.03)	-0.868** (-2.55)	-1.359*** (-4.23)	-1.212*** (-3.50)	-1.151*** (-3.40)	-1.200*** (-3.71)	-1.244*** (-3.90)	-1.413*** (-4.58)
LInfl	-0.048 (-0.19)	-0.166 (-0.64)	0.086 (0.35)	-0.148 (-0.59)	-0.119 (-0.46)	-0.025 (-0.10)	-0.090 (-0.37)	-0.80 (-0.33)	-0.229 (-0.96)
LUnempl	-0.497 (-1.65)	-0.415 (-1.38)	-0.600 (2.11)	-0.430 (-1.46)	-0.419 (-1.41)	-0.502 (-1.65)	-0.506 (-1.64)	-0.424 (-1.48)	-0.466 (-1.64)
LTarate	0.817* (1.92)	-0.690 (1.57)	0.892** (2.19)	0.709* (1.70)	0.870* (1.93)	0.756* (1.78)	0.719* (1.73)	0.744* (1.79)	1.797** (2.10)
Inst*TO	-0.0004*** (-2.69)								
CC*TO		-0.0002 (-1.30)							
GE*TO			-0.0006*** (-3.72)						
PV*TO				-0.0003** (-2.25)					
RQ*TO					-0.0003* (-1.92)				
RL*TO						-0.0003** (-2.48)			
VA*TO							-0.0003*** (-2.90)		
TO*educ								-0.00059*** (-2.95)	

TO*Tarate									-0.0023*** (-3.16)
Constant	3.799 (1.02)	6.456* (1.70)	2.149 (0.60)	4.425 (1.16)	5.691 (1.55)	4.278 (1.15)	4.947 (1.42)	-6.050 (-1.02)	-4.388 (-0.84)
F-Stat Prob>F	10.66 (0.0000)	9.28 (0.0000)	12.31 (0.0000)	10.12 (0.0000)	9.78 (0.0000)	10.40 (0.0000)	10.97 (0.0000)	11.04 (0.0000)	11.36 (0.0000)
R-squar	0.5458	0.5112	0.5811	0.5329	0.5242	0.5395	0.5527	0.5444	0.5614
Obs	80	80	80	80	80	80	80	80	80
*Note: Values in brackets indicate student statistics; while *, ** and *** show significance level at 10, 5 and 1 percent*									

For trade interaction terms, results in table 7 from pooled OLS regression show that trade interaction terms (overall institution, Government effectiveness, political stability and absence of violence, regulation quality, rule of law, voice and accountability, education, and tariff rate) are negatively associated with poverty severity. Their coefficients are statistical significant at 1, 5 or 10 percent; except for the interaction between Trade and corruption.

These results imply that trade openness would be profitable to reduce poverty severity if the institutions quality improved, if there were higher education level and lower tariff rate in COMESA countries. However, for individual coefficients, trade openness is positively associated with poverty severity and statistically significant at 1 or 5 percent. Financial development is shown to exert a negative effect with poverty severity, while tariffs rate coefficient is positively associated with poverty severity. Their coefficients are statistically significant at 1, 5 and 10 percent. For instance, if tariffs rate increases of 1 percent, poverty severity increases of 0.817 percent.

5.2.2. Fixed effects model estimation results

After Pooled OLS estimation, fixed effects model is estimated to examine the relationships among institutions, trade openness and Poverty severity in COMESA countries. To address potential heteroscedasticity and correlation, fixed effects (within) regression with AR (1) disturbances under xtregar command is used. Yet, Fixed effect model is chosen instead of random effect model since Hausman specification test assumes the presence of individual fixed effects at the nullity of Probability associated with Chi-square on trade openness and Poverty severity equations.

Table 8. Results from Fixed Effects regression with AR (1) disturbances from Openness Equation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LPs	-0.023 (-0.72)	-0.018 (-0.50)	-0.009 (-0.29)	-0.025 (-0.78)	-0.008 (-0.25)	-0.013 (-0.38)	-0.019 (-0.60)	0.067 (0.62)
LGdpca	-0.300*** (-3.38)	-0.285*** (-3.05)	-0.280*** (-3.02)	-0.274*** (-3.16)	-0.275*** (-3.09)	-0.296*** (-3.12)	-0.309*** (-3.51)	-0.282*** (-3.16)
Leduc	0.387** (2.21)	0.389** (2.11)	0.387** (2.11)	0.391** (2.28)	0.354* (1.99)	0.402** (2.20)	0.503*** (2.85)	0.381** (2.19)
LDCPS	0.238** (2.62)	0.276*** (2.91)	0.267*** (2.79)	0.234** (2.62)	0.279*** (3.11)	0.272*** (2.82)	0.245*** (2.78)	0.284*** (2.76)
LInfl	0.052 (1.22)	0.058 (1.29)	0.055 (1.21)	0.057 (1.37)	0.067 (1.56)	0.055 (1.24)	0.056 (1.36)	0.056 (1.26)
LUnempl	-0.169 (-0.84)	-0.075 (-0.33)	-0.041 (-0.20)	-0.086 (-0.47)	-0.084 (-0.44)	-0.032 (-0.16)	-0.086 (-0.46)	-0.122 (-0.60)
LTarate	-0.056 (-0.71)	-0.069 (-0.81)	-0.049 (-0.59)	-0.056 (-0.72)	-0.027 (-0.34)	-0.064 (-0.67)	-0.058 (-0.74)	-0.052 (-0.67)
Institut	0.014** (2.31)							0.013** (2.10)
CC		0.004 (0.79)						
GE			0.004 (0.97)					
PV				0.010** (2.62)				
RQ					0.009** (2.07)			
RL						0.004 (0.96)		
VA							0.015** (2.59)	
Linst*Ps								-0.032 (-0.83)

