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Breaking Out Of the Middle-Income Trap: Assessing the Role of Structural Transformation

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Abstract

This paper investigates whether lack of structural transformation can explain why countries fall in the middle-income trap. Expanding the analysis of Eichengreen, Park and Shin (2013), it performs a probit regression analysis of a panel of 137 countries from 1963 to 2010. The variables of interest are *export diversification* and *manufacturing export quality* as proxies of structural transformation at the middle-income level. The paper empirically tests whether these two characteristics of the structural transformation can lower the likelihood of middle-income slowdowns. The findings show that diversifying the export composition can offer a way to escape the trap, while upgrading manufacturing goods is a fruitless strategy to avoid middle-income slowdowns.

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Contents

Abbreviations

GDP: Gross Domestic Product

MICs: Middle-income countries

LICs: Low-income countries

HICs: High-income countries

GVC: Global value chains

FDI: Foreign Direct Investment

MIT: Middle-income trap

L-MIT: Lower middle-income trap

U-MIT: Upper middle-income trap

R&D: Research and development

EPS: Eichengreen, Park and Shin

UNIDO: United Nations Industrial Development Organization

UNCTAD: United Nations Conference on Trade and Development

ILO: International Labour Organisation

ICT: Information and communications technology

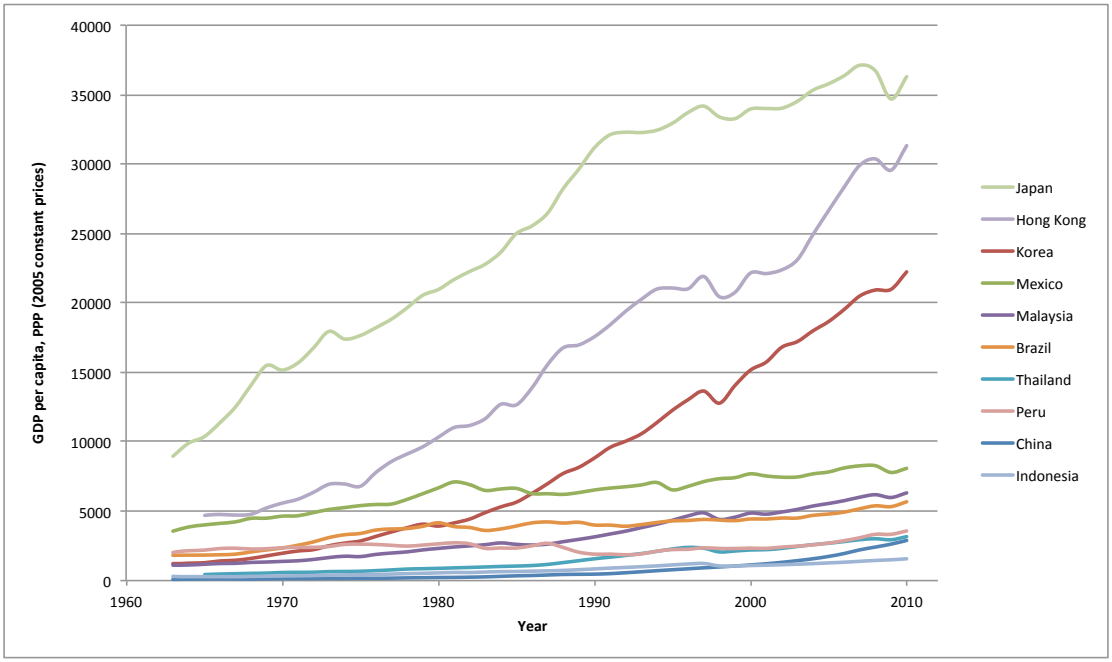
IT: Information technology

PC: Personal computer

Introduction

The majority of the poor people today live in middle-income countries (Kanbur and Sumner, 2011). Since World War 2, very few have successfully graduated to the high-income country group, and most have been stuck in the "middle-income trap". Until recently, growth literature has explained the lack of economic performance in developing countries through "poverty traps" (Sachs, 2005), "conflict traps", (Collier, 2007), inadequacies of the Washington Consensus policies (Rodrik, 2007), lack of institutions (Acemoglu, et. al., 2001; 2012), or lack of "good governance" (North, 2003). These explanations are addressed to less-developed countries in general, but less is known about what blocks the way of middle-income countries in joining their high-income counterparts. There have been only 13 middle-income countries out of 101 who were able to join the "high-income club" since the 1950s (World Bank, 2012). The performances of the ones who were able to converge and the ones who have been stuck are illustrated in figure 1.

Figure 1: Cross-country comparison of income convergence



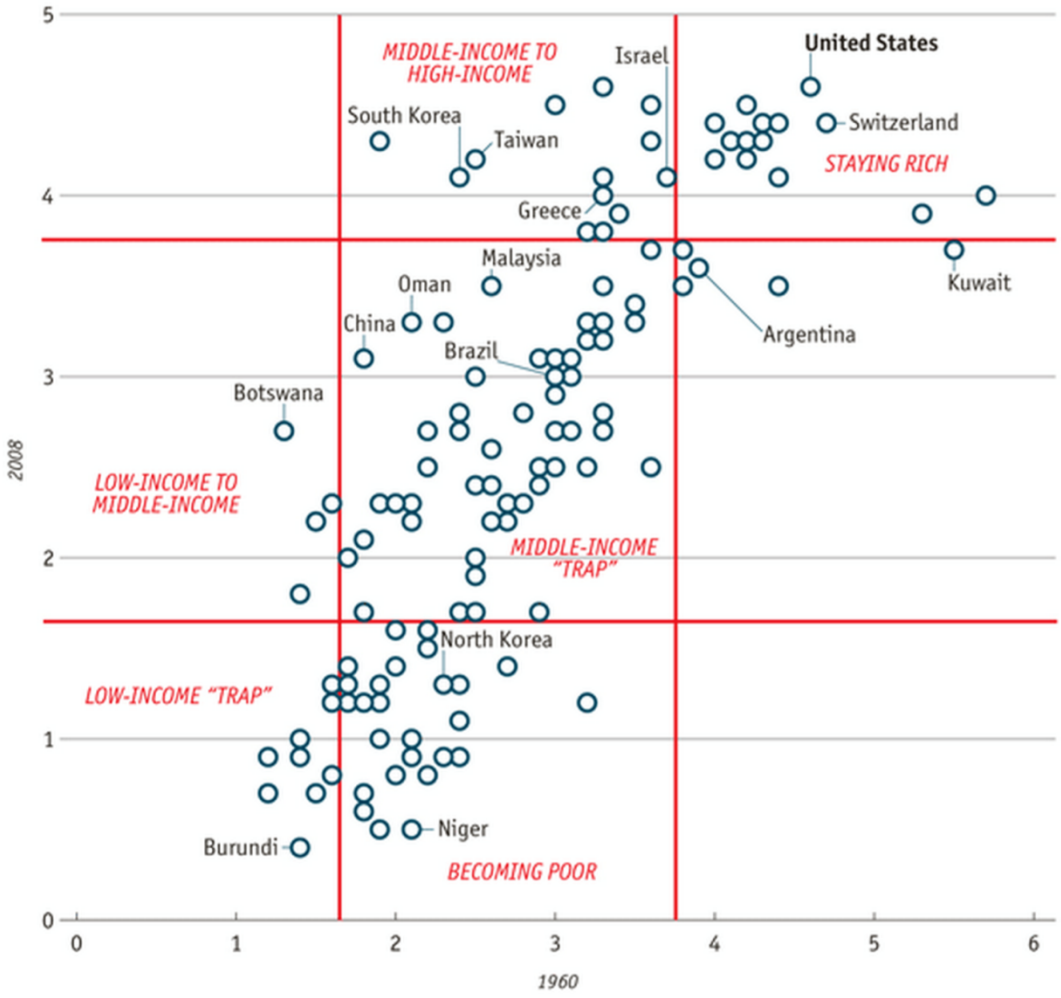
Source: Author's own calculation using data from World Bank's database from 1963 to 2010.

Although 20 years ago low-income countries (LICs) had 93% of the world's poor, global poverty has shifted its geography towards the middle-income countries (MICs,

henceforth) where 72% of the world's poor live today (Kanbur and Sumner, 2011). Therefore, understanding the economic performance of the MICs can make a substantial contribution to improve the living standards of the world's poor. To refer to the developmental challenges the MICs are facing, Gill and Kharas coined the term "middle-income trap" (MIT, henceforth) in a report to the World Bank in 2007. In their definition, MICs are trapped between the low-wage poor-country competitors in labour-intensive production and the rich-country innovators in technology-intensive production, which disables them to make further progress after they graduate into the middle-income level (page 5).

However, the consensus over MIT's existence or its definition still have not been formed. The camp that denies the existence of the MIT includes Pritchett and Summers (2014) who do not find a systematic challenge in income convergence that is particular to MICs. On the other hand, Aiyar et. al. (2013) find that MICs systematically slow down after they join the middle-income group and fail to graduate into the high-income group. In their study, the determinants of these slowdowns are lack of infrastructural development, lack of regional integration, and lack of diversification in product and export basket. Similarly, Eichengreen, Park and Shin (EPS, henceforth) in 2013 found evidence for fast-growing MICs slowing down at the income ranges of $10,000-$11,000 and at $15,000-$16,000 GDP per capita level. They also show that the risk of slowdowns increase with volatile inflation rates, undervaluation of exchange rates, old-age dependency ratios, low levels of education, and lack of high-technology products in the export basket.

Figure 2: Countries that avoided the Middle-Income Trap*



**2008 per capita GDP relative to the US, against 1960 per capita GDP relative to the US.*

Source: The Economist "The Middle-Income Trap", calculated using data from the World Bank

Figure 2 shows the countries that are trapped and those that have escaped the MIT. Those that are in the top middle section are the ones who successfully transitioned from the middle-income to high-income level, whereas those that are in the mid-section in the middle row are the ones who have been trapped in the same category since 1960. On a more optimistic note, the rise of East Asia may offer a template for a way out of the MIT to attain income levels comparable to early industrialised countries. On a more pessimistic note, however, Latin American countries failed to attain high-income levels for several decades, almost for half a century, and have stagnated at the middle-income level (Aiyar et. al., 2013: 3; Paus, 2014: 9). What are

the characteristics that distinguish the performances of the escapees of the MIT with those that have remained trapped?

In answering this question, this paper will investigate the role of structural transformation. It will expand EPS (2013)'s probit model to investigate the association between structural transformation – measured by *quality upgrading* of manufacturing goods, and *diversification* of the country's export structure – and the risk of growth slowdowns after attaining the MIC status. To quantify these measures, I employ the indices from IMF (2014)'s Export Diversification and Quality Databases. Using a panel of 137 countries from 1963 to 2010, I run a probit regression to investigate the effect of export diversification and the quality of manufactured goods on the likelihood of experiencing middle-income growth slowdowns. Interestingly and somewhat paradoxically, the results show that upgrading the quality of manufacturing exports increases the likelihood of experiencing a slowdown, while diversifying the export structure lowers the same likelihood.

Given the importance of such a relationship for development policy and funding, the findings of this research have value for providing a clear policy framework to the MICs. The results of the present paper indicate that a manufacturing-oriented growth strategy may not be viable for today's MICs. The results also advise the MICs to diversify their economic activities to escape the MIT. This is because diversification enables the creation of backward and forward linkages between sectors (captured by the *intensive diversification index*); it also allows the economy to advance towards the production of new goods (captured by the *extensive diversification index*) which together makes the national economic structure more dense, less dependent on foreign demand and less susceptible to external shocks.

The originality of the present research comes from its contribution to the MIT literature by providing the first analysis that links *diversification* and *manufacturing quality* to the *likelihood of falling in the MIT*. It is the first to offer an econometric analysis to investigate the association between structural transformation and the likelihood of experiencing middle-income growth slowdowns.

The paper first reviews the literature and identifies the gap and the problems with the existing work. Only one study (Felipe et. al., 2012) in the literature examines the relationship between the performance on structural transformation and the MIT. However, it only offers Student t-test comparisons of decadal averages of index values of *sophistication* and *diversification* between trapped and non-trapped countries, but they do not support this with an empirical investigation. Thus, the present paper aims to contribute to the literature by providing the first empirical evidence for the association between the MIT and structural transformation, by examining the relationship between manufacturing quality and MIT, and between export diversification and MIT.

The purpose of this study is to show that growth without enhancing production capabilities (through diversifying the products and upgrading their quality) is doomed to slow and is insufficient to enable countries to attain high-income country standards. The results show robust evidence for the effect of export diversification in lowering the probability of growth slowdowns but provide no evidence for a positive effect of quality upgrading of manufacturing exports to lower the same probability.

Literature Review

Standard growth theory, especially the neoclassical variant, has little room to explain growth slowdowns or the MIT. The augmented Solow model, which narrowly reduces economic growth down to capital accumulation, labour and productivity growth, predicts long-term income convergence rate of 2%, which implies that the economy moves to its steady state* in about 70 years (Mankiw, Romer, and Weil, 1992). However, this prediction is proved to be unrealistic by both economic analysis (Bernanke and Gurkaynak, 2001) and historical evidence: 70% of the middle-income countries in 1970 still remain in the middle-income range, while 14% fell into the low-income classification (Bulman et. al., 2014).

*steady state is the equilibrium state with stable population, stable consumption and stable income level

Gill and Kharas (2007) identified MICs' economic and developmental challenges by calling it broadly the "middle-income trap" and pioneered a mass literature on the subject. Rigorous studies followed to investigate such systematic challenges at the middle-income level, assessed by both *economic growth* (Aiyar, et. al. 2013; Eichengreen et. al. 2012, 2013; Robertson and Ye, 2013, World Bank 2011, 2012) and by the *development of productive capabilities* and *structural change* (Felipe, et. al., 2012; Fortunato, 2014; Ohno, 2009; Paus, 2014, ILO, 2014; OECD, 2013; World Bank, 2012).

MIT remains a controversial subject. Hence, there is a large volume of discussion among academics and international institutions over its existence, its definition, and its empiricism. The complexity of different approaches and definitions obstruct the forming of a consensus. Two approaches to the MIT are discussed in this section, namely the *growth performance approach* and the *structural transformation approach*, which will then be linked to provide a comprehensive understanding of the MIT.

The growth performance framework

This framework is often where the debate on the existence of the MIT takes place. The considerably large room for arbitrariness in defining the "trap", classifying the "middle-income" level, and specifying the empirical measurements can change the results the authors find. For this group of authors, the MIT is a slowdown of growth and lack of income convergence. From this perspective, it is methodologically plausible to both accept and reject that the MIT exist.

Middle-Income Trap Does Not Exist

One of the main studies that reject the idea of a MIT is from Pritchett and Summers (2014). They find that growth slowdowns do not particularly occur at the middle-income range, because in their study there is weak statistical evidence for the relationship between the *level of income* and the *likelihood of a deceleration*. They

acknowledge the lack of persistence of developing country growth rates, but they argue that in the long-term these slowdowns are in fact 'regression to the mean' – a statistical tendency where random upward fluctuations will be followed by decreases to revert the pattern towards the mean. Hence, the higher the growth rate of a country, the higher the risk of a slowdown, regardless of the income level. Therefore, the fast-growing countries which recently entered the middle-income classification will almost by definition slow down, and this "regression to the mean" should not be overstated by calling it a "trap".

Im and Rosenblatt (2013)'s analysis examines the historical transitions of countries' moving from one classification to another. They find that the probability of joining the HICs is no less than the probability of remaining in the MIC category, and reject the existence of the MIT.

