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Approaches to Identify the Middle Income Trap and Episodes of Growth Slowdown

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ABSTRACT

Economic growth and human wellbeing from the perspective of cross-country differences of income are among the core and fundamental concern. This study analyzes the episodes of persistent and aggravated growth slowdown commonly known as middle income trap by employing the data for 183 countries over the period 1960 to 2021. We attempt to identify the middle-income trap by using absolute income approach based on different criteria. Considering the neoclassical growth model and theoretical framework of conditional convergence, we also attempt to identify the middle-income trap by using relative income approach. Based on two approaches, the results identify existence of middle-income trap in different parts of the world, particularly in East Asia, Latin America and Middle East region. Findings of the study are beneficial for policy implications regarding strategies to counter the presence of inertia and growth slowdown in income transition in MICs which may be helpful to a great extend in avoiding the MIT.

1 Introduction

The idea of the middle income trap (henceforth, MIT) is a relatively recent and new phenomenon as it is attracting increasing attention in the literature entering policy debates, especially in the context of growth and development of emerging market economies in different regions of the world. Although the concept, its causes and the findings of MIT are discussed in academic and policy debates, its more precise identification still remains unclear (Felipe et al., 2012). Some researchers try differently to elaborate the idea of being trapped. For example, the study by Gill and Kharas (2007) define countries in MIT as being are "squeezed between the low-wage poor-country competitors that dominate in mature industries and the rich-country innovators that dominate in industries undergoing rapid technological change". Moreover, they also show that middle-income countries (henceforth, MICs) have high probability of being fallen into MIT as compared to other countries which are either richer or poor. By getting focused from the perspective of the observation highlighted by Gill and Kharas (20015) that the pace of growth begins to decline towards a slowdown when these countries start to move towards a high income status.

A considerable part of the literature shifts its attention to the slowdowns experienced by MICs. The analysis by Eichengreen et al., (2012) is an example of such a first systematic empirical analysis where, based on per capita income (hereafter, PCI), an attempt is made to identify a prolonged period of aggravated growth slowdown when these fast growing economies reach the middle income level. They find that the economic growth rate gets slowdown as GDP per capita approaches in the neighborhood of $17,000 GDP per capita measured at constant 2005 international prices.

A few years later, in a second study on the issue, Kharas and Kohli (2011) made an additional and serious contribution by asking the following questions: "What is MIT? Why do countries fall into this situation and how can it be avoided?" Since then, many attempts have been made in the literature, with few studies even raising questions about the very existence of MIT (Han and Wei 2017; Felipe et al., 2017), but many of these, attempt to finding the origins of MIT, correlate & prevalence of slowdown in MICs.

In the light of modern growth theory, Gill and Kharas (2007) predict that MICs, particularly East Asian economies, are expected to undergo three transformations. First, specialization rather than diversification of production. Second, investments are becoming less important and innovations are expected to accelerate. Finally, education systems will produce quality workers with high skills that will prepare them to shape new products and processes instead of preparing them to adapt to new technologies. They observe that a considerable number of countries have failed to make the further step from upper-middle income to high-income status, even after successfully moving from low to middle-income status. In order to support export competitiveness, they emphasize the crucial management of export-related policies of the newly industrialized countries of East Asia by illustrating the MIT as one that is treated as "squeezed between the low-wage poor country competitors that dominate in mature industries and the rich-country innovators that dominate in industries undergoing rapid technological change" (Eichengreen et al., 2012; Cai, 2013; Zhuang, 2012).

Economic and development challenges are broadly grouped under the notion of MIT in the pioneering work of Gill and Kharas (2007) who first identified MIT and their work attracts the accumulation of mass literature on the subject. Many rigorous studies and investigations highlight the systematic challenges confronting at the middle-income phase (Eichengreen et al., 2012, 2014; Aiyar et al., 2018) and from the perspective of developing productive capacities and structural reforms (Ohno, 2009; Felipe et al., 2012; Fortunato, 2014). By characterizing the global dynamics and establishing conditions for prolong slowdown under different growth patterns in several representative economies at different development stages, Wu et al., (2023) calibrate the general model to the data to find the existence of MIT. In contrast, a few studies like Im and Rosenblatt (2015) and Bulman et al., (2017) could not find any strong support that transition from middle to high income is different from other stages of development.

