FOREIGN AID MIX AND MANUFACTURED EXPORTS PERFORMANCE IN SUB-SAHARAN AFRICA

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DEDICATION

To

My daughters, Tadala and Vanessa, and son, Donwell

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Abstract

This study aims at finding out effects of foreign aid mix on manufactured exports performance in Sub-Saharan Africa. This is important as the region has lagged behind on promotion of manufactured exports thereby relying on primary exports. For a country's exports to be competitive internationally, and hence improve economically, it has to manufacture products part of which can be exported. Sub-Saharan African countries have relied on primary exports which fetch low prices at international market thereby bringing in low foreign exchange. This is why African countries have relied on foreign aid since they cannot generate enough foreign exchange which is needed to import goods and services they cannot produce domestically. African countries have to boost manufactured exports which fetch high prices at international market hence they bring in the much-needed foreign exchange. Reliance on foreign aid may not be sustainable as donors have their own priorities and may not be able to give aid indefinitely. African countries have to find sustainable ways of generating foreign exchange one of which is to boost manufactured exports. As boosting manufactured exports in these countries requires resources, foreign aid can be used to improve manufacturing and manufactured exports. In this case, the countries can later stop relying on foreign aid.

This study first examines the impact of foreign aid on terms of trade. Holding price of imports constant, improvement in terms of trade means that either prices of primary exports have increased or there has been improvement in manufactured exports which are known to fetch high prices at international market. The study then examines the impact of foreign aid on manufactured exports. Most of the studies have dwelt on the impact of foreign aid on exports. This study has gone further to assess the impact of foreign aid on one of the components of exports namely manufactured exports. Thereafter, the study examines the impact of disaggregated foreign aid on manufactured exports. While some studies have criticised foreign aid as having little or no impact on recipient country, it is necessary to disaggregate the aid by sector since aid to some sectors may have positive impact on those sectors, and other sectors of the economy. The study has also examined asymmetric effects of various types of foreign aid, that is, whether or not, positive and negative changes of each type of aid have the same impact on manufactured exports. The study uses both panel and pooled data for 30 Sub-Saharan African countries for the period from 1970 to 2019. Models used include Autoregressive Distributed Lag (ARDL), Non-linear Autoregressive Distributed Lag (NARDL), Generalised Least Squares (GLS), among other models.

The study has found that foreign aid has a negative and statistically significant impact on terms of trade. This means that foreign aid does not improve export prices relative to those of imports in the Sub-Saharan African countries. According to Prebisch-Singer Dependency Theory, price of primary commodities declines relative to the price of manufactured goods, causing terms of trade of primary product-based economies to deteriorate. This study has shown that foreign aid deteriorates terms of trade thereby worsening the situation of African countries which mainly export primary commodities and import manufactured products. This calls for African economies to diversify their export base to include manufactured exports, otherwise, foreign aid, which is one of the main sources of resources for African economies will keep on worsening the countries' terms of trade.

Further, the study finds that foreign aid has negative impact on manufactured exports. Like other studies that have disputed the impact of foreign aid on economic growth, this study has also found that foreign aid does not have a positive impact on manufactured exports, one of the most important factors influencing economic growth in any country. This calls for policy reform on building manufacturing capabilities in the Sub-Saharan African countries. Effectiveness of foreign aid also depends on dynamics of a country as country specific results show varying effects of foreign aid on manufactured exports, with some countries experiencing positive impact and others negative impact. Donors should therefore be assessing whether in the prospective recipient country, foreign aid will have a positive impact on manufactured exports especially if their aim is to boost manufactured exports.

Though total aid has a negative and statistically insignificant impact on manufactured exports, disaggregating it shows that other types of aid such as grants, agricultural aid and health aid have positive and statistically significant impacts. Thus, criticising foreign aid is not proper as some of its components have positive impact on manufactured exports. Therefore, allocating foreign aid to sectors that can impact positively on manufactured exports will go a long way in boosting manufactured exports in these countries. In addition to assessing recipient countries, donors should assess sectors in each country to find out sectors which if funded can boost manufactured exports. Country-specific results show different impacts of different types of aid with some types having positive impact, and others negative impact on manufactured exports. This means that the effectiveness of different types of foreign aid depends on a country. The study has also shown that

there are no asymmetric effects of all types of aid meaning that there are no significant differences in impacts of positive or negative changes in the types of aid.

Fixed capital (proxy for infrastructure development), foreign direct investment, and openness are found to be positively related to manufactured exports and statistically significant regardless of model used, and whether data used is pooled or panel. This calls for other ways of improving manufactured exports in the region. Improving infrastructure (fixed capital), attracting foreign direct investment, and opening up Sub-Saharan African countries can go a long way in promoting manufactured exports in the region. The study also ran regressions after including private sector credit, and excluding Zimbabwe, a country that faced economic challenges during the study period especially towards the end of the study period to the extent that macroeconomic fundamentals were far from being normal. However, results are not much different from results without private sector credit, and inclusion of Zimbabwe.

Key words: manufactured exports; foreign aid; terms of trade; theory of comparative advantage; Heckscher-Ohlin model; big push theory; dual gap model; free trade; mercantilist (interventionist trade); import substitution; export promotion; industrial policies

JEL Codes: F11, F13, F14, F35, L60

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ACRONYMS

AfT	Aid for Trade
ARDL	Autoregressive Distributed Lag
COMESA	Common Market for Eastern and Southern Africa
CPI	Consumer Price Index
DOLS	Dynamic Ordinary Least Squares
EAC	East African Community
ECOWAS	Economic Community of West African States
EU	European Union
FAO	Food and Agriculture Organisation
FDI	Foreign Direct Investment
FMOLS	Fully Modified Ordinary Least Squares
GDP	Gross Domestic Product
GLS	Generalised Least Squares
GMM	Generalised Method of Moments
GVC	Global Value Chain
H-O	Heckscher-Ohlin
IFAD	International Fund for Agricultural Development
IFS	International Financial Statistics
ILO	International Labour Organisation
IMF	International Monetary Fund
LDCs	Least Developed Countries

MENA	Middle East and North Africa
NARDL	Nonlinear Autoregressive Distributed Lag
OECD	Organisation of Economic Cooperation and Development
OLS	Ordinary Least Squares
R&D	Research and Development
SADC	Southern African Development Community
SICs	Semi-Industrialised Countries
SSA	Sub-Saharan Africa(n)
UK	United Kingdom
UN	United Nations
UNICEF	United Nations Children's Fund
UNHCR	United Nations High Commissioner for Refugees
USA	United States of America
WDI	World Development Indicator
WFP	World Food Programme
WHO	World Health Organisation
WTO	World Trade Organisation

Chapter 1

Introduction

1.1 Introduction

This study focuses on investigating relationship between foreign aid and manufactured exports in SSA. Foreign aid has been one of the major sources of financial resources for the region. However, the region has lagged behind in terms of economic development. One would therefore cite as a reason, allocation of the aid to sectors that could not contribute to economic development of the region. When one looks at how the region has faired on promoting manufactured exports, it becomes apparent that the region has not done well in increasing manufactured exports, instead, the region has concentrated on producing primary exports which have not brought the much-needed results on economic development.

Manufactured exports have been instrumental in fostering economic development in many countries, and it would not be wrong to say that if manufactured exports were promoted in the region, economic development would be enhanced. The fact that manufactured exports have been very low in the region means that the manufacturing sector has not been given support it deserves including financial support. Foreign aid would therefore have been a source of financing for the sector leading to improvement in manufacturing and manufactured exports but it seems the aid has been directed to other sectors.

This study therefore aims at finding the impact of foreign aid on manufactured exports. This will inform decision makers in the region to utilise aid in such a way that they promote manufacturing and manufactured exports especially if their strategy is to improve manufacturing and manufactured exports. However, various studies have found out that foreign aid does not have a positive impact on economic growth and other macroeconomic variables. Based on these findings, foreign aid may not be important in promotion of manufactured exports. It is therefore necessary to investigate impacts of various types of foreign aid on manufactured exports since just stopping at total foreign aid, it might be concluded that foreign aid is not important in promotion of manufactured exports when in actual fact, some types of aid have positive impact on manufactured exports. The study does not only assess the impact of foreign aid on manufactured exports, it also assesses impacts of various types of foreign aid on manufactured exports. Further, the study

examines asymmetric effects of positive changes and negative changes of types of foreign aid on manufactured exports. This will inform policy makers and indeed donors on the consequences of increasing or decreasing each type of foreign aid.

1.2 Background

This study examines effects of foreign aid mix on manufactured exports performance in SSA. The region has registered lower manufactured exports than in other regions due to poor human capital and reliance on exports of primary goods (Chipanda *et al.,* 2020; Mukwaya, 2019; Amakom, 2012). Exports as a whole, though crucial for bringing foreign exchange into a country, the type of exports also matters. History shows that excessive reliance on raw natural resources is never a prudent development strategy (Chipanda *et al.,* 2020; Raudino, 2016; Amakom, 2012). Prebisch-Singer Dependency Theory (Prebisch, 1950 and Singer, 1950) states that prices of primary commodities decline relative to prices of manufactured goods, causing terms of trade of primary-product-based economies to deteriorate. This creates a situation where producers of primary goods transfer value in form of low prices for raw materials to producers of manufactures. In addition, primary products face competition from heavily subsidised agricultural products and heavy import duties in developed countries (Chuku *et al.,* 2018; Raudino, 2016). Most SSA countries have been exporting primary products, but their economic conditions have not improved (Katoka & Dostal, 2022).

Figure 1: Trends in Manufactured Exports. Manufactured exports are presented as manufactured exports as a percentage of merchandise.
Source: World Development Indicators

In Figure 1 , manufactured exports have been less than 25 percent of goods exported over the past 50 years meaning that over 75 percent of exports has been primary exports while economic growth in the region has consistently been less than 10 percent (Figure 2). On the other hand, other countries including East Asian countries have been exporting manufactured products and they have advanced economically (Constantinescu *et al*., 2018); Soderbom & Teal, 2002). SSA countries therefore have to promote manufacturing and manufactured exports if their economies are to grow faster as manufactured exports remain one of the most powerful engines for economic growth. Manufactured exports have been increasing since early 1980s and reached peak in mid 1990s (Figure 1). Most of African countries transitioned from economies where government controls were extensive to more open market-oriented regimes, and substantial increase in manufactured exports during this period could be attributed to the liberalisation (Soderbom & Teal, 2002).

However, improvement in manufactured exports cannot be wholly attributed to trade liberalisation, there might also be long term effects of protectionism. As Jomo and Amim (2012) argue, African economies were gaining comparative advantage in labour intensive manufacturing in 1980s. After reaching a peak in mid 1990s, manufactured exports plateaued in 2000s and in some cases, they declined. This shows that liberalisation has not had substantial impact on manufactured exports in these countries. As Oqubay (2015) observes, the absence of import substitution policies and globalisation have resulted in decline of manufacturing in countries lacking comparative advantage.

Economic growth has also been following trend of manufactured exports (Figure 2) in the Sub-Saharan Africa, that is, when manufactured exports increased, economic growth also increased reaching a peak in mid 1990s. This study therefore aims at finding out if foreign aid improves manufactured exports in SSA. As foreign aid is one of the major sources of funding in this region, policy makers and donors can allocate more funding to manufacturing sector if foreign aid is found to have a positive impact on manufactured exports especially if their goal is to improve manufactured exports.

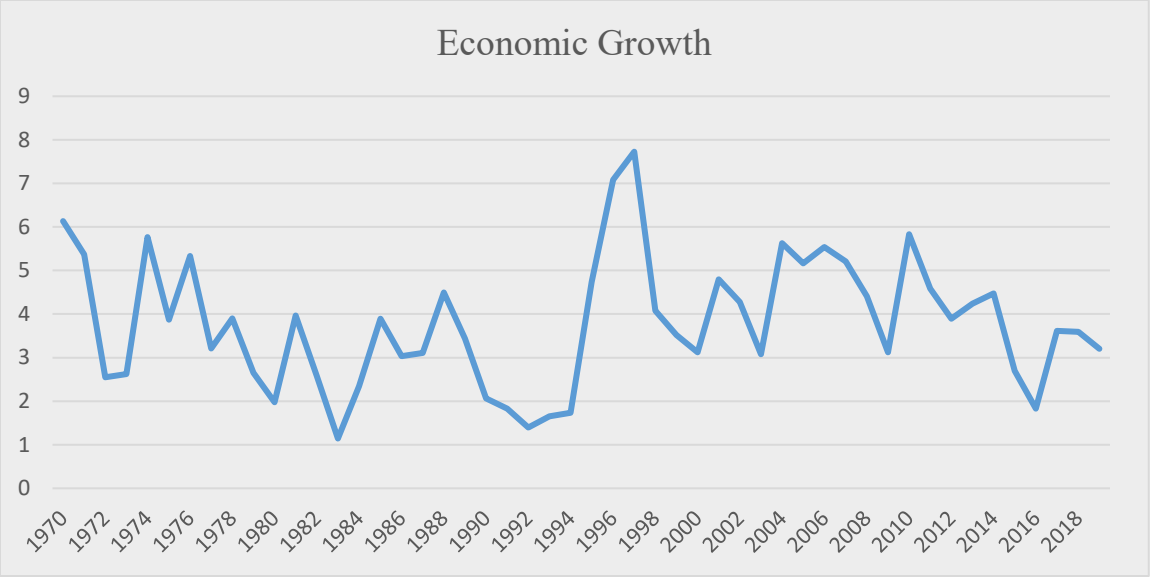

Figure 2: Trends in economic growth of Sub-Saharan African countries since 1970
Source: World Development Indicators

Figure 1 further shows that during the period from 1980 to 1995, manufactured exports were on the increasing trend and thereafter, they plateaued, and in some cases decreased. During the period from 1980 to 1995, SSA countries implemented industrial policies which included protectionism, that is, they protected their domestic industry. This is why manufactured exports were on the increasing trend. After 1995, most of the countries liberailised their economies thereby exposing their domestic industries to international competition. In light of liberalisation, these countries were supposed to make manufacturing industry resilient in order to withstand international competition.

Foreign aid has been crucial in providing funding to almost all countries in SSA countries (Ilorah & Ngwakwe, 2021). However, it is not clear whether the aid has fostered development of the countries. Figure 2 and Figure 3 show that foreign aid growth and economic growth are negatively related in SSA countries. For instance, in the mid 1980s, when foreign aid growth increased, economic growth slowed down, and tended to pick up when aid decreased. Similarly, in the 1990s, when total aid growth was on the decreasing trend, economic growth was increasing reaching peak of over 5 percent in mid 1990s. It is also evident that, between 2010 and 2020, increase in foreign aid growth tended to lead to decrease in economic growth while decrease in foreign aid growth tended to lead to increase in economic growth.

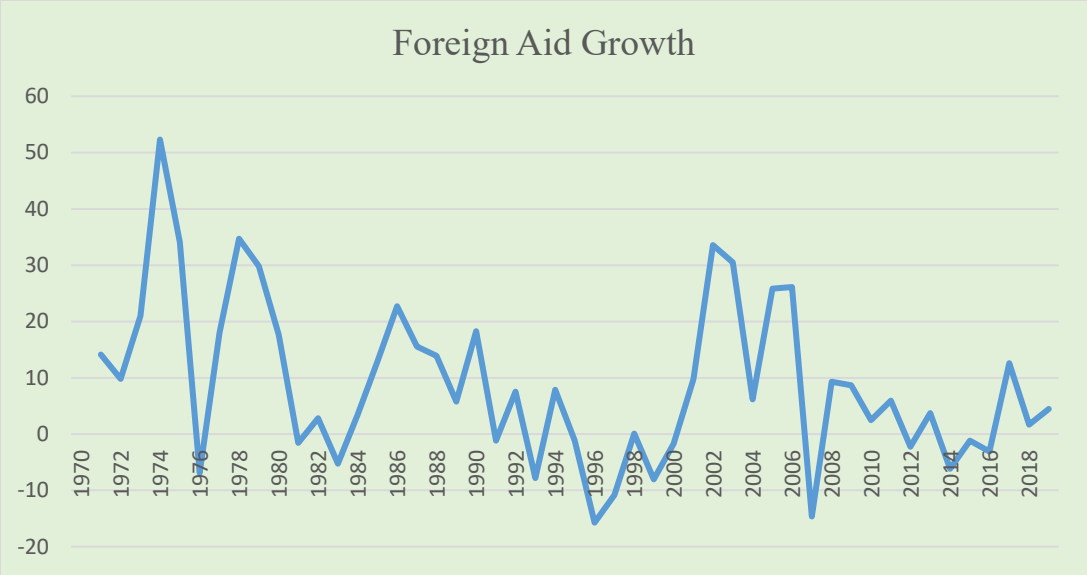

Figure 3 Trends in foreign aid growth in Sub-Saharan Africa since 1970
Source: World Development Indicators

Studies on impact of foreign aid in SSA have brought mixed results, sometimes ambiguous ones (Ilorah & Ngwakwe, 2021; Riddell, 2014). Most of the studies have used methodologies that do not consider the fact that the relationship between foreign aid and manufactured exports may not be linear. They have not considered the possibility of asymmetric effects of aid, that is, the possibility of having different impacts on manufactured exports if there is a positive or negative aid shock. Donors have placed conditionalities on aid and have often withdrawn it from countries for non-compliance with the conditionalities without considering the impact that these actions can have on the countries' economies. There are situations where countries have faced serious challenges after aid has been withdrawn (O'Brien-Udry, 2022; Brandt & Jorra, 2012). This study will therefore go further by testing asymmetric effects of aid, that is, effects of positive and negative changes of various types of foreign aid on manufactured exports. This will inform the countries which type of aid is effective in boosting manufactured exports, hence they will be able to increase resources arising from foreign aid to those sectors in order to boost manufactured exports.

1.3 Overview of Literature Related to Foreign Aid and Manufactured Exports

The overview covers theories of trade, trade regimes, and the role of industrial policies in promoting exports in general, and manufactured exports in particular. The overview goes on to

discuss foreign aid and its impact on promoting exports and manufactured exports in developing countries including African countries.

1.3.1 Classical Trade Theories

Classical trade theories suggest that countries should specialise and export goods in which they have comparative advantage (Ohlin,1933; Heckscher,1919; Ricardo,1817). However, by specialising and exporting a relatively small number of products, countries increase their degree of vulnerability to external shocks (Osakwe, 2007). Moreover, comparative advantage can be created as a result of technological know-how, innovations, and R&D, among others (Oqubay, 2015; Amakom, 2012; Khan & Blankenburg, 2009; Amsden &Tschang, 2003; Amsden, 2001). In addition, classical models assume that all goods and services are exported but some countries have produced to satisfy the domestic market before exporting (Amsden, 2001; Teitel & Thoumi, 1986; Krugman, 1980). Other theorists have attempted to improve the classical models especially the H-O model, including Samuelson (1948) with his factor-price equalisation; Kravis (1956) with his Theory of Availability; Posner (1961) with Imitation or Technological Gap Theory; and Keesing (1966) who emphasised on differences in endowments, and intensities of skilled and unskilled workers (Leontief paradox), among others.

1.3.2 Trade Regimes

Countries can mainly follow two paths of trade namely free trade and mercantilist (interventionist) trade (Soludo *et al*., 2004; Amsden, 2001). Under free trade, the market takes care of everything while under interventionist trade, the state intervenes to correct some market failures (Oqubay, 2015; Stiglitz *et al.*, 2013; Khan & Blankenburg, 2009; Soludo *et al*., 2004; Amsden &Tschang, 2003; Amsden, 2001). These trade regimes have produced mixed results in countries they have been practiced. Experiences of the US show that free trade can work with remarkable success though free trade seems ideal for developed countries whose industries can compete anywhere in the world while interventionist policies can work perfectly well in developing countries (Soludo *et al.,* 2004). For instance, globalisation and trade liberalisation as integral parts of free trade have led to premature deindustrialisation in the developing world (Black *et al.,* 2017). This is so because most of the developing countries export primary commodities and import manufactured goods, similar to comparative advantage theory resulting in trade imbalance (Oqubay, 2015; Priewe, 2015; Amsden, 2001).

Countries which follow interventionist regimes implement industrial policies to correct market failures, and sometimes government failures, situations where markets themselves do not lead to efficient or desirable resource allocations (Oqubay, 2015; Stiglitz *et al.*, 2013; Khan & Blankenburg, 2009; Amsden, 2001). The state can intervene to facilitate technology acquisition by creating new incentives that the market on its own cannot create (Oqubay, 2015). Industrial policies have produced good results especially in East Asian countries such as South Korea, China, and Taiwan.

1.3.3 Industrial Policies

Industrial policies are known to improve exports in countries that were not previously competitive. The state can play a role in boosting industrialisation by formulating policies that promote R&D, and attract personnel with skills through immigration (Juhász *et al.* 2023; Amsden & Tschang, 2003). Industrial policies are synonymous with import substitution and export promotion especially in developing countries. The countries mainly export primary commodities and import manufactured goods (Oqubay, 2015; Amakom, 2012; Amsden, 2001). The countries have to promote domestic industries in order to save foreign exchange and boost the countries' opportunities to export manufactured goods (Balchin *et al*., 2016; Amakom, 2012; Khan & Blankenburg, 2009; Amsden, 2001).

Export of primary products has not improved the situation of developing countries due to worsening terms of trade of primary commodities at international markets (Raudino, 2016; Oqubay, 2015; World Bank, 2000). Though wholesale export promotion can boost trade, promoting the export of manufactured goods can improve any country's competitiveness (Oqubay, 2015; Amakom, 2012; Soludo *et al.,* 2004; Amsden, 2001). Countries have progressed mainly by adopting import substitution industrialisation strategy that has translated into exporting part of the domestically manufactured goods, a good example being South Korea (Priewe, 2015; Khan and Blankenburg, 2009; Amsden, 2001; Teitel & Thoumi, 1986).

Though trade liberalisation reduces inefficiencies, and copes with adverse external shocks, industrial policies are required to enable countries improve infrastructure and technology, and achieve social objectives such as improving income distribution and protecting the environment. East and South Asian countries liberalised their economies selectively, in a gradualist approach.

Even developed countries such as UK and the USA protected their infant industries during their initial industrialisation phases (Oqubay, 2015; Chang, 2002; Amsden, 2001).

Rather than developing policies for all sectors, states formulated them with a focus on few sectors in order to promote manufactured exports (Oqubay, 2015; Priewe, 2015; Khan & Blankenburg, 2009; Amsden, 2001). The state was a single most important player in capital formation with development banks as agents for financing public and private investment (Oqubay, 2015; Amsden, 2001). Export processing zones have also been instrumental in the production of goods meant for export while benefiting from incentives provided by the state (Amsden, 2001).

Nevertheless, import substitution and export promotion can be implemented concurrently as countries pursuing import substitution have ended up exporting part of the goods while those pursuing export promotions have ended up satisfying the domestic market as well (Priewe, 2015; Oqubay, 2015; Amsden, 2001). Many Asian countries applied both import substitution and export promotion, mostly first the former and then the latter, but often concurrently with the Republic of Korea, China and Vietnam being cases in point (Priewe, 2015).

1.3.4 Foreign Aid and Industrialisation

Apart from industrial policies, foreign aid can also contribute to industrialisation by providing capital needed for improvement of infrastructure (Ali & Isse, 2007; Chenery & Stout, 1966; Rosenstein-Rodin, 1943). Developing countries including those in SSA have received foreign aid to complement locally generated resources in order to boost their economies. However, the impact of the aid has not been clear cut as many developing countries that have received aid have not had their economies improved, instead, their economies have deteriorated.

Extensive literature on effectiveness of foreign aid has found very weak evidence of any effect of aid on economic development (Nowak-Lehman *et al.,* 2010; Moyo, 2009; Djankov *et al.,* 2008; Arellano *et al.,* 2005). Critics say that foreign aid results in overvaluation of exchange rate thereby discouraging exports, similar to Dutch disease (Nowak-Lehman *et al.,* 2010; Moyo, 2009; Arellano *et al.,* 2005).

However, studies have mainly focused on the impact of foreign aid on exports in general rather than manufactured exports, and results have been mixed. Foreign aid has been found to have a positive impact on exports (Kang *et al.,* 2010). On the other hand, foreign aid has been found to

have a negative impact on exports (Rajan & Subramanian, 2009; Munemo *et al.,* 2007). In consideration of manufactured exports alone, foreign aid has been found to have negative impact on them (Arellano *et al.,* 2005). Arellano *et al*. (2005) studied relationship between foreign aid and manufactured exports for 73 aid dependent countries globally while this study examined the relationship for SSA countries only.

When aid is disaggregated, the types of aid such as multilateral aid, bilateral aid, grants, aid to infrastructure, aid to trade, and education aid have been found to have positive impact on exports, and not manufactured exports (Lemi, 2017; Ojeaga, 2012). This study is different from the studies as it examines the impact of disaggregated aid on manufactured exports, and not exports as a whole. Going beyond exports to examine types of exports such as manufactured exports or agricultural exports can inform policy makers and donors to which sectors foreign aid should be allocated in order to increase exports and export earnings.

1.4 Statement of Research Problem

Trade in Africa in general and SSA in particular has faced various challenges ranging from reliance on primary commodities and attendant deteriorating terms of trade for the commodities, poor infrastructure, lack of resources, geography, among other challenges, but history shows that excessive reliance on raw natural resources is never a prudent development strategy (Raudino, 2016; Amakom, 2012). According to World Bank Development Report (2020), countries are classified into four main types based on GVCs namely commodities, limited manufacturing, advanced manufacturing and services, and innovative activities. This classification is also based on products they export and their participation in GVCs (World Development Report, 2020).

According to the classification, Africa, Central Asia and Latin America are mostly involved in commodities and limited manufacturing GVCs. Africa remains a small actor in the global economy accounting for just 3 percent of global trade in intermediate goods and African exports tend to enter at the very beginning of GVCs. A high share of primary exports serves as inputs for exports of other countries reflecting the still-predominant role of agriculture and natural resources in African countries (World Development Report, 2020). Therefore, Africa needs to increase participation in trade globally by graduating into manufacturing. Globally, for instance, in 2014, agricultural exports accounted for 2 percent of world exports in contrast to 60 percent for manufactures and around 20 percent for services (World Development Report, 2020).

Poor infrastructure is also another factor that contributes to lower manufactured exports (Collier, 2007). The East and South Asian countries followed policies whereby states intervened in the promotion of manufacturing and other industries. The states established development banks that financed manufacturing infrastructure thereby boosting manufacturing and manufactured exports (Amsden, 2001). The countries were able to build industrial capabilities through skills formation, lowering transport costs, attracting FDI and equity links, and promoting exports (Balchin *et al*., 2016; Amakom, 2012).

For African countries to graduate into manufactured exports, there is need for resources to improve infrastructure and other capital outlays. The resources can be in form of foreign aid (Chenery & Stout, 1966; Rosenstein-Rodin, 1943). Over the past fifty years, Africa has received more than US$1 trillion worth of aid but the continent has remained poor (Moyo, 2009). However, Africa has relied predominantly on exports of primary commodities (Raudino, 2016; Amakom, 2012). Manufactured exports have been low in the region over the past 50 years, at the same time the region has received substantial amount of foreign aid.

One would be tempted to think that had aid been utilised in manufacturing and other related sectors, manufactured exports would have been boosted thereby improving economic performance of the region. This study therefore aims at exploring the impact of foreign aid and disaggregated aid on manufactured exports. Size and direction of the impact of various sectoral aid allocations can inform policy makers on how to engage donors on their most crucial financial needs.

1.5 Evaluation of the Current Situation and Identification of the Gap

Despite the importance of manufactured exports in fostering economic growth, studies have concentrated more on examining the impact of foreign aid on exports in general than manufactured exports in particular. This is a concern because manufactured exports are an engine for economic growth. Countries such as those in the East have developed economically by exporting manufactured goods. If SSA countries continue exporting primary products, their progress on economic development will be minimal. This study intends to address this concern by exploring ways of improving production and exportation of manufactured products in the region, one of which is funding the manufacturing sector through foreign aid. There is a belief that if manufactured exports are promoted in the region, terms of trade and economic growth will improve.

Studies on exports have concentrated on foreign aid as a whole and not disaggregated foreign aid. This is a concern as foreign aid might not be regarded as an important source of funding for exports in general, and manufactured exports in particular given the fact that some studies have found that foreign aid has a negative impact on economic growth especially in SSA region. If the study finds a negative and statistical impact on manufactured exports, it can be concluded that foreign aid is not an important factor for promoting manufactured exports. That is why this study has gone further by disaggregating foreign aid to examine whether various types of foreign aid have impact on manufactured exports. This is very important since instead of concluding that foreign aid does not have an impact on manufactured exports, policy makers will realise the benefits of foreign aid by allocating it to sectors that will contribute to improvement of manufactured exports.

Investigating the impact of foreign aid as a whole on manufactured exports may hide important dynamics, examining its impact by type of aid is also necessary because that can inform development partners on which type of aid can boost manufactured exports and economic development. For instance, education aid and health aid just like humanitarian aid can enhance quality of human capital that might lead to long run productivity growth in manufacturing sector among other sectors hence improving manufactured exports. It is also necessary to find out whether or not positive and negative changes of each type of foreign aid have the same impact on manufactured exports. The problem is that sometimes donors have withdrawn aid from recipient countries and the countries have faced so many challenges as a result of the withdrawal (O'Brien-Udry, 2022; Brandt & Jorra, 2012). The study has addressed this by testing asymmetric effects of various types of foreign aid on manufactured exports. This will inform donors, consequences on manufactured exports, of withdrawing aid from certain sectors of the economy.

In summary, the study deviates from previous studies on similar subject matter in the following ways (1) it examines the impact of foreign aid on manufactured exports (not exports as a whole) in Sub-Saharan Africa. Arellano *et al*. (2005) studied the relationship between foreign aid and manufactured exports for 73 aid dependent countries globally while this study examines the relationship for Sub-Saharan African countries only. In addition, Arellano *et al.* (2005) used a theoretical model called Neoclassical dynamic general equilibrium model while this study used ARDL, NARDL and other models. (2) The study further examines the impact of disaggregated foreign aid on manufactured exports in Sub-Sharan Africa. (3) The study has also analysed country

specific results for impact of foreign aid on manufactured exports, and country specific results for impact of disaggregated aid on manufactured exports in SSA countries. (4) Further, the study has examined asymmetric impacts of various types of foreign aid on manufactured exports in SSA.

1.6 Goals of the Study

The objective of the research is to examine effects of foreign aid, disaggregated by sectoral allocation, on manufactured exports performance in SSA. This goal will be achieved through the following specific sub-goals:

1. To examine the impact of total foreign aid on terms of trade
2. To examine the impact of total foreign aid on manufactured exports performance
3. To investigate the impacts of different types of aid, disaggregated by sectoral allocation, on manufactured exports performance

1.7 Methodology

The study has used ARDL and NARDL, following the methodology in Alimi *et al*. (2020), Sheikh *et al*. (2020), Shuaibu & Isah (2020), Iman *et al*. (2019). Previous studies on the impact of foreign aid on exports let alone Manufactured exports used various methodologies such as Panel Vector Autoregressive Model (Kang *et al*., 2010), GLS (Ojeaga, 2014; Osei *et al*., 2004). The models did not consider non-linearity and asymmetric effects of foreign aid. On the other hand, NARDL allows for simultaneous modeling of asymmetric nonlinearity and cointegration among variables in a single equation framework, providing significant advantages over standard cointegration techniques. It is a dynamic error-correction representation which provides robust empirical results even for small sample sizes.

NARDL is an extension of ARDL co-integration model proposed by Pesaran *et al.* (2001). The ARDL model does not consider the fact that positive and negative shocks of an independent variable can have varying impacts on an independent variable. NARDL does not only detect the existence of asymmetric effects that independent variable may have on a dependent variable, but also permits testing for cointegration in a single equation framework. The model is flexible as it does not require all variables to have the same order of integration, that is, the variables can be integrated of order one or not integrated, that is a mixture of I (0) and I (1) but not I (2). The study has also used various other models such as OLS with Robust Standard Errors, Random Effects, Fixed Effects, and GLS.

1.8 Significance and Contribution of the Study

The study has found that foreign aid has a negative impact on terms of trade. Instead of reversing the Prebisch-Singer Dependency Theory where terms of trade of developing countries deteriorate due to export of primary commodities, foreign aid seems to strengthen the theory. The results also show that total foreign aid has a negative impact on manufactured exports thereby disproving Big Push and Dual Gap theories which advocate for foreign aid to developing countries in order to promote industrialisation and economic growth. However, several types of foreign aid such as agricultural aid have positive impact on manufactured exports, hence confirming Big Push and Dual Gap theories. Previous studies have mainly dwelt on examining the impact of foreign aid on exports, and not manufactured exports. Further, the studies have also dwelt on examining the impact of foreign aid, and not disaggregated aid on exports.

The study has also used several methodologies such as ARDL, NARDL, fixed effects model, random effects model, and GLS. Of particular interest is NARDL which measures asymmetric effects of disaggregated foreign aid on manufactured exports. The study has found that there are no asymmetric effects of the positive and negative changes of types of foreign aid. Previous studies have not tested asymmetric effects of various types of foreign aid on manufactured exports.

The importance of this study lies in its contribution to global debates about aid policy and aid effectiveness in SSA. By focusing on the impact of different types of aid on manufacturing exports, the study resurrects the secular terms of trade deterioration debate and demonstrates the need for aid policy and aid mix reform. In addition, the findings can play an important role in informing the rethinking of domestic financing of manufacturing just as East Asian and some Latin economies did.

1.9 Conclusion

The study examines impact of foreign aid on manufactured exports on one hand, and impacts of foreign aid disaggregated by sector on the other. The study also examines impact of foreign aid on terms of trade which, if positive can translate into encouraging manufactured exports. By focusing on manufactured exports, the study seeks to highlight the importance of manufactured exports in boosting any economy unlike the situation in SSA where most of the exports are in form of natural resources which do not fetch good prices internationally thereby contributing to deteriorating terms of trade. Classical Theories emphasise the importance of specialising and exporting goods in which

a country has comparative advantage through specialising. Exporting a relatively small number of products may increase the countries' vulnerability to external shocks. It is also believed that comparative advantage can be created through technological know-how, innovations, and R&D.

The study has also described trade regimes to include free trade, and mercantilist (Interventionist) Trade. Free trade by its name, means that trade is left to flow freely letting the market to take care of everything while under interventionist trade, the state intervenes to correct market failures. The countries mainly implement industrial policies to correct market failures. Despite the importance of manufactured exports in fostering economic growth, studies have concentrated more on examining the impact of foreign aid on exports in general than manufactured exports in particular. Studies on manufactured exports have also concentrated on foreign aid as a whole and not disaggregated foreign aid. The study will therefore examine the gap that is there whereby aid is disaggregated into various types, and relationships are studied between the disaggregated aid and not exports as whole, but manufactured exports.

1.10 Organisation of the Study

Chapter 1 covers introduction and includes background of the study and brief overview of literature related to foreign aid and manufactured exports, statement of research problem, and evaluation of the current situation and identification of the gap. It also looks at goals of the study, and methodology. Chapter 2 deals with literature review, both theoretical and empirical, and Chapter 3 presents methodology. Subsequent three chapters deal with three sub-goals of the study. Chapter 4 looks at impact of total foreign aid on terms of trade, Chapter 5 deals with impact of total foreign aid on manufactured exports, and Chapter 6 investigates impacts of different types of aid, disaggregated by sectoral allocation on manufactured exports performance. Finally, Chapter 7 involves conclusions and recommendations, limitations of the study, and suggestions for further research.

Chapter 2

Literature Review

2.1 Introduction

This Chapter involves review of literature both theoretically and empirically. Theoretical literature review has discussed various theories ranging from trade theories to foreign aid theories. One of trade theories discussed is comparative advantage theory as propounded by Ricardo (1817) and later Heckscher (1919) and Ohlin (1933) otherwise known as Heckscher-Ohlin Theory. Comparative advantage states that a country with relatively abundant factors of production will have a comparative advantage in producing a product that requires those abundant factors to be produced. Foreign aid theories that have been discussed include Big Push Theory by Rosenstein-Rodin (1943), Dual Gap Theory by Chenery and Strout (1966), and Two State Model by Djajic *et al.* (1999). These theories show that foreign aid is a source of resources necessary for social and economic development of resource poor countries.

While empirical evidence has mostly supported trade theories such as comparative advantage, there have been mixed empirical findings on foreign aid theories. Various studies have found that foreign aid does not have positive impact on economic growth and other macroeconomic variables while others have found that foreign aid has positive impact on economic growth. Other studies have disaggregated foreign aid, and have found that other types of foreign aid have positive impacts on economic growth while others have found negative impacts. The studies have used various methodologies ranging from simple regression analyses to complicated ones, but still, foreign aid has been found to have mixed results most of them tilting towards negative impact. Thus, this study has examined impact of foreign aid and disaggregated foreign aid not on economic growth but on manufactured exports. The study has also examined asymmetric effects of positive and negative changes of various types of foreign aid.

2.2 Theoretical Literature Review

Trade theories in this study have been grouped into two namely old theories and contemporary theories. According to this study, old trade theories comprise those theories before 1980, and contemporary theories comprise those from 1980. Old theories mostly focused on factor abundance and relative factor prices, and how these influenced trade between countries. On the

other hand, Contemporary theories dwelt on improving the old theories to include other factors that influence international trade such as size of domestic market and technology.

2.2.1 Old Trade Theories

Ricardo (1817) laid groundwork for substantial developments in the theory of international trade through the law of comparative advantage whereby two countries can benefit from trade even if they produce exactly the same commodities, and even if none has an absolute advantage in the production of the goods. In this case, international trade is always beneficial so long as each country has a relative advantage of production, and a better ratio of labour contained in the exchange commodity, every party has to gain from it (Stigler, 1952).

Heckscher (1919) and Ohlin (1933) further developed the theory of comparative advantage by focusing on relationships between the composition of countries' factor endowments and commodity trade patterns as well as consequences of free trade for functional distribution of income within countries. The model highlights the relevance of abundant factors of production, and the producing country's competitive advantage over another country that does not have relatively abundant factor of production of that product. In this case, two countries can respectively produce products from their respective abundant factors and trade each other the products. That is, each commodity is produced separately with respective inputs of factors of production that, in each country, are supplied perfectly inelastically.

The model further defines factor abundance in terms of labour and relative factor prices in the two countries. If the home country's capital-labour ratio is less than the capital-labour ratio of another country, the home country is said to be labour abundant. Similarly, if the home country's wage rate is lower than the other country's wage rate, the home country is said to be labor abundant as well. Since factor prices are determined by demand and supply conditions, these two versions need not correspond. In particular, if the home country is, in the physical sense, relatively labour abundant, it might nonetheless have its wage rate relatively high if taste patterns at home are strongly biased towards the labour intensive commodity compared with tastes abroad. In such a case, the trade pattern reflects the factor–price comparison, that is, the home country exports the physically capital-intensive commodity.

However, in the real world, where there are many countries trading and production processes cannot at best be described by constant returns to scale, the theory cannot be relevant. The modern

world is associated with technological know-how, innovations, and R&D that contribute to increasing returns to scale, that is, comparative advantage can be created through deliberate policy efforts (Oqubay, 2015; Amakom, 2012; Khan & Blankenburg, 2009; Amsden &Tschang, 2003; Amsden, 2001). In addition, the theory assumes that the countries can trade in goods that can be produced in one country and all goods are exported. However, some countries have produced to satisfy domestic market first before exporting their goods and services (Amsden, 2001; Teitel & Thoumi, 1986; Krugman, 1980).

Countries should not only rely on comparative advantage but also industrial policies that can put state intervention in the forefront (Oqubay, 2015; Stiglitz *et al*., 2013; Khan & Blankenburg, 2009; Amsden, 2001). Samuelson (1948), elaborating on the Heckscher-Ohlin (H-O) model, introduced the concept of factor price equalisation. Since an open international economy pays factors of production, capital and labour, with similar remunerations independently from the place where they are, there is no need for labour in developing countries to go abroad to benefit from the win-win advantages of economic liberalism. According to Samuelson (1948), salaries and return on capital in developing countries with open economies are destined to catch up with levels in developed countries, at least in the long run.