Similarly, Bulman, Eden, and Nguyen (2014) reject the view that there is an unusual stagnation or a trap particular for MICs. However, they acknowledge that a lack of transition of growth strategies from LIC- to MIC-oriented growth will result in stagnation. In their view, if the MICs insist on growth strategies that are focused on capital accumulation and labour-intensive production, it is natural that they will experience stagnation. Instead, the growth strategies that the authors recommend for MICs to escape the trap include (1) transforming the economic structure from agriculture towards industry, (2) increasing export shares, (3) lowering inequality and dependency ratios will enable MICs to escape the so-called trap.

Middle-Income Trap Exists

EPS (2012) find evidence for systematic slowdowns at the middle-income level. In their definition, which extends Hausmann et. al. (2005)'s *growth acceleration* definition, three conditions must be satisfied to identify a growth episode as a "slowdown":

$$g_{t,\,t+n} \geq 3.5 \qquad \textbf{(1)}$$
$$g_{t,\,t+n} - g_{t-n,t} \geq 2.0 \qquad \textbf{(2)}$$
$$y_t > \$10{,}000 \qquad \textbf{(3)}$$

A slowdown is identified if a country has had an episode of growth over 3.5% or above during a horizon of *n* years (equation 1). This must be followed by a growth deceleration of 2% or more between two successive episodes of growth (equation 2). The final condition requires the country to have a per capita income level of $10,000 or above (equation 3). They set the time horizon to be 8 years, hence n=7, which again follows Hausmann et. al. (2005). EPS (2013) find evidence for systematic slowdowns peaking at two modes, one at $10,000-$11,000 and the other at $15,000-$16,000 per capita GDP.

They admit Pritchett and Summers (2014)'s argument that a mechanical relationship solely between income level and growth slowdown is implausible, but they also attempt to find determinants other than income level. Their data show that traps are more likely with low trade openness, high old-age dependency ratios, high and volatile inflation rates, undervalued exchange rates and low consumption shares of GDP. In their later study, they confirm the significance of these factors and also add that middle-income countries with high levels of secondary and tertiary education and with larger shares of high-tech products in their export composition have less risk of falling in the trap. They also speculate that the lack of qualified and educated staff explain Malaysia's and Thailand's MIT, and that China is under the same skills-shortage risk (EPS, 2013: 13), which is confirmed by other studies (Felipe, 2012; Flaaen, 2013).

The main shortcoming of EPS (2012, 2013)'s methodology is that it limits the sample of countries above an income level of $10,000 per capita. Therefore, the slowdowns they identify are mainly of developed and oil-exporting countries. $10,000 income per capita and above does not fit with any MIC classification in the academic literature or in the lending criteria of international organisations. Although the authors try to justify this for taking interest in "economic maturity", their analysis do not have any implications on the countries that are by definition in the "middle-income" range. This weakness was also criticised by Aiyar et. al. (2013), Paus (2014), Pritchett and Summers (2014).

Williamson (2012) also criticises EPS (2012) and argues through a neoclassical lens that these slowdowns are implicit in the notion of convergence. Williamson is still

hopeful that these "slowing down countries" will eventually achieve a high-income status, and that "trap" is an exaggeration. However, his view is challenged when one considers the fact that there are only 13 countries that became high-income since the 1950s (World Bank, 2012:12).

In contrast to EPS (2012, 2013), Aiyar et. al. (2013) take all slowdowns into account regardless of their income levels and find that MICs experience disproportionately more growth slowdowns. This confirms the link between income level and growth slowdowns, and specifically the link between middle-income level and growth slowdowns, which is in contrast to Pritchett and Summers (2014)'s findings. Testing 15 different thresholds to define a "middle-income" country, they find that the frequency of the slowdowns of the MICs is consistently and remarkably higher than that of the LICs and HICs. The MICs' frequency is shown in orange in Figure 3. This finding is complemented by Robertson and Ye (2013), who make comparisons using the income *ratio* relative to the US, instead of using income *levels,* and they confirm Aiyar et. al. (2013)'s conclusion. Thus, MIT exist and is robust to definitional differences.

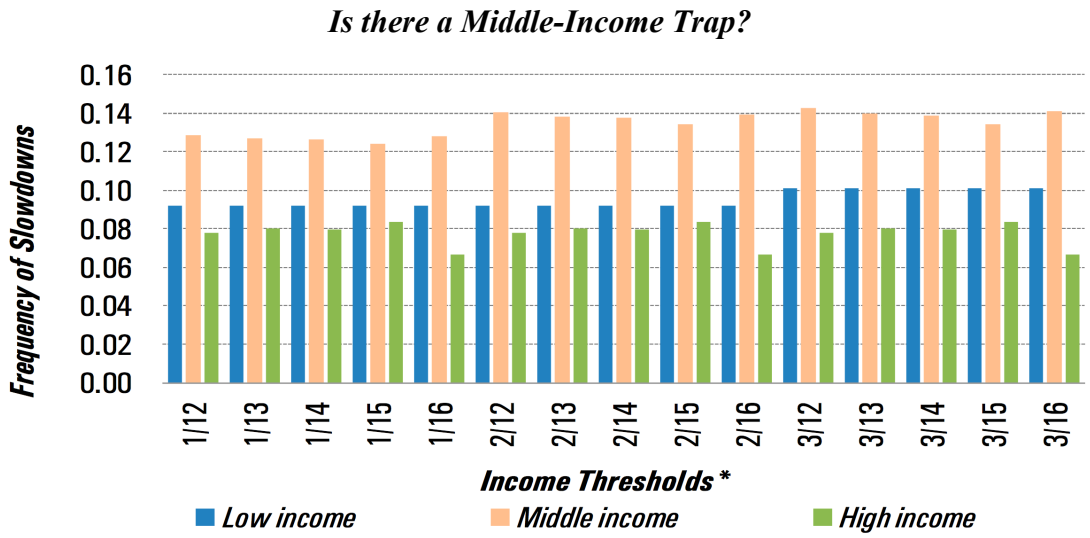


Figure 3: Aiyar et. al. (2013) calculations.

**Income thresholds show the lower and upper threshold for defining the middle-income range; for example, 1/12 indicates a lower threshold of $1,000 and an upper threshold of $12,000.*

Source: *Aiyar et. al (2013) page 12*

For classifying countries, Felipe et. al. (2012) find that the following set of thresholds has the highest explanatory power:

$t_0 = \$2{,}000$	*Separating low from lower-middle income*
$t_1 = \$7{,}250$	*Separating lower-middle from upper-middle income*
$t_2 = \$11{,}750$	*Separating upper-middle from high income*

Felipe et. al. have a unique methodology to identify a trapped country. They take the median of years spent in the middle-income category by the escapees of the trap, and if another country took longer than this number of years in the MIC group, then they are considered 'trapped'. For lower-MICs, this threshold is 28 years, and for upper MICs, this is 14 years. The level of arbitrariness is small in their classification, as they test 10,080 possible combinations of income thresholds using the Maddison income dataset starting from year 1. Accordingly, 30 countries are in the lower-MIT, and 5 are in the upper-MIT, which are listed in the table in Appendix 1.

The following table summarises the views discussed.

Table 1: Summary of views on the "middle-income trap"

Authors	**Does MIT Exist?**	**Approach**	**Classification**	**Variables**
Summers and Pritchett (2014)	NO	Growth Slowdown, Structural Breaks	None	Convergence to the US GDPpc; Absolute level of GDPpc
Im and Rosenbaalt (2013)	NO	Lack of convergence	**First**: ***a.*** Less than 15% of US income ***b.*** Between 15% and 30% ***c.*** Between 30% and 45% ***d.*** Between 45% and 60% ***e.*** Higher than 60% **Second**: ***a.*** 1/16 of US income ***b.*** Between 1/16 and 1/8 ***c.*** Between 1/8 and 1/4 ***d.*** Between ¼ and ½ ***e.*** Higher than ½	Probability of switching from one category to another
Bulman, Eden, Nguyen (2014)	NO	Growth stagnation	***a.*** LIC: Less than 10% of US income per capita, ***b.*** Lower-MIC: 10%-30% of US income, ***c.*** Upper-MIC: 30%-50% of US income ***d.*** HIC: 50% and above of US income	***1.*** Economic structure and the extent of structural change ***2.*** Export shares, ***3.*** Inflation ***4.*** Inequality and dependency ratios ***5.*** TFP-efficiency
Eichengreen, Park, Shin (2012)	YES	Growth slowdown	Above $10,000	***1.*** Trade openness ***2.*** Old-age dependency ratio ***3.*** Inflation rates ***4.*** Undervalued exchange rates ***5.*** Consumption share of GDP

Eichengreen, Park, Shin (2013)	YES	Growth slowdown	Above $10,000	In addition to the above: ***6.*** Secondary and tertiary education ***7.*** High-tech products as a share of exports
Aiyar et. al. (2013)	YES	Growth slowdown	Various	42 explanatory variables to explain **(1)** institutions, **(2)** demography, **(3)** macro environment and policies, **(4)** composition of the economy, **(5)** trade, **(6)** others
Robertson and Ye (2013)	YES	Lack of convergence	8-36% of US GDP per capita	No discussion on determinants
Felipe (2012)	YES	Number of years in MIC group, according to income	Lower-MIT: $2000-$7,250 Upper-MIT: $11,750	***1.*** Diversification of exports ***2.*** Export sophistication ***3.*** Potential for further structural change ***4.*** Uniqueness of export products

Structural Transformation Lens

Growth can be initiated through inflows of foreign short-term capital, inflows of remittances and commodity price booms. This type of growth is unlikely to be sustained if the long-term international competitiveness of the economy depends on declining wages and inflows of foreign investment, and the risk of falling in MIT will be high. Unlike the structural transformation lens, measurements of economic growth fail to capture the essential transformation in the economy's production structure and capabilities.

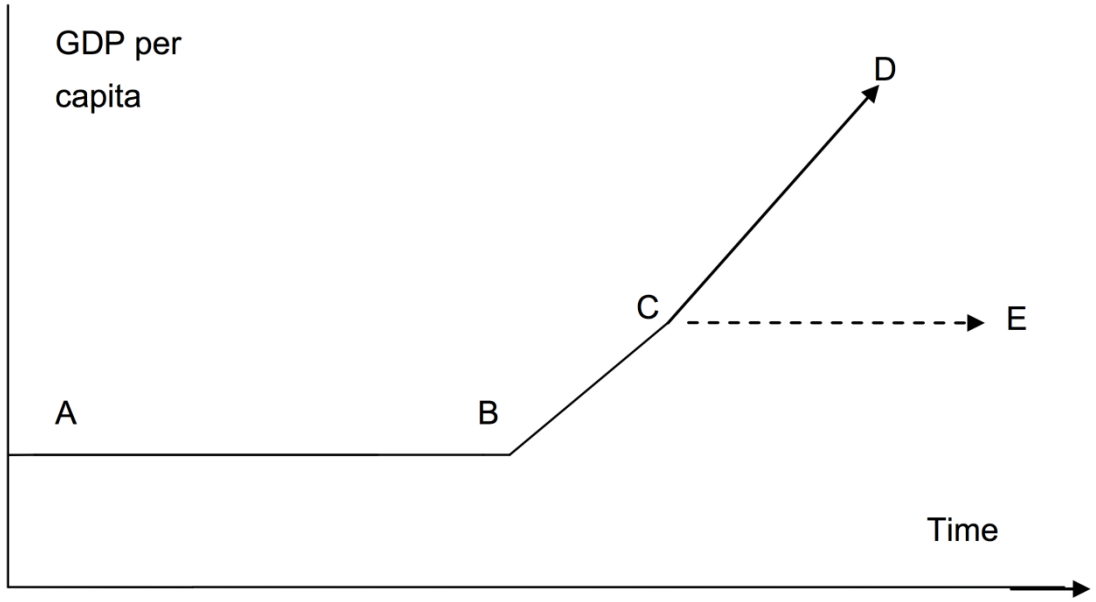
"Quality upgrading" and "diversification of production" are essential for MICs to continue transforming their economic structure and develop their production capabilities. Strategies for a MIC's structural transformation, which are focused on diversifying and upgrading, are different than the strategies for a LIC's structural

transformation, which primarily refers to the transfer of surplus labour from traditional to relatively more modern activities. This section will provide the theoretical model behind structural transformation, which will be followed by the literature linking that to the MIT.

The Lewisian dual-sector model divides the economy into two sectors: *'traditional' low-productivity sector* and *'modern' high-productivity sector* (Lewis, 1954). Looking at figure 4, the traditional society starts off with the initial stage from *A* to *B*, underdeveloped and facing the poverty trap (Tho, 2013: 4). When it escapes the poverty trap, point *B*, the country will start to structurally change its economy shifting its labour surplus from traditional to modern sectors, taking advantage of its cheap and unskilled labour and imitation of foreign technology to modernise its production (Dewitte, 2014). During this stage, people's incomes rise; demand for food will reach its natural limit, while demand for industrial goods will rise.

However, this will only sustain progress until the "Lewisian turning point" which coincides with C in figure 4. This is when the surplus labour drains and wages start rising, labour-intensive exports will become less competitive in global markets, and boosting productivity by shifting labour surplus from agriculture to industries is no longer possible (Tho, 2013, page 4). Hence, MICs are more likely to fall in the MIT after their labour surplus is transferred.

Figure 4: Development Stages of an Economy



***A-B**: Traditional society, underdeveloped and facing "poverty trap"*
***B-C**: Start of the development stage, escape from "poverty trap"*
***C**: Middle-income level*
***C-D**: Sustained growth towards the high-income level*
***D**: High-income level*
***C-E**: Stagnation – "middle-income trap"*
Source: Tho, 2013, page 4

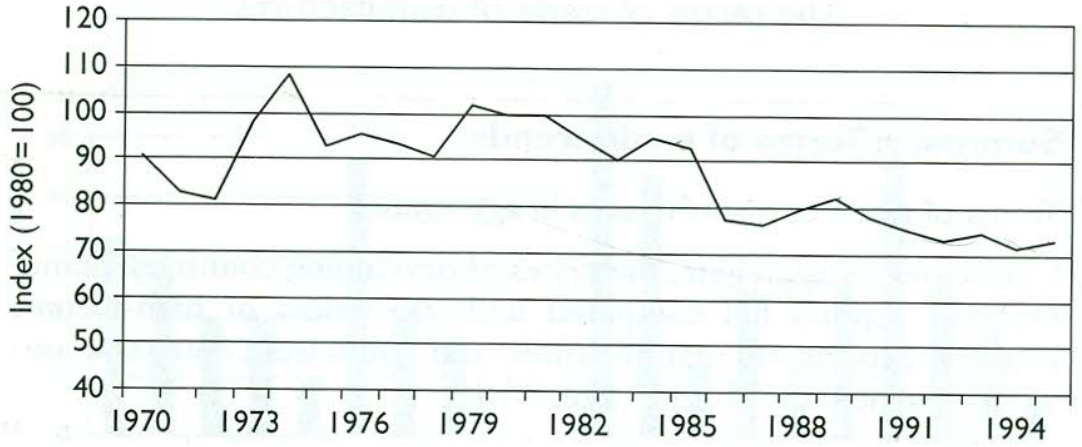
The countries that are able to adapt their growth strategies away from capital- and labour-intensive production will follow the path from C to D, and develop production capabilities with more diversified and dynamic production, with more backward and forward linkages, and with more technology and quality content. Others, who fail to do so, are squeezed between low-wage country competitors and high-technology innovator countries, which is denoted as the line from C to E – "the middle income trap" (ibid, page 5).

