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DEINDUSTRIALIZATION IN THE GLOBALIZATION ERA

Examining the Relationship between Globalization and Industrialization in Developing Economies

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Abstract:
Industrialization has been the key engine for economic growth in the developed world, and currently these economies are substituting away from manufacturing towards services. The alarming trend is that developing countries are doing so as well to an even greater extent and at a lower level of GDP and development. This phenomenon of deindustrialization is premature for developing economies as they have never reached full industrialization in the first place and can be harmful to their economic growth prospects. Examining the underlying causes of this novel concept sheds light into the black box of deindustrialization and generates insights that can benefit policy makers. The economic impact of globalization is often debated and in theory is predicted to have a positive relationship with industrialization. However, some empirical evidence and other researchers argue that this might not be the case. This paper revisits the debate on the relationship between globalization and industrialization and examines if it differs for developed and developing economies. Using a sample of 32 developing and 8 developed countries spanning a time period from 1960 – 2010 it finds a positive relationship for both developed as well as developing economies. There appear to be regional differences among the developing regions regarding the evolution of the manufacturing sector. Asia does fairly well and even increases its manufacturing share on the global level. Contrasting is the stagnation and decline in Sub-Saharan Africa and Latin America. Regarding the impact of globalization there are also regional differences. The Asian region experiences a larger increase in manufacturing employment with the increase of globalization, whereas the Sub-Saharan African region benefits the least. Overall, support is found for the idea that Latin America and Sub-Saharan Africa are prematurely deindustrializing and are benefitting the least from globalization which can harm their economic growth path.

Key words: Globalization, Deindustrialization, Economic Growth, Manufacturing Employment, Developing Countries.

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1. INTRODUCTION

Industrialization has been the key engine for economic growth in most of the developed world. One of the most significant changes of the past half a century has been the strong decline in manufacturing employment in these developed economies. During the time period 1960 to 2010 manufacturing employment as a share of total employment has fallen from an average above 20 percent to an average below 10 percent in developed economies (Timmer, de Vries and de Vries, 2015). An alarming similar trend is found among developing economies. The average manufacturing employment in developing economies is at a comparable level as the level in developed economies. Based on past experiences it is highly unexpected that the developing world has such a low manufacturing employment share at the level of development and income they are at. The real question one should asked in order to understand the problem at hand is what has caused this trend to occur? Why are developing economies deindustrializing at a much lower level of development and income than one would expect? Within this debate the main discussion point is often the impact of (economic) globalization (Brady and Denniston, 2006).

Globalization as a phenomenon has been occurring since the 18th century and has accelerated over time. The integration of economies is not a new trend, yet it has been a widely discussed topic for the past decades (Held, McGrew, Goldblatt and Perraton, 1999). In academia as well as in the media, we are made aware of the positive and negative impacts of globalization. The current economic exchanges taking place within the world economy are often seen as a maze of interdependent systems which are complex and potentially highly sensitive (Dicken, 2003; Gereffi, 2005). Developing economies are at this time searching for a growth path within this arena of high globalization and interconnectedness as they see their path of industrialization being cut short and are experiencing premature deindustrialization. In this study, the debate concerning the impact of globalization on industrialization is revisited. Simply put this research aims at offering insights into the question; What is the relationship between globalization and industrialization and does the relationship differ for developed and developing economies?

Considering developed economies, it becomes clear that industrialization has played a major role in shaping their growth paths and the modern world (Rodrik, 2016). Following the industrial revolution, developed economies have been able to create sustained productivity growth which is also one of the drivers of the big divergence between developed and

developing countries (Rodrik, 2016). The high productivity growth rates were generated and maintained within the manufacturing sector, often viewed as the engine behind economic growth (Kaldor, 1996). It is based on these history lessons that developing economies hope for (new) manufacturing industries to grow their economy by the help of industrialization (Dasgupta and Singh, 2006). It may however be the case that history is not repeating itself. Developed economies have been experiencing deindustrialization for the past three decades and have moved towards the post-industrial phase of development (Rodrik, 2016). Deindustrialization has been a phenomenon discussed since the 1980's in first instance to explain the divergence between developed economies (Rowthorn and Wells, 1987). Recently, the debate has shifted away from the developed economies perspective towards the developing economies perspective.

A large contributor to this attention shift has been Rodrik (2016). In his impactful paper he detects premature deindustrialization in developing economies and lightly touches upon the causes for premature deindustrialization in developing nations but does not go beyond theory and hypothetical reasoning. In earlier research on deindustrialization globalization has been coined as the central cause, but due to empirical research the debate has turned more skeptical about the impact of globalization. Skepticism has been driven by the theory and model of Rowthorn (Rowthorn and Wells, 1987; Rowthorn and Ramaswamy, 1997, 1999). He brings forward arguments that go against the globalization argument and argues that productivity and natural economic development are the main sources. The debate is however not decided as researchers such as Wood (1995) clearly show that the increase in trade has led to rise in demand for unskilled labor contributing to deindustrialization in developed economies. Moreover Rodrik (2016) elaborates on Wood's points as he brings forward arguments concerning the impact of trade and globalization on the structure of trade flows and global value chains. Rodrik and other researchers' arguments emphasize the importance of the impact of trade and globalization on the trend to move away from manufacturing at an earlier stage of income for developing countries. The consequences of premature deindustrialization should not be neglected and taking a step back to find out what is causing deindustrialization is a useful exercise.

Focusing on a potential instigator of deindustrialization could offer insights beneficial to policy development and mitigation analysis. Premature deindustrialization is a rather novel concept and little empirical research has been done focusing on the causes of this trend. The scope of this paper is aimed at the countries included in the Groningen Growth and Development Center (GGDC) 10-sector database. Allowing an analysis based on eleven countries in Sub-Saharan Africa, eleven countries in Asia, two in the middle-east and North Africa and nine in Latin-America. As comparison countries to identify premature deindustrialization this database also includes eight countries in Europe and the United States of America. The timeframe of this paper spans as long as possible in order to detect the influence of globalization and runs from 1960 – 2010.

The remainder of this paper is organized as follows. Section two touches upon the relevant literature combined with insights from earlier research. In this section the following important concepts will be reviewed and defined; industrialization and consequently the measure and definition of (premature) deindustrialization. Furthermore, globalization can be measured and defined in a range of manners and this paper shortly delves into that debate. This section also links globalization and the impact on industrialization which is tested in the empirical analysis. The literature on both industrialization and globalization is very extensive. Therefore, this paper chooses to focus on relevant angles and is aware that many more angles and literature is available. The third section focusses on the collection and critical assessment of the data used in the analysis. The fourth section is concerned with outlining the two-part empirical method. Followed by the empirical analysis and discussion of results in the fifth section. The first part of the empirical analysis is concerned with delving into the phenomena of globalization and (de)industrialization; analyzing the relevant trends as an additional value to reviewing earlier done research. This paper concludes with the insights gained into the question what the relationship is between globalization and deindustrialization and if this differs in developing countries compared to developed. Whilst recognizing limitations of the research and identifying areas for future research.

2. LITERATURE REVIEW

Development economics literature seeks for answers to the question what the best way for countries or regions is to generate growth. There is a range of theories and angles one can take. The comparative advantage theory implies that countries should mainly specialize in the sectors in which their country, in comparison to their competitors, produces the most efficient. Post-Keynesian theory argues that the choice of sector specialization should be conducted on basis of strategic arguments and that the choice of sectors should be able to generate innovation and productivity for the whole economy (Cantore, Clara, Lavopa & Soare, 2017). A third large piece of literature and theory focusses on the role of the manufacturing sector along the economic growth path.

2.1 INDUSTRIALIZATION & ECONOMIC GROWTH

The relevance and emergence of the literature on industrialization and deindustrialization is therefore rooted in the foundation of development economics. This literature aims at creating understanding regarding economic growth, the growth slowdowns, and the different growth paths taken or experienced. Delving into industrialization as a concept within economic growth allows for a better understanding of the different situations and offers the possibility to derive economic policy implications. Industrialization, productivity and economic development have manifested differently over the past decades, among countries and regions, and most arguably against earlier ideas that countries would experience similar growth paths (Kaya, 2010).

In the ideal world where all conditions are met for different countries early industrialization theory predicted that the process of industrialization, as experienced by the West, would repeat itself. Clark in the early 1940's published the idea of the inverted U-shape regarding the relationship between manufacturing employment and economic development (Clark, 1957). His theory of industrial employment was based on the idea that whilst an economy develops the relative demand and price for agricultural products declines. At the same time manufacturing goods experience an increase in demand therefore creating higher manufacturing employment rates. The process would repeat itself with demand for manufacturing goods declining when income rises leading to an increase in demand for service goods, naturally decreasing manufacturing employment (Clark, 1957). Building upon Clark's inverted U-shape theory, economist such as Krugman and Lawrence (1994) and Rowthorn and Wells (1987) added productivity into the mechanisms of the U-shape. Changes and increases

in productivity, according to Krugman and Lawrence (1994), would be the mechanism behind the decrease in prices and Rowthorn and Well (1987) argue that deindustrialization is caused by the increases in productivity rather than other forces. Overall, the common denominator in the early industrialization theories is the idea that the manufacturing sector functions as an engine of economic growth and that it is important for the development of an economy.

Industrialization as the Economic Growth Engine

The idea that the manufacturing sector is the engine behind economic growth was well established in the contributions of Kaldor (1966, 1967); building upon classical economics and the idea that the manufacturing sector could create macroeconomies of scale (Young, 1928). In contrast to neoclassical economics, Kaldor considered both the demand and supply side of the economic market as he outlines the differences between sectors for both sides. He argues that the manufacturing sector on the supply side has more productivity growth potential compared to the service industry (Dasgupta and Singh, 2006). This is important as Baumol has contributed to the literature with the idea that sectors which are performing below average on productivity growth, endure above average costs (Baumol and Bowen, 1965, 1966; Baumol, Blackman and Wolff, 1985). This idea makes the above average productive manufacturing sector more attractive for overall economic growth compared to the less productive agriculture and service sector. Secondly, Kaldor also argues for a causal relationship between the growth of manufacturing output and the growth of GDP. Obviously, manufacturing output is generally a large part of total output, and Kaldor's first law implies that the faster the manufacturing sector experiences growth over GDP growth the faster GDP as a total will grow (Dasgupta and Singh, 2006). At a certain point, however, it might be that income elasticity of demand for service goods becomes greater compared to the income elasticity of demand for manufacturing goods (Rowthorn and Ramaswamy, 1999). This point can be seen as the point that an economy in theory is matured and a decline in the role, for example in level of demand, of the manufacturing sector might be observed, which is empirically proven by contributions of Rowthorn and Coutts (2004) and Rodrik (2009).

The literature brings forward several arguments why industrialization has the role of being an engine for growth. First, as noted before the productivity in the manufacturing sector is higher compared to the agricultural sector (and often also to the service sector) (Syrquin, 1984, 1988; Fei and Ranis, 1964). The potential for higher productivity is often also seen as greater in the

manufacturing sector therefor shifting employment into manufacturing (also known as the process of industrialization) often comes with a structural change bonus (Szirmai and Verspagen, 2015). Secondly, the manufacturing sector offers greater opportunities for capital accumulation due to the concentration of the manufacturing industry often in geographical sense (Szirmai and Verspagen, 2015). This brings along all types of benefits such as higher investment rates which make a positive contribution towards aggregate growth. Thirdly, as mentioned before in Kaldor's contribution the manufacturing sector allows for economies of scale (Kaldor, 1966, 1967). Technological progress is often embodied in the manufacturing industry and diffuses towards other industries. Leading to the next reason for the engine of growth argument that the manufacturing sector has strong linkage and spillover effects (Hirschman, 1958; Szirmai and Verspagen, 2015). Lastly, the demand effect of the manufacturing sector in comparison to the agricultural sectors relates back to Engel's Law. The low-income elasticity of agricultural goods leads to a higher share of manufacturing goods in total expenditure of income. Recently this argument has also been made for the service sector (Falvey and Gemmell, 1996; Iscan, 2010), yet if the services are non-tradable it will not be as much of a driver of growth as the manufacturing sector (Szirmai and Verspagen, 2015). Overall, there are many theoretical arguments for the idea that the manufacturing sector is the engine of growth for countries.

In light of this theory, the idea that industrialization is necessary for growth has been contested in recent years by some evidence in the literature. The developed world as we know it today is much of a product of industrialization, as undisputedly it was the industrial revolution that allowed economies to generate high productivity growth rates in the manufacturing sector (Szirmai, 2012). It is based on these history lessons that current developing economies still believe and hope for new manufacturing industries to grow their economy (Dasgupta and Singh, 2006). More recent literature has however pointed out that it may be questionable how much manufacturing will actually be an engine for growth in the future (Szirmai, 2012). Park and Shin (2012) find evidence that Asian countries have been able to gain labor productivity increases in the service sector, significantly contributing to the growth of the economy. They also find that the possibilities to increase labor productivity within the service sector is higher at lower income than at higher levels of national income. Timmer and de Vries (2009) argue for the increasing importance of the service sector in the acceleration growth periods of developing economies, yet they also note that manufacturing is still very important. The mixed

evidence does challenge the idea that countries necessarily need the manufacturing sector for growth, and this might be a positive finding as the currently alarming trend of premature deindustrialization is visible. This trend may be a new big threat to economic growth for both developing nations as well as the world economy if new paths of growth cannot be developed.

2.2 Deindustrialization & The Consequences

Applying the industrialization theory, it can be noted that nowadays the manufacturing sector as the engine of growth is not as relevant anymore for current developed economies (Fagerberg and Verspagen, 1999, 2002). These economies are now experiencing deindustrialization as predicted by the inverted U-shape hypothesis (Szirmai and Verspagen, 2015). Deindustrialization has been a phenomenon widely discussed since the 1980's in order to explain the divergence between developed nations (Rowthorn and Wells, 1987). Starting with the disappointing post-war growth of the United Kingdom after which Kaldor (1966, 1967) and Singh (1977) attempted to explain the trend by the hand of the weak performance of the UK manufacturing sector. They concluded that the UK was in the process of deindustrialization. The idea that developed economies deindustrialized based on the U-shaped hypothesis is not a shock. The debate, after the observation that deindustrialization could be a cause for the divergence between developed economies, moved towards the consequences of a decrease in manufacturing as the engine of growth.

Definition, Measurement and Consequences

The first aspect to tackle in this debate is the question what deindustrialization is and how it can be defined. Deindustrialization can be defined as the process of systematic divestment of the manufacturing sector in a nation (Bluestone and Harrison, 1982). This disinvestment can relate to the manufacturing sector's declining employment or output. This can be both in current or constant output prices as well as in absolute terms or as a share of the total economy (Tregenna, 2011; Rowthorn & Wells, 1987; Rodrik, 2016). In the literature there are multiple measures to define both industrialization and deindustrialization. The three most used measures are manufacturing output, defined by manufacturing value added (MVA) as a share of GDP in either current or constant prices and the third measure is manufacturing employment as share of total employment. Manufacturing employment is often used to define deindustrialization because it is also often used as the indicator for industrialization, moreover it is relatively easy to define and to collect data on a large scale. The use of MVA as a share of GDP in current

prices is less meaningful as it conflates the variation in prices and quantities. Real MVA as a share of GDP is often used in comparison to the evidence provided for by employment share. Depending on the aim of the research either measure can be used. This research uses the employment share, unless stated otherwise, in order to detect the trends in the manufacturing sector. In the literature there is often debate concerning the definition of deindustrialization but generally the decline in the share of manufacturing employment is the common definition. This measure allows for the discussion of particular economic, political and social consequences. The aim of this research is to explore a potential underlying cause of the trend of deindustrialization and this is most clearly examined by the use of employment. In the following sections it does become clear that considering employment leaves out a part of the story and combining the results with output trends or understanding of the trends is a valuable exercise.

Deindustrialization as a phenomenon is not solely confined to economic literature as it is also discussed in the realm of sociology, geography and other disciplines. A large portion of the literature, irrespective of discipline, is concerned with the consequences and causes of deindustrialization (Rowthorn and Coutts, 2004; Brady and Denniston, 2006). It is relevant to consider the impact of deindustrialization on both developed economies as well as on developing economies. Deindustrialization in developing economies brings with it the same negative consequences as seen in the developed world such as, loss of good jobs, rising inequality, and declining innovation capacity (Rodrik, 2016). It however does not stop there, as the developing economy is of a different structure as the developed economy. In a developing economy premature deindustrialization reduces the chance of economic growth and lowers the possibility to converge with developed nations (Rowthorn and Ramaswamy, 1997). This is evident considering that labor is moving towards less productive sectors, either services or low-productivity manufacturing goods, causing labor productivity and output to decline, henceforth decreasing the economic growth opportunities (McMillan, Rodrik and Verduzco-Gallo, 2014). This trend then requires a new channel of growth which has not yet been discovered or proven to exist in the current globalized world economy.

Moreover, there are many researchers that link economic growth and its potential to political stability in countries (Barro, 1991; Feng, 1997). Developing economies tend to be in the starting phase of creating a stable and trustworthy political environment. Deindustrialization

and the lack of sustainable economic growth may cause political unrest, threaten the implementation of sound democracy and the stability of a nation. Logically this does not improve the setting to secure a new economic growth path. It is therefore clear to policy makers and researchers that premature deindustrialization at this point is a threat to the development of emerging and developing economies.

2.3 Globalization & Manufacturing Employment

Shortly going back to the earlier mentioned case of the United Kingdom and the trend of deindustrialization after the war. This event also started the conversation linking deindustrialization and globalization. The debate of the influence of globalization on the process of deindustrialization soon was also held in Canada and the United States. In mainland Europe the debate was held from the 1980's onwards (Alderson, 1999).

It is first important to examine what is meant when rereferring to globalization as a potential cause for the deindustrialization trend. There has been a wide variety of ways researchers have defined globalization, often believed to be a term that is not definable. It is obvious that globalization is not defined by one concept, yet it is also not easy to define it within a set time frame (Al-Rodhan and Stoudmann, 2006). There is not one beginning and one ending to the process of globalization and it is in relation to the situation what the definition might be. The background of one's political, social and cultural situation already influences the perception of what globalization is. To illustrate the President of the Third World Network in Malaysia has defined globalization as colonization in 1995 (Al-Rodhan and Stoudmann, 2006). In contrast are the definitions which refer to globalization as the process in which the world becomes smaller and allows for interaction with mutual benefit across the globe (Al-Rodhan and Stoudmann, 2006). Illustrating that depending on the position in the world the perception of the process of globalization can be very different.

Most importantly globalization is not solely an economic process and goes beyond the economic integration of a country into the world economy. Dreher, Gaston and Martens (2008) elaborate on the idea that globalization is also concerned with the political and social spheres. The impact of globalization is vast and at the same time the lack of a common definition might hinder the process of examining the exact impact in various areas. Dreher et al. (2008) use the following definition of globalization; "the intensification of cross-national economic, political,

cultural, social and technological interactions that lead to the establishment of trans-national structures and the global integration of economic, political, and social processes on global, supra-national, national, regional and local levels" (Dreher et al., 2008, p.31). This definition ties in with the view of Atkinson (1997) and Friedman (1999) that social aspects of globalization are important for a complete understanding of the relationship between globalization and changes on the national level. It becomes clear that globalization is more than the economic integration of countries. Regarding its measurement multiple attempts have been made and in order to encompass the multi facet of the concept, indices have grown to be the most used measurement. A review of different indices is given in the following data section.

Global Value Chains and Manufacturing

Globalization has come in waves and the latest wave has been driven by the changes in labor division among countries (Castells, 1996; Hoogvelt, 1997). The creation of goods is now organized through the use of complex networks of firms, also referred to as Global Value Chains (GVC) (Gereffi, 2005; Dicken, 2003). These GVCs reallocate jobs and work to the places where goods are most efficiently and effectively made. Often in the literature the explanation for this pattern follows the Heckscher-Ohlin theory, where comparative advantage is created by the relative abundance of factors of production in a country in comparison to other countries. With this in mind Wood in 1995 argued that globalization would increase the size and earnings of low-skilled workers in mainly developing economies as they create the comparative advantage in manufacturing. Along the same line, Dodzin and Vamvakidis (1999) provide evidence that the increases in trade lead to higher levels of industrialization within countries that are focused on labor-intensive work during the period 1970-1995. Lastly, Bollen and Appold (1993) demonstrate that the exports of manufacturing goods lead to an increase in the size of manufacturing employment.

Taking into account the mechanisms of globalization and economic theory it becomes clear that trade between developing and developed economies has a different effect on both sides. Using the Stolper-Samuelson theory increased trade sets off deindustrialization in developed countries by the outsourcing of low skilled labor-intensive parts of the GVC and the decline in the relative price of low skilled labor goods (Saeger, 1997). The Stolper-Samuelson theory is an extension of the Heckscher-Ohlin model as it is able to incorporate domestic nontraded goods as well (Saeger, 1997). An assumption of the model is that trade between two countries

is balanced and leads to the movement of excess labor into less productive non-traded good sectors (Saeger, 1997). Moreover, it is important to understand that the increase in links between developed and developing economies changes the structure of imports for the developed world and exports of the developing economies. The developed world deindustrializes with the increase of globalization by outsourcing to the developing world, which is expected to industrialize based on economic theory.

Obviously, there might also be a reverse effect of globalization on the manufacturing employment share of a developing country. In more recent years it can be seen that among developing countries investments have taken place towards other developing countries. One such an example is Taiwan investing in China leading to a decline in the manufacturing employment domestically in Taiwan (Zhang, 2005). The dispersion of manufacturing as a result of the latest economic globalization wave leads to the utilization of low labor cost globally (Kaya, 2010). This clearly leads to the deindustrialization of developed economies as they outsourced multiple parts of the global value chains to lower cost developing countries. The expectation is that developing countries by the mechanisms of integration within GVCs would industrialize and expand their manufacturing employment. The prime example of successfully industrializing when opening up to the global value chains is China whose' manufacturing employment share is still around 20 percent. The hypothesis based on economic theory, literature and previous research is that globalization has a positive relationship with manufacturing employment share in developing economies. The following sections describe the data and methods used in order to test this hypothesis later on.

3. DATA

3.1 DATA SOURCES

3.1.1 INDUSTRIALIZATION AND DEINDUSTRIALIZATION

As noted above there are multiple ways to measure industrialization and deindustrialization and the Groningen Growth and Development Center (GGDC) has collected data on 42 countries covering the period 1950-2010 for multiple measures useful to map industrialization (Timmer et al., 2015). The full list of countries and details on the data availability of the 42 countries can be found in the appendix.