Prebisch (1950) and Singer (1950), otherwise called Prebisch-Singer dependency theory, state that price of primary commodities declines relative to price of manufactured goods, causing terms of trade of primary product-based economies to deteriorate. According to them, this creates a situation where producers of primary goods transfer value in form of low price to producers of manufactures. Further, this declining trend in prices, and reliance on fewer primary commodities means declining trend of export earnings. A developing country should therefore explore diversification of its export portfolio to include manufactures.

Export of manufactured exports improves terms of trade of a country as manufactured exports fetch high prices at international market. Terms of trade derive from fundamental classical propositions in the theory of trade whereby only two countries and two commodities were assumed to exist (Rostow, 1960). Rostow (1960) mainly dwelt on the relationship between quantity of factors of production required to produce a unit of the same commodities in different countries, and looked at short period and long period approaches in determining terms of trade. Rostow (1960) was interested in international capital movements and movement in terms of trade of the

capital importing country, and the capital exporting country, with reference to Heckscher-Ohlin work. Apart from H-O work, he cited economic development such as opening up of new territories, the building of towns as the reason for relative rise of Canadian prices in relation to world prices. Viner (1924) argued that only the existence of capital imports permitted a general price rise to take place; and that, otherwise, a relative increase in investment would have resulted in a rise in the prices of producers' goods and a fall in consumers' goods.

Keesing (1966) emphasises differences in endowments, and intensities of skilled and unskilled workers. He explains the Leontief paradox: Since the U.S. has highly trained, educated workers relative to other countries, U.S. exports tend to be skilled-labor intensive. In the Theory of Availability by Kravis (1956), a country produces and exports those goods which it has available, that is the goods developed by its innovators and entrepreneurs. Thus, Kravis propounded the theory that the composition of traded commodities is determined primarily by availability which means an elastic supply. Trade only takes place in those commodities which are not available at home.

Kravis theory was further developed by Posner (1961) in his Imitation or Technological Gap Theory in which he analysed the effect of technology on trade. When a firm comes into existence with products which become profitable in the domestic market and enjoys temporary monopoly, production will be expanded by the exporting country and sold out in the foreign markets, and has an absolute advantage in this product. Then the imitation will be encouraged in the other countries when the innovation firm curves the great profit of its own. Until the importing country learns how to produce the commodity, the exporting country will continue its exports and have a comparative advantage in its production. Even during the period of imitation gap, imports of the new product in the other country continue.

2.2.2 Contemporary Trade Theories

In an improvement of Heckscher-Ohlin Model, Krugman (1980) analyses causes of trade between economies with similar factor endowments, and the role of large domestic markets in encouraging exports. He assumes that two countries have the same tastes and technologies, and one-factor world, hence there cannot be any differences in factor endowments. In this case, according to him, there will be trade and gains from trade. Trade will occur because, in the presence of increasing returns, each good will be produced in only one country for the same reasons that the good is

produced by only one firm. Gains from trade will occur because the world economy will produce a greater diversity of goods than would either country alone, offering each individual country a wider range of choice. He finds that in a world characterised by economies of scale, one would expect workers to be better off in larger economies, because of the larger size of the local market.

A secondary benefit would be in the form of better terms of trade with workers in the rest of the world. If product costs were the same in both countries, it would always be more profitable to produce near the larger market, thus minimising transportation costs. To keep labour employed in both countries, this advantage must be offset by a wage differential. Krugman (1980) further finds that countries will tend to export those kinds of products for which they have relatively large domestic demand. Each will be a net exporter of the class of goods in which it specialises. This argument is wholly dependent on increasing returns since in a world of diminishing returns, strong domestic demand for a good will tend to make it an import rather than an export.

The Krugman Model, though trying to be realistic by including the domestic market and the importance of larger domestic markets in boosting exports, it does not consider the fact that foreign trade can bring a curse in form of Dutch disease especially when the exports are natural resource based (Moyo, 2009; Arellano *et al.,* 2005). In other words, exports come in different forms with each form having effects on the economy. Exports can be in form of natural resources such as minerals, primary products and manufactured products. The model does not take such factors as natural resource-based exports and manufactured exports that can have varying impacts on the economy (Oqubay, 2015; Amakom, 2012).

The idea advanced by Krugman (1980) of larger domestic market as stimulating export of goods is buttressed by Teitel and Thoumi (1986) who documented manufacturing exports experience of Argentina and Brazil. They observed that Latin American semi-industrialised countries (SICs), in general, and Argentina and Brazil in particular, have a strong natural resource base, a relatively skilled labour force, and a fairly high income per capita, with a substantial concentration of income in a few large urban centres. Furthermore, although they have pursued import substitution process in both countries, and although the domestic market has historically been the main source of demand growth for manufactures, Argentina and Brazil have also become the largest exporters of manufactures in the region, and are among the main exporters of manufactures in the developing world (Amsden, 2001; Teitel & Thoumi, 1986).

Sapsford *et al.* (1992) emphasised on the classical belief in a circular improvement in the terms of trade of primary products. This follows from two classical laws, the operation of the law of diminishing returns in the primary producing sectors, and the law of increasing returns in manufactures. The policy implication of this classical proposition is that an agricultural country need not industrialise to enjoy the fruits of technical progress in manufactures. Free play of international market forces will distribute the gains from technical progress of the industrial countries to the agricultural countries by turning the terms of trade to the favour of primary products and the primary product exporting countries.

Prebisch (1950) and Singer (1950) however argued that technological changes more than offset positive effects on the terms of trade of primary producers arising from diminishing returns to fixed factors of production in primary production. According to Prebisch and Singer, price of primary commodities declines relative to price of manufactured goods over long term, which causes terms of trade of primary product-based economies to deteriorate, a theory called Prebisch-Singer Dependency Theory. On the other hand, Friedman & Meiselman (1958) stated that in a country with flexible exchange rate, fluctuations in the terms of trade will be offset by movements in the exchange rate, eliminating much of the impact on economic activity. Thus, countries with fixed exchange rates will have their economic activity decreased much more than countries with flexible exchange rates.

Bigsten *et al.* (2002) through learning by exporting hypothesis say that past export status has a significant effect on the propensity to export. Thus, for a non-exporting firm with average characteristics, entering the export market raises the probability that this firm will export in the next period. There are at least two important policy implications. First, if incentives can be created for firms to enter the exports market, they are likely to remain in the exports market for some time. Second, large entry costs imply that there is a set of firms that remain focused on the domestic market even though they are internationally competitive. By reducing or eliminating the entry costs, these firms will get access to a larger market.

2.2.3 Foreign Aid Theories

Trade theories provide a distinction between capital and labour and their availability. However, most of the developing countries including SSA have abundant labour but scarce capital, therefore there should be ways of boosting capital in the countries if they are to develop economically. One

of the ways is foreign aid, and theories have been developed to support foreign aid as a source of resources necessary for social and economic development of resource poor countries.

Big Push Theory as espoused by Rosenstein-Rodin (1943) emphasises that foreign aid is important for providing capital needed for improving infrastructure. The theory centers on potential constraints (such as growth traps and poverty traps) to raising the level of fixed investment crucial for economic growth. Rosenstein-Rodin (1943) was interested in achieving more equal distribution of income between different areas of the world by raising incomes in depressed areas at a higher rate than in rich areas. According to him, in order to maximise world income, labour must either be transported towards capital (emigration), or capital must be transported towards labour (industrialisation and international aid). Emigration and resettlement would however present problems in both host and sending areas hence it cannot be considered feasible on a large scale. Industrialisation in depressed areas would be the only option to maximise and redistribute world income. The industrialisation can only be undertaken with substantial international investment or capital lending or foreign aid.

The role of the state in industrialisation was stressed since if this is left to the private sector alone, the rate of investment would be smaller and national income lower. However, foreign aid has been more of a curse than a blessing in many countries especially in SSA where instead of bringing prosperity, it has brought conflicts and corruption (Raudino, 2016; Moyo, 2009). In other words, Rosenstein-Rodin (1943) did not consider negative side of aid such as corruption, conflicts and uncompetitive foreign exchange regimes as a result of Dutch disease. Moreover, migration has enabled areas with low skilled manpower to attract foreign skilled manpower thereby bringing about industrialisation (Oqubay, 2015; Amsden & Tschang, 2003).

Chenery and Strout (1966) came up with Dual Gap Model, an improvement of Big PushTheory. The model capitulates foreign aid as playing a role in filling resource gaps in a resource constrained country. According to Chenery and Stout (1966), there are two gaps namely savings-investment gap and import-export gap. Developing countries cannot overcome shortage of savings and foreign exchange on their own due to their limited resources. Foreign aid is needed in order to purchase those imports of manufactured goods and natural resources which they cannot produce yet or do not have as natural endowments. The rationale is that the saving to income ratio is too small, and could only be increased by lowering living standard below the poverty line. Private capital inflows

or borrowing are suspected to be unlikely or unaffordable (Priewe, 2015). Thus, the rationale of the Dual Gap Approach is that foreign aid should make up differences between either the saving-investment gap or the export-import gap (Ali & Isse (2007). Like the Big PushTheory, the model does not look at adverse effects of foreign aid. Foreign aid is associated with exchange rate appreciation (Nowak-Lehman *et al.,* 2010; Moyo, 2009; Arellano *et al.,* 2005), similar to Dutch disease, which described the adverse effect of natural resource revenues on manufactured exports sector associated with real exchange rate appreciation following the discovery of natural gas in the Netherlands (Arellano *et al.,* 2005).

Moyo (2009) observes that the risk of Dutch disease is important from an African perspective. She says foreign aid leads to appreciation of local currency thereby making local exports more expensive. She prefers other sources of funding such as savings, remittances, and bonds. However, foreign aid spent on activities with a large import content can avoid Dutch disease (Collier, 2007). Thus, Dutch disease can be avoided if policies are put in place to minimise the exchange rate effect of aid as well as encouraging it (Kang *et al.,* 2010).

Djajic *et al.* (1999) came up with a two-state model, and stated that foreign aid affects welfare via two channels (i) the standard income and terms of trade effects (ii) the investment induced terms of trade effects. According to them, through the first channel, the donor always loses and the recipient benefits. It is the second channel which gives rise to a range of possibilities. The aid-induced increase in investment of the recipient country generates an increase in future output and income, while the resulting change in the terms of trade redistributes future income between the two countries. Provided future income has different valuations relative to present income in the two economies, as is generally the case in the presence of barriers to international capital mobility, this process of creation and redistribution of future income may raise welfare of both the donor and the recipient. In essence, this occurs when a transfer serves as a vehicle for intertemporal trade between the two countries, enabling the donor to indirectly benefit from investment opportunities of the recipient when more efficient means of participation are not available.

However, the theories did not consider the situation whereby foreign aid is disaggregated into various types such as multilateral aid, bilateral aid, education aid, health aid and others. Lemi (2017), Ojeaga (2012), Cali and Velde (2009), Morrissey *et al.* (2004), and Svensson (2000) stated that it is apparent that total aid might have a different impact from disaggregated aid that takes

care of various sectors of the economy. Therefore, considering foreign aid without disaggregating it may obscure some impacts that come with it.

2.2.4 Other Trade Related Literature Review

SSA countries should promote manufactured exports if they are to improve economically (Behuria, 2019). There are several strategies for promoting manufactured exports including free trade and/or mercantilist (interventionist) trade, import substitution and export promotion, and industrial policies. On free Trade and Mercantilist (Interventionist) Trade, countries can follow different paths of conducting trade, however, there are two main trade regimes namely orthodox liberal trade regime and mercantilist (interventionist) trade regime (Soludo *et al*., 2004; Amsden, 2001). A country following free trade leaves everything to be taken care of by the market while the interventionist trade involves the state intervening in the market to correct some market failures (Oqubay, 2015; Stiglitz *et al.,* 2013; Khan & Blankenburg, 2009; Soludo *et al*., 2004; Amsden &Tschang, 2003; Amsden, 2001).

Free trade was one of the principles of the Washington Consensus made by four Washington based institutions regarding economic policies in Latin America which were equally applicable to other countries in the world. The institutions are the US State Department, the US Treasury, the World Bank, and the International Monetary Fund (IMF). The consensus advocated for market determined flexible rates including undervalued exchange rates and removal of quantitative trade restrictions (Priewe, 2015; Williamson, 1990). Under free trade, countries are expected to trade based on the principle of comparative advantage, while FDI is regarded as a means for transfers of capital, expertise and good practices (Raudino, 2016). The market economy is left to regulate with the help of an 'invisible hand' hence every country has to gain from free trade at least in the long run (Raudino, 2016; Ricardo, 1817).

On the contrary, globalisation and trade liberalisation have led to premature deindustrialisation in the developing world (Black *et al.,* 2017). Raudino (2016) observes that economic reforms aimed at promoting free trade are applied in all developing countries irrespective of conditions of the country. He further notes that the fact that these reforms work in developed countries does not mean that they can work everywhere and that developed countries have not always implemented the reforms, they are a recent phenomenon and were implemented gradually. The absence of

import substitution policies, and globalisation have resulted in decline of manufacturing in countries lacking comparative advantage.

Low income countries have struggled to compete internationally and their economic situation in some cases has deteriorated (Raudino, 2016; Oqubay, 2015; Amsden, 2001). The countries have always exported primary commodities, and imported manufactured products, similar to comparative advantage theory resulting in trade imbalance (Oqubay, 2015; Priewe, 2015; Amsden, 2001). Furthermore, declining relative prices in advanced countries means that developing countries have imported deindustrialisation thereby squeezing manufacturing in the countries (Rodrik, 2015). A case in point is South Africa where years of industrial policies created comparative advantage in capital intensive manufacturing, but after 1994 when liberalisation crept in, there was increase in labour intensive manufactured imports which resulted in crippling the labour intensive industry leading to increasing unemployment (Black *et al*., 2017). Free trade is effective where market forces are left to operate freely, but markets hardly work perfectly well hence government intervention is necessary (Oqubay, 2015; Stiglitz *et al*., 2013; Khan & Blankenburg, 2009; Amsden, 2001).

However, a country cannot just adopt free trade when it is in infancy. It has to adopt interventionist trade policies when it is developing, and gradually change to free trade as it progresses. Good examples of this are developed countries since when they were developing countries themselves, they used very few of the policies and institutions that they recommend to, or even force upon, today's developing countries (Raudino, 2016). They were, in fact, often the pioneers and frequently the most ardent users of interventionist trade and industrial policy measures in their early stages of development (Oqubay, 2015; Chang, 2002; Amsden, 2001). As Chang (2002) notes, the developed countries used aggressive infant-industry promotion policies in the early stages of their development and only started practicing free trade after achieving their industrial supremacy.

Chang (2002) further notes that infant industry promotion does not guarantee economic development, but historically, very few countries have achieved economic development without it. Arguably, the East Asia Miracle, one of the most remarkable episodes of growth in history was based largely on government interventions into the market economy, including extensive use of industrial policies (Oqubay, 2015; Stiglitz *et al.,* 2013*;* Khan & Blankenburg, 2009; Chang, 2002; Amsden, 2001).

It has however been concluded that both free trade and interventionist trade can work depending on circumstances. According to Soludo *et al.* (2004), the experiences of the US on the one hand, and Japan and South Korea, on the other, show that both models can work with remarkable success. However, free trade seems ideal for developed countries whose industries can compete anywhere in the world while interventionist trade policies can work perfectly well in developing countries. They note that encouraging low income countries to embrace free trade would create challenges that would worsen their trade imbalances. The principle of trade liberalisation requires specific conditions to work well. Liberalisation could in fact cause more damage if the specific conditions of the liberalising economies are not considered. For instance, countries with well-functioning markets and a diversified production structure benefit more than other countries from the productivity gains through trade reform. In fact, benefits are realised more from trade in manufactures than in primary commodities (Oqubay, 2015; Amakom, 2012; Soludo *et al.,* 2004; Amsden, 2001)

Countries also have to follow import substitution or export promotion if they are to promote manufacturing and manufactured exports. Further, countries that have progressed in manufactured exports have followed such policies as import substitution that later translated into exporting part of the manufactured goods, South Korea being a good example (Priewe, 2015; Khan & Blankenburg, 2009; Amsden, 2001; Teitel &Thoumi, 1986). For instance, in Argentina and Brazil, there seems to have been a lag from production for import substitution to production for export whereby manufactured exports began with natural resource-based exports with some value addition, then evolved into heavy machinery exports (Teitel & Thoumi, 1986). This notwithstanding, import substitution has brought such challenges as an inefficient domestic manufacturing industry. Trade liberalisation may be a solution as it reduces inefficiencies, and copes with adverse external shocks (Amakom, 2012; Soludo *et al.,* 2004).

Developing countries, which mainly export primary commodities and import manufactured goods, have to promote domestic industries that can produce goods which are imported (Oqubay, 2015; Amakom, 2012; Amsden, 2001). This can save foreign exchange and boost the countries' opportunities to export manufactured goods (Balchin *et al*., 2016; Amakom, 2012; Khan & Balnkenburg, 2009; Amsden, 2001). Export of primary products has not improved economic situation of a developing country due to worsening terms of trade of primary commodities at

international markets (Raudino, 2016; Oqubay, 2015; World Bank, 2000). While wholesale export promotion can boost any country's trade, promoting the export of manufactured exports can improve the country's competitiveness (Oqubay, 2015; Amakom, 2012; Soludo *et al.,* 2004; Amsden, 2001).

The absence of import substitution policies and globalisation have resulted in decline of manufacturing in countries lacking comparative advantage. Low income countries have struggled to compete internationally and their economic situation in some cases has deteriorated (Raudino, 2016; Oqubay, 2015; Amsden, 2001). The countries have always exported primary commodities and imported manufactured products, similar to comparative advantage theory resulting in trade imbalance (Oqubay, 2015; Priewe, 2015; Amsden, 2001). Free trade is effective where market forces are left to operate freely, but markets hardly work perfectly well hence government intervention is necessary (Oqubay, 2015; Stiglitz *et al*., 2013; Khan & Blankenburg, 2009; Amsden, 2001).

Nevertheless, import substitution and export promotion can be implemented concurrently (Oqubay, 2015; Amsden, 2001; Hirschman, 1968). In fact, countries that have followed import substitution strategy have found themselves embarking on export promotion (Amsden, 2001; Rodrik, 1998; Lall,1992). Conversely, export promotion may not be pursued without satisfying the domestic market especially when there is domestic market for the goods (Amsden, 2001). It would therefore make sense to pursue these two strategies together as manufactures can always be bought domestically and if there is an international market for them, the producers cannot wait for the domestic market to be satisfied first before exporting (Amsden, 2001). Many Asian countries applied both import substitution and export promotion, mostly first the former and then the latter, but often concurrently with the Republic of Korea, China and Vietnam being cases in point (Stiglitz *et al*., 2013; Rodrik, 1998; Lall,1992).

States formulate industrial policies with a focus on few sectors in order to promote manufactured exports (Carboni, 2016; Johnson 2016; Oqubay, 2015; Khan & Blankenburg, 2009). For instance, China and India liberalised their economies in selected areas gradually in the past decades (Priewe, 2015). They maintained capital inflow and outflow controls to some extent, as well as the usage of some kind of industrial policies (Priewe, 2015; Khan & Blankenburg, 2009). However, the global financial crisis in 2008 has shown that market forces are not enough, industrial policies are

necessary especially in developing countries (Chang & Andreoni, 2020; Stiglitz *et al.,* 2013). The policies will enable the countries to improve infrastructure and technology, and achieve social objectives such as improving income distribution and protecting the environment. Even East and South Asian countries liberalised their economies selectively in a gradualist approach, maintaining capital inflow and outflow controls (Lane, 2020; Priewe, 2015). Developed countries such as the UK and the USA used interventionist industrial, and technology policies to promote infant industries during their initial stages of industrialisation (Oqubay, 2015; Chang. 2002; Amsden, 2001). Subsidies and duty drawbacks were used to promote exports (Chang, 2002). States should formulate industrial policies with a focus on few sectors in order to promote manufactured exports (Oqubay, 2015; Priewe, 2015; Khan & Blankenburg, 2009; Amsden, 2001).

The state can provide public infrastructure much needed for facilitating manufacturing and export promotion (Andreoni & Chang, 2020; Amsden & Tschang, 2003). There is some infrastructure that the private sector cannot be interested to develop including development of human capital through knowledge acquisition (Oqubay, 2015; Amsden & Tschang, 2003). For most of the post-war era, the developmental state was by far the single most important player in capital formation with development bank as an agent for financing public and private investment (Oqubay, 2015; Amsden, 2001).

Development banking has been a major instrument that has not been limited by international agreements (Oqubay, 2015). Development banks played a reciprocal control mechanism by targeting strategic industries, monitoring their loans, imposing export target conditionality, and lending at lower interest rates (Amsden, 2001). In addition, export processing zones have been instrumental in the production of goods meant for export. Companies in these zones benefit from incentives that governments provide in order to encourage them to produce for exports. The incentives include importation of duty-free inputs in exchange for an obligation to export their output (Amsden, 2001).

Khan and Blankenburg (2009) and Amsden (2001) observe that countries design and implement industrial policies to correct market failures, and sometimes government failures. Markets by themselves do not lead to efficient, or desirable resource allocation. The state supports the industry by coordinating risky investment decisions, providing necessary infrastructure, and facilitating capacity building of workforce. These interventions cannot be done by a single company (Stiglitz

et al., 2013). As for manufactures, the state can facilitate skill transfer from foreign skilled workers to domestic workforce (Aiginger & Rodrik, 2020; Oqubay, 2015).

Late developers can catch up with more advanced countries by learning modern technologies from the countries (Amakom, 2012; Amsden & Tschang, 2003). States intervene to facilitate technology acquisition by creating new incentives and opportunities. The market on its own may not suffice as a disciplining mechanism for the resources allocated by the states (Oqubay, 2015). The state can provide public infrastructure much needed for facilitating manufacturing and export promotion (Khan & Blankenburg, 2009; Amsden & Tschang, 2003). There is some infrastructure that the private sector cannot be interested to develop including development of human capital through knowledge acquisition (Amsden, 2001).

The experience of East Asian countries shows that industrial policies can boost trade in developing countries including Africa (Behuria, 2019). Critics of industrial policies say that industrial policies do not work, but the case of the successes of east Asian countries is attributed to industrial policies proving that the policies work (Oqubay, 2015). The fact that the industrial policies failed somewhere does not mean that they cannot work, as even where they failed, it has been noted that free trade succeeded by benefiting from some of the outcomes of the policies (Khan & Blankenburg, 2009).

On the other hand, Africa has been riddled with bad policies that are more often predefined for them and have often contributed to poor economic performance (Raudino, 2016). World Trade Organisation restrictions have also not helped matters. The restrictions involve discouragement of industrial policies. These restrictions include reduced industrial protection, reduced trade discrimination, removal of subsidies in trade and industrial promotion, among others (Amsden, 2001). African countries have been discouraged to use industrial policies, and this has led to deindustrialisation especially in SSA (Black *et al*., 2017; Rodrik, 2015; Stiglitz et *al.,* 2013).

Countries should design and implement industrial policy to correct market failures, and sometimes government failures, situations where markets by themselves do not lead to efficient, or desirable resource allocation (Oqubay, 2015). Moreover, many important national and global policy objectives such as equality of opportunity for all citizens, financial stability and inclusion, environmental protection and pollution control and others are not often reflected in market prices and cannot be achieved by markets on their own (Stiglitz et al., 2013). The state should therefore

support the industry by coordinating risky investment decisions, providing necessary infrastructure, and facilitating capacity building of workforce, interventions which cannot be done by a single company (Khan and Blankenburg, 2009; Amsden & Tschang, 2003). As for manufactures, the state can facilitate skill transfer from foreign skilled workers to the domestic workforce (Khan & Blankenburg, 2009; Amsden & Tschang, 2003). Late developers can catch up with more advanced countries by learning modern technologies from the countries (Amakom, 2012). The states intervene to facilitate technology acquisition by creating new incentives and opportunities as the market on its own may not suffice as a disciplining mechanism for the resources allocated by the state (Oqubay, 2015).

The state and institutions should however be capable of managing rents whereby rents management should involve withdrawing them from non-performers and concentrating on those that have potential for success (Oqubay, 2015; Khan & Blankenburg, 2009; Amsden, 2001). In this case, rents management can ensure productivity growth through technological progress or learning, hence strong institutions are needed to enforce industrial policies (Acemoglu *et al.,* 2001; Rodrik, 2000). In order to catch up, late developers should have stronger and different institutions with higher productivity than the early developers, and should implement infant industry strategies through among others, subsidy to facilitate acquisition of advanced technologies through learning by doing (Oqubay, 2015; Khan & Blankenburg, 2009; Amsden & Tschang, 2003; Amsden, 2001).

It is therefore imperative for a facilitating state or what is sometimes called a developmental state in a developing country to identify and select new industries which are consistent with comparative advantage, use its limited resources to improve infrastructure for the selected industries, provide adequate incentives for first movers, and coordinate private firms' related investments in those industries so that clusters can be formed successfully and quickly (Oqubay, 2015; Stiglitz *et al.,* 2013; Hirschman & Rothschild, 1973). Industrial policies should also facilitate the generation and acquisition of new knowledge that empowers households and firms (Amsden & Tschang, 2003). In fact, East Asian countries have been able to converge toward the income levels of advanced economies through learning (Amakom, 2012). Therefore, the suggestion that governments should not intervene is not proper as the objective of any government should be both to correct negative externalities and promote positive externalities that arise from learning and sharing knowledge (Stiglitz *et al.,* 2013; Amsden, 2001).

Manufacturing and manufactured exports can also be boosted through R&D. Amsden and Tschang (2003) bring forward the role of the state in boosting industrialisation by promoting R&D, and attracting technical skills where there is shortage through policies that encourage immigration of personnel with such skills. According to them, R&D can be classified based on timeframe with basic research taking a long time and applied research taking short period. Basic research involves the generation of new technologies while applied research involves application of existing technologies. They further distinguish five types (stages) of R&D that a country goes through starting from pure science, then basic research, applied research, exploratory development, and advanced development though there might be overlaps. They distinguish progression of research between early and late industrialising countries whereby early industrialising countries followed the R&D stages chronologically starting with pure science, basic research and so forth.

Late industrialising countries did it in opposite direction from advanced or exploratory development focused on manufacturability and the import substitution of parts components to the generation of at least a differentiated product through better product design. Amsden and Tschang (2003) further illustrate the role that Singaporean government played in promoting R&D in the country. The government attracted multinationals through financial incentives such as subsidies and tax benefits and protection of intellectual property. The government also created research institutes and universities with qualified research personnel that collaborated with the multinationals when doing research. As a very small economy with a population of about 4.1 million, Singapore suffered from a shortage of high-level research personnel. The government therefore adopted liberal immigration laws to attract foreign skilled technical personnel. Thus, government needs to play a big role in promoting manufacturing.

As for SSA countries, poor human capital and abundant primary commodities are important reasons its manufactured exports are lower than those in other regions (Amakom, 2012). The continent is blessed with abundant labour but is largely unskilled and cheap. This is in a way a comparative advantage as unskilled labour intensive industries can be developed to take advantage of the cheap unskilled labour, while paying attention to products that are produced in order for them to effectively compete at international market (Black *et al*., 2017). African countries should among other priorities ensure that resources (labor, capital and knowledge) are transferred from low- to high-productivity sectors and areas, including the migration of Africa's abundant unskilled

rural labor to unskilled labor-intensive industries (Stiglitz et *al.,* 2013; Lewis, 1955). Learning and education are also important to transform the largely unskilled labour to skilled labour in order to improve productivity and quality (Stiglitz et *al.,* 2013; Amakom, 2012). Further, poor infrastructure is a barrier to export performance (Collier, 2007).

Domestic financing through development banks can play a role in financing infrastructure in these countries. According to Amsden (2001), East and South Asian countries relied on development banks to finance manufacturing infrastructure that boosted manufacturing and manufactured exports. Most of these banks were wholly owned by states. FDI can also promote export competitiveness in these countries (Amakom, 2012). FDI delivers to recipient economies tangible and intangible assets such as technology and know-how thereby inducing international competitiveness (Ngundu & Ngepah, 2019; Ghosh & Roy, 2018; Balchin *et al*., 2016; Amakom, 2012).

Type of FDI, its degree of integration into local value chains, and its technology content play an important role, among other factors, in improving international competitiveness (Priewe, 2015). To attract more FDI, African countries should improve business climate, education/skills development, and infrastructure (Ngundu & Ngepah, 2019; Balchin *et al*., 2016; Amakom, 2012). Other regions, especially Asia, were able to develop a strong manufacturing sector from the 1960s onwards by building industrial capabilities through skills formation, lowering transport costs, attracting FDI and other equity links, and promoting exports which supported strong job creation in countries such as Korea, Malaysia, Singapore and Taiwan (Behuria, 2019, Balchin *et al*., 2016). FDI is a permanent catalyst for transfers of capital, expertise and good practices (Raudino, 2016).

Trade in Africa in general and SSA in particular has faced various challenges ranging from reliance on primary commodities and attendant deteriorating terms of trade for the commodities, poor infrastructure, lack of resources, geography, among other challenges, but history shows that excessive reliance on raw natural resources is never a prudent development strategy (Raudino, 2016; Amakom, 2012). Exports improvement in the manufacturing sector is vital for growth of SSA economies (Behuria, 2019; Amakom, 2012). However, rather than diversify, Africa concentrates on exporting a few primary commodities with highly volatile terms of trade (World Bank, 2000). This is in line with Prebisch-Singer Dependency Theory (Prebisch, 1950 and Singer, 1950) which states that price of primary commodities declines relative to price of manufactured

goods, causing terms of trade of primary product-based economies to deteriorate thereby creating structurally trading system in which the producers of primary goods transfer value to the producers of manufactures. In addition, primary products face competition from heavily subsidised agricultural products and heavy import duties in developed countries (Raudino, 2016).

Globally, growth of trade in manufacturing has outpaced growth of trade in natural resources or agricultural products over the past decade (Balchin *et al*., 2016), yet SSA has continued to rely on trading in natural resources. As Stiglitz et *al.,* 2013 observes, while today's prices are near record high, commodity markets are often known to collapse abruptly. He further observes that recent gains in agriculture may be undermined by climate change and environmental concerns. Adam Smith (1776) and other researchers regard geography as one of the determinants of trade and industrialisation. Those countries along the sea coast, banks of navigable rivers, industry of any kind begins there, then after a long time, the industry is extended to the inland parts of the countries. Geography and demographic factors have been suggested as contributing to low growth in Africa. Such factors include tropical climate, tropical disease burden, hostile and unfertile soil quality, a high youth dependency ratio, among others (Soludo *et al.,* 2004; Myint, 1977).

Natural resource endowment is another factor of geography. Africa is blessed with natural resources hence it has found itself exporting primary commodities without adding value to them and has ended up importing manufactured goods. The theory of comparative advantage seems to hold in the African context whereby it exports primary commodities and imports manufactured goods (Soludo *et al*., 2004). Industrial policies are necessary because Africa is going through a major structural transformation and markets by themselves manage such transformations poorly, for a variety of reasons that have been set forth elsewhere (Khan & Blankenburg, 2009; Amsden, 2001). The success of East Asian economies in designing and implementing industrial policies proves that it is possible to promote industries that are consistent with the economy's comparative advantage (Stiglitz *et al.,* 2013). As Stiglitz *et al.* (2013) note, critics say that industrial policies cannot work in Africa due to such factors as politics, pervasive corruption., and capacity of government officials to design and implement industrial policies.

Stiglitz et *al.* (2013) however argue that these concerns should affect the form of industrial policy, not whether the government should undertake industrial policy. They further argue that even other policies such as monetary policy have been mismanaged but have not been abandoned, while the

fact that industrial policies have sometimes been mismanaged has often been used as an argument against such policies. They also observe that governance structures in countries such as South Korea where industrial policies were successful were far from being perfect, and even advanced countries have governance structures that are far from being ideal. They therefore observe that deficiencies in governance should affect the type of industrial policies and the manner in which they are implemented, not the use of industrial policies themselves.

2.3 Empirical Review

Empirical tests on Heckscher-Ohlin Trade Theory have brought mixed results. Differences in production factor abundance have been found to explain unit production factor prices (Bigsten *et al*., 2002; Trefler, 1993). Those countries that are labour abundant have been found to have lower labour prices and export labour intensive manufactures. Ojeaga (2012), Ruffin (1974) and Turnovsky (1974) argue that specialisation of this kind can only be possible if there is no uncertainty. In the presence of uncertainty, diversification may be a better policy option than specialisation based on comparative advantage.

Osakwe *et al*. (2018) found that trade liberalisation, in the form of lower tariffs, contributes to exports diversification in developing countries, and the results for the long term are even stronger for SSA countries. With regard to trade intensity, they found that trade is associated with diversification in developing countries and in SSA countries in the short term. However, for SSA countries, it actually leads to concentration in the long term. The empirical analyses also show that human capital, GDP per capita and institutions, play important roles in exports diversification.

Ngundu and Ngepah (2019) found that FDI from China and the rest of Asia does not influence growth in all SSA countries through export upgrading. On the other hand, FDI from the US and the EU seems to have a significant impact on growth through export upgrading only beyond certain thresholds of terms of trade. Countries with terms of trade between 1.02% and 1.08% are negatively affected. As the terms of trade improve beyond 1.08%, the growth effects of FDI from both the EU and the US become positive, albeit insignificant. Thus, threshold level of 1.08% provides direction as to how negative effects of FDI from the US and the EU can be overcome in SSA (Ngundu & Ngepah, 2019). Romer (1986) finds that FDI brings new technology, human capital development and technical know-how into the host country, know-how and the training of labour, all of which have a positive impact on economic growth. Aye and Jin-Sang (2015) found

that foreign aid had positive and statistically significant impact on economic growth in low income African countries but not in middle income countries. FDI had positive and statistically significant impact on economic growth in middle income African countries but not in low income countries. Aye and Jin-Sang (2015) concluded that while foreign aid has a strong positive impact on economic growth in low-income African countries, it is the FDI inflow that has resulted in a significant impact on economic growth for middle-income African countries. The probable explanation is perhaps that low-income countries have few options of financial resources. This eventually enables them to create a better macro-economic management system and also to utilise foreign aid in a very efficient way. Donors also give smaller amounts of aid to middle-income African countries than to low-income ones.

Aye and Jin-Sang (2015) further found that one percentage increase in the ratio of fixed capital formation to total GDP will increase economic growth by 12.4 per cent for middle-income and low-income African countries. Amakom (2012) confirms learning by exporting hypothesis in SSA. He recommends further investment in human resources and physical infrastructure as well as R&D to boost productivity. He also finds that if a country has a larger home market for a product, it will be a net exporter of the product thereby confirming New Trade Theory by Krugman (1980).

It has been found that export-led growth requires laggard countries to reduce the technological gap with respect to more advanced ones by undertaking R&D, and acquiring technological skills from advanced countries (Gabriel *et al*., 2014; Castellacci, 2010). However, the innovation gap between the rich and poor has not reduced, in fact it might be increasing (Castellacci, 2010). It has also been found that domestic R&D and human capital stocks are critical for foreign technology adoption (Castellacci, 2010; Crespo *et al*., 2004). Richer countries are more successful in taking advantage of international technology spillovers (Crespo *et al*., 2004). Weak learning, application and production effort of African countries have been exerted so far to imitate technologies from advanced countries thereby making equilibrium technological gap to widen (Gebrerufael, 2020). This means that economic growth potential that arises from production of less complex commodities in Africa can worsen international development differential as long as the technological gap exists.

Lee *et al*. (1988) found that US uses land and capital-intensive production technologies in agriculture to compete with agricultural foreign goods thereby dismissing the Leontief Paradox.

The findings are also consistent with comparative advantage theory by Heckscher (1950) and Ohlin (1950) as US agricultural production is relatively more land and capital abundant than other trading nations, and the US exports crops that best utilise this abundance. Similar results were found by Kwok and Yu (2005), and Leamer (1980).

Broda & Tille (2003), using vector autoregression technique and data from 1973 to 1998 for seventy-five developing countries in Africa, Latin America, Asia, and Eastern Europe found that terms of trade volatility are cushioned by flexible exchange rate regime. They observed that output effects of a 10 percent decline in export prices in seventy-five developing countries with differing exchange rate regimes, real GDP was almost unaffected in countries with a flexible exchange rate while it dropped by about 2 percent in countries with a fixed exchange rate. These results provide strong support for the theory that a flexible exchange rate can help to insulate an economy against fluctuations in export and import prices.

Cremers & Sen (2009) found that there is always foreign aid transfer paradox whereby a donor's terms of trade improves thereby improving the donor country's welfare while recipient's improvement in terms of trade depends on whether the terms of trade are static or intertemporal. The international transfer deteriorates static terms of trade of a recipient, however intertemporal terms of trade of the recipient country will improve thereby improving its welfare. Di Pace *et al.* (2020) found that export price shocks are, on average, twice more important than import price shocks for domestic business cycles and its components, and that global economic shocks have impact on the terms of trade. The larger, the commodity export share, the larger the effect of export price shocks on business cycle variables.

The effect of foreign aid following the Big Push theory has attracted research that has at best brought interesting results. Assessing the impact of foreign aid on economic growth in Nigeria using ARDL model and data from 1980 to 2018, Adebayo & Beton (2020) found a negative and significant relationship between external aid and economic growth. Ilorah & Ngwakwe (2021) assessed the relationship between external aid and economic growth in five SSA countries using fixed effects panel multiple regression model. In their first analysis, Ilorah & Ngwakwe (2021) found a negative link between external aid and GDP per capita in sub-Saharan Africa. In their second analysis with governance moderating variables, they found a positive relationship between foreign aid and GDP with rule of law providing a positive boost to foreign aid and GDP growth,

but corruption and governance had a negative relationship with economic growth. They highlighted policy implications for the need to reduce corruption, and to strengthen governance institutions to enable foreign aid to function effectively towards economic growth.

Using fixed effects model and OLS with robust standard errors, and using data from 1985 to 2018 for 37 developing countries, Khan and Feng (2021) found that foreign aid had a positive influence on economic growth of all countries under study. However, when they examined the relationship based on the income blocks, results indicated a mixed outcome. They found that foreign aid had limited effect on low income countries while the lower-middle income countries experienced a positive effect of foreign aid on economic growth. This shows that effectiveness of foreign aid depends on level of economic development of a country. Using ARDL and data from 1980 to 2014 for Cambodia, Sothan (2018) found that foreign aid had a positive effect on economic growth in short term only. In the long term, foreign aid had a negative influence on economic growth. He concluded that it is deleterious on economic growth to depend on foreign aid for a longer period.

Using ARDL and data from 1996 to 2017 for 16 West African countries, Babalola and Shittu (2020) found that external aid had no effect on economic growth of recipient countries. When they imputed institutional variables into the model, the outcome changed to a negative result. They concluded that the change showed the devastating effect that institutions in SSA can have on external aid received into the region for development. Using ARDL model, and using data from 1980 to 2021 for Afghanistan, Fazlly (2024) found that there was positive and significant relationship between net official development assistance and economic growth in Afghanistan both in short and long run. He found that a 1 percent increase in net official development assistance in Afghanistan enhanced economic growth by 0.10 percent in the short-run and by 0.14 percent in the long-run.

Kang *et al.* (2010) used heterogenous panel vector autoregression model and data from 1960 to 2002 for 55 countries to study dynamic response of exports, imports, and per capita GDP growth to a global aid shock (the common component of individual country aid to GDP ratios). They found that responses of exports and per capita GDP to a global aid shock were strongly positively correlated, and both responses were inversely related to exchange rate overvaluation. Similar results were found by Munemo *et al.* (2007), and Rajan and Subrimanian (2009). This suggests that the channel for these effects is the real exchange rate appreciation caused by aid inflows

thereby confirming the Dutch disease. In particular, Rajan and Subrimanian (2009), and Munemo *et al.* (2007) observe that those countries that receive more aid and have manufacturing industries that export more, and are likely to be affected by an appreciating exchange rate, grow slower than manufacturing industries that typically export less. This shows that exchange rate policy should be an important area of focus to try to contain contagion from Dutch disease in response to aid inflows. This also suggests that the extent to which aid is spent on imported goods as opposed to domestically produced goods may explain what permits some countries to avoid Dutch disease (Kang *et al.,* 2010).