In the same tradition as Lewis, Kaldor (1967) regarded manufacturing as the engine of growth – as the typical "*high-productivity sector"* where the surplus labour will be absorbed the most. Further, structural economists, including Rosenstein-Rodan (1943), Prebisch (1950), Singer (1950), hypothesised that primary commodities – associated with the *low-productivity sector* – have declining prices against the price of manufactured goods, and that trading without establishing a manufacturing sector would be a "dead end" for developing countries. This tradition is furthered by more

recent studies, including Rodrik (2012) and Felipe (2014), who show that manufacturing industries exhibit unconditional convergence in labour productivity and income growth, which help LICs and MICs attain high-income standards. UNCTAD (2003:93) confirm these theoretical arguments; high manufacturing exports distinguish slowed-down MICs from high-growth MICs, because manufacturing sector has more capacity to absorb the labour surplus from agriculture during the structural change. Historically, manufacturing activity has also enabled the growth-enhancing reallocation of resources to industries in East Asia and Europe (Henn, et. al., 2013; Timmer et. al., 2014).

However, it is also questionable whether manufacturing is imperative for developmental progress in today's context. Technological innovation might be blocking the potential of manufacturing sector to offer job opportunities and absorb the surplus labour, because production is becoming more capital- and skill-intensive and the need for labour is falling. In fact, Ghani and O'Connell (2014) found that since 1990s, services offer latecomers more advantage in catching up compared to the manufacturing sector (page 6). Further, Kaplinsky (2005) shows that export price and terms of trade of manufacturing commodities have consistently deteriorated, which is shown in figure 5. According to him, developing countries have targeted the expansion of manufacturing sector as a growth strategy in an attempt to avoid specialising in primary commodities such as coffee or cocoa (page 188). However, returns from manufactured goods are also poor and have fallen since the 1974, even more sharply since 1985 when China entered the global market for manufactures. This could be a result of the hierarchy of global value-chains (GVCs, henceforth) where the manufacturing goods are losing their value-added by becoming the intermediaries, stuck between the design and marketing of the final product. Hence, emphasising manufacturing may not be the solution to "unequal trade" anymore, as Singer and Prebisch hypothesised.

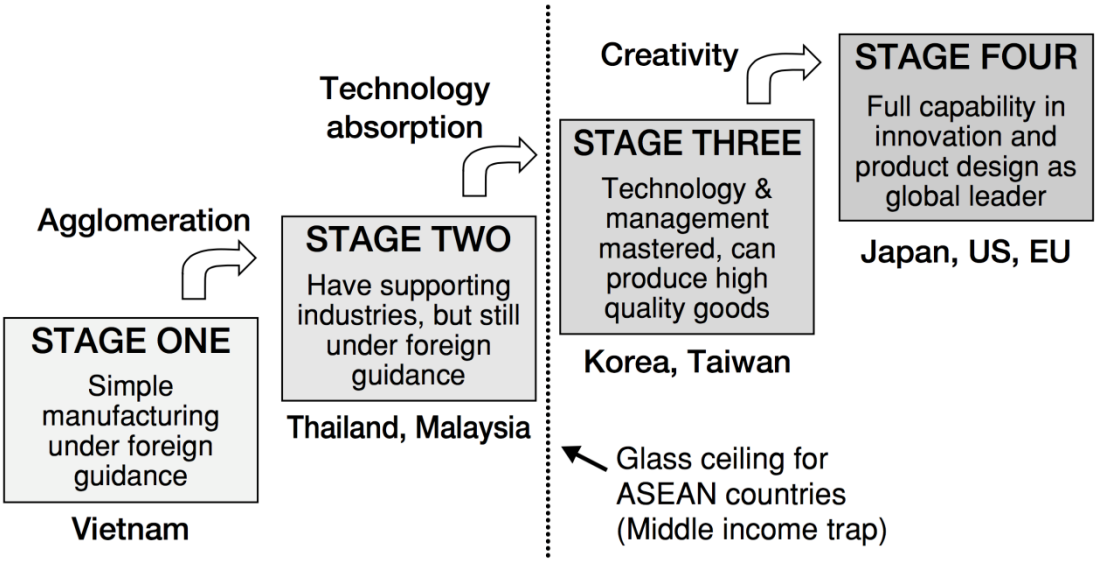
Figure 5: Terms of trade in manufactures 1969-1995



Source: Kaplinsky, 2005, page 188

Further, Ohno (2009) argues that the main reason why growth is difficult to sustain after middle-income levels is because *capabilities* are hard to internalise from foreign investors. Developing countries are typically asked to engage with the lowest segment of the GVCs for labour-intensive assembly under foreign guidance, where the value-added of the final product goes to the foreign companies who own the technology and the management of the local production. Hence, the difficulty of local producers to internalise the technology and management is depicted as the "glass ceiling" between stage 2 (foreign guidance of production) and stage 3 (localised management and technology) in Ohno's analysis, as shown in figure 6. Avoiding the MIT depends on the ability of the local firms to break the glass ceiling and make this transition (ibid: 1-25).

Figure 6: Stages of Catch-up Industrialisation



Source: Ohno, 2009, page 37

Structural Transformation by Upgrading Quality

Hausmann, Hwang, and Rodrik (2007) show that more "sophisticated" products and exports will allow better growth and developmental performance at all income levels. Transforming the product and export basket to include more sophisticated products is an indicator of development of production capabilities, which will enable the MICs to further continue transforming their economic structure after they reap the benefits of transferring labour from agricultural to urban jobs. Further, Sutton (2001, 2005) argues that growth is driven by the accumulation of the firms' capabilities, which is revealed by the *quality* of their production.

Felipe et. al (2012) examines the role of *sophistication* of the export basket in the MIT context. He takes the index of export sophistication from Hausmann et. al. (2007) and compares it between the countries that are in the MIT and the countries who are not (who recently graduated from the MIC level). The results, based on Student t-test comparisons (see Appendix 2), show that the sophistication index of trapped countries is significantly lower than that of the countries who made a transition out of the MIC level. Hence, sophistication of the export basket may be one of the characteristics that distinguish the performance of trapped and non-trapped countries. (ibid: page 39-40).

Structural Transformation by Diversifying Production

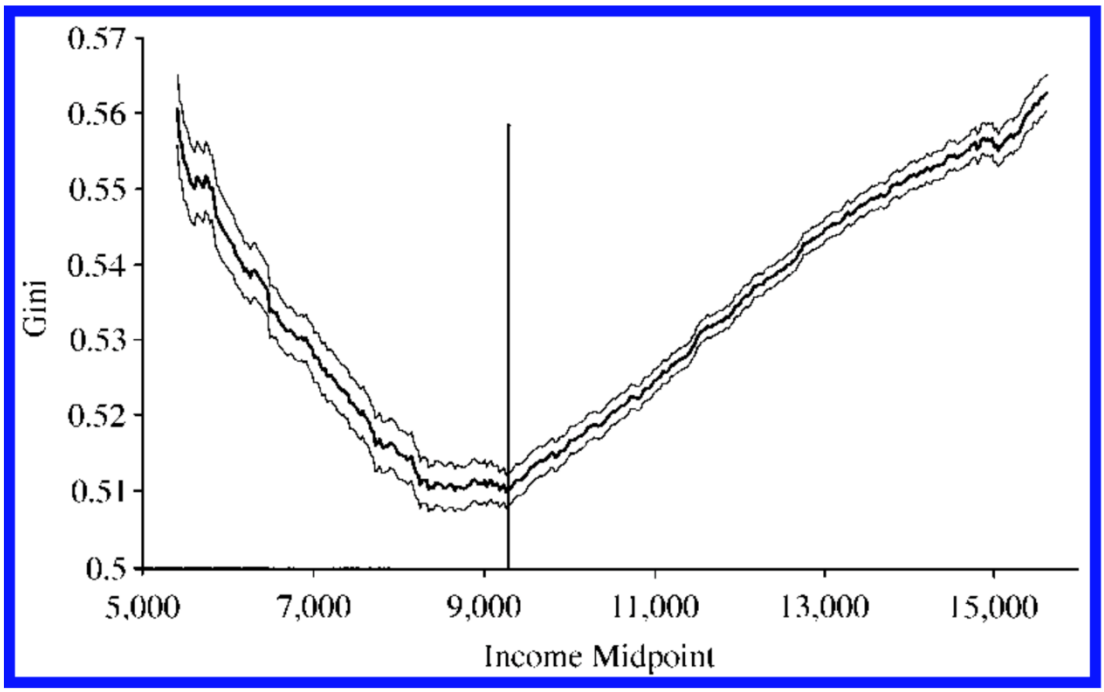
The existing theories of trade and growth, especially the Ricardian trade theory, predict that economies which specialise in a specific range of goods will be able to increase competitiveness and accumulate technologies in that production. Dornbusch et. al. (1977) also argue that countries must specialise in a narrow range of products and import the rest of their demands to benefit the falling transport costs, economies of scale and the multilateral liberalisation of trade. Kharas and Kohli (2011) and Gill and Kharas (2007) suggest that specialising in production will enable MICs to take advantage of *economies of scale* and become "champions in specific niche areas" (page 286). They say, specialising in fewer activities will allow the spillovers of technology and exploitation of foreign innovation in those specific sectors. These theories, however, do not take development of production capabilities, structural change or the hierarchy of global production chains into account.

There are contending theoretical arguments, which are in favour of diversification. Acemoglu and Zilibotti (1997) argue that lack of diversification will increase uncertainty and slow down the progress in development and growth (page 711). Diversification minimises the risks of relying on a narrow range of projects and of sector specific shocks, and thus, accompanies economic growth.

One of the pioneering empirical studies on diversification is from Imbs and Wazciarg (2003) where they investigate the pattern of sectoral diversification along the developmental path. Their findings show that, at the start of the economic development, countries first diversify by spreading economic activity across various sectors. There is a point, however, when sectoral diversification starts to fall and economies start concentrating in certain activities – indicating a U-shaped pattern between sectoral *concentration* and income as shown in figure 7. Looking at the experience of HICs, this point occurred at approximately $9,000 GDP per capita in 1985 dollars, which corresponds to around $20,000 in today's dollars. As stated above, considering that the middle-income range is from $2,000 to $11,750 (Felipe, et. al., 2012), these results tell that a MIC should adopt a growth strategy that is targeted at diversification even after it becomes a borderline HIC. Klinger and Lederman (2006) and Cadot, Carrère and Strauss-Khan (2011) expand the same

investigation and find an almost identical turning point. Hence, it is plausible to speculate that the MICs that prematurely specialise in a narrow range of sectors may get "stuck" along the economic development path, as they are typically below $20,000 per capita income level.

Figure 7: Sectoral Diversification and GDP per capita*



**The Gini index here has the same intuition as the conventional Gini index; higher levels of the index indicate inequality among sectors and more concentration; lower levels indicate more distribution and equality among sectors and more diversification.*
Source: Imbs and Wacziarg, 2003, page 71

Taking this to the context of MIT, Felipe et. al. (2012) construct an index of diversification and compare this indicator between a group of trapped countries and another group of countries that graduated from the MIC status. The figures in Appendix 2 show the remarkably low levels of diversification in trapped countries. The authors speculate that the trapped countries may in fact be in a "product trap", because they perform very poorly in both sophistication and diversification of products. Being stuck at producing goods that are not well-connected with other products (because of lack of diversification) and that are unsophisticated, they fail to discover new and upgraded products that they could be competitive at. Thus, lack of

diversification coupled with lack of sophistication may explain why countries fall in the MIT (ibid, page 39).

In conclusion, almost all the studies of the MIT literature acknowledge the distinct challenges that MICs are facing, but some are too cautious to use such a strong word by calling it a "trap". After all, the concept is still very new and there is no theoretical characterisation of the phenomenon.

Structural transformation approach allows us to differentiate between "income convergence" and "capability convergence". Assessing an economy through its income level is incomplete, because it neglects the extent of structural transformation and the development of production capabilities in the economy. What this paper is interested in is the MICs' ability to continue their structural transformation, after they pass the Lewisian turning point, by developing their *production capabilities*. Therefore, it adopts a quantitative analysis framework that complements the growth slowdown approach with variables that proxy structural transformation (development of *production capabilities* through *quality upgrading* and *diversifying*) in its empirical specification.

Data and Empirical Specification

Identification of Slowdowns

I take EPS (2012, 2013)'s identification of 'growth slowdowns' which builds on Hausmann, Pritchett and Rodrik (2005)'s identification of 'growth accelerations'. The present analysis will take the same conditions that EPS (2012, 2013) apply but change the last one:

$$g_{t,\ t+n} \geq 3.5 \qquad \textbf{(1)}$$

$$g_{t-n,t} - g_{t,\ t+n} \geq 2.0 \qquad \textbf{(2)}$$

$$y_t > \$2{,}000 \qquad \textbf{(3)}$$

EPS are interested in slowdowns associated with "economic maturity" (ibid, 2012: 7). Therefore, they limit their data by specifying the third condition as (3) $y_t > \$10{,}000$. However, this research is concerned with the kind of slowdown that captures MICs' "inability to develop", rather than "economic maturity". Therefore, I limit the data to include MICs, whose GDP per capita is above $2,000. This threshold comes from Felipe et. al. (2012)'s classification of countries in which the level of arbitrariness is small, as discussed in the literature review. Further, this classification does not differ much from other classifications such as that of the World Bank, Aiyar et. al. (2013), Im and Rosenblatt (2013).

The first condition requires that a growth episode of n years must have an average growth rate of 3.5% or above. Growth rate average $(g_{t,\, t+n})$ over a horizon of n years is calculated by taking the least squares growth rate of GDP per capita from year t to year $t+n$. Both EPS (2012, 2013) and Hausmann et. al. (2005), take $n=7$ as the length of a growth episode, and so do I.

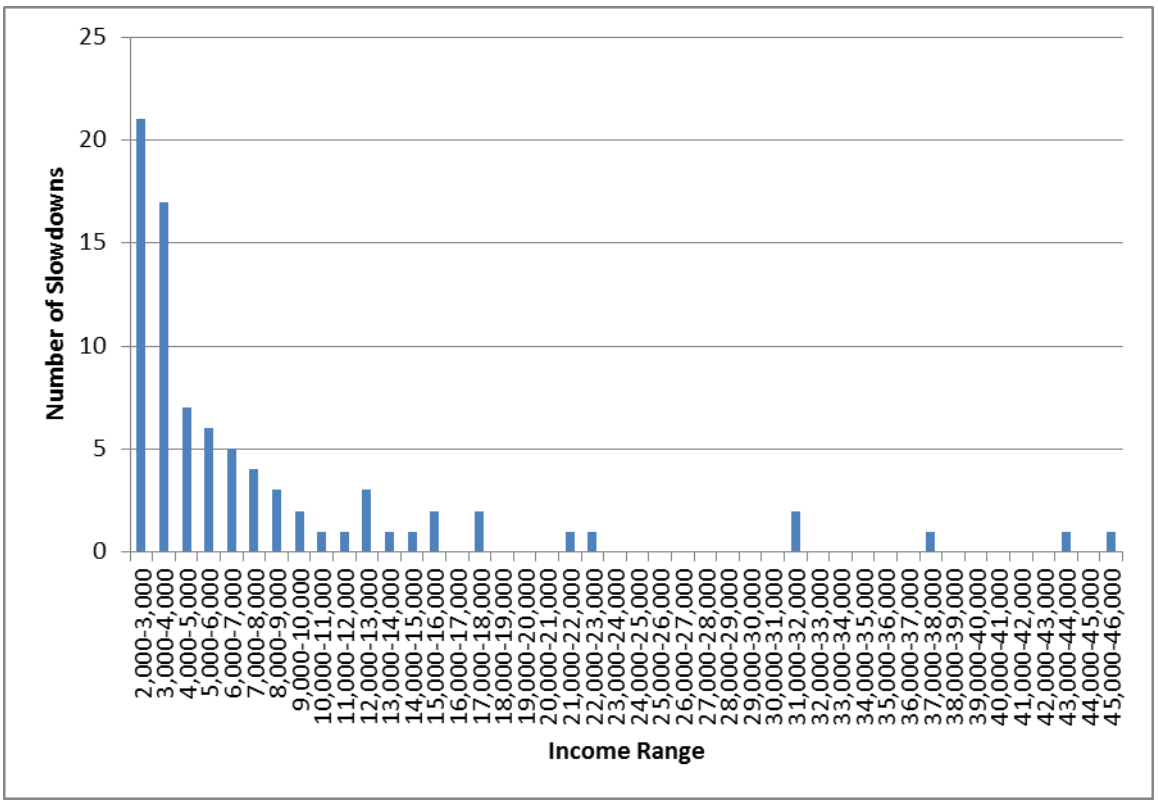
The second condition demands that growth must decelerate by 2%. This means that there must be a 2 percentage point difference between successive growth episodes, for example, between the episode of 1990-1997 and the episode of 1997-2004. If all these conditions are satisfied, then I can conclude that the slowdown is non-negligible.