In recent years, there has been growing concern among middle-income countries, particularly those who are on the track of being trapped. MIT refers to the special circumstances in which an economy has a higher probability of experiencing a sudden slowdown in growth rate as it moves from middle-income to high-income status. According to the World Bank (2010), among the 101 low-income countries (henceforth, LICs) in 1960, only 13 countries managed to achieve high-income country status in 2008. Another 88 countries failed to mark the breakthrough of middle income threshold and most of them remained there or even some of these reverted back in low-income level.

Besides the theoretical discussion on the issue, empirical quantification is also very important for the understanding of the researcher and policy makers. The MIT phenomenon includes the stagnant state of income of approximately 70% of the world's population living in MICs (Kharas & Gill, 2020). Stagnating growth on such a scale could have serious consequences not only for humanity but also for the global economic system as a whole. A more insightful picture of MIT identification may be helpful in analyzing the driving forces of successful growth transition and it can be useful in guiding future discourse as well as developing the policy framework. For instance, the MIT concept is very useful for designing policy recommendations and maintaining the pace of economic growth in China, India and Malaysia.

While previous studies remain limited to economic growth from a broader perspective, this attempt focuses exclusively on the transition of economies out of the middle-income level and reaching the standard of living of advanced economies. In investigating the MIT phenomenon, this study

contributes in two main areas. First, by clearly identifying the MIT based on the absolute income approach in the context of economic slowdown. Second, by identifying MIT based on a relative income approach that is well grounded in convergence theory, this analysis demonstrates income convergence.

The analysis in this study focuses on episodes of growth slowdown in the context of MICs. The primary objective is to identify the existence of MIT using absolute income approach as well as relative income approach. The remainder of the article is organized as follows. Section 2 provides a brief overview of the existing literature from the perspective of absolute and relative income approaches. Section 3 explains the research methodology and describes the data source as well as the theoretical and analytical framework for the empirical analysis of MIT. Section 4 presents and discusses the results of the two approaches and section 5 concludes the study with policy implications.

2 Literature Review

This section presents a brief overview of the existing literature on the identification of MIT. The evidence regarding the presence of MIT is based on previous studies and can be broadly classified into two main categories. The first category consists of the theoretical approach while the second category covers the empirical evidences and we start our discussion with the theoretical approach.

2.1 Theoretical Approaches on Identification of MIT

According to theoretical approach, MIT is defined as the result of missing reforms in institutions as well as economic structure or in other words, a sort of failure in the context of political economy. A major advantage of theoretical approach is that it is general in nature and its interpretation is universal with broad usefulness. Here, defining the trap is not narrowly fixed and no conditions are attached to a specific income level, index number or relative income with reference to the frontier country. It covers the theoretical definitions related to pioneer work on MIT (Garrett, 2004; Ohno, 2009; Gill & Kharas, 2007). These studies highlight the macroeconomic policies and institutions required for an economy as it start moving out of middle-income phase. According to Kharas and Kohli (2011, p. 282), "countries are caught in the MIT if they 'cannot make a timely transition from resource-driven growth, with low-cost labor and capital, to productivity-driven growth".

The countries in MIT are termed as being squeezed between rich and poor countries, as the benefits of globalization have been harvested either of both on the cost of MICs. On the one hand, rich countries have knowledge-based economies with built-in mechanism for rewarding skills and strong institutions responsible for promoting cutting edge technological innovation. On the other hand, poor countries have low-wage economies which gets benefits of commonly accessible technology to complete routine activities at the lowest cost (Garrett , 2004). This explains that how advanced economies are getting richer for getting acceleration in technological advancement while poor economies are moving toward accelerating in manufacture sector's growth, but MIT countries may not experience any change and find no way out of the trap (Gill & Kharas, 2007). A theoretical model with five stages (labelled 0 to 4) is proposed by Ohno (2009) having a glass ceiling or MIT between stage 3 and stage 4.

One of the major issues with the theoretical approach is that it is not completely helpful in solving the puzzle of whether or not a specific country is stuck in the MIT, by providing much room for varying interpretations. This leads us to focus on the second type of approach, namely the empirical approach (also termed as quantitative approach by Glawe & Wagner, 2016) requiring a clear and accurate procedure to provide more refined and precise methods of identifying the MIT.