Good economic policies have also been found to have a positive impact on exports (Ojeaga, 2012). On the contrary, economic policies decreased aid effectiveness in promoting trade in Africa (Ojeaga, 2012). This is in line with past findings that aid will be effective in the presence of good policies (Burnside & Dollar, 2004). The presence of natural resources exerted a reduced effect on exports across all sectors, reducing aid effectiveness across sectors implying that diversifying economy in many African countries should be a strong concern to governments (Ojeaga, 2012). Ogbonna *et al.* (2021) used system GMM estimation technique and data from 2010 to 2018 for forty-two African countries to estimate effects of foreign aid on economic growth in Africa. They found that foreign aid had a negative and significant effect on economic growth in Africa. They also found that such negative effects could be moderated by strengthening quality of institutions in the continent. Further, they found that trade openness, human and physical capital accumulation, and initial real GDP per capita were robust drivers of growth in Africa.

Jena and Seth (2020) used FMOLS and PDOLS to examine effectiveness of foreign aid in improving economic growth prospects in SSA region from 1993 to 2017. They found that foreign aid had a positive and significant effect on economic growth in SSA countries. Other variables that had significant and positive income on economic growth were investment, financial deepening, price stability, and trade openness. Kirikkaleli *et al.* (2021) used ARDL, FMOLS, and dynamic OLS, and data from 1982 to 2018 to explore the nexus between foreign aid and Chad's economic growth. They found that foreign aid had insignificant effect on growth and suggested that high administrative costs could be a significant factor, therefore there was a need for the cost of administration to reduce. They also found that gross capital formation did not influence GDP growth in Chad. Using feasible GLS, and data from 1990 to 2017 for 29 SSA countries, Anetor *et*

al. (2020) found that foreign aid and foreign direct investment had negative impact on poverty reduction. The results suggested that foreign direct investment required to alleviate poverty had not been reached, and that foreign aid had not been properly channelled.

Disaggregating aid by type and sectoral destination is crucial for understanding the effects of aid. When aid is disaggregated, the effect of the types of aid mostly have positive impact on exports (Ojeaga, 2012). Bilateral aid, multilateral aid, aid to trade and infrastructure areas, aid to education have positive and significant impact on exports (Ojeaga, 2014; Ojeaga, 2012; Velde & Cali, 2009; Morrisey *et al.,* 2004). Using gravity model and data from 2002 to 2012 for 50 African countries, Lemi (2017) finds that Aid for Trade (AfT) from OECD countries has increased Africa's imports from and exports to OECD countries. Chinese AfT has played only a limited role in influencing Africa's trade flows particularly Africa's exports to China. He also finds that OECD aid for trade to education and training increases Africa's exports to OECD countries. Further, the results show that flows of OECD aid to all sectors and economic infrastructure have increased both Africa's imports from and exports to OECD countries. These results suggest the importance of directing aid to the right sectors and promoting sound economic policies by recipient countries. Shaibu and Shaibu (2022) found that foreign aid had a positive and significant effect on agricultural productivity and growth. However, multilateral aid had a stronger positive and significant effect on agricultural productivity and growth. This shows that disaggregating aid can have stronger effect than total aid.

Ugwuegbe *et al.* (2016) used OLS multiple regression model and data from 1980 to 2013 to examine the effect of external borrowing and foreign aid on the growth of Nigerian economy. They found that grants had a positive and statistically significant impact on economic growth in the short run but became statistically insignificant in the long run. Neanidis (2012) used GMM and data from 1973 to 2007 to examine the effect of humanitarian aid on fertility and economic growth in recipient countries. He found that humanitarian aid had no impact on economic growth citing as a reason that humanitarian aid influences the probability of survival to adulthood, health in childhood, and the time that adults allocate to childrearing, giving rise to an ambiguous effect on economic growth. Using system GMM and data from 1990 to 2004 for 38 SSA countries, Asiedu (2014) found that aid in primary education had a positive and significant effect on growth while aid in post-primary education had an adverse effect or at best no significant impact on growth.

Aljonaid *et al.* (2022) used seemingly unrelated regression framework (SUR), and data from 1996 to 2017 for 37 SSA and MENA recipient developing nations to investigate the effect of heterogeneous effects of sectorally allocated aid inflows on their corresponding growth sectors (industry, agriculture and services). They found that aid allocated to agricultural sector had a strong positive impact on agricultural growth thereby helping to boost overall growth while aid allocated to service and industrial growth sectors tended to minimise the net benefits of total aid on growth.

Using dynamic common correlated effect estimator, and data from 1970 to 2018 for African countries, Gyimah & Gentry (2020) found that agricultural aid had positive and statistically significant positive effects on agricultural output in Africa, and that composition of aid mattered for aid effectiveness. Gnangnon (2020) used system GMM and data from 2002 to 2014 for 100 recipient countries of which 31 were LDCs to examine the effect of AfT on services export diversification in recipient countries. He found that total aid for trade flows exerted a positive effect on services export diversification with magnitude of positive effect being higher for less advanced countries such as LDCs than for relatively advanced economies. However, the components of aid for trade namely aid for trade for services, and aid for trade for non-services sectors exerted a higher positive effect on services diversification in less advanced countries, notably LDCs than in relatively advanced countries.

Going beyond examining exports to examine types of exports such as manufactured exports or agricultural exports can inform policy makers and donors to which sectors foreign aid should be allocated in order to increase exports and export earnings. Using neoclassical dynamic general equilibrium model and data from 1981 to 2000 for 73 aid dependent countries globally, Arellano (2005) studied relationship between foreign aid and manufactured exports. They found a negative relationship between foreign aid and manufactured exports. Countries receiving additional aid equivalent to 1 percentage point of GDP compared to the mean had manufactured exports lower by 2/5 to 1 percentage point of total exports. They also found that endowment and transaction costs were relevant variables for determining exports citing densely populated countries and those with lower transaction costs as having higher share of manufactured exports in total exports. Further, aggregate investment and volatility of terms of trade shocks were found to be negatively related to manufactured exports.

Ojeaga (2014) used GLS and instrumental variables with random effects, and data from 1970 to 2008 for five African countries to examine the impact of foreign aid on exports. He found that better economic policies had significant positive impact on exports while institutional quality did not have a significant effect on exports. Natural resources had a significant negative effect on exports. This suggests that reliance on natural resources has not fueled export growth in these countries. He also found that as income levels increase, aid has more of a positive impact on exports. This is logical as at very low-income levels aid may be spent more on fulfilling basic needs rather than investment in export-capable operations.

Ojeaga (2014) further found that good economic policy and aid may be substitutes. Natural resources and aid make each other more effective, that is, they are complements. The presence of natural resources has a positive impact on the amount of foreign aid received. Infrastructure is particularly important in natural resource extraction, so it is not surprising that natural resources would lead to more infrastructure aid. Multilateral donors may view natural resources as an aid project with a more direct, certain payoff. Bilateral donors may have a strategic interest in funding aid going to natural resource-based projects.

Masunda (2020) used GMM and data from 2005 to 2015 for 42 SSA countries to measure the effect of AfT on export diversification. He found that aid for trade mainly aimed at enhancing productive capacity had positive and statistically significant effect on export diversification. Using two-step GMM and data from 2002 to 2018 for 90 developing countries to examine the effect of development aid particularly the impact of AfT component on export resilience, Gnangnon (2022) found that total aid flows including both aid for trade flows and non-aid for trade flows exerted a positive effect on export resilience. Among aid for trade components, aid for trade for productive capacities appeared to exert greater effect upon export resilience than aid for trade for economic infrastructure, and aid for trade for trade policy and regulation. In addition, development aid, regardless of which aid variable is considered, exerted the greatest positive effect upon export resilience in countries such as LDCs that have the lowest productive capacities. He recommended that donor countries should give higher development aid flows, in particular, aid for trade, to countries such as LDCs that have low productive capacities.

Aye and Jin-Sang (2015) found that openness had a positive and statistically significant impact on economic growth in middle income countries but not in low income countries. This implies that

openness to trade can enhance productivity by enabling more efficient allocation of resources, by providing greater opportunities to exploit economies of scale, and by exposing the domestic economy to greater competitive pressures. They also found that infrastructure was a crucial factor in speeding up economic growth only in middle-income African countries, whereas no significant evidence was found in low-income African countries due to the fact that infrastructural development was still at the infant stage in such countries.

2.4 Conclusion

This Chapter discussed trade theories that brought insight into how international trade improves economies of countries. The comparative advantage theory by Ricardo (1817) demonstrated how trade volume could increase between two countries. According to Ricardo (1817), each country should concentrate on producing and exporting goods whose factors of production are in abundance, and import goods whose factors of production are scarce. A labour abundant country would therefore produce and export labour intensive goods and import capital intensive goods.

Heckscher (1919) and Ohlin (1933) defined factor abundance in terms of factor combinations and prices. A country with lower capital labor ratio is said to be a labour abundant country and should produce and export labour intensive goods and import capital intensive goods. Similarly, a country with a lower wage rate is said to be labour abundant, and therefore produces and exports labour intensive goods. However, applicability of the theories comes into question especially nowadays when comparative advantage can be created. A labour intensive country can formulate policies that attract foreign direct investment which bring in more capital thereby producing and exporting capital intensive goods.

Samuelson (1948) came up with factor equalization theory whereby salaries and return on capital in developing countries with open economies are destined to catch up with levels in developed countries, at least in the long run. Therefore, factors of production especially labour does not need to go to developed countries to benefit from higher salaries. Krugman (1980), in his new trade theory, says that countries will tend to export those kinds of products for which they have relatively large domestic demand, that is, each country will be a net exporter of the class of goods in which it specialises. These trade theories emphasise on exporting manufactured goods. However, SSA countries have continued to export primary commodities that have faced many challenges at international market including low prices leading to deteriorating terms of trade of these countries

(Prebisch, 1950; Singer, 1950). Sapsford *et al.* (1992) however observed that the law of diminishing returns in the primary producing sectors, and the law of increasing returns in manufactures removes the necessity for an agricultural country to industrialise to enjoy fruits of technical progress in manufactures. Free play of international market forces will distribute the gains from technical progress of the industrial countries to the agricultural countries by turning the terms of trade to the favour of primary products and the primary product exporting countries.

On the other hand, SSA countries have received substantial amount of foreign aid but their economic situation has not improved. This follows theories that have put forward the importance of foreign aid in bringing the much-needed resources for importation of goods and services necessary for development of the countries. Such theories include Big PushTheory, Dual Gap Theory and others. Big Push Theory (Rosenstein-Rodin, 1943) states that foreign aid is crucial for industrialisation whereby capital in form of foreign aid and foreign direct investment is transferred from developed countries to developing countries to improve production of goods and services including manufactured exports. Dual Gap Theory (Chenery & Strout, 1966) states that there are two gaps namely savings-investment gap and import-export gap. Developing countries need foreign aid to fill savings-investment gap so that they can purchase imports of manufactured goods and natural resources which they cannot produce yet or do not have as natural endowments thereby filling import-export gap.

The Chapter also explores how SSA countries can promote manufactured exports by examining free trade and interventionist trade. Free trade allows market forces to dictate trade while interventionist trade involves intervention by the state to correct market failures. The chapter discusses the essence of adopting free trade on one hand, and interventionist trade on the other. Free trade has been blamed for deindustrialisation of the SSA countries due to competition that domestically produced goods face at international market. Countries are therefore urged to first adopt interventionist trade through the use of industrial policies, and where necessary adopt free trade gradually. Import substitution and export promotion are also discussed. Countries that have progressed in manufactured exports have followed such policies as import substitution that later translated into exporting part of the manufactured products though import substitution and export promotion can be done concurrently. The role of R&D in promoting manufacturing and manufactured exports has also been discussed. The state can promote R&D, and attract technical

skills where there is shortage through policies that encourage immigration of personnel with such skills. Amsden and Tschang (2003) illustrate the role that Singaporean government played in promoting R&D in the country. The government attracted multinationals through financial incentives such as subsidies and tax benefits. Singapore also suffered from a shortage of high-level research personnel. The government therefore adopted liberal immigration laws to attract foreign skilled technical personnel.

The Chapter has also looked at empirical evidence of various theories that have been discussed in the theoretical literature. Bigsten *et al*, 2002 and Trefler, 1993 confirmed Heckscher-OhlinTheory, that is, differences in production factor abundance explain unit production factor prices. Countries that are labour abundant have lower labour prices and export labour intensive manufactures. FDI has also positively influenced economic growth (Ngundu & Ngepah, 2019; Romer, 1986). On terms of trade, flexible exchange rate has been found to cushion volatility of terms of trade (Broda & Tille, 2003). These results provide strong support for the theory that a flexible exchange rate can help to insulate an economy against fluctuations in export and import prices. The share of commodity exports also matters as the larger the share, the larger the effect of export price shocks on business cycle variables (Di Pace *et al.*, 2020).

On the other hand, foreign aid has been found to have positive impact on exports thereby confirming Big Push and Dual Gap theories (Kang *et al.,* 2010). Other studies have found that foreign aid has negative impact on exports thereby dismissing Big Push and Dual Gap theories (Rajan & Subrimanian, 2009; Munemo *et al.,* 2007). Disaggregated aid by sectoral destination has been found to have varying impacts on exports. Bilateral aid, multilateral aid, aid to trade, and aid to education have been found to have positive and significant impact on exports (Lemi, 2017; Ojeaga, 2014; Ojeaga, 2012; Velde & Cali, 2009; Morrisey *et al.,* 2004). This shows that though total foreign aid might have a negative impact on exports, allocating foreign aid to certain sectors of the economy can have a positive impact on exports.

Going beyond examining exports to examine types of exports such as manufactured exports or agricultural exports can inform donors or policy makers to which sectors, foreign aid should be allocated to increase exports and export earnings. Arellano *et al.* (2005) found a negative relationship between total foreign aid and manufactured exports. This study however differs from the study by Arellano *et al.* (2005) since total aid has been disaggregated by sectoral allocation

and their impacts on manufactured exports have been assessed. Further, asymmetric effects of the disaggregated aid have been assessed.

Chapter 3

Methodology

3.1 Introduction

The study has used various methodologies to examine the impact of foreign aid on terms of trade and manufactured exports on one hand, and the impact of various types of foreign aid on manufactured exports on the other. Apart from foreign aid alongside its various types, terms of trade and manufactured exports, other variables have also been used mainly as control variables and they include real effective exchange rate, government expenditure, fixed capital, private sector credit, foreign direct investment, openness, real interest rate, and consumer price index. The study has used both pooled and panel data spanning 50 years from 1970 to 2019 for 30 SSA countries. Unit root tests namely Fisher Type and Augmented Fuller test have been conducted on panel and pooled data respectively to determine stationarity of the data. The study has used various models including ARDL, NARDL, Random Effects Model, Fixed Effects Model, and GLS. NARDL has been used to measure asymmetric effects of positive and negative changes of various types of foreign aid on manufactured exports.

3.2 Research Paradigm

Theory has cited foreign aid as having positive impact on the economy. Theories such as Big Push, Dual Gap, and Two State model have all supported foreign aid's ability to bring a difference to poor countries in terms of economic development. This study first examines whether foreign aid has a positive effect on terms of trade. Improvement in terms of trade would mean prices of exports of the countries have increased relative to prices of imports thereby dismissing Dependency Theory by Prebisch-Singer. One of the ways of improving export prices of these countries is to boost manufactured exports as manufactured exports fetch high prices at international market relative to prices of primary products (Prebisch, 1950; Singer, 1950). Therefore, after examining the impact of foreign aid on terms of trade, the study goes further by examining the impact of foreign aid on manufactured exports to confirm hypotheses that state that foreign aid has positive impact on the economies of these countries. Exports, especially manufactured exports, contribute to economic growth of countries. The study also disaggregates aid to find out whether various types of aid have positive impact on manufactured exports thereby confirming the foreign aid

theories. Further, the study examines asymmetric effects of the types of aid, that is, whether increase and decrease in the types of aid have different impacts on manufactured exports.

3.3 Sources of data and definition of variables

The study uses both pooled and panel data for SSA countries for the period 1970 to 2019. Sources of data are World Development Indicators (WDIs) and International Financial Statistics (IFS) of the IMF. Several variables are used in the study including manufactured exports, foreign aid, terms of trade, and a host of control variables. Definitions of the variables are presented below, and these definitions were mainly derived from World Bank Development Indicators.

Manufactured Exports (manuexp)

These are all manufactured products including machinery and equipment, chemicals, and other manufactured goods. Manufactured exports were collected as presented in the World Development Indicators, expressed as manufactures exports as a percentage of merchandise exports. This measure was used in studies by Sumiyati (2020) and Beecroft *et al.* (2020). In this study, manufactured exports are dependent variable.

Total Foreign Aid (foraid)

Foreign aid refers to international movement of money, services, or goods from governments or international institutions for the benefit of the receiving country and its citizens. Foreign aid was collected as presented in the World Development Indicators specifically named as net official aid received (current US$). In this study, the net official aid received is expressed as a percentage of gross domestic product. According to Big Push Theory (Rosenstein-Rodin,1943) and Dual Gap Theory (Chenery and Strout,1966), foreign aid is important for providing capital needed for infrastructure development and industrialisation. This is why foreign aid is one of the explanatory variables for manufactured exports. Several studies have also used foreign aid as explanatory variable (Anetor *et al.,* 2020; Sumiyati, 2020; Tsaurai, 2018).

Net Barter Terms of Trade (tot)

Net barter terms of trade index is calculated as ratio of the export unit value indexes to the import unit value indexes, measured relative to the base year, 2000. In the World Development Indicators, it is presented as net barter terms of trade index (2000=100). This study has included terms of trade

as a dependent variable when examining the impact of foreign aid on terms of trade. The variable has also been used as one of control variables when examining the impact of foreign aid on manufactured exports because of the influence of terms of trade on manufactured exports. Some studies used terms of trade as one of explanatory variables of economic growth (Jawaid & Raza, 2013; Broda 2004; Blattman et *al.*, 2003; Kose 2002; Bleaney & Greenaway 2001; Mendoza 1997). Net barter terms of trade were included since improvement in the terms of trade may mean prices of locally manufactured exports have increased which encourage producers to go into manufactured products part of which can be exported.

Grants (grants)

These are donated funds and other non-repayable receipts from other foreign governments, international organizations, and other foreign government units. In this study, grants were collected as presented in the World Development Indicators namely grants and other revenue (% of revenue). Grants were included because they are almost free resources which can be used in various sectors of the economy such as manufacturing which can lead to increase in manufactured products. Ugwuegbe *et al.* (2016) included grants as one of independent variables to examine the effect of external borrowing and foreign aid on economic growth in Nigeria.

Agricultural Aid (agriaid)

This is foreign aid allocated to agricultural sector to boost production of agricultural products. In this study, data was collected from World development Indicators and involved summing up aid from various institutions which promote agricultural activities in the countries. For instance, Net official flows from UN agencies such as FAO (current US$), and IFAD (current US$). Agricultural aid is expressed as a percentage of gross domestic product. Agricultural aid is included because it improves agricultural production which serves as a source of raw materials for manufacturing leading to increase in manufacturing. Shaibu and Shaibu (2022) examined the impact of foreign aid on agricultural productivity. Other studies have also examined the impact of agricultural aid on agricultural growth (Aljonaid *et al.,* 2022; Gyimah & Gentry, 2020).

Education Aid (eduaid)

This is foreign aid to the education sector to improve quality of education and increase school enrollment. Data was collected from World Development Indicators and involved addition of net

flows from international institutions such as UNCEF and ILO. Education aid is expressed as a percentage of gross domestic product. Education aid is included because it leads to improvement in human capital which is used in such sectors as manufacturing. Several studies have included education aid as one of disaggregated aid variables to find the impact of disaggregated aid on exports (Ojeaga, 2014; Asiedu, 2014; Ojeaga, 2012; Velde & Cali, 2009; Morrisey *et al.,* 2004).

Health Aid (healthaid)

This is foreign aid to health sector to improve health of people including improving health infrastructure. Data was collected from World Development Indicators and involved addition of net flows from international institutions such as WHO, UNAIDS, UNPFA and others. Health aid is expressed as a percentage of gross domestic product. Health aid is included because it improves health of workforce leading to increase in productivity in sectors such as manufacturing. Asaleye *et al.* (2023) used health aid as one of disaggregated aid to examine asymmetric and shock effects of foreign aid on economic growth and employment generation.

Humanitarian Aid (humaid)

This is foreign aid to support humanitarian relief efforts as a result of natural and man-made disasters. Data was collected from World Development Indicators and involved addition of net flows from international institutions such as WFP and UNHCR. Humanitarian aid was expressed as a percentage of gross domestic product. This type of aid has been included as it improves the health and welfare of the vulnerable some of whom work in manufacturing. Neanidis (2012) included humanitarian aid in his study on humanitarian aid, fertility and economic growth.

Real Effective Exchange Rate (exchrate)

Real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs. Data was collected from World Development Indicators presented as real effective exchange rate index (2010=100). Exchange rate is an important factor to include for determination of manufactured exports as depreciation makes goods cheaper in international markets (Sumiyati, 2020; Aye & Jin-Sang, 2015).

Government Expenditure (govexp)

Government expenditure is the sum of household final consumption expenditure (private consumption) and general government final consumption expenditure (general government consumption). In World Development Indicators, the variable is indicated as general government final consumption expenditure (% of GDP). Government expenditure has been included since it increases aggregate demand thereby stimulating domestically produced goods and services, part of which can be exported. Asiedu (2014) used government expenditure as one of control variables to examine the impact of foreign aid on economic growth in Nigeria.

Fixed Capital (fixedcap)

Fixed capital, also known as gross fixed capital formation, means all forms of infrastructure development including roads, schools etc. Data was collected from World Development Indicators presented as gross fixed capital formation (Current US$). In this study, fixed capital is expressed as a percentage of gross domestic product. Fixed capital is included as one of control variables as fixed capital is a proxy for infrastructure development. Better infrastructure enhances transportation of goods and services enabling easier transportation of raw materials on one hand, and domestic manufactured exports, on the other, leading to increase in manufactured exports. Several studies have included fixed capital as one of control variables to measure the impact of foreign aid on economic growth (Kirikkaleli *et al.,* 2021; Aye & Jin-Sang, 2015).

Private Sector Credit (pvtseccredit)

Domestic credit to private sector by banks refers to financial resources provided to the private sector by other depository corporations (deposit taking corporations except central banks), such as commercial banks through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries, these claims include credit to public enterprises. This is calculated as a percentage of gross domestic product. Private sector credit has been used as one of control variables because availability of private sector credit means that manufacturers can borrow to expand their production thereby increasing manufactured products.

Foreign Direct Investment (fdi)

Foreign direct investment refers to foreign inflows less foreign disinvestment, expressed as a percentage of GDP. Foreign direct investment was collected as presented in the World Development Indicators named as foreign direct investment, net inflows (% of GDP). Tsaurai (2018) used this variable as one of control variables in his study on complementarities between foreign aid and financial development as a driver of economic growth in selected emerging markets. Other studies include that of Beecroft *et al*. (2020), Anetor *et al.* (2020), and Cheung and Lin (2004). This study has also used this variable as control variable due to its importance in influencing manufacturing and manufactured exports in the destination country. FDI promotes exports by augmenting domestic capital for exports, transferring technology and new products for exports, facilitating access to new and large foreign markets, and providing training for the local workforce, and upgrading technology and management skills (Abor *et al.,* 2008). Foreign Direct investment is included because it brings to a country expertise, technology and capital crucial for manufacturing leading to increase in manufactured exports.

Openness (openness)

This is a ratio of the sum of exports and imports to the country's gross domestic product. Exports and imports data were collected from World Development Indicators, and the sum of them was expressed as a percentage of GDP. In the World development Indicators, the exports were presented as exports of goods and services (current US$) and imports were presented as imports of goods and services (current US$). Tsaurai (2018) used openness as one of independent variables to measure complementarity of foreign aid and financial development in influencing economic growth.

Ogbonna *et al.* (2021), and Jena and Seth (2020) also used openness as one of control variables to measure the impact of foreign aid on economic growth. This study will therefore use this variable as one of control variables. Openness is included since it means that the domestic industry is exposed to international market thereby increasing market for domestically produced goods and services. On the other hand, openness brings foreign competition to the domestic market stimulating demand for imports at the expense of domestically produced goods and services leading to lower manufactured exports.

Real Interest Rate (realint)

This is lending rate adjusted for inflation as measured by GDP deflator. In the World Development Indicators, it is presented as real interest rate (%). Thus, the study expects the upward movement of lending rate to have a negative effect on manufactured exports due to the fact that upward trends in lending rate (increase in lending rate) is associated with high cost of borrowing which tends to deter borrowing from banks to increase consumption and investment. However, downward movement in lending rate is expected to increase manufactured exports because it encourages borrowing since it is associated with low cost of borrowing thereby leading to increase in investment (Adabor, 2022). Real interest rate has been included as a control variable because increase in interest rates means cost of borrowing has increased which translates into lower borrowing by manufacturers leading to lower manufactured exports.

Consumer Price Index (cpi)

Consumer price index reflects changes in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. In World Development Indicators, consumer price index is presented as inflation, consumer prices. Various studies have used inflation as one of independent variables for manufactured exports and some studies have found positive impact while others have found a negative impact on manufactured exports (Uysal & Mohamoud, 2018; Modebe & Ezeaku, 2016; Mawufemor *et al*., 2016; Abidin et *al.*, 2013). This study will therefore use inflation as one of control variables. Inflation is very important in the modelling because it increases prices for raw materials for manufacturing which leads to increase in the price of manufactured goods.

3.4 Model Specification

Model specification starts with ARDL model, and then NARDL is run including F-Bounds Test. Asymmetry is tested using Wald Test. The empirical review in this study shows that several studies used ARDL to assess the impact of foreign aid on either exports or economic growth. Such studies include fazlly (2024), Kirikkaleli *et al.* (2021), Adebayo and Beton (2020), Babalola and Shittu (2020), and Sothan (2018). Another model used in studies which were reviewed under the empirical literature review was GMM. The studies include Gnangnon (2022), Ogbonna *et al.* (2021), Gnangnon (2020), Masunda (2020), Asiedu (2014), and Neanidis (2012). This study has chosen ARDL as opposed to GMM. The approach is preferred over GMM and other conventional

modeling methods because among other advantages, it effectively corrects for possible endogeneity of explanatory variables, and can avoid unit root pretesting as it can be applied regardless of whether the series are I(0) or I(1), and thus avoids uncertainties created by unit root testing (Kirikkaleli *et al.,* 2021). Further, the study intends to measure asymmetric effects of types of foreign aid, and that can easily be done by extending ARDL to NARDL.

Ojeaga (2014) used GLS and instrumental variables with random effects while Anetor *et al*. (2020) used feasible GLS. Most of the studies that were reviewed under empirical literature review also used other models mainly for robustness purposes. For instance, apart from ARDL, Kirikkaleli *et al.* (2021) used FMOLS and dynamic OLS. Other studies used fixed effects model (Ilorah & Ngwakwe, 2021; Khan & Feng , 2021), OLS with robust standard errors (Khan & Feng, 2021), and PDOLS (Jena & Seth, 2020). This study has also used most of these models including fixed effects, random effects, OLS with robust standard errors, and GLS.

3.4.1 ARDL Model

ARDL was proposed by Pesaran *et al.* (2001), and begins with the following equation:

$$y_{it} = \alpha_i + \sum_{l=1}^{p} \beta_0 y_{i,t-l} + \sum_{l=0}^{q} \beta_1 d_{i,t-l} + \sum_{l=0}^{q} \beta_2 x_{i,t-l} + \mu_{it} \qquad (1)$$

For total aid, y_{it} is manufactured exports as a percentage of GDP, and d_{it} is foreign aid as a percentage of GDP, and x_{it} is a vector of control variables. Null hypothesis is that foreign aid does not affect manufactured exports ($\beta=0$) against alternative hypothesis that foreign aid affects manufactured exports ($\beta \neq 0$). Once ARDL is run, results can be further analysed by transforming the equation so that short run and long run results can be displayed (Menyah, 2013).

For disaggregated foreign aid, y_{it} is manufactured exports as a percentage of GDP, and d_{it} is a vector of different types of foreign aid as percentages of GDP, and x_{it} is a vector of control variables. Null hypothesis is that each type of foreign aid does not affect manufactured exports ($\beta_{1i} = 0$) against alternative hypothesis that each type of foreign aid affects manufactured exports ($\beta_{1i} \neq 0$)

To measure the impact of foreign aid on manufactured exports in short and long run, F-Bounds hypothesis is used. As with most tests for cointegration, the objective is to test for the lack of cointegration, and long-run equilibrium relationship between variables. In the case of equation (2) below, the absence of a cointegrating relationship would be seen through zero-coefficients of long-

run components. Non-zero coefficients lead to a rejection of the null hypothesis, implying that there is sufficient evidence to conclude that the variables exhibit a long-run cointegrating relationship. Pesaran *et al*. (2001) provide bounds on the critical values based on the asymptotic F-distribution. The lower bound assumes that all variables in the model are I(0), while the upper bound assumes that they are I(1). If the test statistic calculated falls below the I(0) bound, the variables cannot be cointegrated as it can be concluded that the variables are I(0). If the test statistic is greater than the upper bound, it is concluded that the variables are I(1) and cointegrated. A test statistic between the bounds is inconclusive (Amaral & Breitenbach, 2021; Giles, 2013).

In short, to measure the impact of foreign aid in short and long run, equation (1) is reproduced:

$$\Delta y_{it} = \alpha_i + \Phi_i\left(y_{i,t-1} - \theta_1 d_{i,t-1} - \theta_2 x_{i,t-1}\right) + \sum_{l=1}^{p-1} \lambda_{il} \Delta y_{i,t-l} + \sum_{l==0}^{q-1} \lambda'_{il} \Delta d_{i,t-l} + \sum_{l=0}^{q-1} \lambda''_{il} \Delta x_{i,t-l} + \mu_{it} \quad (2)$$

where Φ_i is rate of adjustment from short run to long run.

For total aid, short run null hypothesis is foreign aid does not affect manufactured exports in the short run ($\lambda = 0$) against alternative hypothesis that foreign aid affects manufactured exports in the short run ($\lambda \neq 0$). Similarly, the long run null hypothesis is that foreign aid does not affect manufactured exports in the long run ($\theta = 0$) against alternative hypothesis that foreign aid affects manufactured exports in the long run ($\theta \neq 0$).

For disaggregated foreign aid, short run null hypothesis is each type of foreign aid does not affect manufactured exports in the short run ($\lambda = 0$) against alternative hypothesis that each type of foreign aid affects manufactured exports in the short run ($\lambda \neq 0$). Similarly, long run null hypothesis is that each type of foreign aid does not affect manufactured exports in the long run ($\theta = 0$) against alternative hypothesis that each type of foreign aid affects manufactured exports in the long run ($\theta \neq 0$).

However, the ARDL approach does not consider the possible asymmetric link among the variables. In other words, it assumes implicitly that positive and negative variations of the explanatory variables have the same effect on the dependent variable. This may not be a correct approach to study the relationship between variables as there may be asymmetric links between them (Asaleye *et al.,* 2023; Alimi *et al*., 2020).

The study has therefore used among other models, NARDL, following the methodology in Alimi *et al*. (2020), Sheikh *et al*. (2020), Shuaibu & Isah (2020), and Iman *et al*. (2019). NARDL allows for simultaneous modeling of asymmetric nonlinearity and cointegration among variables in a single equation framework, providing significant advantages over standard cointegration techniques. It is a dynamic error-correction representation which provides robust empirical results even for small sample sizes (Asaleye *et al*., 2023; Adabor, 2022).

NARDL is an extension of ARDL cointegration model proposed by Pesaran *et al.* (2001). ARDL does not consider the fact that positive and negative shocks of an independent variable can have varying impacts on an independent variable (Asaleye *et al*., 2023). On the other hand, NARDL does not only detect the existence of asymmetric effects that independent variable may have on a dependent variable, but also permits testing for cointegration in a single equation framework. The model is flexible as it does not require all variables to have the same order of integration, that is, the variables can be integrated of order one or not integrated, that is a mixture of I(0) and I(1) but not I (2). There is a possibility of testing for hidden cointegration, avoiding to omit any relationship which is not visible in conventional linear setting, and has a better performance in small samples. It also permits differentiating among linear cointegration, nonlinear cointegration and lack of cointegration (Alimi *et al*., 2020; Sheikh *et al*., 2020).

3.4.2 NARDL Model: Asymmetry Test

Nonlinear version of ARDL (NARDL) is used to allow asymmetric relationships (Shin *et al.* (2014). Asymmetric long-run estimation requires a decomposition of an independent variable into its positive and negative sub-variables, which define (d+) and (d−) as partial sums of positive and negative changes in the variable (Sheikh *et al*., 2020; Shuaibu & Isah, 2020).

To assess asymmetry effects, equation (2) is reproduced:

$$\Delta y_{it} = \alpha_i + \Phi_i\left(y_{i,t-l} - \theta_1 d^{+}_{i,t-l} - \theta_2 d^{-}_{i,t-l} - \theta_3 x_{i,t-l}\right) + \sum_{l=1}^{p-1} \lambda_1 \Delta y_{i,t-l} + \sum_{l=0}^{q-1}\left(\lambda_2 \Delta d^{+}_{i,t-l} + \lambda_3 \Delta d^{-}_{i,t-l}\right) + \sum_{l=0}^{q-1} \lambda_4 \Delta x_{i,t-l} + u_{it} \quad (3)$$

Here, each type of foreign aid is decomposed into its positive and negative sub-variables, which define (d+) and (d−) as partial sums of positive and negative changes in the different types of foreign aid.

Where

$$d^{-}_{i,t} = \sum_{j=1}^{t} \Delta d^{-}_{ij} = \sum_{j=1}^{t} max\left(\Delta d_{ij}, 0\right) \text{ and } d^{+}_{i,t} = \sum_{j=1}^{t} \Delta d^{+}_{ij} = \sum_{j=1}^{t} max\left(\Delta d_{ij}, 0.\right)$$

By reparametrising equation (3), we obtain:

$$\Delta y_{it} = \alpha_i + \Phi_i\left(y_{i,t-l} - \theta_1 d^{+}_{i,t-l} - \theta_2 d^{-}_{i,t-l} - \theta_3 x_{i,t-l}\right) + \sum_{l=1}^{p-1} \lambda_1 \Delta y_{i,t-l} + \sum_{l=0}^{q-1}\left(\lambda_2 \Delta d^{+}_{i,t-l} + \lambda_3 \Delta d^{-}_{i,t-l}\right) + \sum_{l=0}^{q-1} \lambda_4 \Delta x_{i,t-l} + u_{it} \quad (4)$$

3.4.3 GLS using Random and Fixed Effects Models

The study has also used GLS method to analyse pooled data following studies by Majid & Maulana (2012) and Droms & Walker (1996). This method has been mainly used to examine the effect of total foreign aid on terms of trade (Chapter 4). The model starts with the following equation:

$$Y_{it} = \alpha + \beta_1 X_{it} + \beta_2 Z_{it} + u_{it} \quad (5)$$

Where Y represents terms of trade, X represents total foreign aid, Z represents a set of control variables and u is error term while i stands for ith cross sectional unit and t for time period. Despite substantial advantages, panel data has several shortfalls associated with both cross-sectional data such as heteroscedasticity, and times series data such as autocorrelation. These problems need to be addressed and there are several techniques to address them. Two of them are fixed effects model and random effects model which can lead to GLS.

The fixed effects model is represented by rewriting equation (5)

$$Y_{it} = \alpha_i + \beta_1 X_{it} + \beta_2 Z_{it} + u_{it.} \quad (6)$$

where subscript i on the intercept suggests that intercepts of individual equations may be different. The differences may be due to special characteristics of each country such as natural endowments.

The fixed effects model is ideal in circumstances where individual specific intercept may be correlated with one or more exogenous variables. An alternative to fixed effects model is random effects model which assumes that the intercept of an individual equation is randomly drawn from larger population with a constant mean. The individual intercept is then expressed as a deviation from this constant mean. The random effect model is ideal in circumstances where the (random) intercept of each cross-sectional unit is uncorrelated with exogenous variables.

The random effects model is represented by rewriting equation (5)

$$Y_{it} = \alpha + \beta_1 X_{it} + \beta_2 Z_{it} + \varepsilon_i + u_{it.} \quad (7)$$

$$= \alpha + \beta_1 X_{it} + \beta_2 Z_{it} + w_{it} \quad (8)$$

where $w_{it} = \varepsilon_{it} + u_{it}$

The composite error term w_{it} consists of two components, ε_{it}, which is the cross section, or individual-specific error component, and u_{it}, which is the combined time series and cross-section error component. Hausman test is used to find the better of the two models. It tests the null hypothesis that coefficients estimated using random effects model are the same as the ones estimated by fixed effects model. Thus, the null hypothesis is that random effects model is appropriate while the alternative hypothesis is that fixed effects model is appropriate. Once the better model has been chosen, tests for heteroscedasticity and autocorrelation are carried out. If they are not present, then results of the chosen model are unbiased and can be relied upon. If they are present, then GLS should be carried out (Majid & Maulana, 2012).

Diagnostic Tests

The study has used diagnostic tests such as normality test, Breusch Godfrey Test for autocorrelation, Breusch-Pagan-Godfrey test for heteroscedasticity, and CUSUM and CUSUM Squares tests for model stability.

Normality Test

Jaque-Bera test shows histogram, skenewness, kurtosis, test statistic and p-value. If the histogram is bell shaped and p-value is more than 5 percent, then the data is normally distributed. Jaque-Bera test statistic can be computed using the following:

$$JB=n\ [S\ 2/6+\ (K-3)2/24] \quad (9)$$

where, n= sample size, s= skewness coefficient and k= kurtosis coefficient. If s=0 and k=3, then the value of the J-B statistic is expected to be 0 reflecting normality of the data.

Test for Autocorrelation Breusch Godfrey Test

Tool & Islam (2019) describe Breusch Godfrey Test of autocorrelation as the most widely used LM test to check for autocorrelation. This likelihood based LM type test is one of the most appropriate tests to check for the presence of autocorrelation in dynamic models. The test follows the usual mechanics of any LM test:

$$y_t = \alpha y_{t-1} + \beta x_t + u_t \quad (10)$$

with a suspected autoregressive scheme of order 1

$$ut = \rho_1 u_{t-1} + \varepsilon_t \quad (11)$$

The model could be rewritten as

$$y_t = \alpha y_{t-1} + \beta xt + \rho_1 u_{t-1} + \varepsilon_t \quad (12)$$

This formation of the model is termed as unrestricted model, because of the fact that ρ can take any value without restriction, as a result, the error term can be dependent (autocorrelated) or independent with ρ being 0 in the latter case. Null Hypothesis for the test is that there is no autocorrelation, and alternative hypothesis is that there is autocorrelation.

Breusch-Pagan-Godfrey test for heteroscedasticity

Uddin *et al*. (2015) present a formula for Breusch-Pagan-Godfrey test as follows:

$$X^2=N*R^2 \sim \text{asy } X^2\ (s-1) \quad (13)$$

where X^2 shows chi-square distribution with (s-1) degrees of freedom. Null hypothesis is that there is no heteroscedasticity while alternative hypothesis is that there is heteroscedasticity.

Stability Test -CUSUM and CUSUMSQ Tests

Cumulative sum (CUSUM) test identifies systematic changes in the regression coefficients, while the cumulative sum of squares (CUSUMSQ) test detects sudden changes from the constancy of the regression coefficients. There is Absence of any instability of the coefficients if plots of CUSUM and CUSUMSQ statistics fall inside critical bands of 5 per cent confidence intervals of parameter stability.

3.5 Unit Root Test

Preliminary analysis includes checking whether the data series are stationary or have unit roots. If they have unit roots, the results of all standard estimation techniques could be invalid and any conclusions could be misleading. Thus, they should be differentiated unless they are cointegrated. To do that, the study uses Im, Pesaran and Shin (2003). The method uses ADF statistics computed for each cross-section unit in the panel using the following equation:

$$\Delta y_{it} = \alpha_{0i} + \rho_i y_{it-1} + \sum_{j=1}^{p_i} \varphi_{ij} \Delta y_{it-j} + \varepsilon_{it} \tag{14}$$

where, as usual, i =1, 2,..., N, t =1, 2,..., T, and defines a t-bar statistic as a simple average of the simple ADF statistics,

$$\bar{t} = \frac{1}{N} \sum_{i=1}^{N} t_{iT} \tag{15}$$

The t-statistic and p-value for the levels and differences of the data are used to assess statistical significance of the data. As usual, statistical significance is tested at 5% level. If they are non-stationary in levels, then stationarity should be tested in differences.