First of all, the GGDC ten sector database provides country level data separated into the ten main sectors of the economy as defined by the International Standard Industrial Classification (ISIC), Revision 3.1 for a large group of developing countries. Manufacturing is among the ten sectors and contains all activities and employment within the broad category D as defined by the ISIC rev. 3.1. The ten sectors together cover the whole economy, and their sectorial summation is a representation of the total of the economy. This total might be slightly different from the total reported by national accounts as adjustments to the data takes place on the sectorial level (Timmer et al., 2015). This paper takes the summation of the ten sectors as representative of the total output of the economies.

The GGDC in their ten-sector database provides three main variables, namely employment represented by people engaged in thousands of persons. Gross value added (GVA) per sector at current local currency prices in millions and gross value added at constant local currency 2005 prices in millions. The following section discusses in more depth the construction and validity of the base variables and the other variables used in this paper. With these three main variables it is possible to examine the role of the manufacturing sector in the economy and the process of deindustrialization. The database covers for a mixture of developed and developing countries, by including data for eleven Asian, nine Latin American, two countries from the Middle East and North Africa, eleven African countries and nine Western European countries and the United States (Timmer et al., 2015). The GGDC collected the data based on a country-by-country in-depth study on available statistics and data resources. Currently, it is the main database providing long-term time series on sectoral development within both developed as developing economies. This paper focusses on the countries included in the GGDC as they represent a range of developing nations on a geographical basis, on level of development and on the size of the economy.

The different variables for manufacturing data are supplemented by the use of the World Bank Indicator database and the Maddison Historical Statistics database for long-term data on income and population for the different countries. These are used for the baseline results documenting the trend of deindustrialization and premature deindustrialization. Extending on the paper of Rodrik (2016) this paper looks beyond this observation and spends time considering underlying causes of the observed trends.

3.1.2 GLOBALIZATION

In order to look beyond the research done on premature deindustrialization there is a need to model for globalization. As mentioned above globalization is a broad term with multiple definitions. There is not one universally accepted definition therefore measuring globalization is difficult and uncertain. Broadly speaking it is possible to divide measures of globalization into two categories, single index and synthetic index (Samimi, Lim & Buang, 2011). The single index can be either a proxy measurement of de facto or de jure, depending on the variable taken. With the single index globalization is measured by one element that is believed to be more important in light of certain research and studies than other elements of globalization. There is a range of measurements that are able to proxy for trade globalization or financial globalization, such as tariff rates, IMF restriction measurements, FDI flows or stocks, and openness based on the ratio of trade.

In order to capture more dimensions of globalization researchers aim at capturing multiple dimensions into one index; creating a synthetic index. Combining different variables and indicators and introducing a weight to their effects results in several globalization indices. Not all are able to cover a large sample both on the time and country dimension. This paper uses the KOF Globalization database 2018 and the CSGR Globalization Index. The KOF Globalization index was first introduced by Dreher (2006) and combines the economic, social and political dimension of globalization into one overall value and at the same time is able to be broken down in its original elements (Samimi et al., 2011). The CSGR Globalization index is constructed by the University of Warwick and based on the globalization index of AT Kearney/Foreign Policy. As well as the KOF Globalization index it represents three spheres of globalization. The strength of these indices is that they include a large set of countries covering a long-time span and they are able to distinguish between various spheres of globalization. The KOF Globalization is available from 1970 onwards and for all countries also represented in the GGDC dataset. The CSGR is available from 1980 onwards and covers 35 countries of the 42 in the GGDC. This allows this paper to examine the relationship between globalization and manufacturing employment for a relatively long time period and for a decent number of developing countries.

3.2 Assessment of the Construction of the Variables

In order to examine the reliability, representability and validity of the data from the different sources it is useful to take a closer look at the way of construction and identify potential limitations and the quality of the data.

3.2.1 Dependent Variable

The dependent variable in the upcoming model is in disguise (de)industrialization which is represented by the proxy of the share of manufacturing employment and in a few cases the share of real manufacturing value added in constant 2010 US dollars in an economy is used for comparison.

In the GGDC database employment is defined as 'all persons employed', which in this case includes all paid employees, self-employed and family workers (Timmer et al., 2015). The data is collected via labor force surveys held at the household level, via business surveys which are held at the firm level and population census. Combined they are fairly able to represent annual sectoral employment within the countries. The limitations lie within the method of sampling as the labor force surveys generally have a small sample size, creating inconsistency with national account data (Timmer et al., 2015). Moreover, is it difficult to control for the geographical spread of the sample as labor force surveys are often conducted in urban areas and do not sample as much in rural areas. Regarding the business surveys, the reported value of value added is most often in-line with national accounts, however service industries are not well represented in the sample of business surveys. Generally, business surveys do not collect data on smaller firms, self-employed and unpaid family members resulting in a sub-optimal representation of the whole economy by sectors (Timmer et al., 2015). Additionally, the definition of the manufacturing sector might be clear in theory based on the use of a sectoral classification scheme but is a lot more difficult in reality. The scope and scale of the manufacturing sector has changed over the past centuries. It is very difficult nowadays to pinpoint to one location as the place of origin of a manufactured good. It has also become more difficult to define which employees' jobs are related to manufacturing and if they should be counted or not (Levinson, 2017).

All in all, the labor force surveys and the business surveys experience several severe limitations due to small sample size, no full coverage of the population and a limited sectoral breakdown. The GGDC solves for this by using population census which are not suitable to derive annual trends as they are generally quinquennial or decennial (Timmer et al., 2015). In combination with the labor force surveys and business surveys they are able to report absolute levels of employment via the census and in between trends via the surveys. This enables them to reliably construct for most countries sectoral level employment and value added. Consistency is ensured by being able to link data and repair large breaks in the time series if applicable through the census and the surveys (Timmer et al., 2015). International consistency is achieved by the use of the ISIC rev. 3.1 for sectoral classification as national primary data classification is often directly related to the ISIC rev. 3.1 division (Timmer et al., 2015).

In general, it is advisable to be critical regarding the data, as measurement errors occur easily especially in developing economies (Devarajan, 2013; Jerven, 2013). There are documented problems surrounding the capacity to collect, manage and process data in developing nations (Young, 2012). It is however not possible to collect data with a guarantee of no measurement errors, and the countries included in the GGDC have a relatively long history of collecting data (Timmer et al., 2015). Focusing on the long-run trends as done in this research does reduce the concerns of measurement errors. In the long run random errors tend to cancel out yet systematic errors will still persist (Kane, 2010). It is therefore that with a note of caution this paper still uses the data whilst being aware of the shortcomings of the collection method, processing and construction of the variables.

3.2.2 Independent Variables

The main interest in this study is creating a better understanding of the underlying causes of premature deindustrialization with a specific focus on globalization. In order to model globalization both single and synthetic index variables are considered.

Single Index

The single index variables which this paper considered are foreign direct investment flows both in- and outflows as percentage of total GDP representing the financial globalization as a de facto measurement. Secondly, it considered including exports and imports of goods and services as percentage of GDP as proxy for openness and trade globalization also being a de

facto measurement. In general, the main shortcomings of single index variables are that they only consider globalization from one angle, often the economic angle. Secondly, using de facto measurements always measures globalization indirectly, without being able to capture the full force of globalization.

Regarding the two single index measurements considered in this research it is useful to realize the following points. First, taking the sum of export and import to GDP ignores the geographical and economic characteristics of a country (Lockwood, 2004). Small population countries will most likely trade more as a share of GDP than larger countries. It would be beneficial to take country specific characteristics into account such as Pritchett (1996). He determines trade openness as the residual of a regression considering the relevant country specifics which influence the percentage of trade of GDP. Lastly, considering FDI flows it is noteworthy to observe that it only captures the financial integration of a country into the world economy. FDI does represent the ability to attract foreign investment yet the motivation or the efficient use of these investments are not reflected in the variables. Therefore, this paper concludes that basing the analysis on a single index is a less powerful exercise compared to analyzing the research question based on a synthetic index.

Synthetic Index

Trying to capture multiple or even all dimensions of globalization is the aim of synthetic indices. In order to critically examine different synthetic indices, it is relevant to consider a number of criteria. First aspect to consider is the number of indicators compiled into one index. More indicators might increase the comprehensiveness of the index, yet also cause problems in the collection of data points. It is relevant to examine which spheres of globalization are covered by the index. Three broad spheres can be distinguished; economic globalization, social globalization and political globalization. Within the criteria of number of indicators, it is also important to examine the coverage of the index based on years and countries included. Secondly, the method of weighing the indicators. Adding indicators that end up with negligible weight makes the index weaker (Samimi et al., 2011). Lastly, geographical adjustment is often deemed relevant as it influences the different aspects of globalization (Dreher et al., 2008).

This paper compares the KOF Globalization 2018 index (KOF) with the A.T. Kearney/Foreign Policy Globalization (KFP) and the Centre for the Study of Globalization and Regionalization

from the University of Warwick (CSGR). The KFP index was one of the first to create a synthetic globalization index and has been the foundation of many other indices to work from (Gygli, Haelg & Sturm, 2018). Data from the KFP index is not publicly obtainable yet it is still a useful exercise to theoretically compare the indices. The CSGR index is created based on the initial workings of the KFP yet with several significant adjustments based on the critique received by the KFP. The CSGR adjust for geographical characteristics of countries leading to a structurally adjusted version of the KFP variables (Lockwood, 2004). In table 1 it is clear that the KOF Globalization 2018 is able to account for all three spheres of globalization and has the largest coverage of countries, years and includes a solid number of indicators.

Table 1. Synthetic Index Criteria between KOF and KFP

Index	**Criteria**								
	Years	Number of Countries	Number of Indicators	Economic Globalization				Social Globalization		Political Globalization
				Actual Flow		Actual Flow of trade	Restriction on Trade and Capital	Culture	Information and contact	
				Foreign Capital	FDI					
KOF	1970-2015	158	28	✓	✓	✓	✓	✓	✓	✓
KFP	1971-2006	62	12	✗	✓	✓	✗	✗	✓	✓
CSGR	1980-2004	62	16	✓	✓	✓	✗	✗	✓	✓

Source: Samimi et al. (2011)

The main theoretical benefit from the KOF over the KFP and CSGR is the inclusion on restriction to trade and capital as an indicator. Only measuring the actual flows of trade does not indicate the level of protectionism from a country which is important in relation to the employment level within an economy. Including the restrictions on trade and capital allows for a more precise measure of economic globalization based on theory. However, both the KOF and CSGR attempt to adjust for geographical structures of countries which should limit the impact of country characteristics on the level of globalization. The KOF uses the most direct way of controlling by only controlling for the size of the country as the variables are divided by GDP or population size (Gygli et al., 2018). The literature provides more advanced methods to control for geographical characteristics such as by Lockwood (2004). In Lockwood's

method variables are regressed against country characteristics and the residual of the regression is included in the index as the effect of globalization. Gygli et al. (2018) decide that based on other literature from Clark (2000), Norris (2000) and Nye and Keohane (2000) that solely correcting for the size effects is sufficient for the case of KOF Globalization 2018 (Gygli et al., 2018). The CSGR however does uses Lockwood's adjustment methodology and therefore controls more in depth for country characteristics.

Going beyond the theoretical comparison and examination of the two indices it is worth observing if different globalization indices measure the same 'reality' and trends over time. As data from the KFP is not publicly released but the CSGR is the improved and complementary version of this index it is useful to compare the KOF and CSGR. In table 2 the correlations between the two measures are shown. Overall there is a strong positive correlation between the two measures implying that they measure similar trends among the sample countries and years.

Table 2. Correlation Matrix KOF Globalization and CSGR Globalization

	KOF Overall Globalization	KOF Economic Globalization	KOF Social Globalization	KOF Political Globalization
Overall CSGR Globalization	0.812	0.668	0.667	0.716
CSGR Economic Globalization	0.300	0.531	0.272	-0.063
CSGR Social Globalization	0.751	0.750	0.728	0.384
CSGR Political Globalization	0.591	0.279	0.384	0.861

Source: Authors own calculations

As mentioned earlier the KOF economic globalization is one of the only indices to take into account economic restrictions as well, and this is most likely an explanation for the lower correlation with the CSGR economic index. The CSGR index uses similar variables to calculate the index on all other aspects except for the economic globalization sphere. The country correction within the CSGR is done by using the more advanced residual method of Lockwood

and might therefore measure more precisely the effect of globalization rather than the differences between country characteristics.

The differences between the trends in the KOF and CSGR are brought forward when visually representing the trend captured by both indices. In figure 1 the changes of the two globalization indices over time are represented. It is interesting to note the difference of absolute level of globalization between the CSGR index and the KOF index. The KOF index has a higher starting level of globalization on both accounts and it also shows an increase of 42 percent in economic globalization. In contrast the CSGR experiences a 23 percent increase in economic globalization during the given timespan. It can also be observed that the economic globalization of the CSGR follows the trend of the overall globalization less compared to the behavior of the KOF economic index. In figure 2, 3, and 4 the different trends using the KOF Globalization and the CSGR index are demonstrated by region. The main eye catcher is the difference in economic globalization regarding the developed economies. Using the CSGR the developed countries experience a lower economic globalization compared to Asia whereas using the KOF the developed economies are well above Asia. Furthermore, it appears using the CSGR that only Asia has really experienced an increase in economic globalization whereas within the KOF all regions experience an upward facing trend.

We can carefully, on basis of the correlation matrix and the figures, infer that the two indices show relatively similar trends, yet there are still differences between the two that could be crucial to further analysis. It could be that the difference in method for country characteristics adjustment plays a relatively large role in this. Concluding that there are to an extent clear differences among mainly the economic globalization index the results in the analysis will be tested against both indices.

Overall not one measure is necessarily the best to model for globalization but in this case the synthetic index of KOF Globalization of 2018 and CSGR provide for a comprehensive theoretical representation of globalization. The main advantage of using a synthetic index compared to a single index in this paper is the risk of endogeneity. Ideally, globalization would be modeled for by an exogenous variable, but this has proven to be difficult to find for a larger set of developing economies. Impactful work on the impact of globalization, using instrumental variables and exogenous variety, has been carried out by Autor and his colleagues; they use

the China trade shock as the exogenous globalization shock on the American labor market (Autor, Dorn and Hanson, 2016). It appears to be more feasible to find an exogenous shock for one country case studies as it has been challenging to find a similar shock for a large sample of countries and especially developing countries. Therefore, this paper uses a globalization index as second-best option to model for globalization. The inclusion of multiple dimensions of globalization into an index reduces the endogeneity of only looking at one factor or variable as a proxy for globalization. In the appendix the full list of indicators included in the KOF Globalization 2018 and the CSGR can be found. In section five the results using this data will be described and examined after which the impact of globalization on manufacturing employment will be discussed.

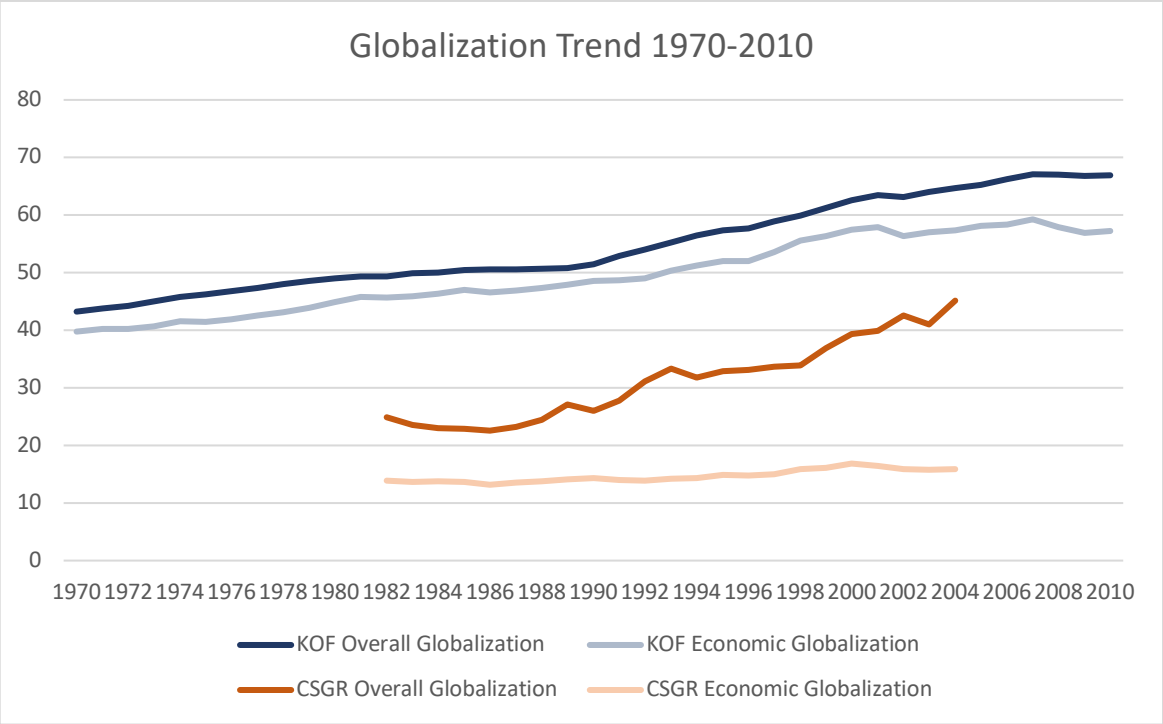

Figure 1. Globalization Trends using KOF Globalization 2018 and CSGR Globalization Index

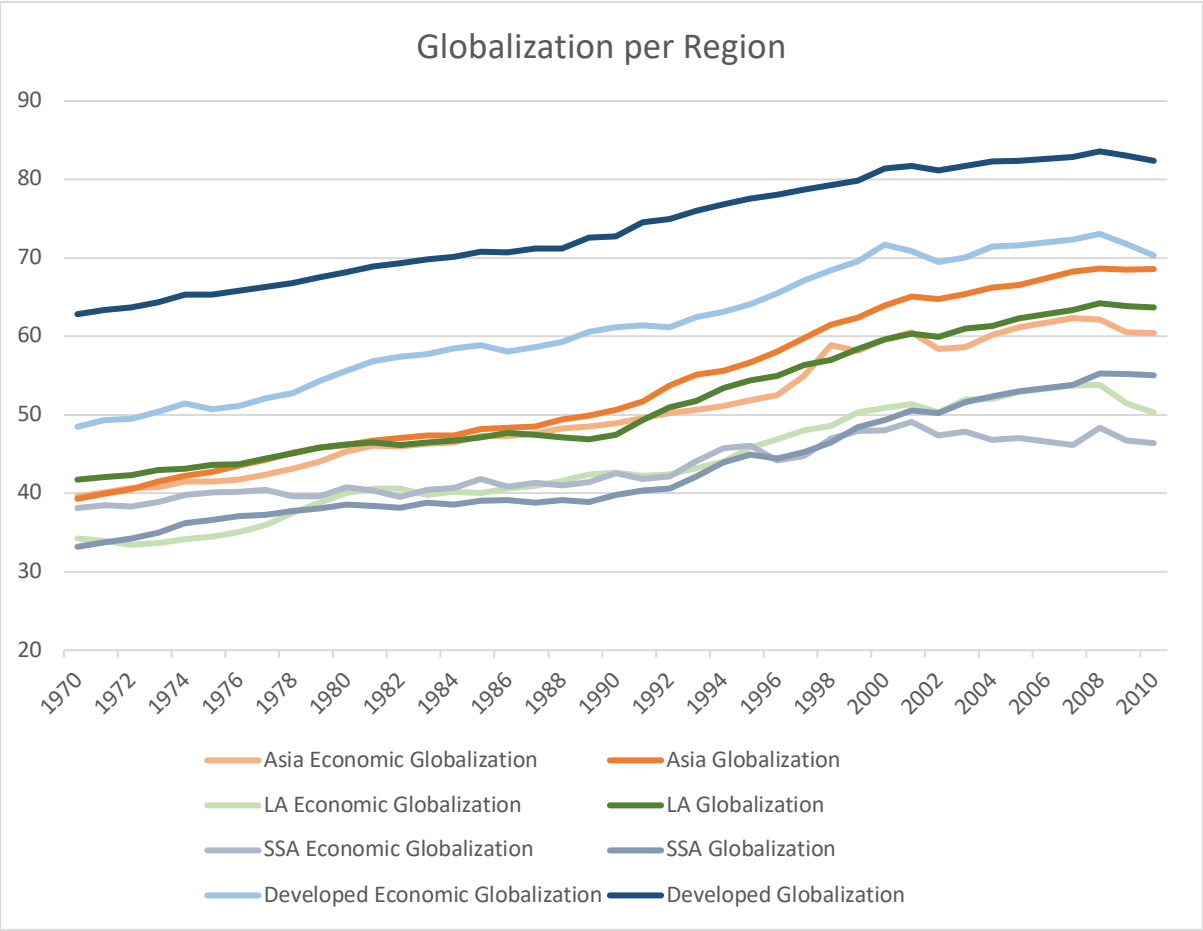

Figure 2. Globalization trends per region, using KOF Globalization Index

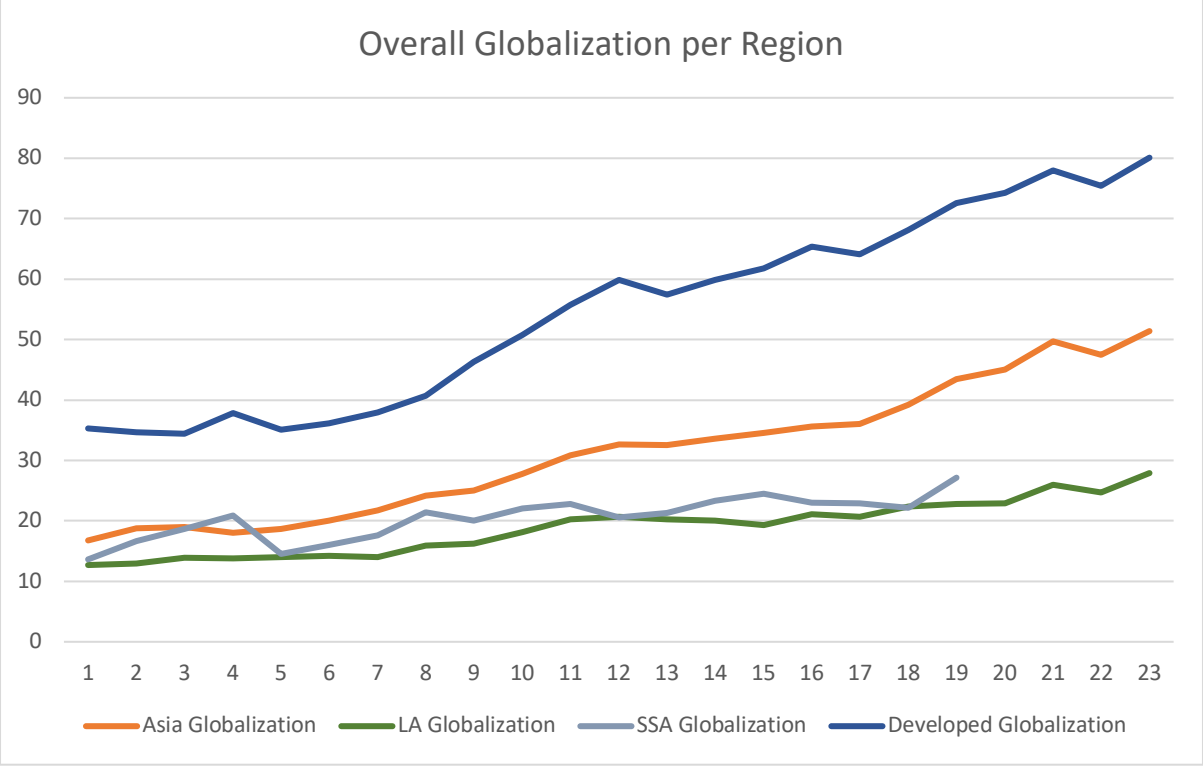

Figure 3. Overall Globalization per Region using CSGR Globalization Index.