2.2 Empirical Approaches on Identification of MIT

This approach attempts to assess and quantify the evidence for the identification of MIT on empirical grounds that initially requires an appropriate measure of absolute or relative per capita income. The most cited works include, among others, Eichengreen et al., (2012), Spence (2011) and Aiyar et al., (2018). The Empirical literature highlights two main procedures to examine the presence of MIT. According to the initial assessment, MIT is represented in the form of fragile or persistence stagnant of low economic conditions in terms of absolute income per capita and this approach is referred as absolute income approach (Eichengreen et al., 2012; Felipe et al., 2012 and Pruchnik & Zowczak, 2017). The second method considers MIT as an inability and failure of relative convergence in terms of economic performance compared to advanced countries and this approach is called relative income approach (Woo, 2012; Ye & Robertson, 2016). The empirical approach can be further subdivided into absolute income approach and relative income approach. Now we start explaining both approaches one by one.

2.2.1 Absolute Income Approach

The absolute income approach has been primarily used by the World Bank to classify countries into four income groups, namely low, lower middle, upper middle and high income. These income categories gets revised on first of July every year and are used to determine eligibility of countries for lending. According to updated classification of the World Bank , LICs are those whose GNI per capita is less than or equal to $1,135; countries having GNI per capita above $1,135 but less than $4,466 are categorized as lower middle-income; countries with a GNI per capita of $4,466 or more but less than $13,846 are considered as upper middle-income and those having GNI per capita of $13,846 or above are included in the category of high-income.

Without explicitly mentioning the "trap", but referring only to the transition of MICs, Spence (2011) was the first with the clearest exposition of the issue at hand by suggesting a fixed threshold for it. The author observes that since 1975, few economies have been successful in attaining a GDP per capita above $10,000 (2005 constant PPP). As a consequence, there appears a cluster of economies within the range of income levels between $5,000 and $10,000. This suggests that in this particular phase of development, moving towards high incomes becomes difficult and quite challenging, as countries go for specialization of the industry and attempt to have the essential know-how of subsequent higher income status. With the aim to enhance the understanding of MIT, rigorous and systematic empirical research, in addition to others, contributes from Eichengreen et al., (2012, 2014) and Aiyar et al., (2018). These studies not only present empirical evidences for the existence of such traps, but are also helpful to a great deal to uncover and specify the most likely factors that are responsible for these prolong growth stagnations.

A well-focused empirical analysis on MIT using the absolute income approach is the study by Eichengreen et al., (2012, 2014) who ask whether MICs have a higher probability of experiencing a slowdown in growth. Building on and extending the symmetrical examination of "growth accelerations" by Hausmann et al., (2005), they detect an incidence of growth slowdown. By reversing the basic criteria, they replace accelerations by growth slowdowns and augment criteria of GDP per capita. The extended model depicts three basic criteria for identifying the slowdown of income growth. The first criterion requires that prior to slowdown, the growth rate of the seven-year moving average of PCI had been strong, at least 3.5% or above, emphasizing that growth has been speedy prior to the time of breakpoint at slowdown. The second criterion detects a slowdown having a sudden drop-down in the seven-year average growth of PCI by a margin of two percentage points or more, stressing that the slowdown is substantial and sizeable. The third criterion restricts slowdowns to the limited cases where PCI is $10,000 and above, to keep focus on the income transition of MICs only and therefore not considering LICs which have not started the development process, yet.

With the help of these criteria, Eichengreen et al., (2012) find that growth slowdowns generally occur around the PCI of $15,000 (constant 2005 PPP US$). At the neighborhood of this point, the growth rate of PCI becomes slow by an average value of 3.5 percentage points. Subsequently, in another study, Eichengreen et al. (2014) attempt to find out structural breaks with the help of a Chow test for a sample of countries comprising of rapidly growing middle-income economies. Surprisingly, the findings suggest that there appear two levels of income around which slowdowns are concentrated and that the likelihood of systematic slowdowns is having bimodal nature: the first peak in the range of $10,000–$11,000 and the second peak in the high range of $15,000 to $16,000 at constant 2005 PPP US$. This evidence calls for and appears to advice for an alert that a bulk of MICs are at the risk of being fallen into the trap, adding further proof of MIT (Eichengreen et al. 2014). However, these results contradict previous findings from the study by Eichengreen et al., (2012), in which they identify only one slowdown in the range of $15,000 to $16,000. This requires an immediate implication regarding economies which may themselves experience a slowdown at lower PCI compared to previous findings. The authors suggest the role of technology transition ladder for avoiding similar stagnation in the future.