3.5.1 Stationarity Tests

Unit root tests are carried out to determine stationarity of the variables (Table 1). All variables are found to be stationary of order 0 and 1 in both pooled and panel data. This means that ARDL model can be run on both types of data. NARDL model can also be run.

Table 1: Stationarity Tests

Variable	Panel Data (Fisher Type)		Pooled Data (Augmented Dickey Fuller Test)	
Variable	t-Statistic	Order of Integration	t-Statistic	Order of Integration
manuexp	-9.9300***	I (0)	-2.2051	-
			-9.2592***	I (1)
foraid	-10.4534***	I (0)	-1.7938	-
			-5.9756***	I (1)
grants	-12.0168***	I (0)	-2.204	-
			-6.113***	I (1)
agriaid	-11.7865***	I (0)	-2.526	-
			-7.353***	I (1)
eduaid	-6.9213***	I (0)	-1.742	-
			-3.763***	I (1)
healthaid	-10.4182***	I (0)	-4.895***	I (0)
humaid	-12.7086	I (0)	-2.294	-
			-4.500***	I (1)
tot	-8.266***	I (0)	-5.4121***	I (0)
exchrate	2.8791	-	1.4688	-
	-16.207***	I (1)	-5.8310***	I (1)
govexp	-10.057***	I (0)	-3.2937**	I (0)
fixedcap	-11.033***	I (0)	-3.2434**	I (0)
pvtseccredit	45.1414	-	42.5492	-
	-19.2703***	I (1)	-16.5968***	I (1)
fdi	-0.711***	I (0)	-1.1097	-
			-11.6877***	I (1)
openness	-10.781***	I (0)	-2.1088	-
realint	-11.5131***	I (0)		
cpi	-12.8026***	I (0)		

Note: ***, $p < 0.01$; **, $p < 0.05$

3.6 Conclusion

This chapter has described how the study will analyse data using models such as ARDL, NARDL, fixed effects model, random effects model, and GLS. ARDL, proposed by Pesaran *et al.* (2001), corrects for possible endogeneity, and can be applied regardless of whether the series are I(0) or I(1) thereby avoiding uncertainties created by unit root testing. NARDL, which is nonlinear version of ARDL is used to test asymmetric relationships (Shin *et al.,* 2014). Decomposition of independent variables into positive and negative changes enables asymmetric tests to be carried out using Wald test.

GLS method that makes use of fixed and random effects models has been used to take care of heteroscedasticity and autocorrelation associated with panel data. Diagnostic tests have also been discussed. The tests include Jaque-Bera test to test normality of data, Breusch Godfrey Test to test autocorrelation, and Breusch-Pagan-Godfrey test to test heteroscedasticity. CUSUM and CUSUMSQ tests for stability of parameters have also been discussed. Stationarity of data has been tested using Fisher type test for panel data, and Dickey Fuller test for pooled data. All variables are either I(0) or I(1) making them suitable for various models used in the study including ARDL and NARDL.

Chapter 4

Impact of Total Foreign Aid on Terms of Trade

4.1 Introduction

This study aims at finding out the impact of foreign aid on terms of trade in SSA countries. The countries mainly export primary products and import manufactured products. According to Prebisch-Singer Theory, terms of trade of the countries deteriorate since prices of primary commodities tend to decrease overtime relative to prices of manufactured goods. This study therefore examines the impact of foreign aid on terms of trade. The study is expected to find out whether foreign aid reverses the Prebisch-Singer Hypothesis or not. The study also attempts to confirm foreign aid theories such as Big Push Theory and Dual Gap Theory. Improvement of the terms of trade would mean that either foreign aid contributes to increase in the price of primary products exports relative to manufactured exports, or foreign aid boosts manufactured exports which fetch relatively higher prices at international markets.

4.2 Variables and Expected Signs

Big Push Theory (Rosenstein-Rodin, 1943) states that foreign aid provides resources necessary for social and economic development of resource poor countries. Dual Gap theory (Chenery & Strout, 1966) says that foreign aid plays a role in filling resource gaps in a resource constrained country leading to economic development of the countries. Cremers and Sen (2009) found that foreign aid can either have a positive or negative impact on terms of trade depending on whether the terms of trade are static or intertemporal. The sign of foreign aid is therefore expected to be either positive or negative. Government expenditure is expected to have a positive impact on terms of trade as such it is expected to have a positive sign. Fixed capital, a proxy for infrastructure development, is expected to have positive impact on terms of trade. FDI brings new technology, human capital development and technical know-how into the host country, all of which have a positive impact on economic growth (Ngundu & Ngepah, 2019; Romer, 1986). This study therefore expects FDI to have a positive impact on terms of trade.

Openness exposes domestic industry to international markets thereby bringing foreign exchange at the same time, the country is able to purchase inputs, implements and other machinery necessary

for production of goods and services leading to economic growth. On the other hand, openness exposes an economy to economic shocks which impact terms of trade negatively including economic growth (Baltagi *et al.*, 2009). Openness is therefore expected to affect terms of trade either positively or negatively. High interest rates encourage savings and according to McKinnon (1973), economic growth increases if savings are channelled towards productive sectors of the economy, otherwise high interest rates discourage investment leading to decrease in economic growth. Low interest rates enhance investment as investors access cheap funds, hence interest rate is expected to have positive or negative effect on terms of trade. High inflation rates affect the economy negatively while moderate inflation rates affect the economy positively (Mallik & Chowdhury, 2001), hence inflation rate is expected to have positive or negative effect on terms of trade. Table 2 shows a summary of expected signs of variables, and sources of data for each variable.

Table 2: Variables and Expected Signs

Variable	Acronym	Expected Sign	Sources of Data
Terms of trade	tot		World Development Indicators
Foreign Aid	foraid	+/-	World Development Indicators, International Financial Statistics
Government expenditure	govexp	+	World Development Indicators, International Financial Statistics
Fixed capital	fixedcap	+	World Development Indicators, International Financial Statistics
Foreign direct investment	fdi	+	World Development Indicators
Openness	openness	+/-	World Development Indicators, International Financial Statistics
Real interest rate	realint	+/-	World Development Indicators, International Financial Statistics

Consumer price index	cpi	+/-	World Development Indicators

Source: Author's compilation

4.3 Results

Results comprise descriptive statistics, correlation and regression analysis. Descriptive statistics gives impression of central tendency and dispersion of the data while correlation shows statistical relationships between variables. Correlation may also give a preview of how regression results will come out especially in terms of signs and size of coefficients, and significant levels. Regression analysis in this study involves analysis of data using various regression models such as fixed effects model, random effects model, OLS with robust standard errors, and GLS.

4.3.1 Descriptive Statistics

Table 3 shows descriptive statistics for pooled data from 1970 to 2019 for SSA countries. The mean of terms of trade over the years is 125.6. This means that the region has been, on average, able to export its goods and services at higher prices than the price of imports. The median of 132.733 also shows that the countries have been having terms of trade of over 100 which is good for the region when it comes to generating resources out of international trade. However, the minimum terms of trade of 94.344 shows that the performance has not always been good over the years. On the other hand, the region has been receiving foreign aid on average 3.5 percent of gross domestic product over the years with the maximum at 6.2 percent of GDP, and the lowest at 1.9 percent of GDP of this region. As has always been stated, this aid has not brought tangible development to this region (Moyo, 2009).

On skewness, terms of trade have a skewness of -0.652 which is less than a normal skewness of 0, meaning that there are more lower values than the sample mean. Jarque-Bera Statistic shows the probability of 0.059 thereby failing to reject the null hypothesis that the terms of trade variable is normally distributed at 5 percent level of significance. This means that terms of trade variable is normally distributed. As for Kurtosis which measures flatness of the distribution of series, it is 1.991 which is lower than the value of 3, therefore terms of trade series has a flat surface.

Table 3: Descriptive Statistics

	tot	foraid	govexp	fixedcap	fdi	openness	realint	cpi
Mean	125.578	3.531	72.961	27.628	1.453	60.482	6.565	19.856
Median	132.733	3.234	75.186	25.493	1.281	59.609	6.751	13.090
Maximum	142.634	6.204	83.288	52.218	4.085	75.041	9.926	176.234
Minimum	94.344	1.860	45.821	19.914	0.069	49.376	2.125	2.903
Std. Dev.	15.255	1.122	9.291	8.433	1.002	6.575	1.958	28.262
Skewness	-0.652	0.495	-1.757	1.771	0.502	0.344	-0.416	4.118
Kurtosis	1.991	2.310	5.372	5.269	2.264	2.317	2.457	21.235
Jarque-Bera	5.658	3.038	37.443	36.853	3.232	1.958	2.054	834.048
Probability	0.059	0.219	0.000	0.000	0.199	0.376	0.358	0.000
Sum	6278.911	176.529	3648.043	1381.385	72.663	3024.118	328.236	992.808
Sum Sq. Dev.	11402.820	61.672	4230.024	3484.322	49.213	2118.299	187.882	39136.970

On total aid, the series has a skewness of 0.495 which is more than 0 meaning that there is positive skewness, that is, there are more higher values than the sample mean. Jaque-Bera also shows probability of 0.219 thereby failing to reject the null hypothesis of normal distribution. The series has a Kurtosis of 2.310 which is lower than 3, therefore, though the series mirrors normal distribution, it has more lower values below the mean, that is, it has a flat surface.

4.3.2 Correlation

Before moving to regression analysis, it is important to examine correlations among the variables. Correlation coefficient determines the nature and strength of relationship between variables. Correlation analysis not only helps to clarify relations among variables but also often suggests directions for experimental research such as regression analysis (Aye & Jin-Sang, 2015). Table 4 shows that correlation among variables is low as all correlation coefficients are below 0.8., therefore there is no problem of multicollinearity. According to Tsaurai (2018) and Gujarati (2007), there is no problem of multicollinearity between variables when correlation coefficients are below 0.8.

Correlation between total aid and terms of trade is positive but the relationship is not statistically significant. The other explanatory variables of terms of trade have negative correlations. Openness and real interest rate have significant correlations with terms of trade at 1 percent significant level

while correlations for government expenditure and fixed capital with terms of trade are significant at 5 percent significant level. Correlation for foreign direct investment and terms of trade is significant at 10 percent significant level while correlation between consumer price index and terms of trade is not statistically significant.

Table 4: Correlation

Variable	tot	manuexp	foraid	govexp	fixed cap	fdi	openness	realint	cpi
tot	1.000								
manuexp	-0.216***	1.000							
foraid	0.004	-0.046*	1.000						
fovexp	-0.077**	0.439***	0.268***	1.000					
fixed cap	-0.162**	0.326***	0.089***	0.442***	1.0000				
fdi	-0.045*	0.014	0.109***	0.046*	0.138***	1.0000			
openness	-0.115***	0.406***	0.148***	0.511***	0,376***	0.279***	1.000		
realint	-0.107***	0.016	0.015	-0.105***	-0.092***	0.016	-0.028	1.000	
cpi	-0.034	-0.060**	-0.010	0.014	0.023	0.035	0.048*	-0.354***	1.000

Note: ***, $p < 0.01$; **, $p < 0.05$ and*, $p< 0.10$.

4.3.3 Regression Analysis

Regression analysis was run on various models such as ordinary least squares, fixed effects model, random effects model, and generalised least squares to ensure robustness and consistency of results. The models produced different results including different signs (Table 5). Conclusions on the signs and significance of variables are based on judgement of all results of the models. For GLS, Hausman Test is run on fixed and random effects results. The null hypothesis is that random effects model is the better of the two while alternative hypothesis is that fixed effects model is the better of the two (Majid & Maulana, 2012). The null hypothesis is rejected ($p = 0.0310$) meaning that fixed effects model is better model for analysis. However, in the presence of heteroscedasticity and autocorrelation, GLS model would give results that could be unbiased and relied upon, hence GLS model is run (Majid & Maulana, 2012). GLS model works well even in the presence of heteroscedasticity and autocorrelation (Majid & Maulana, 2012; Droms & Walker, 1996). Regression analysis results are discussed below.

Foreign aid

OLS with robust standard errors results show that foreign aid is positively related to terms of trade and statistically significant albeit at 10 percent significant level with a coefficient size of 0.250 (Table 5). The weak significance and the small size of coefficient shows that foreign aid is not an important factor for improvement of terms of trade. The relationship becomes negative and statistically significant at 1 percent significant level when fixed and random effects models are run thereby confirming Prebisch-Singer Hypothesis. Under fixed effects model, the size of coefficient is -0.588, and based on Hausman test, the model is preferred to random effects model which has coefficient size of -0.516. The strong significance level and sizes of the coefficients mean that foreign aid has an adverse effect on terms of trade.

GLS method results also show that foreign aid has negative impact on terms of trade albeit insignificant. In short, foreign aid has a negative impact on terms of trade and in some cases, the relationship is statistically significant. This is not in line with a study by Cremers and Sen (2009) who found that foreign aid had positive impact on terms of trade. The results however confirm previous studies that have found that foreign aid does not help the recipient countries, if anything, it worsens their economic situations. Some of the studies are Rajan and Subrimanian (2009), and Munemo *et al.* (2007).

Foreign aid seems to be directed to sectors that do not contribute to promotion of exports let alone manufactured exports which fetch relatively higher prices at international market. This calls on authorities to allocate foreign aid to sectors that contribute to improvement in manufactured exports, the result of which can improve terms of trade. The results also bring pessimism about Big Push and Dual Gap theories that put forward foreign aid as having positive impact on industrialisation and economic growth. This may also be due to Dutch disease whereby foreign aid affects terms of trade through exchange rate.

Government expenditure

Government expenditure has a negative relationship with terms of trade under OLS with robust standard errors, but the relationship is not statistically significant. The relationship is positive under fixed effects and random effects models, but the relationship is not statistically significant. GLS model shows that the relationship is also negative but not statistically significant. It can therefore

be concluded that government expenditure has no impact on terms of trade. This is in line with results of a study carried out by Asiedu (2014).

Fixed capital

Fixed capital has a negative impact on terms of trade under OLS with robust standard errors. The relationship is statistically significant at 1 percent significant level, and size of coefficient is -0.647. Fixed effects model results show that fixed capital has positive effect on terms of trade but not statistically significant. Random effects model results show that fixed capital has a negative impact on terms of trade but not statistically significant. GLS model results show that fixed capital has negative impact on terms of trade, and the relationship is statistically significant at 10 percent significant level. Size of coefficient is -0.123. Thus, fixed capital, proxy for infrastructure development, impacts negatively on terms of trade as it encourages export of primary products which fetch low prices at international market. Infrastructure development aimed at directly boosting manufactured exports can go a long way in improving terms of trade.

Foreign direct investment

Results for OLS with robust standard errors show that foreign direct investment has negative effect on terms of trade but the relationship is not statistically significant. Fixed effects model results show that foreign direct investment has a negative and statistically significant effect on terms of trade at 1 percent significant level. Random effects model results also show that there is a negative and statistically significant relationship between foreign direct investment and terms of trade at 1 percent significant level with coefficient size of -0.564. GLS model results show that foreign direct investment has a positive and statistically significant impact on terms of trade at 5 percent significant level with a coefficient size of 0.142. Overall, foreign direct investment has a negative effect on terms of trade. Foreign direct investment might be directed at goods and services which are consumed domestically and not for exports. Further, foreign direct investment might be focused on producing primary products that fetch low prices at international markets.

Openness

Ordinary least squares with robust standard errors results shows that openness has a negative and statistically significant impact on terms of trade at 1 percent significant level with coefficient size of -0.091 (Table 5). Results for fixed effects model show that openness is positively related to

terms of trade and the relationship is statistically significant at 5 percent, and size of coefficient is 0.122. Random effects model results also show that there is a positive relationship between openness and terms of trade. The relationship is statistically significant at 10 percent and size of coefficient is 0.097. GLS model results show that openness has a positive impact on terms of trade but the relationship is not statistically significant. Overall, openness has a positive and statistically significant effect on terms of trade and in most cases, the relationship is statistically significant. Openness opens up the economy to international markets which lead to improvement in quality of exports which can fetch high prices. Opening up also brings in foreign direct investment which if invested in manufactured exports can lead to high prices of exports.

Table 5: Regression Results

tot	OLS with Robust Std. Errors	Fixed Effects	Random Effects	GLS
foraid	0.250*	- 0.588***	- 0.516***	- 0.085
	(0.133)	(0.144)	(0.142)	(0.065)
govexp	- 0.101	0.427	0.324	- 0.082
	(0.173)	(0.266)	(0.258)	(0.125)
fixed cap	- 0.647***	0.003	- 0.073	- 0.123*
	(0.121)	(0.177)	(0.172)	(0.073)
fdi	- 0.024	- 0.622***	- 0.564***	0.142**
	(0.139)	(0.196)	(0.195)	(0.060)
openness	- 0.0909***	0.122**	0.097*	0.023
	(0.034)	(0.057)	(0.055)	(0.024)
realint	0.707***	- 0.552***	- 0.550***	- 0.098**
	(0.142)	(0.123)	(0.122)	(0.040)
cpi	0.025***	- 0.027***	- 0.027***	0.002
	(0.005)	(0.0074263)	(0.007)	(0.004)
		Hausman test		
		chi2(7) = 15.42		
		Prob>chi2 = 0.031		

Note: (...) indicates standard error, and ***, p < 0.01; **, p < 0.05 and*, p< 0.10.

4.4 Conclusion

This study examined the impact of foreign aid on terms of trade in SSA. Results show that foreign aid has a negative, and in some cases statistically significant effect on terms of trade (Foreign aid Chap 4). This is not in line with Big Push and Dual Gap theories which emphasise on the importance of foreign aid in boosting economic growth. The fact that foreign aid worsens terms of

trade means that it has adverse impact on the economy. Further, foreign aid seems to perpetuate the Prebisch-Singer dependency theory as it worsens terms of trade. Fungibility of foreign aid means that the funds can be used for other purposes rather than those meant for promoting manufactured exports that can fetch high prices at international markets thereby improving terms of trade.

Other variables also show that they have negative impacts on terms of trade in SSA countries. The variables include government expenditure (Gov exp Chap 4), fixed capital (Fixed capital Chap 4), and foreign direct investment (Foreign dir inv Chap 4). This shows that SSA countries have a huge task of improving terms of trade in order for them to benefit from international trade. Openness has a positive impact on terms of trade and in some cases, the relationship is statistically significant (Openness Chap 4). Countries in SSA countries should therefore open up in order to attract foreign direct investment which can be put to use in production of manufactured exports that can attract high prices at international markets. As foreign aid has been found to have negative impact on terms of trade, there is need to explore ways which can boost terms of trade in SSA region. One of the ways is to improve manufactured exports which fetch high prices at international market. This study, therefore examined the impact of foreign aid on manufactured exports as presented in Chapter 5 below.

Chapter 5

Impact of Total Foreign Aid on Manufactured Exports Performance

5.1 Introduction

This study examines the impact of foreign aid on manufactured exports. In Chapter 4, it was found that foreign aid had negative impact on terms of trade (Foreign aid Chap 4). One of the ways of improving terms of trade, as stated in Chapter 4, is to boost manufactured exports as they fetch high prices at international market. Theories such as Big Push and Dual Gap cite foreign aid as a source of resources necessary for boosting economic growth of countries through capital expenditure programmes. Exports are one of the factors that contribute to economic growth. Specifically, manufactured exports are important in improving economic growth of any country.

On the contrary, SSA countries are known for exporting primary commodities that fetch low prices at international market leading to deterioration of terms of trade of these countries. The countries have to boost manufactured exports if they are to experience meaningful development. This study therefore examines the impact of foreign aid on manufactured exports. The study also examines the impact of other variables on manufactured exports. The variables include government expenditure, fixed capital, foreign direct investment, openness, among others. The study has also run regressions on dataset that includes private sector credit and excludes Zimbabwe.

5.2 Variables and Expected Signs

Big Push and Dual Gap theories state that foreign aid is important for fostering industrialisation and economic development in developing countries. On the other hand, empirical studies have found that foreign aid has a negative impact on manufactured exports (Rajan and Subrimanian, 2009; Munemo *et al.,* 2007). Foreign aid is therefore expected to have either positive or negative impact on manufactured exports. Increase in terms of trade is expected to lead to decrease in manufactured exports as prices of domestic goods are relatively high at international market, and since the countries export primary commodities, producers switch to primary products. Empirical studies have also found that terms of trade have negative impact on exports and economic growth (Jebran *et al*., 2018; Tehseen & Ali, 2012), hence terms of trade are expected to have a negative impact on manufactured exports.

Exchange rate depreciation leads to increase in manufactured exports as prices of manufactured exports are relatively low at international market (Sumiyati, 2020). Studies have also found that exchange rate has positive impact on exports (Uysal & Mohamoud, 2018; Bakar *et al.,* 2015; Abidin *et al*., 2013; Alam *et al*., 2017; Nguyen, 2010). Exchange rate is therefore expected to have a positive impact on manufactured exports. Studies have found a negative impact of government expenditure on economic growth (Okoye, 2019; Asiedu, 2014). Government expenditure is therefore expected to have a negative sign. Fixed capital, a proxy for infrastructure development, is expected to have positive impact following studies by Okoye *et al*. (2019) and Tsaurai (2018). Private sector credit, proxy for financial sector development, impacts the economy positively through channelling savings into more productive use (Grossman, 1976). Kiprop *et al.* (2015) noted that excessive financial development misallocates resources and causes economic volatility. Private sector credit is therefore expected to have either positive or negative effect on manufactured exports.

FDI brings new technology, human capital development, and technical know-how into the host country, all of which have a positive impact on industrialisation and economic growth (Ngundu & Ngepah, 2019; Romer, 1986). This study therefore expects FDI to have a positive impact on manufactured exports. Openness exposes domestic industry to international markets at the same time, the country is able to purchase inputs, implements and other machinery necessary for manufacturing of goods and services leading to improvement in manufacturing and manufactured exports (Ogbonna *et al.,* 2021; Jena & Seth, 2020). Openness exposes an economy to international competition leading to increase in imports thereby impacting negatively on domestic manufacturing and manufactured exports (Tsaurai, 2018). Openness is therefore expected to affect manufactured exports either positively or negatively.

High interest rates encourage savings, and according to McKinnon (1973), economic growth increases if savings are channelled towards productive sectors of the economy. Low interest rates enhance investment as investors access cheap funds. Interest rate is therefore expected to have either positive or negative effect on manufactured exports. High inflation rates affect the economy negatively while moderate inflation rates affect the economy positively (Mallik & Chowdhury, 2001). Some studies have found that inflation has negative impact on exports (Uysal & Mohamoud, 2018; Mawufemor *et al.,* 2016; Abidin *et al*., 2013), hence inflation rate is expected

to have either positive or negative effect on manufactured exports. Table 6 shows a summary of expected signs of variables, and sources of data for each variable.

Table 6: Variables and Expected Signs

Variable	Acronym	Expected Sign	Sources of Data
Manufactured exports	manuexp		World Development Indicators
Foreign Aid	foraid	+/-	World Development Indicators, International Financial Statistics
Terms of trade	tot	-	World Development Indicators
Exchange rate	exch rate	+	World Development Indicators
Government expenditure	govexp	-	World Development Indicators, International Financial Statistics
Fixed capital	fixedcap	+	World Development Indicators, International Financial Statistics
Private sector credit	pvtseccredit	+/-	World Development Indicators
Foreign direct investment	fdi	+	World Development Indicators
Openness	openness	+/-	World Development Indicators, International Financial Statistics
Real interest rate	real int	+/-	World Development Indicators, International Financial Statistics
Consumer price index	cpi	+/-	World Development Indicators

Source: Author's compilation

5.3 Results

Results comprise descriptive statistics, correlation and regression analysis. Descriptive statistics gives impression of central tendency and dispersion of the data including mean, median, mode, variance, skewness, just to mention a few. Correlation gives a preview of how regression results

will come out especially in terms of signs and size of coefficients, and significant levels. Regression analysis in this study involves analysis of data using various regression models such as fixed effects model, random effects model, OLS with robust standard errors, and GLS.

5.3.1 Descriptive Statistics

The mean of manufactured exports is 24.48 percent (Table 7), and median and mode (each of them at 26.69) are not very far from the mean which means that most of the countries' manufactured exports percentages are close to the mean. The minimum percentage is 10.17 and the highest is 34.67. This means that manufactured exports observations are within the range of 10.17 percent and 34.64 percent. The standard deviation is 6.08 meaning that observations are on average 6.08 away from the mean. In short, manufactured exports as a percentage of gross domestic product are very low implying that SSA countries mainly export primary products.

Manufactured exports have a skewness of -1.03 which is less than a normal skewness of 0, hence manufactured exports variable is not normally distributed (Table 7). This is buttressed by Jarque-Bera Statistic which shows the probability of 0.01 thereby rejecting the null hypothesis that the manufactured exports variable is normally distributed. Kurtosis, which measures flatness of the distribution of series, is -0.24 and is lower than the value of 3. This means that manufactured exports series has more lower values below the mean. This again shows that the sample is not normally distributed as kurtosis is supposed to be zero when the sample is normally distributed (Demir, 2022). The non-normality of the distribution does not matter as studies have found that results are still robust even if data is not normally distributed (Blanca *et al*., 2017; Lantz, 2013; Schmider *et al*., 2010).

On total foreign aid, the series has a skewness of 0.51 which is more than 0 meaning that there is positive skewness, that is, there are more higher values than the sample mean. Jaque-Bera also shows probability of 0.22 thereby failing to reject the null hypothesis of normal distribution. The series has a Kurtosis of -0.63 which is lower than 3, hence, though the series mirrors normal distribution, it has more lower values below the mean.

Table 7: Descriptive Statistics

Statistic	manuexp	foraid	govexp	fixedcap	fdi
Mean	24.48	3.53	72.96	27.63	1.45
Standard Error	0.86	0.16	1.31	1.19	0.14
Median	26.69	3.23	75.19	25.49	1.28
Mode	26.69	-	45.82	52.22	-
Standard Deviation	6.08	1.12	9.29	8.43	1.00
Sample Variance	36.94	1.26	86.33	71.11	1.00
Kurtosis	-0.24	-0.63	2.76	2.64	-0.68
Skewness	-1.03	0.51	-1.81	1.83	0.52
Range	24.50	4.34	37.47	32.30	4.02
Minimum	10.17	1.86	45.82	19.91	0.07
Maximum	34.67	6.20	83.29	52.22	4.09
Jarque – Bera	8.55	3.04	37.44	36.85	3.23
Probability	0.01	0.22	0.00	0.00	0.20

5.3.2 Correlation Analysis

Table 4 shows that correlation among variables is low as all correlation coefficients are below 0.8. Low correlation amongst variables imply that there is no problem of multicollinearity as multicollinearity may lead to spurious results (Abel & Le Roux, 2016; Granger & Newbold, 1974). Foreign aid is negatively correlated with manufactured exports at 10 percent significant level. Government expenditure, fixed capital and openness are also positively correlated with manufactured exports at 1 percent significant level. On the contrary, fixed capital is negatively correlated with manufactured exports at 1 percent significant level. Foreign direct investment and real interest rate are also positively correlated with manufactured exports but the correlations are not statistically significant. Consumer price index is negatively correlated with manufactured exports and the correlation is statistically significant at 5 percent significant level.

5.3.3 Regression Results

In this study, ARDL model has mainly been used to analyse the data. Analysis also involves assessing robustness of ARDL results by running fixed effects, random effects and GLS models. Further analysis is done on panel data by running fixed and random effects. After running Hausman

Test on fixed and random effects results, null hypothesis of random effects as being the better of the two is rejected (p = 0.000) meaning that fixed effects model is the better model for analysis (Table 8). However, when Heteroscedasticity test is run, null hypothesis of homoskedasticity is rejected (p = 0.000) meaning that there is heteroskedasticity.

A test on autocorrelation is also carried out and null hypothesis of no autocorrelation is rejected (p = 0.000) meaning that there is autocorrelation. Under these circumstances, GLS model would give results that could be relied upon, hence GLS model is run (Majid & Maulana, 2012). GLS assumes that there is heteroskedasticity across panels and that residuals are autocorrelated within the panel data. Further robustness checks are done using pooled data by OLS with robust standard errors. Ordinary least squares regression is run on the assumption of constant variance, and that there are no outliers in the dataset. However, under normal circumstances, such assumption may not be true and results of ordinary least squares may be biased. It is in view of this that after running ordinary least squares, OLS with robust standard errors model is run. In this case, the results may not be biased, and therefore can be relied upon. Regression analysis results are discussed below.

Foreign aid

ARDL results show that foreign aid has positive and insignificant effect on manufactured exports. Ordinary least squares with robust standard errors model results show that foreign aid has negative and significant effect on manufactured exports at 1 percent significant level. Size of coefficient is -0.434. Fixed effects model results also show that foreign aid has negative impact on manufactured exports but the relationship is not statistically significant. Similar results apply to random effects model. GLS model results also show that foreign aid has a negative and statistically significant effect on manufactured exports at 5 percent significant level, and size of coefficient is -0.288. In short, foreign aid is found to be negatively related to manufactured exports, and in some cases, the relationship is statistically significant (Table 8). This is not in line with pro-foreign aid theories such as Big PushTheory and Dual Gap Theory. The results are also not in line with previous studies including Jena and Seth (2020) and Kang *et al*. (2010) as foreign aid was found to be positive and statistically significant. The results are however in line with studies such as Ogbonna *et al.* (2021), Rajan and Subrimanian (2009), and Munemo *et al.* (2007).

Terms of Trade

ARDL results show that terms of trade have a positive and insignificant effect on manufactured exports. OLS with robust standard errors model results show that terms of trade have negative impact on manufactured exports at 1 percent significant level, and size of coefficient is -0.079. Under fixed effects model, terms of trade have negative effect on manufactured exports, and the relationship is statistically significant at 5 percent, and size of coefficient is -0.02. Random effects model results also show that terms of trade have negative impact on manufactured exports at 1 percent significant level, and size of coefficient is -0.022.

GLS model results also show that terms of trade have a negative effect on manufactured exports at 10 percent significant level, and size of coefficient is -0.074. All these results show that terms of trade have negative impact on manufactured exports, and in most cases, the relationship is statistically significant. This means that if terms of trade increase, manufactured exports decrease due to the fact that increase in terms of trade means that prices of exports have increased relative to price of imports. As SSA countries mainly export primary commodities, more attention is focused on exporting primary commodities than manufactured exports. The results are in line with previous studies (Jebran *et al*., 2018; Tehseen & Ali, 2012). The results are however not in line with other studies such as Jawaid and Raza (2013), Broda (2004), Blattman *et al*. (2003), Kose (2002), Bleaney and Greenaway (2001), and Mendoza (1997).

Exchange rate

Results for ARDL, fixed effects model, and random effects model show that exchange rate has a negative effect on manufactured exports, and the relationship is statistically significant at 1 percent significant level. Further, results for GLS, and OLS with robust standard errors model show that exchange rate has a negative effect on manufactured exports but the relationship is not statistically significant. Therefore, exchange has a negative relationship with manufactured exports, and in some cases, the relationship is statistically significant. This is not in line with theory that says depreciation of currency makes exports cheaper at international market thereby leading to increase in exports including manufactured exports. This is also not in line with some studies which have found positive relationship between exchange rate and manufactured exports (Uysal & Mohamoud, 2018; Alam *et al*., 2017; Bakar *et al.,* 2015; Abidin *et al*., 2013; Nguyen, 2010).

Government expenditure

ARDL results show that government expenditure has a positive and statistically significant effect on manufactured exports at 5 percent significant level, and size of coefficient is 0.156. However, fixed effects model results show that government expenditure has a negative and statistically significant effect on manufactured exports at 1 percent significant level, and size of coefficient is -0.356. Random effects model also shows that government expenditure has a negative and statistically significant effect at 1 percent significant level, and size of coefficient is -0.305.

OLS with robust standard errors model results show that government expenditure has a positive relationship with manufactured exports, and the relationship is statistically significant at 1 percent level with coefficient size of 1.062. GLS Model results also show that government expenditure has a positive and statistically significant effect on manufactured exports at 1 percent significant level. Overall, government expenditure is positively related to manufactured exports, and the relationship is statistically significant. Thus, government expenditure leads to improvement in manufactured exports. This is not in line with previous studies (Okoye *et al.,* 2019; Asiedu, 2014).

Fixed capital

ARDL results show that fixed capital has a positive effect on manufactured exports but the relationship is not statistically significant. Fixed effects model results show that fixed capital has a positive effect on manufactured exports at 1 percent significant level, and size of coefficient is 0.290. Random effects model results show that fixed capital has a positive and statistically significant effect on manufactured exports at 1 percent significant level, and size of coefficient is 0.299. OLS with robust standard errors model results show that fixed capital has a positive and significant effect on manufactured exports at 1 percent significant level with coefficient size of 0.243. GLS model results also show that fixed capital has a positive and significant effect on manufactured exports at 1 percent significant level with coefficient size of 0.204. In short, fixed capital has a positive and significant effect on manufactured exports. This is in line with studies by Okoye *et al.* (2019), and Tsaurai (2018).

Foreign direct investment

ARDL results show that there is a positive relationship between foreign direct investment and manufactured exports, and the relationship is statistically significant at 1 percent significant level,

and size of coefficient is 0.182. Fixed effects model results also show that foreign direct investment has a positive and statistically significant effect on manufactured exports at 1 percent significant level with a coefficient size of 0.175. Random effects model results show that foreign direct investment has a positive and significant effect on manufactured exports at 1 percent significant level with coefficient size of 0.160.

OLS with robust standard errors model results show that foreign direct investment has a negative and significant effect on manufactured exports at 1 percent significant level, and size of coefficient is -0.289. Further, GLS model results show that foreign direct investment has a negative and statistically significant effect on manufactured exports at 1 percent significant level with coefficient size of -0.401. Though two of the regressions show negative and statistically significant impacts, overall, it can be concluded that foreign direct investment has a positive effect on manufactured exports, and in some cases, the relationship is statistically significant. This means that foreign direct investment plays a crucial role in promoting manufactured exports. The results are in line with studies by Ngundu and Ngepah (2019), and Romer (1986).

Openness

ARDL results show that there is a positive relationship between openness and manufactured exports at 5 percent significant level with coefficient size of 0.029. Fixed effects model results show that openness has positive but not significant relationship with manufactured exports, so are random effects model results. OLS with robust standard errors model results show that openness has a positive and significant effect on manufactured exports at 1 percent significant level with coefficient size of 0.180. Further, GLS results show that openness has a positive and significant effect on manufactured exports at 1 percent significant level, and coefficient size is 0.172. In short, openness has a positive effect on manufactured exports, and in most cases, the relationship is statistically significant. This means that if the SSA region opens up fully, manufactured exports can be boosted. This is contrary to the assertion that openness exposes domestic industry to international competition thereby hindering its growth. The results are in line with previous studies (Ogbonna *et al.,* 2021; Jena & Seth, 2020).

Table 8: Results: ARDL, Generalised Least Squares, and Ordinary Least Squares with Robust Standard Errors

Manufacture	ARDL (Short run)	Fixed Effects	Random Effects	GLS	OLS with Robust Std Errors
ecm	-0.463***				
	(0.117)				
foraid	0.049	-0.129	-0.142	-0.288**	-0.434***
	(0.033)	(0.089)	(0.089)	(0.116)	(0.069)
foraid sq.		-.0004	-0.0003	-0.003	
		(0.001)	(0.001)	(0.002)	
tot	0.010	-0.020**	-0.022***	-0.074***	-0.079 ***
	(0,007)	(0.008)	(0.008)	(0.011)	(0.011)
exchrate	-1.87e-09***	-1.60e-09***	-1.56e-09***	-9.88e-10	-4.10e-10
	(3.07e-10)	(5.58e-10)	(5.62e-10)	(8.58e-10)	(5.16e-10)
uovexp	0.156**	-0.356***	-0.305***	1.113***	1.062***
	(.068)	(0.080)	(0.079)	(0.095)	(0.135)
fixedcap	0.036	0.290***	0.299***	0.204***	0.243***
	(0.055)	(0.053)	(0.053)	(0.061)	(0.075)
fdi	0.182***	0.175***	0.160***	-0.401***	-0.289***
	(0.051)	(0.059)	(0.059)	(0.096)	(0.103)
openness	0.029 **	0.012	0.019	0.172***	0.180***
	(0.015)	(0.017)	(0.017)	(0.020)	(0.028)
realint	0.202***	0.136***	0.134***	0.038	0.059
	(0.037)	(0.037)	(0.037)	(0.054)	(0.052)
cpi	0.003	-0.0003	-0.0005	-0.118***	-.012***
	(0.003)	(0.002)	(0.002)	(0.004)	(0.004)
Hausman Test		Prob> chi2 = 0.0001			
Homoskedasticity		Prob > F = 0.0000			
Autocorrelation		Prob > F = 0.0000			

Note: (...) indicates standard error, and ***, $p < 0.01$; **, $p < 0.05$ and*, $p< 0.10$.

Country specific results using Panel ARDL

The study also analyses country specific results which show that there are different results for different countries. Thus, while aggregate results might show that an independent variable does not have a positive impact on manufactured exports, country specific results may show positive impact in some countries and negative impact in others (Table 9 and Table 10). The results are discussed below.

Foreign aid

In 18 countries, foreign aid has positive impact on manufactured exports though only in four out of the eighteen countries, the relationship is statistically significant namely Benin, Guinea, Madagascar and Niger. In Benin, the relationship is statistically significant at 5 percent significant level with a coefficient size of 0.989. In Guinea, it is also significant at 5 percent significant level, and size of coefficient is 0.823 percent. In Madagascar, the relationship is significant at 10 percent significant level with a coefficient size of 0.416. In Niger, the relationship is statistically significant at 5 percent significant level with a coefficient size of 0.287. Though foreign aid has positive impact on manufactured exports in these countries, sizes of coefficients are small in all the countries meaning that the impact is minimal. All in all, the results are in line with Big Push and Dual Gap theories. They are however not in line with previous studies (Rajan & Subrimanian, 2009; Munemo *et al.,* 2007).

Foreign aid has negative impact on manufactured exports in 12 countries and the relationship is statistically significant in three countries namely Central African Republic, Ghana and Mozambique. In Central African Republic, the relationship is statistically significant at 5 percent with a coefficient size of -1.182. In Ghana, the relationship is also statistically significant at 5 percent and size of coefficient is -1.180. Similarly, in Mozambique, the relationship is statistically significant at 5 percent significant level with a coefficient size of -0.103 (Table 9). The strong significance and sizes of coefficients show that foreign aid can have adverse effect on manufactured exports contrary to theories such as Big Push and Dual Gap Theories. The results are in line with studies such as those done by Rajan and Subrimanian (2009), and Munemo *et al.* (2007).

Terms of trade

Terms of trade have a positive effect on manufactured exports in fourteen countries and the relationship is not statistically significant in all the countries. Other studies also found positive relationship between terms of trade and manufactured exports (Jawaid & Raza, 2013; Tehseen & Ali, 2012; Broda, 2004; Blattman *et al*., 2003; Kose 2002). The results are however not in line with other studies such as Jebran *et al*. (2018). Terms of trade have negative effect on manufactured exports in sixteen countries but the relationship is statistically significant in three countries namely Congo Republic, Mozambique and Togo. In Central African Republic, the relationship is significant at 5 percent significant level with a coefficient size of -0.160.

In Mozambique, the relationship is statistically significant at 1 percent significant level, and size of coefficient is -0.061. In Togo, the relationship is statistically significant at 5 percent significant level with a coefficient size of -0.123. This signifies that African countries mainly export primary products which, though their prices might improve at the international market, they cannot lead to improvement in manufactured exports. The results are in line with previous studies (Jebran *et al*., 2018). The results are however not in line with other studies such as Jawaid and Raza (2013), Broda (2004), and Kose (2002).

