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**How has globalisation affected the economic growth, structural change and poverty reduction linkages?
Insights from international comparisons
Aradhna Aggarwal**

Maastricht Economic and social Research institute on Innovation and Technology (UNU-MERIT)
email: info@merit.unu.edu | website: <http://www.merit.unu.edu>

Boschstraat 24, 6211 AX Maastricht, The Netherlands
Tel: (31) (43) 388 44 00

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HOW HAS GLOBALISATION AFFECTED THE ECONOMIC GROWTH, STRUCTURAL CHANGE AND POVERTY REDUCTION LINKAGES? INSIGHTS FROM INTERNATIONAL COMPARISONS

Aradhna Aggarwal

Abstract: This paper examines economic growth, structural change and poverty reduction linkages across 147 countries of the world during 1991-2015. It emphasises that under the liberal market growth model structural change-growth linkages are complex, which in turn can complicate the poverty reduction effects of growth. It proposes a conceptual framework to explain how growth and structural dynamics have been influenced by globalisation. It argues that at the core of the conventional growth-structural change relationship lies the assumption that economic activities within and across sectors are strongly connected with each other through forward and backward linkages. Globalisation may distort this connectedness affecting different sectors asymmetrically. As a result, structural change in value added and employment may not commensurate with each other exerting ambiguous effects on cross-sector productivity dispersions. The study hypothesises that the convergence between them is critical for productivity enhancing structural change, and in turn, for poverty reducing effects of growth. The generalised method of moments (GMM) estimator within the framework of a dynamic panel data approach upholds the hypothesis. These findings question the sustainability of the growth and structural change processes taking place in the developing world and call for deeper strategic government interventions for broad based economic development with an emphasis on manufacturing.

Key words: Economic Growth, Globalisation, Structural Change, Poverty reduction, Cross country analysis

JEL classification: E24, O14, O4

1. Introduction

There is overwhelming evidence that the world has made unprecedented progress in reducing extreme poverty particularly since 1990, the year that is generally cited as the beginning of the current era of globalisation. According to World Bank (2016) the percentage of the world's population that is living in extreme poverty (at \$1.90 a day at 2010 prices) declined between 1990 and 2013 from about 35 % to 10.7%, and the absolute number from an estimated 1.9 billion to 767 million over the same period. Not only that, world inequality as measured by the Gini coefficient, which takes the value zero for the most equal society and one for the most unequal one, has also declined from 0.88 in 1988 to 0.65 in 2013 (World Bank 2016). Viewed by mainstream economists as significant outcomes of global integration, these trends are often cited to support the argument that rapid economic growth in developing countries associated with globalisation has been instrumental in reducing global poverty and inequality (Bourguignon 2004; Dollar and Kraay 2002; Dollar et al. 2014). However, many argue that the relationship between growth and poverty is not so simple as projected in the mainstream literature. Evidence suggests that countries differ widely in terms of their ability to translate growth into poverty and

inequality reduction (Ravallion 2001; Kappel et al. 2005; see, for literature surveys: Škare & Družeta 2016; Melamed 2011; Bigsten and Levin 2004 among many others). This has led economists to question why do poverty reduction rates relative to the rate of economic growth differ widely across countries. Some argue that the prospects for poverty reduction potential of growth depend on the initial conditions, in particular initial levels of inequality (Angelsen and Wunder 2006; Squire 1993; Lipton and Ravallion 1995) while others focus on the types of growth processes, highlighting the role of investment in education (Thomas et al 2000; Eicher and Garcia-Penalosa 2001 among others), rural diversification (Christiaensen and Kaminski 2015), use of labour intensive technologies, good governance (Thomas et al 2000), or pro poor policies of the government (Cook 2006). Following the latter line of thinking, the present study examines the proposition that poverty reduction is linked to economic growth via ‘structural change’ (Cook 2006; Tello 2015; Williams 1991). It draws on the basic tenets of “New Structural Economics” to argue that economic growth if accompanied by productivity enhancing structural change ensures sufficient returns to workers to permit them and their dependents a level of consumption above the poverty line. More specifically, the argument is that economic growth associated with productivity enhancing structural change is an important contributor to poverty reduction. The term ‘structural change’ can have different meanings under different contexts; here it refers to the change in the sectoral composition of economic activity and productive factors (Machlup 1991; Silva and Teixeira 2008).

Historically, economic growth is observed to be invariably accompanied by the type of structural change which had been locked in a mutually reinforcing relationship with growth and was poverty reducing (see, Silva and Teixeira 2008 for a survey of literature). However, many currently developing countries in the globalised era appear to have defied this empirical regularity. They have experienced long spells of economic growth which has not been accompanied by productivity enhancing structural change nor by commensurate poverty reduction. This observation has led many to revisit the relationship between economic growth and structural change (see, *inter alia*, Aggarwal 2018; Fagerberg 2000; Timmer and Szirmai 2000; Kaniovski and Peneder 2002; Dietrich 2012; Vu 2017; de Vries et al. 2012; Mcmillan et al. 2014; Pieper 2000; Roncolato and Kucera 2014; Üngör 2014; Yilmaz 2016) on the one hand, and that between growth and poverty on the other (see, Škare and Družeta, 2016; Bigsten and Levin, 2004 for literature review). However, the literature on structural change and poverty linkages remains rather thin (Aggarwal and Kumar 2015; Chatterjee 1995; Cook 2006; Hasan et al 2013; Lavopa and Szirmai 2012; Kim et al 2017; Tello 2015). The present study contributes to this literature in three ways that follow.

First, it proposes a conceptual framework that explains how the forces of globalisation may turn growth-structural change relationship heterogeneous and complex and how this in turn can influence poverty rates in the currently developing countries. While extant literature attributes the missing link between growth and productivity enhancing structural change to internal conditions of a country such as natural factor abundance, currency valuation by policy makers, and labour market rigidities (Macmillan et al. 2014), there is, as yet, little understanding about how globalisation can impede the channels underlying this link and disrupt the historically observed mutually reinforcing relationship between growth, structural change and poverty reduction. Second, the study proposes a novel measure of productivity enhancing structural change. The two most common structural change indicators which are often used

interchangeably in the literature are: changes in the sectoral value-added shares (e.g., Clark 1940; Fischer 1939; Cook 2006; Szirmai and Verspagen 2015) and sectoral employment shares (e.g., Chenery et.al 1986; Timmer and de Vries 2009). Following Dietrich (2012), a body of literature has emerged that uses ‘aggregate indices’ of the magnitude of structural change based on either sectoral shares of GDP or those of employment. This tendency to treat sectoral value added and employment shares as alternative measures of structural transformation is based on the premise that the two tend to converge in the process of growth as has been historically observed in the now developed countries. However, considering that there are large productivity gaps across sectors in the currently emerging countries, the two may differ considerably. Any measure of structural change should therefore be based on this reality. Further, none of the commonly used measures indicates whether structural change is growth-enhancing, which is crucial for my analysis. With growing recognition that structural change may not always be growth-enhancing, some measures for growth-enhancing structural change are proposed in the literature. For instance, Macmillan et al (2014) have focused on the contribution of inter-sectoral shifts in labour allocation to value added in the shift share decomposition. However, according to some researchers this measure may underestimate structural change in an economy because a part of inter-sectoral shifts in labour allocation in shift share decompositions may be counted in the ‘within’ effect (Timmer and de Vries, 2009). To address this issue, Vu (2017) develops a concept of ‘effective structural change’ index: a modified version of Dietrich (2012) that takes into account changes in the sectoral employment shares of only those sectors that make a positive contribution to labour productivity growth irrespective of the direction of change in employment shares. This measure is not completely free from the limitations that are inherent in Dietrich’s index. The novel measure proposed here focuses on the gap between the sectoral shares of value added and employment to measure growth enhancing structural change that I call ‘convergent structural change’. Growth- and productivity-enhancing terms will be used interchangeably in the analysis. Last, this is arguably the first attempt to employ quantitative tools to assess the impact of productivity enhancing structural change on poverty covering a large number of developing countries (126) broken down into 10 major regions. The data are collected from various international sources for the period from 1991 to 2015. The results obtained using the generalised method of moments developed by Arellano and Bond (1991) support the key hypothesis proposed here. I draw on the analysis to raise some pertinent issues regarding the growth process under globalisation and conclude by highlighting the need for deeper strategic government interventions beyond market friendly reforms (McMillan et al. 2014) or redistributive policies (World Bank 2016) for sustained and broad-based economic growth and development.

The rest of the paper is divided into 6 sections. The following section discusses the theoretical underpinnings of growth-structural change and poverty linkages. Sections 3 and 4 document the growth and structural transformation process in all major developing regions of the world during the two decades, using the National Accounts data from the United Nations Statistics Division, labour statistics from ILO, and the GDP data from World Development Indicators (WDI). Section 5 is devoted to the analysis of poverty and inequality trends based on the World Bank data provided on its Poverty and Equity Data Portal. Section 6 piece together the data analysed in different sections and investigates, using quantitative techniques, the relationship between growth enhancing structural change and poverty. Finally, Section 7 draws policy implications.

2. Growth -Structural Change- Poverty Linkages in Historical and Contemporary Perspective

In historical perspective, one of the most significant characteristics of modern economic growth is that it is accompanied by structural shifts of production and resource away first from agriculture to industry and then from industry to services (Kuznets 1966; Gabardo et al. 2017). Historical time series data strongly confirm this process of structural transformation in today's advanced economies. This historically observed process of growth and structural change is underpinned by three mutually supporting mechanisms: labour pull (Lewis 1954), labour push (Nurkse 1953; Rostow 1960), and dynamic adjustment between the structural transformation in employment and value added (Alvarez et al 2011). These are founded on the assumptions that there are sectoral differences in income elasticity of demand on the one hand, and patterns of technological advancements on the other. As income rises, demand shifts from low-income elasticity agricultural goods to high-income elasticity goods produced in the industrial sector, triggering the mechanism of 'labour pull' by industry. This calls for 'labour push' from agriculture which is normally associated with a rapid rise in agricultural productivity (Ngai and Pissarides, 2007; Timmer 2007:7). However, since industry enjoys relatively higher productivity due to opportunities of capital accumulation and technological development including economies of scale and scope, agriculture despite a rise in productivity, tends to lose shares in GDP while its share in labour force may still be large. The sectoral employment and value-added shares would thus tend to diverge and with relatively large population working in agriculture producing a small proportion of value-added poverty would worsen. This requires dynamic adjustment between the sectoral shares of value added and employment which comes about with a rapid expansion in industry particularly manufacturing. It catalyses not only labour pull but also labour push by agriculture by improving its productivity through better quality of inputs and technologies used in the sector, and 'labour pulls' which release pressures on agriculture. Thus, the productivity gap between agriculture and manufacturing narrows, and their value added and employment shares tend to converge. The smaller the initial productivity gaps between the two sectors, the greater is the speed of convergence (Timmer 2007). As the country develops further, a high level of industrial dynamism spurs growth and expansion of the service sector. This leads to reallocation of resources towards services and initiates a dynamic convergence process between their value added and employment shares as well. However, the sectoral shares of value added and employment *do not* fully converge. Manufacturing which is subject to increasing returns to scale (Kaldor –Verdoorn Law), and continuously upgrades from low to medium to high tech activities, continues to grow both in size and productivity driving the catch-up dynamics in other sectors raising overall productivity and hence growth in the economy. The dynamic expansion in product and factor markets dampens mobility barriers in labour and financial markets generally with the support of state interventions. The process of structural change is thus a process of '*cumulative causation*' reinforcing and accelerating growth (Chenery et al. 1986; Kaldor 1966; Storm 2015) with manufacturing being at its core. In this process where sectors are locked with each other in catch-up dynamics, inter-sectoral productivity differentials *tend to* converge and average earnings continue to grow resulting into poverty and inequality reduction.