Constant	3.693*** (5.80)	3.624*** (5.06)	3.515*** (5.15)	3.482*** (5.55)	3.432*** (5.30)	3.547*** (5.16)	3.124*** (5.09)	3.401*** (4.73)
F. (Fe) Prob>F	5.53 (0.0000)	5.29 (0.0000)	5.68 (0.0000)	4.57 (0.0000)	6.17 (0.0000)	6.07 (0.0000)	6.36 (0.0000)	6.05 (0.0000)
Corr(u_i,x_b) F-test	-0.6709*** (3.35)	-0.5601** (2.49)	-0.5510** (2.55)	-0.4205*** (3.64)	-0.6026*** (3.16)	-0.5298** (2.54)	-0.6736*** (3.61)	-0.6381*** (2.92)
Obs	64	64	64	64	64	64	64	64
*Note: Values in brackets indicate student statistics; while *, ** and *** show significance level at 10, 5 and 1 percent*								

Fixed effects regression results in table 8 indicate that institutional quality on average, political stability and absence of violence, regulatory quality, and voice and accountability exert a statistically significant positive effect on openness to trade at 5 percent level. Control variables such as education and financial development (DCPS) have a positive significant influence at least at 10% level. The coefficient of per capita GDP is also statistically significant at 1 percent but negatively associated with trade openness. On contrary, theoretical basis expects the sign of per capita GDP coefficient to be positive in order to increase openness to trade.

Yet, this result is in similar line of Osei, Sare and Ibrahim (2019). Their findings suggest that while economic growth enhance robustly trade openness in lower income countries, the effect is no more robust in low-middle-income countries and becomes largely negative. After they estimated a threshold point of openness for low-middle-income countries, they suggest that beyond that point, any increase in economic growth dampens openness.

Table 9. Estimation results of Fixed Effects model with AR(1) disturbances on Poverty severity equation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LTO	-0.257 (-0.36)	-0.166 (-0.25)	-0.043 (-0.06)	-0.409 (-0.55)	0.016 (0.02)	-0.110 (-0.16)	-0.269 (-0.36)	-0.462 (-0.60)
LGdpca	0.896** (2.10)	0.809** (1.96)	1.017** (2.44)	0.886** (2.11)	1.022** (2.46)	0.916** (2.16)	0.891** (2.03)	0.909** (2.12)
Leduc	-0.335 (-0.41)	-0.451 (-0.57)	-0.333 (-0.41)	-0.246 (-0.30)	-0.290 (-0.35)	-0.337 (-0.41)	-0.080 (-0.09)	0.370 (0.30)
LDCPS	-0.941** (-2.09)	-0.949** (-2.19)	-0.914*** (-1.98)	-0.893*** (-2.01)	-0.919** (-2.03)	-0.938** (-2.08)	-0.206*** (-2.01)	-0.920** (-2.03)
LInfl	-0.185 (-0.91)	-0.203 (-1.03)	-0.178 (-0.86)	-0.155 (-0.77)	-0.183 (-0.89)	-0.189 (-0.91)	-0.163 (-0.83)	-0.208 (-1.01)
LUnempl	-1.107 (-1.22)	-0.293 (-0.78)	-0.174 (-0.83)	-1.147 (-1.24)	-1.016 (-0.76)	-1.175 (-1.07)	-1.151 (-1.11)	-1.064 (-1.33)
LTarate	0.191 (0.55)	0.078 (0.23)	0.203 (0.58)	0.173 (0.50)	0.182 (0.51)	0.167 (-0.47)	0.193 (0.55)	0.237 (0.67)
Inst	0.028 (0.99)							0.075 (1.12)
CC		0.040** (2.00)						
GE			-0.00009 (-0.00)					
PV				-0.024 (-1.31)				
RQ					-0.006 (-0.32)			
RL						0.013 (0.66)		
VA							0.025 (0.80)	
Inst*educ								-0.0006

								(-0.78)
Constant	1.645 (0.41)	3.188 (0.82)	0.008 (0.00)	1.706 (0.44)	-0.317 (-0.08)	1.063 (0.26)	0.375 (0.10)	-0.388 (-0.08)
F. (Fe) Prob>F	11.11 (0.0000)	11.82 (0.0000)	11.16 (0.0000)	11.12 (0.0000)	11.14 (0.0000)	10.82 (0.0000)	10.94 (0.0000)	10.32 (0.0000)
Corr(u_i,x_b) F-test	-0.3758** (2.63)	-0.5467* (3.15)	-0.1770** (2.52)	-0.3266** (2.73)	-0.1474** (2.53)	-0.2732** (2.51)	-0.3184** (2.56)	-0.3266** (2.40)
Obs	64	64	64	64	64	64	64	64
*Note: Values in brackets indicate student statistics; while *, ** and *** show significance level at 10, 5 and 1 percent.*								

Estimation results in Table 9 show that corruption control has a positive and significant effect on poverty severity in COMESA countries. If control of corruption increases of 1 percent, poverty severity increases of 0.040 percent. Weak institutions in terms of corruption control translate into worse effects in the reduction of poverty severity in COMESA countries. Trade openness does not have a significant effect on the severity of poverty.

In all regressors, Domestic credit to private sector exerts a negative and statistically significant effect on poverty severity, whilst GDP per capita has a positive and significant effect on poverty severity at 5 percent level. The positive effect was not theoretically expected, but it is in the line with results of Ezzat (2018) on MENA countries. He has found that per capita income is positively associated with multidimensional poverty. His analysis indicates that gains of boosting economic growth fail to reach poor people and those living in extreme poverty so that they move out of poverty. Redistribution way has been marginal. He suggests that rich countries with higher income show a trivial degree of poverty.