Table 9: Country Specific Results

Variable	Countries with Positive Relationship	Countries with Negative Relationship
Foreign Aid	Benin (0.989,0.431)**, Burkina Faso, Burundi, Congo Republic, Ethiopia, Guinea (0.823, 0.412)**, Kenya, Lesotho, Liberia, Madagascar (0.416, 0.239)*, Mali, Niger (0.287, 0.145)**, Senegal, Tanzania, Togo, Uganda, Zambia, Zimbabwe	Angola, Botswana, Gabo Verde, Cameroun, Central African Republic (-1.182,0.481)**,Coted'Ivoire, Gambia, Ghana(-1.180,0.345)***,Malawi, Mozambique(-0.103,0.046)**, Rwanda, Sudan
Terms of Trade	Angola, Benin, Burundi, Central African Republic, Cote d' Ivoire, Ethiopia, Ghana, Lesotho, Liberia, Madagascar, Niger, Senegal, Uganda, Zimbabwe	Botswana, Burkina Faso, Gabo Verde, Cameroun, Congo Republic (-0.160, 0.065)**, Gambia, Guinea, Kenya, Malawi, Mali, Mozambique(-0.061, 0.022)***, Rwanda, Sudan, Tanzania, Togo (-0.123, 0.057))**, Zambia

Exchange rate	Angola(0.028,0.017)*, Benin, Botswana, Burkina Faso (0.026,0.007)***,Central African Republic, Congo Republic, Cote d'Ivoire, Malawi, Mozambique (0.714, 0.084)***, Niger, Rwanda, Senegal, Togo, Zambia, Zimbabwe	Burundi, Gabo Verde, Cameroun, Ethiopia, Gambia, Ghana, Guinea, Kenya, Lesotho (-6.089, 1.291) ***, Liberia, Madagascar, Mali (-0.031, 0.015) **, Sudan, Tanzania, Uganda
Government Expenditure	Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroun, Congo Republic, Cote d'Ivoire, Lesotho (0.703, 0.357) **, Madagascar, Mozambique, Senegal, Zimbabwe	Gabo Verde (-3.871, 2.059) *, Central African Republic, Ethiopia, Gambia, Guinea, Kenya, Liberia, Malawi, Mali, Niger, Rwanda, Sudan, Tanzania, Togo, Uganda, Zambia
Fixed capital	Angola, Benin (1.603, 0.355)***, Burundi, Garbo Verde, Cameroun, Central African Republic, Congo Republic, Cote d' Ivoire, Gambia, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mozambique (0.176, 0.108)*, Niger (0.431, 0.163) ***, Senegal, Zimbabwe	Botswana, Burkina Faso, Ethiopia, Ghana, Guinea, Mali (-0.816, 0.445) *, Rwanda, Sudan, Tanzania, Togo, Uganda, Zambia
Foreign Direct Investment	Angola(0.085,0.047)*,Botswana, Burkina Faso, Burundi, Gabo Verde, Central African Republic (2.59, 1.529) *, Congo Republic, Cote d'Ivoire, Ghana, Guinea (0.565, 0.286) **, Lesotho (1.061, 0.640) *, Madagascar (1.856, 0.605) ***, Malawi, Mali, Niger, Senegal, Sudan, Tanzania, Togo, Uganda, Zambia (0.353, 0.180)**, Zimbabwe (1.161, 0.520) **	Benin (-1.897,1.146)*,Cameroun, Ethiopia, Gambia, Kenya, Liberia, Mozambique, Rwanda
Openness	Angola, Botswana, Gabo Verde, Cameroun, Central African Republic, Gambia, Madagascar (0.318, 0.149)**, Malawi (0.093, 0.052)*, Mozambique, Sudan, Tanzania, Uganda, Zambia, Zimbabwe	Benin, Burkina Faso, Burundi (-0.421, 0.146)***, Congo Republic, Cote d'Ivoire, Ethiopia, Ghana, Guinea, Kenya, Lesotho, Liberia, Mali, Niger, Rwanda, Senegal, Togo
Real Interest	Angola, Central African Republic, Ethiopia, Gambia, Ghana, Guinea, Kenya, Lesotho (0.257, 0.123)*,Liberia,Madagascar,Malawi, Mozambique, Niger (0.833, 0.277)***, Rwanda (0.417, 0.111)***, Sudan, Togo, Uganda, Zambia (0.132, 0.055)**, Zimbabwe (0.436, 0.189)**	Benin(-1.669, 0.576)***, Botswana (-0.123, 0.053)**, Burkina Faso, Burundi, Gabo Verde,Cameroun,Congo Republic, Cote d'Ivoire, Mali (-1.281, 0.484)***, Senegal, Tanzania (-0.348, 0.186) *
Consumer Price Index	Angola, Botswana, Burundi, Gabo Verde, Cameroun (0.190, 0.102)*, Cote d'Ivoire, Gambia,	Benin, Burkina Faso, Central African Republic(-0.339, 0.181)*,Congo

	Guinea, Kenya, Lesotho (0.346, 0.130)***, Madagascar, Mali (0.251, 0.124)**, Niger, Rwanda, Uganda, Zimbabwe	Republic, Ethiopia, Ghana, Liberia, Malawi, Mozambique(-0.090, 0.040) **, Senegal, Sudan, Tanzania, Togo, Zambia

Note: (...) indicates coefficient, standard error, and ***, $p < 0.01$; **, $p < 0.05$ and*, $p< 0.10$.

Exchange rate

Exchange rate has a positive and significant impact on manufactured exports in fifteen countries but the relationship is statistically significant in three countries namely Angola, Burkina Faso and Mozambique. Other studies also found positive relationship between exchange rate and manufactured exports (Alam *et al.,* 2017; Bakar *et al.,* 2015; Abidin *et al*., 2013). In Angola, exchange rate is statistically significant at 10 percent significant level with a coefficient size of 0.028. In Burkina Faso, the exchange rate is statistically significant at 1 percent significant level, and coefficient size is 0.026. In Mozambique, the relationship is statistically significant at 1 percent significant level with a coefficient size of 0.714. The small sizes of coefficients mean that exchange rate depreciation leads to small improvement in manufactured exports. It seems, depreciation which makes prices of local products relatively low at international market, leads to increase in the exports of primary products rather than manufactured goods.

Exchange rate has a negative impact on manufactured exports in fifteen countries, and in two countries, the relationship is statistically significant namely Lesotho and Mali. The results are not in line with other studies which found positive relationship (Uysal & Mohamoud, 2018; Bakar *et al.,* 2015, Abidin *et al*., 2013). In Lesotho, the relationship is statistically significant at 1 percent significant level with a coefficient size of -6.089. The strong significance and the large size of coefficient means that depreciation leads to large decrease in manufactured exports implying that relatively low prices of domestic goods at international market lead to decrease in manufactured exports as local producers increase exports of primary products. In Mali, the relationship is significant at 5 percent significant level with a coefficient size of 0.031. Though the significance is strong, coefficient size is small. This means that depreciation leads to small decrease in manufactured exports in the country.

Government expenditure

Government expenditure has a positive impact on manufactured exports in thirteen African countries, and the relationship is statistically significant in one country namely Lesotho. The results are not in line with a study by Okoye *et al.* (2019). In Lesotho, the relationship is statistically significant at 5 percent significant level with a coefficient size of 0.703. The strong significance and small size of the coefficient means that increase in government expenditure leads to small increase in manufactured exports.

Government expenditure has negative effect on manufactured exports in seventeen countries, and the relationship is statistically significant in one country namely Garbo Verde. The results are in line with a study by Asiedu (2014) which found a negative relationship. In Garbo Verde, the relationship is statistically significant at 10 percent significant level with a coefficient size of -3.871. Though weak significance, the large size of the coefficient means that increase in government expenditure leads to large decrease in manufactured exports. The negative impact may be due to the fact that most of the government expenditure is made on sectors such as health and education that may not directly impact (at least in the short run) manufacturing, and manufactured exports.

Fixed capital

Fixed capital has a positive impact on manufactured exports in eighteen countries, and the relationship is significant in three countries namely Benin, Mozambique and Niger. This means that fixed capital, a proxy for infrastructure development, plays a role in boosting manufactured exports at least in the eighteen countries. This is in line with studies by Okoye e*t al*. (2019) and Tsaurai (2018). In Benin, the relationship is significant at 1 percent significant level with a coefficient size of 1.603. In Mozambique, the relationship is significant at 10 percent, and size of coefficient is 0.176.

In Niger, the relationship is statistically significant at 1 percent significant level with a coefficient size of 0.431. This means that fixed capital plays a role in boosting manufactured exports in the three countries. Fixed capital has a negative impact on manufactured exports in twelve countries, and the relationship is statistically significant in one country namely Mali. This may mean that the type of fixed capital that the countries have does not directly impact manufactured exports, in fact,

it has negative impact on manufactured exports. This is contrary to studies by Okoye e*t al*. (2019) and Tsaurai (2018). In Mali, the relationship is statistically significant at 10 percent significant level with a coefficient size of -0.816.

Foreign direct investment

Foreign direct investment seems to be an important variable in influencing manufactured exports as it has a positive impact on manufactured exports in twenty-two countries, and the relationship is statistically significant in seven countries namely Angola, Central African Republic, Guinea, Lesotho, Madagascar, Zambia and Zimbabwe. The results are in line with previous studies (Beecroft *et al*., 2020; Anetor *et al.,* 2020; Cheung & Lin, 2004). In Angola, the relationship is statistically significant at 10 percent specific level with coefficient size of 0.085. In Central African Republic, the relationship is also significant at 10 percent significant level with coefficient size of 2.59.

In Guinea, the relationship is significant at 5 percent significant level, and size of coefficient is 0.565. In Lesotho, the relationship is statistically significant at 10 percent significant level with coefficient size of 1.061. In Madagascar, the relationship is statistically significant at 1 percent significant level with a coefficient size of 1.856. In Zambia, the relationship is statistically significant at 5 percent significant level with a coefficient size of 0.353. In Zimbabwe, the relationship is statistically significant at 5 percent significant level with coefficient size of 1.161. Thus, SSA countries should put in place policies aimed at attracting foreign direct investment if they are to boost manufactured exports.

Foreign direct investment has a negative impact on manufactured exports in eight countries, and the relationship is statistically significant in one country namely Benin. This is not in line with studies by Ngundu and Ngepah (2019), and Romer (1986). In Benin, the relationship is statistically significant at 10 percent significant level with a coefficient size of -1.897. This means that, in the country, foreign direct investment goes to other sectors such as primary sector.

Openness

Openness has a positive effect on manufactured exports in fourteen countries, and the relationship is statistically significant in two countries namely Madagascar and Malawi. This is in line with

previous studies (Ogbonna *et al.,* 2021; Jena & Seth, 2020). In Madagascar, the relationship is statistically significant at 5 percent significant level with a coefficient size of 0.318. In Malawi, the relationship is statistically significant at 10 percent significant level with a coefficient size of 0.093. The small sizes of coefficients imply that the contribution of openness though positive, is dismal.

Openness has a negative impact on manufactured exports in sixteen countries and the relationship is statistically significant in one country namely Burundi. This shows that liberalisation of SSA countries has not boosted manufactured exports. The results are contrary to other studies (Jena & Seth, 2020; Tsaurai, 2018). In Burundi, the relationship is statistically significant at 1 percent significant level with a coefficient size of -0.421. Opening up economies in this region exposes domestic industries to international competition thereby affecting manufacturing industry negatively.

Real interest rate

Real interest rate is found to be positively related to manufactured exports in nineteen countries and the relationship is statistically significant in six countries namely Angola, Lesotho, Niger, Rwanda, Zambia and Zimbabwe. In Angola, the relationship is statistically significant at 10 percent with a coefficient size of 0.033. In Lesotho, the relationship is statistically significant at 10 percent significant level with a coefficient size of 0.257. In Niger, the relationship is significant at 1 percent significant level with coefficient size of 0.833. In Rwanda, the relationship is statistically significant at 1 percent significant level, and coefficient size is 0.417.

In Zambia, the relationship is statistically significant at 5 percent significant level with a coefficient size of 0.132. In Zimbabwe, the relationship is statistically significant at 5 percent significant level with a coefficient size of 0.436. One of the reasons for the positive relationship could be increase in interest rates means availability of more loanable funds as a result of increase in savings that can be accessed by manufacturers leading to increase in manufactured exports.

In eleven countries, real interest rate is found to be negatively related to manufactured exports, and in four countries, the relationship is statistically significant. The countries are Benin, Botswana, Mali and Tanzania. In Benin, the relationship is statistically significant at 5 percent significant

level with a coefficient size of -1.669. In Botswana, the relationship is statistically significant at 5 percent with a coefficient size of -0.123. In Mali, the relationship is significant at 1 percent significant level, and coefficient size is -1.281.

In Tanzania, the relationship is significant at 10 percent significant level with a coefficient size of 0.348. Low interest rates attract investment part of which can be in manufacturing thereby increasing manufactured goods and manufactured exports. Low interest rates also mean cheap funds in form of credit which translates into more imports leading to depreciation of currencies thereby making exports including manufactured exports competitive at international market.

Consumer price index

Consumer price index is found to be positively related to manufactured exports in sixteen countries, and the relationship is statistically significant in three countries namely Cameroun, Lesotho and Mali. In Cameroun, the relationship is statistically significant at 10 percent significant level with a coefficient size of 0.190. In Lesotho, the relationship is statistically significant at 1 percent significant level with a coefficient size of 0.346. In Mali, the relationship is statistically significant at 5 percent significant level, and the size of coefficient is 0.251. Increase in prices means that producers are encouraged to produce more part of which can be exported.

Consumer price index has negative impact on manufactured exports in fourteen countries, and the relationship is statistically significant in two countries namely Central African Republic and Mozambique. In Central African Republic, the relationship is statistically significant at 10 percent significant level, and the size of the coefficient is -0.339. In Mozambique, the relationship is statistically significant at 5 percent significant level, and size of coefficient is -0.090.

Country/ Variable	foraid	tot	exch rate	goveexp	fixed cap	Fdi	openness	realint	cpi	ect
Angola	-0.458	0.020	0.028*	-0.131	0.013	0.085*	0.002	0.033*	0.001	0.183***
	(0.397)	(0.015)	(0.017)	(0.137)	(0.109)	(0.047)	(0.023)	(0.017)	(0.001)	(0.069)
Benin	0.989**	0.156	0.011	(0.962)	1.603***	-1.897*	-0.115	-1.669***	-.0004	-0.648***
	(0.431)	(0.111)	(0.017)	0.613)	(0.355)	(1.146)	(0.160)	(0.576)	(0.144)	(0.125)
Botswana	-0.058	-0.139*	0.906	.0167963	-0.026	0.035	0.018	-0.123**	0.068	0.027
	(0.187)	(0.076)	(0.744)	(0.171)	(0.089)	(0.078)	(0.045)	(0.053)	(0.130)	0.067
Burkina	0.244	-0.078	0.026***	0.003	-0.204	0.640	-0.009	-0.256	-0.057	-0.463***
Faso	(0.192)	(0.057)	(0.007)	(0.221)	(0.205)	(0.594)	(0.148)	(0.237)	(0.051)	(0.117)
Burundii	0.138	0.026	-0.003	0.309	0.140	1.017	-0.421***	-0.005	0.030	-0.543***
	(0.148)	(0.026)	(0.016)	(0.305)	(0.248)	(0.792)	(0.146)	(0.091)	(0.076)	(0.116)
Garbo Verde	-0.643	-0.053	-0.003	-3.871*	0.079	1.066	0.278	-1.092	0.321	-0.095
	(0.439)	(0.083)	(0.267)	(2.059)	(0.744)	(0.862)	(0.281)	(1.398)	(0.531)	(0.058)
Cameroun	-0.467	-0.008	-0.020	0.573	0.005	-0.162	0.002	-1.381	0.190*	-0.439***
	(0.329)	(0.040)	(0.013)	(0.804)	(0.111)	(0.383)	(0.103)	(1.578)	0.102	(0.112)
CAR	-1.182**	0.006	0.084**	-0.539	0.616	2.589*	0.002	2.282	-0.339*	-0.362***
	(0.481)	(0.106)	(0.035)	(0.862)	(0.634)	(1.529)	(0.337)	(4.750)	(0.181)	(0.099)
Congo Rep	0.302	-.0160**	0.032	0.625	0.265	0.097	-0.111	-5.630	-0.173	-0.160**
	(0.235)	(0.065)	(0.023)	(0.399)	(0.181)	(0.358)	(0.089)	(4.234)	(0.170)	(0.067)
Cote	-0.250	0.023	0.009	0.436	0.090	0.231	0-.087	0-.070	0.109	-0.501***
d'Ivoire	(0.164)	(0.026)	(0.010)	(0.394)	(0.247)	(0.576)	(0.086)	(0.089)	(0.090)	(0.132)
Ethiopia	0.179	0.061	-0.806	-0.348	-0.159	-0.262	-0.224	0.030	-0.024	-0.285**
	(0.290)	(0.043)	(0.734)	(0.295)	(0.391)	(0.442)	(0.139)	(0.071)	(0.046)	(0.126)
Gambia	-0.215	-0.031	-0.495	-.130	0.430	-1.410	0.257	0.004	0.120	-0.541***
	(0.356)	(0.220)	(1.023)	(0.422)	(0.406)	(0.929)	(0.177)	(0.114)	(0.260)	(0.129)
Ghana	-1.180***	0.028	-2.500	-0.151	-0.047	0.585	-0.048	0.201	-0.0123	-0.565***
	(0.345)	(0.054)	(4.159)	(0.432)	(0.217)	(0.523)	0.076	(0.218)	(0.025)	(0.119)
Guinea	0.823**	-0.043	-0.002	-0.134	(-0.137)	0.565	-0.055	0.181	0.094	-0.461***
	(0.412)	(0.090)	(0.003)	(0.643)	(0.132)	(0.286)	(0.097)	(0.214)	(0.154)	(0.127)
Kenya	0.180	-0.100	-0.106	-0.088	0.016	-0.485	-0.052	0.032	0.051	-0.205
	(0.497)	(0.111)	(0.151)	(0.674)	(0.358)	(0.831)	(0.108)	(0.089)	(0.089)	0.130
Lesotho	0.154	0.020	-6.094***	0.703**	0.258	1.061*	-0.015	0.237*	0.346***	-0.388***
	(0.297)	(0.120)	(1.291)	(0.357)	(0.248)	(0.670)	(0.075)	(0.123)	(0.130)	(0.101)
Liberia	0.001	0.002	-0.002	-0.002	0.001	-0.001	-0.001	0.001	-0.001	0.001
	(0.003)	(0.005)	(0.004)	(0.021)	(0.011)	(0.003)	(0.001)	(0.007)	(0.014)	(0.010)
Madagascar	0.416*	0.111	-0.004	0.264	0.045	1.856***	0.318**	0.197	0.041	-0.139**
	(0.239)	(0.112)	(0.008)	(0.368)	(0.124)	(0.605)	(0.149)	(0.201)	(0.119)	(0.069)

Table 10: Country Specific Results

Country/ Variable	Foraid	tot	exchrate	goveexp	fixed cap	fdi	openness	realint	cpi	ect
Malawi	-0.157	-0.013	0.001	-0.051	0.126	0.203	0.093*	0.004	-0.020	-0.254**
	(0.104)	(0.033)	(0.010)	(0.401)	(0.114)	(0.128)	(0.052)	(0.031)	0.032	(0.109)
Mali	0.282	-0.118	-0.031**	-0.612*	-0.816*	0.651	-0.016	-1.281***	0.251**	-0.260***
	(0.327)	(0.083)	(0.015)	(0.366)	(0.445)	(0.462)	(0.168)	(0.484)	(0.124)	(0.096)
Mozambique	-0.103**	-0.061***	0.714***	0.105	0.176	-0.005	0.018	0.339***	-0.090**	-1.237***
	(0.046)	(0.022)	(0.084)	(0.111)	(0.108)	(0.078)	(0.033)	(0.083)	(0.040)	(0.105)
Niger	0.287**	0.031	0.001	-0.310	0.431***	0.041	0-.098	0.833***	0.021	-0.261**
	(0.145)	(0.027)	(0.009)	(0.266)	(0.163)	(0.308)	(0.098)	(0.277)	(0.055)	(0.119)
Rwanda	0.048	-0.035	0.015	-0.228	-0.626	-0.533	-0.083	0.417***	0.101	-0.467***
	(0.086)	(0.038)	(0.028)	(0.282)	(0.383)	(0.844)	(0.129)	(0.111)	(0.088)	(0.128)
Senegal	0.388	0.044	0.001	0.908	0.808	1.254	-0.091	-0.066	-0.064	-0.288**
	(0.564)	(0.127)	(0.022)	(1.063)	(0.515)	(1.246)	(0.178)	(0.647)	(0.130)	(0.127)
Sudan	-0.055	-0.025*	-0.075	-0.018	-0.054	0.016	0.086	0.134	-0.004	-0.649***
	(0.147)	(0.015)	(0.063)	(0.141)	(0.087)	(0.282)	(0.063)	(0.173)	(0.011)	(0.132)
Tanzania	0.126	-0.026	-0.022	-0.199	-0.193	0.378	0.108	-0.348*	-.0160231	-0.139
	(0.467)	(0.152)	(0.023)	(1.024)	(0.637)	(1.124)	(0.224)	(0.186)	(0.181)	(0.135)
Togo	0.049	-0.123**	0.032	-0.016	-0.002	0.298	-0.074	0.678	-0.142	-0.043
	(0.367)	(0.057)	(0.020)	(0.353)	(0.206)	(0.242)	(0.092)	(0.447)	(0.122)	(0.081)
Uganda	0.047	0.007	-0.001	-0.019	-0.096	0.941	0.082	0.037	0.026	-0.170*
	(0.196)	(0.020)	(0.004)	(0.271)	(0.298)	(0.751)	(0.093)	(0.046)	(0.028)	(0.092)
Zambia	0.075	-0.021	0.885	-0.069	-0.383	0.353**	0.004	0.132**	-0.010	-0.612***
	(0.048)	(0.014)	(0.743)	(0.295)	(0.240)	(0.180)	(0.042)	(0.055)	(0.022)	(0.129)
Zimbabwe	0.264	0.139	1.21e-09	0.004	0.025	1.161**	0.026	0.436**	0.021	-1.241***
	(0.393)	(0.156)	(9.27e-1)	(0.186)	(0.175)	(0.520)	(0.108)	(0.189)	(0.046)	(0.145)

Regression Analysis after including Private Sector Credit as one of Control Variables, and excluding Zimbabwe

Private sector credit can be used as a proxy for state of financial development in a country. Regression analysis is therefore done considering the level of financial development in a country by including private sector credit as one of control variables. The control variable mostly shows negative and insignificant impact on manufactured exports (Table 11). Tsaurai (2018) used the variable to measure complementarity of foreign aid and financial development in influencing economic growth. Further, upon close scrutiny of Zimbabwe data, it is found that due to developments that took place during the period under study especially towards the end of the study period, the country is removed from the dataset as it may be an outlier, and hence may distort results. Regressions are done using ARDL model, fixed effects model, random effects model, and ordinary least squares with robust standard errors. Hausman test is conducted on fixed effects and random effects, and null hypothesis that random effects model is the better of the two models is rejected ($p = 0.000$) meaning that fixed effects model is the better model (Table 11).

Foreign aid

ARDL results show that foreign aid has a positive and insignificant impact on manufactured exports. OLS with robust standard errors results show that foreign aid has a negative and significant effect on manufactured exports at 1 percent significant level with a coefficient size of - 0.396. Squaring the aid still yields negative relationship between foreign aid and manufactured exports though the relationship is insignificant. Fixed effects and random effects models show negative and statistically significant relationship between foreign aid and manufactured exports at 10 percent and 5 percent significant level respectively. Despite inclusion of private sector credit and removal of Zimbabwe from the dataset, results still show that foreign aid has negative impact on manufactured exports, and in most cases, the relationship is statistically significant. This again is contrary to Big Push and Dual Gap Theories. The results are in line with previous studies (Rajan & Subrimanian, 2009; Munemo *et al.,* 2007).

Terms of trade

Terms of trade are negatively related to manufactured exports in all four regressions. The relationship is statistically significant in ARDL and OLS with robust standard errors, and sizes of

coefficients are -0.033 and -0.070 respectively. The results are in line with previous studies (Jebran *et al*., 2018). They are however not in line with a study by Tehseen and Ali (2012).

Table 11: Regression Results after including Private Sector Credit and Removing Zimbabwe Dataset

Variable	ARDL	Fixed Effects	Random Effects	OLS with Robust Std Errors	
				With aidsq	Without aidsq
aid	0.010	-0.079*	-0.091**	-0.251	-0.396***
	(0.056)	(0.044)	(0.044)	(0.172)	(0.070)
aid sq.				-0.003	
				(0.004)	
tot	-0.033***	-0.007	-0.009	-0.070***	-0.070***
	(0.010)	(0.008)	(0.008)	(0.011)	(0.011)
exch rate	0.006***	0.001**	0.001**	0.001*	0.001*
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
gov exp	-0.007	-0.230***	-0.018**	1.148***	1.173***
	(0.116)	(.008)	(0.082)	(0.145)	(0.141)
fixed cap	-0.040	0.216***	0.227***	0.207***	0.203***
	(0.076)	(0.005)	(0.053)	(0.076	(0.075)
pvttseccredit	-0.013	0.022	0.020	-0.021	-0.022
	(0.053)	(0.046)	(0.047)	(0.071)	(0.070)
fdi	1.056***	0.026	0.012	-0.394***	-0.400***
	(0.218)	(0.058)	(0.059)	(0.129)	(0.120)
openness	0.124***	-0.044**	-0.036*	0.172***	0.017***
	(0.027)	(0.018)	(.018)	(0.030)	(0.029)
realint	-0.001	-0.002	-0.002	-0.013	-0.013***

	(0.015)	(0.002)	(0.002)	**(0**.004)	(0.004)
Hausman Test		Prob> chi2 = 0.0000			

Note: (...) indicates standard error, and ***, p < 0.01; **, p < 0.05 and*, p< 0.10.

Exchange rate

Exchange rate has a positive and significant impact on manufactured exports at 1 percent significant level with a coefficient size of 0.006 under ARDL, at 10 percent level with a coefficient size of 0.001 under OLS with robust standard errors, and at 5 percent level with a coefficient size of 0.001 under fixed effects and random effects models. Thus, exchange rate has positive and statistically significant impact on manufactured exports. This means that depreciation of the currency will lead to increase in manufactured exports as the exports will be relatively cheaper at international market. The results are in line with studies by Bakar *et al.* (2015), and Abidin *et al.* (2013).

Government expenditure

ARDL results show that government expenditure has a negative and insignificant impact on manufactured exports. Fixed effects and random effects models show that the variable has negative impact with coefficient sizes of -0.230 and -0.018 at 1 percent and 5 percent significant level respectively. Government expenditure has positive and significant impact on manufactured exports at 1 percent significant level with a coefficient size of 1.173 under ordinary least squares with robust standard errors. Overall, government expenditure seems to have a negative and, in some cases, significant impact on manufactured exports. Limited resources of these SSA countries mean that governments focus on such sectors as education and health at the expense of equally important sectors such as manufacturing. The results are in line with studies by Okoye *et al*. (2019) and Asiedu (2014).

Fixed capital

ARDL results show that fixed capital has negative and insignificant effect on manufactured exports while fixed effects model, random effects model and linear regression with robust standard errors model have positive and significant impact on manufactured exports with coefficient sizes of 0.216, 0.227 and 0.207 respectively at 1 percent significant level. Fixed capital seems to have a positive and significant effect on manufactured exports. Fixed capital, a proxy for infrastructure

development, is crucial for manufacturing as it facilitates production and transportation of goods and services. The results are in line with studies by Okoye e*t al*. (2019) and Tsaurai (2018).

Private sector credit

Private sector credit, a proxy for financial development, has a negative and insignificant effect on manufactured exports under ARDL and OLS with robust standard errors while the relationship is positive but again insignificant under fixed effects and random effects models. This means that private sector credit does not influence manufactured exports. It seems, most of the private sector credit goes towards production of primary commodities as economies of these countries are predominantly biased towards production of primary commodities rather than manufactured products. The results are not in line with a study by Tsaurai (2018).

Foreign direct investment

Under ARDL, foreign direct investment has a positive and statically significant impact on manufactured exports at 1 percent significant level with a coefficient size of 1.056. Fixed effects and random effects model also have positive but insignificant effect on manufactured exports. Under OLS with robust standard errors, the relationship is negative and statistically significant at 1 percent significant level with a coefficient size of 0.400. Overall, it seems foreign direct investment has a positive and, in some cases significant impact on manufactured exports. Foreign direct investment brings skills and technology which are crucial for manufacturing. The results are in line with previous studies (Beecroft *et al*., 2020; Anetor *et al.,* 2020; Ngundu & Ngepah, 2019; Cheung & Lin , 2004; Romer, 1986).

Openness

Under ARDL, openness has a positive and statistically significant impact on manufactured exports at 1 percent significant level with a coefficient size of 0.124. Under linear regression with robust standard errors, openness has also a positive and statistically significant impact on manufactured exports at 1 percent significant level with a coefficient size of 0.017. Fixed effects and random effects model results show that openness has a negative and statistically significant relationship with manufactured exports at 5 percent and 10 percent level with coefficient sizes of -0.044 and -0.036 respectively. Openness therefore has a positive and statistically significant effect on manufactured exports. Openness exposes countries to international competition thereby enabling

economies to increase and improve their manufactured products. The results are in line with studies by Ogbonna *et al.* (2021), Jena and Seth (2020), and Tsaurai (2018).

Real interest rate

Real interest rate has a negative and insignificant impact on manufactured exports under ARDL, fixed effects and random effects models, while under linear regression with robust standard errors, the relationship is negative and statistically significant at 1 percent level with a coefficient size of -0.013. It can therefore be concluded that real interest rate has a negative and, in some cases significant effect on manufactured exports. This may be so since increase in interest rate means that cost of borrowing has increased thereby discouraging manufacturers from borrowing to increase production.

Country Specific ARDL Results

The study also analysed country specific results after including private sector credit and excluding Zimbabwe (Table 12 and Table 13). The results are discussed below.

Foreign aid

Country specific results for ARDL show that in eighteen countries, foreign aid is positively related to manufactured exports but the relationship is statistically significant in three countries namely Benin, Madagascar and Niger. In Benin, the relationship is statistically significant at 10 percent significant level with a coefficient size of 0.873. In Madagascar, the relationship is statistically significant at 5 percent significant level with a coefficient size of 0.453 while in Niger, the relationship is statistically significant at 10 percent significant level with coefficient size of 0.289. In these countries, the results seem to be in line with Big Push and Dual Gap Theories. They are also in line with results of studies by Jena & Seth (2020) and Kang *et al*. (2010).

Foreign aid has a negative impact on manufactured exports in eleven countries, and the relationship is statistically significant in three countries namely Central African Republic, Ghana and Mozambique. In Central African Republic, the impact is statistically significant at 5 percent significant level with a coefficient size of -0.989 while in Ghana, the impact is statistically significant at 1 percent significant level with a coefficient size of -0.704. In Mozambique, the impact is statistically significant at 5 percent significant level with a coefficient size of -0.152. In

these countries, Big Push and Dual Gap theories seem not to hold. However, the results are in line with studies such as Ogbonna *et al.* (2021), Rajan and Subrimanian (2009), and Munemo *et al.* (2007).

Terms of Trade

In twelve countries, terms of trade have positive impact on manufactured exports with one country statistically significant namely Angola at 10 percent significant level with a coefficient size of 0.025. The fact that in most of the countries, the relationship is not statistically significant means that Sub-Saharan African countries mainly export primary commodities that fetch low prices at international market thereby confirming the Prebisch Singer Theory. The results are not in line with other studies such as Jawaid and Raza (2013), Blattman *et al*. (2003), Kose (2002), and Bleaney and Greenaway (2001). In seventeen countries, the impact of terms of trade on manufactured exports is negative, and the relationship is statistically significant in four countries. These countries are Botswana, Congo Republic, Mozambique and Togo, and the relationship is significant at 5 percent in the four countries with coefficient sizes of -0.192, -0.166, -0.085 and -0.125 respectively. The results are in line with previous studies (Jebran *et al*., 2018; Tehseen & Ali, 2012).

Table 12: Country Specific Results after Including Private Sector Credit and Removing Zimbabwe Dataset

Variable	Positive	Negative
Total aid	Benin (0.873,0.484) *, Burkina Faso, Burundi, Congo Republic, Ethiopia, Guinea, Kenya, Lesoth0, Liberia, Madagascar (0.453 ,0.230) **, Mali, Niger (0.289,0.158) *, Rwanda, Senegal, Tanzania, Togo, Uganda, Zambia	Angola, Botswana, Garbo Verde, Cameroun, Central African Republic (-0.989,0.475) **, Cote d'Ivoire, Gambia. Ghana (-0.704 ,0.119) ***, Malawi, Mozambique (-0.152 ,0.073) **, Sudan
Terms of trade	Angola (0.025,0.014) *, Benin, Burundi, Cameroun, Central African Republic, Cote d'Ivoire, Ethiopia, Gambia, Ghana, Guinea, Lesotho, Liberia,	Botswana (-0.192, 0.074) **, Burkina Faso, Garbo Verde, Congo Republic (-0.166, 0.065) **, Kenya, Malawi, Mali, Mozambique

	Madagascar, Niger, Senegal, Uganda	(-0.085,0.040) **, Rwanda, Sudan, Tanzania, Togo (-0.125 ,0.058) **, Zambia
Exchange rate	Angola, Benin, Botswana (1.233,0.733) *, Burkina Faso (0.023,0.008) ***, Central African Republic (0.084 ,0.035) **, Congo Republic, Cote d'Ivoire, Gambia, Mozambique (0.315, 0.146) **, Tanzania, Togo, Zambia (2.226, 0.749) ***	Burundi, Garbo Verde, Cameroun (-0.025,0.013) *, Ethiopia, Ghana, Guinea, Kenya, Lesotho (-5.840 ,1.266) ***, Liberia, Madagascar, Malawi, Mali, Niger, Rwanda, Senegal, Sudan, Uganda
Government expenditure	Benin, Botswana, Burundi (0.535 ,0.290) *, Cameroun, Congo Republic, Cote d'Ivoire, Gambia, Kenya, Lesotho, Madagascar, Mozambique, Senegal (2.397,1.186) **, Togo,	Angola, Burkina Faso, Garbo Verde (-4.228,2.017) **, Central African Republic, Ethiopia, Ghana, Guinea, Liberia, Malawi, Mali, Niger, Rwanda, Sudan, Tanzania, Uganda, Zambia
Fixed capital	Benin (1.224,0.395) ***, Burundi, Garbo Verde, Cameroun, Central African Republic, Congo Republic, Cote d'Ivoire, Gambia, Lesotho, Liberia, Madagascar, Malawi, Niger (0.382, 0.176) **, Senegal (1.232,0.501) **, Tanzania, Togo	Angola, Botswana, Burkina Faso, Ethiopia, Ghana, Guinea, Kenya, Mali, Mozambique, Rwanda (-0.873,0.384) **, Sudan, Uganda, Zambia
Privateseccredit	Angola (0.523,0.159) ***, Benin, Congo Republic, Cote d'Ivoire, Ethiopia, Gambia, Ghana (0.756,0.314) **, Kenya, Madagascar, Mozambique, Sudan, Uganda	Botswana, Burkina Faso, Burundi (-0.609,0.302) **, Garbo Verde, Cameroun, Central African Republic, Guinea, Lesotho, Liberia, Malawi, Mali, Niger, Rwanda, Senegal (-1.370,0.584) **, Tanzania, Togo, Zambia
Foreign Direct Investment	Angola, Botswana, Burkina Faso, Burundi, Garbo Verde, Central	Benin (-2.515,1.279) **, Cameroun, Congo Republic, Cote d' Ivoire,

	African Republic (2.530,1.531) *, Ghana, Guinea (0.681 ,0.326) **, Lesotho (1.116,0.650) *, Madagascar (1.897 ,0.577) ***, Mali, Mozambique (0.383 ,0.132) ***, Senegal, Tanzania, Togo, Uganda, Zambia	Ethiopia, Gambia (-1.718,0.996) *, Kenya, Liberia, Malawi, Niger, Rwanda, Sudan
Openness	Garbo Verde, Central African Republic, Gambia, Madagascar (0.222, 0.133) *, Malawi, Mozambique (0.155 ,0.059) ***, Sudan, Tanzania, Uganda	Angola, Benin, Botswana, Burkina Faso, Burundi (-0.437,0.136) ***, Cameroun, Congo Republic, Cote d'Ivoire (-0.213,0.085) **, Ethiopia (-0.279,0.151) *, Ghana (-0.124 ,0.066) *, Guinea, Kenya, Lesotho, Liberia, Mali, Niger, Rwanda (-0.205,0.123) *, Senegal, Togo, Zambia (-0.082 ,0.047) *
Real interest rate	Angola, Benin, Burundi, Garbo Verde, Cameroun (0.161,0.089) *, Cote d'Ivoire, Guinea, Kenya, Lesotho (0.303,0.108) ***, Liberia, Madagascar, Mali, Niger, Rwanda (0.200 ,0.078) **, Uganda	Botswana, Burkina Faso, Central African Republic (-0.371,0.180) **, Congo Republic (-0.275,0.151) *, Ethiopia, Gambia, Ghana, Malawi, Mozambique, Senegal, Sudan, Tanzania, Togo, Zambia

Note: (...) indicates standard error, and ***, $p < 0.01$; **, $p < 0.05$ and*, $p< 0.10$.

Exchange rate

In twelve countries, exchange rate has a positive impact on manufactured exports, and in five countries, the impact is statistically significant namely Botswana, Burkina Faso, Central African Republic, Mozambique and Zambia. The results are in line with studies by Bakar *et al.* (2015), and Abidin *et al*. (2013). In Botswana, the relationship is statistically significant at 10 percent significant level with coefficient size of 1.233. In Burkina Faso, the impact is statistically significant at 1 percent significant level with a coefficient size of 0.023 while in Central African

Republic, the relationship is statistically significant at 5 percent significant level with coefficient size of 0.084. In Mozambique, the relationship is statistically significant at 5 percent significant level with coefficient size of 0.315, and in Zambia, the impact is statistically significant at 1 percent significant level with coefficient size of 2.226. In these countries, depreciation of exchange rate means that exports are relatively cheaper at international market, hence manufactured exports increase.

In seventeen countries, the impact is negative, and is statistically significant in two countries namely Cameroun and Lesotho. In Cameroun, the impact is statistically significant at 10 percent significant level with coefficient size of -0.025. In Lesotho, the relationship is statistically significant at 1 percent significant level with coefficient size of -5.840. This means that depreciation of the kwacha leads to decrease in manufactured exports. In this case, price of exports become relatively cheaper at international market, and countries export primary products as most of the countries in SSA are predominantly primary commodities based. The results are not in line with studies by Bakar *et al. (*2015), and Abidin *et al*. (2013).

Government expenditure

In thirteen countries, government expenditure has positive impact on manufactured exports, and in two countries, the relationship is statistically significant namely Burundi and Senegal. The results are not in line with studies by Okoye *et al.* (2019), and Asiedu (2014). In Burundi, the impact is statistically significant at 10 percent significant level with coefficient size of 0.535 while in Senegal, the impact is statistically significant at 5 percent significant level with a coefficient size of 2.397. In the remaining sixteen countries, government expenditure has a negative impact on manufactured exports, and the relationship is statistically significant in one country namely Garbo Verde with a coefficient size of - 4.228. The results are in line with studies by Okoye *et al*. (2019) and Asiedu (2014). Though there might be expenditure to boost manufacturing in these countries, it might be so minimal that there is no meaningful impact on manufactured exports.