The mechanisms underlying the conventional growth –structural change relationship as described above require two basic conditions to allow them to operate. One, demand dynamics

and economic activities within and across sectors are strongly connected with (and are dependent on) each other through forward and backward linkages (Pasinetti 1981; Verspagen 1993). Two, the productivity gap between the fast growing and catching up sectors is not very large to begin with. Globalisation, which drives economic growth by integrating national economies with global markets through trade and global value chains (GVCs) may rupture both these basic conditions in emerging economies. Global integration of the sectors where these economies have revealed comparative advantages spurs growth in GDP. But productivity levels of these sectors are substantially higher than those of the rest affecting the catching up process and hence the rate of adjustment rather adversely. Not only that, the globally integrated sectors experience much faster productivity growth than the rest which can drive further divergence between the sectoral shares of value added and employment, instead of convergence. This possibility is quite imminent because the intra- and inter-sectoral connectedness (the first basic condition) is also affected asymmetrically by globalisation. Growth in trade specialised sectors (irrespective of what sector) may actually create a 'resource curse like situation' and affect the 'non-specialised tradable' and non-tradable sectors asymmetrically. It may fuel growth of the latter at the cost of the former through both, the price and demand mechanisms. The demand mechanism works when a rapid rise in productivity, competition and financial flows in the trade specialised sector creates demand boom for non-tradable sectors within the economy while any rise in the demand for goods and services produced in the non-specialised tradable sectors may be directed to international markets (Krüger 2008; Timmer 2007). The rising demand puts pressure on relative prices of non-tradables stimulating investment in non-tradable sectors. In contrast, there are few demand spillovers for non-specialised tradable sectors to expand domestically. Since trade-specialised sectors themselves depend upon global demand for growth stimulus, their own growth potential may remain severely limited. Even where economic specialisation occurs in the manufacturing sector, growth may remain concentrated in specific industries with few implications for other industries and sectors due to weak intra-and inter-sectoral linkages, impeding the Kaldor-Verdoorn dynamism which places manufacturing at the core of the growth process (Kaldor 1966).

The upshot is that non-tradable sectors expand and exert labour pull effects. A large share of employment therefore gets absorbed in these sectors (Alvarez-Cuadrado et al. 2017) pulling their productivity further down. The process of labour reallocation is supported by a low elasticity of substitution between capital and labour in these sectors. The specialised and non-specialised tradable sectors on the other hand would generate labour push effects, for different reasons though. This process will have ambiguous effects on productivity dispersions across the three sectors: trade specialised, non-specialised and non-tradable, depending on the initial levels of productivity in these sectors and can produce highly differential outcomes. *Under the globalised regime, therefore structural change-growth linkages are complex, which* in turn can complicate the poverty reduction effects of structural change. The major hypothesis tested in the study is,

H₀: Economic growth is poverty reducing only if it is accompanied by growth enhancing structural change i.e. it results into productivity convergence across sectors by narrowing the gap between the sectoral value added and employment shares.

For testing the major hypothesis, I examine a series of minor hypotheses to understand the final outcome of these complexities.

- H1: Globalisation is associated with an increased pace of economic growth.
- H2: Growth accelerations of the post 2000 period have been associated with accelerations in the process of structural change in sectoral value added shares.
- H3: The structural change in sectoral value-added shares in the emerging economies in the post 2000 period does not conform to the historically observed patterns in today's advanced countries and does not follow any systematic pattern of structural change.
- H4: Globalisation is likely to promote economic specialisation, which may favour the expansion of non-tradable sectors at the cost of the tradable ones.
- H5: Structural change in value added and employment may not commensurate with each other in emerging economies exerting ambiguous effects on cross-sector productivity dispersions.

In what follows, I examine these minor hypotheses by analysing structural change patterns in sectoral value added and employment shares across 10 major regional groupings of emerging economies: Caribbean and Central America (CCA), South America, Sub-Saharan Africa (SSA), Middle East and North Africa (MENA), South Asia, South East Asia, East Asia, Central Asia, and Central and East Europe (CEE).

3. Globalisation and Economic Growth

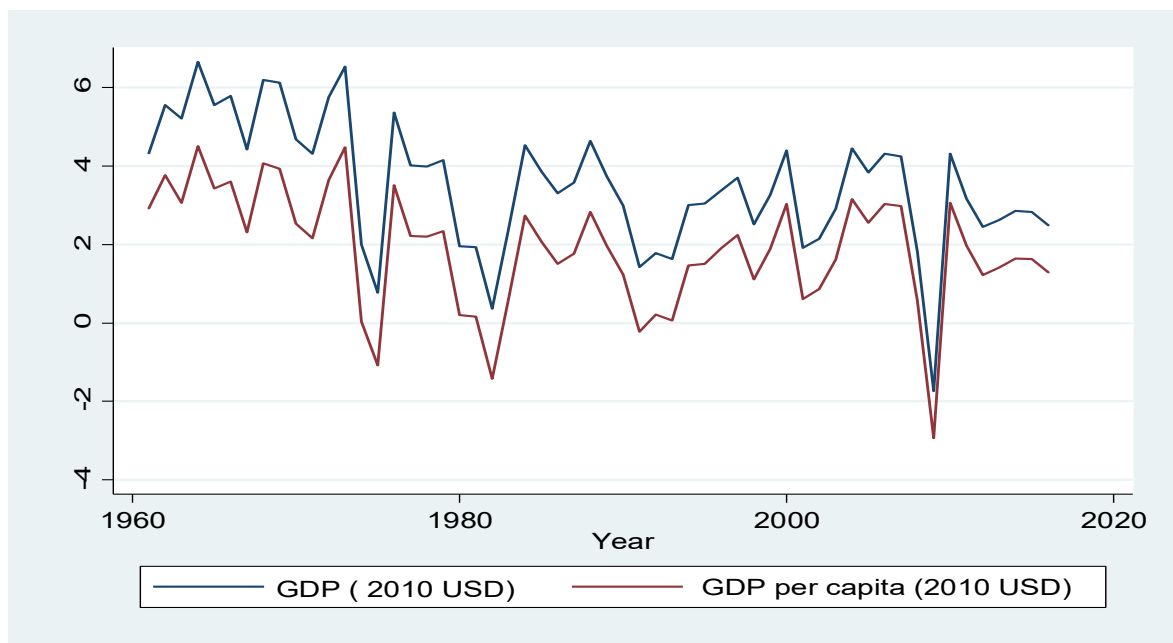
H1: Globalisation is associated with an increased pace of economic growth.

Globalisation is associated with integration of international markets through trade, and emergence of global production networks that are growth enhancing from the perspective of mainstream and new growth theories. The mainstream theories (Solow, 1958), which focus on the availability and efficiency of resources in determining growth highlight how global integration promotes growth by improving allocative efficiency of resources through their reallocations towards high productivity sectors where the country has revealed comparative advantages. New growth theories (Romer, 1994) on the other hand, view flow of knowledge as the key channel underlying the effects of global integration on growth. It promotes knowledge creation, technological changes and innovations. The neo institutional economic theories (Acemoglu *et al.*, 2005; North, 1990) however take a cautious view. According to the explanations advanced by various theories rooted in this view, the effect of global integration on the efficiency of resources and knowledge promotion is contingent on incentives and the constraints created by given institutional and political environment. In a similar vein, the geographical perspective which is being revitalised by a group of scholars (Diamond, 1997; Sachs, 2001, 2012) takes into account the influence of location, climate and natural resource endowment while explaining the effects of globalisation on economic growth. A lack of access to a seaport or distance from major trading centres for instance, may significantly constrain international trade and in turn economic growth. The existing literature that examines the impact of globalisation on growth thus remains inconclusive indicating that it is a matter of empirical findings (For literature survey, see Samimi and Jenatabadi, 2014).

I assess here worldwide economic growth patterns from 1960 onwards using the World Development Indicators (WDI) data tables provided by the World Bank. The data base provides four series that measure growth in an economy’s economic activity: GDP growth in local currency converted into constant USD, GDP per capita growth in local currency converted into constant USD, GDP growth in PPP dollars and GDP per capita growth in PPP dollars. While GDP growth is a primary indicator of economic performance, GDP per capita growth reflects improvement in the standard of living and is more relevant from the perspective of our analysis of poverty reduction. However, growth in constant USD may be unfit because the exchange rates are a policy matter and do not reflect the purchasing power differences (Bhalla 2002). GDP per capita in real PPP dollars, which is adjusted for purchasing power differences across countries is therefore the most preferred indicator of growth. I shall however use all four growth measures in this section. This is because the data on GDP in PPP dollars is not available for the period prior to 1991 whereas I present the growth analysis since 1960.

A cursory analysis of World GDP (at USD 2010 prices) shows that it has risen by 66 trillion dollars from 11.2 trillion dollars in 1960 to 77.3 trillion dollars in 2016 at an average annual growth rate of 3.5%, representing an increase of 600 percent in constant GDP over this period. GDP growth exceeded population growth. As a result, in 2016, GDP per capita (at constant USD 2010 prices) was 300% higher than in 1960 depicting an annual average growth rate of 2.0% per annum.

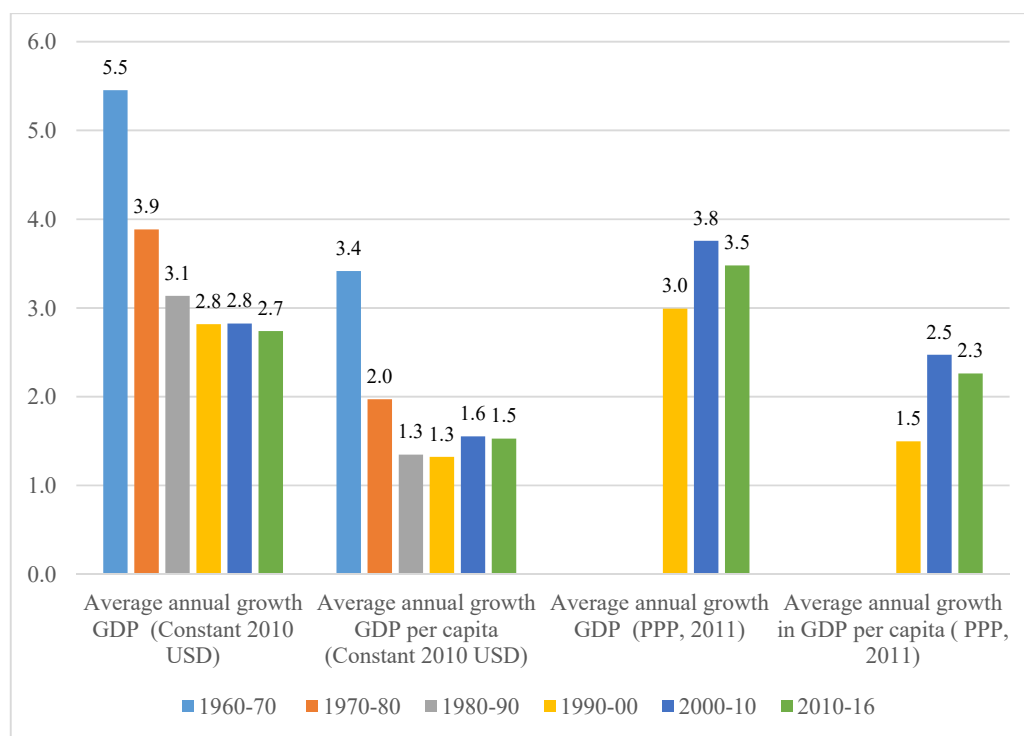
Figure 1: Yearly growth rates in World GDP and GDP per capita in constant 2010 USD: 1961-2016



Source: Author based on World Development Indicators, World Bank

A yearly analysis of growth trends however indicates that global growth has been highly uneven over time. Figure 1 shows that the peak GDP growth rates of above 6% achieved in the 1960s and early 1970s were never witnessed by the world again. Post 1970s, almost every growth upturn yielded the peak that was smaller than the previous peak at least until the year 2000. The GDP per capita in constant USD conveys a similar story with few exceptions. During the 1980s many countries (both developed and developing) adopted pro market- and outward oriented reforms marking a dramatic shift in economic philosophies in favour of the neoliberal perspective. Economic reforms initiated in the 1980s became widely pervasive in the 1990s and were termed as the process of ‘globalisation’. However, the world did not substantially benefit from this transformation in terms of GDP and GDP per capita in constant prices. The decade of 2000s finally witnessed an upsurge in growth when the forces of globalisation were unleashed. Figure 2, which presents decadal trends in GDP constant and PPP dollars for the period from 1991 to 2015¹, clearly brings out a discerning rise in the growth rate of GDP and GDP per capita in the post 2000 period. The turnaround is observed mainly in GDP in PPP dollars. It is prima facie evidence that policy adjustments of the post 2000s facilitated the participation of world population in the process of economic growth.