Table 10. Estimation Results of Fixed Effects model on Poverty severity equation with interaction terms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
LTO	0.154 (0.20)	0.023 (0.03)	0.575 (0.86)	-0.475 (-0.61)	-0.591 (-0.79)	-0.102 (-0.14)	-0.002 (-0.00)	-0.022 (-0.02)	0.211 (0.29)
LGdpca	1.242* (3.72)	1.229* (3.71)	1.230* (3.82)	1.149* (3.43)	1.232* (3.78)	1.196* (3.54)	1.215* (3.53)	1.226* (3.66)	1.239* (3.76)
Leduc	-0.780 (-1.38)	-0.772 (-1.37)	-0.671 (-1.21)	-0.616 (-1.07)	-0.736 (-1.32)	-0.767 (-1.36)	-0.737 (-1.23)	-0.812 (-1.23)	-0.795 (-1.40)
LDCPS	-1.275* (-3.31)	-1.263* (-3.27)	-1.179* (-3.12)	-1.139* (-2.87)	-1.341* (-3.50)	-1.275* (-3.33)	-1.267* (-3.31)	-1.254 (-3.12)	-1.277* (-3.33)
LInfl	0.290* (1.79)	0.295* (1.82)	-0.221 (1.36)	0.280* (1.75)	0.295* (1.85)	0.312* (1.87)	0.296* (1.82)	0.287* (1.71)	0.291* (1.80)
LUnempl	-1.052 (-1.58)	-1.032 (-1.48)	-1.111 (-1.18)	-1.068 (-0.90)	-1.308 (-1.62)	-1.047 (-1.60)	-1.101 (-0.67)	-1.066 (-1.38)	-1.051 (-1.16)
LTarate	0.174 (0.68)	0.161 (0.63)	0.171 (0.69)	0.102 (0.40)	0.114 (0.45)	0.118 (0.44)	0.143 (0.50)	0.158 (0.60)	0.333 (0.60)
Inst*TO	-0.00003 (-0.17)								
CC*TO		0.00002 (0.14)							
GE*TO			-0.0003* (-1.69)						
PV*TO				0.00018 (1.13)					
RQ*TO					0.0002 (1.19)				
RL*TO						0.0001 (0.49)			
VA*TO							0.00005 (0.18)		
TO*educ								0.000026 (0.12)	

TO*Tarate									-0.00015 (-0.34)
Constant	0.645 (0.17)	1.186 (0.34)	-1.682 (-0.49)	-2.632 (-0.77)	-0.595 (-0.18)	1.981 (0.53)	1.253 (0.36)	1.408 (0.29)	0.158 (0.04)
F. (Fe) Prob>F	18.10 (0.0000)	19.75 (0.0000)	17.42 (0.0000)	19.21 (0.0000)	19.70 (0.0000)	18.48 (0.0000)	17.77 (0.0000)	17.68 (0.0000)	17.38 (0.0000)
Corr(u_i,x_b) F-test	-0.1613* (4.89)	-0.1946* (4.89)	-0.0185* (5.50)	-0.3090* (5.15)	-0.1146* (5.18)	-0.2531* (4.94)	-0.2149* (4.89)	-0.1906* (4.89)	-0.1612* (4.91)
Obs	80	80	80	80	80	80	80	80	80
*Note: Values in brackets indicate student statistics; while *, ** and *** show significance level at 10, 5 and 1 percent.*									

Results in table 10 show the interaction effects of trade openness and institutional quality on poverty severity. Indeed, in Table 9, trade openness alone does not have a significant effect on poverty severity. However, the interaction between trade openness and quality of institutions in terms of government effectiveness (GE*TO) exerts a negative and significant influence on poverty severity at 10 percent level in COMESA countries. It indicates that openness would be good to alleviate poverty if governance in terms of government effectiveness improved. Among coefficients of control variables, Inflation coefficient exerts a positive significant effect on poverty severity at 10 percent. Financial development coefficient has a negative and significant effect on poverty severity at 10 percent. Similar to previous results in table 9, GDP per capita exerts a positive and significant effect on poverty severity at 1 percent.

5.2.3. Generalized Method of Moments (GMM) estimation Results

In addition to pooled OLS and fixed effects estimation, GMM estimates provide results of the overall effects of institutions, and trade openness on poverty severity in COMESA countries. To choose between difference- and system-GMM, we use a rule of thumb (Bond et al., 2001). In application of pooled OLS, we initially use estimations of the autoregressive model. Fixed effect model and GMM estimations are also deployed through similar autoregressive model.

The choice decision focuses on the autoregressive model parameter. Within the table (11) below, on openness equation (LTO (-1)), coefficient of one-step difference GMM **(0.745)** is neither closer to nor below the coefficient of Fixed effect model **(0.435)**, there is a benefit to use One-step Difference GMM since its coefficient is further closer to Pooled OLS coefficient **(0.788)**. While table 10 shows on poverty severity equation (LPs (-1)) that the autoregressive model parameter of one-step Difference GMM **(0.077)** is closer to or below the Fixed Effect' **(0.096)**, the one-step system-GMM estimator **(1.253)** is suggested to bring greater benefit since its coefficient is as well closer to Pooled OLS coefficient **(0.858)**.

Table 11. Deciding a choice between either Difference GMM or System GMM estimator

Autoregressive parameter model	Pooled OLS	Fixed Effects	One-Step Difference GMM	Two-Step Difference GMM	One-Step System GMM	Two-Step System GMM
LTO (-1) Coefficients	0.788***	0.435***	0.745***	0.537***	0.660***	0.591***
LPS (-1) Coefficients	0.858***	0.096***	0.077***	-0.027***	1.253***	1.278***
*** *represents statistical significance level at 1 percent*						

Results from table 11 permit us to only present results from Difference GMM estimation in table 12, while results from System GMM estimation are suggested to be presented in table 13 & 14