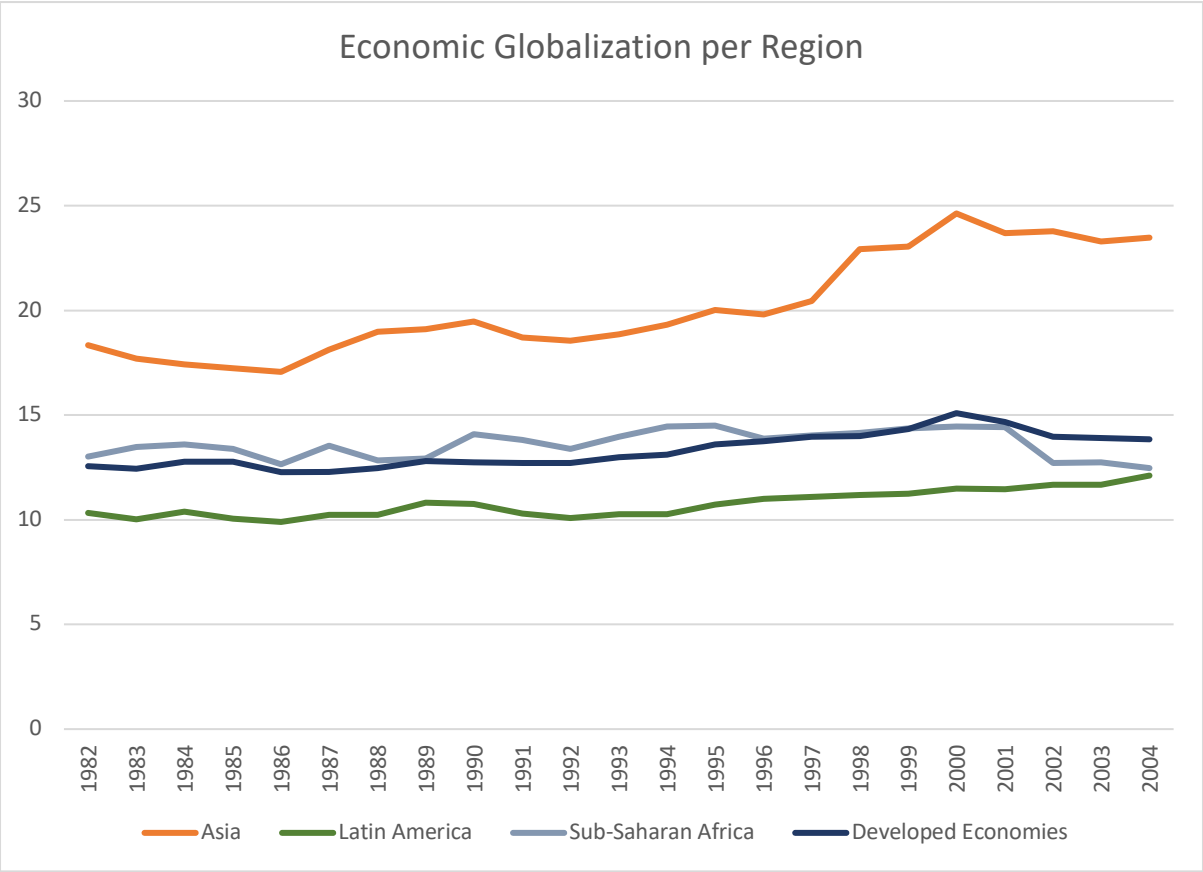

Figure 4. Economic Globalization per Region using CSGR Globalization Index.

4. METHODS

The first part of the methodology of this paper is inspired by the earlier done research of Rodrik (2016) and Tregenna (2011). The overall methodology is two folded. First, this paper will identify the trend of (premature) deindustrialization and deeper analyze the periods of deindustrialization. This analysis entails examining if certain time periods have experienced more rapid deindustrialization than other periods and examining the effects inducing the change in manufacturing sector employment share. This creates a more thorough understanding of the trends observed by Rodrik (2016) and allows for further investigation into potential underlying causes. Therefore, the second part of the methodology continues with examining the relationship between globalization and the share of manufacturing employment.

4.1 PART ONE: EXAMINING DEINDUSTRIALIZATION TRENDS

4.1.1 TIME ANALYSIS OF DEINDUSTRIALIZATION

In order to observe the trend of deindustrialization data descriptive and summaries are used. The results are reported in section five of this paper. It becomes clear that economies are deindustrializing and at the same time it is clear that developing countries are deindustrializing at a lower level of income compared to the developed economies. The second step is to explore if certain periods in time have experienced more rapid deindustrialization (Rodrik, 2016). This is done to potentially identify a period in which the trend has accelerated. By means of a baseline regression, which includes dummies for the different periods it is possible to gauge the effects of common shocks on manufacturing employment in each time period we include, relative to the excluded time period of pre-1970 (Rodrik, 2016).

The baseline regression used in this part of the methodology is as follows:

$$(1) \qquad manshare_{jt} = \beta_0 + \beta_1 \ln(pop_{jt}) + \beta_2 \ln(pop_{jt})^2 + \beta_3 \ln(y_{jt}) + \beta_4 \ln(y_{jt})^2 + \sum_T \varphi_T PER_T + \alpha_j + \epsilon_{jt}$$

where $manshare_{jt}$ is defined by:

$$(2) \qquad manshare_{jt} = \frac{manufacturing\ employment_{jt}}{total\ employment_{jt}}$$

where j is the country index and t the time index, taken as annual year from 1960 onwards. Equation 1 controls for the effect of income trends by the inclusion of y_{jt}, GDP per capita and demographic trends are accounted for by the inclusion of population (pop_{jt}) both are also added as a quadratic term. Moreover, country effects (α_j) are attempted to control for by the use of a fixed effect model and by the inclusion of period dummies the time effect is also controlled for. The element of interest in this baseline regression is $\sum_T \varphi_T PER_T$ which includes period dummies. Periods consist out of ten years and the period of 1960 is not included in the regression. Therefore, φ_T , is the coefficient of interest as it indicates the effect on manufacturing share in each period relative to pre-1970, or in other words relative to the period of 1960.

Following the examination of period trends, it is interesting to gain insights based on different country groups. Country groups are distinguished based on geography leading to the following groups; Latin America, sub-Saharan Africa, Asia and developed countries (European countries and the United States). Basing it on geography leads to the inclusion of Japan in the Asian countries even though Japan is often classified as developed (United Nations World Economic Situation and Prospects report, 2018). All the regressions are done by using the baseline regression and results are presented in section five.

4.1.2 Decomposition of Manufacturing Employment Changes

Decomposing the changes in manufacturing employment share is done in order to create more understanding of the mechanisms behind the process of deindustrialization as reported by the data in earlier steps. The changes in the share of manufacturing in total employment can be decomposed into three components, based on the accounting method from Tregenna (2011). The three components are manufacturing labor-intensity, share of manufacturing in total value added and aggregate labor-productivity.

In order to execute the decomposition, it is necessary to modify the data obtained on value added, both for the manufacturing sector specific as well as total value added. The GGDC 10-sector provides the value added monetary data in current local currency and in constant local currency 2005 prices. In order to compare between countries, it is important to harmonize this data. This is done by the use of a GDP deflator and the exchange rate from local currencies to US 2010 dollars.

The value-added data is transformed by obtaining a timeseries GDP deflator from the World Bank (2017) for the period 1960-2010 for most countries. The following steps allow for the transformation of current local currency value added in millions to constant 2010 US dollar value added in millions.

$$Real\ total\ value\ added_{jt} = \frac{Total\ value\ added_{jt}}{GDP\ Deflator_{jt}}$$

$$Total\ value\ added\ in\ constant\ 2010\ US\ dollar = \frac{Real\ value\ added_{jt}}{Exhange\ rate_{j-US\ in\ 2010}}$$

The same procedure is used for the manufacturing value added, which is also deflated using the GDP deflator. It is a common exercise to deflate output due to the impact of inflation by the use of a general price index. It is however a minor limitation to use the general price index for sectorial output deflation as well (Ma, 2009). It would be optimal to be able to account for sector heterogeneity by the use of a sectorial price deflator. Due to data limitation this is not available for the whole sample in this paper. For the following decomposition value added is entered in constant 2010 US dollars.

In order to proceed with the decomposition, the following identifications are needed:

Firstly, $L_{jt} = \sum_{i=1}^{10} L_{ijt}$ where L_{jt} is the employment in country j in time t defined by the summation of all sectors i in the country in that time. The GGDC has defined 10 sectors in its database.

Secondly, the following identity allows for the definition of L_{ijt}; $L_{ijt} = \phi_{ijt} Q_{ijt}$ where ϕ_{ijt} is the labor-intensity of the (manufacturing) sector respectively measured by $\frac{L_{ijt}}{Q_{ijt}}$ (the inverse of labor-productivity). Q_{ijt} is the value added of sector i in this case we are interested in the manufacturing sector. The product of the value added and the labor-intensity results in the employment in the (manufacturing) sector.

Thirdly, defining $\theta_{jt} = \frac{Q_{jt}}{L_{jt}}$ gives the aggregate labor-productivity in country j. The share of manufacturing in total value added is defined by δ_{ijt} and measured by $\frac{Q_{ijt}}{Q_{jt}}$.

Lastly, σ_{ijt} represents the share of manufacturing in total employment.

Tregenna (2011) proposes the following identity to express the share of manufacturing (taking i representing the manufacturing sector) in total employment as a product of three components, being the labor-intensity of manufacturing (ϕ_{ijt}), share of manufacturing in total value added (δ_{ijt}) and aggregate labor-productivity (θ_{jt})

(3) $$\sigma_{ijt} = \frac{L_{ijt}}{L_{jt}} = \phi_{ijt} * \delta_{ijt} * \theta_{jt}.$$

This identity enables for the separation of changes in the share of manufacturing into three components. These components are the labor-intensity effect, the sector share effect and the aggregate labor-productivity effect. In appendix 4 the full derivation leading to equation 4 can be found.

$$(4) \qquad \Delta\sigma_{ij} = \underbrace{\frac{1}{6}(\phi_{ijt} - \phi_{ijt-h})\{(\delta_{ijt-h}\theta_{jt-h} + \delta_{ijt}\theta_{jt}) + (\theta_{jt-h} + \theta_{jt})(\delta_{ijt-h} + \delta_{ijt})\}}_{labor-intensity\ effect} +$$

$$\underbrace{\frac{1}{6}(\delta_{ijt} - \delta_{ijt-h})\{(\theta_{jt-h}\phi_{ijt-h} + \theta_{jt}\phi_{ijt}) + (\theta_{jt-h} + \theta_{jt})(\phi_{ijt-h} + \phi_{ijt})\}}_{sector\ share\ effect} +$$

$$\underbrace{\frac{1}{6}(\theta_{jt-h}\theta_{jt})\{(\delta_{ijt-h}\phi_{ijt-h} + \delta_{ijt}\phi_{ijt}) + (\delta_{ijt-h} + \delta_{ijt})(\phi_{ijt-h} + \phi_{ijt})\}}_{aggregate\ labor-productivity\ effect}$$

It is relevant to break down the change in manufacturing employment into the different components and compare across countries in order to derive different trends over time. The labor-intensity effect relates to the change in labor-intensity of the manufacturing sector and as it is defined as the inverse of labor-productivity, the effect is equal to the changes in productivity in the manufacturing sector. The sector share effect relates to the change in value added of the manufacturing sector in total value added and the effect it has on the share of manufacturing employment in the economy. Lastly, the aggregate labor-productivity is the effect of aggregate labor-productivity changes on the share of manufacturing employment. In section five the results of the decomposition are discussed and the differences between the developed, Sub-Saharan, Latin America and Asian countries are shown.

4.2 Part Two: Consideration of Underlying Causes

After having delved into the observation of the deindustrialization trend the second part of the methodology of this paper focusses on considering a potential underlying cause for the observed trend. As stated before based on theory one could assume that globalization has a positive effect on manufacturing employment in developing countries, based on the comparative advantage theorem. Using the KOF Globalization index 2018, the CSGR Globalization Index and the manufacturing data from the GGDC ten sector database this paper aims at generating insights into this hypothesis.

The statistical software STATA 14.2 is used. This paper works with a strongly balanced panel data set spanning from 1970 – 2010 for 40 countries (dropped Taiwan and West Germany from the original data source due to data availability issues on other variables) resulting in more than 1500 observations. The choice for a fixed effect model is due to the fact that it controls for the unobserved country effects and reduces the bias caused by unobserved effects (Halaby, 2004). The fixed effect model takes into account the variation in the data within a country, rather than comparing between countries. In the case of this paper this is needed as the interest is the effect globalization has on industrialization within a country across the panel.

In order to derive the relationship between industrialization and globalization the different aspects of the KOF Globalization Index 2018 and the CSGR will be used. Furthermore, it is of interest to compare effects between countries with different levels of development and geographical positioning. This will be done by the use of interaction terms, in order to not lose statistical power. The globalization variable will be interacted with different region dummies to generate the separate effects. All results and models are discussed in the following section.

The barebone model is defined as follows;

$$(5)\quad manshare_{jt} = \beta_0 + \beta_1 GLOB_{jt} + \beta_2\, ln(pop_{jt}) + \beta_4\, ln(y_{jt}) + \beta_5\, ln(y_{jt})^2 + \alpha_j + t_t + \epsilon_{jt}$$

Where $manshare_{jt}$ is the share of manufacturing employment in country j in period t. $GLOB_{jt}$ is the globalization variable expressed on a range from 0 -100, where 100 implies 'total globalization'. As outlined above the KOF and CSGR index are able to break down the globalization effect into three dimensions of globalization, as the process of globalization is multidimensional. This paper evaluates the role of the different dimensions.

In models building upon the barebone model in equation 5 the following improvements will be introduced. In order to decrease the chances of problems concerning measurement errors and annual fluctuations t can also be defined as a period of five years. Furthermore, the globalization index will be entered into the model by one lag as it is not completely expected that globalization affects manufacturing share instantly. Therefore, in those models globalization in period 1995-1999 explains the manufacturing share of period 2000-2004. The aim is that this reduces the potential reverse causality problem. Moreover, as in the previous

regression the country fixed effects estimator is applied (α_j), and the use of this is also confirmed by the Hausman test. Time fixed (t_t) effects are also introduced by either year time fixed effects or period fixed effects depending on the model.

Controls are considered to test for the robustness of the model yet not many controls are needed or of added value due to the construction of the globalization indices. The CSGR already controls for the area of a country and if it is landlocked or not. These two controls in relation to globalization are important as it impacts the level of natural exposure to globalization and mainly economic globalization. For the preferred model as described in the following section, this paper also controls for institutional quality and real market value. These do not alter the outcome of the model implying a certain level of robustness for the model.

5. RESULTS

5.1 MANUFACTURING DATA ANALYSIS

Examining the variety among the different countries shows that the experiences within the sample in the past fifty years have been very different. In appendix 5 the pathway of manufacturing employment as share of total employment, based on the data from GGDC, from all forty countries in the sample are displayed. In appendix 6 the full summary statistics of the variables in this research are presented. Manufacturing employment share as part of total employment has been at its highest at 45% in Hong Kong in 1976 and the lowest in Botswana in 1967 with a value of 0.6% within this sample. In table 3 the different values per region are shown and it is interesting to note that the developing regions (Asia, Latin-America and Sub-Saharan Africa) have experienced much larger minimum and maximum annual rates of change in manufacturing share compared to Europe and North America, implying that the pathways potentially have been more extreme in its volatility or have experienced sudden turns. Moreover, the variation within the Sub-Saharan Africa region is the largest regarding the annual rate of change with a standard deviation of 8.9%.

Table 3. Minimum and maximum value of manufacturing employment as share of total and annual rate of change of the share per region over the period 1960-2010 (expressed in %).

	Asia (including China)			Latin-America			Europe			North America			Sub-Saharan Africa		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
MFG share of total employment	3.9	45.3	15.7	6.8	27.2	14.3	10.2	32.2	21.4	8.7	23.7	17.0	0.06	32.2	7.3
MFG share annual rate of change	-29.8	27.8	0.25	-15.3	19.8	-1.5	-9.3	4.6	-1.4	-7.3	1.6	-2.0	-45.3	92.2	2.0

Source raw data: GGDC 10-sector database, calculations authors own.

Taking a closer look at the individual pathways in appendix 5, it is clear that most developing economies (Europe and North America) have a fairly straight downward sloping trend. Manufacturing employment share started on average around 26% in 1960 for Europe and 24% for the United States yet by 2010 this average is reduced by half to 13% on average for Europe and 9% for the United States. Europe and the US are the most used examples of how the industrialization pathway looks within developed nations. It can however be seen that other regions and countries currently have similar levels of manufacturing share while their income level is not at the same height as developed economies. In the case of Asia, in 1980 the manufacturing share was 18% and in 2010 this is already 14% on average which is similar to Europe's current share. Whilst Asia's average real GDP per capita is almost half of that of Europe. Asia's real GDP per capita in constant 2010 US dollars is around $19,490 and Europe's is around $35,803. More striking is the low share of manufacturing in the Sub-Saharan Africa region, where in 2010 the average share of manufacturing employment was only 8.4% at an income level of $5500 GDP per capita. A first indication that countries are experiencing lower manufacturing employment shares of total employment at lower income levels. This may be the result of them either never reaching similar shares of 25% or they are experiencing a decrease of manufacturing share at a much lower level of income compared to developed economies. This is the exact trend Rodrik (2016) has found in his research and the argument for Dasgupta and Singh (2006) to coin the term premature deindustrialization.

5.1.1 GLOBAL MANUFACTURING TRENDS

Taking a closer look at the observation of the trend of deindustrialization it is interesting to look at different decades in order to observe trends in global manufacturing value added. In table 4 the share of manufacturing value added (in constant 2010 US dollars) is disaggregated by region and six decades. In the first decade half of the manufacturing value added is generated

by the now developed world. In contrary in 2016 Asia and China are responsible for half of the value added. This shows that the share of manufacturing value added of the total global value added has shifted regions and shows the growing importance of China. It is to keep in mind that the increase in Asia and China might be a result of offshoring from Europe and the US, implying that demand could still be in the developed world, yet production has shifted. This cannot become clear from the below table, but is a side note to keep in mind. Secondly, it is remarkable that the contribution of Sub-Saharan Africa has not improved over the past five decades and is still at just 1% of global value added. Latin America has kept a relatively similar portion of the global share over time, however looking at the manufacturing value added as a share of national GDP we see different trends occurring.

Table 4. Global Manufacturing Trends in 2010 constant US dollars

	World	USA	Western Europe	Latin America and Caribbean	Asia (ex. China)	China	Sub-Saharan Africa	Other
Shares in global manufacturing value added (MVA)								
1970	1.00	0.24	0.23	0.08	0.17	0.00	0.02	0.25
1980	1.00	0.20	0.20	0.10	0.19	0.00	0.02	0.19
1990	1.00	0.20	0.18	0.09	0.25	0.01	0.01	0.26
2000	1.00	0.23	0.16	0.09	0.21	0.06	0.01	0.24
2010	1.00	0.17	0.12	0.07	0.26	0.18	0.01	0.19
2016	1.00	0.15	0.12	0.06	0.27	0.24	0.01	0.15

Source raw data, authors own calculations: United Nations National Accounts Main Aggregates Database, https://unstats.un.org/unsd/snaama/selbasicFast.asp. China's data before 2005 is extrapolated from the aggregate group of ISIC C-E by the use of shares and growth rates.

In the below table 5 it is worth noting that the global share of manufacturing has not decreased over the past decades, as confirmed by Felipe and Mehta (2016). Sometimes the share within the regions has changed in unexpecting ways, such as within the developing regions of Latin America and Sub-Saharan Africa. From the table below, it becomes clear that they have deindustrialized even though it is well known that they have not yet reached a development level or income level at which that is expected. Asia and China have experienced as a region industrialization which is also potentially a strong explanation for the high economic growth rates in this region. At the same time, it can be observed that within the developed regions deindustrialization has taken place as well, in line with the theory of the inverse U-shaped curve regarding manufacturing value added in relationship with national income (Lawrence & Edwards, 2013; McKinsey Global Institute, 2012). The next step is to look if the

deindustrialization trend has been more rapid in certain periods of time in order to move on to the consideration of underlying causes.

Table 5. Manufacturing Value Added as a share of GDP

	World	USA	Western Europe	Latin America and Caribbean	Asia (ex. China)	China	Sub-Saharan Africa
Manufacturing value added (MVA) as share of GDP							
1970	0.16	0.15	0.19	0.17	0.16	0.02	0.13
1980	0.15	0.13	0.18	0.17	0.16	0.04	0.14
1990	0.15	0.12	0.17	0.16	0.18	0.08	0.13
2000	0.14	0.13	0.15	0.16	0.18	0.20	0.11
2010	0.16	0.12	0.15	0.14	0.32	0.32	0.09
2016	0.16	0.11	0.16	0.13	0.35	0.31	0.10

Source raw data, authors own calculations: United Nations National Accounts Main Aggregates Database, https://unstats.un.org/unsd/snaama/selbasicFast.asp. China's data before 2005 is extrapolated from the aggregate group of ISIC C-E by the use of shares and growth rates.