Figure 2: Average global growth rates: 1960-2016 (%)

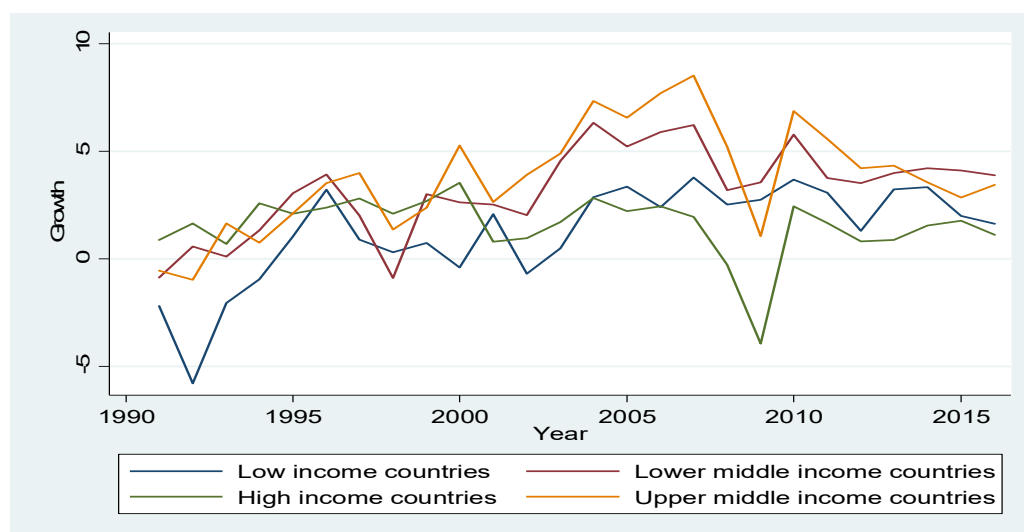


Source: Author based on World Development Indicators, World Bank

¹ GDP data in PPP dollars is available since 1991. There is no data prior to that year.

For a disaggregated analysis of growth patterns, the world economies may be broken down into four income groupings using the standard classification provided by the World Bank: high, upper-middle, lower-middle, and low income countries. Figure 3 presents average annual growth rates in GDP per capita in 2011 PPP for all four groups of countries for the period from 1991 onwards. It indicates that the post 2000 economic acceleration in global growth stems predominantly from stronger growth rate in the developing countries. In the early 1990s, industrialised countries had been leading the world economic growth. Post 2000, however there was a considerable slowdown in the growth rate of high-income countries with upper- middle, lower- middle and low-income countries outpacing them.

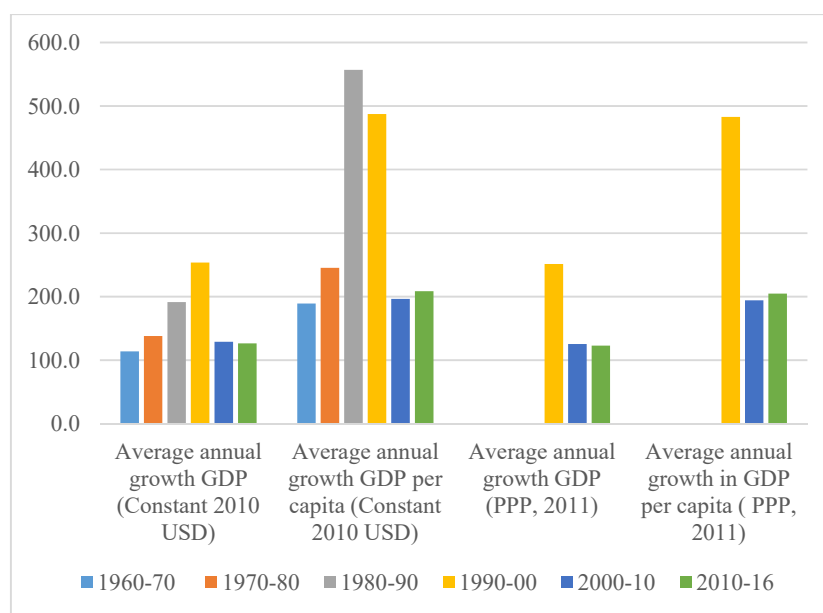
Figure 3: Regional economic growth rates by economic category: 1991-2016 (%)



Source: Author based on World Development Indicators, World Bank

A further analysis of growth patterns reveals that the post-2000 global growth acceleration has been unprecedentedly widespread. The growth rate dispersion (the coefficient of variation in growth rates) across countries has declined sharply in the post 2000 period irrespective of the GDP measure used (Figure 4).

Figure 4: Cross-country coefficient of variation in World GDP Rates: 1960-2016



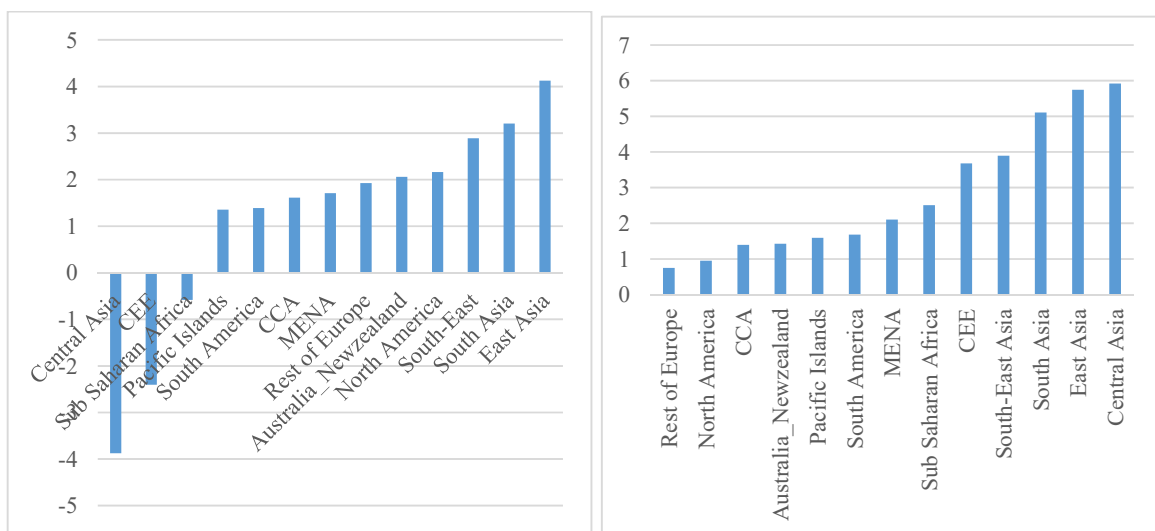
Source: Author based on World Development Indicators, World Bank

For a better understanding of these patterns, I also examined the World Bank data on historical classification of 205 countries by income category available from 1987 onwards (Fantom and Serajuddin, 2016). It shows that during 1990-2016, 112 (developing) countries crossed at least one threshold level of income. Of the remaining 93 countries, 43 had already been in the high-income category in 1990, which means that only 50 countries remained stuck in the same income group as in 1990. A decadal analysis however shows that most countries achieved this feat in the post 2000 period. In the 1990s, only 28 countries moved one threshold level of income up, while 25 others moved one level down. The post 2000 period, in contrast, witnessed upgrading of 130 countries by the World Bank. Of these, 22 were the ones that just managed to recover their status that they had lost in the 1990s while 108 improved their economic status.

An analysis of growth patterns broken down by geographical regions reveals that growth accelerations were experienced across almost all regions of the developing world *albeit* in varying degrees. For the analysis, the world economies have been divided into 13 regional groupings: Caribbean and Central America (CCA), South America, Sub-Saharan Africa (SSA), Middle East and North Africa (MENA), South Asia, South East Asia, East Asia, Central Asia, Central and East Europe, North America (NA), the Rest of Europe, and Australia-New Zealand. Regional growth patterns during the 1990s and post 2000 presented in Figure 5, indicate that world growth performance in the post 2000 period has been driven largely by the economic turnaround of Central Asia and CEE countries. It may be noted that Central Asia covers Asian countries formerly controlled by the Soviet Union, while CEE countries were their European counterparts in the former Soviet Union. These regions suffered a massive blow upon disintegration from the USSR in the 1990s. Several of these countries lost their economic ranking in the 1990s. Nevertheless, post 2000 they bounced back contributing robustly to global growth rates. For some of these countries, growth experienced was more than a recovery; they crossed the income category they were in previously. These are Poland, Slovak Republic, Latvia, Lithuania, Azerbaijan, Croatia, and Czech Republic. Another major contributor to robust global

growth performance of the post 2000 period was Sub Saharan Africa. It had registered a negative growth rate in the 1990s, which improved to over 2% in the post 2000 period. This is despite the fact that, of the 50 countries that did not cross any threshold level during 1990-2016, 27 were in this region and were spread across the West, Central and East Africa. In addition, East, South East and South Asia, which had been the top performers in the 1990s further enhanced their growth performance. China led the growth process in East Asia crossing two threshold levels of income over the period of two decades. In South East Asia, Malaysia, Thailand, Indonesia, Vietnam, and Cambodia crossed one threshold level each. In South Asia, India dominated the growth process but Bangladesh, Maldives and Bhutan also experienced growth episodes that could be described as economic acceleration. CCA and Pacific Islands were the only regional groupings that witnessed a marginal decline in their average annual growth rates.

Figure 5: Average annual growth rates by region: 1991-2000 and 2000-2015



Source: Author based on World Development Indicators, World Bank

Figure 6 shows that growth rate dispersions declined in the 2000s within all developing regions with the only exceptions of South Asia (owing to exceptional growth in India) and CCA region. This could be due to greater regional integration through trade and FDI liberalisation.

Figure 6: Intra regional coefficient of variation in growth rates: 1990-2000 and 2001-2015

Source: Author based on World Development Indicators, World Bank

To sum up, the process of globalisation, which has its genesis in liberal policy reforms of the 1980s, did not bring about immediate gains in terms of growth. The process was accompanied by adjustment pains which dampened economic performance particularly that of lower-middle and low income countries in the initial phases. A turnaround occurred in the 2000s, which lifted the economic performance of most emerging countries, supporting my hypothesis. In what follows, I explore how this growth trend is linked with structural change in GDP and employment, and finally poverty.