Table12. Difference GMM Results on Trade Openness Equation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LTO (-1)	0.500** (2.94)	0.491*** (2.95)	0.521** (2.79)	0.434*** (3.74)	0.433** (2.68)	0.543** (2.75)	0.600*** (3.53)	0.504*** (2.99)
LPS	0.0078 (0.25)	0.017 (0.56)	0.020 (0.69)	-0.004 (-0.14)	0.021 (0.67)	0.024 (0.77)	0.026 (1.16)	-0.028 (-0.31)
LGdpca	-0.525*** (-7.73)	-0.469*** (-6.48)	-0.514*** (-6.57)	-0.491*** (-5.73)	-0.454*** (-5.01)	-0.514*** (-6.76)	-0.4.88*** (-7.58)	-0.507*** (-6.61)
Leduc	0.126 (0.90)	0.203 (1.23)	0.132 (0.86)	0.149 (1.09)	0.142 (0.87)	0.173 (1.21)	0.357** (2.69)	0.116 (0.79)
LDCPS	0.120 (1.33)	0.200** (2.28)	0.141* (1.68)	0.127* (1.69)	0.202** (2.43)	0.158* (1.94)	0.144* (1.90)	0.119 (1.23)
LInfl	-0.023 (-0.57)	-0.005 (-0.14)	-0.024 (-0.61)	-0.012 (-0.36)	-0.0009 (-0.02)	-0.028 (-0.65)	-0.017 (-0.43)	-0.022 (-0.56)
LUnempl	-0.113 (-0.56)	0.005 (0.03)	-0.024 (-0.15)	-0.053 (-0.30)	-0.010 (-0.06)	-0.058 (-0.31)	-0.126 (-0.71)	-0.044 (-0.84)
LTarate	-0.054 (-0.52)	-0.076 (-0.71)	-0.047 (-0.41)	-0.053 (-0.60)	-0.043 (-1.39)	-0.097 (-0.65)	-0.089 (-0.95)	-0.054 (-0.55)
Inst	0.013** (1.90)							0.0093* (1.76)
CC		0.002 (0.59)						
GE			0.007** (2.13)					
PV				0.009*** (3.16)				
RQ					0.005* (1.82)			
RL						0.007** (2.18)		
VA							0.018*** (3.81)	
Linst*Ps								0.010 (0.32)
Obs	48	48	48	48	48	48	48	48
Chi2 Prob>chi	98.15 (0.000)	74.25 (0.000)	85.72 (0.000)	111.18 (0.000)	79.25 (0.000)	86.48 (0.000)	114.46 (0.000)	74.49 (0.000)
Arellano Bond test for AR(1)	0.030	0.050	0.084	0.050	0.070	0.033	0.002	0.043
Arellano Bond test for AR(2)	0.768	0.633	0.520	0.669	0.608	0.854	0.677	0.753
Sargan test	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087

*Values in brackets for the coefficients stand for asymptotic standards errors; Values for diagnostics tests are P-values; *, **, *** denote statistical significance level at 10, 5 and 1 percent level on one-step difference GMM estimate*

Estimation results from Table 12 show that the validity of instruments is tested by Sargan test for over-identification restrictions. The assumption indicates that Sargan test F-stat probability is ≥ 0.05. Such asymptotic properties help us confirm the validity of instruments in the model. The difference GMM estimation results show that except for control of corruption (CC), all the other indicators of institutional quality (regulatory quality, rule of law, government effectiveness, and political stability and absence of violence) have a significant positive effect on trade openness at 1, 5 and 10 percent level in COMESA countries. The estimated coefficient of the lagged dependent variable is positive and statistically significant for all cases. It implies that former degree of openness can intuitively explain current degree of openness in COMESA countries. However, the interaction effect of overall institution and poverty severity is not statistically significant in explaining trade openness.

Among other set independent variables, GDP per capita has a negative significant effect on trade openness at 1 percent. This relationship is also not expected in theoretical bases. Yet, Osei, Sare and Ibrahim (2019) have found similar results in their evidence of determinants of openness to trade in low and lower-middle-income countries. Financial development and education exert a significant positive effect on openness to trade. Openness is here explained by higher level of financial development and of education.

Table13. System-GMM results on Poverty Severity equation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LPS (-1)	0.655***	0.637***	0.689***	0.609***	0.694***	0.727***	0.586***	0.500***
	(6.92)	(5.90)	(6.94)	(6.74)	(6.37)	(8.43)	(7.27)	(4.95)
LTO	0.742*	0.883**	0.803*	0.469	0.836**	0.972**	0.435	0.542
	(1.82)	(2.34)	(1.92)	(1.12)	(2.07)	(2.36)	(1.07)	(1.44)
LGdpca	-0.174	-0.599*	-0.160	-0.245	-0.210	-0.234	-0.649*	0.104
	(-0.53)	(-1.75)	(-0.47)	(-0.70)	(-0.68)	(-0.60)	(-1.75)	(0.31)
Leduc	-0.465	-0.027	-0.408	0.049	-0.570	-0.657	-0.535	-0.273
	(-0.99)	(-0.06)	(-0.89)	(0.10)	(-1.12)	(-1.14)	(-0.91)	(-0.64)
LDCPS	-0.863**	-0.858**	-0.653*	-0.825***	-0.707*	-0.577*	-0.785***	-1.226***
	(-2.55)	(-2.57)	(-1.80)	(-2.70)	(-1.92)	(-1.66)	(-3.07)	(-3.81)
LInfl	0.262	0.358**	0.287	0.251	0.320	0.361*	0.328*	0.015
	(1.35)	(2.00)	(1.43)	(1.36)	(0.153)	(1.80)	(1.87)	(0.08)
LUnemp	0.175	0.550*	0.137	-0.069	0.247	0.262	0.422	0.022
	(0.59)	(1.77)	(0.41)	(-0.26)	(0.84)	(0.81)	(1.50)	(0.08)
LTarate	1.012***	0.898***	0.706**	0.896***	0.927***	0.791***	0.946***	0.843***
	(3.36)	(3.95)	(2.45)	(3.41)	(2.84)	(2.64)	(3.37)	(2.97)
Institut	0.022							0.091***
	(1.63)							(3.54)