5.1.2 MANUFACTURING TRENDS OVER TIME

In order to see if deindustrialization has taken place more rapidly in certain decades the baseline regression as outlined in equation 1 is carried out. This first column of table 6 presents the results of the full sample regression with clustered standard errors by country in order to correct for heteroskedasticity and serial correlation. The most interesting aspect is the significant negative trend over time on manufacturing employment share. On average a country in this sample had 7 percentage points lower manufacturing employment share after 2000 compared to the 1960s. The countries even had on average 4 percentage points (0.0713-0.0306) lower manufacturing employment share after 2000 compared to 1980. It may therefore be said that there is a steady decrease for the manufacturing employment share within countries on average over time. Expanding this analysis, the rest of the columns of table 6 show the results for the different regions.[1]

It is expected that developed economies have on average 8.7 percentage points less manufacturing employment in the period after 2000 compared to the period before 1970. The unexpected result is the similar path Latin America as a region has followed. On average countries in this sample in Latin America have almost 10 percentage point lower manufacturing employment share as part of total after 2000 compared to the period before 1970. This is worrisome as mentioned before the level of industrialization is still thought of as a crucial

[1] Note the small number of countries in the breakdown per region potentially reducing the statistical power. Egypt and Morocco do not fit within any region and are therefore excluded from the region level estimations.

engine to growth. Moreover, considering the Sub-Saharan Africa regional group it makes a difference if the high manufacturer exporter Mauritius is included or not (Rodrik, 2016). When Mauritius is excluded, the other countries in the region on average show a heavy loss of 3.5 percentage point after 2000 compared to 1960. This is very worrisome as most of the countries in the sample for this region are still in the earlier phases of development and really poor (average of $3449 US 2010-dollar GDP per capita).

Lastly, considering the Asian results it can be concluded that, as the period dummies do not appear significant, the trend in manufacturing employment share is most likely explained by the income trend captured by GDP. Overall, the evidence that Asia did quite well, the impact of the inclusion or exclusion of heavy exporter Mauritius has on the results, suggest that the results are most likely linked to the comparative advantage theory (Rodrik, 2016). The patterns observed in above tables seem to be linked with globalization as manufacturing value added has shifted regions, and the regions that deindustrialized seem worse off in the past decades. It might be the case that strong manufacturing countries have avoided deindustrialization whereas others have suffered. One observation is quite clear, the strong performances of the Asian region in this sample is most likely offset against a decline and large loss in other developing countries. This is due to the observation that the developed region has not suffered as much compared to Latin America and Africa.

Continuing the quest to better understand the trend at hand and the potential underlying causes it is of interest to decompose the changes observed in manufacturing employment into different components. It might become clear what a potential mechanism is behind the well performing Asian region or maybe the less performing Latin America region.

Table 6. Dependent variable manufacturing employment share of total; per region baseline regression

VARIABLES	All Countries	Developed countries	Latin America	Asia	Sub-Saharan Africa	Sub-Saharan Africa excl. Mauritius
log Population	0.0913	-0.389	0.112	0.292	0.0462	0.0940
	(0.0720)	(0.682)	(0.0747)	(0.208)	(0.0848)	(0.0787)
log Population^2	-0.00166	0.0156	-0.00187	-0.0144	-0.00160	-0.00225
	(0.00390)	(0.0227)	(0.00444)	(0.00871)	(0.00431)	(0.00412)
log Real GDP per capita	0.508***	1.270***	1.186**	0.746***	-0.0843	-0.159*
	(0.126)	(0.183)	(0.364)	(0.208)	(0.145)	(0.0776)
log Real GDP per capita^2	-0.0278***	-0.0639***	-0.0648**	-0.0401***	0.00643	0.0101*
	(0.00738)	(0.0104)	(0.0203)	(0.0116)	(0.00832)	(0.00492)
period1970	-0.0134	-0.0156*	-0.0220	0.000523	-0.00140	-0.00194
	(0.00923)	(0.00715)	(0.0123)	(0.0131)	(0.00753)	(0.00741)
period1980	-0.0306*	-0.0480***	-0.0497*	-0.00362	-9.48e-05	-0.0191
	(0.0154)	(0.0128)	(0.0223)	(0.0211)	(0.0180)	(0.0125)
period1990	-0.0459**	-0.0695***	-0.0659*	-0.0180	-0.000482	-0.0330*
	(0.0189)	(0.0169)	(0.0308)	(0.0320)	(0.0279)	(0.0148)
period2000	-0.0713***	-0.0872***	-0.0995**	-0.0390	-0.00489	-0.0353*
	(0.0236)	(0.0239)	(0.0361)	(0.0393)	(0.0254)	(0.0161)
Constant	-2.857***	-3.711	-6.142**	-4.661**	0.0464	0.00246
	(0.688)	(4.592)	(1.880)	(1.736)	(0.573)	(0.512)
Observations	1,933	408	459	447	517	475
R-squared	0.443	0.863	0.467	0.382	0.214	0.327
Number of countries	40	8	9	10	11	10
Country FE	YES	YES	YES	YES	YES	YES

Note: Clustered Robust Standard Errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Take caution with result interpretation due to small number of countries in breakdown.

5.1.3 Decomposition of Changes in Manufacturing Employment Shares

After constructing the different identities using employment share in thousands of persons and the value added in constant 2010 US dollars (after initial transformation) it is possible to decompose the change in manufacturing employment share into three effects. The weighted averages, based on absolute total employment in thousands of persons, for the four subgroups are presented in figure 5 – 8. The individual breakdown of the composition per country can be found in appendix 7.

The labor intensity effect indicates the change in productivity as an inverse, meaning that a negative labor-intensive effect implies a more productive manufacturing sector. The sector share effect relates to the effect of the share of manufacturing value added as part of total value added, implying that a negative effect is a shrinkage in the manufacturing sector in value added. Lastly, the aggregate labor productivity effect refers to the overall productivity level increase or decrease in the economy (including the manufacturing sector) measured by value added output and employment in persons. There are several takeaways possible from the below outlined figures (figures 5-8) and three striking ones are outlined below.

First, deindustrialization is often defined as the change in manufacturing employment share of total employment yet there is more to the story. The change in employment share could be also due to a decrease in labor intensity in the manufacturing sector in other words an increase in productivity in this sector. This is the case for the weighted average, based on total employment in thousands of persons, for the Asian countries in the first period 1980-1990 (figure 6) which could refer to the increase of technology used in the sector. In the second period 1990-2000 a similar trend can be observed in Asia, yet it is interesting to note that a country such as Hong Kong experiences a small decrease in labor intensity and at the same time a large loss in the sector share effect implying that the manufacturing sector added value shrank and is a strong cause for the employment decline (see appendix). For other countries such as Malaysia it is potentially problematic that in the period 2000-2010 the sector share effect is negatively large even though it is compared with a productivity increase in the manufacturing sector. Malaysia in terms of income level should basing on theory not experience large losses in sector share therefore this might be damaging for economic growth prospects.

Secondly, the difference in experience of decomposition between Asia and Latin America and Africa is remarkable. On average the African countries experience a positive effect of labor intensity in all three periods which is a negative effect for growth, combined with a strong negative sector share effect. A decrease in productivity and sector share at the level of development these countries are is potentially very harmful for future growth paths. Countries such as Ghana and South Africa should be aware of their declining sector share of manufacturing regarding their national income level. In Latin America the declining sector share and little increase in manufacturing productivity is in contrast to the increases Asia experienced. The differences between the decomposition of Asia and Latin America and the magnitude of the effects are most likely not unrelated to the different economic growth experience of these regions in the past decades (Tregenna, 2011).

Lastly, noting that the decline in manufacturing employment share may be driven by either one of the three effects leads to the idea that each effect has a different impact on economic growth. A decline in employment share dominated by the labor intensity effect might question the appropriateness of calling it deindustrialization (Tregenna, 2011). Especially in the case of for example Korea which experiences a decline of 7 percentage point in employment in the period 1990-2000 and yet the sector share has increased by more than 2%. The decline in employment is therefore mainly driven by the decrease in labor intensity (i.e. the sector become much more productive!). On the other hand, if the share of manufacturing is linked to mainly the decline in manufacturing sector share as a share of total GDP it is a different case. This could imply that an economy is losing the growth pulling effects of industrialization and in need of finding a different growth engine (Tregenna, 2011).

Overall, the decomposition showcases the heterogeneity in the experiences of developing countries 'deindustrializing'. It is important to become aware of the mechanisms behind the fall in manufacturing employment if this is the denotation of deindustrialization. Some of the countries might be defined as deindustrializing countries whilst they are not in danger of missing out on growth pulling effects as productivity is increasing, and sector share is moving positively as well. On the other hand, this decomposition shows the danger the Sub-Saharan African countries are in and the need to create a deeper understanding of the mechanisms behind the decline in manufacturing employment share.

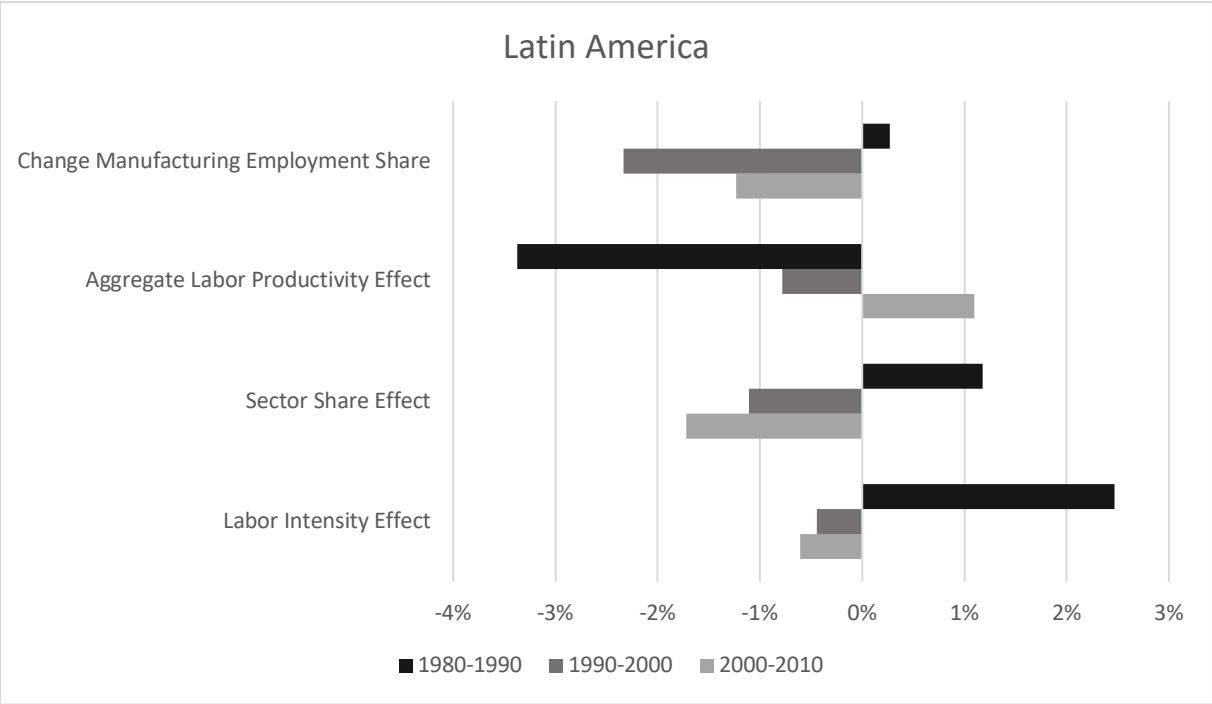

Figure 5. Decomposition of manufacturing employment share of total employment for the weighted average for the region of Latin America, period 1980-1990, 1990-2000, and 2000-2010.

Figure 6. Decomposition of manufacturing employment share of total employment for the weighted average of the region of Asia, period 1980-1990, 1990-2000, and 2000-2010.

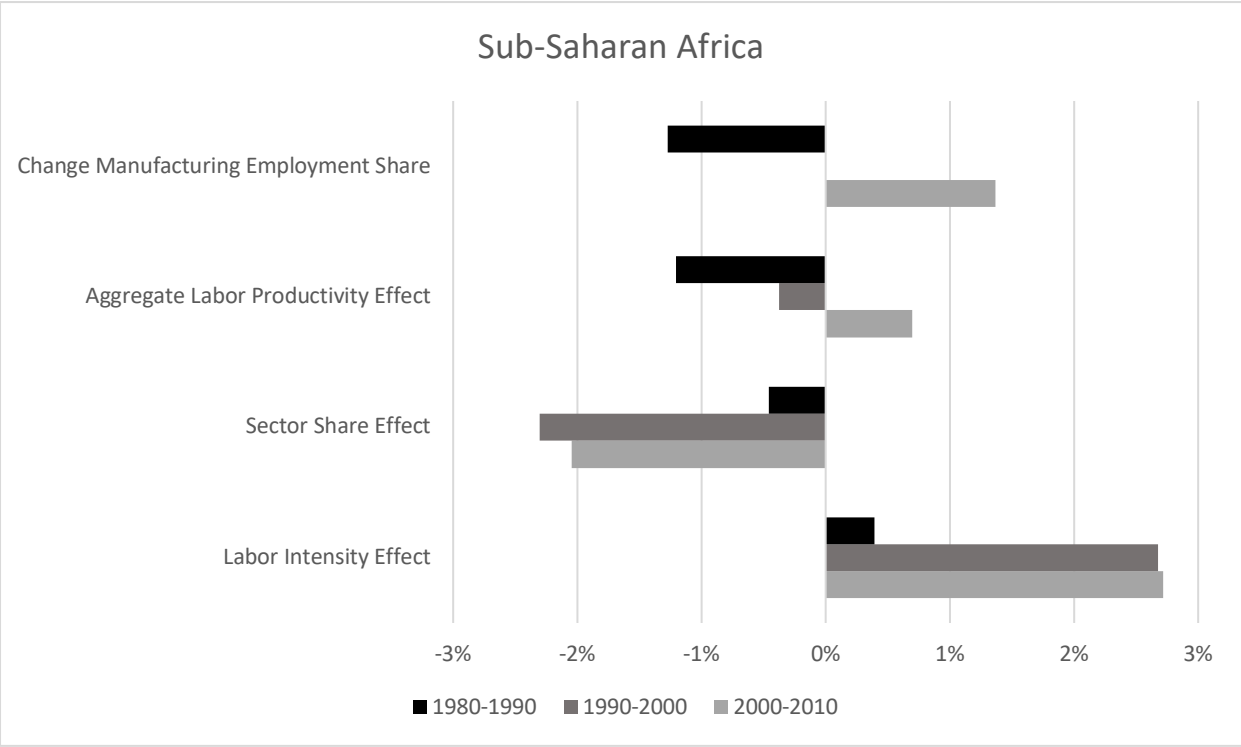

Figure 7. Decomposition of manufacturing employment share of total employment for the weighted average of the region of Sub-Saharan Africa, period 1980-1990, 1990-2000, and 2000-2010.

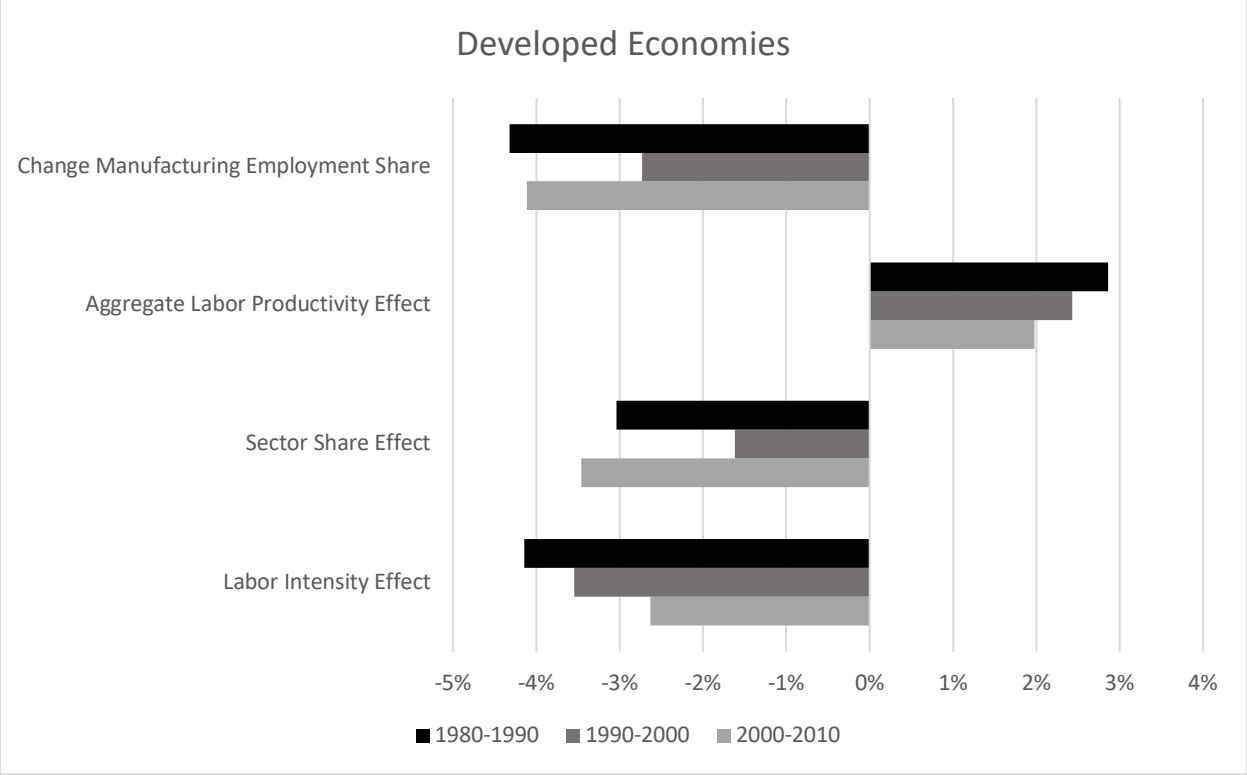

Figure 8. Decomposition of manufacturing employment share of total employment for the weighted average of the developed countries, period 1980-1990, 1990-2000, and 2000-2010.

5.2 Underlying Cause Analysis

After realizing that manufacturing employment share has manifested unexpected among developing and developed economies in relation to conventional theory it is of interest to take a closer look into a potential cause for the declining trend of industrialization. The relationship between globalization and industrialization has been examined in earlier sections and based on traditional theory one expects a positive relation between the increase of globalization and the expansion of the manufacturing employment share of total employment. There is however also the suspicion that globalization might negatively influence developing countries these days in their process of development.

Starting with the base line model we obtain the following results as presented in table 7. In column one the bare bone model with the simple controls for population and income trends (as represented by log of population, log of real GDP per capita and the quadratic term log real GDP per capita) and the use of the KOF Globalization index is presented. In column two the same regression is executed but using the CSGR overall globalization variable. Both specifications do not yield statistically significant results as the overall globalization index might be too broad and not capturing the correlation with manufacturing employment share and globalization. One improvement tested for is entering the globalization variable with a lag in order to capture more realistic the potential impact of changes in globalization exposure on manufacturing employment. It is not certain that a change in globalization exposure influences manufacturing share in the exact same year, as logically one might expect a delay in the effect. Again, both the lagged KOF and CSGR do not show statistical significance, yet they do appear to have a constant positive sign.

In order to create more insight into the relationship between globalization and industrialization it is a useful exercise to consider the three types of globalization as separate effects. In table 7 model 5 and 6 show the results for the KOF and CSGR breakdown. Interestingly the KOF coefficients stay statistically insignificant whilst the CSGR economic and social globalization effects show up significant at the 1% and 5% level. This may be due to the differences in variable construction and method of controlling for country characteristics between the two indices. It is noteworthy that the results using the CSGR Globalization index suggest that there is support for a positive relationship between economic globalization and the increase in manufacturing employment share. The interpretation of the coefficients is as follows; a 10-

point increase in economic globalization (on a range from 0-100) implies a 3.9 percentage point increase in manufacturing employment share on average for this sample. Suggesting support for the idea of a positive relationship between manufacturing employment share and the level of economic globalization. Whilst the social globalization index appears to be negative and implying a negative relationship between social globalization and manufacturing employment, although the effect is relatively small (a 10-point increase in social index leads to 0.5 percent point decrease in manufacturing employment).

There are a few differences between the KOF Globalization and CSGR Globalization regression which may be reasons for the differences in statistical significance between the two. First, the number of countries in the sample. In the KOF Globalization all 40 countries from the previous sample are included. In the CSGR index there is no sufficient data for Tanzania, Botswana, Ghana, Ethiopia and Hong Kong, leading to 35 countries in the sample. Second, the time span is shorter as the CSGR runs from 1980 – 2004 instead of 1970 – 2010 in the KOF index. Third and probably most important the construction of the index. The main difference is the way of controlling for country characteristics during the process of constructing the index. The CSGR is known for the adjustment based on the method of Lockwood (2004) and has been recognized for their method of controlling for fixed country effect. They acknowledge that not controlling for this effect heavily influences the economic globalization index as country size and geographical location impact the economic outcome of policies implemented. The CSGR variables take into account globalization outcomes rather than policy whilst the KOF also includes policy measures on globalization. Furthermore, the KOF index only weighs the variables by GDP and might therefore still reflect a lot of country characteristics variances rather than globalization outcome variance.

Realizing that there is support for the idea that economic globalization may have a positive impact on manufacturing employment this paper delves further into the question at hand; how does globalization impact manufacturing employment in developing countries? In order to do so this paper continues using the CSGR globalization index in the coming models. Furthermore, the base model with the three spheres of globalization has been exposed to additional control variables such as institutional quality and real market potential. These controls do not alter the outcome of the model and give a sense of robustness for the base model which therefore will be used in further analysis.

Table 7. Impact of globalization on manufacturing employment share of total employment.

VARIABLES	(1) KOF Globalization	(2) CSGR Globalization	(3) KOF Globalization Lagged	(4) CSGR Globalization Lagged	(5) KOF Globalization Breakdown	(6) CSGR Globalization Breakdown
Overall Globalization KOF	0.00191					
	(0.00131)					
Overall Globalization CSGR		0.000299				
		(0.000363)				
Overall Globalization KOF (lagged one year)			0.00181			
			(0.00133)			
Overall Globalization CSGR (lagged one year)				0.000349		
				(0.000330)		
Economic Globalization KOF					0.000803	
					(0.000876)	
Social Globalization KOF					0.000479	
					(0.000701)	
Political Globalization KOF					0.000538*	
					(0.000286)	
Economic Globalization CSGR						0.00395***
						(0.00125)
Social Globalization CSGR						-0.000588**
						(0.000265)
Political Globalization CSGR						0.000226
						(0.000214)
Log Population	0.101***	0.135*	0.101***	0.129*	0.106***	0.120***
	(0.0287)	(0.0674)	(0.0292)	(0.0647)	(0.0278)	(0.0430)
Log Real GDP per capita	0.487***	0.612***	0.506***	0.630***	0.493***	0.333**
	(0.139)	(0.197)	(0.143)	(0.188)	(0.153)	(0.147)
Log Real GDP per capita^2	-0.0266***	-0.0320***	-0.0277***	-0.0332***	-0.0269***	-0.0166**
	(0.00866)	(0.0109)	(0.00898)	(0.0103)	(0.00928)	(0.00819)
Constant	-3.127***	-4.125***	-3.200***	-4.126***	-3.196***	-2.762***
	(0.440)	(0.854)	(0.455)	(0.836)	(0.604)	(0.459)
Observations	1,629	689	1,593	689	1,629	689
R-squared	0.479	0.483	0.480	0.485	0.479	0.590
Number of countries	40	35	40	35	40	35
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Clustered Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.