The data for growth rate of GDP based on constant 2005 US dollars come from World Bank's database, covering years from 1960 to 2014 with 137 countries. The data and this specification yield 154 incidences of growth slowdown. This is similar to the number of slowdowns EPS (2013) identify, which is 146, although their data come from Penn World Table 7.1.

This specification identifies a string of consecutive years as growth slowdowns in some cases. For example, all years from 2005 to 2007 in Argentina satisfy all slowdown conditions. However, since I am interested in slowdown 'episodes', not individual years of slowdown, I break them by using a Chow test which selects the year that has the highest likelihood of a structural break. Doing so reduces the number of slowdowns from 154 to 83. The table in Appendix 3 shows all 83 slowdown episodes this specification identifies.

The following demonstrates the growth slowdowns according to income ranges per thousand dollars:

Figure 8: Frequency of slowdowns according to income ranges per thousand dollars



Source: Author's own calculation using data from World Bank's growth rate of GDP and GDP per capita based on constant 2005 US dollars

The figure shows that slowdowns occur disproportionately at the $2,000-3,000 and $3,000-4,000 GDP per capita level. This emphasises the strength of this specification; if I followed EPS (2012, 2013) who limited their data to $10,000 income per capita or above, I would have missed a significant number of the slowdowns that MICs have experienced.

The list of slowdowns (in Appendix 3) shows that 42% of the slowdowns identified are of Latin American countries, 2% are of East Asian, 10% are of Sub-Saharan Africa, and 11% are of European or North American countries.

Determinants of Slowdowns

Variables

I use an *index for diversification of exports* and an *index for quality of manufacturing exports* to capture the effect of the extent of structural transformation on the probability of falling in the MIT. The data for both indices come from IMF's Diversification Toolkit, which cover 137 countries from 1963 to 2010.

Diversification

Export diversification index is constructed by using the Theil Index, which is originally proposed to measure income inequality and lack of racial diversity. If the export shares are more equal, the economy is more diversified. *Higher values* indicate *lower diversification* and *more specialisation*.

The index has three indicators: extensive, intensive and total Theil index. Export product diversification can occur through *new product lines*, which is captured by the *extensive margin*. Extensive diversification is calculated through:

$$T_B = \sum_k (N_k/N)\ (\mu_k/\mu)\ \ln(\mu_k/\mu)$$

where k is the group of products, N_k is the number of products exported in group k, and μ_k/μ represents the relative average of exports in group k. On the other hand, intensive margin represents diversification through a more diversified mix of *existing products* and is calculated by:

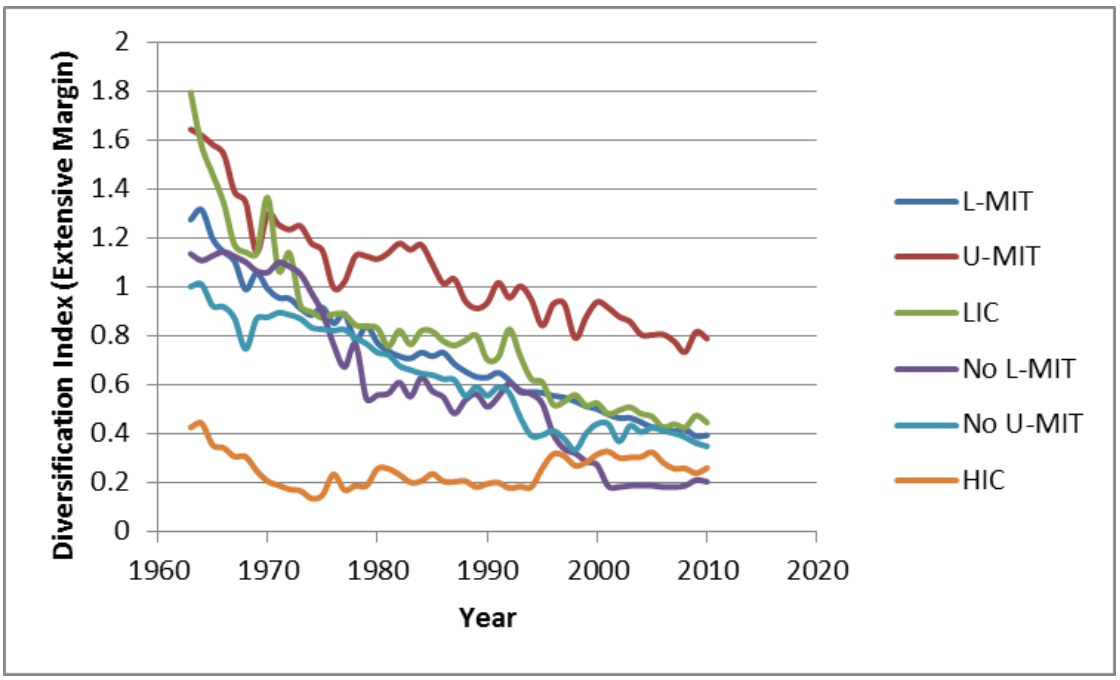
$$T_w = \sum_k (N_k/N)\ (\mu_k/\mu)\ \{(1/N_k)\ \sum_{i \in Ik} (x_i/\mu_k)\ \ln(x_i/\mu_k)\}$$

where x is export value. Total margin is the sum of extensive and intensive margins (IMF, 2014). I test all three measures of diversification for robustness.

The following figures demonstrate the average values of diversification by income groups and by "trapped" status. It is clear that LICs and the trapped MICs have done

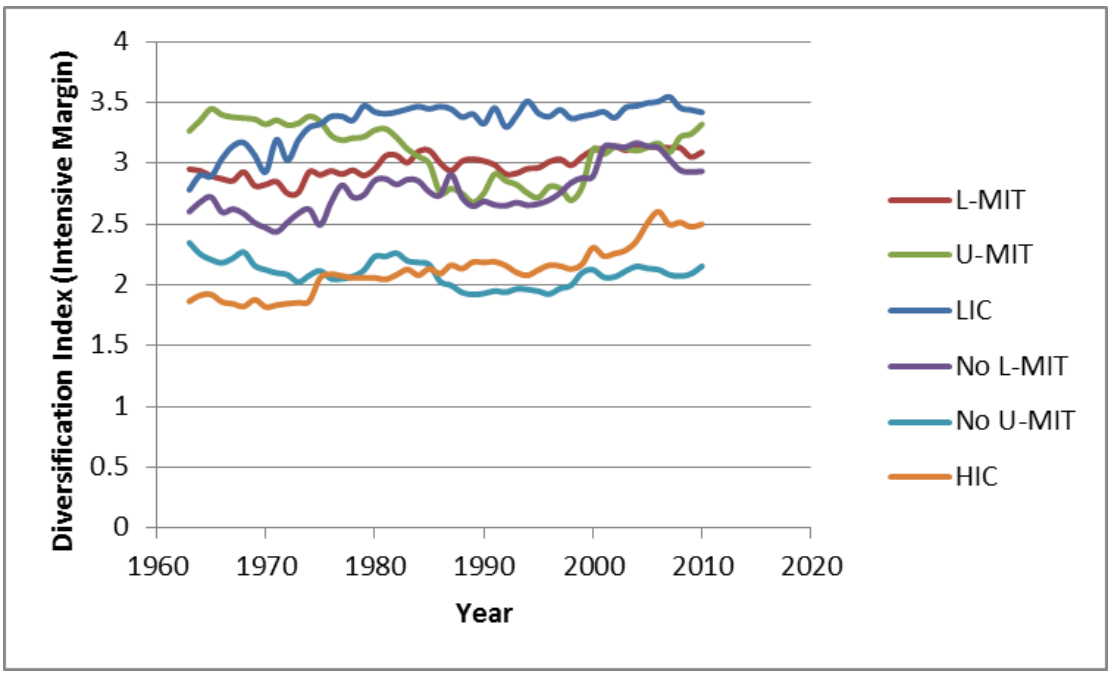
consistently worse in all measurements (where high values indicate low diversification).

Figure 9: Export diversification (extensive) against income goups



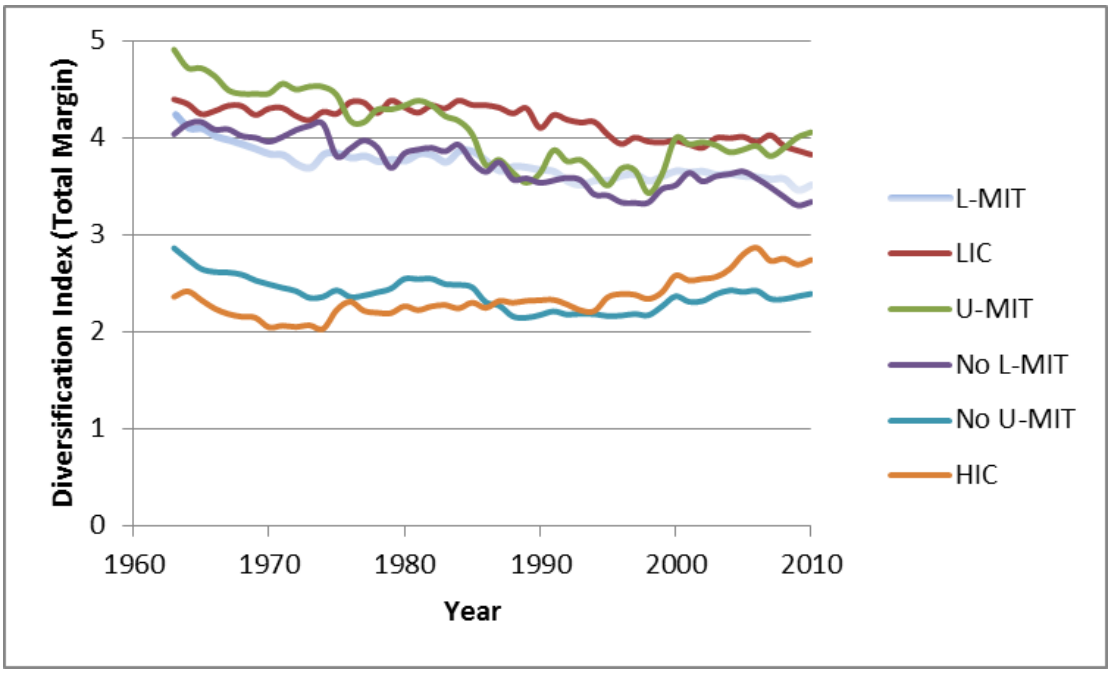
Source: Author's own calculation

Figure 10: Export diversification (intensive) against income groups



Source: Author's own calculation

Figure 11: Export diversification (total) against income groups



Source: Author's own calculation

Quality

I take the upgrading of manufacturing quality rather than overall quality of the export basket. Since my research interest is the effect of (lack of) structural transformation, manufacturing activity is more relevant to this investigation. As an agricultural product, tomato may experience a quality upgrade because of a rise in water availability or improvement in weather, which does not imply structural transformation or improvement in production capabilities. Hence, such false effects are controlled by focusing solely on the production of manufactured goods. The 1-digit SITC (Standard International Trade Classification) Revision 1 level is used as data for manufacturing quality as it provides broad sectoral information on manufacturing.

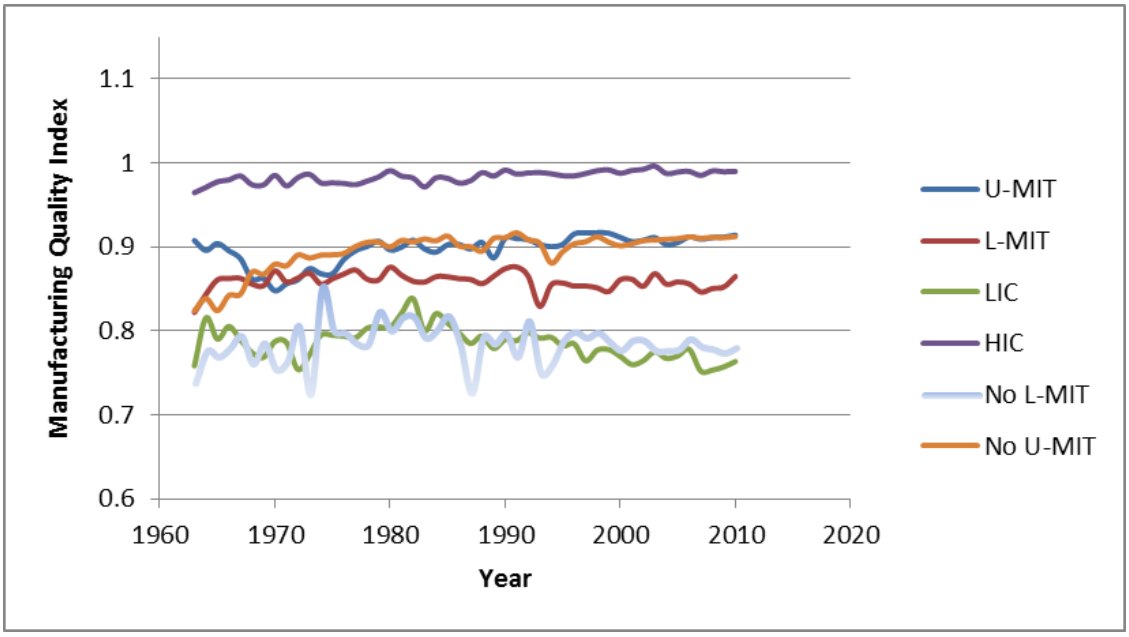
The equation to estimate quality is:

$$\text{Quality estimate}_{xmt} = \delta \ln\theta_{mxt} = \zeta'_1 \ln p_{mxt} + \zeta'_2 \ln y_{xt} + \zeta'_3 \ln \text{Dist}_{mx}$$

which adjusts for the differences in the cost of production and the bias for relative distance between exporters and importers. θ_{mxt} is the quality estimate; p_{mxt} is the price of any given product, and m, x and t are importer, exporter, and time period, respectively. y_{xt} is per capita income of the exporter, and Dist_{mx} is the distance between the importer and exporter (Henn, et. al. 2013). The index estimates quality through the *unit price of the export,* and controlling for price differences due to income, cost differences in the production, and biases due to large distances of trade and high transport costs. The index assumes that what remains after controlling for these factors is *quality* (Hallak, 2006; Henn, 2013). More technical information on how they control for such effects is explained in Appendix 4.

The following figure shows the average values of manufacturing export quality by income groups and by trapped status. Interestingly, the trapped countries have higher average quality in manufacturing exports compared to non-trapped MICs.