CC		0.027** (2.30)						
GE			0.0057 (0.43)					
PV				0.012 (1.52)				
RQ					0.017 (1.19)			
RL						0.010 (0.95)		
VA							0.016* (1.86)	
Inst*educ								-0.0008*** (-2.79)
Obs	64	64	64	64	64	64	64	64
Chi-square Prob>chi2	435.30 (0.000)	470.32 (0.000)	434.63 (0.000)	487.95 (0.000)	416.76 (0.000)	445.15 (0.000)	494.00 (0.000)	541.66 (0.000)
Arellano Bond test for AR(1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arellano Bond test for AR(2)	0.196	0.391	0.272	0.269	0.485	0.403	0.374	0.685
Sargan test	0.027	0.337	0.141	0.029	0.206	0.307	0.007	0.231
*Values in brackets for the coefficients stand for asymptotic standards errors; Values for diagnostics tests are P-values; *, **, *** denote statistical significance level at 10, 5 and 1 percent level on one-step system-GMM estimate*								

System-GMM estimation results for the poverty severity equation are presented in Table 13. Sargan test shows that the null hypothesis that over-identification restrictions are valid cannot be rejected, which indicates that the instruments used are valid except for equation with VA variable (panel7). Arellano-Bond test for serial autocorrelation shows that the null hypothesis of no second-order autocorrelation cannot be rejected.

Both Sargan and Hansen tests have similar properties, yet we randomly choose Sargan test in order to verify the above assumptions. Since we fail to reject the specified null hypothesis, instruments for all the model are valid and there is no second-serial correlation.

Concerning independent variables, the estimation results indicate that trade openness and institutions quality in terms of control of corruption, exert a positive and significant effect on poverty severity at 5 and 10 percent for COMESA countries. Similar results were found in studies of Agénor (2004), Liang (2006) and Lee (2014).That sign (positive) was not expected but theoretical assumptions and studies of Perera and Lee (2013) and Hafiz et al. (2016) denote that Developed countries have better institutions, while developing countries are characterised by bad institutions.

The effects of institutions (corruption control and democratic accountability) on poverty get now as ambiguous as the effect of openness on poverty. Poverty reduction effects hinge on the degree of openness of a country's economy. The interaction term of overall institution and education has a negative and statistical significant effect on poverty severity at 1 percent level. The lagged dependent variable has a significant positive effect on poverty severity at 1 percent level. This shows that past rate of poverty helps to explain current poverty rates. GDP per capita has a significant negative influence on poverty severity, similar to the above (see table 9). Financial development (DSPS) is negatively and significantly associated with poverty severity at 1, 5 and 10 percent.

In addition, tariffs rate, unemployment rate and inflation exert a significant positive effect on poverty severity at 1, 5 and 10 percent level. Yet, an increase in tariffs rate causes an increase in poverty severity. Similar result is found by Mitra (2016) & Le Goff and Singh (2013). This corroborates relationships between changes in import tariffs and changes in the prices of tradable goods into calculations of the adjustment in income needed for poor people affected by these economic changes.

As poor countries live mostly on imported goods and services, when the tariffs rate get higher, price changes on imported products are raised. Prices pass through conditions of local market especially: transport infrastructure, distance from the nearest port, distributors, etc.

Table 14. System-GMM estimation results on Pov. Sev equation with interaction terms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
LPS (-1)	0.630*** (5.09)	0.637*** (4.42)	0.542*** (4.44)	0.677*** (5.45)	0.559*** (4.16)	0.814*** (7.98)	0.812*** (7.32)	0.536*** (4.94)	0.443*** (2.92)
LTO	1.052* (1.86)	0.966* (1.73)	1.116** (2.17)	0.711 (1.21)	1.288** (2.35)	0.643 (1.17)	0.208 (0.37)	1.315*** (3.08)	1.831*** (3.05)
LGdpca	1.140*** (2.78)	0.936** (2.32)	1.144*** (3.14)	0.951** (2.33)	1.007*** (2.85)	0.852* (1.95)	0.602 (1.50)	-0.446 (-1.33)	0.465* (1.82)
Leduc	-1.988** (-2.13)	-1.671* (-1.81)	-1.897** (-2.42)	-1.536 (-1.63)	-1.760** (-2.16)	-1.660* (-1.66)	-0.985 (-1.01)	-0.55 (-0.12)	-0.950 (-1.58)
LDCPS	-0.760* (-1.93)	-0.657 (-1.55)	-0.724* (-1.87)	-0.770** (-1.99)	-0.837** (-2.12)	-0.260 (-0.73)	-0.420 (-1.25)	-0.711** (-2.25)	-0.970*** (-2.79)
LInfl	0.017 (0.08)	0.083 (0.36)	0.041 (0.19)	-0.006 (-0.03)	0.058 (0.27)	0.209 (0.91)	0.238 (1.19)	0.292 (1.46)	0.292* (1.68)
LUnempl	-0.773 (-1.53)	-0.436 (-0.80)	-0.818 (-1.59)	-0.653 (-1.22)	-0.643 (-1.40)	-0.531 (-1.62)	-0.286 (-1.22)	0.448 (1.57)	0.422 (1.15)
LTarate	0.241 (0.81)	0.133 (0.46)	0.047 (0.17)	0.379 (1.25)	-0.074 (-0.26)	0.181 (0.54)	0.313 (0.88)	0.371 (1.56)	1.402*** (3.19)
Inst*TO	-2.10^{-4} ** (-2.34)								
CC*TO		-3.10^{-4} ** (-2.25)							
GE*TO			-4.10^{-4} *** (-3.53)						
PV*TO				-10^{-4} (-1.27)					
RQ*TO					-4.10^{-4} *** (-3.43)				
RL*TO						-10^{-4} (-1.62)			
VA*TO							-6.10^{-5} (-0.55)		

TO*educ								-0.00019* (-2.03)	
To*Tarate									-0.00089* (-1.68)
Obs	64	64	64	64	64	64	64	64	64
Chi-square Prob>chi2	271.06 (0.000)	258.19 (0.000)	295.85 (0.000)	266.49 (0.000)	299.51 (0.000)	275.43 (0.000)	262.73 (0.000)	557.73 (0.000)	479.80 (0.000)
Arellano Bond test for AR(1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Arellano Bond test for AR(2)	0.053	0.056	0.075	0.029	0.052	0.024	0.012	0.389	0.666
Sargan test	0.102	0.120	0.160	0.038	0.096	0.139	0.037	0.227	0.296
*Values in brackets for the coefficients stand for asymptotic standards errors; Values for diagnostics tests are P-values; *, **, *** denote statistical significance level at 10, 5 and 1 percent level on one-step system-GMM estimate*									