5.2.1 REGIONAL ANALYSIS ECONOMIC GLOBALIZATION

Finding a general positive relationship between economic globalization and manufacturing employment does not yet tell the story of the difference between developed and developing countries. In order to answer the question how globalization affects manufacturing employment in developing countries this paper introduces interaction variables between the different regions and the three spheres of globalization using the CSGR index. In order to not loose statistical significance interaction variables are used instead of splitting the sample into the different regions.

Table 8 shows the results for these regressions, using the same division in regions as before. Therefore, excluding Morocco and Egypt as they do not belong to the Sub-Saharan Africa region. There are a few noteworthy observations and implications from the below results. The most noteworthy is the result that the interaction effect with Sub-Saharan Africa is relatively largely negative for economic globalization. Implying that a 10 percent point increase in globalization in the African countries only leads to a 1.7 percentage point increase in manufacturing employment, whilst the global average is 3.9 percentage point as discussed before. This leads to the understanding that even though one would expect the African countries to gain the most from globalization, based on economic theory, they are profiting less in terms of growth in manufacturing employment share. Secondly, in contrast is the experience of the Asian countries which have a strong positive signed interaction coefficient with a value of 0.00347 leading to a total increase in manufacturing employment share of 5.2 percentage point when economic globalization increases by 10 points. This tells us that the Asian region has been benefitting relatively more than the global average from globalization regarding the increase in manufacturing employment share of total employment. Lastly, the interaction term of Latin America is not significant and therefore implies that there is no significant effect regarding the Latin America region and the global outcome.

Overall, it is interesting to note that again the African region appears to be the worst off in the case of benefitting from globalization and the Asian region has the largest positive effect. Moreover, these results are in line with the shift of manufacturing activities on a global scale, where the global share of the African region stayed very low and the Asian region has taken up a large part of the global share of manufacturing activity.

Table 8. Regional Dummies and Breakdown of Globalization

VARIABLES	Globalization Developed	Globalization Asia	Globalization Africa	Globalization Latin America
Economic Globalization CSGR	0.00395***	0.00173*	0.00464***	0.00410***
	(0.00127)	(0.000882)	(0.00147)	(0.00120)
Social Globalization CSGR	-0.00115***	-0.000343	-0.000546**	-0.000686**
	(0.000371)	(0.000295)	(0.000231)	(0.000272)
Political Globalization CSGR	0.000312	0.000102	4.89e-05	0.000108
	(0.000267)	(0.000222)	(0.000191)	(0.000248)
Economic Globalization CSGR * Developed	-0.000179			
	(0.00248)			
Social Globalization CSGR * Developed	0.00103**			
	(0.000411)			
Political Globalization CSGR * Developed	-0.000383			
	(0.000373)			
Economic Globalization CSGR * Asia		0.00347*		
		(0.00187)		
Social Globalization CSGR * Asia		-0.000660*		
		(0.000358)		
Political Globalization CSGR * Asia		0.000330		
		(0.000442)		
Economic Globalization CSGR * SSA			-0.00296*	
			(0.00169)	
Social Globalization CSGR * SSA			-0.00172	
			(0.00183)	
Political Globalization CSGR * SSA			0.00118	
			(0.000709)	
Economic Globalization CSGR * Latin America				-0.00321
				(0.00223)
Social Globalization CSGR * Latin America				-0.00147***
				(0.000488)
Political Globalization CSGR * Latin America				-0.000418
				(0.000410)
Log Population	0.151**	0.128***	0.0989**	0.131***
	(0.0607)	(0.0457)	(0.0370)	(0.0433)
Log Real GDP per capita	0.266*	0.224	0.346**	0.326**
	(0.145)	(0.151)	(0.129)	(0.146)
Log Real GDP per capita^2	-0.0124	-0.0110	-0.0172**	-0.0164*
	(0.00813)	(0.00822)	(0.00733)	(0.00822)
Constant	-2.826***	-2.312***	-2.627***	-2.824***
	(0.693)	(0.601)	(0.456)	(0.464)
Observations	689	689	689	689
R-squared	0.621	0.621	0.612	0.630
Number of countries	35	35	35	35
Country FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Clustered Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.2.2 Five Year Periods and Globalization

As a form of a robustness check it is useful to examine if the results change when considering period averages and lagged period averages. It is not necessarily expected that the effect of globalization on manufacturing employment share is in effect in the same period or year. Testing if the lagged values show a similar trend as in period trends adds evidence that the impact might be there. Secondly, averaging over a five-year period limits the chances of having results being driven by measurement errors or annual fluctuations.

In table 9 results using the five-year average periods are displayed in column 1 and 2. In column 3 and 4 the five-year period average is entered as a lag. Therefore, the impact of (economic) globalization in period 1980-1984 is seen in a change in manufacturing employment share in period 1985-1989. It appears that the overall globalization index is not sensitive to the adjustment of five-year period average neither to the entrance as a lagged variable as it stays statistically insignificant. One of the reasons for this may be that it is imprecisely estimated and that the changes in manufacturing employment are not as much related to overall globalization. This might be interfered because when breaking down the overall globalization index into the three spheres the economic globalization effect in column 2 and 4 shows up significant. Similar to the year to year analysis the effect is positive. Remarkably is that the absolute effect is larger with both the normal period coefficient and the lagged value of economic globalization. A ten-point increase in economic globalization is suspected to be paired with a 5.3 percentage point increase in manufacturing employment share in the same period. The lagged value is slightly smaller, namely 4.4 percentage point but still larger than the 3.9 percentage point increase in the year to year analysis.

Overall, the year to year results are robust to an averaging over five-year period. In appendix 8 a similar table to table 9 can be found with the period taken as a ten-year average. The absolute values of the coefficients are in the same range as those provided in table 9. Noteworthy, is the observation that the coefficients of the period entered and lagged entered variable are almost similar in magnitude. Implying that the effect of globalization is not very sensitive to the lagged values and that the effect also shows up in year to year or period to period analysis.

Table 9. Averages of five-year periods and the globalization effect

VARIABLES	(1) Globalization Period	(2) Globalization Period Breakdown	(3) Globalization Period Lagged	(4) Globalization Period Breakdown Lagged
Overall Globalization CSGR	0.000301			
	(0.000481)			
Economic Globalization CSGR		0.00534***		
		(0.00141)		
Social Globalization CSGR		-0.000832***		
		(0.000301)		
Political Globalization CSGR		0.000246		
		(0.000263)		
Overall Globalization CSGR				
(Lagged one period)			0.000411	
			(0.000418)	
Economic Globalization CSGR				
(Lagged one period)				0.00436***
				(0.00126)
Social Globalization CSGR				
(Lagged one period)				-0.000548*
				(0.000313)
Political Globalization CSGR				
(Lagged one period)				0.000327
				(0.000272)
Log Population	0.120*	0.110***	0.114**	0.106***
	(0.0653)	(0.0365)	(0.0461)	(0.0298)
Log Real GDP per capita	0.679***	0.254*	0.676***	0.370***
	(0.211)	(0.147)	(0.132)	(0.118)
Log Real GDP per capita^2	-0.0354***	-0.0121	-0.0363***	-0.0195***
	(0.0117)	(0.00814)	(0.00726)	(0.00641)
Constant	-4.288***	-2.342***	-4.135***	-2.733***
	(0.930)	(0.513)	(0.668)	(0.465)
Observations	152	152	182	182
R-squared	0.539	0.668	0.612	0.696
Number of countries	35	35	35	35
Country FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Clustered Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.3 Robustness Checks

Throughout the analysis several robustness checks have already taken place in order to check whether the regressions results are robust to changes of model specifications and additional control variables.

The first robustness check is related to the choice of globalization index and shows that results are likely to be highly sensitive to the type of globalization index used. Theoretically the KOF globalization index is able to reflect globalization to a fuller extent compared to the CSGR index. However, the overall globalization index for both did not show up significant in the results as the relationship is more likely to be stronger between the manufacturing sector and economic globalization. When testing both the KOF and CSGR economic globalization index it became clear that the observation that they do not reflect the same trends (correlation of 0.531) is crucial to their usefulness in this paper's analysis. The CSGR index has a stronger control and adjustment method for country fixed effects which are highly relevant to economic globalization. The CSGR controls for geographical and demographical characteristics which are not taken into account in the KOF Globalization index. It might be the case that the KOF Globalization index in reality reflects more country differences than the trend of globalization. Nevertheless, the results with the CSGR index should be interpreted with caution as they may be sensitive to the use of another index as well.

Secondly, the distribution of the economic, social and political index might influence the results and to test for this the log of the index has been taken. The results of the baseline regression are robust to this adjustment as well as the signs and significance of the variables. Thirdly, as seen in the analysis above adding the lagged value of the variables does influence the absolute value but not the effect. The magnitude of the effect is still comparable with the year to year or period entry of the variables. Fourthly, it might be that certain countries influence the relationship heavily even though they are only very small, such as Mauritius, or a unique case due to the size of their economy and population such as China. In order to test if the relationship is robust to these factors the regressions are weighed based on total population of the countries in 1970. The results appear robust concerning the relationship and significance for the full sample. Considering the effect on the regional analysis most interaction variables become insignificant which might imply that certain countries heavily influence the earlier results. It is interesting to note in the appendix that the effect of globalization for Latin America

becomes negative when weighing by country population. This might indicate that large countries such as Brazil experience negative effects of globalization and that some smaller countries benefit from it regarding manufacturing employment.

Lastly, is the choice of manufacturing employment share as the dependent variable instead of manufacturing value added. The choice has been explained before, but in short, the objective of this paper is to give insights into the impact of globalization on industrialization in developing economies. In order to examine a potential cause for the premature deindustrialization trend we have detected. Deindustrialization has been defined as the divestment in the manufacturing sector and therefore related to the amount of people working in the sector in this case. It is obvious from the decomposition that there is always more to the story. It is not necessarily the case when employment goes down that the manufacturing sector plays less of a role in the economy. However, based on the first part of the analysis, using manufacturing value added as share of GDP, it does appear that deindustrialization can be observed in developing economies both using employment and value added. In order to check if the results are robust to the change of the dependent variable in the appendix the base line regression and the regional analysis are presented. Overall the results are robust in sign and estimation. There are however differences in the magnitude of the effect, yet this may be due to the fact that there are other causes also effecting the trend within manufacturing value added that are not accounted for in these basic regressions. The relationship between globalization and value added is different than the relationship between employment and globalization. Other aspects come into play for which are not controlled for. It is however reassuring that the results are robust as the positive effect of globalization holds whether considering employment or value added.

5.4 Discussion

This paper is focused on creating insights into the relationship between industrialization and globalization among developed and developing countries. It is a useful exercise as it creates a better understanding of a potential cause behind the premature deindustrialization trend visible in the data among developing countries. Based on previous research the importance of industrialization for economic growth has been emphasized (Clark, 1957; Kaldor 1966; 1967). It is therefore alarming that there is a deindustrialization trend occurring among developing economies, at a level of income and development that can undermine economic growth.

Based on the trend analysis of manufacturing in the last four decades it is suggested that in the first half the developed world is responsible for the production of manufacturing value added, whereas in the second half this is taken over by Asia and China. The alarming trend is that deindustrialization is occurring in Latin America and there is stagnation in the progress of Sub-Saharan Africa. These two regions are expected to increase their industrialization activities based on their level of development and the development theory related to the inverse U-shape of Clark (1957). Furthermore, is it even more worrisome that the same regions are experiencing declining manufacturing value added as share of their own GDP. This decline in MVA as share of GDP cannot be attributed to a global decline in MVA as the global level is still set at around 16% of total world GDP. There has been a clear shift in manufacturing activity and it has not benefitted the developing countries in Latin America and Sub-Saharan Africa. Asia and China on the other hand have experienced expected or arguably even more than expected growth in manufacturing sector activities. This could be brought forward as a potential source for the economic growth differences between Asia and the other developing regions.

Delving more into the trend of deindustrialization one take away is that for developing economies deindustrialization has occurred fastest in the period of 2000 – 2010. In the same period, it is thought of that globalization for developing economies increased with for example the opening up of China to world trade. This leaves the question what has caused the deindustrialization trend and one answer to that might be globalization. The expected relation between globalization and industrialization, for developing economies, is positive based on economic theory and a large body of earlier done research (Wood, 1995). Although based on the analysis done in this paper it might be expected that it is negative as globalization increases and deindustrialization trends are detected in both developed and developing economies. Decomposing the changes in manufacturing employment share does show that the trend of deindustrialization is not a clear-cut story. Several countries in Asia experience deindustrialization based on manufacturing employment but also experience an increase in manufacturing labor productivity. Leading to the implication that deindustrialization based on manufacturing employment share might not always be a negative story.

This paper explores the relation between globalization and industrialization and it is suggested that there is a positive relationship. This relationship is positive for both developed as well as developing economies. Leading to the assumption that the increase in globalization is most

likely not the source for the premature deindustrialization trend among developing economies. The absolute impact of globalization does differ among developing economies and offers an insight into the slow catching up observed among Sub-Saharan African countries regarding manufacturing employment. The absolute impact of globalization and the increase in manufacturing employment is the largest in Asia, well above the global average in this sample, whilst Sub-Saharan Africa experiences the least benefits from globalization. This trend implies that it is probably necessary for the African economies to find a different growth path that does not depend fully on the manufacturing sector.

Consequences of the shrinking of manufacturing employment are severe in developing economies. In Latin America it can be observed that the informal sector has grown, and that economy wide productivity has decreased (Rodrik, 2016). Moreover, in Africa the service sector is expanding, yet it is the less productive part of the service sector therefore not contributing to growth enhancing activities (Rodrik, 2016). Altogether, there are also political consequences of not having the security of industrialization as experienced by the West. The development of democracy has often been a product of labor movements which rises out of industrialization (Acemoglu and Robinson, 2009). The contribution of this paper suggests that even though developing economies experience growth as proven in Rodrik (2014) it is probably not driven by the traditional engine of growth. Industrialization most likely has not contributed as much to this growth as its share is declining, making it highly uncertain how sustainable the current growth is experienced by developing economies. Moreover, is the increase in globalization most likely not the primary source for this decline in manufacturing employment. Based on the relationship both theoretical and empirical is it expected that manufacturing employment increases over time if globalization increases. The results in table 7 and 8 suggest that the association between globalization and manufacturing employment is positive.

It is therefore crucial that future research looks into the potential source of the deindustrialization trend in developing economies. The pattern in developed economies can be attributed to the inverse U-shape and the maturing of the economy. They are also not necessarily in need of an expansion of their industrial sector. The developing economies are in need of understanding what is causing their industrial path to be cut short and what are potential mitigation strategies. Looking into the productivity argument made by Rowthorn and Well

(1987) and the technological progress argument made by Lawrence and Edwards (2013) might shed light into the black box of premature deindustrialization in developing economies. It is however still very much likely that globalization has a play in the deindustrialization trend as well. Based on Rodrik (2016) and the comparative advantage theorem some countries, as seen in the results, do experience a positive relationship between more globalization and industrialization. It might, however, also be that a country is importing deindustrialization, or importing manufacturing goods if they did not have a comparative advantage, these trends or mechanisms are difficult to detect on the aggregate regional level this paper is working with.

Overall, this paper aimed at offering insights into a black box which has not been opened many times before. The awareness regarding premature deindustrialization in developing countries is relatively new. Not many have attempted to empirically show what a potential cause might be, yet this would offer policy makers the needed insights in order to draw up mitigation strategies. Globalization in this sample based on a relatively small number of countries does not offer the explanation for the declining trend in manufacturing employment. It does offer some insights in the differences among the developing countries and regions. It shows clearly that Latin America and Sub-Saharan Africa are facing a different reality than Asia and are not profiting as much from globalization as they should be. For these regions it would be beneficial to either understand what is causing the decline in their manufacturing employment or to find a strategy allowing them to benefit from globalization rather than get hurt by it.

6. CONCLUSION

In order to prepare ourselves for the future we try to understand history and learn from the experiences in the past. It is known that current developed economies have benefitted greatly from industrialization in order to generate sustainable economic growth. Based on theory if conditions are met developing economies could have similar experiences. This however is not the case as either conditions are not met or because other factors have altered the playing field. In both developed and developing economies a decline in manufacturing employment share of total employment is visible. This is an alarming trend for developing economies; as developing economies are expected to increase their manufacturing and industrialization sector based on historical experiences in order to generate economic growth.

6.1 Main Results

This paper focusses on this trend and fills in the gap in the literature by going one step further, by taking one step back, and generates insights into the relationship between globalization and industrialization in developed and developing economies. This paper aims at going beyond the theoretical speculations offered up until now concerning the causes of the novel concept of premature deindustrialization in developing economies. It does so by creating insights into the following question:

What is the relationship between globalization and industrialization and does the relationship differ for developed and developing economies?

Globalization, is hard to define, yet no matter how it is defined the consensus in general is that it has increased in the past decades. Economies are more interconnected, and the world market is the playing field for most economies. As the data analysis in this paper suggests manufacturing employment is decreasing in both developed as developing economies and globalization has risen. Theoretically and based on historical lessons it is expected that globalization has a positive relation with industrialization. There are however also researchers such as Rodrik (2016) who speculate that this relation might be negative. Analyzing the data on industrialization and globalization in depth yield some interesting findings.

First, there are significant regional differences among developing regions regarding the evolution of the manufacturing sector. Asia has increased its share both on a global level as well as a share of its own GDP. In contrast Latin America is strongly deindustrializing and Sub-Saharan Africa has experienced stagnation of progress at one percent MVA of total GDP. Furthermore, are the mechanisms behind the changes in manufacturing employment different among the regions. Again, Asia does experience a decline in manufacturing yet also an increase in labor productivity, calling into question if their experience can be coined as deindustrialization. On the other hand, Latin America and Africa experience a large decrease in sector share and an increase in labor intensity. All of these trends indicate the need to be worried about Latin America and Sub-Saharan Africa and show that potentially the positive experience of Asia might be offset by the experience in Latin America and Africa.

Second, the impact of globalization, as a potential cause behind the deindustrialization trend, on manufacturing employment is suggested to be positive in our sample. Implying that an increase in globalization leads to a higher employment level in the manufacturing sector. This is in line with many theoretical arguments yet when taking a closer look a few interesting insights can be generated. The main insight is that Sub-Saharan Africa benefits the least from globalization and does not manage to gain as much from economic globalization compared to regions such as Asia. This is bothersome as it this region that needs it the most in order to generate sustainable economic growth. Moreover, Asia experiences a highly positive impact of globalization and well above the global average. This might be a reason for their extraordinary growth experience in the past decades. Overall, the relation between globalization and industrialization appears to be positive and it appears to not differ in sign but in magnitude among regions.

6.2 Limitations and Future Research

Despite the cautious taken approach regarding the data, the reasoned methodology and robustness checks this study is still subject to several caveats, which deserve attention. First, the results rely on the accuracy of the data used and the construction of the globalization index. The harmonization across different countries regarding the manufacturing data is crucial and the use of data from developing countries always needs a cautious approach. Secondly, the globalization indices used show different results and emphasize the sensitivity of results in relation to the type of globalization index. As said before it would be most beneficial to use exogenous variety of globalization, yet this is hard to collect and find for a large set of developing economies. Thirdly, being able to control for country characteristics is still a difficult task. Even though the CSGR globalization index implements an advanced method, in the overall analysis it becomes difficult to separate country difference effects and globalization effects in the sample. Fourthly, the sample of developing countries in this study is a relatively small sample and could improve from the inclusion of more developing countries. This will include more variety among the countries in the sample, generating more robust results. The same limitation applies to the time period. Even though the paper is able to include a reasonable number of years, the most recent trends are not included. The CSGR globalization index allows an analysis based on 1970 – 2004 which leaves out the last decade in which a large effect of globalization may be expected. The paper could improve if both manufacturing and globalization data would be available for the more recent decade as well.

This leads to the identification of future research areas. In order to design adequate policies, it is important to do a follow-up study with more current data. It is beneficial to test the relation between globalization and industrialization in the past decade as this might show different results than the historical relation. Furthermore, is it useful to focus on other potential causes of deindustrialization and research the relation and mechanisms. The arguments of technological improvements and productivity might be able to shed more light into the black box. In light of the renowned research of Autor et al. it is worth attempting a similar study regarding a developing country, where globalization can be modeled exogenously. The economic impact of globalization will for a long time be a large black box which we should attempt to understand piece by piece. It is a useful exercise to understand why the trend of industrialization is acting differently than expected, based on history, in developing economies as it can be crucial for their economic growth paths.

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APPENDICES

APPENDIX 1 – COVERAGE OF GGDC 10 SECTOR DATABASE

Acronym	Country	Value Added in current prices	Value Added in constant prices	Employment by sector
		Sub-Saharan Africa		
BWA	Botswana	1964-2010	1964-2010	1964-2010
ETH	Ethiopia	1961-2010	1961-2010	1961-2010
GHA	Ghana	1960-2010	1960-2010	1960-2010
KEN	Kenya	1960-2010	1964-2010	1969-2010
MWI	Malawi	1960-2010	1966-2010	1966-2010
MUS	Mauritius	1960-2010	1970-2010	1970-2010
NGA	Nigeria	1960-2010	1960-2010	1960-2011
SEN	Senegal	1960-2010	1970-2010	1970-2010
ZAF	South Africa	1960-2010	1960-2010	1960-2010
TZA	Tanzania	1960-2010	1960-2010	1960-2010
ZMB	Zambia	1960-2010	1965-2010	1965-2010
		North Africa		
EGY	Egypt	1960-2013	1960-2012	1960-2012
MOR	Morocco	1970-2012	1960-2012	1960-2012
Asia				
CHN	China	1952-2011	1952-2010	1952-2011
HKG	Hong Kong	1970-2011	1974-2011	1974-2011
IND	India	1950-2012	1950-2012	1960-2010
IDN	Indonesia	1966-2012	1960-2012	1961-2012
JPN	Japan	1953-2011	1953-2011	1953-2012
KOR	South Korea	1953-2011	1953-2011	1963-2011
MYS	Malaysia	1970-2011	1970-2011	1975-2011
PHL	Philippines	1971-2012	1971-2012	1971-2012
SGP	Singapore	1970-2012	1960-2012	1970-2011
THA	Thailand	1951-2011	1951-2011	1960-2011
		Latin America		
ARG	Argentina	1950-2011	1950-2011	1950-2011
BOL	Bolivia	1958-2011	1950-2011	1950-2010
BRA	Brazil	1990-2011	1950-2011	1950-2011
CHL	Chile	1950-2011	1950-2011	1950-2012
COL	Colombia	1950-2011	1950-2011	1950-2010
CRI	Costa Rica	1950-2011	1950-2011	1950-2011
MEX	Mexico	1950-2011	1950-2011	1950-2012
PER	Peru	1950-2011	1950-2011	1960-2011
VEN	Venezuela	1960-2012	1950-2012	1950-2011

		North America		
USA	United States of America	1947-2010	1947-2010	1950-2010
		Europe		
DNK	Denmark	1970-2011	1947-2009	1948-2011
ESP	Spain	1970-2011	1947-2009	1950-2011
FRA	France	1970-2011	1950-2009	1950-2011
GBR	United Kingdom	1960-2011	1949-2009	1948-2011
ITA	Italy	1970-2011	1951-2009	1951-2011
NLD	The Netherlands	1970-2011	1949-2009	1950-2011
SWE	Sweden	1970-2011	1950-2009	1950-2011

Source: Timmer, M. P., de Vries, G. J., & de Vries, K. (2015). "Patterns of Structural Change in Developing Countries". In Routledge Handbook of Industry and Development, (eds.) J. Weiss, & M. Tribe, Routledge, pp. 65-83.