Country/ Variable	Foraid	tot	exch rate	goveexp	fixed cap	pvtsec credit	fdi	openness	realint	ecm
Angola	-0.176	0.025*	0.018	-0.112	-0.171	0.523***	0.035	-0.001	0.001	-0.176
	(0.353)	(0.014)	(0.013)	(0.126)	(0.118)	(0.159)	(0.045)	(0.022)	(0.001)	(0.353)
Benin	0.872*	0.176	0.003	1.017	1.224***	0.112	-2.515**	-0.270	0.088	-0.696***
	(0.484)	(0.125)	(0.019)	(0.700)	(0.395)	(0.327)	(1.279)	(0.177)	(0.161)	(0.132)
Botswana	-0.117	-0.192***	1.233*	0.026	-0.015	-0.224	0.044	-0.002	-0.075	0.014
	(0.200)	(0.074)	(0.733)	(0.174)	(0.092)	(0.161)	(0.080)	(0.042)	(0.048)	(0.047)
Burkina	0.247	-0.053	0.023***	-0.012	-0.183	-0.040	0.245	-0.074	-0.045	-.0505***
Faso	(0.201)	(0.054)	(0.008)	(0.226)	(0.209)	(0.268)	0.607	(0.149)	0.052	(0.122)
Burundi	0.047	0.036	-0.008	0.535*	0.025	-0.609**	0.456	-0.437***	0.054	-0.664***
	(0.129)	0.024	(0.014)	(0.290)	(0.237)	(0.302)	(0.764)	(0.136)	0.070	0.124
Garbo Verde	-0.713	-0.057	-0.037	-4.228**	0.118	-0.227	0.956	0.335	0.135	-0.099*
	(0.436)	(0.084)	(0.270)	(2.017)	(0.747)	(0.581)	(0.907)	(0.288)	(0.521)	(0.058)
Cameroun	-0.540	0.016	-0.025*	0.409	0.018	-0.168	-0.333	-0.001	0.161*	-0.331***
	(0.342)	(0.044)	(0.013)	(0.820)	(0.115)	(0.229)	(0.403)	(0.108)	(0.089)	(0.100)
CAR	-0.989**	0.003	0.084**	-0.051	0.102	-1.601	2.530*	0.245	-0.371**	-0.337***
	(0.475)	(0.106)	(0.035)	(0.894)	(0.714)	(1.279)	(1.531)	(0.390)	0.180	(0.099)
Congo Rep	0.155	-0.166	0.036	0.373	0.186	0.326	-0.102	-0.095	-0.275*	-0.165***
	(0.223)	(0.065)	(0.024)	(0.376)	(0.180)	(0.416)	(0.363)	(0.090)	(0.151)	(0.062)
Cote	-0.210	0.034	0.010	0.175	0.132	0.232	-0.237	-0.213**	0.028	-0.640***
d'Ivoire	(0.153)	(0.026)	(0.010)	(0.344)	(0.228)	(0.212)	(0.556)	(0.085)	(0.059)	(0.118)
Ethiopia	0.188	0.064	-0.008	-0.391	-0.082	0.115	-0.369	-0.279*	-0.021	-0.191
	(0.323)	(0.045)	(0.652)	(0.322)	(0.419)	(0.379)	(0.446)	(0.151)	(0.048)	(0.128)
Gambia	-0.279	0.138	0.520	1.013	0.313	0.031	-1.718*	0.250	-0.020	-0.305***
	(0.323)	(0.237)	(1.013)	(0.445)	(0.441)	(0.783)	(0.996)	(0.202)	(0.118)	(0.110)
Ghana	-1.249***	0.039	-1.667	-0.552	-0.007	0.756**	0.359	-0.124**	-0.014	-0.704***
	(0.302)	(0.048)	(3.041)	(0.369)	(0.179)	(0.314)	(0.448)	(0.066)	(0.022)	(0.119)
Guinea	0.527	0.008	-0.005	-0.796	-0.194	-0.126	0.681**	-0.071	0.090	-0.071*
	(0.433)	(0.099)	(0.003)	(0.776)	(0.148)	(1.096)	(0.326)	(0.106)	(0.181)	(0.038)
Kenya	0.390	-0.145	-0.101	0.014	-0.079	0.166	-0.735	-0.082	0.020	-0.049
	(0.503)	(.107)	(0.152)	(0.676)	(0.352)	(0.294)	(0.821)	(0.111)	(0.072)	(0.066)
Lesotho	0.194	.025	-5.840***	0.588	0.342	-0.118	1.116*	-0.041	0.303*	-0.217***
	(0.322)	(0.127)	(1.266)	(0.374)	(0.259)	(0.452)	(0.650)	(0.079)	(0.108)	(0.065)
Liberia	0.001*	0.002	-0.001	-0.001	0.002	-0.001	-0.001	-0.001	0.001	-0.001
	(0.003)	(0.005)	(0.003)	(0.021)	(0.011)	(0.016)	(0.003)	(0.001)	(0.006)	(0.001)
Madagascar	0.453	0.088	-0.007	0.330	0.015	0.526	1.897***	0.222*	0.044	-0.124*
	(0.230)	(0.113)	(0.005)	(0.375)	(0.123)	(0.750)	(0.577)	(0.133)	(0.124)	(0.072)

Table 13: Country Specific Results after including Private Sector Credit and without Zimbabwe

Country/ Variable	Foraid	tot	exch rate	goveexp	fixed cap	pvtseccredit	fdi	openness	realint	ecm
Malawi	-0.110	-0.013	-0.007	-0.146	0.123	-0.090	-0.036	0.061	-0.025	-0.352***
	(0.097)	(0.030)	(0.009)	(0.367)	(0.098)	(0.153)	(0.133)	(0.049)	(0.024)	(0.088)
Mali	0.094	-0.058	-0.025	-0.278	-0.529	-0.106	0.823	-0.050	0.192	-0.167*
	(0.376)	(0.096)	(0.018)	(0.413)	(0.534)	(0.339)	(0.549)	(0.196)	(0.145)	(0.090)
Mozambique	-0.152**	-0.085**	0.315**	0.115	-0.046	0.301	0.383***	0.155***	-0.021	0.005
	(0.073)	(0.040)	(0.146)	(0.192)	(0.186)	(0.212)	(0.132)	(0.059)	(0.074)	(0.036)
Niger	0.289*	0.028	-0.005	-0.375	0.382**	-0.450	-0.051	-0.055	0.034	-0.257***
	(0.158)	(0.029)	0.009	(0.291)	(0.176)	(0.303)	(0.333)	(0.103)	(0.059)	(0.096)
Rwanda	0.082	-0.0468	-0.019	-0.174	-0.873**	-0.687	-0.966	-0.205*	0.200***	-0.547***
	(0.088)	(0.039)	0.025	(0.290)	(0.384)	(0.472)	(0.868)	(0.123)	(0.078)	(0.119)
Senegal	0.247*	0.065	-0.014	2.397**	1.232**	-1.370**	0.635	-0.046	-0.098	-0.158*
	(0.543)	(0.118)	(0.022)	(1.186)	(0.501)	(0.584)	(1.221)	(0.170)	(0.127)	(0.093)
Sudan	-0.083	-0.015	-0.040	-0.108	-0.159	0.213	-0.261	0.031	-0.009	-0.121
	(0.173)	(0.018)	(0.070)	(0.167)	(0.099)	(0.259)	(0.340)	(0.070)	(0.013)	(0.097)
Tanzania	0.005	-0.044	0.005	-.500	0.446	-0.112	0.249	0.0479	-0.212	0.001
	(0.494)	(0.159)	(0.020)	(1.081)	(0.587)	(0.339)	(1.146)	(0.237)	(0.140)	(0.127)
Togo	0.001	-0.125	0.032**	0.071	0.036	-0.196	0.302	-0.084	-0.155	-0.020
	(0.374)	(0.058)	(0.020)	(0.402)	(0.211)	(0.353)	(0.253)	(0.094)	(0.126)	(0.045)
Uganda	0.025	0.014	-0.001***	-0.037	-0.059	0.179	0.883	0.063	0.026	-0.180**
	(0.189)	(0.020)	(0.004)	(0.261)	(0.284)	(0.430)	(0.741)	(0.097)	(0.030)	(0.089)
Zambia	0.004	-.0089	02.23	-0.364	-0.395	-0.035	0.129	-.0082*	-0.024	-0.506***
	(0.052)	(0.016)	(0.749)	(0.324)	(0.265)	(0.159)	(0.22)3	(0.047)	(0.024)	(0.117)

Fixed capital

Fixed capital has positive impact on manufactured exports in sixteen countries, and the relationship is significant in three countries namely Benin, Niger and Senegal. In Benin, the impact is statistically significant at 1 percent significant level with coefficient size of 1.224. In Niger, the impact is significant at 5 percent significant level with coefficient size of 0.382. In Senegal, the relationship is significant at 5 percent significant level with coefficient size of 1.232. Therefore, fixed capital, a proxy for infrastructure development impacts manufactured exports positively in these countries. The results are in line with studies by Okoye *et al.* (2019) and Tsaurai (2018). Fixed capital has a negative impact on manufactured exports in thirteen countries, and the relationship is statistically significant in one country namely Rwanda. In the country, the relationship is statistically significant at 5 percent significant level with a coefficient size of -0.873.

Private sector credit

Private sector credit has a positive impact on manufactured exports in twelve countries and the impact is statistically significant in two countries namely Angola and Ghana. The results are in line with a study by Tsaurai (2018). In Angola, the relationship is statistically significant at 1 percent significant level with coefficient size of 0.523 while in Ghana, the relationship is significant at 5 percent level with coefficient size of 0.756. This means that private sector credit is mainly directed towards manufacturing in these countries. Private sector credit has negative impact on manufactured exports in seventeen countries, and the impact is significant in two countries namely Burundi and Senegal. In both countries, the impact is significant at 5 percent significant level with coefficient sizes of -0.609 and -1.370 respectively. In SSA, the financial sector is not well developed, hence there is limited availability of credit to the private sector, and most of the credit is not directed towards manufacturing, that is why there are many countries where private sector credit has a negative impact on manufactured exports.

Foreign direct investment

Foreign direct investment has positive impact on manufactured exports in seventeen countries, and the relationship is statistically significant in five countries namely Central African Republic, Guinea, Lesotho, Madagascar and Mozambique. In Central African Republic, the impact is significant at 10 percent significant level with coefficient size of 2.530. In Guinea, the impact is

significant at 5 percent significant level with a coefficient size of 0.681. In Lesotho, the relationship is significant at 10 percent significant level with coefficient size of 1.116 while in Madagascar, the impact is significant at 1 percent significant level with coefficient size of 1.897. In Mozambique, the impact is significant at 1 percent significant level with coefficient size of 0.383. The results are in line with previous studies (Anetor *et al.,* 2020; Beecroft *et al*., 2020; Ngundu & Ngepah, 2019; Cheung & Lin, 2004).

Foreign direct investment seems to make strong positive impact on manufactured exports considering the number of countries in which the impact is positive, and where the impact is significant, sizes of coefficients are high. Foreign direct investment has negative impact in the remaining twelve countries and in two countries, the relationship is significant namely Benin and Gambia. In Benin, the impact is significant at 5 percent with coefficient size of -2.515 while in Gambia, the impact is significant at 10 percent level with coefficient size of -1.718. The fact that there are few countries in which the impact is negative and there are also few countries where the impact is significant with weak significance levels means that foreign direct investment in most cases enhances manufactured exports.

Openness

Openness has positive impact on manufactured exports in nine countries, and the impact is significant in two countries namely Madagascar and Mozambique. In Madagascar, the impact is significant at 10 percent significant level with coefficient size of 0.222 while in Mozambique, the impact is significant at 1 percent level with coefficient size of 0.155. The results are in line with studies by Ogbonna *et al*. (2021), Jena and Seth (2020) and Tsaurai (2018). Openness has a negative impact in twenty countries, and the relationship is significant in six countries namely Burundi, Cote d' Ivoire, Ethiopia, Ghana, Rwanda and Zambia.

In Burundi, the impact is significant at 1 percent significant level with coefficient size of -0.437 while in Cote d'Ivoire, the relationship is significant at 5 percent level with coefficient size of -0.213. In Ethiopia, Ghana, Rwanda and Zambia, the impact is significant at 10 percent level with coefficient sizes of -0.279, -0.124, - 0.205 and -0.082 respectively. Thus, openness in some SSA countries can impact manufactured exports negatively.

Real interest rate

Real interest rate has a positive impact on manufactured exports in fifteen countries, and the relationship is significant in three countries namely Cameroun, Lesotho and Rwanda. In Cameroun, the impact is significant at 5 percent significant level with coefficient size of 0.161 while in Lesotho, the relationship is significant at 1 percent significant level. In Rwanda, the impact is significant at 5 percent significant level with coefficient size of 0.200. Real interest rate has negative relationship with manufactured exports in fourteen countries, and the relationship is significant in two countries namely Central African Republic and Congo Republic. In Central African Republic, the impact is significant at 5 percent level with coefficient size of -0.271 while in Congo Republic, the impact is significant at 10 percent significant level with coefficient size of -0,275.

5.4 Conclusion

This study examined the impact of foreign aid on manufactured exports in SSA countries. ARDL results show that foreign aid has positive and insignificant effect on manufactured exports. However, other regression analyses such as OLS with robust standard errors, fixed effects model, random effects model, and generalised least squares model consistently show that foreign aid has negative impact on manufactured exports, and in most cases, the relationship is statistically significant (Foreign aid Chap 5, Foreign aid with Prvt sec credit Chap 5). This is not in line with Big Push, Dual Gap and other theories which emphasise on the importance of foreign aid in boosting economic growth. As manufactured exports are an important factor for boosting economic growth, one would expect Big Push and Dual Gap theories to apply on manufactured exports as well.

The results also confirm previous studies that have found that foreign aid does not help recipient countries, if anything, it worsens their economic situations. Such studies include Rajan and Subrimanian (2009), and Munemo *et al.* (2007). Terms of trade are found to be negatively related to manufactured exports (Terms of trade Chap 5, Terms of trade with Prvt sec credit Chap 5). Improvement in terms of trade means that prices of goods which are predominantly primary commodities have improved. This leads to increase in production of primary commodities for export thereby leading to reduction of manufactured goods. Exchange rate is also negatively related to manufactured exports (Exchange rate Chap 5) since if the exchange rate depreciates,

exports of these countries, which are mainly primary commodities become relatively cheaper at international markets, hence there is increase in production of primary commodities leading to reduction in manufactured exports.

Other variables such as government expenditure (GovExp Chap 5), fixed capital(Fixed Capital Chap 5), foreign direct investment (Foreign Direct Inv Chap 5), and openness (Openness Chap 5) have positive impacts on manufactured exports. Thus, improving infrastructure, attracting foreign direct investment, and opening up the SSA countries can improve manufactured exports. Country specific results show that foreign aid has varying impacts (Foreign Aid Country Specific Chap 5), having positive impact in some countries while in other countries, it has negative impact on manufactured exports. The same applies to other variables such as terms of trade (Terms of trade Country Specific Chap5), government expenditure (Gov Exp Country Specific Chap 5), fixed capital (Fixed Capital Country Specific Chap 5), foreign direct investment (Foreign direct inv Country Specific Chap 5), and openness (Openness Country Specific Chap 5).

Similar results are found when private sector credit, a proxy for financial development, is included, and Zimbabwe dataset which seems to be an outlier is excluded. This shows that the results are consistent regardless of methodology used. Though total foreign aid has been found to have negative impact on manufactured exports, stopping the study at this point might give impression that foreign aid is not effective in the countries. Foreign aid has several types including grants, agricultural aid, education aid, health aid, humanitarian aid, just to mention a few. It is therefore important to examine the impact of various types of foreign aid instead of criticising it in its entirety. There is possibility that some of the types of aid have positive and significant impacts on manufactured exports. Donors and recipient countries would then know which type of aid and to which sectors should foreign aid be allocated in order to boost manufactured exports. This research therefore goes further by examining impacts of disaggregated foreign aid on manufactured exports. The study is presented in Chapter 6 below.

Chapter 6

Impacts of Different Types of Foreign Aid, Disaggregated by Sectoral Allocation, on Manufactured Exports Performance

6.1 Introduction

This chapter examines the impact of disaggregated foreign aid on manufactured exports. In Chapter 5, it was found that foreign aid had negative impact on manufactured exports (Foreign aid Chap 5, Foreign aid with Prvt sec credit Chap 5). In this case, foreign aid may be regarded as having adverse effect on manufactured efforts. It is therefore necessary to examine whether various types of foreign aid have equally adverse effect on manufactured exports or some of them or all have positive effect on manufactured exports. Big Push Theory, Dual Gap Theory, and others maintain that foreign aid is very crucial for availing the much-needed resources for developmental activities in developing countries such as those of the SSA region. Manufactured exports are a very important component of exports that fetch high prices at international markets thereby bringing to a country foreign exchange which can be used for purchasing goods and services necessary for development of the countries.

Specifically, manufactured exports are important in improving economic growth of any country. On the contrary, SSA countries are known for exporting primary commodities that fetch low prices at international market leading to deterioration of terms of trade of these countries. The countries have to boost manufactured exports if they are to experience meaningful development. The study therefore examines the impact of disaggregated foreign aid on manufactured exports, apart from examining impacts of other variables on manufactured exports. The variables include government expenditure, fixed capital, foreign direct investment, openness, among others. The study has also carried out asymmetric test to find out whether positive change of each type of foreign aid has different effect from negative change of each type. Further, the study has run regressions after including private sector credit as a proxy for financial development, and removing Zimbabwe dataset.

6.2 Variables and Expected Signs

Table 6 contains expected signs of variables in this study and their justifications are presented in Section 5.2. The variables are terms of trade, exchange rate, government expenditure, fixed capital,

private sector credit, foreign direct investment, and openness. However, expected signs of types of foreign aid and their justifications are discussed in this section. Grants, as almost free aid, are expected to have a positive impact on manufactured exports especially if they are directed to manufacturing sector. Ugwuegbe *et al*. (2016) found a positive relationship between grants and economic growth, therefore in this study, grants are expected to have a positive sign. The same applies to agricultural aid as it provides the much- needed resources for boosting agricultural production contributing to economic growth. Various studies have found a positive impact of agricultural aid on economic growth (Shaibu & Shaibu, 2022; Aljonaid *et al.,* 2022; Gyimah & Gentry, 2020). Agricultural aid is therefore expected to have a positive sign. Education aid improves learning conditions including educational infrastructure such as schools. Several studies also found that education aid has a positive impact (Asiedu, 2014; Ojeaga, 2012). Education aid is therefore expected to have a positive sign.

Health aid improves health of people thereby improving quality of labour which translates into high labour productivity. Asaleye *et al.* (2023) found a positive relationship between health aid and economic growth. Health aid is therefore expected to have a positive sign. Humanitarian aid improves the health and welfare of the vulnerable some of whom work in manufacturing. Neanidis (2012) found an ambiguous effect on economic growth. Thus, in this study, humanitarian aid is expected to have either a positive or negative sign.

6.3 Results

Presentation of results in this study starts with descriptive statistics discussing various measures such as mean, median, mode, normality of the data, and correlation. Regression analysis then follows whereby diagnostic tests are carried out including residual normality test, serial correlation, heteroskedasticity, and stability test, and then main results are discussed.

6.3.1 Descriptive Statistics

For descriptive statistics for manufactured exports, refer to Table 7 . The average of grants as a percentage of gross domestic product is 23.7 percent over the period from 1970 to 2019 as compared to that of total aid which is 24.5 percent (Table 14). This means that most of the aid comes in form of grants. The median for grants is 22.2 percent while minimum is 20.7 percent, and maximum is 28.8 percent. Standard deviation is 2.7 which means that most of the observations are close to the mean. This means that annual grants are above 20 percent and below 28 percent

over the entire period. The SSA countries have received mostly grants as a form of foreign aid but still, the region is mired in underdevelopment. This implies that foreign aid has not helped the region to develop economically.

Average agricultural aid is 0.01 percent of GDP and median is 0.02 percent while minimum is 0.001 percent, and maximum is 0.045 percent. Standard deviation is 0.01 which means that most of the observations are close to the mean. Aid allocated to agriculture is very low. Similarly, average education aid is 0.06 percent, and median is 0.045 while minimum is 0.03 percent, and maximum is 0.14 percent. In short, aid allocated to sectors such as agricultural sector, educational sector, health sector, and aid allocated for humanitarian purposes is very low. Comparing averages, apart from grants, humanitarian aid is the highest aid at 0.12 percent followed by education aid at 0.06, agricultural aid at 0.01 percent and health aid at almost 0.01 percent.

Table 14: Descriptive Statistics

	grants	agriaid	eduqid	healthaid	humaid
Mean	23.699	0.013	0.055	0.007	0.115
Median	22.244	0.014	0.045	0.009	0.088
Maximum	28.827	0.045	0.144	0.012	0.430
Minimum	20.655	0.001	0.027	0.002	0.018
Std. Dev.	2.698	0.010	0.026	0.003	0.103
Skewness	0.774	0.783	1.527	-0.555	1.580
Kurtosis	2.253	4.249	5.134	1.796	4.879
Jarque-Bera	6.159	8.358	28.925	5.586	28.161
Probability	0.046	0.015	0.000	0.061	0.000
Sum	1184.971	0.659	2.756	0.363	5.728
Sum Sq. Dev.	356.803	0.005	0.032	0.001	0.517

6.3.2 Correlation

Table 15 shows that agricultural aid is positively correlated with manufactured exports with coefficient size of 0.639 at 1 percent significant level. This means that if regression analysis is run, coefficient of agricultural aid may have a positive sign. Educational aid is also positively correlated with manufactured exports with a coefficient size of 0.072 but the relationship is not statistically significant. Grants are negatively correlated with manufactured exports but the relationship is not

statistically significant. Health aid is also negatively correlated with manufactured exports but the relationship is not statistically significant.

Table 15: Correlation

	manuexp	grants	agriaid	eduaid	Healthaid	humaid	govtexp	fixedcap	fdi
manuexp	1.000								
grants	- 0.104	1.000							
agriaid	0.639***	0.075	1.000						
eduaid	0.072	0,072	0.172	1.000					
healthaid	- 0.068	- 0.168	- 0.188	0.000	1.000				
humaid	0.155	0.092	0.193	0.653***	0.076	1.000			
govexp	0.584***	- 0.094	0.373***	0.092	0.239	0.082	1.000		
fixedcap	0.602***	0.120	-0.387***	0.049	- 0.128	0.061	- 0.951***	1.000	
fdi	0.476***	-0.046	0.077	- 0.244*	- 0.150	- 0.469***	0.414***	-0.516***	1.000

Note: ***, $p < 0.01$; **, $p < 0.05$; *, $p < 0.1$

6.3.3 Regression Analysis

Diagnostic tests for pooled regression

Before investigating short run and long run relationships between manufactured exports and explanatory variables, there is need for diagnostic tests. These include normality test, serial correlation, heteroskedasticity, and stability test. Based on results presented in Table 16, the proposed model passes all tests. Jarque–Bera shows that residuals are normally distributed, that is, the null hypothesis that the residuals are normally distributed is not rejected (p-value = 0.7267). Figure 6 also shows that residuals are normally distributed. The same applies to autocorrelation of residuals. Breusch-Godfrey Serial Correlation LM Test (Table 16) shows that the residuals are not autocorrelated at 5 percent significant level (p=0.0602).

Breusch-Pagan-Godfrey Heteroskedasticity test shows that there is no heteroscedasticity in the residuals (p-value = 0.5162). The stability of the model is tested by conducting CUSUM and CUSUM Squares tests as shown in Figure 4 and Figure 5. Both tests reveal the stability of the model coefficients since the estimated model lies within the 5% significance lines for CUSUM and CUSUM Squares tests.

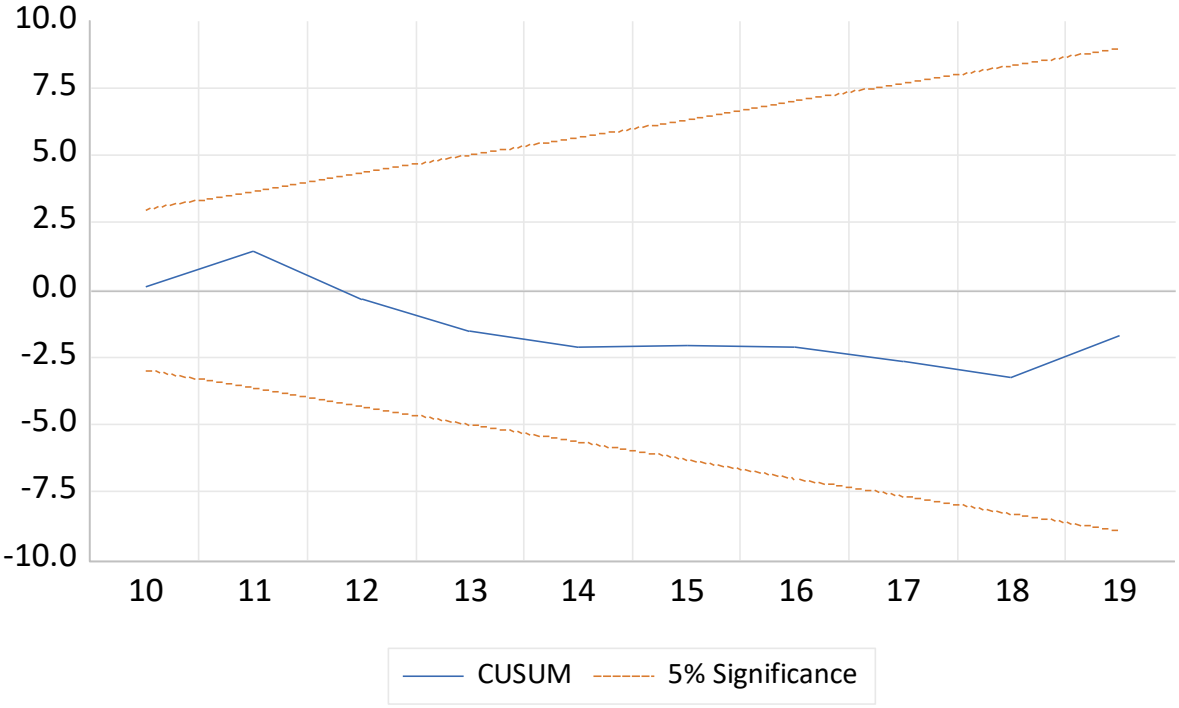

Figure 4: NARDL CUSUM

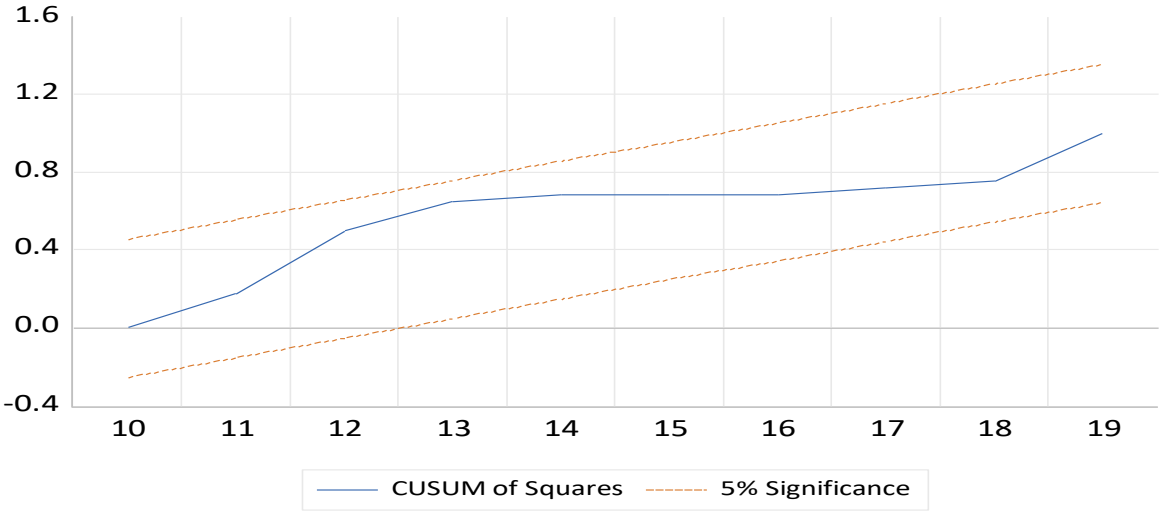

Figure 5: NARDL CUSUM Squares

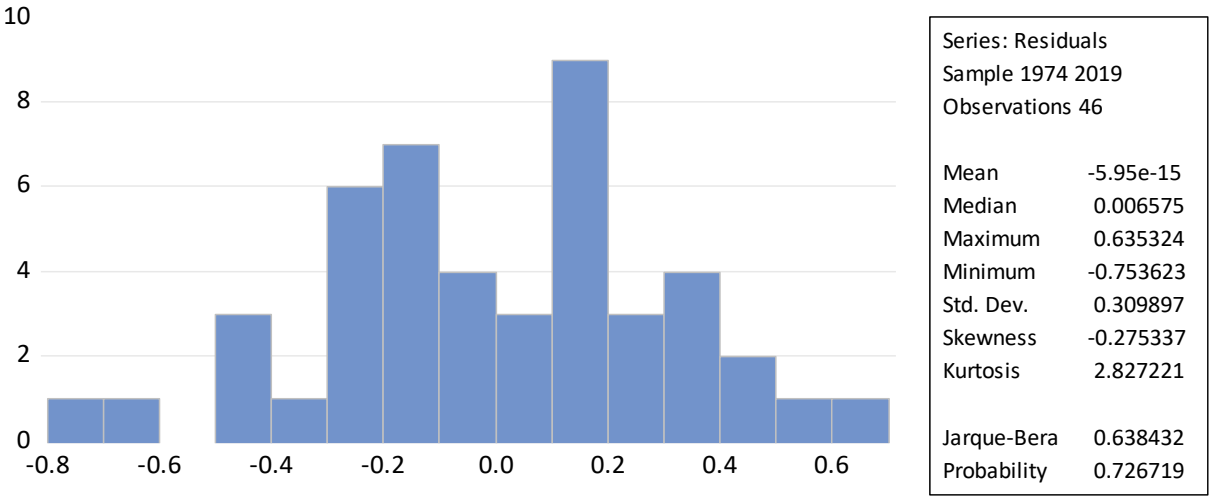

Figure 6: Test of Normal Distribution

Analysis using Autoregressive Distributed Lag (ARDL)

Grants

ARDL results for panel data show that grants have a positive impact on manufactured exports at 1 percent significant level, and size of coefficient is 0.637 (Table 16).This is in line with Big Push and Dual Gap theories, and some empirical studies such as that of Ugwuegbe *et al.* (2016). This implies that donors should give aid mainly in form of grants if they are to improve manufactured exports and economic performance of these countries.

Agricultural aid

ARDL results for pooled data show that agricultural aid has a positive effect on manufactured exports, but the relationship is not statistically significant. However, first lag shows that agricultural aid has a positive impact on manufactured exports at 10 percent significant level, and size of the coefficient is 74.399. ARDL results for panel dada show that agricultural aid has positive impact on manufactured exports, and the relationship is statistically significant at 1 percent significant level. Size of coefficient is 30.188. This is in line with previous studies (Shaibu & Shaibu, 2022; Aljonaid *et al.,* 2022; Gyimah & Gentry, 2020). The size of the coefficient and strong significance shows that agricultural aid has a substantial impact on manufactured exports in SSA countries. Boosting agricultural production means that raw materials are readily available for value addition resulting in improvement in manufactured products some of which can be exported. This calls upon policy makers in these countries to come up with agro-based

manufacturing industrialisation strategies. Agro-processing (value addition) is crucial for enhancing manufacturing in these countries as most of the economies are agro-based.

Education aid

ARDL results for pooled data show that education aid has a positive impact on manufactured exports but the relationship is statistically insignificant. ARDL results for panel data show that education aid has a negative impact on manufactured exports but not statistically significant. Thus, education aid has no impact on manufactured exports. Funding on education has mostly been found to have a long-term impact. Individuals tend to spend most of their childhood lives getting educated, and fruits of education only start materialising in their middle ages. The results are not in line with studies by Asiedu (2014) and Ojeaga (2012) which found that education aid had a positive and significant impact on economic growth and exports respectively.

Health aid

ARDL results for pooled data show that health aid has a negative effect on manufactured exports but statistically insignificant. When ARDL results for panel data are considered, health aid is found to be positively related to manufactured exports, and the relationship is statistically significant at 1 percent significant level. Size of coefficient is 49.272. The size of the coefficient shows that health aid has a strong impact on manufactured exports. Human capital formation is crucial for enhancing manufacturing, and health aid contributes to health people thereby contributing to human capital formation. A healthy workforce is more productive in whatever sphere of economic activity including manufacturing. The results are in line with a study by Asaleye *et al.* (2023).

Humanitarian aid

ARDL results for pooled data show that humanitarian aid has a negative and statistically insignificant effect on manufactured exports. The sign becomes positive when ARDL results for panel data are considered, though the relationship is statistically insignificant. This means that humanitarian aid has an insignificant impact on manufactured exports implying that aid directed towards disaster and relief efforts does not have impact on manufactured exports. This is so because humanitarian aid is for emergency purposes aimed at relieving suffering of the affected people. This may not have direct impact on manufacturing. The results are in line with a study by Neanidis (2012) who found that humanitarian aid had an ambiguous effect on economic growth.

Terms of trade

ARDL results for panel data show that terms of trade have a negative and statistically significant effect on manufactured exports at 1 percent significant level with a coefficient size of -0.027 (See also Terms of trade Chap 5, Terms of trade with Prvt sec credit Chap 5). Most of the exports of countries in Sub-Saharan Africa are primary products. Improvement in prices of primary exports means that producers commit their resources to primary products industry. This leads to neglect of manufacturing thereby impacting negatively on manufactured exports. The results are in line with Prebisch-Singer Theory. The results are also in line with previous studies (Jebran *et al*., 2018; Tehseen & Ali, 2012). However, they are not in line with other studies such as Jawaid and Raza (2013), Blattman *et al.* (2003), Kose (2002), and Bleaney and Greenaway (2001).

Government expenditure

ARDL results for panel data show that government expenditure has a negative and statistically significant effect on manufactured exports at 5 percent significant level and coefficient is -0.225 (See also Govt exp with Prvt sec credit Chap 5). Government expenditure is mostly made on sectors such as health, education and not on the manufacturing industry thereby impacting negatively on manufacturing at least in the short run. The results are in line with studies by Okoye *et al*. (2019) and Asiedu (2014).

Fixed capital

ARDL results for pooled data show that fixed capital has a negative and statistically significant impact on manufactured exports at 1 percent significant level with a coefficient size of -0.217. The results change with first lag when fixed capital is positive and statistically significant, again at 1 percent significant level, and size of coefficient is 0.664. This shows that initially, fixed capital formation drains resources that would otherwise have been used to fund manufacturing including manufactured exports. However, as the fixed capital, which is a proxy for infrastructure development comes into use, it attracts investors including foreign ones that lead to increased manufacturing and manufactured exports. ARDL results for panel data shows that fixed capital has negative impact but statistically insignificant. The results are not in line with studies by Okoye *et al*. (2019), and Tsaurai (2018).

Foreign direct investment

ARDL results for pooled data shows that foreign direct investment has a positive but statistically insignificant effect on manufactured exports. It becomes positive and statistically significant with first lag and size of the coefficient is 1.431. ARDL results for panel data show that foreign direct investment has a positive and statistically significant effect on manufactured exports at 5 percent significant level, and size of coefficient is 0.534 (See also Foreign Direct Inv Chap5, Foreign dir inv with Prvt sec credit Chap 5). This shows that foreign direct investment plays a crucial role in boosting manufacturing and manufactured exports. This is expected as foreign direct investment mostly targets manufacturing leading to increase in manufactured products. The results are in line with previous studies (Anetor *et al.,* 2020; Beecroft *et al*., 2020; Ngundu & Ngepah, 2019; Cheung & Lin, 2004).

Openness

ARDL results for panel data show that openness has a positive and statistically significant effect on manufactured exports at 1 percent significant level, and size of coefficient is 0.088 (See also Openness Chap 5, Openness with Prvt sec credit Chap 5). Openness means domestic products have access to international markets thereby boosting exports including manufactured exports. The results are in line with studies by Ogbonna *et al.* (2021), Jena and Seth (2020), and Tsaurai (2018).

Table 16: ARDL Results for Pooled and Panel Data

manuexp	ARDL Results for Pooled Data Coef.	ARDL Results for Panel Data
manuexp (-1)	0.756***	
	(0.984)	
grants		0.637***
		(0.202)
agriaid	16.399	30.188***
	(42.367)	(4.838)
agriaid (-1)	79.429*	
	(42.645)	
eduaid	15.935	-3.822
	(13.371)	(3.655)
healthaid	-0.858	49.272***
	(80.551)	(17.727)

humaid	-1.470 (4.464)	0.501 (0.856)
tot		-0.027*** (0.009)
govexp		-0.225** (0.091)
fixedcap	-0.217*** (0.065)	-0.057 (0.073)
fixedcap (-1)	0.664*** (0.078)	
fdi	O.628 (0.520)	0.534** (0.210)
fdi (-1)	1.431*** (0.508)	
openness		0.088*** (0.029)
Breusch-Godfrey Serial Correlation LM Test	F- Statistic 4.074	Prob 0.0602
Heteroskedasticity Test: Breusch-Pagan-Godfrey	F- Statistic 1.028	Prob 0.5162
Jarque- Bera	0.6380	
Probability	0.7267	

Note: (...) indicates standard error, and ***, $p < 0.01$; **, $p < 0.05$ and*, $p< 0.10$.

Country specific results using ARDL

Country specific results have been analysed below. They show that various types of foreign aid have different impacts in different countries (Table 17 for results of a sample of six countries, and Table 18 for all countries).

Grants

Grants are found to be positively related to manufactured exports in several countries while in other countries, they are negatively related to manufactured exports. Sample of countries in Table 17 shows that grants are negatively related to manufactured exports in all six countries in the sample, and the relationship is statistically significant in four countries namely Cameroun, Central African Republic, Malawi and Sudan. In Cameroun, the relationship is statistically significant at 10 percent significant level with a coefficient size of -1.608. In Central African Republic, the relationship is statistically significant at 1 percent significant level with coefficient size of -4.732. In Malawi, the relationship is statistically significant at 1 percent significant level with a coefficient size of -.0.992. In Sudan, the relationship is statistically significant at 1 percent

significant level and the size of coefficient is -0.770. This means that, in the countries, grants are mostly directed to other sectors rather than manufacturing.

Agricultural aid

Agricultural aid has a negative impact in all six countries (Table 17) and the relationship is statistically significant in two of the countries namely Cameroun and Niger. In Cameroun, the relationship is statistically significant at 5 percent significant level and size of coefficient is -100.268. In Niger, the relationship is statistically significant at 1 percent significant level with a coefficient size of -32.795.

Education aid

Educational aid is positively related to manufactured exports in five of the six countries and the relationship is statistically significant in one country namely Benin. In the country, the relationship is statistically significant at 10 percent significant level with a coefficient size of 54.629. This means that improvement in skills in the country as a result of the aid enhances manufactured exports.

Table 17: Sample of Countries with Results

Country	Variable	Coefficient
Benin	Grants	-0.086
		(0.584)
	Agricultural aid	-2.294
		13.503
	Educational aid	54.629*
		(31.095)
	Health aid	69.483*
		(38.657)
	Humanitarian aid	6.645
		(11.948)
	Terms of trade	0.147
		(0.131)

	Government exp.	0.683
		(0.652)
	Fixed capital	1.571***
		(0.338)
	FDI	-3.402**
		(1.371)
	Openness	-0.215
		(0.193)
Cameroun	Grants	-1.608*
		(0.966)
	Agricultural aid	-100.268**
		(41.494)
	Education aid	9.769
		(52.799)
	Health aid	17.464
		(194.409)
	Humanitarian aid	-7.227
		(22.981)
	Terms of trade	0.035
		(0.042)
	Government exp.	1.780**
		(0.758)
	Fixed capital	0.076
		(0.111)
	FDI	-0.238
		(0.441)
	Openness	0.014
		(0.100)
Central African Republic	Grants	-4.732***
		(0.740)
	Agricultural aid	-4.403
		(17.862)
	Educational aid	2.588
		(4.950)
	Health aid	-15.732
		(40.018)
	Humanitarian aid	1.264
		(11.021)
	Terms of trade	- 0.005
		(0.081)
	Government exp.	0.248
		(0.762)
	Fixed capital	0.959**
		(0.491)

	FDI	2.247*
		(1.330)
	Openness	-0.015
		(0.274)
Malawi	Grants	-.0.992***
		(0.225)
	Agricultural aid	-0.937
		(2.129)
	Educational aid	- 0.667
		(3.134)
	Health aid	-11.528
		(11.101)
	Humanitarian aid	-0.223
		(0.321)
	Terms of trade	0.0291
		(0.031)
	Government exp.	0.184
		(0.330)
	Fixed capital	0.220**
		(0.087)
	FDI	0.319***
		(0.120)
	Openness	0.019
		(0.042)
Niger	Grants	-5.666
		(7.334)
	Agricultural aid	-32.795***
		(9.773)
	Educational aid	6.863
		(6.120)
	Health aid	-25.113
		(19.144)
	Humanitarian aid	4.186**
		(1.868)
	Terms of trade	0.028
		(0.024)
	Government exp.	-0.348
		(0.266)
	Fixed capital	0.462***
		(0.165)
	FDI	-0.189
		(0.297)
	Openness	-0.127
		(0.090)
Sudan	Grants	-0.770***
		(0.168)

Agricultural aid	-10.017
	(10.189)
Educational aid	1.643
	(4.174)
Health aid	-39.476
	(41.899)
Humanitarian aid	-2.868**
	(1.310)
Terms of trade	-0.044***
	(0.015)
Government exp.	-0.001
	(0.132)
Fixed capital	0.038
	(0.092)
FDI	-0.580**
	(0.295)
Openness	0.011
	(0.054)

Note: (...) indicates standard error, and ***, $p < 0.01$; **, $p < 0.05$ and*, $p< 0.10$.

