The Role of FDI on Structural Transformation among Sub-Saharan African and EAP Countries Using a Panel Data Approach

By

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Abstract

In recent decades, the activities of multinational corporations have increased across the globe substantially having a massive flows of foreign direct investment. This paper empirically examines the role of FDI on structural transformation among Sub-Saharan African and EAP Countries Using a Panel Data Approach. To achieve the objective, the study took 31 years panel data. The study used descriptive analysis and empirical methods of analysis. The panel Autoregressive Distributed Lag model with error correction models of Pooled Mean Group technique were employed after checking the possible assumptions of our economic series. The results of Im-Pesaran-Shin test confirms our economic series are stationary at level and first difference forms. Pedroni's cointegration tests suggests the existence of co-integration between the variables. According to the descriptive analysis, on average structural transformation index (STI) is the highest for China (30.52%) followed by South Korea (25.86), while Ethiopia (4.85) is having the lowest. On other hand, the East Asian and Pacific (EAP) countries in the higher income category are performing better than Sub-Saharan African countries. In addition, Sub-Saharan Africa countries are by far having low level of FDI inflows as compared to EAP countries. Particularly, the FDI inflows for EAP countries in the higher income category is around USD 52 Billion, and while for low and middle income category SSA countries it accounts around USD 2.2 Billion and USD 85 million, respectively.
More specifically, across countries in the panel the FDI inflow is the highest for China while on average Kenya is having the lowest FDI inflows. On the other hand, according to the ARDL model of Pooled Mean Group estimation technique in the long-run financial development indicator and FDI have positive impact on the structural transformation index of nations at 1 percent level of significance for the full sample in the panel. Moreover, pooled mean group regression result among the Sub-Saharan African and EAP countries FDI has a significant but having different sign for the two group in predicting structural transformation. Particularly, for EAP countries FDI has a negative effect in the long run and a positive effect in the short-run on structural transformation index which are also statistically significant. While for Sub-Saharan African countries FDI has a positive and statistically significant effect on structural transformation both in the long run and short-run. Finally, the government of developing countries like SSAs should provide different incentive packages to attract FDI inflows, among others.

Key words: Structural Transformation, Foreign Direct Investment, Pooled Mean Group and East Asian and Pacific

1. Introduction

In recent decades the activities of multinational corporations (MNCs) have increased across the globe substantially having a massive flows of foreign direct investment (FDI). According to the report of UNCTAD (2018) FDI inflows of the world averaged annually around 1.28 trillion US dollars for the years between 2000 and 2016, which is approximately equivalent to a 2.3 percent of global GDP, over the same period. Similarly, in the year 2018 the external debt stock of the world reached around 38.9 trillion US dollars and 604.6 billion US dollars for Sub-Saharan Africa region, and

FDI as a driver of economic development is part of highly debatable concern around the world (Mainguy, 2004; Liu et al., 2017; Sur and Nandy, 2018; Jie and Shamshedin, 2019; Megbowon et al., 2019). The FDIs are therefore essential in structural transformation move of economies (Tiwari and Mutascu, 2011; Liu et al., 2017) and assists technology transfer from developed to developing nations. Similarly, the importance of FDI in least developed nations remains indisputable (Megbowon et al., 2019). In the environment of limited domestic resources, the FDI in least developed nations can be justified by their effects on economic growth, the inflow of financial resources, poverty, opening up to international markets and improving local management capacities and technology transfer (Mainguy, 2004; Tiwari and Mutascu, 2011). Furthermore, FDI can finance sectors with high added value and stimulate the reallocation of resources from the less productive sectors to the most productive sectors of the economy in order to achieve effective structural transformation.

During the last decade, FDI has become increasingly important in the least developed countries, with an increasing number of developing countries has been succeeded in attracting
a significant amount of FDI. For instance, for Sub-Saharan African nations, the available data indicates that the share of FDI inflows from the total GDP is around 1.66 percent while for East Asia and the Pacific (EAP) it accounts around 1.83 percent for the year 2019 (WB, 2020). However, FDI can compromise the development of host countries (Chudnovsky and Lopez, 1999; Tomohara and Takii, 2011; Sothan, 2017). When MNCs produce the needs of host countries, they compete with small local businesses that tend to be closed down, and therefore weigh heavily on domestic entrepreneurship’s development. According to Sothan (2017), FDI puts pressure on domestic firms if they are not based on exports. Similarly, for Tomohara and Takii (2011) FDI can lead to an increase in labor cost in host countries with the consequence of weakening domestic firms. Generally, MNCs are more productive, cost wise and better paying than domestic firms. In this logic, the employees of domestic firms put pressure on them to improve their wages by not necessarily taking into account the level of productivity and thereby prone to incur loss. Thus, all the domestic firms which do not compete with the new wage levels are forced to shutdown.

2. Statement of the problem

SSA region is among the top regions of FDI destinations in Africa, and the leading recipient with the average yearly inflow of 12.68 Billion US dollars for the periods from 1970 to 2019. In addition, the region accumulated a massive amount of FDI stock which grew from around 295.19 billion US dollars in 2010 to 633.8 billion US dollars in 2019, showing a dramatic increment. While the FDI inflows for East Asian and the pacific reached 8.81 trillion US dollars with the average annual inflows of 176.15 billion US dollars of the year 2019. However, currently the inflow of FDI for East Asian countries is declining from 609.27 billion US dollars in 2018 to 493.72 billion dollars in 2019 (IMF,2020; WB, 2020).

Recent empirical data shows that both regions have accommodated a massive inflows of FDI stock which accounted approximately 9.44 trillion dollars (WB, 2020). The statistics also indicated that the GDP share of major economic sector composition for SSA countries is around 15.48 percent of the primary sector, 11.34 percent of manufacturing sector and 50.66 percent for service sector, and for East Asian countries agriculture, manufacturing and service sectors accounted for 4.46 percent, 22.79 percent, and 60.57 percent, respectively. This shows that the two regions are in different angles in relation to the structural transformation theme is considered, but having same economic history in the past decades of 1950s and early 1960s.