APPENDIX 2 – INDICATORS INCLUDED IN KOF GLOBALIZATION 2018

Indices and Variables	*Sources*	*Definitions*
Economic Globalization (KOFEcGI)		
Economic Globalization, de facto (KOFEcGIdf)		
Trade Globalization, de facto (KOFTrGIdf)		
Trade in goods	World Bank WDI (2017)	Sum of exports and imports in goods as share of GDP.
Trade in services	World Bank WDI (2017)	Sum of exports and imports in services as share of GDP.
Trade partner diversification	Own calculations based on IMF DOTS (2017)	Herfindahl-Hirschman concentration index for trade in goods. Constructed as the average of the sum of squares of trade partner shares in total exports and imports (inverted)
Financial Globalization, de facto (KOFFiGIdf)		
Foreign direct investment	IMF IIP (2017) / historical data from EWN	Sum of stocks of assets and liabilities of foreign direct investments (% of GDP).
Portfolio investment	IMF IIP (2017) / historical data from EWN	Sum of stocks of assets and liabilities of international equity portfolio investments (% of GDP).
International debt	IMF IIP (2017) / historical data from EWN	Sum of inward and outward stocks of international portfolio debt securities and international bank loans and deposits (% of GDP)
International reserves	IMF IIP (2017) / historical data from EWN	Includes foreign exchange, SDR holdings and reserve position in the IMF (% of GDP)
International income payments	IMF IIP (2017) / historical data from EWN	Sum of capital and labor income to foreign nationals and from abroad (% of GDP)
Economic Globalization, de jure (KOFEcGIdj)		
Trade Globalization, de jure (KOFTrGIdj)		
Trade regulations	Gwartney et al. (2017)	Average of two subcomponents: Prevalence of non-tariff trade barriers and compliance costs of importing and exporting.
Trade taxes	World Bank WDI (2017)	Income from taxes on international trade as percentage of revenue (inverted).
Tariffs	Gwartney et al. (2017)	Unweighted mean of tariff rates.
Financial Globalization, de jure (KOFFiGIdj)		
Investment restrictions	Gwartney et al. (2017)	Prevalence of foreign ownership and regulations to international capital flows.
Capital Account Openness 1	Chinn, Ito (2017)	Chinn-Ito index of financial openness.
Capital Account Openness 2	Jahan, Wang (2016)	Jahan-Wang index of openness of the capital account.

Social Globalization (KOFSoGI)

Social Globalization, de facto (KOFSoGIdf)

Interpersonal Globalization, de facto (KOFIpGIdf)

International voice traffic	ITU (2017)	Sum of international incoming and outgoing fixed and mobile telephone traffic in minutes per capita.
Transfers	World Bank WDI (2017)	Sum of gross inflows and outflows of goods, services, income or financial items without a quid pro quo per capita.
International Tourism	World Bank WDI (2017)	Sum of arrivals and departures of international tourists as a share of population.
Migration	World Bank WDI (2017)	Number of foreign or foreign-born residents as percentage of total population.

Informational Globalization, de facto (KOFInGIdf)

Patent Application	Own calculations based on World Bank WDI (2017)	Patent applications by non-residents filed through the Patent Cooperation Treaty procedure or with a national patent office (stocks as % of population)
International Students	UNESCO (2017)	Sum of inbound and outbound number of tertiary students (% of population)
High Technology Exports	World Bank WDI (2017)	Exports of products with high R&D intensity as share of total merchandise exports.

Cultural Globalization, de facto (KOFCuGIdf)

Trade in Cultural Goods	UN Comtrade (2017)	Sum of exports and imports of cultural goods as defined in UNESCO (2009).
Trademark Applications	World Bank WDI (2017)	Applications to register a trademark with a national or regional Intellectual Property (IP) office by non-residents in percent of all applications.
Trade in Personal Services	IMF BOPS (2017)	Sum of exports and imports in personal services.
McDonald's restaurant	Various Sources	Number of McDonald's restaurants (per capita).
IKEA stores	IKEA	Number of IKEA stores (per capita)

Social Globalization, de jure (KOFSoGIdj)

Interpersonal Globalization, de jure (KOFIpGIdj)

Telephone subscriptions	World Bank WDI (2017)	Fixed telephone and mobile subscriptions as percentage of population.
Freedom to visit	Gwartney et al. (2017)	Percentage of countries for which a country requires a visa from foreign visitors.
International airports	ICAO (2017)	Number of airports that offers at least one international flight connection (per capita).

Informational Globalization, de jure (KOFInGIdj)

Television	World Bank WDI (2017)	Share of households with a television set.

Internet user	World Bank WDI (2017)	Individuals using the internet (as % of population). Internet users are individuals who have used the internet in the last three months.
Press freedom	Gwartney et al. (2017)	Numerical scores evaluating the legal environment for the media, political pressure that influence reporting and economic factor that affect access to news and information.
Internet bandwidth	ITU (2017	Total used capacity of international internet bandwidth in bits per second per capita.
Cultural Globalization, de jure (KOFCuGIdj)		
Gender parity	UNESCO (2017)	Ratio of girls to boys enrolled in primary education level in public and private schools.
Expenditure on education	UNESCO (2017)	General government expenditure on education (current, capital and transfers) per capita.
Civil freedom	Gwartney et al. (2017)	Quantification of aspects on freedom of expression and belief, associational and organizational rights, rule of law and personal autonomy and individual rights.
Political Globalization (KOFPoGI)		
Political Globalization, de facto (KOFPoGIdf)		
Embassies	Europe World Yearbook (various years)	Absolute number of embassies in a country.
UN peace keeping missions	Department of Peacekeeping Operations, UN	Personnel contributed to U.N. Security Council Missions per capita.
International NGO	Union of International Association (various years)	Number of international oriented nongovernmental organizations (NGO) with members in that country or territory.
Political Globalization, de jure (KOFPoGIdj)		
International Organizations	CIA World Factbook (various years).	Number of international inter-governmental organizations in which a country is member.
International treaties	United Nations Treaty Collection.	International treaties signed between two or more states and ratified by the highest legislative body of each country since 1945.
Number of partners in investment treaties	UNCTAD (2017)	Number of distinct treaty partners of a country with bilateral investment treaties.

Source: Gygli, S., Haelg, F. & Sturm, J.-E. (2018). The KOF Globalization Index – Revisited, Working Paper, No. 439, KOF Swiss Economic Institute, ETH Zurich, Available Online: https://www.research-collection.ethz.ch/handle/20.500.11850/238666

APPENDIX 3 – INDICATORS INCLUDED IN CSGR GLOBALIZATION INDEX

Indices and Variables	*Sources*	*Definitions*
Economic Globalization (ECOCSGR)		
Trade	World Bank WDI (2017)	Exports plus imports of goods and services as a proportion of GDP
Foreign Direct Investment	World Bank WDI (2017	Inflows plus outflows of foreign direct investment as a proportion of GDP
Portfolio Investment	IMF IFS (2017)	Inflows plus outflows of portfolio investments as a proportion of GDP
Income	World Bank WDI (2017	Employee compensation paid to non-resident workers and investment income from foreign assets owned by domestic residents plus employee compensation paid to resident workers working abroad and investment income from domestic assets owned by foreign residents, as a proportion of GDP
Social Globalization (SOCSGR)		
Foreign Stock	World Bank WDI (2017)	Stock of foreign population as proportion of total population.
Foreign Flow	World Bank WDI (2017)	Inflows of foreign population as proportion of total population.
Worker Remittances	World Bank WDI (2017)	Worker remittances (receipts) as a proportion of GDP
Tourist	World Bank WDI (2017)	Number of tourists (arrivals plus departures) as proportion of total population
Phone calls	ITU (2017)	International outgoing telephone traffic (minutes) per capita.
Internet users	ITU (2017)	Internet users as a percentage of population
Films	ICAO (2017)	Number of films imported and exported.
Books and newspapers	UNESCO 1999 Statistical Yearbook	Sum of value of books and newspapers imported and exported per capita (US dollars).
Mail	UNESCO 1999 Statistical Yearbook	Number of international letters delivered and sent per capita.
Political Globalization (POCSGR)		
Embassies	Europe World Yearbook (various years)	Absolute number of embassies in a country.
UN peace keeping missions	CIA World Factbooks various years and UN website	Number of UN peacekeeping operations in which country participates.
International NGO	CIA World Factbooks various years	Number of memberships of International organizations.

APPENDIX 4 – DETAILED DECOMPOSITION CHANGE IN MANUFACTURING EMPLOYMENT SHARE

Closely following the decomposition proposed for by Tregenna (2011) the following steps are taken as outlined in his paper.

$$\sigma_{ijt} = \frac{L_{ijt}}{L_{jt}} = \phi_{ijt} * \delta_{ijt} * \theta_{jt}.$$

Implying that $\Delta\sigma_{ij} = \phi_{ijt}\delta_{ijt}\theta_{jt} - \phi_{ijt-h}\delta_{ijt-h}\theta_{jt-h}$.

Which leads to the following three alternative formulations:

$$\Delta\sigma_{ij} = \phi_{ijt}\delta_{ijt}\theta_{jt} - \phi_{ijt-h}\delta_{ijt-h}\theta_{jt-h}$$

$$= (\phi_{ijt} - \phi_{ijt-h})\left(\frac{\delta_{ijt-h}\theta_{jt-h} + \delta_{ijt}\theta_{jt}}{2}\right) + (\delta_{ijt} - \delta_{ijt-h})\left(\frac{\theta_{jt-h} + \theta_{jt}}{2}\right)\left(\frac{\phi_{ijt-h} + \phi_{jt}}{2}\right) + (\theta_{jt-h}\theta_{jt})\left(\frac{\delta_{ijt-h} + \delta_{ijt}}{2}\right)\left(\frac{\phi_{ijt-h} + \phi_{jt}}{2}\right)$$

$$= (\phi_{ijt} - \phi_{ijt-h})\left(\frac{\delta_{ijt-h} + \delta_{ijt}}{2}\right)\left(\frac{\theta_{jt-h} + \theta_{jt}}{2}\right) + (\delta_{ijt} - \delta_{ijt-h})\left(\frac{\theta_{jt-h}\phi_{ijt-h} + \theta_{jt}\phi_{ijt}}{2}\right) + (\theta_{jt-h}\theta_{jt})\left(\frac{\delta_{ijt-h} + \delta_{ijt}}{2}\right)\left(\frac{\phi_{ijt-h}\phi_{jt}}{2}\right)$$

$$= (\phi_{ijt} - \phi_{ijt-h})\left(\frac{\delta_{ijt-h} + \delta_{ijt}}{2}\right)\left(\frac{\theta_{jt-h} + \theta_{jt}}{2}\right) + (\delta_{ijt} - \delta_{ijt-h})\left(\frac{\theta_{jt-h} + \theta_{jt}}{2}\right)\left(\frac{\phi_{ijt-h} + \phi_{ijt}}{2}\right) + (\theta_{jt-h}\theta_{jt})\left(\frac{\delta_{ijt-h}\phi_{ijt-h} + \delta_{ijt}\phi_{ijt}}{2}\right)$$

The first element of each formulation is the labor-intensity effect, the second element the sector share effect and the third element the aggregate labor-productivity effect. When taking the means from each effect in the three formulations the three effects sum up to the total change of employment share of manufacturing in total employment in period h.

Labor intensity effect $= \frac{1}{6}(\phi_{ijt} - \phi_{ijt-h})\{(\delta_{ijt-h}\theta_{jt-h} + \delta_{ijt}\theta_{jt}) + (\theta_{jt-h} + \theta_{jt})(\delta_{ijt-h} + \delta_{ijt})\}$

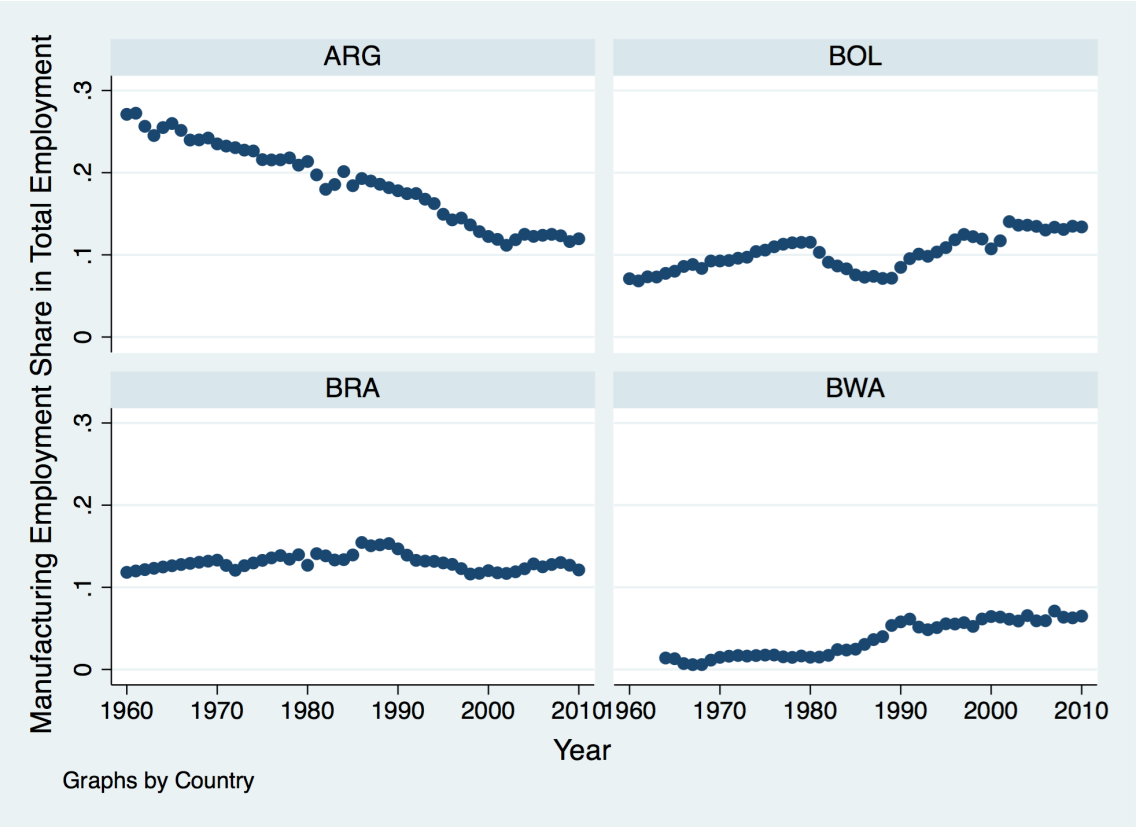
Sector share effect $= \frac{1}{6}(\delta_{ijt} - \delta_{ijt-h})\{(\theta_{jt-h}\phi_{ijt-h} + \theta_{jt}\phi_{ijt}) + (\theta_{jt-h} + \theta_{jt})(\phi_{ijt-h} + \phi_{ijt})\}$

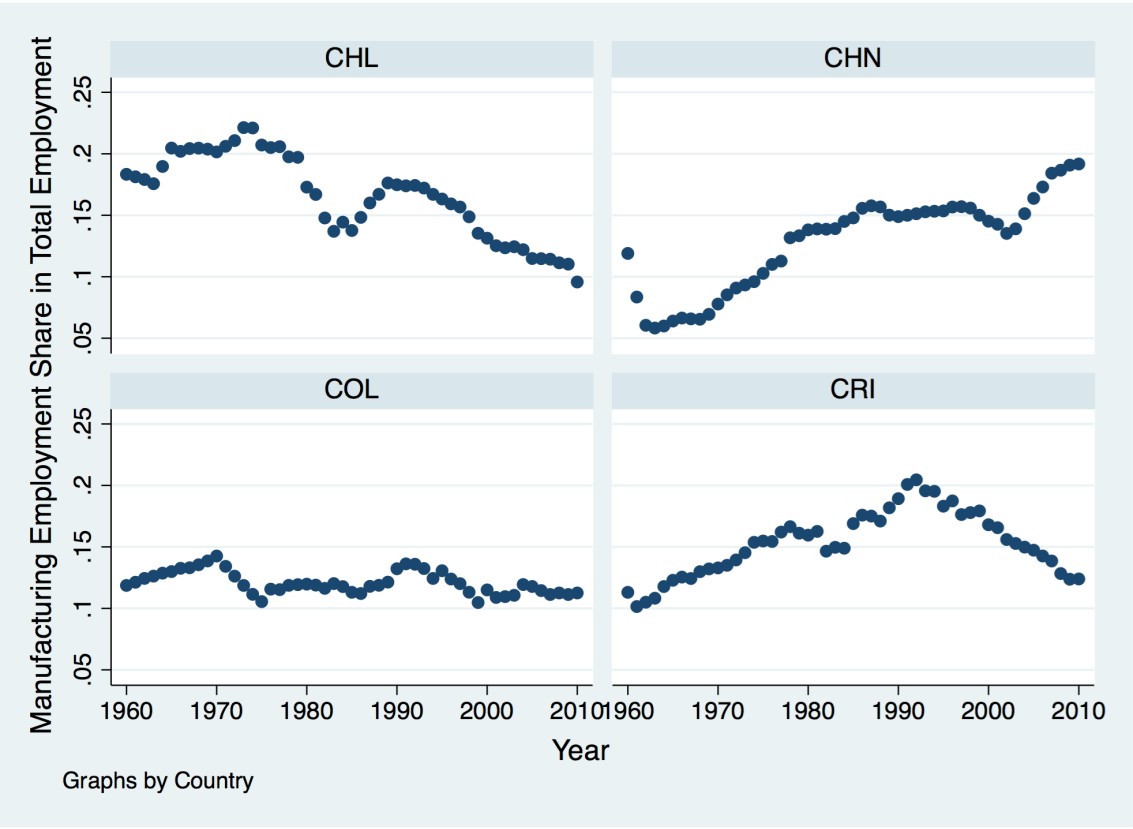
Aggregate labor-productivity effect $= \frac{1}{6}(\theta_{jt-h}\theta_{jt})\{(\delta_{ijt-h}\phi_{ijt-h} + \delta_{ijt}\phi_{ijt}) + (\delta_{ijt-h} + \delta_{ijt})(\phi_{ijt-h} + \phi_{ijt})\}$

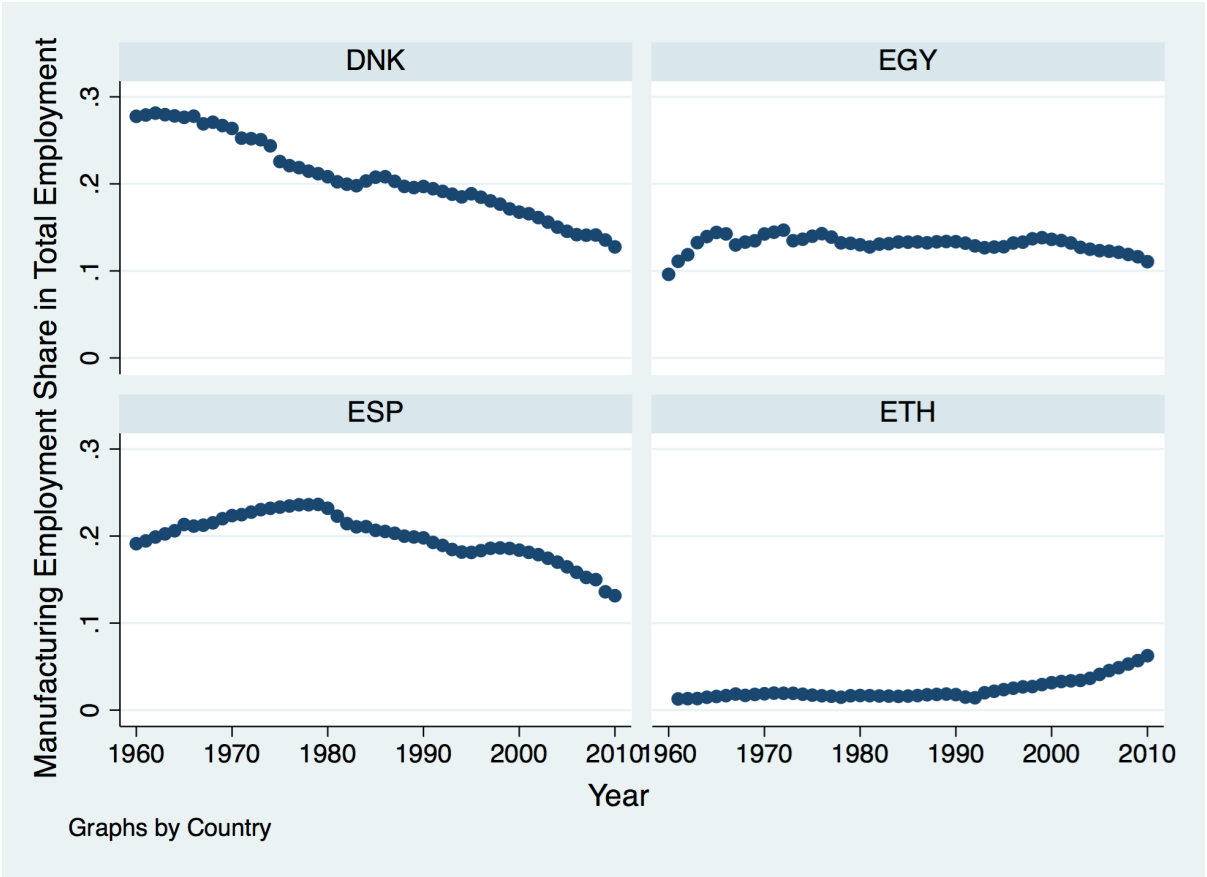
Resulting in the following overall formula:

$$\Delta\sigma_{ij} = \underbrace{\frac{1}{6}(\phi_{ijt} - \phi_{ijt-h})\{(\delta_{ijt-h}\theta_{jt-h} + \delta_{ijt}\theta_{jt}) + (\theta_{jt-h} + \theta_{jt})(\delta_{ijt-h} + \delta_{ijt})\}}_{labor-intensity\ effect}$$
$$+ \underbrace{\frac{1}{6}(\delta_{ijt} - \delta_{ijt-h})\{(\theta_{jt-h}\phi_{ijt-h} + \theta_{jt}\phi_{ijt}) + (\theta_{jt-h} + \theta_{jt})(\phi_{ijt-h} + \phi_{ijt})\}}_{sector\ share\ effect}$$
$$+ \underbrace{\frac{1}{6}(\theta_{jt-h}\theta_{jt})\{(\delta_{ijt-h}\phi_{ijt-h} + \delta_{ijt}\phi_{ijt}) + (\delta_{ijt-h} + \delta_{ijt})(\phi_{ijt-h} + \phi_{ijt})\}}_{aggregate\ labor-productivity\ effect}$$