Figure 12: Manufacturing export quality against income groups



Source: Author's own calculation

The control variables included in this empirical model are income level (GDP per capita in 2005 dollars), pre-slowdown growth rate, trade openness (as a share of GDP, sum of exports and imports), age dependency (ratio of dependents to the working-age population), years of education (total and secondary or higher in separate variables). EPS (2012, 2013) find that these control variables are also correlated with the probability of a slowdown event, which may alter the coefficients of the explanatory variables. Therefore, in order to maintain consistency and avoid omitted variable bias, I also include these variables. The sources of data, coverage, and more information are available in Appendix 5.

Empirical Specification

In order to test if the lack of structural transformation is a determinant of growth slowdowns, this analysis follows EPS (2012, 2013) and uses a probit model with panel data covering 137 countries from 1963 to 2010 with two explanatory variables and six control variables. This specification proxies structural transformation with

manufacturing quality upgrading and *diversification of exports,* which are the explanatory variables.

I will test the null hypothesis, H_0, that export quality and export diversification do not change the likelihood of experiencing a middle-income growth slowdown, against the alternative hypothesis, H_1, that higher manufacturing export quality will lower the likelihood of experiencing a slowdown event, and H_2 that more export diversification will lower the same likelihood. The model that I wish to fit is:

$$Probability\ (slowdown=1) = \Phi(\beta_0 + \beta_1 ExportDiversification + \beta_2 ExportQuality + \beta_3 GDPpc + \beta_4 Pre\text{-}SlowdownGrowthRate + \beta_5 TradeOpenness + \beta_6 AgeDependency + \beta_7 Education + \beta_8 HigherEducation)$$

where β_0 is the constant. I expect that β_1 is significant and positive, meaning that more diversification lowers the probability of a growth slowdown (the diversification index reports lower values for higher diversification). Therefore, I expect it to have a positive effect; less diversification – with higher values – will increase the likelihood of a slowdown. β_2 is expected to have a significant and negative coefficient, meaning that higher manufacturing quality in exports will lower the probability of a growth slowdown. The others are control variables. Appendix 5 summarises the description of all variables and their data sources, and Appendix 6 provides the summary of statistics of each variable.

Results

Because of the nature of the probit model, I am only able to interpret the direction of the probabilities – whether it has a positive or negative effect on the probability of a slowdown event. Other studies in the MIT literature, including Aiyar (2013) and EPS (2012; 2013), interpret the results of their probit regressions similarly. Hence, the present results also do not report the exact value of the change in probability.

Table 2: Determinants of Growth Slowdowns, Regression Results

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
GDP per capita	0.000	0.000*	0.000	-0.000****	-0.000****	-0.000****	-0.000****
	0.138	*0.079*	*0.208*	*0.000*	*0.000*	*0.000*	*0.000*
Pre-slowdown Growth	0.286****	0.290****	0.311****	0.371****	0.355****	0.357****	0.370****
	0.000	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
Diversification (Total)	0.155**				0.142**		
	0.037				*0.038*		
Diversification (Extensive)		0.331***				0.183*	
		0.003				*0.101*	
Diversification (Intensive)			0.043				0.162*
			0.649				*0.060*
Quality of Manufacturing				5.711****	5.518****	5.268****	5.912****
				0.000	*0.000*	*-1.040*	*0.000*
Trade Openness	0.003**	0.002*	0.003**	0.001	0.002	0.002	0.001
	0.029	*0.057*	*0.033*	*0.173*	*0.133*	*0.137*	*0.179*
Age dependency	0.043***	0.034**	0.034	0.029**	0.042***	0.032**	0.042***
	0.009	*0.024*	*0.560*	*0.033*	*0.006*	*0.022*	*0.007*
Years of Edu (Total)	0.086	0.084*	0.06	0.055	0.077*	0.069	0.067
	0.064	*0.072*	*0.224*	*0.227*	*0.094*	*0.141*	*0.143*
Years of Edu (Secondary)	-0.155	-0.112	-0.142	-0.101	-0.128	-0.097	-0.131
	0.085	*0.221*	*0.148*	*0.269*	*0.160*	*0.292*	*0.150*
Constant	-3.798****	-3.413****	-3.230****	-7.828****	-8.380****	-7.678****	-8.614****
	0.000	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
Constant	-2.582**	-2.650**	-1.998***	-13.600	-13.794	-13.309	-13.544
	-1.070	*-1.080*	*-0.780*	*-16.550*	*-16.550*	*-26.670*	*-16.300*
Wald Chi2	58.31	58.7	49.89	84.98	88.15	87.14	87.00
Prob>Chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	4339	4358	4343	4285	4223	4217	4244
Number of Countries	132	135	133	137	131	135	133
*p<0.10, ** p<0.05, *** p<0.01, ****p<0.001							

**p-values are shown in italics under the coefficient values*

Source: Author's own calculation

The summary of results is shown in table 2. The high likelihood ratio (Wald chi-square) and p-value of 0.0000 in all specifications tells that the models as a whole are

all individually statistically significant, and that at least one of the coefficients is not equal to zero.

Export diversification is significant with a positive coefficient and robust to different measurements in five out of six of the regression models. Total, extensive and intensive diversification indices have 1, 5 and 10 percent significance levels, respectively. I first tested them separately and then together with manufacturing quality and their significance and signs did not change, except for model three where *intensive diversification* variable is insignificant. However, this variable gains significance at a 10% level when it is tested with manufacturing quality. Further, the sign of the coefficient for diversification in all the models confirms my prediction; higher values of the index – less diversification – increase the likelihood of a growth slowdown. Therefore, I am able to reject the null hypothesis in favour of the alternative which hypothesises that export diversification is a determinant of growth slowdowns. These results suggest that a rise in export diversification – both through new and existing product lines – lowers the likelihood of experiencing a growth slowdown at the middle-income level.

Manufacturing quality, on the other hand, yielded surprising results. It is tested separately in model four and together with total, extensive and intensive diversification in models five, six, and seven respectively. Its sign and the significance level are consistent and highly significant in all the models with a 99.9% confidence level. However, the sign is the opposite of what I expected. Holding GDP level, pre-slowdown growth rate, trade openness, dependency ratio, and education level constant, having higher quality manufacturing exports increases the likelihood of a growth slowdown. This can be extended to infer that improving production capabilities in the manufacturing sector does not allow a country to escape the MIT. Counter-intuitively, it makes it more likely that they will fall in the trap. Therefore, I fail to reject the null hypothesis.

Discussion of Results and Policy Implications

Discussion of Results

Almost half of the slowdowns this specification identifies occur at a narrow range of $2,000-4,000, which corresponds to the middle-income level (see figure 8). This provides evidence in favour of the existence of the MIT, in line with the findings of Aiyar et. al. (2013), EPS (2012, 2013) and Felipe et. al (2012).

The results show an element of "regression to the mean", as the coefficient for pre-slowdown growth rate is significant and positive. This suggests that having a high growth rate before the slowdown episode makes a country more prone to experience a growth slowdown or fall in the MIT, holding GDP level, pre-slowdown growth rate, trade openness, dependency ratio, and education level constant. This is partial evidence for the findings of Pritchett and Summers (2014), but the results of the present paper also show the significance of other determinants such as export diversification and manufacturing quality.

The results indicate that diversification of the export composition helps MICs avoid being trapped at the middle-income level. This confirms my earlier speculation that diversifying output and processes will create more opportunities to establish backward and forward linkages and form a dense economic structure with various activities complementing and supporting each other. Creation of backward and forward linkages, captured by the *intensive diversification* variable, reduces the probability of a growth slowdown with a coefficient significant at the 10% level in the seventh regression model. Additionally, diversifying into new activities that did not exist in the initial output structure, which is captured by the *extensive diversification* index, reduces the likelihood of a slowdown event with a coefficient significant at 1% level in model two and 10% in model six. Hence, countries can escape the MIT through a diversification strategy allowing them to follow a stable and non-volatile growth path and join the high-income group.

The results on export diversification are parallel to Felipe et. al. (2012)'s analysis as well as the findings of Imbs and Wacziarg (2003), Klinger and Lederman (2006) and

Cadot, Carrère and Strauss-Khan (2011). It is easier for MICs to gain competitiveness in higher value-added activities if they diversify towards new product lines and let go of specialising in a specific sector. Diversifying the economic activity across multiple sectors will dampen the effects of sector-specific shocks and reduce dependency on a narrow range of sectors. The creation of backward and forward linkages provides local support for other industries and makes it more likely to establish a dense network of sectors that support each other in positive interactions. This facilitates the process of jumping from lower to higher value-added activities or discovering new and efficient methods of production (Hidalgo and Hausmann, 2009). Intuitively, it is easier for economies to upgrade from assembling toys to assembling computers than to upgrade from tomatoes to automobiles.

However, the results on manufacturing quality are not as intuitive, especially from a structuralist perspective. The index for manufacturing quality is consistently and highly significant at the 0.1% level in all the models, from model four to seven. However, this does not mean that structural transformation, which the *manufacturing quality* index is a proxy of, leads to growth slowdowns. In fact, the results warn us about the applicability of designating "*high-productivity* versus *low-productivity*" with "*industrial* versus *non-industrial*". (Ghani, 2013). The argument in favour of industrialisation being imperative to development must be revised, and tertiary sectors must be included in the discussion of "*modern*" sectors for structural transformation.

Structuralists, including Lewis, Prebisch, Singer and Kaldor, say that a shrinking agriculture sector is a sign of structural transformation because it implies that the economy's resources are directed towards the manufacturing sector, where there are more opportunities for the development of production capacities. In contrast, Aiyar et. al. (2013) find that the diminishing of agriculture and services sectors will increase the likelihood of a country to slow down. EPS (2012) also find that increasing manufacturing employment raises the likelihood of a growth slowdown. My results support the latter view and show that from 1963 to 2010 manufacturing sector has not offered the MICs any opportunities to graduate into the high-income level.

The unexpected findings on manufacturing quality might be a result of "premature deindustrialisation" (Dasgupta and Singh, 2006; Rodrik, 2015; UNCTAD, 2003),

which refers to the premature contraction of the manufacturing sector in developing countries. For example, India's manufacturing sector peaked in 2001 when manufacturing employment share was only 15% of the national employment, whereas the UK's manufacturing peaked in 1970 when its share of manufacturing employment was 35% (Felipe, et. al. 2014: 3). Deindustrialisation is not necessarily a concern for advanced countries, if they already have gone through a proper experience of industrialisation. However, having little experience in industrialisation may prematurely push the latecomers towards petty services, unlike the type of services that advanced countries are specialising in, such as finance and ICT. Because of relative price trends determined by the manufacturing industries in advanced countries, coupled with technological innovation curtailing the need for labour in manufacturing (Rodrik, 2015: 4), manufacturing sector might have lost its effectiveness in structural transformation, in contrast to what was traditionally thought.

Another explanation can be offered by a GVC analysis. Kaplinsky (2000) argues that manufacturing products are analogous to primary commodities since production became globalised. Manufacturing products have low value-added rents, and the highest economic rents are outside manufacturing production and are at design and marketing activities (page 121). Manufacturing products without a brand-name are easily replicable by other firms worldwide and will not live as long as copyrighted products (Knutsen, 2003). That is why increasing manufacturing production may not necessarily lead to a proportional growth in national income or avoid the MIT.

This is in contrast to Singer-Prebisch's hypothesis, which assumes that relative prices in manufacturing are higher vis-à-vis primary commodities and predicts that industrialisation will enable developing countries become competitive in an unequal global trade structure. Today, manufacturing exports cannot expand as traditionally thought, because wages start rising and cost competitiveness decline at the middle-income level. Therefore, it does not offer economic rents to MICs as structuralists expect. Hence, improvements in manufacturing do not provide the MICs leverage for development anymore.

Policy Implications

Manufacturing Quality

The results of this analysis call attention to growth strategies other than industrialisation for MICs. In the age of globalisation, tertiary activities can also enable linkage creation between sectors to upgrade the overall economic structure. With improvements in technology, most services can be electronically exported (Paus, 2012:122). Examples include call centres (call centres in India serving customers in Britain, exploiting India's comparative advantage in English language), software development, business processing, health services, education, insurance, audit and many more.

Services as a share of global trade is also growing rapidly, while the share of manufacturing industry is declining. Therefore, services can offer the MICs opportunities at least as much as manufacturing industry, especially through today's global value chains with opportunities in commercial services, IT, factoring, marketing, logistics, distribution, post-sales services, as these are often sub-contracted globally (Ghani and O'Connell, 2014: 21).

Flaaen et. al. (2013) argue that Malaysia is in MIT, because it has long been unable to switch from labour-intensive manufacturing towards more value-added modern services. Additionally, evidence from India shows that services sector – including ICT, business services and finance – are growing rapidly and is the new engine of India's growth, while manufacturing stalls behind (Dasgupta and Singh, 2005:1055; Dasgupta and Singh, 2006:15). Further, for the last 15 years, services sectors have been growing rapidly in size and in their contribution to economic development in India, and the mix of skilled and unskilled labour in manufacturing is similar to that of services (Eichengreen and Gupta, 2011). Similar observations were made in Pakistan and Sri Lanka (Ahmed and Ahsan, 2011; Noland, et. al., 2012). These imply that manufacturing sector does not raise labour and overall productivity any more than the tertiary sectors raise, which means that the *high-productivity sector* we often mention in structural transformation may as well be the services sector.

However, one must be cautious of making generalisations based on the experience of a few countries. The diminishing of industrial opportunities in Latin America did not have similar consequences as it did in India, Pakistan or Sri Lanka. As a result of Washington Consensus policies that the Latin American countries followed in the 1980s and 1990s after their debt crisis, the ensuing structural change was growth-reducing with specialisation in current and static comparative advantages rather than long-term dynamic comparative advantages (Ocampo, 2005; Shafeaeddin, 2005). With the exception of Chile, countries started deindustrialising at very premature levels; Brazil and Mexico already peaked in their manufacturing production in 1986 and 1990 with manufacturing employment shares of 16% and 20%, respectively, which are low relative to the respective shares of advanced and industrialised countries (Rodrik, 2015). This resulted in a shift of activities towards primary commodities, natural resources and petty services (UNCTAD, 2003: 124-142). Hence, deindustrialisation did not automatically enable the flourishing of modern services. In the absence or shrinking of industrial opportunities, businesses should have been directed towards viable alternatives.

Taiwan, as one of the successful latecomers, did differently. Diverging away from the policies associated with the so-called Washington Consensus, Taiwanese state used *industrial* and *regulatory policies* to facilitate the networking among sectors, incubated high-tech start-ups (by limiting foreign competition and subsidised local development of high-tech firms), allowed existing local business groups to diversify into modern service sectors and high-technology electronics, while its promotional policies evolved away from manufacturing industries. According to Amsden and Chu (2003), government intervention was heavy and systematic, and it allowed the economy to evolve from labour-intensive industries controlled by multinational corporations (MNCs) towards large national firms which diversified into high-tech electronics and services. Hence, state involvement enabled them to break the "glass-ceiling" between foreign management of local production (stage 2) and localised production and management (stage 3) as Ohno (2009) described (see figure 6). As the authors have put:

"*It is more in the interests of national entities than foreign multinational firms to invest in the specific assets that are required to compete at this [latecomer developing country] stage of development."* (Amsden and Chu, 2003: 3) (emphasis added).

Hence, a proactive government is imperative to ease the diversification of activities away from manufacturing and to ensure that the objectives of the foreign investors are in line with the developmental objectives of the host country. Taiwan was able to break that glass-ceiling and escape the MIT by maintaining its industrial and regulatory policies but changing its content to include high-technology electronics and services and diversifying to include more activities other than manufacturing.