Table 14 presents the system-GMM estimation results for the interaction effect between trade openness and institutional quality on poverty severity in COMESA countries. The trade interaction terms intend to assess whether quality of institutions influence trade openness to affect poverty severity in COMESA countries. Sargan test shows that the instruments used are valid while Arellano-Bond test indicates that there is no second-order serial autocorrelation of errors. The results show that a number of interaction terms (Inst*TO and CC*TO; GE*TO and RQ*TO; TO*educ and TO*Tarate) exert a significant negative influence on the poverty severity as expected. Openness to trade could help alleviate poverty severity if institutional quality in terms of corruption control, government effectiveness, regulation quality improved, and if higher education level and lowered tariffs rate were in COMESA countries (see for example, Le Goff and Singh, 2013). The coefficient of the lagged explained variable is positive and statistically significant at 1 percent level.

However, Openness to trade, tariffs rate, inflation and GDP per capita have also a significant positive effect on poverty severity. Education and financial development (DCPS) are found to exert a negative influence on the poverty severity at 1, 5 and 10 percent.

5.3. Analysis and Discussion of Results

A number of empirical studies present ambiguous evidence on the relationship between Openness to trade and poverty in low and lower-middle-income countries (See for example, Ezzat, 2018; Kelbore, 2015; Bayar and Sezgin, 2017; Lee, 2014; Le Goff and Singh, 2013; Onakoya, Johnson and Ogundajo, 2019; Warrad and Muhtaseb, 2017; Lestari, 2017). This study aimed at assessing the relationships among institutional quality, trade openness and poverty severity in COMESA countries. The empirical evidence from all estimation approaches used (pooled OLS, fixed effect (within) and difference GMM) shows that mostly quality of institutions improves trade openness and that some of institutional quality indicators reduce poverty severity in COMESA countries.

Firstly, results from pooled OLS estimation have shown that institutional quality in all its dimensions enhances trade openness in COMESA countries. This implies that greater institutional quality is associated with more open economies. On contrary, the results have shown that the interaction effect of institution quality and poverty severity on openness to trade is negative. Which implies that the positive effect of institutional quality on openness is compromised by higher level of poverty severity. This confirms the view that the positive relationship of institutional quality and trade openness depends on the level of development of countries (Anthonsen et al. 2012).

The level of development determines the availability of resources to build and foster strong institutions and creates broader demands for transparent static and dynamic institutional efficiency (Alonso and Garcimartín, 2009). Similar results are found by use of fixed effects (see table 8), where some dimensions of institutional quality (government stability, Regulatory quality and democratic accountability) are found to exert a positive significant effect on trade openness.

Results from dynamic panel data confirmed the same positive effect of institutional quality on trade openness (see table 12). As Niyongabo (2004) points out, strong quality of institutions complements the effect of open policies. In addition, the results have shown that education level and financial development exert a positive influence on trade openness, which would imply that higher human capital (education level) and high financial development are associated with great trade performance.

Secondly on the effect of trade openness on poverty severity, results give ambiguous evidence depending on the estimation approach used. Results from Pooled OLS indicated that poverty severity increases with openness to trade in COMESA countries (see table 6). However, results from fixed effects model showed that trade openness does not significantly affect poverty severity. Like pooled OLS, results from dynamic panel data have shown also a positive significant influence of openness to trade on poverty severity. This is in line with the findings of Kpodar and Singh (2011) and Onakoya and Ogundajo (2019).

On the effect of control variables included in the model, estimation results have shown that the level of income (GDP per capita) and financial development (domestic credit to private sector) have a significant negative effect of poverty severity. Such results imply that poverty severity reduces with the higher level of income and higher financial development. Since coefficients associating poverty severity and unemployment, tariffs rate and inflation are positive, the effects on poverty severity grow with the increasing unemployment, tariffs rate and inflation in COMESA countries. Yet theoretically, less unemployment rate indicates poverty alleviation in COMESA countries in order to achieve realistic macroeconomic stability and labor market mobility. Lower tariffs rate on all traded goods in a major part of developing countries, are primarily agricultural and labour-intensive manufactural and great trade barriers. So removing those barriers leads to boosting economic growth and reduction of poverty, whilst more inflation rate in such areas harms the poor. With the controversies surrounding the trade-poverty relationship, interaction terms were introduced to decide on whether complementary or substitute policies to be implemented in COMESA countries.

Results from pooled OLS model and dynamic panel data (table 7 and table 14), have shown that interaction terms considered, between institutional quality and openness to trade, and between openness to trade and education or tariffs rate (Inst*TO, GE*TO, PV*TO, RQ*TO, RL*TO, VA*TO, TO*educ and TO*Tarate) have a significant negative effects on poverty severity. The gains of trade openness in terms of poverty reduction are boosted by higher institutional quality in terms of overall institution, bureaucratic quality, political stability and absence of violence, regulatory quality, rule of law, and voice and accountability.

Higher level of human capital development (education) and lower level of tariffs rate increase also the poverty reduction effects of trade openness. Strong institutions in terms of control of corruption, higher government effectiveness, political stability, regulation quality, rule of law, as well as increased education level and lowered tariffs rate can enhance the poverty reduction effects of trade openness in COMESA Countries.

The effects of openness on poverty severity is conditional to a set of good domestic institutions, higher education level and lower tariffs rate in COMESA countries.