Economic growth and Structural change in Value added

H2: Growth accelerations of the post 2000 period have been associated with accelerations in the process of structural change in sectoral value added shares

While addressing the first question I use the ‘Norm of Absolute Values’ (NAV) index of structural change (Dietrich 2012)²:

$$NAV_{s,t} = 0.5 * \sum |X_{it} - X_{is}|,$$

Where $X_{it} - X_{is}$ represents the differences in sectoral shares of GDP between two years s and t . The NAV indices are calculated for equally spaced two time periods of 15 years each: 1985-2000 and 2000-2015 for each of the ten developing regions using a 7-sector disaggregation of the aggregate value added: primary sector; manufacturing; mining and utilities; construction; trade, hotels and repairs; transport and communication; and other services. The analysis is based on the UNSTAT National Accounts data available from 1970 to 2015 in constant USD. The indices

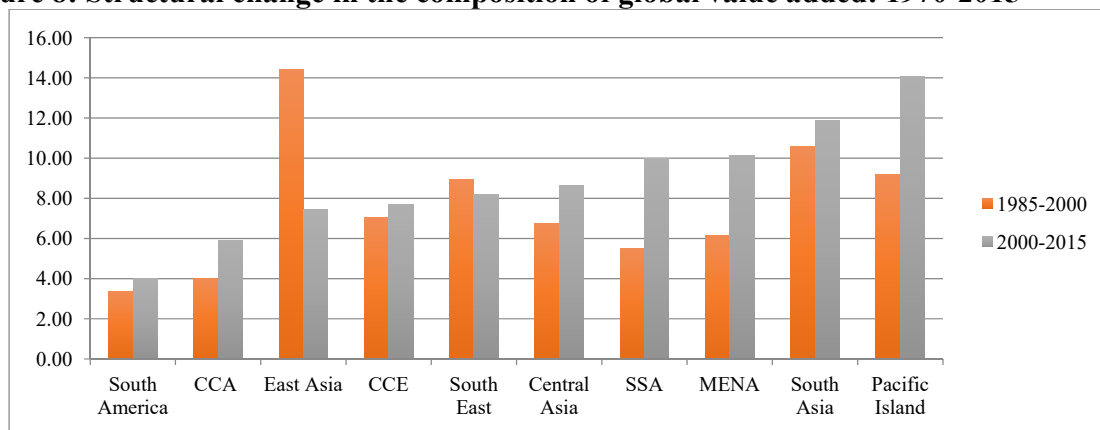
² The Modified Lilien index (MLI) is also used in the literature to measure structural change (Lilien, 1982). It is constructed as:

$$MLI = \sqrt{x_{it} \cdot x_{is} \left(\ln \frac{x_{it}}{x_{is}} \right)^2} \quad \text{where } x_{is} > 0 \text{ and } x_{it} > 0.$$

Both, MLI and NAV indices were found to be quite similar in their magnitudes and patterns, and hence I reported only the latter .

presented in Figure 8 reveal that the growth turnaround of the 2000s speeded up the process of structural transformation across all regions with the only exceptions of East and South East Asia which underwent tremendous structural change during 1985-1990 but slowed down since then.

Figure 8: Structural change in the composition of global value added: 1970-2015



Source: Based on UNSTAT <https://unstats.un.org/home/>

Notwithstanding a general acceleration in structural change there have been wide regional variations. Interestingly, the bottom three regions by average GDP per capita, namely, Sub-Saharan Africa, South Asia and Pacific Islands have accorded the most pronounced structural change in sectoral shares of GDP. While the former two also witnessed growth acceleration, the last one was not so successful. Countries in the MENA region also appear to have undergone an impressive structural transformation manifesting a growing importance of economic activities other than mining in the region. On the opposite side of the spectrum are relatively high-income regions of Latin America which exhibit the slowest structural change. These regions are also laggards in economic growth. The former Soviet Union countries of Central Asia and Central and Eastern Europe who had achieved a high level of industrialisation in terms of the share of industry in their GDP before 1990 in accordance with the massive state sponsored industrialisation programme under the Soviet rule seem to have experienced substantial structural change dynamism in recent years and are in the middle of the spectrum along with East and South East Asia.

H3: The structural change in sectoral value-added shares in the emerging economies in the post 2000 period does not conform to the historically observed patterns in today's advanced countries and does not follow any systematic pattern of structural change.

In order to examine this, I have investigated long term sectoral value-added shares over 1971-2015 by region and presented them in Figure 9. To maintain clarity in the figure, data is aggregated into four broad sectors: Agriculture and allied activities, manufacturing, mining and utilities, and services (including construction). It reveals apparent cross-regional differences in the patterns of structural change, in line with my hypothesis H1. For instance, the share of agriculture has declined in all regions in varying degrees but Sub Saharan Africa is an exception, where it has grown from 12% in 1985 to 16% in 2015. The share of manufacturing increased in East Asia, South Asia, South East Asia, MENA and CEE but eroded in the rest. Finally, a rise in the share of services appears to be a common feature across all regions but East Asia and CEE

countries seem to have defied that. The correlation coefficients between a dummy for the post 2000 period (D2000=1 if year>1999; =0 otherwise) and sectoral shares of GDP for each region over the period 1991-2015 presented in Table 1 support the observations based on the graphical presentation made above.

Table 1: Correlation coefficients depicting changes in the sectoral value added shares in the post 2000

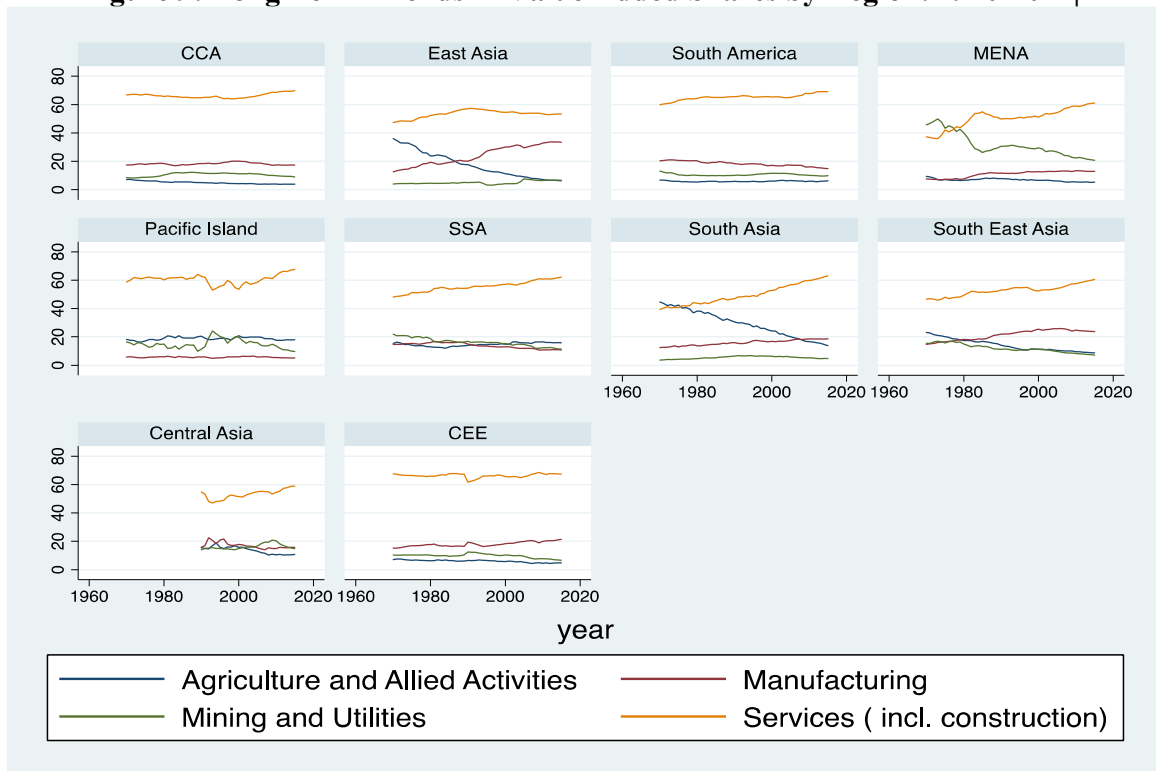
	Agriculture	Mining	Manufacturing	Construction	Services
CCA	-0.87	-0.65	-0.37	-0.48	0.67
South America	0.58	-0.04	-0.69	-0.27	0.58
MENA	-0.80	-0.76	0.81	0.53	0.78
SSA	0.82	-0.78	-0.79	0.62	0.77
Pacific Island	0.30	-0.60	0.27	0.73	0.21
East Asia	-0.74	0.70	0.82	-0.82	0.11
South Asia	-0.84	-0.77	0.69	0.81	0.83
South East Asia	-0.70	-0.64	0.71	-0.76	0.64
Central Asia	-0.73	0.58	-0.75	0.65	0.63
CEE	-0.81	-0.75	0.81	-0.50	0.56

Source: UNSTAT <https://unstats.un.org/home/>

H4: Globalisation is likely to promote economic specialisation, which may favour the expansion of non-tradable sectors at the cost of the tradable ones.

The third salient question related to the value-added shares of tradable and non-tradable sectors in the process of structural change requires splits of sectors into two groups, which may be difficult at a high level of aggregation of economic activity. However, since the sectors where the majority of the output faces international competition are tradable, agriculture, mining and manufacturing may be deemed as typically tradable sectors. Construction on the other hand is broadly a non-tradable sector. The service sector which is traditionally considered non-tradable is increasingly becoming tradable. Evidence from the US however indicates that the average service sector is less tradable than the average manufacturing sector and that there is considerable within-sector variation in estimated tradability of the sector (Gervais and Jensen 2012; Ariu 2012). It is thus a heterogenous sector with both tradable and non-tradable services. While interpreting Table 1 using this typology, it is observed that there is a tendency among emerging economies to get integrated globally and specialised in one of the three typically tradable sectors: agriculture, mining or manufacturing. While East Asia, South East Asia, South Asia, CEE and MENA regions have expanded manufacturing shares in their GDP, South America, Sub Saharan Africa and Central Asia tend to specialise in resource intensive sectors namely mining and/ or agriculture. Small island countries of CCA and Pacific region which have been at the bottom in terms of GDP per capita growth seem to be losing GDP shares across all typical tradable sectors.

Figure 9: Long Term Trends in Value Added Shares by Region: 1970-2014|



Source: UNSTAT <https://unstats.un.org/home/>

Theoretically, the fast growing specialised sector should generate income that initiates a cumulative causation process through intra and inter-sectoral linkages reinforcing its own growth, and at the same time lifting the performance of other (non-specialised) tradable sectors as well. But this is not the case here. The fast-growing tradable sectors in all these regions are accompanied by a decline in the share of the non-specialised tradable sectors. The specialised tradable sectors themselves have grown incrementally, except in East Asia where manufacturing has increased its share substantially. On the other hand, the shares of construction and/or services have tended to expand across all regions. Services may indeed be tradable but the possibility that these are non-tradable services that expanded in most cases cannot be ruled out. There are thus hints that the expansion in the specialised tradable sector has been accompanied by that in non-tradable sectors (H2). However, before drawing any conclusion from this analysis, further explorations are needed particularly into the labour market outcomes of these changes.