It should be noted that this paper does not argue manufacturing should be skipped and structural transformation should follow the transfer of labour from agriculture to directly into tertiary sectors. On the contrary, agricultural labour becoming industrial wage earners might offer a suitable growth strategy in low-income settings. However, MICs typically have developed some industrial base already. Therefore, their strategy might have to move towards services and tertiary activities in order to graduate from the middle-income category (Kharas and Kohli, 2011: 284).

Diversification of Exports

The results show that MICs can reduce the likelihood of slowing down and follow a more stable growth path through diversification. But how does a country diversify? Diversification must be treated as a positive "externality". It is not in an entrepreneur's private advantage to invest in experimenting and discovering the costs and advantages of new activities. There is considerable uncertainty and private loss involved in the discovery process. This process has positive externalities for other entrepreneurs; if the first entrepreneur discovers a successful project, this will enable others to learn and emulate the project, and thus, create economy-wide benefits. However, if the incumbent entrepreneur fails, his or her losses will not be socialised the same way the success would have been socialised. Therefore, the state has a role in enabling the discovery of new profitable activities and socialising the high initial

investment costs in order to facilitate the process of diversification (Hausmann, et al., 2007: 3-4).

The present analysis provides evidence that discovering and diversifying to new activities will have long-term benefits in avoiding the MIT and are in MICs' national interest. Therefore, "*industrial* and *regulatory policies"* are necessary to facilitate this process and overcome the externality problem of diversifying production. The policy agenda must avoid being one-dimensional and based on manufacturing only, have a broader set of strategies, and must transition from LIC-oriented growth strategies towards strategies that are suited for MICs' growth.

Evidence from Imbs and Wacziarg (2003) and Klinger and Lederman (2006) show that advanced countries in their path of income convergence increasingly diversified their product and export composition up until the income level of $20,000 approximately. This paper adds to their findings by showing that MICs can avoid stagnating at middle-income levels if they diversify their export composition. Different products and sectors matter because they bring different learning opportunities and shape the comparative advantages of the future when the economy attains a higher level of income. Therefore, today's activities will influence tomorrow's production capabilities and the potential to innovate in the future. The choice of not having any industrial policy to steer this process is "the acceptance of the current international division of intellectual and physical labour" as it is (Cimoli, Dosi, Stiglitz, 2009: 3) and a refusal to upgrade the "revealed comparative advantages" that a country inherits from its past. Diversification of the economic activities, therefore, offers opportunities to a country to discover the costs and advantages of new activities that can be profitable in the future. A task that is so crucial to the future of a country's development cannot be imputed on the private actors in a market with externalities. The state responsibility is imperative to facilitate and aggregate the diversified activities by linking and organising them.

This brings up the debate on industrial policies (Amsden, 1989; Rodrik, 1995; Wade, 1990) versus market forces (Krueger, 1979; Pack, 2000; World Bank, 1993) for promoting development and structural transformation. If there is a risk of being trapped in the same income group and there are externalities in the market, then

government intervention is justified. The kind of industrial policy understood and needed here is more expansive than simply infant industry protection, and it includes policies on trade, research and development, public provision, foreign investment, and finance (Cimoli et. al., 2009) to coordinate businesses to expand towards new activities from their existing structure.

This missing link, namely the industrial policies, can be identified by looking at countries which were able to diversify and avoid the MIT. For example, Taiwanese low-tech electronics firms were able to diversify through state assistance. A local company, called *GVC*, invested five years of R&D with the help of state subsidies, hired experts and researchers from American IT companies (for example, *Bell Labs*) and was able to diversify out of its traditional product – modems – towards new and modern products such as monitors, notebooks and PCs (Amsden and Chu, 2003: 56). Similar successes were observed in other companies, for example in *Inventec*, which diversified from handheld calculators to PCs in less than five years with state help (ibid: 58). Evidently, state facilitating the discovery process of what can be profitable in the future is one of the reasons why the East Asian high-performers could diversify towards higher value-added activities and thus escape the MIT.

Chile offers another example, where foreign and local investment went predominantly into the natural resource sector. This initially allowed limited spillovers of technology, upgrading and diversifying of activities. It was only in 2000 when the Chilean state founded the foreign investment institution, “Invest Chile”, to target technology-intensive foreign investment and avoid accumulation of investment in the primary commodity and natural resource sectors (Paus, 2012: 133). It is hardly coincidental that Chile graduated from MIC to HIC status in 2010 after this change of strategy. Hence, at the middle stages of development, the state has a role to prioritise developmental goals and promote investment into activities that are not concentrated in the same, low value-added activities.

Limitations

To define a growth slowdown event, I added a lower threshold of $2,000 income per capita to limit the data to countries which are in the MIC group or above. However,

there is no upper threshold to limit the HICs. This may have the risk of capturing the slowdowns from advanced countries, which would have implications that are not necessarily relevant to MICs. However, HICs do not typically experience growth that is as fast as the developing countries which is followed by a steady deceleration – conditions 1 and 2. That is why there are only 9 slowdown events out of 83 that are from HICs, unlike EPS (2011, 2013) study where majority of the slowdowns are of advanced countries.

Further, the calculation of the manufacturing quality index is mainly based on the unit price of the product. This may be capturing the effect of the price of the product, not necessarily its genuine quality, which could be physically measured by the product's longevity, technology-content or number of defects. However, this study does not have the capacity to measure the genuine quality of products; hence, we have to rely on the data provided by reliable sources such as the IMF.

The main challenge of cross-country regressions is that they can easily neglect the country-specific problems. For example, the reason why Chile slowed down in the 1970s and 1980s, as spotted by my specification, might be due to national political instability during the Pinochet Era (Constable and Valenzuela, 1993); therefore, a country-specific investigation could offer more insight than a cross-country regression. However, offering context for each slowdown is beyond the scope of this study. Hence, I refer to further research to complement these findings with context-specific analysis for the slowdowns.

Additionally, a GVC analysis could explain why manufacturing quality upgrading does not enable countries to avoid growth slowdowns. This paper can only speculate that the economic rents of manufacturing production could be captured by the TNCs, and that the competition between low-wage countries that are dependent on labour-intensive production could be lowering the value of intermediary manufacturing goods (Kaplinsky, 2000). However, this study does not have the space to offer that analysis, because the main focus here is the role of structural transformation on the risk of falling in the MIT. The role of other factors behind structural transformation is the subject of another study.

Conclusion

The trend of being trapped at the middle-income level proves to be endemic among geographies, as shown by the findings of this paper (see Appendix 3 for the full list of slowdowns). I find evidence that the slowdowns that MICs experience are disproportionately more than the slowdowns other income groups experience (see figure 8), which provides evidence for the existence of a trap. The results show that lack of diversification of exports increases a MICs' likelihood of falling in the MIT. Therefore, increasing diversification should be a part of strategies for MICs to avoid the MIT, which can be done so by discovering new activities or expanding activities within the existing product lines and existing trade partners. Otherwise, they run the risk of specialising in a narrow range of products, which will likely situate them in the MIT.

Another strategy is to find a balance between manufacturing and tertiary sectors in the economy. The traditional structuralist view, which argues that industrialisation is key to development, is not supported by the present results. Especially at the middle-income level ($2,000 income per capita and above) countries may be unable to maintain competitiveness in manufacturing due to their increasing wages and competition by low-wage LICs. Therefore, focusing on enhancing the manufacturing sector is not an appropriate development strategy for MICs.

The loss of importance of manufacturing leads us to ask what might replace the Industrial Revolution for today's developing countries. One possibility is the tertiary sector, which offers alternative channels for MICs to take advantage of. Especially because of technological improvements, services have become increasingly exportable. For example, call centres in India can offer customer services to British customers of British banks, or clerical jobs can be offered online without face-to-face human contact (Blinder, 2006). Such experimental and inventive ideas can provide alternatives in the face of diminishing industrialisation in size and in importance.

Nevertheless, it is beyond the scope of this research to conclude that services will provide the leverage for MICs to avoid the MIT. There are no examples of a developing country which exploited its services sectors and was successful in

attaining high-income levels, without first achieving a strong manufacturing base (Felipe et. al, 2014). It also depends on country-specific factors. Services may work for India due to language advantages in English and already-established ICT clusters (Balatchandirane, 2007), but this does not mean that services-led growth strategy will work in other MICs. While we should avoid making "one-size fits all" statements – a reminiscent of the Washington Consensus – this paper is only speculating for what comes next in development policy if manufacturing is not working for the MICs, given the evidence that this study shows.

However, enough is known to be reasonably sure of several points: first, diversifying exports to include activities in new and existing sectors will help MICs to avoid slowing down, because it forms linkages between new and existing sectors and enable the discovery of what the economy can become competitive at. Hence, lack of structural transformation (that is, lack of diversification) can explain why countries may fall in the MIT. Second, upgrading manufacturing quality makes it more likely for MICs to slow down. However, this paper cannot be specific about which sectors will provide the alternative leverage for MICs to continue growing and developing to attain high-income levels.

It is important to note that this paper does not argue that manufacturing is inferior to tertiary sectors. It can only conclude that diversifying activities when a country reaches the middle-income level will offer a solution to avoid the MIT, but which sectors must be included and prioritised is still an open question and should be identified by further research.

Perhaps, MIT is a result of the core and the periphery's hierarchical structure. It is not only the MICs who performed poorly in income convergence. LICs are also suffering their own traps, including the poverty trap, conflict trap, natural resource trap. These traps are evidence for a hardly-ever-changing global economic order especially in the post-war era. The backward advantage, which the neoclassical economics claim that the developing countries possess, may in fact be a "backward disadvantage" for developing countries, because they have to break through the established hierarchy of the global economic and trade order. This dissertation provides evidence that within that trade order, it is advisable for MICs to avoid specialising in manufacturing goods.

Instead, they should diversify their trade and production to include activities that are outside their production structure, so as to break the status quo in their ranks in the world trade and global economic order.

Bibliography

Acemoglu, Daron, and Fabrizio Zilibotti. 1997. 'Was Prometheus Unbound By Chance? Risk, Diversification, And Growth'. *Journal Of Political Economy* 105 (4): 709. doi:10.1086/262091.

Acemoglu, Daron, and James A Robinson. 2012. *Why Nations Fail*. New York: Crown Publishers.

Acemoglu, Daron, Simon H. Johnson, and James A. Robinson. 2001. 'The Colonial Origins Of Comparative Development: An Empirical Investigation'. *SSRN Electronic Journal*. doi:10.2139/ssrn.244582.

Ahmed, Ayaz, and Henna Ahsan. 2011. 'Contribution Of Services Sector In The Economy Of Pakistan'. *PAKISTAN INSTITUTE OF DEVELOPMENT ECONOMICS ISLAMABAD* 79. http://workspace.unpan.org/sites/internet/Documents/UNPAN93989.pdf.

Aiyar, Shekhar, Romain A Duval, Damien Puy, Yiqun Wu, and Longmei Zhang. 2013. 'Growth Slowdowns And The Middle-Income Trap'. *IMF Working Papers* 13 (71): 1. doi:10.5089/9781484330647.001.

Amsden, Alice H. 1989. *Asia's Next Giant*. New York: Oxford University Press.

Amsden, Alice H, and Wan-wen Chu. 2003. *Beyond Late Development*. Cambridge, Mass.: MIT Press.

Anand, Rahul, Saurabh Mishra, and Nikola Spatafora. 2012. 'Structural Transformation And The Sophistication Of Production'. *IMF Working Paper*.

Balassa, Bela. 1965. 'Trade Liberalisation And "Revealed" Comparative Advantage'. *Manchester School* 33 (2): 99-123. doi:10.1111/j.1467-9957.1965.tb00050.x.

Balatchandirane, G. 2007. 'IT Clusters In India'. *Institute Of Developing Economies, Japan* 85. http://www.ide.go.jp/English/Publish/Download/Dp/pdf/085.pdf.

Bernanke, Ben S., and Refet S. GÃ¼rkaynak. 2001. 'Is Growth Exogenous? Taking Mankiw, Romer, And Weil Seriously'. *NBER/Macroeconomics Annual* 16 (1): 11-57. doi:10.1162/088933601320224829.

Blinder, Alan. 2006. 'Offshoring: The Next Industrial Revolution?'. *Foreign Affairs*. https://www.foreignaffairs.com/articles/2006-03-01/offshoring-next-industrial-revolution.

Bulman, David, Maya Eden, and Ha Nguyen. 2014. 'Transitioning From Low-Income Growth To High-Income Growth Is There A Middle Income Trap?'. *World Bank Policy Research Paper 7104*. http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2014/11/12/000158349_20141112111916/Rendered/PDF/WPS7104.pdf.

Carrere, Celine, Vanessa Strauss-Kahn, and Olivier Cadot. 2007. 'Export Diversification: What's Behind The Hump?'. *University Of Lausanne*. http://www.hec.unil.ch/crea/publications/autrespub/ed.pdf.

Chandy, L., and G. Gertz. 2011. 'Poverty In Numbers: The Changing State Of Global Poverty From 2005 To 2015'. *Brookings Institute*.

Cimoli, Mario, Giovanni Dosi, and Joseph E Stiglitz. 2009. *Industrial Policy And Development*. Oxford: Oxford University Press.

Collier, Paul. 2007. *The Bottom Billion*. Oxford: Oxford University Press.

Constable, Pamela, and Arturo Valenzuela. 1991. *A Nation Of Enemies*. New York: Norton.

Dasgupta, Sukti, and Ajit Singh. 2005. 'Will Services Be The New Engine Of Indian Economic Growth?'. *Development And Change* 36 (6): 1035-1057. doi:10.1111/j.0012-155x.2005.00449.x.

Dasgupta, Sukti, and Ajit Singh. 2006. 'Manufacturing, Services And Premature Deindustrialization In Developing Countries: A Kaldorian Analysis'. *World Institute For Development Economic Research (UNU-WIDER)* RP2006/49.

Dewitte, Ruben. 2014. 'MIDDLE INCOME TRAP AND EXPORT SOPHISTICATION Assessment And Economic Policy Implications'. MSc, Ghent University.

Dornbusch, Rudiger, Stanley Fischer, and Paul A. Samuelson. 1977. 'Comparative Advantage, Trade, And Payments In A Ricardian Model With A Continuum Of

Goods'. *American Economic Review* 67 (5): 823-39.

Eichengreen, Barry, and Poonam Gupta. 2011. 'The Service Sector As India's Road To Economic Growth'. doi:10.3386/w16757.

Eichengreen, Barry, Donghyun Park, and Kwanho Shin. 2012. 'When Fast-Growing Economies Slow Down: International Evidence And Implications For China âˆ—'. *Asian Economic Papers* 11 (1): 42-87. doi:10.1162/asep_a_00118.

Eichengreen, Barry, Donghyun Park, and Kwanho Shin. 2014. 'Growth Slowdowns Redux: New Evidence On The Middle-Income Trap'. *Japan And The World Economy* 32: 65-84. doi:10.1016/j.japwor.2014.07.003.

Felipe, Jesus, Aashish Mehta, and Changyong Rhee. 2014. 'Manufacturing Matters... But It's The Jobs That Count'. *SSRN Electronic Journal*. doi:10.2139/ssrn.2558904.

Felipe, Jesus, Arnelyn Abdon, and Utsav Kumar. 2012. 'Tracking The Middle-Income Trap: What Is It, Who Is In It, And Why?'. *SSRN Electronic Journal*. doi:10.2139/ssrn.2049330.

Flaaen, Aaron, Ejaz Ghani, and Saurabh Mishra. 2013. 'How To Avoid Middle-Income Traps? Evidence From Malaysia'. *World Bank Poverty Reduction And Economic Management Network (PREM)*.

Fortunato, Piergiuseppe. 2014. 'Export Sophistication, Growth And The Middle-Income Trap'. *Transforming Economies: Making Industrial Policy Work For Growth Jobs, And Development*.