Various previous literatures are focused on the economic growth as well as development effects of FDI, yet the structural transformation role of FDI needs a significant attention. To shade insights let start with reviewing the literature that focused on the effect of FDI on the overall economy. According to the findings by Abdullahi (2012) using fixed and random effect econometric model for 30 countries shows that FDI had a positive effect on growth for all countries included in the panel yet there exists unidirectional causality running from FDI to growth for developing countries. Furthermore, other study examined the short run and the long run effect of FDI on growth in developing countries of the lower-middle-income group covering the time span of 2000–2014, and the result from VECM and Fully Modified OLS model show that FDI helps to stimulate economic growth in the long run, although it has a negative impact in the short run for the countries in this study (Trung et al., 2019). In general, different literatures are inclined in showing the positive impact of FDI on economic growth and development, yet their result depends on the existing trade policies, strategies and the institutional setups (Balasubramanyam et al.,1996; Borensztein et al.,1998; Durham , 2004; Alfaro et al. , 2009; Alguacil et al.,2011; Harms and Meon ,2012, and Jude and Levieuge, 2017).
Studies using annual data sets by Gomez and Tam et al. (2007) investigated the role of FDI to growth by adopting sectoral analysis for China and Vietnam economy. Their findings show that FDI in both countries has a positive and statistically significant effect on economic growth. Interestingly, their finding pinpoints that the effect is not equally distributed across economic sectors. FDI only has a consistently positive effect on growth in the manufacturing sector for both countries, but statistically insignificant for other sectors of the economy, even the result shows a negative dimension in some cases. Similarly, Octavio et al. (2018) conducted an empirical study for Mexico using a data covering the time span of 11 years from 2006 to 2016 by employing a fixed-effect method of estimation. Accordingly, they found that there is a positive effect from FDI on economic growth in enhancing structural transformation. More specifically, their finding indicates that the lag structure of FDI matters and FDI accelerates the growth of industrial sector with the reallocation of medium and low skilled laborers. The findings by Damijan et al. (2013) also supplements that FDI inflows in Central and Eastern European nations acted as an engine in export restructuring by enhancing long-run productivity of industries that employed higher-end technology. Contrary to this, a recent study by Essotanam et al. (2020) analyzed the effects of FDI on the structural transformation in West African Economic and Monetary Union nations by using a data set from 1990 to 2017 and found that FDI inflow has a positive and significant effect on services sector’s productivity only (see also Zhongxiu and Kevin, 2010).

Interestingly, the empirical literature reviewed on the above paragraphs is intended to shade light on the FDI-growth nexus, although the issue of structural transformation is rarely addressed in the literatures. It seems that lack of the availability of the FDI data at sectoral level for longer periods and for some others total absence of the data, especially for developing countries has reduced the interest of scholars in the thematic area. In such a scenario, resorting to aggregate FDI data across economic sectors may be considered an acceptable alternative.

Since the magnitude and direction of FDI inflows varies among Sub-Saharan African and East Asian countries, which calls investigation to differentiate the variations in the achievement of structural transformation goal of a nation. On one hand, the differences of FDI inflows and the structural transformation composition across nations needs an intervention to identify the role of FDI in enhancing the speed of structural transformation. Further, in previous literatures the direct relationship between FDI and structural transformation has been largely ignored, although it is likely to be of high importance for many economies, in particular, for developing countries like ours. This study will adopt structural transformation index (STI) developed by Getachew (2015) as a measure of structural transformation by supplementing it with the value added by each sectors of the economy approach. Further more, the study considers these countries from East Asia and Pacific, and SSA by adopting a macro-panel methods of analysis.

Given the above gaps in the previous literature, the objectives of this study are:

- To identify the impact of FDI on structural transformation across nations from Sub-Saharan Africa and EAP.
- To differentiate the short-run dynamics among FDI and structural transformation using panel data approach.
- To differentiate the long-run dynamics among FDI and structural transformation using panel data approach.
- To identify the intensity of FDI role on structural transformation move of the nations.
3. Significance and motive of the study

A comprehensive and detail analysis of FDI and structural transformation considering experiences from selected countries from Sub-Saharan Africa and EAP Countries is limited. The understanding of the linkage among the macroeconomic variables with considering the move towards structural transformation in selected countries are important for the following reason:

First, theoretically it is believed that inflow of FDI plays an ever-lasting role in economic growth and development. This is via enhancing domestic savings as thereby aggregate investment in the long-run, and enhancing the FER base of the country, thereby improving the trade balance of the country. But the notion is questionable across countries, and further there are lack of consensus among scholars in identifying the role of FDI in the path towards structural transformations. Thus, understanding the role of FDI on structural transformation calls examining the issue across panels of countries with success and failure history.

Second, in this study the structural transformation concept is measured by using the relative share of manufacturing sector to national GDP, which is not commonly used for empirical investigations in the previous literatures as they are taking the aggregate share of industrial sector without identifying which sub-sector is relatively productive. These approaches of measuring structural transformation could add insights to the economic literatures, which is expected to benefit scholars, as well as policy institutions to examine the issue.

Furthermore, the findings from this study will have both theoretical and practical significance by providing scientific findings to policy makers, economists and diplomats representing Ethiopia in various countries (specially countries providing debts and massive supply of FDI to Ethiopia). In addition, it may be used as a source of information for those researchers who want to conduct a deeper study in this thematic area by expanding the scope as well as modifying the methodological approach of this study.

4. Scope of the study

To capture the linkage among external public debt, FER, FDI and structural transformation this study limits it scope in the period 1981 to 2019 for 39 years. The variables are selected due to the fact that all of them are basing on foreign sources, and particularly the study is interested to consider the impact of FDI inflows on the structural transformation objective of nations taking experiences from EAP and SSA countries. The time span also encompasses data before and after the implementation of structural adjustment program (1992/93-1993/94). Furthermore, to examine the short-run and long-run dynamics among external public debt and foreign exchange reserve, and the spillover effect of FDI on domestic investment across the three sectors this study focuses on Ethiopia economy.

More specifically, the study selected four countries from Sub-Saharan Africa (including Ethiopia, Kenya, South Africa and Nigeria) and three countries from Eastern Asia. Among the EAP countries, this study chosen South Korea, Singapore and Taiwan as points of comparison for a number of reasons. Firstly, the development literature on Sub-Saharan Africa suggests that these three countries might serve as more important sources of inspiration than other developed nation. Secondly, South Korea, Singapore and Taiwan are more generalizable than other developed nations in the region as reference point for today’s least developed countries (particularly SSA), and their development process start from an agrarian or raw material base that is typically taken to be the starting point for industrialization. On other hand, they transformed their economies fast as compared to SSA.
countries, despite having similar initial conditions, especially in the year 1960s. Third, from an imitation and copying of technology point of view for today’s SSA countries, looking in particular at South Korea, Singapore and Taiwan is useful (Waal, 2013). Hence, when we examine the historical trends of growth, no nations have grown as fast as the three EAP countries from low to high income levels particularly for the period between 1960 to 1990s. Thus, these nations might act as a reference for the SSA countries in their structural transformation move. Furthermore, this study aims to identify whether FDI is an accelerator/impediment across these selected countries in the story of structural transformation.