APPENDIX 5 – DESCRIPTIVE MANUFACTURING EMPLOYMENT SHARE OF TOTAL EMPLOYMENT






DNK
EGY
ESP
ETH
Manufacturing Employment Share in Total Employment
0
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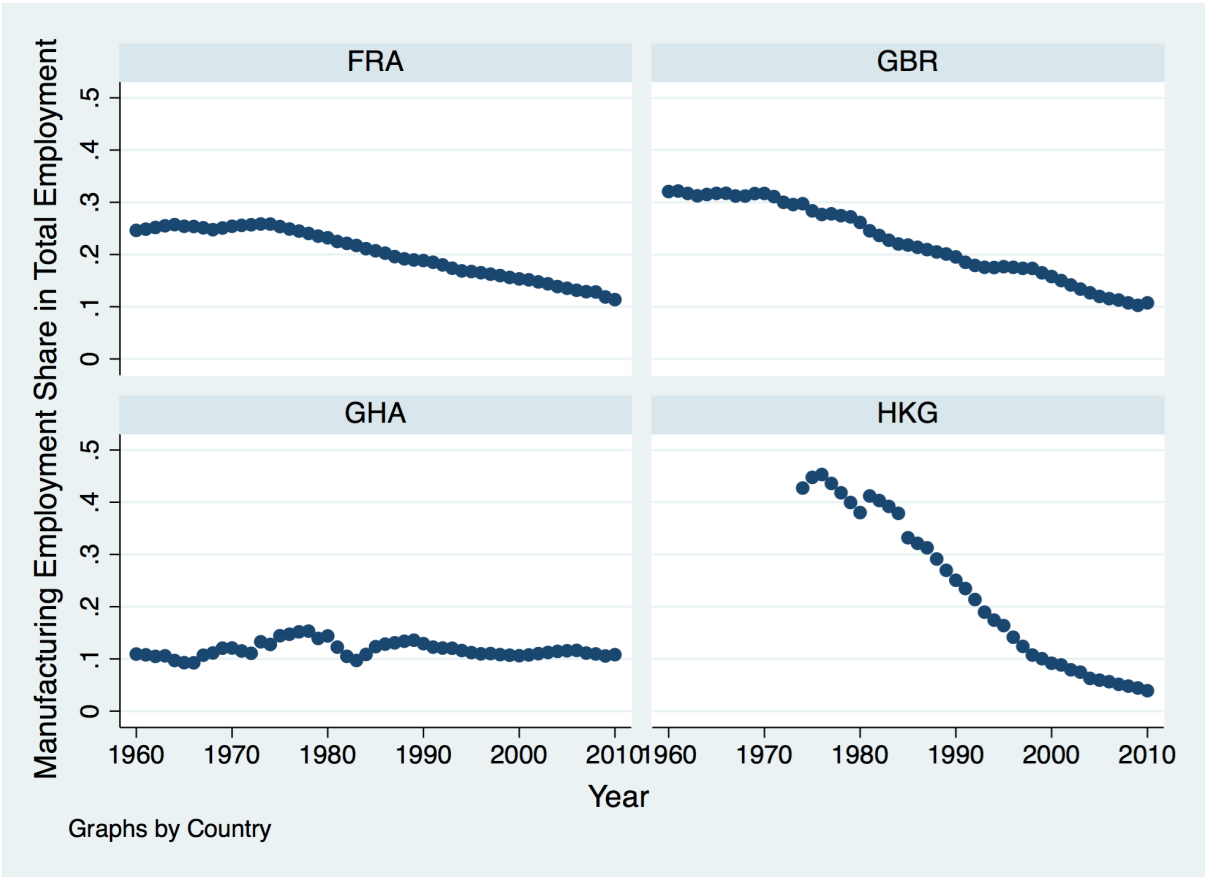
.3
1960
1970
1980
1990
2000
2010
Year
Graphs by Country


FRA
GBR
GHA
HKG
Manufacturing Employment Share in Total Employment
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1960
1970
1980
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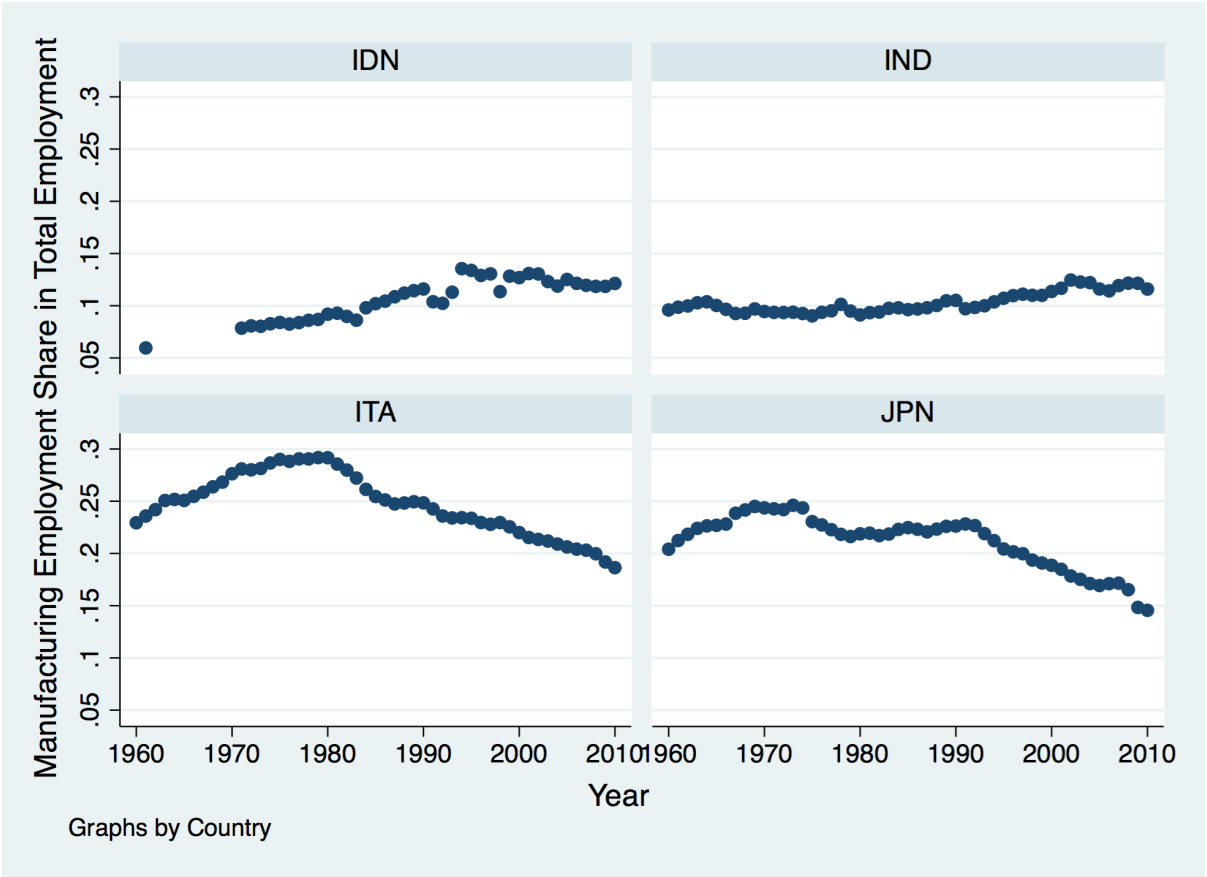
Year
Graphs by Country


IDN
IND
ITA
JPN
Manufacturing Employment Share in Total Employment
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1960
1970
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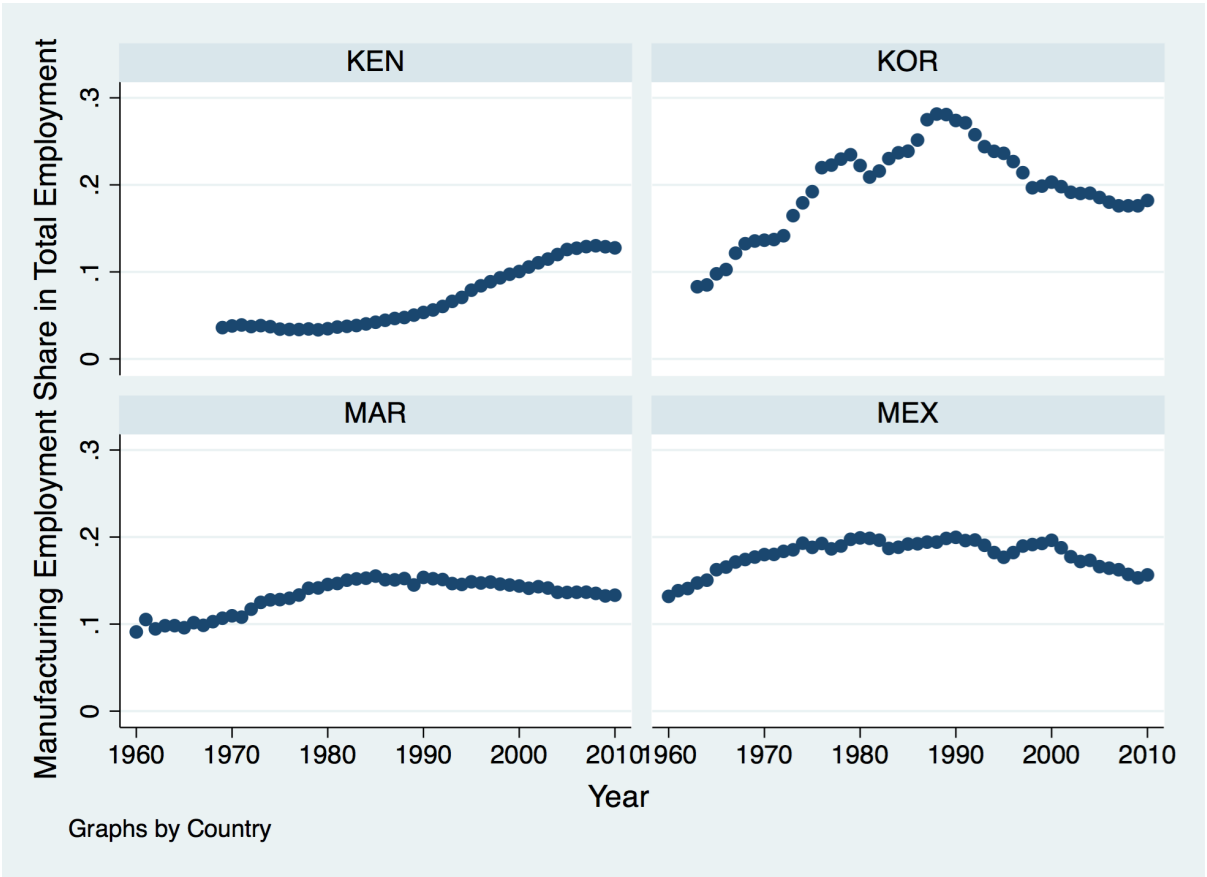
2010
Year
Graphs by Country


KEN
KOR
MAR
MEX
Manufacturing Employment Share in Total Employment
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1970
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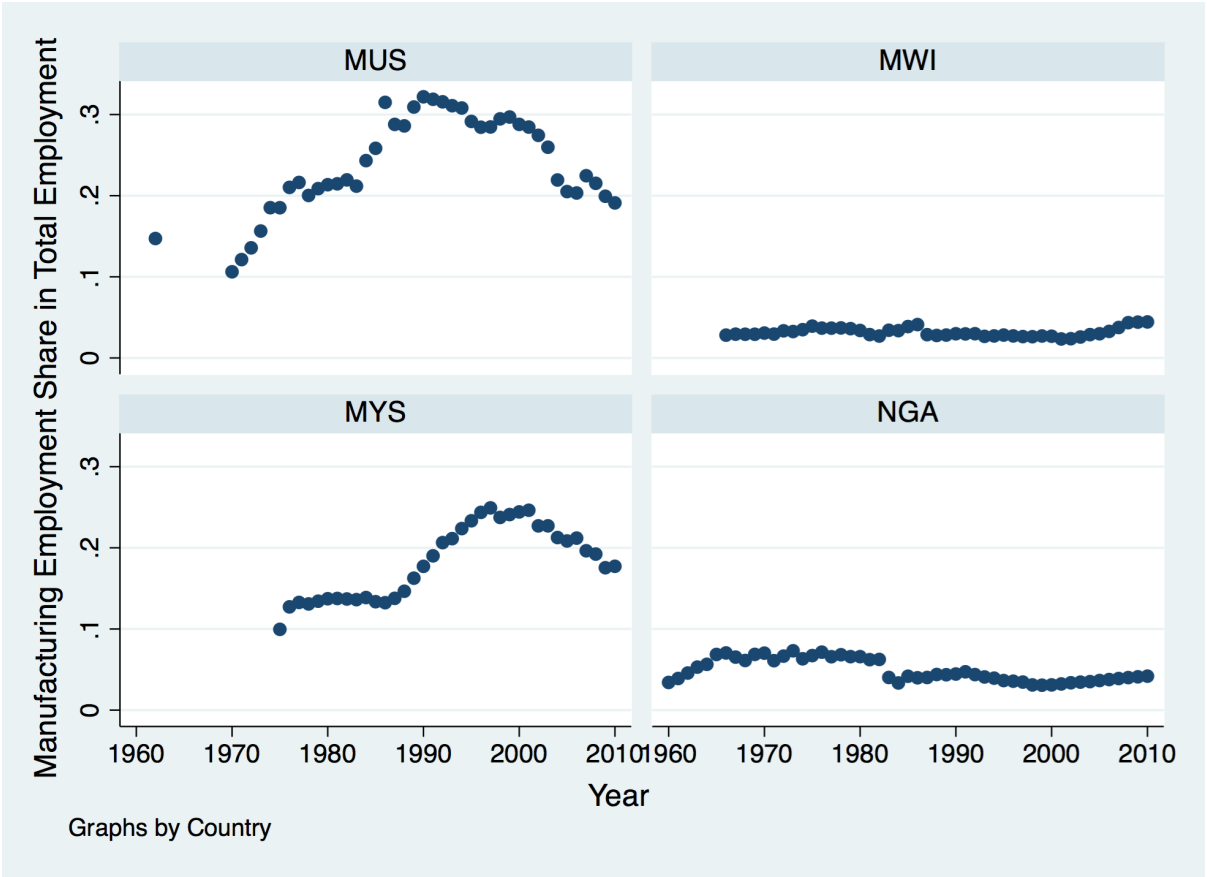
Year
Graphs by Country


MUS
MWI
MYS
NGA
Manufacturing Employment Share in Total Employment
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1960
1970
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1990
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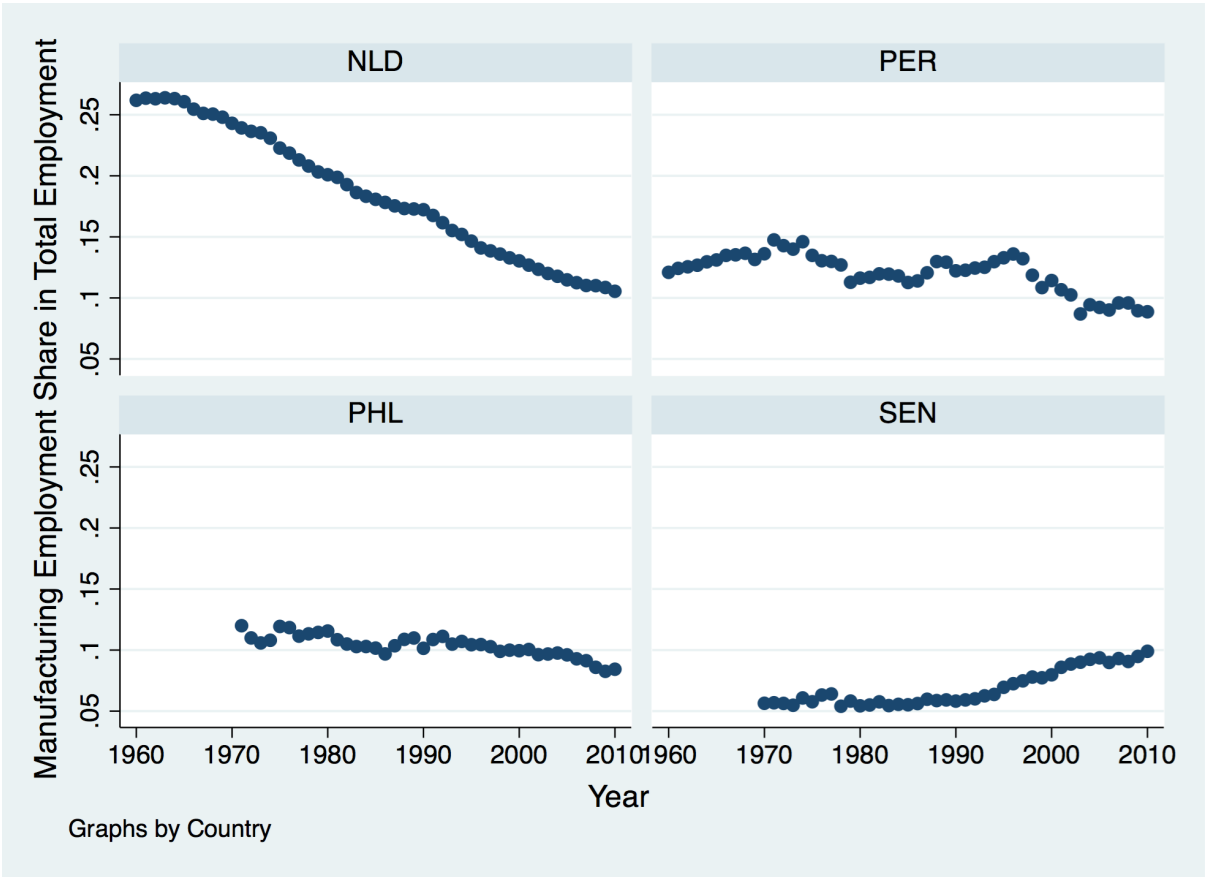
Year
Graphs by Country


NLD
PER
PHL
SEN
Manufacturing Employment Share in Total Employment
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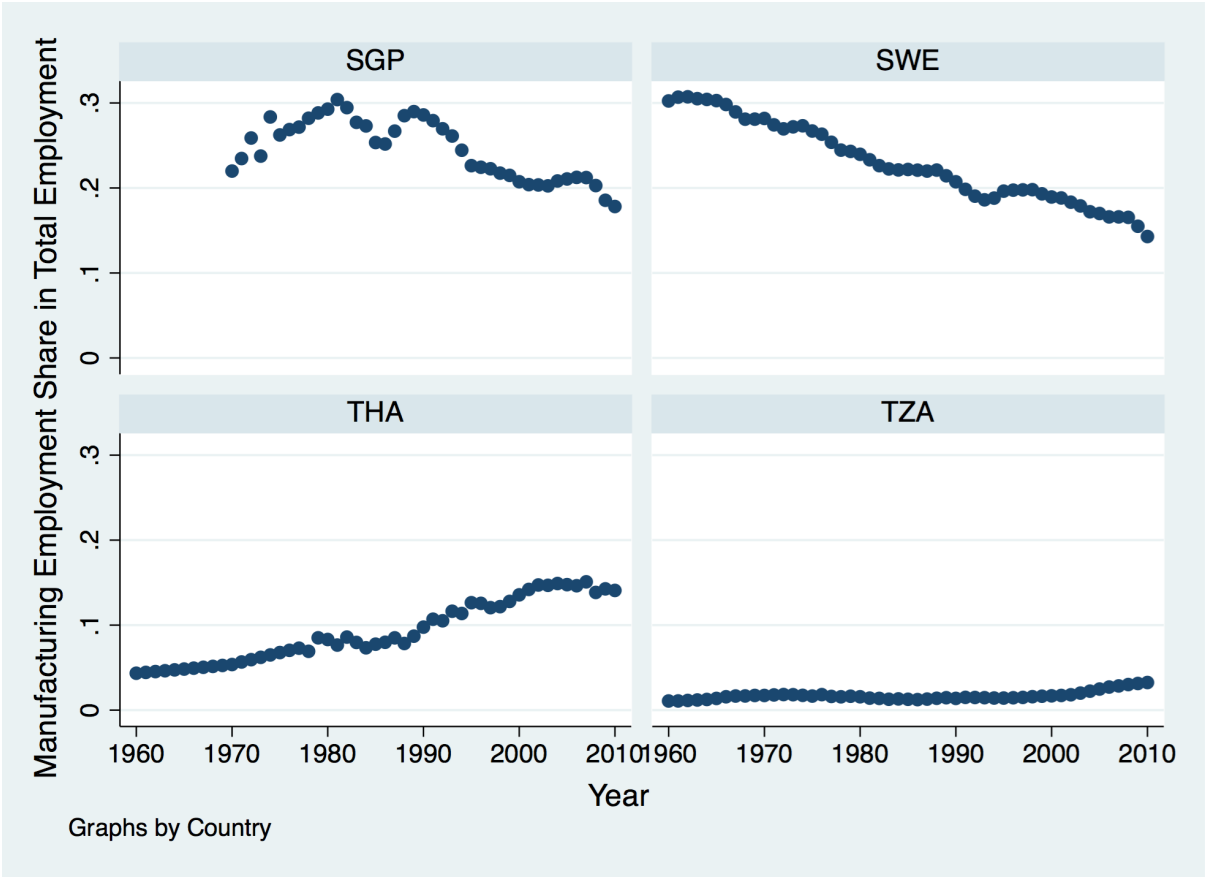
Year
Graphs by Country