Health aid

Health aid has a positive and statistically significant effect on manufactured exports in two of the six countries, and the relationship is statistically significant in one country namely Benin. In the country, the relationship is statistically significant at 10 percent significant level, and size of coefficient is 69.483. In the remaining four countries, the relationship is negative, and statistically insignificant.

Humanitarian aid

Humanitarian aid has a positive impact on manufactured exports in three countries namely Benin, Central African Republic and Niger. The relationship is statistically significant in one country, Niger, at 5 percent significant level, and size of coefficient is 4.186. In the remaining countries, Benin, Malawi and Sudan, the relationship is negative but it is statistically significant in Sudan only at 5 percent significant level with coefficient size of -2.868.

Terms of trade

Terms of trade have positive relationship with manufactured exports in four countries namely Benin, Cameroun, Malawi and Niger, and the relationship is not statistically significant in the countries. On the other hand, terms of trade have negative impact on manufactured exports in two

countries namely Central African Republic and Sudan but the relationship is statistically significant in Sudan at 1 percent significant level with a coefficient size of -0.044.

Government expenditure

Government expenditure has a positive impact on manufactured exports in four of the six countries and the relationship is statistically significant in one country, Cameroun, at 5 percent significant level with coefficient size of 1.780. Government expenditure has negative impact on manufactured exports in one country, Sudan, but the relationship is not statistically significant.

Fixed capital

Fixed capital has positive impact on manufactured exports in all six countries, and the relationship is statistically significant in four countries namely Benin, Central African Republic, Malawi and Niger. In Benin, the relationship is statistically significant at 1 percent significant level with coefficient size of 1.571. In Central African Republic, the relationship is statistically significant at 5 percent significant level, and size of coefficient is 0.959. In Malawi, the relationship is statistically significant at 5 percent and size of coefficient is 0.220. In Niger, the relationship is statistically significant at 1 percent significant level, and size of coefficient is 0.462. Fixed capital is a proxy for state of infrastructure in any country, and the better the state of infrastructure of a country, the more domestic and foreign investment. These translate into increased manufacturing, hence increased manufactured exports.

Foreign direct investment

Foreign direct investment has a positive and statistically significant impact on manufactured exports in two countries namely Central African Republic and Malawi. In Central African Republic, the relationship is statistically significant at 10 percent significant level with coefficient size of 2.247. In Malawi, the relationship is statistically significant at 1 percent significant level, and size of coefficient is 0.319. Foreign direct investment has a negative effect on manufactured exports in four countries, and the relationship is statistically significant in two countries namely Benin and Sudan. In Benin, the relationship is statistically significant at 5 percent significant level and size of coefficient is -3.402. In Sudan, the relationship is statistically significant at 5 percent significant level, and size of coefficient is -0.580.

Openness

Openness has a positive effect on manufactured exports in three countries namely Cameroun, Malawi and Sudan but the relationship is not statistically significant. The variable has negative impact in the remaining three countries namely Benin, Central African Republic and Niger but again, the relationship is not statistically significant.

Worth noting is that, positively or negatively related, there is usually no statistical significance in many cases. That is why manufactured exports have lagged behind in SSA. This also shows that most African countries do not take boosting manufactured exports as a priority.

Country/Variable	grants	agriaid	eduaid	healthaid	humaid	tot	govexp	fixedcap	fdi	openness	ect
Angola	-0.099	-9.299	2.573	6.676	0.743	0.0217	-0.040	-0.045	0.028	-0.029	-0.046
	(0.104)	(138.227)	(9.417)	(106.681)	(1.725)	(0.017)	(0.125)	(0.144)	(0.073)	(0.030)	(0.033)
Benin	-0.086	-2.294	54.629*	69.483*	6.645	.1472	0.683	1.571***	-3.402**	-0.2155	0.554***
	(0.684)	(13.503)	(31.095)	(38.657)	(11.948)	(0.131)	(0.652)	(0.338)	(1.371)	(0.193)	(0.117)
Botswana	0.225**	2.462	-0.501	7.899	-0.095	-0.099	-0.073	-0.067	0.074	-0.006	0.051
	(0.108)	(38.803)	(24.973)	(37.452)	(1.207)	(0.066)	(0.187)	(0.104)	(0.081)	(0.044)	(0.045)
Burkina Faso	-0.914	-6.038	-2.950	12.108	-0.466	-0.052	0.034	-0.001***	0.556	-0.117	-0.450***
	(0.797)	(11.830)	(11.389)	(32.091)	(4.156)	(0.058)	(0.239)	(0.228)	(0.686)	(0.149)	(0.123)
Burundii	0.069	3.072	-1.221	-17.834	-0.124	0.047***	0.254	0.249	0.509	-0.349	-0.545***
	(0.326)	(3.500)	(2.797)	(21.074)	(0.479)	(0.017)	(0.224)	(0.178)	(.525)	(0.010)	(0.098)
Garbo Verde	0.051	-57.506***	-8.069	038.9	-5.091	-0.024	-5.079***	-0.034	0.361	0.311	-0.115**
	(1.389)	(17.103)	(17.548)	(35.182)	(4.161)	(0.071)	(1.809)	(0.718)	(0.774)	(0.273)	(0.047)
Cameroun	-1.608*	-100.268**	9.769	17.464	-7.227	0.035	1.780**	0.076	-0.238	0.014	-0.388***
	(0.966)	(41.494)	(52.799)	(194.409)	(22.781)	(0.042)	(0.758)	(0.111)	(0.441)	(0.100)	(0.112)
CAR	-4.732***	-4.403	2.588	-15.732	1.264	-0.005	0.248	0.959*	2.247*	-0.015	-0.229***
	(0.740)	(17.862)	(4.950)	(40.018)	(11.021)	(0.081)	(0.762)	(0.491)	(1.330)	(0.274)	(0.079)
Congo Rep	-0.188	34.108	-13.932	-17.865	-23.378	-0.181**	0.327	0.123	0.134	-0.102	-0.152***
	(0.264)	(43.937)	(84.907)	(148.738)	(18.456)	(0.076)	(0.398)	(0.171)	(0.457)	(0.088)	(0.058)
Cote d'Ivoire	0.466	258.38**	60.389	-311.152*	11.590	0.035	0.223	0.035	-0.120	-0.163**	-0.590***
	(1.125)	(86.293)	(58.424)	(176.861)	(28.409)	(0.025)	(0.322)	(0.225)	(0.537)	(0.080)	(0.116)
Ethiopia	0.633	18.217	14.539	25.081	-0.938	0.053	-0.335	0.098	-0.260	-0.380***	-0.250**
	(0.391)	(14.407)	(10.640)	(38.892)	(2.191)	(0.043)	(0.332)	(0.356)	(0.442)	(0.142)	(0.116)
Gambia	-2.847	-28.338**	24.013	50.992	1.463	0.247	0.350	0.222	-1.435	0.370**	-0.242**
	(2.777)	(12.929)	(35.078)	(55.466)	(4.066)	(0.231)	(0.508)	(0.434)	(0.906)	(0.216)	(0.110)
Ghana	-0.956**	-83.991***	56.562	-46.552	-6.717	0.021	-0.265	-0.028	-0.198	-0.053	-0.551***
	(0.407)	(31.277)	(45.272)	(62.830)	(11.235)	(0.044)	(0.391)	(0.201)	(0.527)	(0.075)	(0.125)
Guinea	0.277	-7.603	40.147**	-68.18354	6.463	-0.106	-0.620	-0.098	0.442	-0.108	-0.371***
	(2.754)	(14.673)	(19.005)	(69.043)	(18.150)	(0.101)	(0.651)	(0.137)	(0.307)	(0.090)	(0.129)
Kenya	-2.378	27.831	-42.198*	-4.817	12.349***	-0.124	0.468	0.294	-0.902	-0.096	-0.053
	(1.637)	(57.083)	(24.247)	(51.940)	(4.672)	(0.096)	(0.609)	(0.335)	(0.684)	(0.098)	(0.060)
Lesotho	0.344	0.265	-12.002	58.289*	-0.053	-0.069	0.239	0.125	1.023	0.024	-0.133*
	(0.456)	(13.292)	(20.556)	(33.935)	(1.616)	(0.210)	(0.448)	(0.309)	(0.826)	(0.084)	(0.073)
Liberia	-0.067	0.113	0.076	-0.715	0.030	0.003	0.001	0.005	-0.001	-0.001	-0.003
	(0.251)	(0.586)	(0.298)	(1.919)	(0.272)	(0.006)	(0.032)	(0.020)	(0.003)	(0.001)	(0.004)

Table 18: Country Specific Results

Country/Variable	grants	agriaid	eduaid	healtaid	humaid	tot	govexp	fixedcap	fdi	openness	ect
Madagascar	0.368	21.505	6.744	70.073	-8.006	-0.003	0.463	-0.013	2.023***	0.219***	-0.103*
	(0.527)	2(5.760)	(20.886)	(105.867)	(13.064)	(0.133)	(0.401)	(0.131)	(0.612)	(0.137)	(0.053)
Malawi	-0.992***	-0.937	-0.667	-11.528	-0.223	0.029	0.184	0.220**	0.319***	0.019	-0.172***
	(0.225)	(2.129)	(3.134)	(11.101)	(0.321)	(0.031)	(0.330)	(0.087)	(0.120)	(0.042)	(0,062)
Mali	-0.105	0.451	-0.725	-58.614	0.465	-0.050	-0.178	-0.200	1.040*	-0.046	-0.084
	(0.146)	(22.328)	(16.515)	(78.788)	(3.782)	(0.099)	(0.426)	(0.556)	(0.598)	(0.160)	(0.080)
Mozambique	-3.359***	-7.967	1.154	38.263*	-1.181	-0.098**	0.073	0.006	0.372***	0.097**	0.001
	(0.878)	(23.368)	(4.648)	(23.11)	(1.144)	(0.040)	(0.191)	(0.144)	(0.130)	(0.049)	(0.051)
Niger	-5.666	-32.795***	6.863	-25.113	4.186**	0.028	-0.348	0.462***	-0.189	-0.127	-0.260***
	(7.334)	(9.773)	(6.120)	(19.144)	(1.868)	(0.024)	(0.266)	(0.165)	(0.297)	(0.090)	(0.083)
Rwanda	0.297	-16.431**	1.367	-34.006	0.1661	-0.034	-0.112	-0.426	-0.956	-0.128	-0.309***
	(0.516)	(7.085)	(3.011)	(32.417)	(0.564)	(0.045)	(0.333)	(0.445)	(0.948)	(0.195)	(0.087)
Senegal	-2.185	-31.169	-69.674*	45.515	0.301	0.095	1.040	1.180**	1.206	-0.046	-0.191**
	(2.460)	(52.090)	(40.881)	(106.090)	(22.543)	(0.110)	(1.099)	(0.498)	(1.299)	(0.164)	(0.094)
Sudan	-0.770***	-10.017	1.643	-39.476	-2.868**	-0.044***	-0.001	0.038	-0.580**	0.011	-0.444***
	(0.168)	(10.189)	(4.174)	(41.899)	(1.310)	(0.015)	(0.132)	(0.092)	(0.295)	(0.054)	(0.099)
Tanzania	6.630***	-204.428***	-90.747**	-84.413	0.990	-0.048	-0.395	-0.016	-2.336**	0.361	0.158*
	(1.705)	(53.573)	(39.002)	(104.001)	(6.593)	(0.124)	(0.946)	(0.497)	(1.031)	(0.219)	(0.084)
Togo	1.830	2.603	10.207	60.711	15.659	-0.132**	0.159	-0.029	0.179	-0.021	-0.050
	(1.220)	(15.709)	(31.109)	(50.789)	(10.498)	(0.057)	(0.374)	(0.204)	(0.257)	(0.093)	(0.046)
Uganda	-5.016	-24.060*	-3.321	-33.616	-0.316	0.010	0.046	-0.060	1.379**	0.124	-0.059
	(15.123)	(12.701)	(7.0555)	(25.903)	(3.364)	(0.019)	(0.228)	(0.285)	(0.661)	(0.089)	(0.051)
Zambia	-0.069	-17.580	-10.174	-16.396	-1.102	-0.017	-0.101	-0.211	0.296	0.001	0,256**
	(0.271)	(17.499)	(13.384)	(25.629)	(3.577)	(0.015)	(0.384)	(0.296)	(0.211)	(0.054)	(0,122)
Zimbabwe	-1.106	-76.026*	1.852	42.020	4.300**	0.161	-0.045	0.067	0.366	0.162	-0.326***
	(2.792(	(41.862)	(10.547)	(107.937)	(2.118)	(0.223)	(0.296)	(0.284)	(0.831)	(0.140)	(0.111)

Pooled Data Analysis Using NARDL model

As already stated, it is not unusual that positive and negative changes of an independent variable can have different impacts on the dependent variable. For example, giving aid to a poor country can have a totally different impact from withdrawing or not giving aid at all. There are countless instances where donors have withdrawn aid, and the recipient country has faced various challenges especially in SSA.

With ARDL results (Table 16), NARDL long run form and bounds test are performed and results show that F-Statistic (8.301) is more than the upper bound (3.860) at 1% significant level (Table 19). This means that there is a long run relationship. Running Error Correction Model also shows that 52 percent of the equilibrium error in the previous period is corrected in the current period (Table19). This implies that the model can reach equilibrium in about two years.

Table 19: NARDL and Error Correction Model Results

Manu Exp	NARDL Results for Pooled Data		Error Correction Model	
	Coefficient	Standard Error	Coefficient	Standard Error
C	3.432	1.923	3.432***	0.307
MANUEXP (-1)	-0.524	0.229		
AGRIAID_POS (-1)	-330.942*	154.522		
AGRIAID_NEG (-1)	-338.196*	164.369		
EDUAID_POS (-1)	-370.443***	93.312		
EDUAID_NEG	-153.718**	34.280		
HEALTHAID_POS (-1)	-180.881	127.664		
HEALTHAID_NEG (-1)	-126.505	136.874		
HUMAAID_POS (-1)	95.964***	21.734		
HUMAAID_NEG (-1)	29.001***	7.359		
FIXEDCAP (-1)	-0.012	0.060		
FDI2GDP (-1)	0.879	0.638		
D (MANUEXP (-1))	0.234*	0.129	-0.234***	0.056
D(AGRIAID_POS)	103.554	63.640	103.554***	30.646
D (AGRIAID_POS (-1)	864.399***	222.005	864.399***	53.357
D (AGRIAID_POS (-2))	549.058***	133.016	549.058***	62.765
D(AGRIAID_NEG)	-299.877***	88.674	-299.877***	30.623
D (AGRIAID_NEG (-1))	-195.051*	69.785	-195.051***	27.278
D (AGRIAID_NEG (-2))	-123.733	73.410	-123.733***	32.277
D(EDUAID_POS)	77.493***	15.398	77.493***	5.595
D (EDUAID_POS (-1))	282.008***	73.164	282.008***	27.304

D (EDUAID_POS (-2))	99.924	65.967	99.924***	21.669
D (HEALTHAID_POS	15.390	68.339	15.390	33.736
D (HEALTHAID_POS (-1)	335.565**	106.596	335.565***	45.925
D (HEALTHAID_POS (-2))	199.735**	74.954	199.735***	42.498
D (HEALTHAID_NEG	-8.817	102.680	-8.817	54.286
D (HEALTHAID_NEG (-1)	231.443*	116.720	231.443***	54.647
D(HUMAAID_POS)	-9.931	19.448	-9.931*	4.6171
D (HUMAAID_POS (-1))	-95.642***	16.481	-95.642***	9.528
D (HUMAAID_POS (-2))	-16.184	10.727	-16.184**	5.153
D(HUMAAID_NEG)	-5.503	9.306	-5.503**	2.519
D(FIXEDCAP)	-0.323***	0.039	-0.3230***	0.018
D (FIXEDCAP (-1))	0.264***	0.080	0.264***	0.033
D (FIXEDCAP (-2))	0.123	0.079	0.123***	0.037
D(FDI2GDP)	0.096	0.422	0.096	0.171
D (FDI2GDP (-1))	0.463	0.440	0.463**	0.193
CointEq(-1)			-0.524***	0.039

F-Bounds Test			Null Hypothesis: No levels relationship	
Test Statistic	Value	Significant	I (0)	I (1)
			Asymptotic	
			N=1000	
F-Statistic	8.301	10%	1.83	2.94
K	10	5%	2.06	3.24
		2.5%	2.28	3.5
		1%	2.54	3.86

Note: ***, p < 0.01; **, p < 0.05; *, p < 0.1

NARDL Results Analysis

Agricultural aid

In the short run, positive agricultural aid has a positive coefficient of 103.554 though the relationship with manufactured exports is not significant (Table19). However, when the positive agricultural aid is lagged by 1 and 2, it has positive coefficients of 864.399 and 549.058 respectively, and the relationship with manufactured exports is significant at 1 percent significant level. Negative agricultural aid has a coefficient size of -299.877, and the relationship is significant at 1 percent significant level. When negative agricultural aid is lagged by 1 and 2, it has coefficients of -195.051 and -123.733, and the relationship is significant at 10 percent when the variable is lagged by 1 while it is not significant when it is lagged by 2. In the long run, positive agricultural

aid has a negative coefficient of -330.942, and the relationship is significant at 10 percent while negative agricultural aid has a coefficient size of -338.196, and the relationship is also significant at 10 percent significant level.

Education aid

In the short run, positive education aid has a coefficient size of 77.499, and the relationship with manufactured exports is significant at 1 percent significant level. When the variable is lagged by 1 and 2, it has coefficients of 282.008 and 99.924 respectively, and the variable with 1 lag has a significant relationship with manufactured exports at 1 percent significant level while with 2 lags, the relationship is not significant. In the long run, positive education aid has a coefficient of -370.443 and the relationship is significant at 1 percent significant level while negative education aid has a coefficient of -153.718, and the relationship is significant at 5 percent significant level.

Health aid

In the short run, positive health aid has a coefficient of 15.390 but the relationship with manufactured exports is not significant. When positive health aid is lagged by 1 and 2, it has coefficients of 335.565 and 199.735 respectively, and the relationship is significant at 5 percent significant level. Negative health aid has a coefficient size of 8.817, and the relationship is not significant while negative health aid with 1 lag has a coefficient size of -231.443, and the relationship is significant at 10 percent significant level. In the long run, positive health aid has coefficient size of -180.881 but the relationship is not significant while negative health aid has a coefficient size of -126.505 and the relationship is also not significant.

Humanitarian aid

In the short run, positive humanitarian aid has a coefficient size of -9.931, and the relationship with manufactured exports is not significant. When positive humanitarian aid is lagged by 1 and 2, it has coefficients of -95.642 and -16.184 respectively, and the variable with 1 lag has a significant relationship with manufactured exports at 1 percent significant level while the variable with 2 lags has no significant relationship with manufactured exports. Negative humanitarian aid has a coefficient size of -5.503 but the relationship is not significant. In the long run, positive humanitarian aid has a coefficient size of 95.964, and has a significant relationship with

manufactured exports at 1 percent significant level while negative humanitarian aid has a coefficient size of 29.001, and the relationship is also significant at 1 percent significant level.

These relationships are however not meaningful without testing statistical significance of the relationships. Below is the analysis of asymmetry using Wald Test. The test examines significance of the relationships hence finding whether there are asymmetric effects of the types of foreign aid on manufactured exports.

Test of Asymmetry using Wald Test

When NARDL is run on pooled time series, it indeed shows that there are varying impacts between negative and positive changes to independent variables (Table 19). However, we have to test whether these impacts are significant or not meaning that we need to test whether there is significant asymmetry or not using Wald test. The test shows that there is no significant asymmetry in all the aid variables. For instance, agricultural aid is found to be symmetric as the null hypothesis of Coef. of agriaid (-3) / Coef. of manuexp (-1) = Coef. of agriaid (7) / Coef. of manuexp (-1) cannot be rejected (Table 20). The same applies to education aid, health aid, and humanitarian aid. Lags of the positive and negative variables yield the same results. This shows that foreign aid, even if disaggregated by sector, can have almost the same impact on manufactured exports when there are either positive or negative changes.

Table 20: ARDL Long Run Form and Wald Test for Pooled Data

Variable	Null Hypothesis	F-Statistic Value	Degrees of Freedom	Prob.
agriaid	Coef. of agriaid (-3)// Coef. of manuexp (-1)= -Coef. of agriaid (7) / Coef. of manuexp(-1)	1.508	(1, 10)	0.2475
	Coef. of agriaid (-6) / Coef. manuexp (-1) = -Coef. of agriaid (10) / Coef. of manuexp (-1)	1.105	(1, 10)	0.3179
	Coef. of agriaid (-4) / Coef. of manuexp (-1) = -Coef. of agriaid (8) / Coef. of manuexp (-1)	1.348	(1, 10)	0.2726
	Coef. of agriaid (-5) / Coef. of manuexp (-1) = -Coef. of agriaid (9) / Coef. of manuexp (-1)	2.048	(1, 10)	0.1829
eduaid	Coef. of eduaid (-11) / Coef. of manuexp (-1) = -Coef. of eduaid (15) / Coef. of manuexp (-1)	1.167	(1, 10)	0.3054
healthaid	Coef. of healthaid (-16) / Coef. of manuexp (-1)=-Coef. of healthaid (20) / Coef. of manuexp (-1)	0.042	(1, 10)	0.8416

	Coef. of healthaid (-17) / Coef. of manuexp (-1) = -Coef. of healthaid (21) / Coef. of manuexp (-1)	0.024	(1, 10)	0.8805
	Coef. of healthaid (-18) / Coef. of manuexp (-1) = -Coef. of healthaid (22) / Coef. of manuexp (-1)	0.425	(1, 10)	0.5291
humaaid	Coef. of humaaid (-23) / Coef. of manuexp (-1)= -Coef. of humaaid (27) / Coef. of manuexp (-1)	0.034	(1, 10)	0.8567
	Coef. of humaaid (-24) / Coef. of manuexp (-1) = -Coef. of humaaid (28) / Coef. of manuexp (-1)	0.498	(1, 10)	0.4964

Delta method computed using analytic derivatives

Test of Asymmetry using NARDL Multiplier Graphs

NARDL multiplier graphs show varying impacts between negative and positive changes to independent variables.

Agricultural aid

Agricultural aid has non-linear effects in the short run only and there is a positive relationship between manufactured exports and agricultural aid, that is, multipliers for positive series outweigh those for negative series (Figure 7). In the short run, increase in agricultural aid increases inputs for agro-processing thereby increasing agro-processed goods which are part of manufactured goods some of which can be exported.

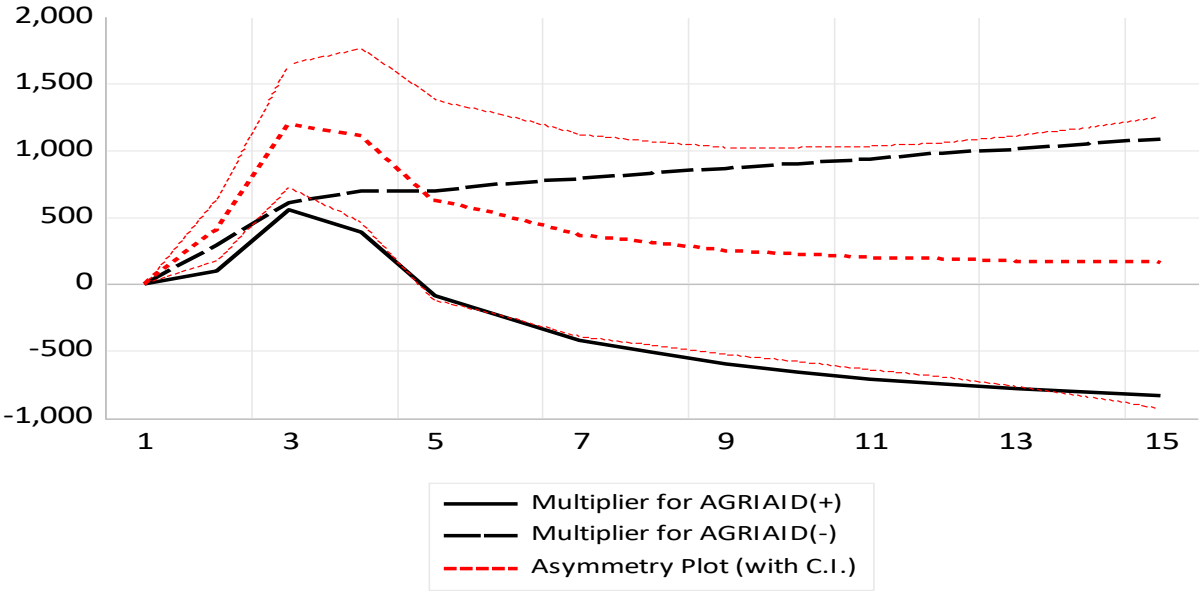

Figure 7: NARDL Multiplier Graph for Agricultural Aid

Education aid

There are non-linear effects mostly in the long run (after 5 Years). However, manufactured exports decrease with increase in education aid, and increase with decrease in education aid, that is, there is an inverse relationship. This is evident with the asymmetry (red dotted line) graph predominantly resting on the negative axis (Figure 8). Aid allocated to education sector seems to have negative effect on manufactured exports especially in the long run as skills acquired are mainly utilised in the primary products industry.

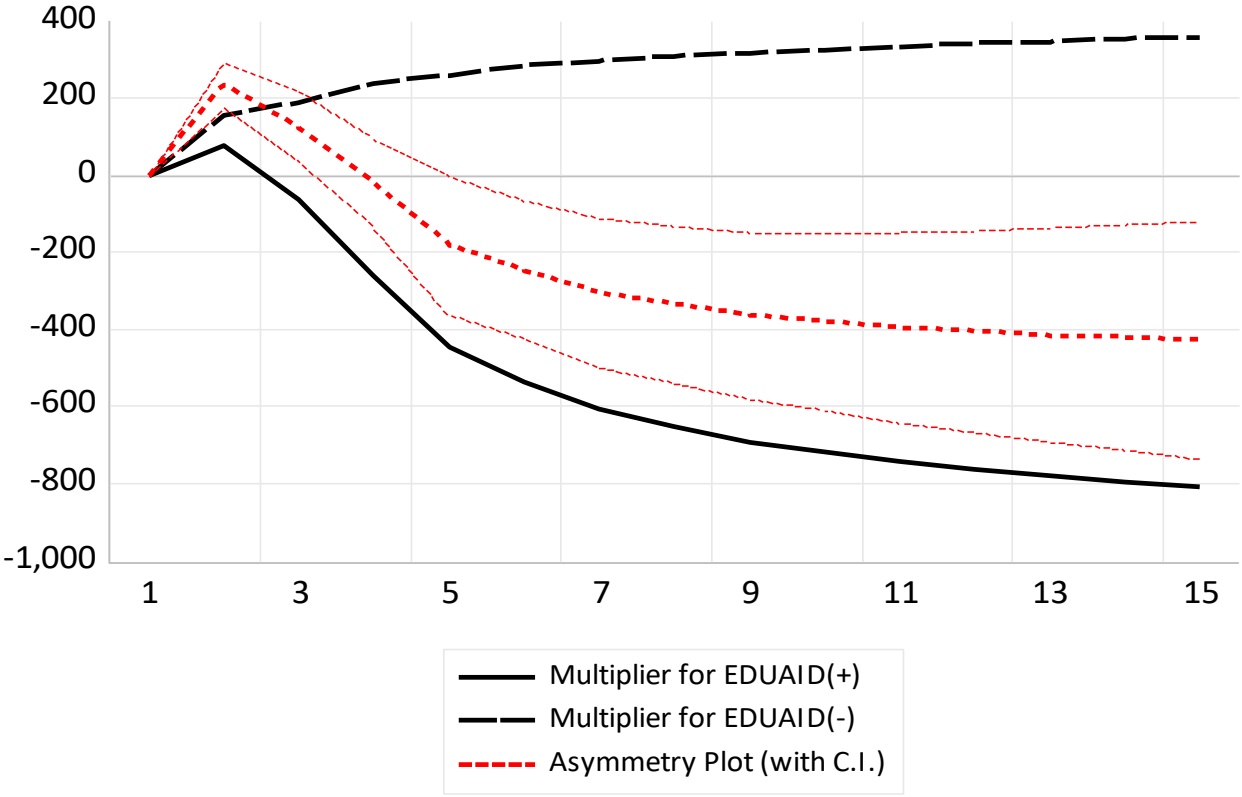

Figure 8: NARDL Multiplier Graph for Education Aid

Health aid

There are no asymmetric effects of health aid since the zero line falls within the confidence interval. The red dotted line is horizontal in the long run meaning that multipliers for positive series are almost equal to multipliers for negative series (Figure 9).

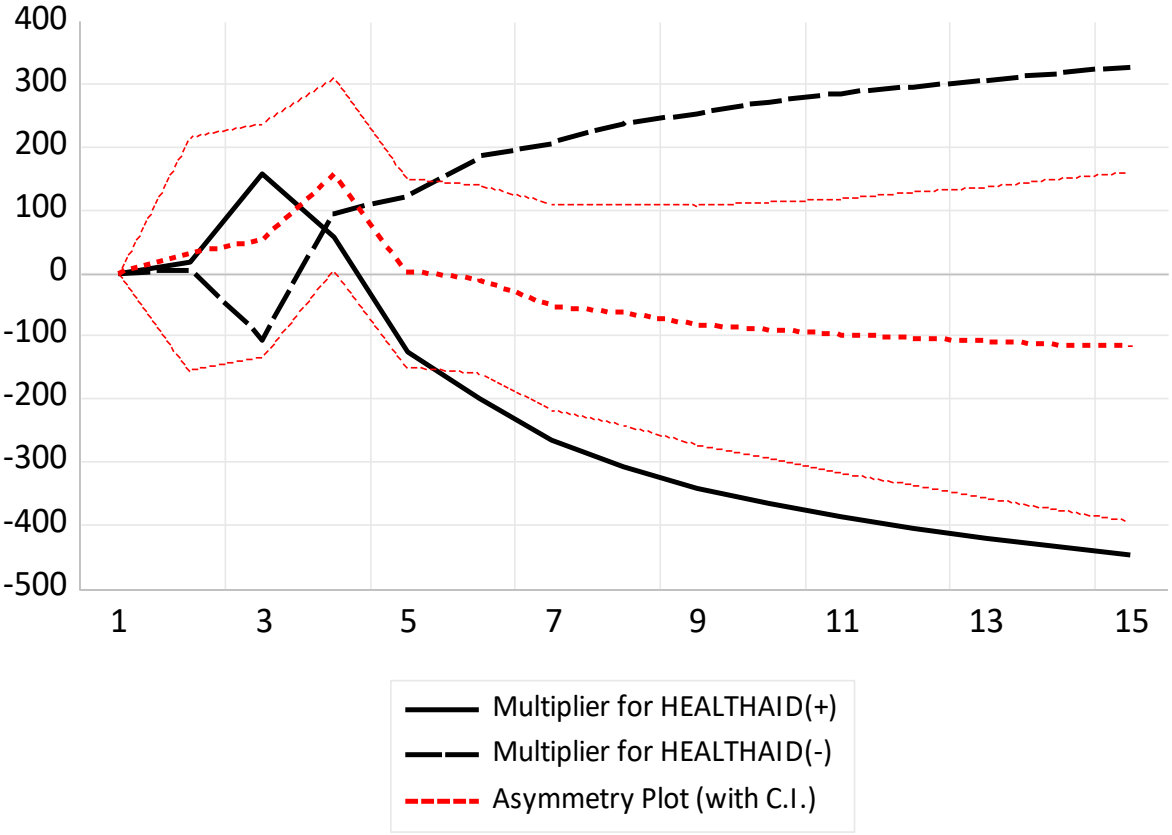

Figure 9: NARDL Multiplier Graph for Health Aid

Humanitarian aid

Since the zero line is outside the confidence interval, humanitarian aid has non-linear effects on manufactured exports (Figure 10). Increase in humanitarian aid increases manufactured exports especially after five years, that is, it has long run effects. This is evident with the asymmetry (red dotted line) graph predominantly resting on the positive axis. Humanitarian aid can improve livelihood of the affected thereby improving quality of labour that can be utilised in manufacturing.

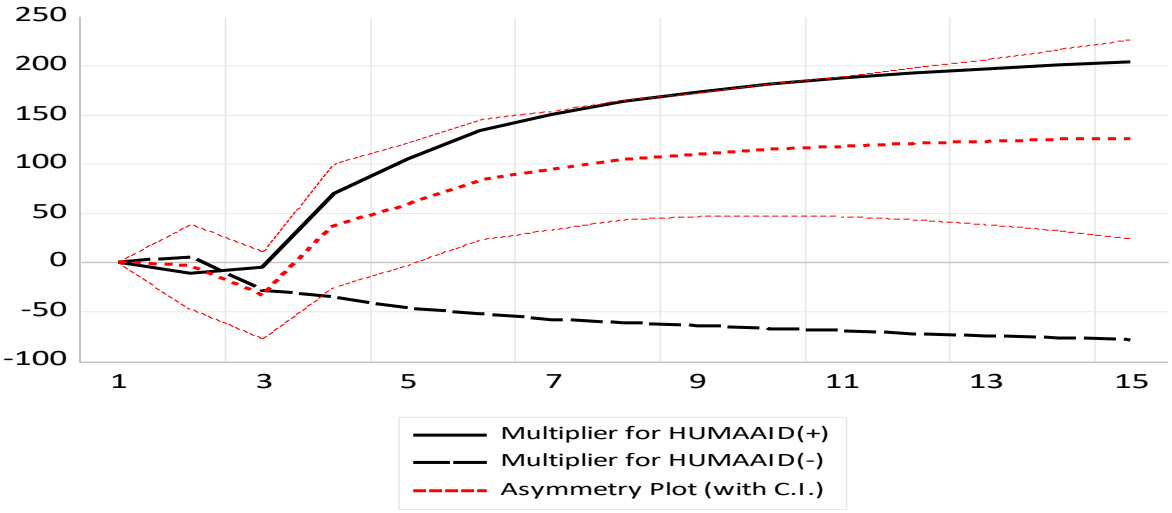

Figure 10: NARDL Multiplier Graph for Humanitarian Aid

Regression Analysis after including Private Sector Credit as one of Control Variables, and excluding Zimbabwe

Regression analysis is also done using ARDL model to examine the impact of disaggregated aid on manufactured exports after including private sector credit as one of control variables, and excluding Zimbabwe (Table 21). The regression analysis is run for robustness purposes.

Agricultural aid

Agricultural aid has a positive and significant impact on manufactured exports at 1 percent significant level with a coefficient size of 21.313 (See also Agricultural aid Chap 6). The coefficient size and the significant level show that agriculture aid has very strong impact on manufactured exports thereby confirming Big Push and Dual Gap Theories. This is in line with previous studies (Aljonaid *et al.,* 2022; Shaibu & Shaibu, 2022; Gyimah & Gentry 2020).

Education aid

Education aid has a negative relationship with manufactured exports but the relationship is not statistically significant (See also Education aid Chap 6). The results are not in line with previous studies (Asiedu, 2014; Ojeaga, 2012).

Health aid

Health aid has a positive relationship with manufactured exports but the relationship is not statistically significant (See also Health aid Chap 6). The results are not in line with a study by Asaleye *et al.* (2023) which found that health aid had a positive and significant impact on economic growth.

Humanitarian aid

Humanitarian aid has a positive relationship with manufactured exports but the relationship is not statistically significant (See also Humanitarian aid Chap 6). The results are in line with a study by Neanidis (2012) who found an ambiguous effect on economic growth.

Terms of trade

Terms of trade have a negative impact on manufactured exports at 1 percent level with a coefficient size of -0.044. This is consistent with other results in this study (Terms of trade Chap 6, Terms of trade Chap 5, Terms of trade with Prvt sec credit Chap 5) . Thus, inclusion of private sector credit and exclusion of Zimbabwe has not changed the results. The results are in li ne with previous studies (Jebran *et al*., 2018; Tehseen & Ali, 2012). However, they are not in line with other studies such as Jawaid and Raza (2013), Blattman *et al.* (2003), Kose (2002), and Bleaney and Greenaway (2001).

Exchange rate

Exchange rate has a negative relationship with manufactured exports but the relationship is not statistically significant. The results are also consistent with other results in this study (Exchange rate Chap 5) meaning that inclusion of private sector credit and exclusion of Zimbabwe has not changed the results. This is not in line with theory that says depreciation of currency makes exports cheaper at international market thereby leading to increase in exports including manufactured exports. The results are also not in line with other studies such as Uysal and Mohamoud (2018), Alam *et al*. (2017), Bakar *et al. (*2015), Abidin *et al*. (2013), and Nguyen (2010).

Government expenditure

Government expenditure has a positive relationship with manufactured exports but the relationship is not statistically significant. The results are not in line with studies by Okoye *et al*. (2019 and Asiedu (2014). The results are also not in line with other results in this study (Gov exp Chap 6), Govt exp with Prvt sec credit Chap 5). Thus, inclusion of private sector credit and exclusion of Zimbabwe have changed the results from having a negative and statistically significant effect on manufactured exports to having a positive and insignificant effect.

Fixed capital

Fixed capital has a positive relationship with manufactured exports but the relationship is not statistically significant (See also Fixed capital Chap 5, Fixed capital with Prvt sec credit Chap 5). The results are not in line with studies by Okoye *et al.* (2019), and Tsaurai (2018). The results are similar to results without private sector credit and with Zimbabwe. Thus, inclusion of private sector credit and exclusion of Zimbabwe has not changed the results.

Private sector credit

Private sector credit, a proxy for financial development has a negative and insignificant effect on manufactured exports (See also Prvt sec credit Chap 5). The results are not in line with a study by Tsaurai (2018). This means that private sector credit does not positively impact manufactured exports in SSA countries.

Foreign direct investment

Foreign direct investment has a positive and significant impact on manufactured exports at 1 percent significant level with coefficient size of 1.554 (See also Foreign dir inv Chap 6, Foreign Direct Inv Chap 5, Foreign dir inv with Prvt sec credit Chap 5). Owing to the strong significance and the size of the coefficient, foreign direct investment seems to have substantial impact on manufactured exports confirming the assertion that developing countries should work to attract foreign direct investment to improve their economies. The results are in line with previous studies (Anetor *et al.,* 2020; Beecroft *et al*. 2020; Ngundu & Ngepah, 2019; Cheung & Lin, 2004). Thus, inclusion of private sector credit and exclusion of Zimbabwe does not change the results for foreign direct investment.

Openness

Openness has a positive and significant effect on manufactured exports at 1 percent significant level with a coefficient size of 0.088 (See also Openness Chap 6, Openness Chap 5, Openness with Prvt sec credit Chap 5). The strong significance level and small size of coefficient means that though openness plays an important role in boosting manufacturing, and manufactured exports, countries should be cautious when opening up. Opening up fully may expose domestic industry to international competition thereby having an adverse impact on domestically produced goods. The results are in line with studies by Ogbonna *et al.* (2021), Jena and Seth (2020), and Tsaurai (2018). The results are also in line with results without private sector credit but with Zimbabwe.