5. Structural transformation

In the conventional economic literature, when the term ”transformation” is applied in economics, it is most often referred to as ”structural transformation”. The term structure refers to a particular stage of an economy in relation to the relative importance of sectors in terms of production and factor use. A change in structure is broadly weighed by changes in the relative importance of sectors in which industrialization is considered to be the central process of such changes. On other hand, the change in the sectoral composition is typified by a shift of economic activities from sectors of low productivity (agriculture) to sectors of high productivity (industrialization). It also results on the change in the location of economic activity that comes along the industrialization process implies urbanization, and changes in demographic transition and income distribution, which is an increase in per capita income of the nation (Syrquin, 1988).

Chenery and Syrquin (1986) empirically identified three Stylized facts of structural transformation. At the critical stage of transformation, the primary sector gives way for the manufacturing sector to take the lead in invigorating growth. The contribution of the manufacturing sector to growth tend to exceed that of the primary sector at a level of per capita income over USD 1,200. This level may vary from country to country based on the resource endowment and trade policies of countries. Normally, the second stage is characterized by a higher rate of capital and a higher contribution of capital to growth. At the third stage, an economy is said to be developed.

The timing and sequence of structural change differ from country to country depending on factor proportions on comparative advantage and policy decisions about the levels of trade and foreign capital inflows. A country of average performance undergoes transformation at an income level of about USD 850 while a large country could reach semi-industrial stage at a per capita income level of USD 550. In contrast, transformation may take a while for a small country specializing in primary exports until it reaches USD 1300. A large country specializing in manufacturing can achieve early industrialization through a policy of import substitution due to a large domestic demand. A small country specializing in light manufactured goods can start with an initial flow of foreign capital and can later gain from export of light manufactures. In general, empirics shows that large countries tend to perform better than small ones among countries that begin transformation. Specialization in manufacturing instead of in primary commodities and outward orientation instead of inward orientation has proved to have facilitated transformation.
5. Foreign direct investment

According to the IMF and OECD definitions, foreign direct investment is defined as an investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor. FDI implies that the investor exerts a significant degree of influence on the management of the enterprise resident in the other economy. Such investment involves both the initial transaction between the two entities and all subsequent transactions between them and among foreign affiliates, both incorporated and unincorporated. FDI may be undertaken by individuals as well as business entities. Flows of FDI comprise capital provided (either directly or through other related enterprises) by a foreign direct investor to an enterprise, or capital received from an investing enterprise by a foreign direct investor.

FDI has three components: equity capital, reinvested earnings and intra-company loans. Equity capital is the foreign direct investor’s purchase of shares of an enterprise in a country other than its own. Reinvested earnings comprise the direct investor’s share (in proportion to direct equity participation) of earnings not distributed as dividends by affiliates, or earnings not remitted to the direct investor. Such retained profits by affiliates are reinvested. Intra-company loans or intra-company debt transactions refer to short- or long-term borrowing and lending of funds between direct investors (parent enterprises) and affiliate enterprises.

FDI stock is the value of the share of their capital and reserves (including retained profits) attributable to the parent enterprise, plus the net indebtedness of affiliates to the parent enterprise. FDI flow and stock data used in WIR are not always defined as above, because these definitions are often not applicable to disaggregated FDI data. For example, in analysing geographical and industrial trends and patterns of FDI, data based on approvals of
FDI may also be used because they allow a disaggregation at the country or industry level. Such cases are denoted accordingly.

6. Some Facts behind SSA and EAP Economy

6.1. The overview of major economic sectors

According to the structural transformation stages developed by Chenery and Syrquin (1986) at initial stage the manufacturing sector’s growth rate tends to increase as compared to other sectors of the economy, and then immediately at the middle stage it’s share outweighs the share agriculture and service sector. The theory also suggests that when the countries becomes developed the share of service sector is relatively greater than other economic sectors. The Figure 2 shows the comparative trends of the share of major economic sectors from GDP for EAP and Sub-Saharan countries. Accordingly, EAP countries are found on the third stage of structural transformation, and the share of service sector is by far higher than agriculture and manufacturing sectors. For them the share of agriculture is falling continuously for the years from 1981 to 2019, and while after 2011 the manufacturing sector’s share is also a little bit falling, and yet the share of service sector is showing a an increment from 2010 (with 61.27 %) to 2019 (63.57 %).

On other hand, the figure also indicates that for SSA countries the share of manufacturing and agriculture sector is neck to neck with the agriculture’s share out-weighting the manufacturing one. Both the share of manufacture and agriculture is increasing especially starting from the year 2005 onwards. Even, currently for the year 2019 the share of manufacturing sector is around 11.34 percent and agricultural sector is around 15.48 percent for SSA countries, which indicates the transformation of economies towards service sector. This raises the issue of structural transformation questionable in examining the structure of SSA economies.

Source: Own Computation based on WB data set, 2021
6.2. The trend of FDI with respect to GDP

According to the UNCTAD (2019) data sets the world FDI flows are dramatically fallen by 13 percent from the year 2017 (with the level of USD 1.3 trillion) to 2018. According to UNCTAD these decline in FDI flows are due to large scale foreign earning repatriations from MNEs centered at USA along with trade tensions, geopolitical risks, increase in e-commerce businesses with less physical assets, fall in returns of FDI across the world and concern by many countries towards more protectionist policies. The largest fall was observed in developed and transitional economies, with flows falling by around 27 percent in the year 2018 as compared to 2017. Conversely, the inward oriented FDI flow reached USD 706 billion in the year 2018, which is an increase by 2 percent as compared to 2017 for the developing economies of the world. Across region wise Asia and the Pacific accommodated the largest inflows which is around 45 percent of the global FDI inflows for the year 2018.