Ghani, Ejaz, and Stephen D. O'Connell. 2014. 'Can Service Be A Growth Escalator In Low Income Countries?'. *World Bank Policy Research Working Paper 6971*.

Gill, Indermit Singh, Homi J. Kharas, Deepak Bhattasali, and World Bank. 2007. 'An East Asian Renaissance: Ideas For Economic Growth'. *Washington, DC: World Bank*.

Hallak, Juan Carlos. 2006. 'Product Quality And The Direction Of Trade'. *Journal Of International Economics* 68 (1): 238-265. doi:10.1016/j.jinteco.2005.04.001.

Hausmann, Ricardo, Dani Rodrik, and Charles Frederick Sabel. 2007. 'Reconfiguring Industrial Policy: A Framework With An Application To South Africa'. *SSRN Electronic Journal*. doi:10.2139/ssrn.1245702.

Hausmann, Ricardo, Jason Hwang, and Dani Rodrik. 2007. 'What You Export Matters'. *SSRN Electronic Journal*. doi:10.2139/ssrn.896243.

Hausmann, Ricardo, Lant Pritchett, and Dani Rodrik. 2005. 'Growth Accelerations'. *Journal Of Economic Growth* 10 (4): 303-329. doi:10.1007/s10887-005-4712-0.

Henn, Christian, Chris Papageorgiou, and Nicola Spatafora. 2013. 'Export Quality In Developing Countries'. *IMF Working Papers* 13 (108): i. doi:10.5089/9781484351635.001.

Hsieh, Yen-Hao, and Soe-Tsyr Yuan. 2015. 'An Innovative Approach To Measuring Technology Spillovers In Service-Dominant Logic'. *Kybernetes* 44 (2): 202-219. doi:10.1108/k-05-2013-0093.

ILO,. 2014. 'Transforming Economies: Making Industrial Policy Work For Growth, Jobs And Development. Edited By Jose Manuel SALAZAR-XIRINACHS, Irmgard NUBLER And Richard KOZUL-WRIGHT'. *International Labour Review* 153 (3): 509-511. doi:10.1111/j.1564-913x.2014.00213.x.

Im, Fernando Gabriel, and David Rosenblatt. 2013. 'Middle-Income Traps: A Conceptual And Empirical Survey'. *Policy Research Working Paper Series 6594, World Bank*. http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2013/09/09/000158349_20130909085739/Rendered/PDF/WPS6594.pdf.

Imbs, Jean, and Romain Wacziarg. 2003. 'Stages Of Diversification'. *American Economic Review* 93 (1): 63-86. doi:10.1257/000282803321455160.

IMF,. 2014. 'The Diversification Toolkit: Export Diversification And Quality Databases (Spring 2014)'. https://www.imf.org/external/np/res/dfidimf/diversification.htm.

Jarreau, Joachim, and Sandra Poncet. 2012. 'Export Sophistication And Economic Growth: Evidence From China'. *Journal Of Development Economics* 97 (2):

281-292. https://ideas.repec.org/a/eee/deveco/v97y2012i2p281-292.html.

Kaldor, Nicholas. 1967. *Strategic Factors In Economic Development*. Ithaca: New York State School of Industrial and Labor Relations, Cornell University.

Kanbur, Ravi, and Andy Sumner. 2012. 'POOR COUNTRIES OR POOR PEOPLE? DEVELOPMENT ASSISTANCE AND THE NEW GEOGRAPHY OF GLOBAL POVERTY'. *Journal Of International Development* 24 (6): 686-695. doi:10.1002/jid.2861.

Kaplinsky, R. 2000. 'Globalisation And Unequalisation: What Can Be Learned From Value Chain Analysis?'. *Journal Of Development Studies* 37 (2): 117-146. doi:10.1080/713600071.

Kaplinsky, Raphael. 2005. *Globalization, Poverty And Inequality*. Cambridge, UK: Polity.

Kharas, H., and H. Kohli. 2011. 'What Is The Middle Income Trap, Why Do Countries Fall Into It, And How Can It Be Avoided?'. *Global Journal Of Emerging Market Economies* 3 (3): 281-289. doi:10.1177/097491011100300302.

Klinger, Bailey, and Daniel Lederman. 2006. 'Diversification, Innovation, And Imitation Inside The Global Technological Frontier'. *Papers.Ssrn.Com*. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=923225.

Knutsen, H. M. 2004. 'Industrial Development In Buyer-Driven Networks: The Garment Industry In Vietnam And Sri Lanka'. *Journal Of Economic Geography* 4 (5): 545-564. doi:10.1093/jnlecg/lbh032.

Krueger, Anne O. 1979. *The Developmental Role Of The Foreign Sector And Aid*. Cambridge: Council on East Asian Studies, Harvard University.

Lewis, W. Arthur. 1954. *Economic Development With Unlimited Supplies Of Labour*. 3rd ed.

Mankiw, N. G., D. Romer, and D. N. Weil. 1992. 'A Contribution To The Empirics Of Economic Growth'. *The Quarterly Journal Of Economics* 107 (2): 407-437. doi:10.2307/2118477.

Maroto-Sanchez, Andres, and Juan R. Cuadrado-Roura. 2009. 'Is Growth Of Services An Obstacle To Productivity Growth? A Comparative Analysis'. *Structural Change And Economic Dynamics* 20 (4): 254-265. doi:10.1016/j.strueco.2009.09.002.

Niosi, Jorge. 2011. 'Mario Cimoli, Giovanni Dosi And Joseph E. Stiglitz (Eds): Industrial Policy And Development: The Political Economy Of Capabilities Accumulation'. *Journal Of Evolutionary Economics* 22 (2): 385-387. doi:10.1007/s00191-011-0250-4.

Noland, Marcus, Donghyun Park, and Gemma Bolotaulo Estrada. 2012. 'Developing The Services Sector As Engine Of Growth For Asia: An Overview'. *SSRN Electronic Journal*. doi:10.2139/ssrn.2159442.

North, Douglass C. 2003. 'Role Of Institutions In Economic Development'. *UNECE*. http://www.unece.org/fileadmin/DAM/oes/disc_papers/ECE_DP_2003-2.pdf.

Ocampo, Jose Antonio. 2005. *Beyond Reforms*. Paulo Alto, CA: Stanford University Press.

Ocampo, JosÃ© Antonio. 2004. 'Latin America's Growth And Equity Frustrations During Structural Reforms'. *Journal Of Economic Perspectives* 18 (2): 67-88. doi:10.1257/0895330041371349.

OECD,. 2013. 'AVOIDING THE MIDDLE-INCOME TRAP: POLICIES FOR SUSTAINED AND INCLUSIVE GROWTH'. http://www.oecd.org/china/China-Brochure-eng-September2013.pdf.

Ohno, Kenichi. 2009. 'Implications For Industrialization Strategies In East Asia And Africa'. *GRIPS Development Forum Discussion Papers*, 1-27.

Pack, Howard. 2000. 'Industrial Policy In Historical Perspective'. https://www.aeaweb.org/aea/2011conference/program/retrieve.php?pdfid=505.

Paus, Eva. 'Latin America And The Middle Income Trap'. *SSRN Electronic Journal*. doi:10.2139/ssrn.2473823.

Paus, Eva. 2012. 'Confronting The Middle Income Trap: Insights From Small Latecomers'. *Studies In Comparative International Development* 47 (2): 115-

138. doi:10.1007/s12116-012-9110-y.

The Economic Development Of Latin America And Its Principal Problems. Lake Success, N.Y.: United Nations Department of Economic Affairs.

Pritchett, Lant, and Lawrence Summers. 2014. 'Asiaphoria Meets Regression To The Mean'. *NBER Working Paper No. 20573*.

Robertson, Peter E., and Longfeng Ye. 2013. 'On The Existence Of A Middle Income Trap'. *SSRN Electronic Journal*. doi:10.2139/ssrn.2227776.

Rodrik, D. 2012. 'Unconditional Convergence In Manufacturing'. *The Quarterly Journal Of Economics* 128 (1): 165-204. doi:10.1093/qje/qjs047.

Rodrik, Dani. 2011. 'The Future Of Convergence'. *SSRN Electronic Journal*. doi:10.2139/ssrn.1927368.

Rodrik, Dani. 2007. *One Economics, Many Recipes*. Princeton: Princeton University Press.

Rodrik, Dani. 2015. 'Premature Deindustrialization'. *NBER Working Paper No. 20935* No. 20935.

Rodrik, Dani, Gene Grossman, and Victor Norman. 1995. 'Getting Interventions Right: How South Korea And Taiwan Grew Rich'. *Economic Policy* 10 (20): 53. doi:10.2307/1344538.

Rosenstein-Rodan, P. N. 1943. 'Problems Of Industrialisation Of Eastern And South-Eastern Europe'. *The Economic Journal* 53 (210/211): 202. doi:10.2307/2226317.

Salazar-Xirinachs, Jose Manuel, Irmgard Nubler, and Richard Kozul-Wright. 2014. 'TRANSFORMING ECONOMIES Making Industrial Policy Work For Growth, Jobs And Development'.

Shafaeddin, S.M. 2005. 'Trade Liberalization And Economic Reform In Developing Countries: Structural Change Or Deindustrialization?'. *UNCTAD Discussion Papers 179*.

Singer, Hans. 1950. 'The Distribution Of Gains Between Investing And Borrowing

Countries'. *American Economic Review* 40: 478-96.

Spatafora, Nicola, Rahul Anand, and Saurabh Mishra. 2012. 'Structural Transformation And The Sophistication Of Production'. *IMF Working Papers* 12 (59): 1. doi:10.5089/9781463937775.001.

Sutton, John. 2001. *Rich Trades, Scarce Capabilities*. London: Toyota Centre, London School of Economics.

Sutton, John. 2005. 'COMPETING IN CAPABILITIES: AN INFORMAL OVERVIEW'. *Http://Info.Worldbank.Org/Etools/Docs/Library/139596/Sutton.Pdf*.

Tho, Tran Van. 2013. 'The Middle-Income Trap: Issues For Members Of The Association Of Southeast Asian Nations'. *ADBI Working Paper Series*.

Timmer, Marcel P., Gaaitzen de Vries, and Klaas de Vries. 2014. *Patterns Of Structural Change In Developing Countries*. GGDC Research Memorandum 149. http://www.ggdc.net/publications/memorandum/gd149.pdf.

UNCTAD,. 2003. 'TRADE AND DEVELOPMENT REPORT, 2003 CAPITAL ACCUMULATION, GROWTH AND STRUCTURAL CHANGE'.

UNIDO,. 2009. 'Breaking In And Moving Up: New Industrial Challenges For The Bottom Billion And The Middle-Income Countries'. *Industrial Development Report*.

Wade, Robert. 1990. *Governing The Market*. Princeton, N.J.: Princeton University Press.

Williamson, John. 2012. 'Some Basic Disagreements On Development'. *Rethinking Development Policy And Packages* World Bank.

World Bank,. 2012. 'China 2030: Building A Modern, Harmonious, And Creative, High-Income Society'. *Washington DC*. http://www.worldbank.org/content/dam/Worldbank/document/China-2030-complete.pdf.

World Bank,. 1993. 'The World Bank The East Asian Miracle'. *Asian Studies Review*

18 (3): 147-155. doi:10.1080/03147539508713031.

Xu, Bin. 2010. 'The Sophistication Of Exports: Is China Special?'. *China Economic Review* 21 (3): 482-493. doi:10.1016/j.chieco.2010.04.005.

Appendices

Appendix 1

Table 3 Economies in the lower-middle-income trap in 2010

Country	Region	2010 GDP per capita (1990 PPP $)	No. of years as LM until 2010	Ave. growth (%) 2000-2010
Philippines	Asia	3,054	34	2.5
Sri Lanka	Asia	5,459	28	4.3
Albania	Europe	4,392	37	4.8
Romania	Europe	4,507	49	4.1
Bolivia	Latin America & Caribbean	3,065	45	1.8
Brazil	Latin America & Caribbean	6,737	53	2
Colombia	Latin America & Caribbean	6,542	61	2.6
Dominican Republic	Latin America & Caribbean	4,802	38	2.8
Ecuador	Latin America & Caribbean	4,010	58	2.2
El Salvador	Latin America & Caribbean	2,818	47	0.4
Guatemala	Latin America & Caribbean	4,381	60	1.1
Jamaica	Latin America & Caribbean	3,484	56	-0.3
Panama	Latin America & Caribbean	7,146	56	2.4
Paraguay	Latin	3,510	38	1.5

	America & Caribbean			
Peru	Latin America & Caribbean	5,733	61	4.2
Algeria	Middle East & North Africa	3,552	42	2.2
Egypt	Middle East & North Africa	3,936	31	3.0
Iran	Middle East & North Africa	6,789	52	3.4
Jordan	Middle East & North Africa	5,752	55	3.5
Lebanon	Middle East & North Africa	5,061	58	4.1
Libya	Middle East & North Africa	2,924	43	2.4
Morocco	Middle East & North Africa	3,672	34	3.3
Tunisia	Middle East & North Africa	6,389	39	3.5
Yemen, Rep.	Middle East & North Africa	2,852	35	0.9
Botswana	Sub-Saharan Africa	4,858	28	1.7
Congo, Rep.	Sub-Saharan Africa	2,391	33	1.8

Gabon	Sub-Saharan Africa	3,858	56	0
Namibia	Sub-Saharan Africa	4,655	61	2.4
South Africa	Sub-Saharan Africa	4,725	61	2
Swaziland	Sub-Saharan Africa	3,270	41	2.2

Table 4 Economies in the upper-middle-income trap in 2010

Country	Region	2010 GDP per capita (1990 PPP $)	No. of years as LM	No. of years as UM until 2010	Ave. growth (%) 2000-2010
Malaysia	Asia	10,567	27	15	2.6
Uruguay	Latin America	10,934	112	15	3.3
Venezuela	Latin America	9,662	23	60	1.4
Saudi Arabia	Middle East	8,396	20	32	0.9
Syria	Middle East	8,717	46	15	1.7

Table 5 Lower-middle-income economies *not* in the trap in 2010

Country	Region	2010 GDP per capita (1990 PPP$)	No. of years in LM until 2010	No. of years before falling into the lower-middle-income trap *	Ave. growth (%) 2000-2010
Cambodia	Asia	2,529	6	22	8.2
India	Asia	3,407	9	19	6.1
Indonesia	Asia	4,790	25	3	3.9

Myanmar	Asia	3,301	7	21	9
Pakistan	Asia	2,344	6	22	2.6
Vietnam	Asia	3,262	9	19	6.1
Honduras	Latin America	2,247	11	17	1.6
Mozambique	Sub-Saharan Africa	2,362	4	24	5.8