Real interest rate

Real interest rate has a negative and significant effect on manufactured exports at 1 percent significant level with coefficient size of -0.064 (See also Real int rate with Prvt sec credit Chap 5). High interest rates discourage producers from borrowing thereby affecting production of manufactured products.

	agriaid	eduaid	healthaid	humaid	tot	exchrate	govexp	fixedcap	privsecc credit	fdi	openness	realint	ect
Ovreall Results	21.313*** (4.085)	-0.180 (1.785)	16.829 (15.366)	8.43e-06 (0.428)	-0.044*** (0.009)	-0.001 (0.001)	0.128 (0.120)	0.072 (0.081)	-0.068 (0.052)	1.554*** (0.230)	0.088*** (0.030)	-0.064*** (0.020)	
Country Specific													
Angola	-62.64631 (134.336)	3.439 (8.006)	40.708 (95.256)	0.025 (1.333)	0.029* (0.014)	0.023 (0.015)	-0.092 (0.110)	-0.150 (0.121)	0.538*** (0.164)	0.059 (0.055)	-0.002 (0.017)	0.001 (0.001)	0.002 (0.007)
Benin	3.151524 (13.303)	63.958* (32.722)	88.619** (41.236)	17.092 (12.620)	0.182 (0.126)	0.016 (0.019)	0.385 (0.697)	1.136*** (0.415)	0.324 (0.333)	-2.307* (1.332)	-0.263 (0.179)	0.137 (0.157)	-0.661*** (0.133)
Botswana	-5.813868 (29.056)	16.031 (25.421)	4.740 (36.697)	-0.464 (0.928)	-0.175** (0.070)	1.107 (0.700)	0.041 (0.173)	-0.019 (0.095)	-0.191 (0.149)	0.054 (0.081)	-0.006 (0.041)	-0.084* (0.046)	0.013 (0.041)
Burkina Faso	-6.087 (9.686)	-10.972 (9.434)	-50.946 (33.806)	0.413 (3.597)	-0.055 (0.054)	0.026*** (0.008)	-0.053 (0.229)	-0.180 (0.209)	-0.055 (0.258)	.0133 (0.616)	0-.064 (0.145)	0-.025 0.052	-0.484*** (0.114)
Burundii	4.426 (3.259)	-0.0236 (3.758)	29.566 (27.519)	0.288 (0.540)	0.050*** (0.017)	-0.001 (0.010)	0.313 (0.211)	0.151 (0.170)	-0.374* (0.217)	0.259 (0.551)	-0.315*** (0.098)	0.034 (0.051)	-0.563*** (0.102)
Garbo Verde	-63.053*** 15.360	-20.970 (19.104)	69.654** (32.351)	3.726 (4.094)	-0.008 (0.071)	-0.118 (0.241)	-4.717*** (1.793)	-0.190 (0.665)	-0.404 (0.507)	0.352 (0.819)	0.360 (0.253)	-0.389 (0.463)	-0.109** (0.050)
Cameroun	-97.131** (39.300)	16.903 (54.647)	71.458 (181.219)	9.366 (23.858)	0328 (0.043)	-0.023* (0.013)	1.462* (0.791)	0.055 (0.112)	-0.112 (0.223)	-0.327 (0.392)	0.044 (0.104)	0.152* (0.086)	-0.342*** (0.103)
CAR	-13.236 (23.342)	-3.501 (5.479)	59.431 (43.134)	-13.301 (14.095)	0.016 (0.111)	0.087** (0.036)	0.328 (0.970)	-0.546 (0.679)	-2.248* (1.300)	1.662 (1.731)	0.156 (0.419)	-0.346* (0.188)	-0.300*** (0.102)
Congo Rep	37.534 (41.912	-46.349 (75.067)	-3.583 (143.957)	-16.407 (18.070)	-0.178*** (0.066)	0.041* (0.023)	0.356 (0.369)	0.193 (0.179)	0.301 (0.418)	-0.155 (0.360)	-0.127 (0.093)	-0.249*** (0.143)	-0.172 0.062
Cote d'Ivoire	233.615*** (77.578)	-21.081 (53.747)	-197.075 (162.416)	6.021 (27.722)	0.047* (0.024)	0.002 (0.009)	0.185 (0.323)	-0.020 (0.216)	0.103 .(0201)	-0.334 (0.525)	-0.248*** (0.080)	0.047 (0.055)	-0.611*** (0.110)
Ethiopia	14.741 (15.695)	24.121** (11.809)	46.308 (45.538)	-2.085 (2.443)	0.060 (0.043)	-0.136 (0.657)	-0.313 (0.323)	-0.271 (0.414)	0.048 (0.354)	-0.326 (0.441)	-0.252* (0.137)	-0.004 (0.050)	-0.136 (0.116)
Gambia	-31.304* (14.140)	30.237 (38.031)	43.009 (58.341)	-0.676 (4.181)	0.166 (0.232)	0.458 (0.972)	0.298 (0.450)	0.317 (0.432)	-0.328 (0.806)	-1.560 (0.981)	0.314 (0.200)	-0.012 (0.110)	-0.230* (0.104)
Ghana	-51.558* (27.804)	(15.459) (46.000)	-61.255 (62.411)	1.537 (11.386)	-0.009 (0.054)	-4.284 (3.396)	-0.379 (0.417)	-0.272 (0.198)	0.542 (0.357)	-0.313 (0.492)	-0.133* (0.075)	0.020 (0.025)	-0.584*** (0.126)
Guinea	-16.518 (17.198)	44.02** (21.127)	-59.907 (73.042)	14.006 (15.049)	0.009 (0.102)	-0.003 (0.003)	-0.274 (0.771)	-0.190 (0.141)	0.102 (1.033)	0.381 (.345)	0.104 (0.102)	0.050 (0.180)	-0.387*** (0.144)

Table 21: Overall and country Specific Results after including Private Sector Credit and Excluding Zimbabwe

	Agriaid	eduaid	heaid	humaid	tot	exchrate	govexp	fixedcap	privsecc credit	fdi	openness	realint	ect
Kenya	-10.078	12.983	-67.392	9.489***	-0.168	-.065	0.004	-0.045	0.118	-0.474	-0.060	0.028	-0.060
	(62.406)	(24.659)	(49.720)	(3.675)	(0.105)	(0.148)	(0.684)	(0.352)	(0.289)	(0.746)	(0.111)	(0.078)	(0.062)
Lesotho	-5.042	4.175	76.471***	1.029	-0.001	-5.776***	0.583	0.312	-0.079	1.02361	-0.022	0.314***	-0.216***
	(9.843)	(15.999)	(25.276)	(1.294)	(0.173)	(1.270)	(0.376)	(0.267)	(0.449)	(0.684)	(0.077)	(0.109)	(0.065)
Liberia	0.156	0.075	-0.067	0.028	0.002	-0.001	-0.002	0.002	-0.001	-0.001	-0.001	0.001	-0.001
	(0.532)	(0.296)	(1.416)	(0.273)	(0.005)	(0.004)	(0.021)	(0.011)	(0.016)	(0.003)	(0.001)	(0.006)	(0.001)
Madagascar	12.220	-2.765	69.415	-4.842	0.043	-0.001	0.447	0.010	0.908	1.743***	0.236*	0.088	-0.124**
	(26.986)	(21.834)	(104.031)	(12.380)	(0.117)	(0.005)	(0.390)	(0.129)	(0.815)	(0.598)	(0.138)	(0.132)	(0.060)
Malawi	-0.648	-2.391	-7.281	-0.041	0.015	0.001	.2391	0.083	-0.045	0.035	0.035	-0.027	-0.246***
	2.251	(3.137)	(11.625)	(0.336)	(0.031)	(0.009)	(0.364)	(0.097)	(0.164)	(0.140)	(0.051)	(0.024)	(0.079)
Mali	4.699	11.195	-47.938	0.807	-0.058	-0.023	-0.281	-0.568	-0.138	0.876	-0.008	0.205	-0.138
	(21.904)	(16.803)	(72.728)	(3.303)	(0.096)	(0.018)	(0.416)	(0.562)	(0.360)	(0.562)	(0.154)	(0.149)	(0.084)
Mozambique	13.505	-1.141	43.679*	-1.125	-0.074*	0.210	0.063	-0.193	0.297	0.396***	0.161	-0.031	-0.001
	(28.095)	(4.091)	(25.502)	(0.994)	(0.0421)	(0.169)	(0.203)	(0.198)	(0.221)	(0.143)	(0.064)	(0.078)	(0.025)
Niger	-31.350***	9.385	-29.769	4.764**	0.008	.0021034	-0.627**	0.326*	-0.385	-0.265	-0.028	0.004	-0.111
	(10.859)	(7.397)	(21.851)	(2.286)	(0.028)	0.009	(0.294)	(0.171)	(0.294)	(0.331)	(0.100)	(0.057)	0.070
Rwanda	-14.238**	2.377	-37.202	0.502*	-0.034	-0.002	-0.139	-0.748*	-0.388	-1.050	-0.089	0.204***	-0.467***
	(6.296)	(1.716)	(28.496)	(0.300)	(0.040)	(0.024)	(0.288)	(0.406)	(0.485)	(0.861)	(0.081)	(0.078)	(0.106)
Senegal	-44.789	-106.642***	-42.563	26.051	0.108	-0.011	2.464**	1.261**	-1.420**	0.273	-0.026	-0.083	-0.154
	(48.755)	(41.664)	(109.417)	(24.252)	(0.122)	(0.022)	(1.160)	(0.504)	(0.577)	(1.264)	(0.155)	(0.125)	(0.096)
Sudan	-7.817	.0549	-15.973	-2.208	-0.006	-0.059	-0.121	-0.149	0.386	-0.239	0.036	-.009	-0.005
	(12.640)	(5.445)	(42.694)	(1.606)	(0.019)	(0.072)	(0.169)	(0.105)	(0.274)	(0.342)	(0.067)	(0.014)	(0.059)
Tanzania	-111.528**	1.586	-83.903	2.033	-0.028	0.007	-0.229	0.114	-0.175	-0.332	0.182	-0.194	0.076
	(54.268)	(43.109)	(120.277)	(7.802)	(0.147)	(0.019)	(0.980)	(0.578)	(0.324)	(1.126)	(0.232)	(0.134)	(0.094)
Togo	11.564	-1.888	42.622	22.153*	-0.131**	0.034*	0.071	0.021	-0.218	0.274	-0.076	-0.155	-0.016
	(15.536)	(31.396)	(50.367)	(11.906)	(0.057)	(0.020)	(0.391)	(0.206)	(0.348)	(0.243)	(0.093)	(0.123)	(0.044)
Uganda	-33.271**	-6.945	-33.044	-0.947	.0187	0.003	-0.220	-0.040	0.642	1.276	0.027	-.004	-0.125**
	(13.859)	(6.966)	(26.488)	(3.326)	(0.019)	(0.004)	(0.262)	(0.270)	(0.433)	(0.676)	(0.092)	(0.031)	(0.062)
Zambia	-21.860	-20.104	-17.141	0.469	-0.014	1.923***	-0.434	-0.421*	-0.032	-0.045	-0.065	-0.006	-0.628***
	(14.105)	(12.316)	22.500	(3.027)	(0.015)	(0.704)	(0.312)	(0.252)	(0.157)	(0.230)	(0.048)	(0.024)	(0.125)

ARDL Country Specific Results after including Private Sector Credit as one of the Control Variables, and excluding Zimbabwe

The study also analysed country specific results with private sector credit and without Zimbabwe. The results are very important as they can be quick point of reference for any country covered in the study to find out whether a certain type of foreign aid has positive impact on manufactured exports in the country without going into a study to assess the variables' impact on manufactured exports. The results are as follows:

Agricultural aid

Country specific results show that agricultural aid has a positive impact on manufactured exports in ten countries, and the impact is significant in one country namely Cote d'Ivoire (Table 21 and Table 22). In the country, agricultural aid is significant at 1 percent significant level with a coefficient size of 233.615. The results are in line with previous studies (Shaibu & Shaibu, 2022; Aljonaid *et al.* 2022; Gyimah & Gentry, 2020). Agricultural aid has a negative impact on manufactured exports in nineteen countries and the impact is significant in eight countries namely Garbo Verde, Cameroun, Gambia, Ghana, Niger, Rwanda, Tanzania and Uganda. In Garbo Verde, the impact is significant at 1 percent significant level with coefficient size of -16.053 while in Cameroun, the impact is significant at 5 percent significant level with coefficient size of -97.131. In Gambia, the impact is significant at 5 percent significant level with coefficient size of -31.304.

In Ghana, the impact is significant at 10 percent significant level with coefficient size of -51.558 while in Niger, the impact is significant at 1 percent significant level with coefficient size of -31.350. In Rwanda, the impact is significant at 5 percent significant level with coefficient size of -14,238. The impact is significant at 5 percent significant level in Tanzania with coefficient size of -111.528 while in Uganda, the impact is significant at 5 percent significant level with coefficient size of -33.271 (See also Agricultural aid Count Spec Chap 6). Overall, agricultural aid has negative impact on manufactured exports in many countries in SSA region confirming the fact that foreign aid has minimal impact on recipient countries. The strong significance and high coefficient sizes shows that the impact is substantial in these countries contrary to Big Push and Dual Gap theories. The results are not in line with other studies such as Shaibu and Shaibu (2022), Aljonaid *et al.* (2022), and Gyimah and Gentry (2020).

Education aid

Education aid has a positive impact on manufactured exports in sixteen countries, and in three countries, the relationship is significant namely Benin, Ethiopia and Guinea. In Benin, the relationship is significant at 10 percent significant level with coefficient size of 63.958 while in Ethiopia, the impact is significant at 5 percent significant level with coefficient size of 24.121. In Guinea, the impact is significant at 5 percent significant level with coefficient size of 44.092. Education aid seems to have a positive impact on manufactured exports in many countries, and coefficient sizes and strong significance shows that education aid positively influences manufactured exports in these countries. The results are in line with studies by Asiedu (2014) and Ojeaga (2012) which found that education aid had a positive and significant impact on economic growth and exports respectively. The relationship is negative in thirteen countries, and in one country namely Senegal, the impact is significant at 5 percent with coefficient size of -106.642 (See also Education aid Count Spec Chap 6).

Health aid

Health aid has a positive impact on manufactured exports in thirteen countries, and the impact is significant in four countries namely Benin, Garbo Verde, Lesotho and Mozambique. In Benin and Garbo Verde, the impact is significant at 5 percent significant level with coefficient sizes of 88.619 and 69.654 respectively. In Lesotho, the impact is significant at 1 percent significant level with coefficient size of 76.471 while in Mozambique, the impact is significant at 10 percent significant level with coefficient size of 43.679. Health aid seems to have a positive impact on manufactured exports in several countries in the region, and where the impact is significant, there is strong significance level and high coefficient sizes meaning that health aid has a strong positive impact on manufactured exports in the countries. The results are in line with a study by Asaleye *et al.* (2023). Health aid has negative impact on manufactured exports in sixteen countries and the impact is not significant in all sixteen countries (See also Healthaid Count Spec Chap 6).

Humanitarian aid

Humanitarian aid has a positive impact on manufactured exports in nineteen countries, and in four countries, the impact is statistically significant namely Kenya, Niger, Rwanda and Togo. In Kenya, the impact is significant at 1 percent significant level with coefficient size of 9.489 while in Niger,

the impact is significant at 5 percent significant level with coefficient size of 4.764. The impact is significant at 10 percent significant level in Rwanda and Togo with coefficient sizes of 0.502 and 22.153 respectively. Thus, humanitarian aid influences manufactured exports in some countries in the region, and in other countries, the impact is strong like in Togo, Kenya and Niger. Humanitarian aid has negative impact in ten countries and the impact is not significant in all countries (See also Humanitarian aid Count Spec Chap 6).

Table 22: Country Specific ARDL Results after including Private Sector Credit and Removing Zimbabwe Dataset

No.	Country	agraid	eduaid	healthaid	humaaid
1	Angola	-62.646	3.439	40.708	0.025
		(134.336)	(8.006)	(95.256)	(1.333)
2	Benin	3.152	63.958*	88.619**	17.092
		(13.303)	(32.722)	(41.236)	(12.620)
3	Botswana	-5.814	16.031	4.740	-0.464
		(29.056)	(25.421)	(36.697)	(0.928)
4	Burkina Faso	-6.087	-10.972	-50.946	0.413
		(9.686)	(9.434)	(33.806)	(3.597)
5	Burundi	4.426	-.0236	29.566	0.288
		(3.259)	(3.758)	(27.519)	(0.540)
6	Garbo Verde	-63.053***	-20.970	69.654**	3.726
		(15.360)	(19.104)	(32.351)	(4.094)
7	Cameroun	-97.131**	16.903	71.458	9.366
		(39.300)	(54.647)	(181.219)	(23.858)
8	Central African	-13.236	-3.501	59.431	-13.300
	Republic	(23.342)	(5.479)	(43.134)	(14.095)
9	Congo Republic	37.534	-46.349	-3.583	-16.407
		(41.912)	(75.067)	(143.957)	(18.070)
10	Cote d'Ivoire	233.615***	-21.081	-197.075	6.02
		(77.578)	(53.747)	(162.416)	(27.722)
11	Ethiopia	14.742	24.121**	46.308	-2.085
		(15.695)	(11.809)	(45.538)	(2.443)
12	Gambia	-31.304**	30.237	43.009	-0.676
		(14.140)	(38.031)	(58.341)	(4.181)
13	Ghana	-51.558*	15.459	-61.255	1.537
		(27.804)	(46.000)	(62.411)	(11.386)
14	Guinea	-16.518	44.092**	-59.907	14.006
		(17.198)	(21.127)	(73.042)	(15.049)
15	Kenya	-10.078	12.983	-67.392	9.489***
		(62.406)	(24.659)	(49.720)	(3.675)
16	Lesotho	-5.042	4.175	76.471***	1.029
		(9.843)	(15.999)	(25.276)	(1.294)
17	Liberia	0.156	0.075	-0.067	0.028

		(0.532)	(0.296)	(1.416)	(0.273)
18	Madagascar	12.221	-2.765	69.415	-4.842
		(26.986)	(21.834)	(104.031)	(12.380)
19	Malawi	-0.648	-2.391	-7.281	-0.041
		(2.251)	(3.137)	(11.625)	(0.336)
20	Mali	4.699	11.195	-47.938	0.807
		(21.904)	(16.803)	(72.728)	(3.303)
21	Mozambique	13.505	-1.14127	43.679*	-1.125
		(28.095)	(4.091)	(25.502)	(0.994)
22	Niger	-31.350***	9.385	-29.769	4.764**
		(10.859)	(7.397)	(21.851)	(2.286)
23	Rwanda	-14.238**	2.377	-37.202	0.502*
		(6.296)	(1.716)	(28.496)	(0.300)
24	Senegal	-44.789	-106.642**	-42.563	26.051
		(48.755)	(41.664)	(109.417)	(24.252)
25	Sudan	-7.817	0.055	-15.973	-2.208
		(12.640)	(5.445)	(42.694)	(1.606)
26	Tanzania	-111.528**	1.586	-83.903	2.033
		(54.268)	(43.109)	(120.277)	(7.802)
27	Togo	11.564	-1.888	42.622	22.153*
		(15.536)	(31.396)	(50.367)	(11.906)
28	Uganda	-33.271**	-6.945	-33.044	-0.947
		(13.859)	(6.966)	(26.488)	(3.326)
29	Zambia	-21.860	-20.104	-17.141	0.469
		(14.105)	(12.316)	(22.500)	(3.027)

Note: (...) indicates standard error, and ***, $p < 0.01$; **, $p < 0.05$ and*, $p< 0.10$.

6.4 Conclusion

This study examined impact of disaggregated aid on manufactured exports. The study followed results of a study on the impact of foreign aid on manufactured exports (Chapter 5) which showed that foreign aid had a negative impact on manufactured exports (Foreign aid Chap 5, Foreign aid with Prvt sec credit Chap 5) . The results meant that foreign aid was not an important factor for improving manufactured exports, and basing on those results only might obscure the importance of foreign aid if any. That is why this study was carried out to find out whether various types of foreign aid can have impact on manufactured exports.

Results indeed show that some types of foreign aid have positive impacts on manufactured exports. For instance, grants are found to be positively related to manufactured exports and the relationship is statistically significant at 1 percent significant level (Grants Chap 6). Agricultural aid also has a positive impact on manufactured exports, and in most cases, the relationship is statistically significant (Agricultural aid Chap 6, Agri aid with Prvt sec credit Chap 6). As these countries are

predominantly agricultural based, boosting agricultural production can lead to value addition of agricultural produce thereby leading to increase in manufactured products.

Education aid has a negative impact on manufactured exports (Education aid Chap 6, Education aid with Prvt sec credit Chap 6) while health aid has a positive impact on manufactured exports (Health aid Chap 6, Health aid without Zimbabwe Chap 6). Education aid usually has a long-term effect while health aid has almost instant impact on the health of people including producers leading to improvement in productivity. Humanitarian aid has no impact on manufactured exports (Humanitarian aid Chap 6, Humanitarian aid with Prvt sec credit Chap 6) since humanitarian aid is mainly meant for disasters may not have direct impact on manufactured exports. The study further tested asymmetric effects of the types of foreign aid, that is, whether positive and negative changes of types of aid have different impacts on manufactured exports.

Results show that there are no asymmetric effects of positive and negative changes of all types of foreign aid on manufactured exports (Asymmetry test results). This means that positive changes of the types of foreign aid have the same impact on manufactured exports as that of negative changes. The study went further to include private sector credit as a proxy for financial development, and also removed Zimbabwe dataset for reasons already stated. Results show no significant differences from results without inclusion of private sector credit, and without removing Zimbabwe dataset.

Chapter 7

Conclusion and Recommendations, Limitations of the Study, and Suggestions for Further Research

7.1 Introduction

Foreign aid is one of sources of funding aimed at boosting economies of developing countries including SSA countries. Big Push and Dual Gap Theories stand out as theoretical models that emphasise on foreign aid as the most important factor for boosting industrialisation and economic growth. Though there are various variables that contribute to economic growth, manufactured exports, a component of exports have stood the test of time as one of the most important factors for boosting economic growth in most countries. Yet, developing countries especially SSA countries mainly export primary commodities which fetch low prices at international market relative to those of manufactured exports leading to deterioration of terms of trade over time, a theory called Prebisch-Singer Dependency Theory. SSA countries should therefore aim at boosting manufactured exports in order to improve terms of trade. Foreign aid can be a source of resources for boosting both manufactured exports and terms of trade. However, there have been few studies regarding impact of foreign aid on manufactured exports and terms of trade.

Despite the importance of manufactured exports in fostering economic growth, studies in SSA have concentrated more on examining the impact of foreign aid on exports in general than manufactured exports in particular. This is a concern because manufactured exports are an engine for economic growth. Countries such as those in East Asia have developed economically by exporting manufactured goods. If SSA countries continue exporting primary products, their progress on economic development will be minimal. This study has attempted to address this challenge by exploring ways of improving production and exportation of manufactured products in the region, one of which is funding the manufacturing sector through foreign aid. There is a belief that if manufactured exports are promoted in the region, terms of trade and economic growth will improve.

Studies on exports have concentrated on foreign aid as a whole and not disaggregated foreign aid. This is a concern as well, as foreign aid might not be regarded as an important source of funding

for exports in general, and manufactured exports in particular given the fact that some studies have found that foreign aid has a negative impact on economic growth especially in SSA. If a study finds negative and statistical impact on manufactured exports, it can be concluded that foreign aid is not an important factor for promoting manufactured exports. That is why this study has gone further by disaggregating foreign aid to examine whether various types of foreign aid have impact on manufactured exports.

Further, donors have sometimes withdrawn aid from recipient countries, and the countries have faced many challenges as a result of the withdrawal. The study has addressed this by testing asymmetric effects of various types of foreign aid on manufactured exports. This may inform donors on the consequences on manufactured exports, of withdrawing aid from certain sectors of the economy. This Chapter starts by considering each objective of the study, then theoretical implications, and policy implications are discussed. Thereafter, limitations of the study, and suggestions for further research are discussed.

7.1.1 Impact of Total Foreign Aid on Terms of Trade

This study started by examining the impact of foreign aid on terms of trade. Positive and statistically significant impact of foreign aid on terms of trade would mean that foreign aid improves terms of trade thereby reversing the Prebisch-Singer Dependency Theory. This would entail that prices of exports have improved relative to prices of imports. Improvement of prices of exports would mean that either prices of primary commodity exports, the SSA region is known for, have improved relative to prices of imports, or exports mix has changed to include higher proportion of manufactured exports which fetch higher prices at international market.

Results of the study show that foreign aid has negative and statistically significant effect on terms of trade (Foreign aid Chap 4) . This means that foreign aid does not improve terms of trade, if anything, foreign aid has adverse effect on terms of trade. The Prebisch-Singer Theory seems to hold despite injection of aid in these SSA countries. The results are also not in line with Big Push and Dual GapTheories that advocate for foreign aid to developing countries as a source of resources for developmental activities. Despite injection of substantial amounts of foreign aid to these SSA countries, its impact on terms of trade has been dismal.

Most of the control variables have negative impact on terms of trade. Government expenditure has a negative and insignificant impact on terms of trade (Gov exp Chap 4). Most of the government

expenditure is made on programmes that are not directly related to promotion of manufactured exports which fetch higher prices at international market. Authorities should therefore make deliberate efforts to allocate resources to sectors that will lead to improvement of exports such as manufactured exports that fetch higher prices internationally. Fixed capital also has negative and statistically significant effect on terms of trade (Fixed capital Chap 4). Fixed capital, proxy for infrastructure development seems to be targeted at infrastructure that promotes export of primary commodities. Policy makers should focus on developing infrastructure that promote export of manufactured exports. Such infrastructure should include building export processing zones with all facilities meant for promoting manufactured exports.

Foreign direct investment also has a negative and statistically significant impact on terms of trade (Foreign dir inv Chap 4). Foreign direct investment to these countries goes to sectors such as agricultural sector that produce and export primary commodities. Authorities should therefore make deliberate policies to attract foreign direct investment to the manufacturing sector to promote production of manufactured goods. On the other hand, openness has positive and statistically significant effect on terms of trade (Openness Chap 4). This is the only variable that has a positive impact on terms of trade. Opening up exposes domestic industry to international markets thereby bringing opportunities for new markets for domestic products, at the same time, domestic industry is exposed to international innovativeness that can lead to improvement in manufacturing. SSA countries should therefore open up for them to improve terms of trade.

7.1.2 Impact of Total Foreign Aid on Manufactured Exports Performance

The study then examined the impact of foreign aid on manufactured exports. Having found that foreign aid has a negative impact on terms of trade, and knowing that manufactured exports fetch higher prices at international market than primary commodities, it was necessary to examine the impact of foreign aid on manufactured exports in SSA countries. Positive and statistically significant impact of foreign aid on manufactured exports would mean that foreign aid contributes positively to economic development of these countries as manufactured exports are one of the most important variables for boosting economic growth. Results show that foreign aid has a negative and, in some cases, statistically significant impact on manufactured exports (Foreign aid Chap 5, Foreign aid with Prvt sec credit Chap 5). This is not in line with Big Push Theory, Dual Gap Theory

and other theories which put forward foreign aid as a catalyst for boosting economic growth in developing countries by availing much needed resources for developmental activities.

The results also confirm previous studies which found that foreign aid does not positively impact economic development of a developing country. Foreign aid can even worsen economic situations of the countries. Such studies include Ogbonna (2021), Rajan and Subrimanian (2009), and Munemo *et al.* (2007), just to mention a few. This may be the reason developing countries especially in SSA have not developed economically despite huge amounts of aid flowing to the region over the past century. Countries should therefore be cautious on aid especially when they intend to boost manufactured exports. One option is for the countries to allocate foreign aid to manufactured exports as it seems the countries have other priority areas when they receive aid.

Country specific results show that in most countries, there is positive relationship between foreign aid and manufactured exports but the relationship is not statistically significant while in the rest of the countries, foreign aid is negatively related to manufactured exports (Foreign Aid Country Specific Chap 5, Foraid with Prvt sec credit Count Spec Chap 5). This again shows that foreign aid is not an important variable for boosting manufactured exports. This is a matter of priority, meaning that in other countries, resources are committed to boosting manufacturing and manufactured exports. The study has also shown that some non-aid factors have positive and statistically significant impact on manufactured exports. Such factors include fixed capital formation, foreign direct investment, and openness. Investment in fixed capital which is a proxy for infrastructure development has positive impact on manufactured exports at least in medium to long term (Fixed Capital Chap 5, Fixed capital with Prvt sec credit Chap 5). One of the reasons is that good infrastructure attracts both domestic and foreign investors to manufacturing and manufactured exports.

Foreign direct investment boosts manufactured exports (Foreign Direct Inv Chap 5, Foreign dir inv with Prvt sec credit Chap 5) as most of the investment is made in manufacturing. It is therefore necessary for the SSA countries to put in place deliberate policies to attract foreign direct investment. Openness has a positive and statistically significant impact on manufactured exports (Openness Chap 5, Openness with Prvt sec credit Chap 5). This seems to dispute the fact that opening up does not promote exports as the domestic industry is exposed to international competition.

Exchange rate has been found to have negative but not statistically significant impact on manufactured exports, and in some cases, the relationship has been found to be statistically significant (Exchange rate Chap 5). This is expected as the more depreciated the currency is, the lower the prices of a country's exports at international market leading to high demand for primary products especially in SSA, hence producers focus on producing primary commodities as opposed to manufactured exports.

7.1.3 Impacts of Different Types of Aid, Disaggregated by Sectoral Allocation, on Manufactured Exports Performance

The study has also shown that it is necessary to disaggregate foreign aid in order to assess the effectiveness of foreign aid when targeted at a certain sector. Studies have shown that foreign aid as a whole does not have positive impact on the recipient economy. This study has indeed shown that criticising foreign aid in its entirety may not be appropriate as disaggregated aid targeted at certain sectors seems to have an impact on that subsector and spills over to other sectors of the economy. Grants have a positive impact on manufactured exports and the relationship is statistically significant (Grants Chap 6).

Foreign aid targeted at agricultural sector has also shown to have an impact not only on the agricultural sector but also other sectors such as manufacturing and manufactured exports (Agricultural aid Chap 6, Agriaid with Prvt sec credit Chap 6). Agricultural sector provides raw materals for manufacturing, and if the sector is boosted with resources from foreign aid, production increases, translating into more raw materials for manufacturing, therefore more manufactured products. Health aid also has a positive and significant effect on manufactured exports (Health aid Chap 6) as the aid contributes to improvement in health services thereby improving health of people including labour force that works in the manufacturing sector.

Education aid (Education aid Chap 6, Education aid with Prvt sec credit Chap 6) and humanitarian aid (Humanitarian aid Chap 6, Humanitarian aid with Prvt sec credit Chap 6) show that they have no impact on manufactured exports. Funding on education has mostly been found to have a long-term impact. Individuals tend to spend most of their childhood lives getting educated and fruits of education only start materialising in their middle ages. Humanitarian aid is for emergency purposes aimed at relieving the suffering of the affected which may not have direct impact on manufacturing. This implies that donors should not just give aid without carefully assessing the

recipient countries and the sectors which are positively responsive to aid. This will enable countries to benefit from the aid. Finally, the study finds that there are no asymmetric effects of all types of aid (Asymmetry test results) meaning that there are no significant differences in impacts of positive or negative changes of the types of aid on manufactured exports.

There are some non-aid variables that can lead to increased manufactured exports if they are boosted. Foreign direct investment (Foreign dir inv Chap 6, Foreign dir inv with Prvt sec credit Chap 6) stands out as one of the most important factors for enhancement of Manufactured exports. By increasing government expenditure on promotion of manufacturing, that can be regarded as a proxy for industrial policies. The impact of government expenditure on manufactured exports when country specific results are considered (Gov exp Count Spec Chap 6) may mean that countries that pursue industrial policies (whose implementation leads to increase in government expenditure) can also help to boost manufacturing and manufactured exports. It seems that government expenditure aimed at promoting manufacturing leads to improvement in manufactured exports. Countries should therefore strive to increase government expenditure on manufacturing industry. This can improve manufactured exports since improvement in manufacturing leads to increase in manufactured products some of which are exported.

7.1.4 Theoretical Implications of the Study

The study has shown that Big Push and Dual Gap Theories do not work at least at the aggregate level of foreign aid. However, the theories seem to work with some types of foreign aid. Grants (Grants Chap 6), agricultural aid (Agricultural aid Chap 6, Agri aid with Prvt sec credit Chap 6) and health aid (Health aid Chap 6) have positive and significant impact on manufactured exports. The study has also shown that improvement in terms of trade (Terms of trade Chap 6, Terms of trade Chap 5, Terms of trade with Prvt sec credit Chap 5) in SSA countries can discourage manufactured exports as producers are attracted to increase in prices of primary exports by concentrating on producing primary commodities.

Openness has consistently shown that manufactured exports can be boosted if SSA countries open up their economies (Openness Chap 6, Openness with Prvt sec credit Chap 6, Openness Chap 5, Openness with Prvt sec credit Chap 5). This is not in line with infant industry theory which advocates for protection of domestic industry against international competition. While theory says that undervaluation of exchange rate boosts exports, this study has shown that not all exports are

boosted as it has been found that the lower the value of the exchange rate, the lower the manufactured exports, at least in the SSA countries (Exchange rate with Prvt sec credit Chap 6, Exchange rate Chap 5). A depreciated exchange rate undermines exports as most of the intermediate inputs for manufacturing are imported. This means that depreciation of exchange rate is not a guarantee that manufactured exports will improve. On the other hand, the study agrees with the theory that foreign direct investment boosts economies of developing countries as it has been found that foreign direct investment has positive impact on manufactured exports (Foreign dir inv Chap 6, Foreign dir inv with Prvt sec credit Chap 6, Foreign Direct Inv Chap 5, Foreign dir inv with Prvt sec credit Chap 5).

7.1.5 Policy Implications of the Study

Foreign aid has a negative impact om manufactured exports (Foreign aid Chap 5, Foreign aid with Prvt sec credit Chap 5) and terms of trade (Foreign aid Chap 4) . The aid seems to be directed to sectors that do not contribute to promotion of exports let alone manufactured exports which fetch relatively higher prices at international market. This may be the reason developing countries especially in SSA have not developed economically despite huge amounts of aid flowing to the region over the past century. Countries should therefore be cautious on aid especially when they intend to boost manufactured exports. One option is for the countries to allocate foreign aid to sectors that contribute to improvement in manufactured exports, the result of which can improve terms of trade and economic growth.

The study has shown that though total foreign aid has negative impact on manufactured exports, disaggregating it shows that some types of foreign aid have positive impact on manufactured exports. Such types include grants (Grants Chap 6), agricultural aid (Agricultural aid Chap 6, Agri aid with Prvt sec credit Chap 6) and health aid (Health aid Chap 6) . This implies that donors should not just give aid without carefully assessing recipient countries and the sectors which are positively responsive to aid. This will enable countries to benefit from foreign aid. There have been instances when aid has just been allocated to a country without proper assessment. This, at times, has led to challenges such as misallocation of the aid and corruption.

Country specific results show that in most countries, there is positive relationship between foreign aid and manufactured exports but the relationship is not statistically significant while in the rest of the countries, foreign aid is negatively related to manufactured exports (Foreign Aid Country

Specific Chap 5, Foraid with Prvt sec credit Count Spec Chap 5). This again shows that foreign aid is not an important variable for boosting manufactured exports. This is a matter of priority, meaning that in other countries, resources are committed to boosting manufacturing and manufactured exports. This also shows that if donors would like to give aid targeted at boosting manufactured exports, they should first assess the countries to find out if in the countries, there is positive and significant relationship between foreign aid and manufactured exports. In that way, foreign aid can be more effective.

The study has also shown that some non-aid factors have positive and statistically significant impact on manufactured exports. Such factors include fixed capital formation (Fixed capital Chap 6, Fixed capital with Prvt sec credit Chap 6, Fixed Capital Chap 5, Fixed capital with Prvt sec credit Chap 5), foreign direct investment (Foreign dir inv Chap 6, Foreign dir inv with Prvt sec credit Chap 6, Foreign Direct Inv Chap 5, Foreign aid with Prvt sec credit Chap 5) and openness (Openness Chap 6, Openness with Prvt sec credit Chap 6, Openness Chap 5, Openness with Prvt sec credit Chap 5). Investment in fixed capital, which is a proxy for infrastructure development, has positive impact on manufactured exports at least in medium to long term. One of the reasons is that good infrastructure attracts both domestic and foreign investors to manufacturing and manufactured exports. This implies that SSA countries have to work to enhance manufacturing and manufactured exports by investing in infrastructure such as export processing zones, roads and bridges. This can attract investors both domestically and internationally.

Foreign direct investment boosts manufactured exports as most of the investment is made in manufacturing. It is therefore necessary for SSA countries to put in place deliberate policies to attract foreign direct investment. Donors can also assist the countries by formulating policies that will result in the flow of foreign direct investment to these countries, instead of concentrating on giving aid to them. Openness has a positive and statistically significant impact on manufactured exports. This seems to dispute the fact that opening up does not promote exports as the domestic industry is exposed to international competition. As far as manufactured exports are concerned, countries should open up to allow for free trading of goods and services if they are to boost manufactured exports. However, countries should be cautious on the extent of opening up as countries might wish to protect some industries and opening up completely will expose those industries to international competition.

Foreign exchange rate has been consistently found to have negative but not statistically significant impact on manufactured exports, and in some cases, the relationship has been found statistically significant (Exchange rate with Prvt sec credit Chap 6, Exchange rate Chap 5). This is expected as the more depreciated the currency is, the lower the prices of a country's exports at international market, leading to high demand for primary products especially in SSA, hence producers focus on producing primary commodities as opposed to manufactured exports. SSA countries should therefore formulate policies aimed at boosting manufactured exports at the same time ensuring that exchange rates are not overvalued.

7.2 Limitations of the Study

Data availability was one of limitations of the study. The SSA region has 48 countries but due to unavailability of data, the study ended up with 30 countries. Further, the countries are at difference levels of development, some have graduated into lower middle- income countries while others are still low- income countries. Others have had macroeconomic instability during the study period to the extent that macroeconomic fundamentals were far from being normal. The study therefore had to leave out two largest economies in the region, and other countries whose economies experienced macroeconomic instability. This was done to avoid outliers that would distort results.

7.3 Suggestions for Further Research

This study examined the impact of foreign aid on terms of trade, the impact of foreign aid on manufactured exports, and the impact of disaggregated foreign aid on manufactured exports. A similar study can be carried out by grouping the countries according to GDP level. A similar study can also be done based on regional blocks such as SADC, EAC, ECOWAS, and COMESA. Another study can be done on the impact of disaggregated foreign aid on terms of trade to examine whether various types of foreign aid have impacts on terms of trade. The study can be important as improvement in terms of trade means that a country's exports are fetching higher prices relative to import prices thereby generating more foreign exchange.

As promotion of manufactured exports is a challenge in most of the SSA countries, and their exports are predominantly agricultural in nature, examining the impact of foreign aid on agricultural exports, on one hand, and the impact of disaggregated aid on agricultural exports on the other, can inform policy makers how foreign aid can be utilised in order to boost agricultural exports of these countries.

7.4 Conclusion

This Chapter has discussed results of the study by summarising analysis of results for each of the three Papers that have been presented in the study. The study has found that foreign aid has a negative impact on terms of trade (Foreign aid Chap 4). Foreign aid also has negative impact on manufactured exports (Foreign aid Chap 5, Foreign aid with Prvt sec credit Chap 5). However, when foreign aid is disaggregated, grants (Grants Chap 6), agricultural aid (Agricultural aid Chap 6, Agri aid with Prvt sec credit Chap 6) and health aid (Health aid Chap 6) have positive and statistically significant impact on manufactured exports. On the other hand, education aid (Education aid Chap 6, Education aid with Prvt sec credit Chap 6) and humanitarian aid (Humanitarian aid Chap 6, Humanitarian aid with Prvt sec credit Chap 6) have negative and no impact on manufactured exports respectively.

Further, asymmetric test shows that there are no significant differences in impacts of positive or negative changes of each type of aid on manufactured exports (Asymmetry test results). The study has also found that there are non-aid factors that have positive impact on manufactured exports. Such factors include fixed capital (Fixed capital Chap 6, Fixed capital with Prvt sec credit Chap 6, Fixed Capital Chap 5, Fixed capital with Prvt sec credit Chap 5), foreign direct investment (Foreign dir inv Chap 6, Foreign dir inv with Prvt sec credit Chap 6, Foreign Direct Inv Chap 5, Foreign dir inv with Prvt sec credit Chap 5) and openness (Openness Chap 6, Openness with Prvt sec credit Chap 6, Openness Chap 5, Openness with Prvt sec credit Chap 5). Country specific results show that foreign aid, and its various types have varying impacts on manufactured exports. The Chapter has also discussed theoretical implications of the study, policy implications, limitations of the study, and suggestions for further research.

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