Fixed effect (within) estimation results indicate that only the interaction between government effectiveness and trade openness (GE*TO) has a negative significant effect on poverty severity. Since the effect is negative, this implies that the poverty reduction effects of trade openness are enhanced with greater government effectiveness. Since income per capita (Gdpca) coefficient exerts a statistical and positive significant effect on poverty severity, the implication is that reallocation of benefits from boosting economic growth by the governments does not reach to actual poor in the community. People are therefore extremely poor (see Ezzat, 2018). As a coefficient of education level is also statistical and negative significant effect on poverty, countries with high level of education exhibit low level of poverty severity.

Lastly, as far as the effect of institutional quality on poverty severity is concerned in COMESA countries, pooled OLS estimation indicated that better institutional quality in terms of government effectiveness (GE) and democratic accountability (VA) is associated with a reduction in poverty severity in COMESA region. This supports that good institutions help reduce poverty and corroborates what other studies have found (see Le Goff and Singh, 2014; Tebaldi and Mohan, 2010; Perera and Lee, 2013). An interaction term of institutions and education (Inst*educ) was added in the equation and the results showed that its effect is also negative. It implies that Institutional quality with increased level of education leads to poverty reduction.

On contrary, the estimation for fixed effect (within) regression gives results that show positively statistical and significant effect of corruption control on poverty severity in COMESA countries (table 9). Similar results are yet found in dynamic panel data for control of corruption (table 13). These results are ambiguous but can be explained to countries with weak institutions as suggested by Perera and Lee (2013) and Hafiz et al. (2016) in their study. The latter indicates positive relationship between corruption and poverty, which may imply the worsening levels of poverty severity in COMESA countries. The lagged dependent variable coefficient is else shown as statistical and positive significant i.e. past poverty rates explain current rates of poverty in COMESA countries. To reverse such adverse relation of institution-poverty, empirical literature calls often for interaction terms to be introduced in order to decide which good policy between complementary and substitute policies (Asonga et al. 2014 and Quang Doan, 2019).

5.4. Conclusion

In sum, the aim of this study was to examine the effects of institutions on trade openness, effects of institutions on poverty severity, and effects of openness to trade on poverty severity for COMESA countries. Overall, the results in all three estimation approaches from this study have shown that good institutions increase trade performance and reduce, except for control of corruption, the level of poverty severity in COMESA countries. Good institutions in terms of corruption control, bureaucratic quality, government stability, regulation quality, rule of law and democratic accountability exert a positive effect on trade openness and a negative effect on poverty severity in COMESA countries. However, while the effects of trade openness on poverty severity was found to be ambiguous, the interaction term of openness to trade and institutions is found to be statistically significant and negative. Trade openness contributes therefore to poverty alleviation in the region. Yet, the effects of institutions on openness has been found compromised by higher level of poverty severity. This relationship institution-trade is conditional to the level of development of COMESA countries. In addition, effects of institution on poverty severity was found encouraging in a way that Pooled OLS approach has shown negative relationship between bureaucratic quality, democratic accountability and poverty severity. Which implies that good institutions help reduce poverty severity in the region.

Yet, Fixed effect or System GMM estimation approach provided positive effects of corruption control on poverty severity corroborating that bad institutions worsen poverty severity levels in COMESA countries (Hafiz et al., 2016). Despite these unusual effects, further findings reveal that such an adverse relationship could be reversed by interaction of institution and education which was negative and statistical significant, implying that institutions with higher education level help reduce poverty severity in COMESA countries. The study makes imperative to introduce supportive complementary policies and reforms in order to apply poverty alleviation effects in the region. In the end, as pooled OLS results are biased because of failure to address heterogeneity, fixed effects and dynamic GMM estimation approaches have provided robust results in examining relationships among Institutions, openness to trade and poverty severity in COMESA countries.

CHAPTER SIX. GENERAL CONCLUSIONS AND POLICY IMPLICATIONS

6.1 Conclusion

While trade openness and institutions quality are theoretically and empirically considered as efficient instruments to enhance economic development, their effects on poverty severity seem to be ambiguous and controversial. Well, potential benefits issued from freer trade are likely to bypass the poor, while unexpected effects from institutions, for instance, in terms of controlling corruption overwhelm expectations of the poor. The study attempts, in COMESA countries, on a basis of advanced econometric tools especially fixed effect model, difference GMM and System GMM estimators to reach more robust results. Strong institutions in terms of mostly overall institutions, political stability and absence of violence, regulation quality, rule of law, voice and accountability have a positive influence on trade openness. Yet, more openness and institutional quality do not seem to be associated with lower poverty severity in COMESA countries. Accordingly, this observation seems to hide more important pattern of reforms complementarities. More openness to trade results in reduction of poverty severity in countries characterised by stronger institutions, higher education levels and lower tariffs rate on tradable products. In addition, improving institutional quality helps reduce poverty severity in countries having increased education levels. These results are consistent with recent literature arguing that, in low and lower-middle-income countries, benefits of freer trade on poverty alleviation are not automatic, neither does governance. Therefore, a set of accompanying policies to reduce poverty severity is needed to elevate the living standards of COMESA citizens by encouraging stronger governance, lower tariffs rate and higher education levels

6.2 Policy Implications and Recommendations

While analysing whether institutions quality can influence how openness to trade affects poverty severity in COMESA countries, the present study suggests countries of the region to implement good domestic institutions. The latter help achieve trade performance and poverty alleviation effects in the region. Otherwise, fighting corruption requires to understand its nature in order to set best anti-corruption strategies. Whether corruption is degenerative or developmental, it will ultimately lead to lower economic growth with the beneficial effects of developmental corruption mostly compensated by its negative effects. Although bureaucratic quality, government stability, regulation quality, rule of law in contracts enforceability and democratic accountability are not all significant in the study, COMESA countries need to improve them in a way to control freer trade effects and counteract poverty severity effects.

The adverse relationships among institutions, trade openness and poverty severity in COMESA countries uncover important pattern that recommends to adopt complementary policies and reforms in the region. Managing openness and improving institutional environment, educational and tariffs reforms should robustly complement to reduce poverty severity in COMESA countries. Since people in poverty severity seem sometimes to be forsaken, and that the pro-poor policy seems to divert, great focus of complement economic development policies should be imperative on ‘‘reducing poverty severity’’ in COMESA countries in order to effectively manage redistributions reforms till to help poorer move out of that category of poverty.