4. Structural composition of value Added and employment in a comparative framework.

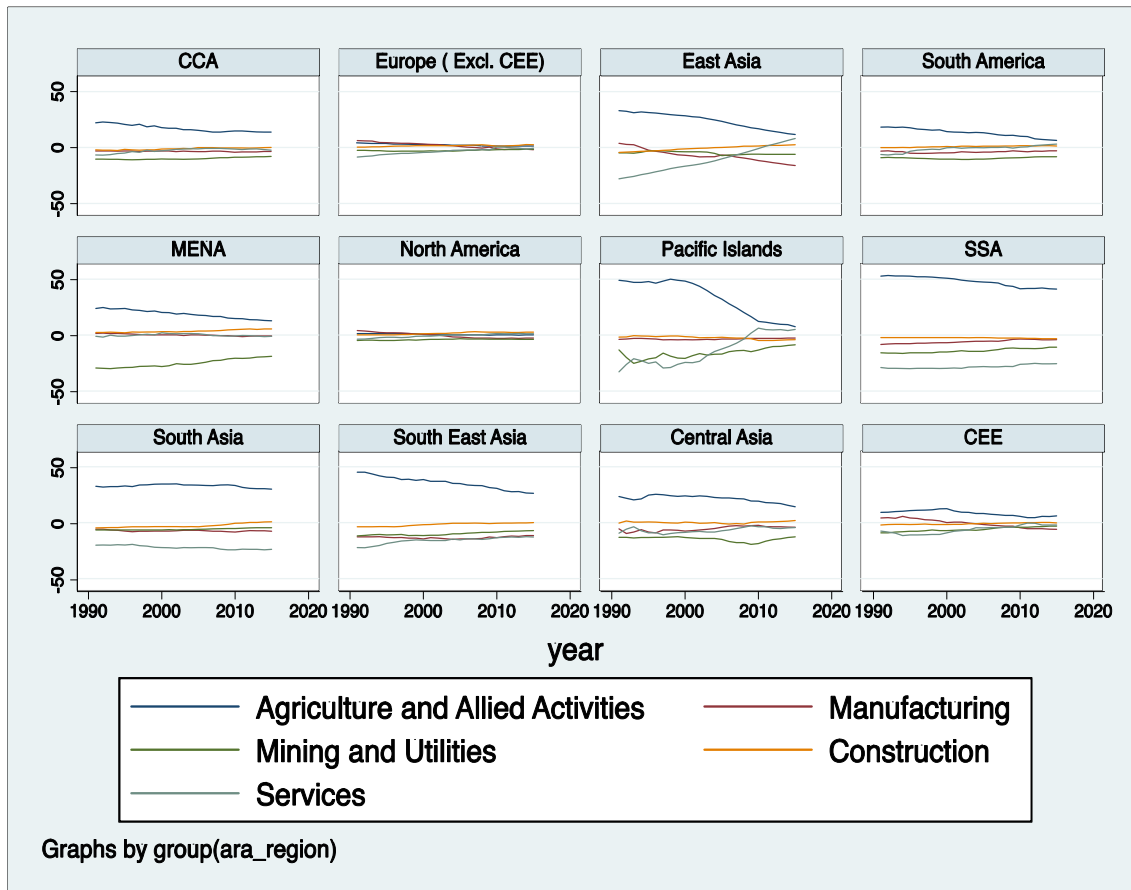
H5: Structural change in value added and employment may not commensurate with each other in emerging economies exerting ambiguous effects on cross-sector productivity dispersions.

This section explores whether the observed changes in value added shares have been associated with commensurate changes in employment shares to narrow the gap between the two (H3). The analysis will provide further insights on H2 as well. Figure 10 presents sectoral gaps between employment and value added shares for both the developed and developing regions during the post 1990 period, using a 5-sector classification of the economy, as used above. The vertical axis is: $Y_{ir}-X_{ir}$ where Y_{ir} represents employment share while X_{ir} is value added share in sector i in region r . A downward sloping curve depicts narrowing of the gap leading to productivity enhancing structural change and vice versa.

The graphs for two developed regions, namely North America and Western Europe confirm that the value added and employment shares tended to converge in the process of growth in the now developed countries. In 1991, the share-differentials were bound between $\pm 5\%$ in both these regions, which have further shrunk over time. It is seen that large employment shares were absorbed in manufacturing at the beginning of the period of globalisation with the service sector being relatively leaner and more productive. Over time, productivity in manufacturing rose reallocating labour towards services to bring convergence between the service and manufacturing sectors. Agriculture and mining also continued to be locked in a catch-up process.

It may be seen that there is a tendency of cross sector convergence between the shares of value added and employment in most developing regions as well. But there are cross regional ambiguities between the patterns of structural change in value added on the one hand, and convergence patterns and economic growth on the other. The regions which exhibit the most prominent structural change in value added shares, namely SSA, South Asia, MENA and Central Asia fail to accord commensurate changes in employment shares resulting in inconsequential convergence. There is no systematic relationship between economic growth and convergence either, in these regions. In contrast, East Asia, CEE and South East Asia have experienced a more dynamic convergence process, in varying degree though; and are successful growth performers. South America and CCA which have been laggards in economic growth and structural change in value added shares do not exhibit significant dynamism in the convergence process either. The 'Pacific islands' looks the most dynamic region in structural change in value added with a sharp convergence process. However, this does not reflect in their economic performance.

Figure 10: Value added and employment shares differentials by sector: 1990-2015



Source: UNSTAT and ILO data on employment

As a matter of fact, the mechanisms that have driven the growth-structural change relationship in developing regions are completely different from the cumulative causation process driven by manufacturing in the developed ones. Figure 10 shows that it is an outcome of the reallocation of labour from the typical tradable sectors towards construction and non-tradable services. Under the pressure of global competition and in the absence of domestic growth spillovers the former push labour instead of pulling it. Labour is therefore pulled in those non-tradable sectors where the elasticity of substitution between capital and labour is low. To explore how the final outcomes depend on the type of the trade specialised, non-specialised tradable and non-tradable sectors; and their initial productivity, I club the regions into three groups:

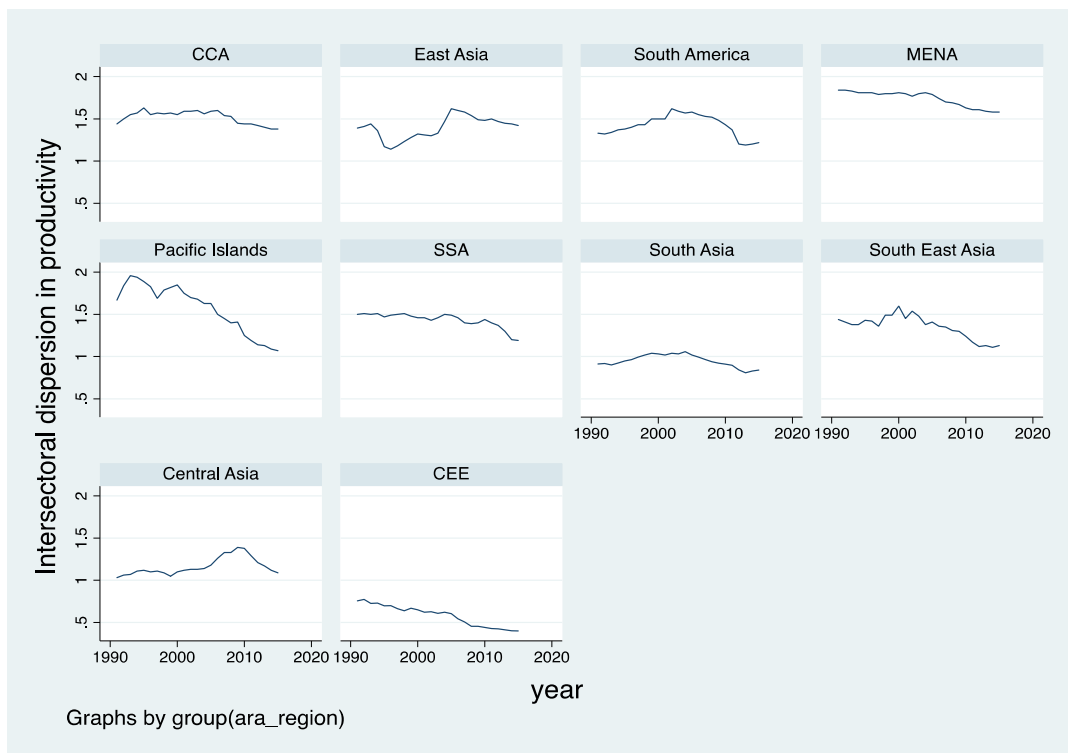
- *Regions with specialisation in resource intensive sectors:* It may be seen that the expansion in agriculture in SSA and mining in Central Asia did not trigger labour

movements across other sectors resulting in small convergence effects. In South America, there is an apparent reallocation of labour from agriculture (due to specialisation) to services with little dynamism in other sectors. However the initial productivity gap between agriculture and services is small which reduced the productivity enhancing potential of structural change, affecting its growth.

- *Regions with specialisation in manufacturing and services:* East Asia and CEE seem to successfully follow the conventional model of growth and structural change. But South East Asia, South Asia and MENA despite being able to expand manufacturing shares are not so successful in terms of economic growth reflecting rather slow dynamics in manufacturing growth. South Asia is an interesting case. Its integration into the global economy seems to be driven not so much by manufacturing as by tradable services due to its emergence as the IT power. This is the only region where the structural change in services is productivity enhancing. Thus both, the manufacturing and service sectors shed labour shares. Since large shares of labour are already stuck in agriculture, labour is being pushed into construction with little sectoral dynamism.
- *Regions with no apparent tendency of specialisation:* Pacific islands seem to be stuck in low productivity trap with labour shifting from low productivity agriculture to low productivity services and even mining. Despite large convergence effects, its potential to enhance growth and reduce poverty remains low. CCA does not show much dynamism in growth or structural change.

Figure 11 which plots coefficient of variations in inter-sectoral productivity levels confirms, in line with H3, that globalisation fostered uneven patterns of changes between value added and employment shares which have had differential effects on sectoral productivity growth complicating the relationship between structural change, growth and poverty reduction. It needs quantitative tools to assess the relationships.

Figure 11: Inter-sectoral dispersion in productivity



Source: UNSTAT and ILO data on employment

5. Poverty: relative and absolute

Trends in Poverty

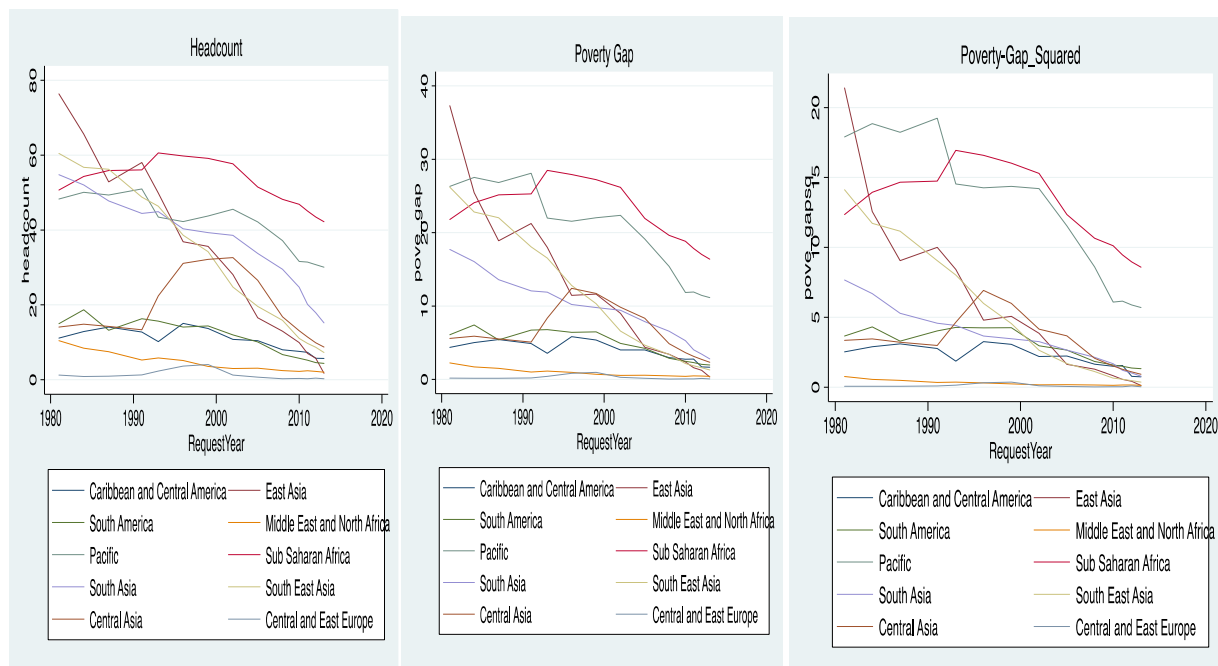
The analysis of how poverty and inequality changed over the past few years presented in this section is based on the recently published data on poverty by the World Bank on its poverty and equity data portal. The portal provides data on three measures of poverty: head count ratio, poverty gap and poverty gap squared, all in 2011 PPP terms. The headcount ratio is a measure of the incidence of poverty. It shows the percent of population below a pre specified poverty line. Poverty gap and poverty gap squared on the other hand are measures of the depth and the severity of poverty respectively. The former measures how far below the poverty line the poor in a given country or region is while the latter assigns a greater weight to those who fall far short of the poverty line rather than those that are closer. World Bank (2016) shows that the incidence of extreme poverty defined at USD 1.90 per day fell continuously from 35% in 1990 to 10.7% in 2013, lifting 1.13 billion people from below \$1.90 per day consumption. Not only that, the depth of poverty in terms of the number of poor living farther from the poverty line also declined from 808 to 234 million (574 million) with severity of poverty inching closer to the poverty-gap ratio.