Moreover, the Figure 3 indicates that the comparative statistics of FDI’s share from the GDP for EAP countries and SSA economies excluding high income nations for the region. It pinpoints that the FDI share of EAP countries is by far larger than SSA countries especially after the year 2008. The trends for the share of FDI from the GDP of EAP is showing fluctuations, while that of SSA economies are relatively showing an increment in the share of FDI across the periods concerned. On other hand, for the year 2010 and 2018, FDI’s share is around 11.92 percent (2.41 percent) and 11.71 percent (1.89 percent) for EAP (SSA) economies, respectively, showing a greater variation among the two regions of the globe.
7. Empirical literature review

7.1. The role of foreign direct investment on structural transformation

Gomez and Tam et al. (2007) examined whether foreign direct investment is good for growth or not by employing sectoral analysis for China and Vietnam using an augmented production function by employing feasible generalized least squares to solve heteroskedasticity problem that arises from the interaction of labour. Their findings show that FDI in both countries has a positive and Statistically significant effect on economic growth. Interestingly their finding pinpoints that the effect is not equally distributed across economic sectors. FDI only has a consistently positive effect on growth in the manufacturing sector for both countries, but statistically insignificant for other sectors of the economy, even the result show a negative dimension in some cases. The findings by Damijan et al. (2013) also supplements that FDI inflows in Central and Eastern European nations acted as an engine in export restructuring by enhancing long-run productivity of industries that employed higher-end technology.

Similarly, Octavio et al. (2018) conducted an empirical study for Mexico using data covering the time span of 11 years from 2006 to 2016 by employing a fixed-effect method of estimation. Accordingly they found that there is a positive effect from FDI on economic growth in enhancing structural transformation. More specifically their finding indicates that the lag structure of FDI matters and FDI accelerates the growth of industrial sector with the reallocation of medium and low skilled laborers. Contrary recent study by Essotanam et al. (2020) analyzed the effects of FDI on the structural transformation in West African Economic and Monetary Union nations by using a data set from 1990 to 2017 that employed the Panel Corrected Standard Errors (PCSE) technique of estimation, and found that FDI inflow has a positive and significant effect on services sector’s productivity only (see also Zhongxiu and Kevin, 2010).

Recently, empirically Pineli et al. (2019) examined the role of FDI, multinational firms and structural transformation in developing countries. The results suggested the existence of a heterogeneous effect of FDI on the structural transformation of different nations. Unlike other nations, their findings show that a positive effect of FDI on the share of employment in modern industries in some nations. In addition, the effect of FDI on structural transformation depends on the level of development of each country and the type of FDI received. Their result also indicates that a higher concentration of FDI in the manufacturing sector reinforces the effect of FDI on structural transformation in the early stages of development, while FDI is necessary for the modern non-manufacturing sector in the later stage. The financial development, trade openness and corruption are the factors that motivate the variations in the effect of FDI on the structural transformation of nations. Likewise, Mühlen and Escobar (2020) entitled as the effect of FDI on structural transformation in Mexico. The results show that FDI contributes positively and significantly to structural transformation in Mexico. This effect stems from flows of foreign direct investment channeled into the modern sector, industry, which favors the reallocation of labour among the sectors of activity in Mexico.

8. Conceptual framework of the study

The conceptual framework of the study is based on the theoretical and empirical findings of Chakraborty and Basu (2002) and Hsiao and Hsiao (2006) with major modifications. Figure 4 shows that the direct and indirect effects macroeconomic variables on structural transformation of a given nation. The indirect effect is illustrated via the effect of FER as external source, debt service payment and total labour force as domestic endowments, and
openness and financial sector development as a policy issue are affecting external public debt and thereby affect the structural transformation move of nations. Similarly, trade openness, public savings, human capital and FDI can affect domestic capital formation, and thereby affect the structural transformation move of nations. Whereas the direct effect is explained by endowment variables like the level of human capital and GDP, foreign sourced FDI and public debt, and domestic investment.

![Conceptual Framework of the Study](image)

**Figure 4. Conceptual Framework of the Study**


**9. Research methodology**

To analyze foreign exchange reserve, public debt, FDI and structural transformation by considering experiences from selected countries, this study will adopt quantitative research design by using a time series and panel data.

This study used secondary data from WB data sets. The main variables under this study are macroeconomic variables like FER, external public debt, FDI, DI and the share of agriculture sector, service and industrial sector from the real GDP of the country as a target variables and other macroeconomic variables which are stated in the model specification part of the paper as a control variables over the period covering from 1981 to 2019 as of annual data, with a total of 38 years that adequately displays the reliability and validity of the time variants.

To examine the role of FDI on structural transformation the study selected a panel of seven countries, and the study period covers from 1981 through 2018. The regional breakdown of these seven countries is given below in Table 1 showing different characteristics of the countries. As shown in the table these countries will provide adequate representation of Sub-Saharan countries in terms of the huge inflow of FDI augmented with the heterogeneous nature of their economy. In the past ten years (2009-2018) the average growth rate of inflow of FDI accounts 65.45% for Ethiopia, 5.68% for Kenya, 15.44% for South Africa, and exceptionally -10.52% for Nigeria yet massive inflows as compared to other SSA countries (UNCTAD, 2019). Similarly, the three Asian tigers are included in the panel to differentiate whether their short dynamic economic growth is due to FDI’s effect on the productivity of the
modern sector, and to examine whether the variations of the effect of FDI on the structural transformation of the nations experiencing same economic base before decades. Surprisingly, same data set reveals that except for Taiwan, the Asian Tigers for the mentioned period have an average growth rate of two digits with Singapore 29.33%, South Korea 20.05% and Taiwan -15.85%. Even though, a complete representation of SSA countries would necessitate inclusion of other countries from the region, availability of the data and the inflow nature of FDI limits to select four countries having relatively the largest share from FDI inflows as shown below.

Table 1. Lists of selected countries

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Country Name</th>
<th>Economic level</th>
<th>FDI Per Capita (in USD, 2019)</th>
<th>FDI’s share from GDP (2019)</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ethiopia</td>
<td>Low income</td>
<td>22.45</td>
<td>2.62</td>
<td>SSA</td>
</tr>
<tr>
<td>2</td>
<td>Kenya</td>
<td>Middle income</td>
<td>25.34</td>
<td>1.40</td>
<td>SSA</td>
</tr>
<tr>
<td>3</td>
<td>South Africa</td>
<td>Middle income</td>
<td>2.52</td>
<td>1.32</td>
<td>SSA</td>
</tr>
<tr>
<td>4</td>
<td>Nigeria</td>
<td>Middle income</td>
<td>16.42</td>
<td>0.74</td>
<td>SSA</td>
</tr>
<tr>
<td>5</td>
<td>Singapore</td>
<td>High income</td>
<td>5,119.5</td>
<td>7.85</td>
<td>EAP</td>
</tr>
<tr>
<td>6</td>
<td>China</td>
<td>High income</td>
<td>336.5</td>
<td>1.32</td>
<td>EAP</td>
</tr>
<tr>
<td>7</td>
<td>South Korea</td>
<td>High income</td>
<td>204.33</td>
<td>0.64</td>
<td>EAP</td>
</tr>
</tbody>
</table>

Source: Own computation from World Development Indicators, 2020

The annual series for the net inflows and sectoral GDP for each of the selected nations and for the time span under considerations will be collected from the combined sources of UNCTAD data base, IMF and World development indicators published by the WB. In this study the net FDI flows and GDP of each country will be converted to their real terms using their respective deflators as recommended by WB.