SGP
SWE
THA
TZA
Manufacturing Employment Share in Total Employment
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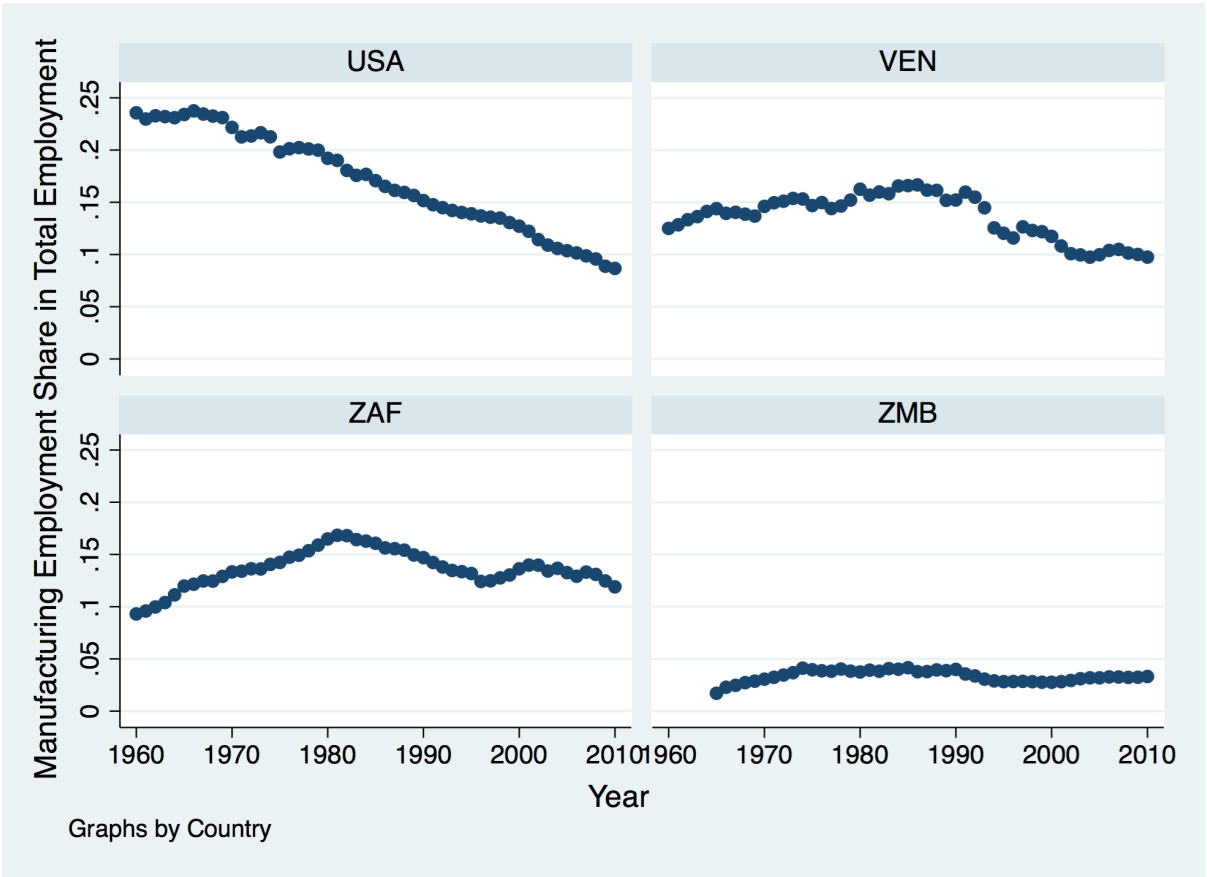
Year
Graphs by Country


USA
VEN
ZAF
ZMB
Manufacturing Employment Share in Total Employment
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1960
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2010
Year
Graphs by Country

APPENDIX 6 – SUMMARY STATISTICS

Variable	Observations	Mean	Standard Deviation	Minimum Value	Maximum Value	Source
Share of Manufacturing Employment	1933	0.141	0.076	0.005	0.452	GGDC (2015) and own calculation

Employment per sector in thousands of persons engaged

Variable	Observations	Mean	Standard Deviation	Minimum Value	Maximum Value	Source
Agriculture	1933	17883	58260	5.24	390980	GGDC (2015)
Mining	1933	360	1345	0.11	12908	GGDC (2015)
Manufacturing	1933	5246	14411	1.04	145898	GGDC (2015)
Utilities	1932	156	379	0.12	3903	GGDC (2015)
Construction	1933	1841	5222	1.71	58995	GGDC (2015)
Trade, restaurants and hotels	1933	4519	8912	1.64	73669	GGDC (2015)
Transport, storage and communication	1933	1474	3413	1.73	30768	GGDC (2015)
Finance, insurance, real estate and business services	1933	1374	3275	0.78	28093	GGDC (2015)
Government services	1542	4341	7609	0	44817	GGDC (2015)
Community, social and personal services	1830	2409	8248	4.07	104518	GGDC (2015)
Summation of sector GDP	1933	38597	100660	174	761050	GGDC (2015)

Globalization Variables

Variable	Observations	Mean	Standard Deviation	Minimum Value	Maximum Value	Source
Overall Globalization	1640	54.7	15.7	19.6	88.8	KOF Globalization 2018
Economic Globalization	1640	49.5	17.9	12.3	93.5	KOF Globalization 2018
Economic Globalization, de facto (actual flows)	1640	44.9	19.9	6.4	98.2	KOF Globalization 2018
Economic Globalization, de jure (restrictions)	1640	54.1	20.8	12.4	93.9	KOF Globalization 2018

Social Globalization	1640	47.1	20.6	6.7	87.6	KOF Globalization 2018
Social Globalization, de facto	1640	43.9	22.6	5.7	95.8	KOF Globalization 2018
Social Globalization, de jure	1640	50.1	20.0	6.9	90.6	KOF Globalization 2018
Political Globalization	1640	67.3	19.8	15.5	99.5	KOF Globalization 2018
Political Globalization, de facto	1640	70.4	19.5	23.6	99.4	KOF Globalization 2018
Political Globalization, de jure	1640	64.1	22.2	1.8	99.7	KOF Globalization 2018
Overall Globalization	689	32.4	18.9	3.7	100	CSGR Globalization
Economic Globalization	769	14.7	6.6	7.4	47.7	CSGR Globalization
Social Globalization	804	9.9	15.6	0.005	98.5	CSGR Globalization
Political Globalization	897	39.9	18.7	11.3	100	CSGR Globalization
Total value added (tva) in 2010 US$ (x1000)	1794	4,898	44,200	0.0038	640,000	GGDC (2015) and own calculation
Manufacturing value added (mva) in 2010 US$	1794	962,038	8,069,614	.054	118,000,000	GGDC (2015) and own calculation
Labor Intensity Manufacturing (emp/mva)	1772	14.5	113.6	.00000654	4711.3	GGDC (2015) and own calculation
Aggregate labor productivity (output/emp)	1772	1041.625	8622.926	.0031827	101402.1	GGDC (2015) and own calculation
Manufacturing Value Added Share (mva/tva)	1794	0.20	0.08	0.02	0.40	GGDC (2015) and own calculation
Demographic Variables						
Variable	**Observations**	**Mean**	**Standard Deviation**	**Minimum Value**	**Maximum Value**	**Source**
Real GDP per capita in 2011US$ (multiple benchmarks)	2040	10213	10842	595	61827	Maddison Historical Statistics
Real GDP per capita in 2011US$ (2011 benchmark)	2040	11451	11298	523	59263	Maddison Historical Statistics
Population (thousands)	2040	85107.82	203012.1	497	1331358	Maddison Historical Statistics

APPENDIX 7– INDIVIDUAL COUNTRY DECOMPOSITION

Table 10. Decomposition of manufacturing employment share of total employment for the region of Asia, period 1980-1990, 1990-2000, and 2000-2010.

ASIA

	Period 1980-1990				Period 1990-2000				Period 2000-2010			
	Change Employment Share	**Labor Intensity Effect**	**Sector Share Effect**	**Aggregate Labor Productivity**	**Change Employment Share**	**Labor Intensity Effect**	**Sector Share Effect**	**Aggregate Labor Productivity**	**Change Employment Share**	**Labor Intensity Effect**	**Sector Share Effect**	**Aggregate Labor Productivity**
China	1.07%	-3.27%	-2.26%	6.61%	-0.37%	-16.43%	1.19%	14.87%	4.65%	-11.93%	-0.08%	16.66%
Hong Kong	-12.95%	-24.25%	-11.93%	23.23%	-15.89%	-0.76%	-18.96%	3.82%	-5.25%	-1.16%	-6.37%	2.28%
Indonesia	2.42%	-3.78%	4.85%	1.34%	1.09%	-0.20%	0.48%	0.81%	-0.56%	-2.48%	-1.71%	3.62%
India	1.39%	-1.82%	0.42%	2.79%	0.86%	-1.87%	-1.11%	3.84%	0.23%	-6.54%	-0.64%	7.41%
Japan	0.75%	-7.04%	-0.09%	7.87%	-3.76%	-2.21%	-3.12%	1.57%	-4.31%	-6.13%	-0.75%	2.57%
Korea	5.18%	-10.86%	0.96%	15.08%	-7.09%	-20.79%	2.52%	11.18%	-2.11%	-9.26%	1.74%	5.42%
Malaysia	3.99%	-6.66%	2.20%	8.45%	6.70%	-7.14%	5.63%	8.22%	-6.70%	-5.57%	-4.23%	3.10%
Philippines	-1.41%	0.40%	-0.14%	-1.68%	-0.20%	1.39%	-0.79%	-0.80%	-1.52%	-2.30%	-1.30%	2.08%
Singapore	-0.69%	-9.55%	-1.09%	9.95%	-7.86%	-18.16%	0.56%	9.75%	-2.92%	-2.61%	-3.56%	3.25%
Thailand	1.45%	-4.56%	1.87%	4.14%	3.80%	-1.65%	1.82%	3.63%	0.52%	-4.00%	0.69%	3.83%

Source data: GGDC 10 sector database.

Table 11. Decomposition of manufacturing employment share of total employment for the region of Latin America, period 1980-1990, 1990-2000, and 2000-2010.

LATIN AMERICA

	Period 1980-1990				Period 1990-2000				Period 2000-2010			
	Change Employment Share	**Labor Intensity Effect**	**Sector Share Effect**	**Aggregate Labor Productivity**	**Change Employment Share**	**Labor Intensity Effect**	**Sector Share Effect**	**Aggregate Labor Productivity**	**Change Employment Share**	**Labor Intensity Effect**	**Sector Share Effect**	**Aggregate Labor Productivity**
Argentina					-5.57%	-6.22%	-4.63%	5.29%	-0.28%	-0.77%	1.07%	-0.58%
Bolivia					2.25%	4.19%	-2.39%	0.45%	2.66%	3.73%	-1.14%	0.07%
Brazil					-2.65%	-1.13%	-1.15%	-0.38%	0.09%	-0.33%	-1.11%	1.54%
Chile	0.19%	-2.64%	4.12%	-1.29%	-4.35%	-10.54%	-0.30%	6.49%	-3.56%	-1.84%	-3.36%	1.64%
Colombia	1.25%	2.55%	-2.61%	1.31%	-1.72%	7.85%	-1.67%	-7.91%	-0.25%	-0.61%	-1.15%	1.50%
Costa Rica	2.97%	9.01%	1.15%	-7.19%	-2.12%	-7.70%	1.70%	3.88%	-4.41%	0.34%	-5.74%	1.00%
Mexico	0.06%	3.30%	1.91%	-5.15%	-0.34%	0.96%	1.24%	-2.54%	-3.97%	-0.65%	-3.46%	0.14%
Peru									-2.56%	-5.31%	-1.06%	3.81%
Venezuela	-1.04%	1.11%	2.84%	-4.99%	-3.48%	2.90%	-4.62%	-1.76%	-1.98%	2.40%	-4.21%	-0.17%

Source data: GGDC 10 sector database.

Table 12. Decomposition of manufacturing employment share of total employment for the region of Sub-Saharan Africa, period 1980-1990, 1990-2000, and 2000-2010.

SUB-SAHARAN AFRICA

	Period 1980-1990				Period 1990-2000				Period 2000-2010			
	Change Employment Share	**Labor Intensity Effect**	**Sector Share Effect**	**Aggregate Labor Productivity**	**Change Employment Share**	**Labor Intensity Effect**	**Sector Share Effect**	**Aggregate Labor Productivity**	**Change Employment Share**	**Labor Intensity Effect**	**Sector Share Effect**	**Aggregate Labor Productivity**
Botswana	4.30%	1.88%	0.61%	1.81%	0.65%	0.26%	-0.55%	0.94%	0.05%	-2.71%	0.44%	2.31%
Ethiopia					1.37%	0.54%	0.86%	-0.03%	3.10%	2.57%	-1.53%	2.06%
Ghana	-1.47%	-4.03%	2.38%	0.17%	-2.31%	-2.75%	-2.40%	2.84%	0.20%	8.42%	-5.65%	-2.58%
Kenya	1.87%	2.17%	-0.28%	-0.02%	4.70%	11.91%	-2.44%	-4.76%	2.72%	3.89%	-0.33%	-0.83%
Mauritius	10.83%	-5.80%	9.90%	6.73%	-3.40%	-15.31%	-2.43%	14.34%	-9.68%	-10.50%	-4.52%	5.34%
Malawi	-0.40%	0.27%	0.02%	-0.69%	-0.30%	-0.01%	-0.77%	0.47%	1.76%	3.81%	-0.35%	-1.70%
Nigeria	-2.14%	1.01%	-1.93%	-1.22%	-1.34%	5.02%	-5.70%	-0.65%	1.08%	3.40%	-2.68%	0.35%
Senegal	0.39%	0.79%	0.80%	-1.20%	2.16%	1.95%	-0.14%	0.35%	1.92%	1.48%	-0.50%	0.94%
Tanzania					0.30%	0.62%	0.01%	-0.33%	1.57%	1.57%	0.10%	-0.11%
South Africa	-1.79%	-0.09%	1.46%	-3.16%	-1.07%	1.90%	-2.82%	-0.15%	-1.73%	-0.75%	-4.15%	3.17%
Zambia	0.24%	-0.31%	2.28%	-1.72%	-1.23%	-1.51%	1.17%	-0.88%	0.55%	-0.23%	-0.71%	1.49%

Source data: GGDC 10 sector database.

Table 13. Decomposition of manufacturing employment share of total employment for the region of developed economies, period 1980-1990, 1990-2000, and 2000-2010.

DEVELOPED ECONOMIES

	Period 1980-1990				Period 1990-2000				Period 2000-2010			
	Change Employment Share	**Labor Intensity Effect**	**Sector Share Effect**	**Aggregate Labor Productivity**	**Change Employment Share**	**Labor Intensity Effect**	**Sector Share Effect**	**Aggregate Labor Productivity**	**Change Employment Share**	**Labor Intensity Effect**	**Sector Share Effect**	**Aggregate Labor Productivity**
Denmark	-1.12%	-2.97%	-1.17%	3.01%	-2.95%	-5.32%	-1.43%	3.81%	-4.00%	-0.68%	-3.85%	0.53%
Spain	-3.40%	-2.73%	-3.18%	2.52%	-1.41%	0.47%	-3.34%	1.46%	-5.23%	-1.54%	-4.80%	1.11%
France	-4.36%	-5.40%	-2.93%	3.97%	-3.52%	-6.41%	0.92%	1.97%	-3.97%	0.54%	-5.04%	0.54%
United Kingdom	-6.61%	-7.92%	-2.68%	4.00%	-3.76%	-2.73%	-4.06%	3.03%	-5.04%	-1.23%	-5.42%	1.61%
Italy	-4.33%	-2.54%	-4.51%	2.72%	-2.84%	-3.42%	-1.41%	1.98%	-3.36%	2.33%	-3.44%	-2.25%
Netherlands	-2.86%	-4.56%	1.03%	0.67%	-4.19%	-3.07%	-2.01%	0.89%	-2.49%	-1.29%	-2.51%	1.31%
Sweden	-3.23%	-5.67%	-0.25%	2.69%	-1.79%	-9.33%	2.03%	5.51%	-4.65%	-2.57%	-5.42%	3.34%
United States	-4.05%	-3.37%	-3.22%	2.54%	-2.46%	-3.46%	-1.52%	2.52%	-4.04%	-4.38%	-2.70%	3.05%

Source data: GGDC 10 sector database. Methodology: Tregenna (2011)

APPENDIX 8 – ROBUSTNESS CHECK REGRESSIONS

Table 14. Robustness Check - 10-year period average

VARIABLES (Manufacturing Employment Share)	Globalization Period	Globalization Breakdown	Globalization Period Lagged	Globalization Breakdown Lagged
Overall Globalization CSGR	0.000488			
	(0.000521)			
Economic Globalization CSGR		0.00498***		
		(0.00142)		
Social Globalization CSGR		-0.000688*		
		(0.000395)		
Political Globalization CSGR		0.000320		
		(0.000358)		
Overall Globalization CSGR (Lagged one period)			0.000558	
			(0.000531)	
Economic Globalization CSGR (Lagged one period)				0.00482***
				(0.00141)
Social Globalization CSGR (Lagged one period)				-0.000768*
				(0.000401)
Political Globalization CSGR (Lagged one period)				0.000437
				(0.000389)
Log Population	0.114**	0.102***	0.114**	0.101***
	(0.0468)	(0.0338)	(0.0466)	(0.0345)
Log Real GDP per capita	0.706***	0.348**	0.718***	0.337**
	(0.166)	(0.147)	(0.169)	(0.146)
Log Real GDP per capita^2	-0.0377***	-0.0181**	-0.0384***	-0.0174**
	(0.00901)	(0.00805)	(0.00917)	(0.00797)
Constant	-4.285***	-2.613***	-4.342***	-2.559***
	(0.822)	(0.543)	(0.832)	(0.533)
Observations	96	96	96	96
R-squared	0.640	0.723	0.641	0.721
Number of countries	35	35	35	35
Country FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Clustered Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 15. Robustness Check – Dependent Variable Manufacturing Value Added in US dollar in 2010 prices

VARIABLES	Manufacturing Value Added	Globalization Developed	Globalization Asia	Globalization Africa	Globalization Latin America
Economic Globalization CSGR	0.00487***	0.00497***	0.00418***	0.00582***	0.00416***
	(0.00107)	(0.00113)	(0.00129)	(0.00161)	(0.00107)
Social Globalization CSGR	-0.000142	0.000198	-0.000581	-5.37e-05	-0.000116
	(0.000341)	(0.000333)	(0.000424)	(0.000330)	(0.000330)
Political Globalization CSGR	7.05e-05	-6.52e-05	-0.000171	0.000226	0.000404**
	(0.000259)	(0.000357)	(0.000312)	(0.000265)	(0.000198)
Economic Globalization * Developed		-0.00173			
		(0.00304)			
Social Globalization * Developed		-0.000750**			
		(0.000362)			
Political Globalization * Developed		0.000293			
		(0.000411)			
Economic Globalization * Asia			0.000373		
			(0.00252)		
Social Globalization * Asia			0.000576		
			(0.000353)		
Political Globalization * Asia			0.000783		
			(0.000519)		
Economic Globalization * SSA				-0.00330*	
				(0.00186)	
Social Globalization * SSA				0.00113	
				(0.00106)	
Political Globalization * SSA				-0.000894	
				(0.000639)	
Economic Globalization * Latin America					0.00723***
					(0.00208)
Social Globalization * Latin America					-0.000335
					(0.000675)
Political Globalization * Latin America					-0.00128*
					(0.000652)
Log Population	0.0278	-0.0104	-0.0111	0.0353	0.0268
	(0.0439)	(0.0457)	(0.0477)	(0.0445)	(0.0454)
Log Real GDP per capita	0.0204	-0.00867	-0.0564	0.0286	0.0276
	(0.120)	(0.119)	(0.113)	(0.107)	(0.104)
Log Real GDP per capita^2	0.00243	0.00391	0.00592	0.00107	0.00242
	(0.00704)	(0.00698)	(0.00675)	(0.00646)	(0.00598)
Constant	-0.516	0.0270	0.306	-0.562	-0.582
	(0.738)	(0.730)	(0.775)	(0.716)	(0.705)
Observations	511	511	511	511	511
R-squared	0.412	0.439	0.446	0.439	0.460
Number of countries	35	35	35	35	35
Country FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Clustered Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 16. Robustness Check - Country weighted by population in 1970

VARIABLES (Manufacturing Employment Share)	Globalization	Globalization Developed	Globalization Asia	Globalization Africa	Globalization Latin America
Economic Globalization CSGR	0.00268**	0.00251**	0.00122**	0.00329**	0.00277**
	(0.00112)	(0.00123)	(0.000519)	(0.00151)	(0.00119)
Social Globalization CSGR	-0.000428***	-0.000387	-0.000451**	-0.000380**	-0.000576***
	(0.000148)	(0.000296)	(0.000176)	(0.000144)	(0.000140)
Political Globalization CSGR	-0.000412**	-0.000395**	-0.000423**	-0.000426***	-0.000481***
	(0.000152)	(0.000188)	(0.000159)	(0.000152)	(0.000144)
Economic Globalization * Developed		0.00196			
		(0.00270)			
Social Globalization * Developed		-2.07e-05			
		(0.000331)			
Political Globalization * Developed		-6.13e-05			
		(0.000186)			
Economic Globalization * Asia			0.00256		
			(0.00219)		
Social Globalization * Asia			2.72e-05		
			(0.000313)		
Political Globalization * Asia			3.28e-05		
			(0.000322)		
Economic Globalization * SSA				-0.00198	
				(0.00160)	
Social Globalization * SSA				0.00474***	
				(0.00152)	
Political Globalization * SSA				0.000187	
				(0.000566)	
Economic Globalization * Latin America					-0.00324*
					(0.00184)
Social Globalization * Latin America					-0.00154***
					(0.000543)
Political Globalization * Latin America					-0.000525***
					(0.000166)
Log Population	0.153***	0.156***	0.139***	0.142***	0.161***
	(0.0403)	(0.0409)	(0.0401)	(0.0416)	(0.0364)
Log Real GDP per capita	0.188*	0.207*	0.166	0.209**	0.161*
	(0.0984)	(0.102)	(0.105)	(0.0952)	(0.0911)
Log Real GDP per capita^2	-0.00863	-0.00967	-0.00769	-0.00980	-0.00761
	(0.00613)	(0.00632)	(0.00631)	(0.00589)	(0.00566)
Constant	-2.728***	-2.847***	-2.438***	-2.685***	-2.659***
	(0.440)	(0.487)	(0.485)	(0.459)	(0.373)
Observations	689	689	689	689	689
R-squared	0.697	0.699	0.706	0.703	0.724
Number of countries	35	35	35	35	35
Country Weight	Population in 1970	Population in 1970	Population in 1970	Population in 1970	Population in 1970
Country FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Clustered Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1