Figure 12 which presents regional poverty patterns, shows that in 1980, regional differences in extreme poverty levels were very wide with the incidence of poverty in CEE being 2-3% as compared with 75% in East Asia. There was a clear divide between high poverty regions (East Asia, South East Asia, Sub Sahara, South Asia and Pacific Islands) with poverty ratios of above 40% and low poverty regions (CEE, Central Asia, CCA, South America and MENA) with those below 20%. East and South East Asia, two group 1 regions, achieved phenomenal success in

poverty reduction and converged with low poverty regions in the 2000s. Along with the incidence, East Asia and South East Asia managed to rapidly reduce the depth and severity of poverty also. South Asia also grew impressively but the poverty reduction process remained relatively slow.

The region is seen to be more successful in reducing depth and severity of poverty than its incidence. Pacific islands and SSA are laggards in poverty reduction despite large structural change. SSA witnessed a rise in extreme poverty in the 1980s and 1990s; there was some improvement in the 2000s but 40% of the population is still living in extreme poverty. Pacific countries which are often clubbed with East Asia do not seem to have much in common with the region. Their population constitutes 40% of the extreme poor despite massive productivity convergence. Poverty gap declined in Pacific and SSA but it still remains 10% or above. These regions also stand out for most pronounced severity of poverty while other regions tend to converge. In group 2, former USSR countries in particular those in Central Asia experienced a sharp increase in poverty in the 1990s following their disintegration with the USSR. But, the recovery started in the late 1990s. The CEE countries have not only recovered but also managed to reduce poverty ratios from the 1990 level while Central Asia still needs to get back to the old level. Latin American regions also managed to reduce poverty rates though slowly. In 1981, the poverty gaps in Latin America were relatively much smaller than those in Asian regions; by 2013, Latin America which could merely reduce it from 5 to around 2.5% closed gaps with Asia. These global patterns of poverty clearly hint at growth-enhancing structural transformation and poverty reduction linkages.

Figure 12 : Trends in poverty ratios by region: 1981 to 2013

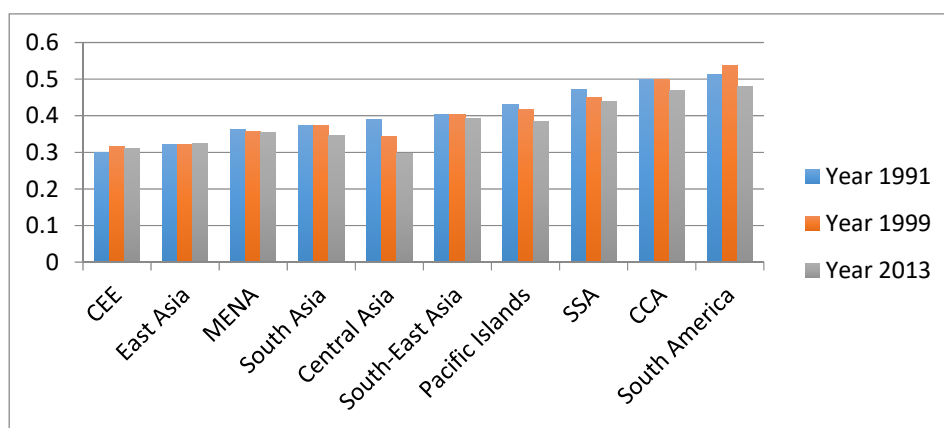


Source: povcalNet poverty data, World Bank

Trends in inequality

Figure 13 landscapes the patterns of the average Gini coefficient, a standard measure of income inequality that ranges from 0 (most equal) to 1 (most unequal), broken down by region for three years: 1987, 1999 and 2013 (Heshmanti 2004). It shows that the Gini coefficient, ranged from 0.3 in CEE countries to above 0.5 in South America in 1991. South America and CCA, regions rank at the top in terms of inequality. Inequality declined in these regions in the 2000s despite weak growth-structural change dynamics; the regions continue to have the distinction of being the most unequal region, though. The other regions with rather small productivity enhancing structural change: Sub Saharan Africa and Pacific Islands stand out as the third and fourth most unequal region. East Asia and CEE which follow the conventional model of growth are on the other side of the spectrum in inequality but it is noteworthy that while they exhibited sharp reduction in poverty they could not manage to reduce inequality. South, Central and South East Asia, and MENA regions have the Gini coefficient varying between 0.3 and 0.4 which is ambiguously related with their growth and structural change dynamics. Central Asia is an interesting case. Despite the fact that the region specialised in mining with not so pronounced decline in poverty, inequality seems to have declined rather prominently in the region. Overall, unlike poverty, inequality patterns seem to be rather ambiguous.

Figure 13 : Gini coefficient for selected years by region: 1987-2013



Source: World Income Inequality Data, UNU Wider

6. Poverty reduction, growth and structural change interrelationship: A quantitative Analysis

The above analysis shows that there is considerable heterogeneity across developing regions in terms of the growth, structural transformation and poverty reduction dynamics. In this section, I analyse interlinkages between these three processes. Since the regional data masks enormous inter-country variations in the development trajectory that different countries have traversed and the institutional contexts in which they are embedded, I use country level data for the analysis. I

pieced together different databases that I used for the analysis of growth, structural change and poverty reduction. Different databases have different coverage in terms of time span and countries. Merging them into a single panel data yielded the data for 147 countries across all regions for 11 years between 1991 and 2013. Of the 147 countries, 126 are developing countries. There is a systematic gap of 2 years between two data points until 2010 after which the data availability is continuous. Since the analysis focuses on the post 2000 period, the final database comprises of panels of 126 developing countries for 7 years each over 2002-2013. To estimate the linkages between growth, structural change and poverty, I focus on the impact of growth enhancing structural change on poverty and draw on the literature to specify the following model:

Poverty/Inequality=f(Income level, economic structuring, government distributional policies)

Since it is panel data, I control for the effects of unobservable time invariant country specific factors (*which cover* geography, natural resource availability, history etc.) and year specific factors(economic, political or international factors). Thus the following specification was identified for estimation:

$$Y_{it} = \alpha_0 + \lambda X_{it} + \lambda S_{it} + \lambda TP_{it} + Tr + T_t + C_i + \varepsilon_{it} \dots \dots (\text{Eq. 1})$$

Where

- Y_{it} represents poverty and inequality ratios in a given country at time t. Poverty is measured by head count ratio, poverty gap and poverty gap squared measures. For inequality, I use two measures: the Gini coefficient and a ratio of the income shares of top three to bottom three deciles called **decile ratio**.
- X_{it} is the log of GDP per capita income and is expected to be negatively related with poverty and inequality ratios.
- S is an index representing growth enhancing structural change . Since the structural index variable is one of the novel features of the study, it owes the reader explanation. This is an inverse of the sum of absolute values of the dispersion between sectoral value added and employment shares i.e.

$$S = -\sum \text{abs}(Y_{it} - X_{it})$$

Where Y_{it} : employment share for i sector in year t; X_{it} is the corresponding value added share. It is expected to be negatively related with poverty and inequality. Higher the magnitude of the index, smaller is the dispersion between the value added and employment shares and hence smaller should be poverty and inequality ratio. I call it ‘convergent structural change’. In addition to this variable, I have also used manufacturing and services shares in employment as structural variables, both of which are expected to be negatively related with poverty and inequality.

- TP stands for transfer payments. It is a proxy for the distributional policies of the government and is measured by the share of transfer payments in GDP. It is also expected to affect poverty and inequality negatively.
- Tr : This is a trend variable

- C_i represents country specific time invariant effects while T_t captures time varying effects

The variables used in equation 1 pose the issue of endogeneity that arises due to simultaneity between poverty/ inequality measures on the one hand, and GDP per capita, on the other. For instance, while I explain the effect of GDP per capita on poverty (Lopez and Servén, 2006) and inequality (Kuznets 1955) many others focus on the impact of poverty and inequality on GDP per capita growth (Persson and Tabellini 1994, Alesina and Rodrik, 1994; Castello-Climent, 2010; Naguib, 2017). To address the problem, I apply the Generalized Method of Moments developed by Arellano and Bond (1991). The GMM estimator computes the first-differences of each variable, eliminates country-specific effects, and uses deeper lags of the dependent variable as instruments for differenced lags of the dependent variables. Thus Equation 1 can be written as:

$$\Delta Y_{it} = \alpha_0 + \lambda \Delta X_{it} + \lambda \Delta S_{it} + \lambda \Delta TP_{it} + T_t + Tr + \varepsilon_{it} \dots \dots \text{(Eq. 2)}$$

Absolute poverty

For the poverty analysis, I first run panel data based 2SLS estimations with all variables in first difference. Income per capita in the base year has been used as instrument for the economic growth variable. This I follow by Arellano-Bond (AB) dynamic panel-data estimation of equation 1 (Eq. 2). The upshot is that I use alternative measures of poverty and structural change, and alternative estimators: 2SLS and AB for robustness check of the results. The results for absolute poverty are presented in Tables 2-3.

The 2SLS results presented in Table 2 confirm a negative relationship between convergent (growth enhancing) structural change and poverty reduction across all measures of poverty. Interestingly, structural change becomes progressively significant with the intensity of poverty. It is more effective in addressing the depth and severity of poverty as compared with the incidence. This could be because it is associated with reallocating labour stuck in extremely low productivity jobs (in agriculture) to relatively higher productivity ones (services and construction). The high productivity sectors may be pushing labour away. The results presented in col. 2,4 and 6 with alternative measures of structural change namely, changes in the employment shares of manufacturing and services show that it is the expansion in services that has poverty reducing effect. The effect of manufacturing shares on poverty is found to be insignificant. These results are not surprising. As seen above, productivity convergence is essentially driven by reallocation of labour from agriculture towards services and construction which enjoy relatively higher productivity. The manufacturing sector is relatively less relevant in the process. It does not however mean that manufacturing has become less relevant (Szirmai and Verspagen, 2015; Szirmai et al. 2013, Szirmai 2012). What it reflects is that the local spillovers of manufacturing are dampened due to weak intra and inter sectoral connectedness affecting its growth dynamics. Yet, it cannot be overlooked that the regions namely East Asia, South East Asia, and CEE, which specialised in manufacturing have experienced the most rapid decline in poverty. MENA region, where manufacturing shares grew rapidly, also seems to have benefitted in terms of poverty reduction. South Asia is an exception where despite an increasing share of manufacturing in GDP, structural change and, in turn, poverty reduction did not show much dynamism. Apparently, increasing manufacturing share alone is not sufficient for poverty

reduction in the globalised regime. On the other hand, service sector expansion turns out to be a significant poverty reducing factor. It is because services have replaced manufacturing as an adjustment mechanism to bring about convergent structural change. But labour reallocation to services may pull down its productivity to converge it with that of agriculture. In South Asia where the service sector is a specialised tradable sector, it pushes labour away and may not be conducive to poverty reduction.

After controlling the effect of growth enhancing structural change, growth in income per capita continues to exert a negative effect on poverty across all specifications of poverty. This effect is statistically significant at 1% in all cases. The result is as expected. It confirms that growth is a critical driver of poverty reduction (see, Fosu, 2017). It may however be noticed that the average incremental relationship between poverty and economic growth becomes weaker with the intensity of poverty. Growth in GDP per capita appears to be more effective in reducing the incidence of poverty than its depth; and the latter is more effectively addressed by growth than severity of poverty. Apparently, growth with desirable structural change is critical to address the depth and breadth of poverty. Furthermore, contrary to the expectations, government transfer payments do not seem to have significant poverty reducing effects. In none of the models does it turn significant. Finally, the trend variable turns out to be significant at 5% in the models for severity of poverty indicating that if there had been no growth and structural change, severity of poverty would have increased.