This study proposes to use both descriptive and econometrics methods of analysis. Under descriptive analysis part it is expected to use tables, figures, charts, historical trends, mean, standard deviation maximum and minimum values for our targeted variables as of Ethiopian economy as well as other countries included in the panel. While under econometrics parts of analysis the study adopts ARDL and VEC models to capture the stated objectives.

Using standard augmented Cobb-Douglas production function framework with the level of FDI inflows as an additional variable along with capital and labor, and develops a
modifications to accommodate structural transformation issue via growth and development. According to economic theories as growth takes place we expect a change in the structure of the economy that is a move from a primary sector dependency to manufacturing, and to service sectors. Thus, here our outcome variable of interest is structural transformation of the nation as proxied by the relative share manufacturing sub-sector on the GDP of the nation.

\[ STI_t = f(L, K, FDI) \] ........................ (1)

where STI is structural transformation index at period t, L is labor, K is capital and FDI is foreign direct investment inflows.

Following Grossman and Elhanan, 1991; Barro and Sala-I-Martin, 1995 and Balasubramanyam et al., 1996, this production’s function has been extended as of the new growth theory, endogenous growth model, introduced by Lucas (1988), Romer (1986), and Rebelo (1991). The endogenous growth theories show that the long run growth of a country is not only inclined by the volume of physical investment, but also hang on the efficiency of utilizing investment. In addition, extending McMillan and Rodrik (2011) approach of measuring structural transformation by a proxy variable, which is the reallocation of labor between sectors for a representative country at time t. This hangs on the economic theory that propagates as the economy develops the resources especially labour moves from the traditional sector to the industrial sector. However, this might does not happen only due to development, rather it’s better to consider the parallel movement of aggregate output change with respect to the share of each sector of the economy in the national output (GDP), and hence better to examine the value added by the major sectors of the economy.

According to the theoretical perceptive structural transformation is measured from either or both from the production side and consumption side, yet in this study we can use structural transformation index as proxied by the relative share manufacturing sub-sector from the GDP of the nation that indicates how transformation is related with productivity. The interest of this paper is to examine the effect of FDI inflows on achieving structural transformation across panel of nations from Asia and SSA countries.

In this study we can adopt a macro-panel data analysis due to the fact that our target groups are seven number of countries from SSA and Asian, and having a time dimension of more than 20 years. The current heterogeneous nature of the economic level and status of the selected countries is important in minimizing the cross country dependency problem of the macro-panel model approach. Basing on the extensions of endogenous growth models Equation (1) above is log and extended by including other important variables as represented by C as a vector for other exogenous factors. The purpose of this paper is to examine the impact of FDI inflows on achieving structural transformation move of nations from SSA and EAP for the period covering 1981-2019. Hence, the impact of FDI on structural transformation move of countries is analyzed by using the following macro-panel econometric equation.

\[ STI_{it} = f(K, L, FDI, C) \] ........................ (2)

Where, STI is the structural transformation index, while FDI is the inflow of foreign direct investment. And C stands as a control variable for other exogenous factors. The purpose of this paper is to examine the impact of FDI on structural transformation move of nations from SSA and EAP for the period covering 1981-2019. Hence, the impact of FDI on structural transformation move of countries is analyzed by using the following macro-panel econometric equation.

\[ STI_{it} = \alpha_0 + \alpha_1PcFDI_{it} + \alpha_2PcGDP_{it} + \alpha_3PcPD_{it} + \alpha_4PcI_{it} + \alpha_5H_{it} + \alpha_6FD_{it} + \epsilon_{it} \] ........................ (3)

Where,
$\alpha_0 (i = 1, 2, 3, \ldots, 7)$ stands for the unknown intercept term for each country in the panel; $\alpha_1, \alpha_2$ and $\alpha_3$ are parameters to be estimated; $\text{PcFDI}$ stands for per capita FDI inflows; $\text{PcGDP}$ stands for per capita GDP; $\text{PcPD}$ stands for per capita foreign public debts; $\text{PcI}$ stands for per capita domestic capital investment; $H$ stands for investment on human capital proxied by secondary school enrollment rate, which is included in the model as it plays a critical role in absorbing foreign knowledge and skills brought in by foreigners in the form of FDI inflows; $\text{FD}$ stands for the level of financial sector development as measured by money supplied over GDP; $i = 1, 2, \ldots, N$ stands for the number of countries (cross-sections) in the study; $t = 1, 2, \ldots, T$ stands for the time periods; and $\varepsilon_{it}$ stands for the model error with $\text{Cov}(\varepsilon_{it}, \varepsilon_{jt}) = \delta_{ij}$ for $i \neq j$: $\delta_{ij} = 0$.

10. Results and discussion

10.1 Descriptive data analysis

Figure 5 shows the average structural transformation index for the year 1981 to 2019 for nations in the panel and income category as of the World Bank classification. Accordingly, Sub-Saharan Africa countries that are categorized as low and middle income are having low level of structural transformation index as compared to EAP countries in the higher income category. More specifically, across countries in the panel the structural transformation index is the highest for China (30.52%) followed by South Korea (25.86), while Ethiopia (4.85) is having the lowest STI and Kenya with 10.21 percent of average structural transformation index. Regional income variation indicates that these countries in the higher income category are having 26.28 percent of average STI followed by middle income categories of countries (13.01 percent). On other hand, the EAP countries in the higher income category are performing better in terms of STI as compared with Sub-Saharan African countries (see Figure 5).

![Figure 5. Structural Transformation Index Across the panel](image-url)
Figure 6 shows the average FDI inflows for the year 1981 to 2019 for nations in the panel and income category as of the World Bank classification. Accordingly, Sub-Saharan Africa countries that are categorized as low and middle income are by far having low level of FDI inflows as compared to EAP countries in the higher income category. Particularly, the FDI inflows for EAP countries in the higher income category is around USD 52 Billion, and while for low and middle income category SSA countries it accounts around USD 2.2 Billion and USD 85 million, respectively. More specifically, across countries in the panel the FDI inflow is the highest for China followed by Singapore, while on average Kenya is having the lowest FDI inflows and next Ethiopia and South Africa for the time span of 1981 to 2019. This shows that the EAP countries in the higher income category are accommodating high inflow of FDI as compared with Sub-Saharan African countries (see Figure 6).