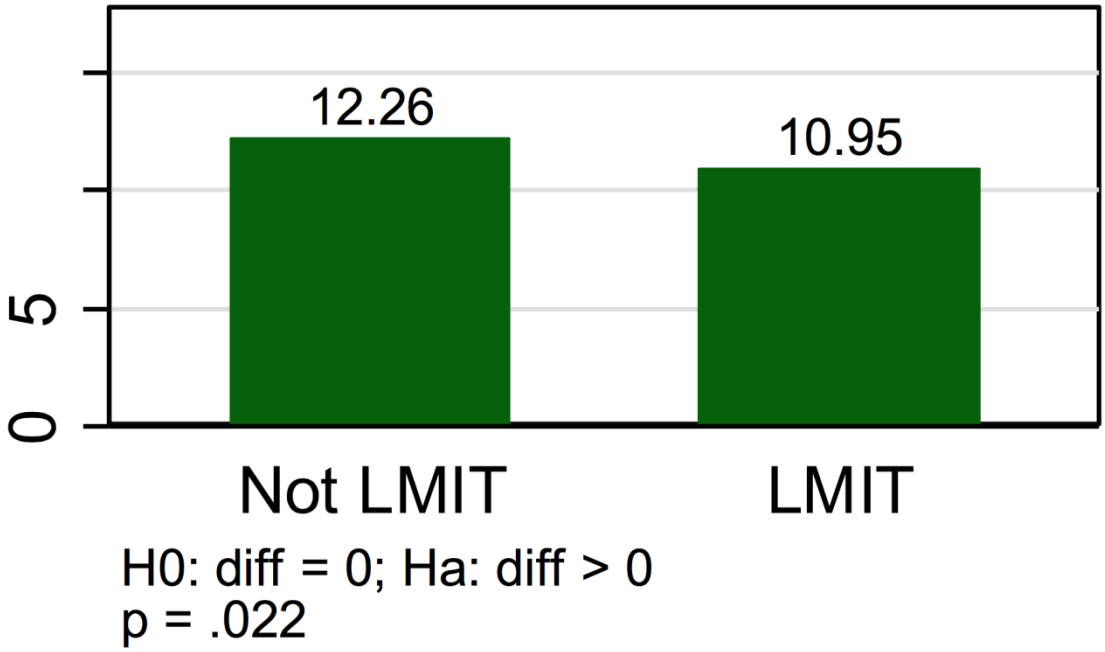
Table 6 Upper-middle-income economies not in the trap in 2010

Country	Region	2010 GDP per capita (1990 PPP$)	No. of years in LM	No. of years in UM until 2010	No. of years before falling into the upper-middle-income trap *	Ave. growth (%) 2000-2010
China	Asia	8,019	17	2	12	8.9
Thailand	Asia	9,143	28	7	7	3.6
Bulgaria	Europe	8,497	53	5	9	4.7
Hungary	Europe	9,000	51	10	4	2.4
Poland	Europe	10,731	50	11	3	3.9
Turkey	Europe	8,123	51	6	8	2.3
Costa Rica	Latin America	8,207	54	5	9	2.9
Mexico	Latin America	7,763	53	8	6	0.7
Oman	Middle East	8,202	33	10	4	1.4

Source: Felipe et. al. (2012) page 27-32

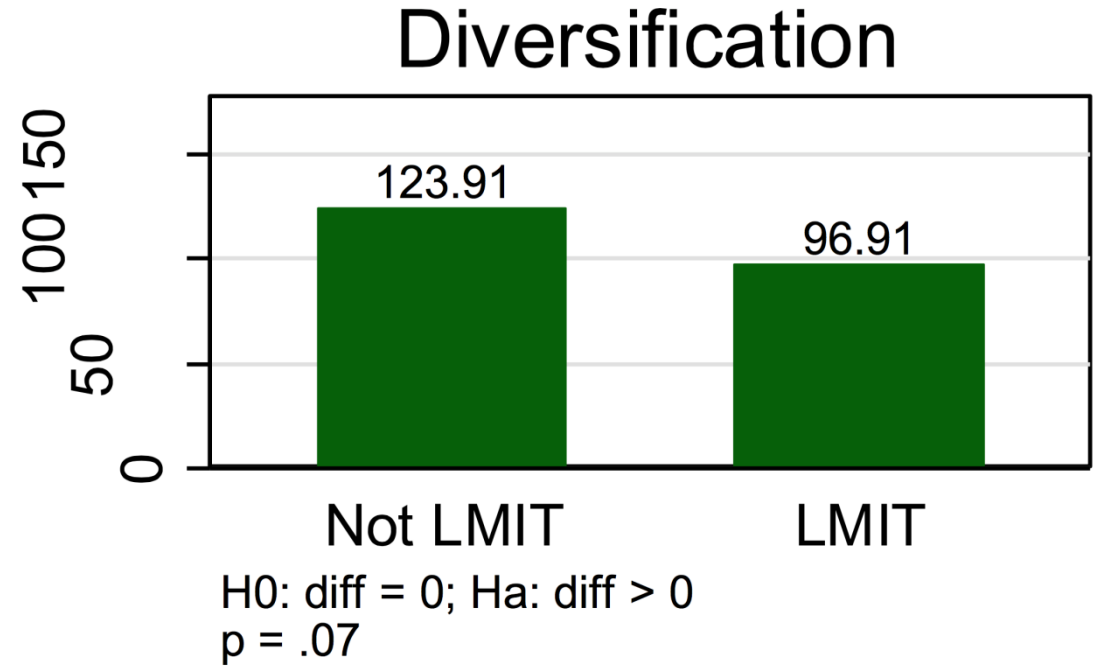
Appendix 2

Figure 13: Comparison of the indicator of export sophistication between lower-MIT countries and ones who graduated from the lower-MIC level



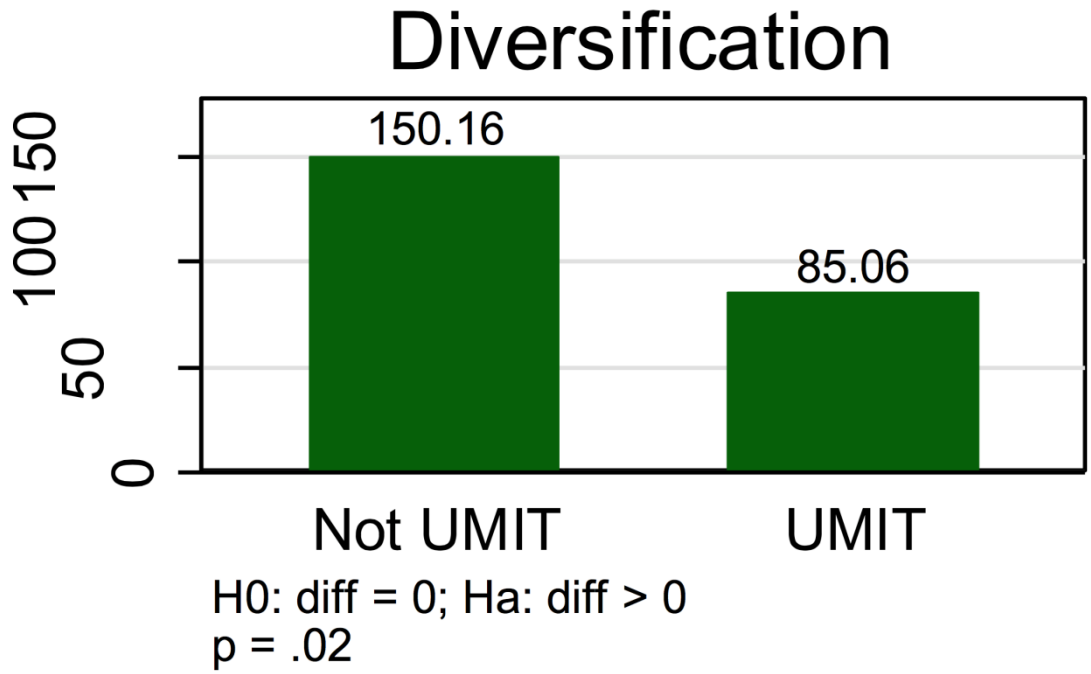
Source: Felipe et. al., 2012, page 38

Figure 14: Comparison of diversification index between lower-MIT countries and ones who graduated from the lower-MIC level



Source: Felipe et. al., 2012, page 38

Figure 15: Comparison of diversification index between upper-MIT countries and ones who graduated from the upper-MIC level



Source: Felipe et. al., 2012, page 39

Appendix 3

Table 7 : Slowdown episodes I identified

Country	Year	GDP per capita at slowdown
Algeria	1972	2070.514581
Angola	2007	2359.279961
Antigua and Barbuda	2004	11505.18573
Argentina	1969	4630.832893
Argentina	1992	4871.828775
Argentina	2005	5767.741657
Azerbaijan	2006	2099.709751
Bahamas	1965	17250.79911
Bahamas	1978	15671.82594
Bahrain	1991	15799.08858
Barbados	1997	12753.96009
Barbados	2006	14962.62387
Belarus	2000	2103.058614
Belarus	2006	3460.131302
Belize	1988	2162.480276
Belize	2000	3604.656189
Botswana	1988	3281.861314
Brazil	1970	2344.716109
Bulgaria	2004	3553.858199
Chile	1979	3153.747052
Chile	1989	4045.688342
Congo, Rep.	1982	2063.775284
Cuba	1981	3127.98448
Cuba	2005	3776.470549
Dominica	1986	3162.408212
Dominican Republic	1997	2821.942007
Ecuador	1973	2064.855792
El Salvador	1974	2371.711074
Equatorial Guinea	1997	2646.326175

Estonia	2003	8764.503247
Fiji	1970	2189.455529
Finland	1998	31641.26118
Gabon	1971	5415.597362
Gabon	1976	13592.00421
Gabon	1984	8849.803507
Gabon	1993	7673.289894
Georgia	1984	3186.775271
Greece	2004	22204.32631
Grenada	1986	3187.539196
Iran	1973	2660.855925
Ireland	1998	37031.11244
Israel	1971	9175.90187
Israel	1995	17748.22222
Kazakhstan	2000	2343.537035
Korea, Rep.	1987	6980.067336
Kuwait	2003	31313.25473
Latvia	2003	6225.45364
Lebanon	2007	5715.89592
Luxembourg	1988	45040.62216
Malaysia	1991	3355.600956
Malta	1978	6353.617869
Mauritius	1986	2401.754045
Nicaragua	1974	2030.576275
Oman	1968	4826.405948
Oman	1983	8989.425668
Panama	1981	3575.602895
Peru	1994	2118.136113
Portugal	1970	7486.989956
Romania	2003	4039.18144
Russian Federation	1999	3503.784691
Russian Federation	2004	4985.323543
Saudi Arabia	1976	21916.55793

Saudi Arabia	1988	12078.19739
Seychelles	1976	5941.323775
Seychelles	1987	7179.400455
Seychelles	1997	10756.11316
Singapore	1968	3866.271153
Slovak Republic	2006	12628.40979
St. Kitts and Nevis	1988	6763.346942
St. Lucia	1988	3411.527392
St. Vincent and the Grenadines	1972	2005.097028
St. Vincent and the Grenadines	1988	2910.686311
Suriname	1989	3187.306505
Swaziland	1990	2017.012324
Thailand	2004	2590.191171
Trinidad and Tobago	1977	7643.427552
Trinidad and Tobago	2002	9578.28683
United Arab Emirates	1989	43692.61073
Uruguay	1976	3615.440747
Uruguay	1996	4855.672885
Uruguay	2007	5768.309584
Venezuela, RB	1976	6957.681969
Venezuela, RB	2004	5022.738461

Appendix 4

Henn et. Al. (2013) first specify the trade price (unit value) equation as:

$$\ln p_{mxt} = \zeta_0 + \zeta_1 \ln\theta_{mxt} + \zeta_2 \ln y_{xt} + \zeta_3 \ln Dist_{mx} + \varepsilon_{mxt} \quad \textbf{(1)}$$

where

p_{mxt} : price of any given product,

θ_{mxt}: unobservable quality

m, x and t: importer, exporter, and time period, respectively.

y_{xt} : exporter's per capita income, which captures cross-country differences in costs related to income.

$Dist_{mx}$: distance between importer and exporter to account for the bias of high prices due to higher shipping costs.

Then they introduce the quality-augmented gravity specification:

$$\ln(imports)_{mxt} = ImFE + ExFE + \alpha Dist_{mx} + \beta I_{mxt} + \delta \ln\theta_{mxt} \ln y_{mt} + \varepsilon_{mxt} \quad \textbf{(2)}$$

where

ImFE and ExFE: importer and exporter fixed effects

I_{mxt} : a set of trade determinants, which comes from the trade gravity literature.

Then they rearrange the first equation for $\ln\theta_{mxt}$ and insert into the second equation, finding:

$$\ln(imports)_{mxt} = ImFE + ExFE + \alpha Dist_{mx} + \beta I_{mxt} + \zeta'_1 \ln p_{mxt} \ln y_{mt} + \zeta'_2 \ln y_{xt} \ln y_{mt} + \zeta'_3 \ln Dist_{mx} \ln y_{mt} + \varepsilon'_{mxt} \quad \textbf{(3)}$$

where

$\zeta'_1 = \delta/\zeta_1$,

$\zeta'_2 = -\delta\zeta_2/\zeta_1$,

$\zeta'_3 = -\delta\zeta_3/\zeta_1$, and

$\varepsilon'_{mxt} = -((\delta\zeta'_0 + \delta\varepsilon_{mxt})/\zeta_1)\ln y_{mt} + \varepsilon_{mxt}$

Then, this estimation is used for 851 products with 851 coefficients. These estimated coefficients are used in rearranging the first equation, to calculate "quality" adjusted for production cost differences and for bias because of relative distance between exporters and importers:

$$\text{Quality estimate}_{xmt} = \delta \ln\theta_{mxt} = \zeta'_1 \ln p_{mxt} + \zeta'_2 \ln y_{xt} + \zeta'_3 \ln \text{Dist}_{mx} \quad \textbf{(4)}$$

Appendix 5

Table 8: Description of variables and data sources.

Variable	Description	Category	Source
Slowdown	Binary variable, takes the value of 1 if there is a slowdown event, and 0 otherwise.	Dependent variable	Author's calculation with GDP per capita data from World Bank
GDP per capita	GDP per capita at purchasing power parity in constant 2005 US dollars.	Independent variable	World Bank
Manufacturing Export Quality	Estimate for quality of manufacturing exports derived in an index	Explanatory Variable	IMF Diversification Toolkit: export Diversification and Quality Databases 2014
Export Diversification (Total)	Estimate for diversification of exports derived in an index – sum of the extensive and intensive indices	Explanatory Variable	IMF Diversification Toolkit: export Diversification and Quality Databases 2014
Export Diversification (Extensive)	Estimate for diversification of exports derived in an index – taking products classified as "new"	Explanatory Variable	IMF Diversification Toolkit: export Diversification and Quality Databases 2014
Export Diversification (Intensive)	Estimate for diversification of exports derived in an index – taking products classified as "existing"	Explanatory Variable	IMF Diversification Toolkit: export Diversification and Quality Databases 2014
Trade Openness	Trade as a sum of exports and imports of goods and services measured as a share of GDP	Control Variable	World Bank

Dependency Ratio	Ratio of dependents of younger than 15 or older 64 to the working-age population	Control Variable	World Bank
Education	Years of schooling of population aged 15 and over.	Control Variable	Barro-Lee Educational Attainment Dataset
Education (Secondary)	Years of secondary schooling of population aged 15 and over	Control Variable	Barro-Lee Educational Attainment Dataset

Appendix 6

Table 9: Summary statistics of the sample

Variable	Observations	Mean	Std. Dev.	Min	Max
Slowdown Binary Variable	8448	0.00982	0.098638	0	1
Pre-slowdown Growth	5707	-0.00392	1.222370	-17.794	16.1189
GDP per capita	6757	7,973	12,654	50	86,129
Diversification (Total)	7368	3.57791	1.281083	0.9610	6.4378
Diversification (Extensive)	7441	0.66017	0.732310	-0.0585	6.4378
Diversification (Intensive)	7392	2.93890	1.049577	0.0000	6.4249
Quality of Manufacturing	6728	0.86731	0.111971	0.0076	1.2470
Trade Openness	6672	76.59403	50.713690	4.9827	531.7374
Age dependency	8301	10.02760	5.812587	0.3905	36.0183
Years of Edu (Total)	6816	6.05214	3.069036	0.0460	13.1800
Years of Edu (Secondary)	6720	1.92057	1.402860	0.0000	6.8700

Source: Author's own calculation