Table 2: Absolute poverty Growth and Structural Change: 2SLS Panel data estimations

	Change in headcount ratio		Change in poverty gap		Change in poverty gap squared	
	(1)	(2)	(3)	(4)	(5)	(6)
Convergent structural change	-3.00E-04		-2.40E-04*		-1.90E-04*	
	(-1.18)		(-1.66)		(-1.89)	
Growth in GDP, per capita	-0.241***	-0.233***	-0.109***	-0.103***	-0.0565***	-0.0526***
	(-7.97)	(-7.61)	(-6.44)	(-6.03)	(-4.64)	(-4.25)
Change in transfer payment share	1.07E-04	1.10E-04	1.09E-04	1.24E-04	9.09E-05	1.07E-04
	(0.42)	(0.43)	(0.77)	(0.87)	(0.89)	(1.04)
Change in manuf. employment share		-0.000798		-0.000101		0.000105
		(-0.65)		(-0.15)		(0.21)
Change in service employment share		-0.0011		-0.0007**		-0.0005*
		(-1.78)		(-2.06)		(-1.97)
Trend	-.0000446	-.000101	.0003667	.0003393	.0004627**	0004506*
	(-.09)	(-.84)	(1.34)	(1.25)	(2.35)	(2.29)
Constant	-0.000347	0.000358	-0.00326	-0.00286	-.0186325	-.0180313
	(-0.08)	(0.08)	(-1.32)	(-1.17)	(-2.48)	(-2.41)
<i>N</i>	664	664	664	664	664	664
<i>Time Effects</i>	Yes	Yes	Yes	Yes	Yes	Yes

Source: Estimations by the author

Table 3 presents Arellano-Bond GMM estimators. The results from the one-step difference GMM estimator with three years lags are reported. All GMM regressions use robust standard

errors. The Sargan test reject the null hypothesis that the equations are overidentified. It may be seen that the AB results confirm the results obtained by 2SLS *albeit* with lower levels of significance. The results of the key variables presented above are thus robust to the statistical technique.

Table 3: Absolute poverty Growth and Structural Change: Arellano Bond estimations

	Change in headcount ratio		Change in poverty gap		Change in poverty gap squared	
	(1)	(2)	(3)		(1)	(2)
Growth in GDP, per capita	-0.129***	-0.122***	-0.0611**	-0.0573**	-0.0305	-0.0281
	(-4.16)	(-3.90)	(-2.85)	(-2.58)	(-1.77)	(-1.61)
Convergent structural change	-0.00021*		-0.00040*		-0.00034*	
	(0.51)		(1.79)		(1.67)	
Change in transfer payment share	0.000178	0.000128	0.0000330	0.0000451	-0.0000354	-0.0000209
	(0.71)	(0.48)	(0.15)	(0.20)	(-0.18)	(-0.11)
Trend	0.00616***	0.00693***	0.00345*	0.00364**	0.00190*	0.00192*
	(3.54)	(3.53)	(2.53)	(2.66)	(1.73)	(1.69)
Change in manuf. employment share		0.000448		0.000247		-0.0000508
		(0.41)		(0.31)		(-0.08)
Change in service employment share		-0.00123		-0.000826*		-0.000583
		(-1.41)		(-1.85)		(-1.52)
Constant	-10.85***	-12.36***	-6.199*	-6.545***	-3.438*	-3.456*
	(-3.41)	(-3.39)	(-2.48)	(-2.62)	(-1.72)	(-1.66)
<i>N</i>	661	661	661	661	661	661
<i>SAGRAN Test</i>	92.5***	93.3***	117.2*	119.7***	175.6***	180.9***

Source: Estimations by the author

Inequality

Following Kuznets (1955), the relationship between inequality and growth has been subject to intense debate in the existing literature (Binatli 2012, Naguib, 2017; Molero-Simarro, 2017, World Bank, 2016 for recent surveys). The findings are ambiguous. I employ here both, the 2SLS and Arellano-Bond GMM estimation techniques to estimate equation (1) using two measures of inequality: the Gini coefficient and a decile ratio. While the former represents the average incidence of inequality, the latter is an indicator of the ‘severity of inequality’. There was a problem of missing data in the context of the indicators of inequality which I dealt by imputing values based on the existing data. Further, the 2SLS results at first difference (eq. 2) broke down due to small variations in the dependent variable. I have therefore estimated eq. 1 at level after controlling for the effects of lagged variables, time and trend. The results presented in Table 4 show that the relationship between the Gini and GDP per capita is rather ambiguous. But, there are traces of a positive relationship between the decile-ratio (severity of inequality) and income levels. The relationship even turns significant in AB estimations indicating that increases in GDP per capita may exacerbate inequality between the top and bottom deciles. However the results are not robust. Structural change on the other hand seems to have a significant negative impact on the incidence of inequality at 1% in the AB estimations with no

apparent impact on its severity (decile ratio). It may be seen that manufacturing and service employment shares have a negative relationship with the Gini but it is the increase in service shares that has a significant equalising effect; manufacturing shares do not turn out to be significant. However, the decile ratio is not significantly affected by the sectoral shares. The transfer payment variable is significant in all columns with a negative sign confirming the hypothesis that government interventions through distributional policies such as taxes and transfers are relevant in addressing inequality. According to a World Bank study (World Bank, 2016), for instance, Brazil's flagship conditional cash transfer (CCT) programme, has had a considerable equalising impact and alone explains between 10 percent and 15 percent of the reduction in income inequality observed in the 2000s. Other countries are also found to have been benefitted by such targeted transfers. Finally, in contrast to poverty, inequality shows a tendency to move downwards over time after controlling the effects of growth, structural change and distribution. It turns significant only in AB estimations.

Table 4: Inequality, Structural Change and Growth: 2 SLS and Arellano Bond estimations

	Gini				Decile-Ratio			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	2SLS		AB		2SLS		AB	
GDP per capita income	-0.00781 (-1.07)	-0.00765 (-1.03)	-0.00194 (-0.11)	0.0316 (1.47)	0.126 (0.73)	0.140 (0.80)	0.678* (1.84)	0.516 (1.50)
Structural index	-0.00015* (-1.83)		-0.00055** (-3.25)		-0.00113 (-0.61)		-0.000628 (0.18)	
Transfer payments to GDP ratio	- 0.000144* (-1.72)	- 0.000136* (-1.62)	- 0.000155* (-1.63)	- 0.000219* (-1.95)	-0.00107 (-0.55)	-0.00110 (-0.56)	-0.00338* (-1.76)	-0.00390* (-2.05)
Trend	-0.000205 (-0.70)	-0.000255 (-0.85)	-0.000305 (-0.30)	-0.00225 (-1.66)	-0.00885 (-1.25)	-0.00752 (-1.05)	-0.0491* (-2.11)	-0.0470* (-2.12)
Manufacturing share in employment		-0.000351 (-0.90)		-0.00111 (-1.08)		0.00406 (0.46)		0.00694 (0.56)
Service share in employment		-0.000141 (-0.78)		-0.00154* (-2.29)		-0.00384 (-0.93)		0.00732 (0.88)
Constant	0.266*** (4.39)	0.283*** (4.68)	0.793 (0.43)	4.524 (1.81)	-0.275 (-0.20)	-0.259 (-0.19)	90.08* (2.13)	87.08* (2.14)
N	648	648	642	642	588	588	581	581
Country fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Estimations by the author

7. Conclusion and Policy implications

The above analysis suggests that productivity enhancing convergent structural change associated with growth has had a positive impact on all dimension of poverty and inequality reduction. However, the challenge is how to trigger and then sustain this process. The mechanisms underlying this process in developing countries are very different from those in the currently developed countries. In developed countries, a rapid increase in the share of manufacturing with a decline in that of agriculture played a key role in catapulting the economy onto a higher growth path. Their long-term growth rates depended on their specialisation in sectors with high degrees

of increasing returns and high income elasticity of demand. The growth process was circular, cumulative and causative led by continuous upgrading and technological changes with manufacturing at its core, which in turn was driven by sectoral demand spillovers and technological interdependence and complementarities that characterised the economic system. In contrast, in developing countries, it is essentially an outcome of the asymmetric changes in the relative sectoral value added and employment shares across tradable and non-tradable sectors. Growth of the most dynamic high productivity trade specialised sector itself is driven by global demand stimulus with inter- and intra-sectoral linkages distorted in favour of the growth of non-tradable sectors. The micro foundations of the process are weak and unsustainable. There is a possibility that growth may not be accompanied by growth enhancing structural change depending on the trade specialised sector and the initial levels of productivity of various sectors as in SSA, Central Asia, Latin America or even South Asia. Even if there is convergent structural change, it may not be sustained in the long run. It is observed that in most cases it operates by pulling down the productivity of services to converge it with that of agriculture. There is thus no in-built inter-sectoral productivity growth dynamism in the system. This calls for government intervention. There is no doubt that global integration has offered more opportunities than ever for growth and prosperity of developing countries. However, leveraging these opportunities requires strong national response. A broad-based national development strategy and supporting economic policies to implement it are critical. Policy makers need to identify the right strategy to ensure widespread spillovers from the fast growing sectors, envision successfully the challenges in implementing this strategy, and design appropriate implementation policies to pre-empt them. Further, as discussed above, manufacturing is the lynchpin of growth, structural change and poverty linkages. A well-defined manufacturing strategy with a focus on upgrading the existing industrial structure needs to be a critical component of this broader development strategy. It must be grounded in a comprehensive understanding of the critical enablers for manufacturers such as, investing in modern infrastructure; building skill, knowledge and technological capability; and strengthening supporting institutions. It is this policy intervention that differentiates the experience of East Asia from that of South East Asia. Finally, agriculture is getting ignored as a low productivity sector in this narrative of productivity enhancing structural change. This policy bias is to be addressed to sustain the growth of other sectors and accelerate the process of structural change with growth.

In a nutshell, the shift of labour towards modern tradable sectors in particular those intensive in knowledge and technology may be the key to growth and poverty reduction. But the desirable kind of structural change, like this, is not an automatic process and cannot be driven by market mechanisms in the contemporary world. Here the government role becomes important. Thus, appropriate state interventions based on their own economic attributes are critical for a sustainable process of structural transformation and poverty reduction.

REFERENCES

Acemoglu D. *Simon Johnson and James Robinson* (2005) Institutions as a Fundamental Cause of Long-Run Growth Chapter 06 in *Handbook of Economic Growth*, 2005, vol. 1, Part A, pp 385-472

Aggarwal A. (2018) Economic Growth, Structural Change and Productive Employment Linkages in India: Did Market Transition Matter? *South Asia Economic Journal*. 19, 1, p. 64-85 22 p.

Aggarwal A. and N. Kumar (2015) Structural Change, Industrialization and Poverty Reduction: The Case of India in *Structural Change and Industrial Development in the BRICS*. Naudé, W., Szirmai, A. & Haraguchi, N. (eds.). Oxford: Oxford University Press, p. 199-243

Alesina A. and Dani Rodrik (1994) Distributive Politics and Economic Growth *The Quarterly Journal of Economics* Vol. 109, No. 2 (May, 1994), pp. 465-490

Alvarez-Cuadrado, Francisco, Ngo Van Long, and Markus Poschke (2011), "Structural change out of agri- culture: Labor push versus labour pull." *American Economic Journal: Macroeconomics*, 3, 127–158. [1230]

Alvarez-Cuadrado, Francisco, Ngo Van Long, and Markus Poschke (2017), *Capital-Labor Substitution, Structural Change and Growth*. *Theoretical Economics* 12 (2017), 1229–1266

Angelsen A. and Sven W. (2006); Poverty and inequality: economic growth is better than its reputation Chapter in Dan Banik (ed.): *Poverty, Politics and Development: Interdisciplinary Perspectives*.

Arellano, M. and Bond, S. (1991). "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations". *Review of Economic Studies*. 58 (2): 277-297. [doi:10.2307/2297968](https://doi.org/10.2307/2297968).