Figure 6. FDI Inflows Across the panel

Source: Own Computation using Stata 13, 2021

The scatter graph below relates the average fluctuation between STI and FDI inflows across the panels. Figure 7 indicates a heterogeneous movement across countries in the panel for the year covering 1981 to 2019. Particularly for China, Singapore and Nigeria the average FDI inflows and STI are following a positive movements having a positive slope. Where as for South Korea and South Africa after some points the movement of the two variables are relatively more steeper with a positive slope. In reverse for Kenya relatively high level of STI is related with low level of FDI inflows, and for Ethiopia the reverse of Kenya holds. This shows that how the pattern of average FDI inflows and STI amount varies across the countries and income categories in the panel (see Figure 7).
10.2. Econometric tests and data analysis

The unit root test

The study adopted Im-Pesaran-Shin test for panel macroeconomic data to check whether the variables are stationary at level form or not. According to Im-Pesaran-Shin unit-root test the value of p-statistics less than 5 percent is an indicator of accepting the Ho stating stationarity of the variable. The result from Table 3 indicates that the p-values for the variable GDP, inflation and FDI are less than 5 percent at level form hence, we fail to reject the null hypothesis of stationarity. Therefore, GDP, Inflation and FDI are stationary at level form, and while the remaining variables are non-stationary at level form. On other hand, as shown on the Table 4.3 the variable structural transformation index, financial development indicator, human capital index and foreign public debt (FPD) are stationary at first difference. This indicates that the variables are integrated of order one, I (1) and they may exhibit some long run linear combination.

Figure 7. Trends of Structural Transformation Index and FDI Inflows Across the panel

Source: Own computation using Stata 13, 2021
Table 3. Im-Pesaran-Shin unit-root test

<table>
<thead>
<tr>
<th>Economic variables</th>
<th>At Level</th>
<th></th>
<th>At First Difference</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Test Statistics</td>
<td>P-value</td>
<td>Test Statistics</td>
<td>P-value</td>
</tr>
<tr>
<td>Structural transformation</td>
<td>2.7425</td>
<td>0.9970</td>
<td>-8.1250</td>
<td>0.0000</td>
</tr>
<tr>
<td>Financial development indicator</td>
<td>-0.4777</td>
<td>0.3164</td>
<td>-5.9916</td>
<td>0.0000</td>
</tr>
<tr>
<td>Human capital index</td>
<td>4.5764</td>
<td>1.0000</td>
<td>-6.3545</td>
<td>0.0000</td>
</tr>
<tr>
<td>Inflation</td>
<td>-3.7162</td>
<td>0.0001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ln of GDP</td>
<td>-1.9284</td>
<td>0.0269</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ln of Foreign Direct investment (lnFDI)</td>
<td>-2.5752</td>
<td>0.0050</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ln of Foreign public debt (lnFPD)</td>
<td>2.2150</td>
<td>0.9866</td>
<td>-7.3509</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Source: Stata 14 output from annual data set, 2018

Optimum lag length
To determine the optimum lag length of the economic series we examined the optimum lag length of each variable across each country, and selected depending on the lag-length recommended by the majority countries. Accordingly, the variable structural transformation is with an optimum lag length of one year since out of seven countries in the panel majority or five of them are pinpointing one year as the optimum lag length. Similarly as shown below on Table 4 the variables financial development indicator, human capital index, inflation, GDP, FDI and Foreign public debt (FPD) are having optimum lag-length of one, two, zero, zero, zero and one year, respectively.
### Table 4. Lag Length Selection

<table>
<thead>
<tr>
<th>Country</th>
<th>Structural transformation</th>
<th>Financial development</th>
<th>Human capital</th>
<th>Inflation</th>
<th>GDP</th>
<th>FDI</th>
<th>FPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethiopia</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Kenya</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>South Africa</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Nigeria</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Singapore</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>China</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>South Korea</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>#Majority</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**Source:** Stata 13 output from annual data set, 2021

**Identifying the existence of co-integration**

To identify the existence of co-integration among the economic series we used Pedroni’s cointegration tests for checking the existence of long-run relationship among the variables. Since the absolute value of the test statistics figures are greater than -.3479, we decide to reject the null hypothesis that states absence of cointegration at 1 percent level of significance for both panel and group statistics. Thus, Pedroni’s cointegration test assured that presence of co-integration among our variables this in turn indicates the existence of a stable and long-run relationship among variables.
Table 5. Pedroni’s cointegration tests

<table>
<thead>
<tr>
<th>Test Statistics</th>
<th>Panel</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>v</td>
<td>-.3479</td>
<td></td>
</tr>
<tr>
<td>rho</td>
<td>1.778</td>
<td>2.565</td>
</tr>
<tr>
<td>t</td>
<td>-.7292</td>
<td>-.608</td>
</tr>
<tr>
<td>adf</td>
<td>-2.32</td>
<td>-2.381</td>
</tr>
</tbody>
</table>

**NB:** All test statistics are distributed $N(0,1)$, under a null of no cointegration, and diverge to negative infinity (save for panel v)

**Source:** Own Computation Using Stata 13, 2021

**Identifying the estimation technique**

After once detected the existence of cointegration among the variables the next procedure should be selecting the ARDL with error correction method to be either adopting the mean group (MG) and the pooled mean group (PMG) estimation technique. Accordingly, the study used Hausman test for selecting estimation technique. Since the value of Prob>chi2 in Hausman test is greater than 5 percent that forces to accept the null hypothesis of homogeneity. On other hand, Hausman test result recommends to use PMG estimation technique (see Table 6).
Table 6. Hausman Test for selecting estimation technique

<table>
<thead>
<tr>
<th>(b)</th>
<th>(B)</th>
<th>(b-B)</th>
<th>sqrt(diag(V_b-V_B))</th>
</tr>
</thead>
<tbody>
<tr>
<td>mg</td>
<td>pmg</td>
<td>Difference</td>
<td>S.E.</td>
</tr>
<tr>
<td>lnFDI</td>
<td>-2.242426</td>
<td>-0.0303254</td>
<td>-2.212101</td>
</tr>
</tbody>
</table>

b = consistent under Ho and Ha; obtained from xtpmg
B = inconsistent under Ha, efficient under Ho; obtained from xtpmg

Test: Ho: difference in coefficients not systematic

\[
\text{chi}^2(1) = (b-B)'[(V_b-V_B)^{-1}](b-B)
\]

\[
= 1.79
\]

Prob>chi^2 = 0.1813

ARDL with Vector Error Correction Model Result

The results of ARDL with vector error correction model using pooled mean group (PGM) technique of estimation is presented in two scenario. Firstly estimation is conducted for full panels to show the effects of FDI on structural transformation depends on whether their movements are temporary or permanent (Table 7). Secondly, investigating the relationship between FDI and structural transformation depends on the level of economic development. For this purpose, we split the sample into two subgroups, namely: developing Sub-Saharan African countries and EAP countries according to 2017 World Bank Classification (Table 8).