6.3 Limitations and Suggestions for Further Studies

Because of data availability challenge on a long period of time for the main variables of the study used, we were firstly constrained to look at short-term effects only. If the number of observations had been large, the study should have run cointegration tests to capture long-term effects of institutions, and trade openness on poverty severity. If data become available on a long period of time, the relationships among the openness to trade, institutions and poverty severity can be revisited.

Secondly, the study did not distinguish between rural or urban areas, in considering poverty severity to determine, what areas are mostly harmed by potential ineffective institutions and trade openness policies. If data can be available, research can be done in that angle.

Thirdly, the study should be extended to determine the certain level of globalisation at which, openness provides good effects to poor people in the region. Future research is suggested to revisit the relationship among institutions, trade openness and Poverty severity by completing analysis with a threshold regression in order to show the optimal level of openness of COMESA economies.

The study has finally captured the quality of institutions only with data from Kauffmann indicators providing formal institutions because of missing data for some countries. Therefore, if data from International Country Risk Guide for Political Services Risk spelled as informal institutions can be available, future research can investigate the results’ robustness along with data spelled informal institutions and explore the relationship among institutions, trade openness and poverty severity in COMESA area in order to bring a strong value added.

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APPENDICES

Stata Do-file used in empirical evidence

```
version 13.1
clear
capture log close
log using Egidek.log, replace
set more off
use "C:\Users\Egide\Documents\Master-Thesis.dta", clear
xtset ID TIME

/*Pooled OLS along with interaction terms*/
reg LTO LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst, robust
reg LTO LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Linst*Ps, robust
reg LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst, robust
reg LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst*TO, robust
reg LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE TO*Educ, robust
reg LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE To*Tarate, robust
reg LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst*educ, robust

/*Hausman test between Fixed effect and Random effect*/
/*with LTO dependent variable*/
quietly xtreg LTO LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst, fe
estimates store fix
quietly xtreg LTO LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst, re
estimates store re
hausman re fix
```

/*with LPS dependent variable*/

quietly xtreg LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst, fe

estimates store fix

quietly xtreg LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst, re

estimates store re

hausman re fix

/*Fixed effects (within) regression with AR(1) disturbances (& interaction terms)*/

Xtregar LTO LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst, fe rhotype(dw) twostep

Xtregar LTO LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Linst*Ps, fe rhotype(dw) twostep

xtregar LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst, fe rhotype(dw) twostep

xtregar LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst*educ, fe rhotype(dw) twostep

xtreg LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst*TO,fe

xtreg LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE TO*Educ, fe

xtreg LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE To*Tarate, fe

/*Dynamic Panel data, GMM estimates*/

quietly tabulate TIME, generate (yd)

/*How to decide on the comparison between Difference GMM and System GMM estimates*/

/*On the LTO variable*/

reg LTO L.LTO LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst, robust

xtreg LTO L.LTO LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst, vce(robust) fe

xtabond2 LTO L.LTO LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*, gmm (L.LTO, collapse) iv(LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*) noleveleq nodiffsargan robust orthogonal small

xtabond2 LTO L.LTO LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*, gmm (L.LTO, collapse) iv(LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*) noleveleq nodiffsargan twostep robust orthogonal small

xtabond2 LTO L.LTO LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*, gmm (L.LTO, collapse) iv(LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*) nodiffsargan robust orthogonal small

xtabond2 LTO L.LTO LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*, gmm (L.LTO, collapse) iv(LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*) nodiffsargan twostep robust orthogonal small

/*On the LPS variable*/

reg LPS L.LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst, robust

xtreg LPS L.LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst, vce(robust) fe

xtabond2 LPS L.LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*, gmm (L.LPS, collapse) iv(LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*) noleveleq nodiffsargan robust orthogonal small

xtabond2 LPS L.LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*, gmm (L.LPS, collapse) iv(LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*) noleveleq nodiffsargan twostep robust orthogonal small

xtabond2 LPS L.LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*, gmm (L.LPS, collapse) iv(LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*) nodiffsargan robust orthogonal small

xtabond2 LPS L.LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*, gmm (L.LPS, collapse) iv(LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*) nodiffsargan twostep robust orthogonal small

/*Dynamic Panel on one-step Difference GMM estimate with interaction term*/

xtabond2 LTO L.LTO LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*, noconstant gmm(L.LTO) iv(LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*) noleveleq nodiffsargan

xtabond2 LTO L.LTO LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Linst*Ps yd*, gmm(L.LTO, collapse) iv(LPS LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Linst*Ps yd*) noleveleq nodiffsargan robust small

/*Dynamic Panel data on one-step System GMM estimate with interaction terms*/

xtabond2 LPS L.LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst yd*, noconstant gmm (L.LPS (LTO Inst LDCPS LGDPCAPITA LINFL LUNEMPL LTARATE yd*),collapse) nodiffsargan orthogonal

xtabond2 LPS L.LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst*TO , noconstant gmm (L.LPS (LTO Inst*TO LDCPS LGDPCAPITA LINFL LUNEMPL LTARATE),collapse) nodiffsargan orthogonal

xtabond2 LPS L.LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE TO*Educ , noconstant gmm (L.LPS (LTO TO*Educ LDCPS LGDPCAPITA LINFL LUNEMPL LTARATE),collapse) nodiffsargan orthogonal

xtabond2 LPS L.LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE To*Tarate , noconstant gmm (L.LPS (LTO To*Tarate LDCPS LGDPCAPITA LINFL LUNEMPL LTARATE),collapse) nodiffsargan orthogonal

xtabond2 LPS L.LPS LTO LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE Inst*educ yd*, noconstant gmm (L.LPS (LTO Inst*educ LDCPS LEDUC LGDPCAPITA LINFL LUNEMPL LTARATE yd*),collapse) nodiffsargan orthogonal