Ariu A. (2012) "Services Versus Goods Trade: Are They the Same?" CEPR Discussion Paper 9036.

Bhalla S. (2002) *Imagine There's No Country: Poverty Inequality and Growth in the Era of Globalisation*, Peterson Institute for International Economics (September 1, 2002)

Bigsten, Arne & Levin, Jorgen, 2004. "Growth, Income Distribution, and Poverty: A Review,in *Growth, Inequality, and Poverty: Prospects for Pro-poor Economic Development* Anthony Shorrocks and Rolph van der Hoeven Oxford University Press

Binatli A.O. 2012, *Growth and Income Inequality: A Comparative Analysis* Economics Research International Volume 2012, Article ID 569890, 7 pages

Bourguignon, F. (2004) *The Poverty-Growth-Inequality Triangle*, paper presented at Indian Council for Research on International Economic Relations, New Delhi, 1-30.

Castello-Climent A.(2010) Inequality and growth in advanced economies: an empirical investigation, *The Journal of Economic Inequality*, 2010, vol. 8, issue 3, 293-321

Chatterjee, S.. 1995. *Growth, Structural Change and Optimal Poverty Interventions*. © Asian Development Bank. <http://hdl.handle.net/11540/3164>. License: CC BY 3.0 IGO.

Chenery, Robinson, and Syrquin, (1986). *Industrialization and Growth: A Comparative Study*. A World Bank Research Publication. New York: Oxford University Press.

Christiaensen L. & Kaminski Jonathan, 2016. "Structural change, economic growth and poverty reduction – Micro-evidence from Uganda," Working Paper Series 2322, African Development Bank.

Clark, C., *The Conditions of Economic Progress*. McMillan & Co.s London, 1940.

Cook, S. (2006). Structural change, growth and poverty reduction in Asia: Pathways to inclusive development. *Development Policy Review*, 24(s1), s51–80.

De Vries, de G, A.A. Erumban, M.P. Timmer, I. Voskoboynikov and H. Wu (2012), "Deconstructing the BRICs: Structural Transformation and Aggregate Productivity Growth", *Journal of Comparative Economics*, 40(2), pp. 211–227.

Diamond, J. (1997). *Guns, Germs, and Steel*. New York: Norton.

Dietrich, A. (2012) Does growth cause structural change, or is it the other way around? A dynamic panel data analysis for seven OECD countries, *Empirical Economics*, 43(3) pp 915–944

Dollar, D., A. Kraay (2002) "Growth Is Good for the Poor", *Journal of Economic Growth*, 7(3), pp. 195-225.

Dollar D., T. Kleineberg, and A. Kraay (2014) Growth, Inequality, and Social Welfare: Cross-Country Evidence Policy Research working paper ; no. WPS 6842; World Bank.

Eicher, Theo S. & Garcia-Penalosa, Cecilia, 2001. "Inequality and growth: the dual role of human capital in development," *Journal of Development Economics*, 66(1), 173-197,
3

Fagerberg, J. (2000). Technological Progress, Structural Change and Productivity Growth: A Comparative Study Structural Change and Economic Dynamics, Volume 11, Issue 4, Pages 393-411

Fantom N. and U. Serajuddin, (2016) e World Bank's Classification of Countries by Income Policy Research Working Paper 7528, World Bank Working paper series,

Fisher, A.G.B. (1939) "Primary, Secondary and Tertiary Production," *Economic Record* 15, June 1939, 24–38.

Fosu, A.K. (2017). "Growth, inequality, and poverty reduction in developing countries: Recent global evidence," *Research in Economics*, Elsevier, vol. 71(2), pages 306-336.

Gabardo F.A., Pereima, J.B. and Einlof P, (2017) The incorporation of structural change into growth theory: A historical appraisal, *Economia*, 18(3): 392-410

Gervais A. and Jensen J.B. (2013) Are services tradable? Evidence from US Micro data, NBER paper

Hasan, R.; Lamba, S., Gupta, A. Sen. (2013) *Growth, Structural Change, and Poverty Reduction: Evidence from India*. © Asian Development Bank. <http://hdl.handle.net/11540/2060>. License: CC BY 3.0 IGO.

Hartwig, J. (2012) Testing the growth effects of structural change. *Structural Change and Economic Dynamics*, 23(1), 11-24

- Heshmati A. (2004). "The World Distribution of Income and Income Inequality: A Review of the Economics Literature." *Journal of World Systems Research*, 12 (1), 61-107.
- Kaldor, N. 1966. *Causes of the slow rate of economic growth in the United Kingdom*. Cambridge: Cambridge University Press.
- Kaniovski S. and M. Peneder (2002) On the structural dimension of competitive strategy *Industrial and Corporate Change*, 2002, 11(3), 557-579
- Kappel, Lay and Steiner (2005) Uganda: No More Pro-poor Growth? *Development policy review* 23 (1), 27-53,
- Kim K., Sumner A. and Arief Anshory Yusuf (2017) How inclusive is structural change? the case of Indonesia, ESRC/ GPID Research Network Working Paper 3, UK
- Krüger J.J. (2008) Productivity and structural change: a review of the literature *J. Econ. Surv.*, 22 (2008), pp. 330-363,
- Kuznets, S. (1955) "Economic Growth and Income Inequality". *The American Economic Review*, Vol. 45, No. 1 (Mar), pp. 1-28.
- Kuznets, Simon (1966), *Modern Economic Growth: Rate, Structure and Spread*, New Haven: Yale University Press.
- Lavopa, A. and A. Szirmai (2012) "Industrialization, employment and poverty". UNU-MERIT Working Paper Series, #2012-081.
- Lewis W.A. (1954) Economic development with unlimited supplies of labour *Manch. School*, 22 , 139-191,
- Lilien, D.M. (1982), "Sectoral Shifts and Cyclical Unemployment", *Journal of Political Economy*, vol. 90, pp. 777-793.
- Lipton, M. & M. Ravallion (1995) "Poverty and policy," *Handbook of Development Economics*, in: Hollis Chenery & T.N. Srinivasan (ed.), *Handbook of Development Economics*, edition 1, volume 3, chapter 41, pages 2551-2657 Elsevier.
- Lopez, H. & Serven, L. (2006) "A normal relationship ? Poverty, growth, and inequality," *Policy Research Working Paper Series 3814*, The World Bank.
- Machlup, F. (1991) *Economic Semantics*, 2nd ed. Transaction Pub.
- McMillan M, D. Rodrik and I. Verduzgo Gallo (2014) *Globalisation, Structural Change, and Productivity Growth, with an Update on Africa World Development* Vol. 63, pp. 11–32, 2014
- Melamed M. (2011) Does development give poor people what they want? Background Note, Overseas Development Institute, February 2011

Molero-Simarro R., 2017, Growth and inequality revisited: the role of primary distribution of income. A new approach for understanding today's economic and social crises *Cambridge Journal of Economics*, Volume 41, Issue 2, 1 March 2017, Pages 367–390,

Naguib, C. 2017 The Relationship between Inequality and Growth: Evidence from new data, *Swiss Journal of Economics and Statistics (SJES)*, 2017, vol. 153, issue III, 183-225

Ngai and Pissarides, (2007). "Trends in Hours and Economic Growth," IZA Discussion Papers 2540, Institute for the Study of Labor (IZA).

North, D. (1990), *Institutions, Institutional Change and Economic Performance*, Cambridge: Cambridge University Press.

Nurkse, R. (1953) *Problems of Capital Formation in Underdeveloped Countries*. New York: Oxford University Press.

Pasinetti L.L. (1981) *Structural Change and Economic Growth* Cambridge University Press, Cambridge (1981)

Persson T. and G. Tabellini 1994, Is Inequality Harmful for Growth? *American Economic Review*, 1994, vol. 84, issue 3, 600-621

Pieper U. (2000) Deindustrialization and the social and economic sustainability Nexus in developing countries: cross-country evidence on productivity and employment, *J. Dev. Stud.*, 36 (4) (2000), pp. 66-99

Ravallion, M. (2001): "Growth, Inequality and Poverty: Looking Beyond Averages", *World Development*, 29(11), pp. 1803-1815.

Ravallion, M. (1995). Growth and poverty: evidence for developing countries in the 1980s. *Economics Letters*, 48, 411-417.

Romer, P. (1994) New goods, old theory, and the welfare costs of trade restrictions, *Journal of Development Economics*, 43(1), pp. 5-38,

Roncolato L. and D. Kucera (2014) Structural drivers of productivity and employment growth: a decomposition analysis for 81 countries, *Camb. J. Econ.*, 38 (2014), pp. 399-42

Rostow, W.W. (1960) *The Stages of Economic Growth* (London: Cambridge University Press, 1960)

Sachs, J. D., and A. Warner (2001). The Curse of Natural Resources. *European Economic Review*, 2001.

Sachs, J. D., (2012) From Millennium Development Goals to Sustainable Development Goals, *The Lancet*, 379 (9832), 2206-2211, JUNE 09, 2012

Samimi P, Jenatabadi HS (2014) Globalisation and Economic Growth: Empirical Evidence on the Role of Complementarities. *PLoS ONE* 9(4): e87824. <https://doi.org/10.1371/journal.pone.0087824>

Silva E. G. and A.C. Teixeira, 2008, "Surveying structural change: Seminal contributions and a bibliometric account," *Structural Change and Economic Dynamics* 19.

Škare M.& Druzeta R.P (2016) Poverty and economic growth: a review, *Technological and Economic Development of Economy*, Volume 22, 2016 - Issue 1

Solow R.M. (1956) A Contribution to the Theory of Economic Growth, *The Quarterly Journal of Economics*, 70 (1), 65- 94.

Storm, S. (2015) *Structural Change, Development Change* 46(4), 666-6699

Szirmai A. and Verspagen B. (2015) Manufacturing and economic growth in developing countries, 1950–2005 *Structural Change and Economic Dynamics* 34, 46-59

Szirmai, A. (2012). 'Industrialization as an Engine of Growth in Developing Countries, 1950- 2005', *Structural Change and Economic Dynamics*, , 23 (4), December 2012, pp. 406-20, <http://www.sciencedirect.com/science/article/pii/S0954349X1100018X>

Szirmai, A., Naudé, W.A. and Alcorta, L. eds. (2013). *Pathways to Industrialization in the 21st Century*. Oxford: Oxford University Press.

Tello, M.D. (2015) Poverty, growth, structural change and social inclusion programs: A regional analysis of Peru *Regional and Sectoral Economic Studies*, 52 (2), 59-7

Thomas, V., M. Aailami, A. Dhareshwar, D. Kaufmann, N. Kishor, R. López, and Y. Wang (2000) *The quality of growth*. Washington, D.C.: World Bank.

Timmer, M.P (2007) *The Structural Transformation and the Changing Role of Agriculture in Economic Development: Empirics and Implications* Wendt Lecture, October 30, 2007 American Enterprise Institute Washington, DC

Timmer, M.P. and A. Szirmai, (2000). "Productivity growth in Asian manufacturing: the structural bonus hypothesis examined," *Structural Change and Economic Dynamics*, Elsevier, vol. 11(4), pages 371-392, December

Timmer, M.P. and G.J. de Vries (2009), "Structural change and growth accelerations in Asia and Latin America: a new sectoral data set", *Cliometrica*, 3(2) pp. 165-190.

Üngör M. (2014) *Productivity Growth and Labor Reallocation: Latin America versus East Asia*

Vu. K.M. (2017) *Structural change and economic growth: Empirical evidence and policy insights from Asian economies*

Williams, D.R. (1991) *Structural Change and the Aggregate Poverty Rate*, *Demography*, 28(2), 323–332

World Bank (2016) *Taking on Inequality , Poverty and Shared Prosperity*, 2016, The World Bank, Washington

Yilmaz G. (2016) Labor productivity in the middle income trap and the graduated countries, Central Bank Review, Volume 16, Issue 2, June 2016, Pages 73-83

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