ARDL with Vector Error Correction Model Taking the Full Panel

According to the ARDL model with pooled mean group regression the long run coefficients are assumed to be same across all the groups that make-up the panel. As shown on the table below in the long run financial development indicator, human capital index, foreign public debt and FDI have a significant impact on the extent of structural transformation of countries. Particularly, in the long-run financial development indicator and FDI have positive impact on the structural transformation extent of nations at 1 percent level of significance, keeping others remain constant. Similarly, in the long-run human capital index and foreign public debt have negative impact on the structural transformation extent of nations at 5 percent and 1 percent level of significance, respectively, keeping others remain constant (Table 7).
<table>
<thead>
<tr>
<th>Panel Variable (i): ID</th>
<th>Number of groups = 7</th>
<th>Number of obs = 216</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Variable (t): Year</td>
<td>Obs per group: min = 30</td>
<td>Log Likelihood = -193.9361</td>
</tr>
<tr>
<td>dStrTransn</td>
<td>Coef.</td>
<td>Std. Err.</td>
</tr>
<tr>
<td>Ec (Long-run)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FDIndicator</td>
<td>.046</td>
<td>.009472</td>
</tr>
<tr>
<td>HCapitalIndx</td>
<td>-.004</td>
<td>.0015124</td>
</tr>
<tr>
<td>lnFPD</td>
<td>-3.48</td>
<td>.3194304</td>
</tr>
<tr>
<td>lnGDP</td>
<td>-.138</td>
<td>.2846138</td>
</tr>
<tr>
<td>Inflation</td>
<td>-.034</td>
<td>.0292971</td>
</tr>
<tr>
<td>lnFDI</td>
<td>.815</td>
<td>.1117305</td>
</tr>
<tr>
<td>SR (short-run)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECT</td>
<td>-.192</td>
<td>.0582098</td>
</tr>
<tr>
<td>dFDIndicator</td>
<td>-.047</td>
<td>.0316592</td>
</tr>
<tr>
<td>dHCapitalIndx</td>
<td>.040</td>
<td>.0217608</td>
</tr>
<tr>
<td>dlnFPD</td>
<td>.797</td>
<td>.4381167</td>
</tr>
<tr>
<td>dlnGDP</td>
<td>-4.15</td>
<td>4.618765</td>
</tr>
<tr>
<td>dInflation</td>
<td>-.017</td>
<td>.0128415</td>
</tr>
<tr>
<td>dlnFDI</td>
<td>4.701</td>
<td>4.544573</td>
</tr>
<tr>
<td>_cons</td>
<td>16.72</td>
<td>5.481965</td>
</tr>
</tbody>
</table>

Note: ***, ** and * indicates 1percent, 5percent and 10percent level of significance respectively.

Source: Stata 14 output from annual data set, 2021
The ARDL model with pooled mean group regression result shows that in the long-run the financial development indicator impacts the extent of structural transformation positively and significantly. Accordingly, in the long-run a percentage increase in the financial development indicator raises the level of structural transformation by around 4.6 percent and which is significant at 1 percent level of significance, keeping other variables constant. This indicates that an improvement in the financial development indicator catalyzes the nations move towards structural transformation.

In the long-run, the ARDL model with pooled mean group regression result shows that the human capital index affects the extent of structural transformation negatively and significantly. Accordingly, in the long-run a percentage increase in the human capital index decreases the level of structural transformation by around 0.4 percent and which is significant at 5 percent level of significance, keeping other variables constant. This indicates that a human capital development in the form of education increases productivity and thereby fastens the nations objective of achieving structural transformation.

In the long-run, the pooled mean group regression result also shows that the variable foreign public debt affects the extent of structural transformation negatively and significantly. Accordingly, in the long-run a percentage increase in the amount of foreign public debt decreases the level of structural transformation by around 348 percent and which is significant at 1 percent level of significance, keeping other variables constant. This indicates that an inflow of foreign public debt has a devastating contribution to a move towards structural transformation.

Furthermore, in the long-run, the ARDL model with pooled mean group regression result shows that the variable foreign direct investment affects the extent of structural transformation positively and significantly. Accordingly, in the long-run a percentage increase in the amount of FDI inflows increases the level of structural transformation by around 81 percent and which is significant at 1 percent level of significance, keeping other factors remain constant. This indicates that FDI inflows via transferring technology on infant manufacturing industries activates the objective of achieving structural transfer by nations.

While the ARDL model with pooled mean group regression estimation result indicates that the short-run the variables human capital index and foreign public debt have a significant effect on the outcome variable, structural transformation. In the short-run a percentage increase of human capital index decreases the level of structural transformation by around 4 percent and which is significant at 10 percent level of significance, keeping other factors remain constant. Whereas, in the short-run a percentage increase in the inflow of foreign public debt increases the level of structural transformation by around 79 percent and which is significant at 10 percent level of significance, keeping other factors remain constant.

More importantly, the short-run error correction term (ECT) is having the expected sign and statistically significant. The coefficient of ECT indicates that any deviation from long-run equilibrium are corrected at 19 percent adjustment speed, which shows that for the occurrence of economic shocks structural transformation variable converges towards its long-run equilibrium (Table 7).

**ARDL with Vector Error Correction Model for the Two Groups**

According to the ARDL model with pooled mean group regression result among the Sub-Saharan African and EAP developed countries the variable foreign direct investment has a
significant but having different sign for the two group in affecting structural transformation. On other hand, the result also indicated that GDP, Foreign direct investment, human capital index has a significant effect on the structural transformation of countries across the two group. Moreover, the error correction term is positive and statistically significant for the two groups, showing a tendency of convergence to its long-run equilibrium.

Table 8 shows for EAP countries FDI has a negative effect on structural transformation in the long run and a positive effect on structural transformation in the short-run which are also statistically significant at 1 percent and 5 percent level of significance, respectively. In the long-run a percentage increase in FDI inflows reduces structural transformation move by around 160 percent, keeping other factors remain constant. On the other hand, in the short-run a percentage increase in FDI inflows increases structural transformation move by around 1866 percent and statistically significant at 5 percent level of significance, keeping other factors remain constant. The result might be due to the fact that developed countries are already established their basement especially human capital base to accommodate FDI inflows and thereby the effect is early more viable on the structural transformation move. While in the long-run the result might be due to the fact that a certain threshold level of income (output) is necessary to absorb the inflow of FDI and thereby new technology, and later-on the contribution of FDI on structural transformation negligible and even declines.

Table 8. ARDL Estimation result for EAP and SSA countries, group variation

<table>
<thead>
<tr>
<th>Panel Variable (i): ID</th>
<th>Number of obs =93</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Variable (t): Year</td>
<td>Number of groups = 3</td>
</tr>
<tr>
<td>(\text{StrTransn})</td>
<td>(\text{Coeff. (Std. Err.)})</td>
</tr>
<tr>
<td>Region</td>
<td>EAP</td>
</tr>
<tr>
<td>ETC (Long Run)</td>
<td></td>
</tr>
<tr>
<td>(\ln\text{FDI})</td>
<td>-1.603(.036)</td>
</tr>
<tr>
<td>Short Run</td>
<td></td>
</tr>
<tr>
<td>(\text{ECT})</td>
<td>.45643(.162)</td>
</tr>
<tr>
<td>(\text{FDIndicator})</td>
<td>-.01189(.012)</td>
</tr>
<tr>
<td></td>
<td>Estimate</td>
</tr>
<tr>
<td>---------------</td>
<td>----------</td>
</tr>
<tr>
<td>HCapitalInd</td>
<td>-0.0104</td>
</tr>
<tr>
<td>lnFPD</td>
<td>-0.1266</td>
</tr>
<tr>
<td>lnGDP</td>
<td>18.67</td>
</tr>
<tr>
<td>lnFDI</td>
<td>18.66</td>
</tr>
<tr>
<td>_cons</td>
<td>1.601</td>
</tr>
</tbody>
</table>

Note: ***, ** and * indicates 1 percent, 5 percent and 10 percent level of significance respectively.

**Source:** Stata 13 output from annual data set, 2021

Similarly, from Table 8 in developing Sub-Saharan African countries FDI has a positive effect on structural transformation both in the long run and short-run which are also statistically significant at 1 percent level of significance. In the long-run a percentage increase in FDI inflows rises structural transformation move by around 56 percent, keeping other factors remain constant. But in the short-run it accelerates structural transformation only by around 37 percent. The result might be due to the fact that developing economies like SSA typically constrained with low level of human capital to accommodate knowledge transfer results on relative less contribution of FDI to structural transformation. However, across time nations may build-up their human capital base and capacitates financial sources of infants firms via FDI inflow to enjoy the associated benefits of increasing production and productivity of manufacturing firms so that the effect on structural transformation more than often, welcomed. Since the long-run effect out-weights the short-run effect, FDI can improve structural transformation for developing countries like SSA. More importantly, in the short-run the variable GDP is negatively and significantly predicting structural transformation for Asian developed countries. Accordingly, in the short-run a unit increase in GDP decreases structural transformation move by around 18 percentage share which is statistically significant at 5 percent level of significance, keeping other factors remain constant. The result pinpoints that the marginal contribution of GDP is not necessarily caused by the productive sector of the economy rather by other sectors that are not contributing significantly for the productive sector. While for developing SSA countries human capital index has a positive and significant effect on structural transformation. Particularly, in the short-run a unit increase in human capital index increases the structural
transformation by 0.09 percent which is statistically significant at 5 percent level of significant, ceteris paribus. The result is consistent with the economic theory that concludes human capital plays a pivotal role in adopting technology and thereby facilitates the objective of achieving structural transformation.

10.3. Conclusion and implications

SSA countries are struggling to achieve structural transformation by attracting a massive amount of FDI inflows in the last decades. Data for the year 2019 indicated that the share of manufacturing sector from the total GDP is by far lower for these nations. Consequently, the governments are providing different incentive packages to attract FDI and thereby to facilitate technology transfer over to the infant firms. This study limited its scope to 1989 to 2019 for 31 years due to the availability of data-sets for these periods. To achieve the objective both descriptive and empirical methods of analysis were used. Different post-estimation tests and diagnostic tests were conducted to examine economic series of variables. To examine their relationships ARDL model was adopted with the extension of ECM with the pooled mean group technique of estimation. Accordingly the study had found the following key findings.

✓ In the long-run, the ARDL model with pooled mean group regression result shows that FDI acts as a catalyst for achieving structural transformation for the panel as a whole. This indicates that FDI inflows via transferring technology on infant manufacturing industries activates the objective of achieving structural transformation.

✓ The result for the heterogeneous income groups concluded that for EAP countries FDI has a negative effect in the long run and a positive effect in the short-run on structural transformation.

✓ While for developing Sub-Saharan African countries FDI has a positive effect on structural transformation both in the long run and short-run which are also statistically significant at 1 percent level of significance.

According to the findings of this study the following major recommendations are forwarded:

- The government and other concerned bodies of developing SSA countries should take further measures to attract FDI inflows to achieve the objective of structural transformation.
- The government and other concerned bodies of developed EAP countries should take measures that minimizes FDI inflows.
- Calling other researchers in the future in related topic by increasing the time frame, differentiating methodologies and including other macroeconomic factors that affect structural transformation index of nations.

Acknowledgement

At First, may all the honor and glory be extended to the exalted Heavenly God for his help and guidance and encouragement in all over my life. Firstly, my appreciation goes to Wolaita Sodo and Arba Minch University for their valuable provision of sponsorship to join the program, PhD in development economics, and this work is also part of the PhD dissertation. Further more, I would like to say thanks to these examiners, Zerayehu S.(PhD), Melkamu M. (PhD), Mesfin M. (PhD) and Malebo M. (PhD) for their constructive comments and suggestion to reach on this final manuscript. Lastly but not least, thanks to all my families, specially of my wife, Lelise Bacha and my daughter, Kalkidan, for their affection in my life.
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