The empirical study of Aiyar et al., (2018) is well grounded in the neoclassical growth model and considers their method of identifying slowdowns as superior to other methods like the rule of thumb used by Eichengreen et al., (2012, 2014). With better theoretical foundation, they define that lasting for at least two consecutive periods, these slowdowns are sudden, large and persistence in nature and deviate from the predicted path of steady state. Here, MIT is considered as a special case of slowdowns and some of factors working in the background that explain it. Comparing actual and estimated growth rates by utilizing a pair of criteria to define the slowdowns is significantly negative over two successive time periods. After replicating this procedure for each country case, ranking in the lowest 20th percentile in ten years or more is therefore considered as economy is passing through a slowdown in that particular time duration. On the basis of their assumption, they propose two cut-offs: the first at $2,000 PCI and the second at $15,000 PCI for low and MICs, respectively. Subsequently, over a time period of forty five years, the analysis identifies 123 slowdowns between 1955 and 2010 for the sample countries.

In the second part of the analysis, they employ the Probit regression model to determine which level of income generally stagnates. By conducting an empirical analysis including variables such as economic structure, institutions, population and trade structure, they observe that when MICs reach around PCI of $3,000 or above, then it becomes increasingly difficult for these countries to make further transition. In addition to institutions, property rights and legal system, market regulation and government size appear to be significant factors among many variables of economic freedom (Aiyar et al., 2018).

Using, to some extent, a different approach, Felipe et al., (2012) classify MICs into two further sub-categories, namely lower middle-income and upper middle-income, on the basis of absolute income threshold. By employing an extensive database maintained by Maddison (2010) for the period 1950–2010, they attempt to estimate the minimum duration which an economy requires in middle-income category. By working out the criteria and threshold for MIT, it is argued that three set of cut-off points have the most explanatory power. The first is $2,000 which split low income from lower-middle income, the second $7,250 which split lower-middle income from upper-middle income and the third is $11,750 which split upper-middle income from high income.

On the basis of historical pattern of development, Felipe et al., (2012) have a distinct method for the identification of the countries in the trap. They determine the duration as the median value based on the number of years spent in the middle-income bracket. If an economy has been there for longer time duration than on average, then they consider that country as being caught in the MIT. They define the MIT in terms of the average length of time a country remains in the lower middle income bracket

($2,000 - $7,250) or the upper middle income bracket ($7,250 - $11,750) before moving to the high income level. So, this bring 124 countries during 1950–2010 and work out historical income transitions among four income categories.

In terms of growth rate, annual PCI growth for lower MICs with a value of $2,000 is required to grow with an average of 4.7 percent or above to avert from being trapped in the lower middle-income bracket. Furthermore, for any country belonging to upper-middle income bracket with a value of $7,250 is required to maintain with mean value of 3.5 percent or above per year for escaping from getting trapped into the upper MIT. So, having no MIT is translated in simple words for having sufficient growth rate in order to moving out of lower-middle income phase in maximum twenty eight years' time duration, and the upper-middle income range in approximately in fourteen years. The findings indicate that out of 124 countries, there are 52 MICs in 2010 and 35 countries belong to this group (13 from Latin American region, 11 from Middle East and North African region and 3 from Asian continent) have fallen into MIT (Felipe et al., 2012).

Later, in another study, Felipe et al., (2017) come up with different results. In particularly, in the new scenario, a country is considered in MIT if it has failed to pass the lower & upper middle income band in 55 and 15 years, respectively. This duration is substantially longer than the period estimated in previous studies like Felipe et al., (2012). Likewise, the average minimum rate for income growth that are needed to overcome the MIT becomes significantly low which is 2.37 percent and 3.27 percent for moving out of the lower and upper middle-income bracket, respectively. In the particular context of China and with the help of both approaches (absolute and relative), Glawe and Wagner (2020) empirically examine the existence of MIT and consider various forecasts that may track the China into the MIT. Furthermore, absolute income gaps between developing and developed economies could persist for decades and likely to hinder the catch-up process (Yülek and Santos, 2022).

2.2.2 Relative Income Approach on MIT

Besides the earlier discussion in the context of absolute income approach, second approach considers MIT as being an unsuccessful catch-up of income, relative to the advanced country and perceives the MIT as the failure of the convergence process. On the basis of relative approach, it can be said that the country, at least, has avoided the MIT and achieved the status of a high-income country (Im & Rosenblatt, 2015).

The initial attempt using the relative approach is proposed by Athukorala and Woo (2011) who construct the catch-up index (CUI) with the values of per capita GDP of a country are denoted as the percentage (%) relative to PCI of the Unites States. This framework suggests that a CUI with a value greater than 55% represents a high-income country, between 20% and 55% indicates a middle-income country and a CUI value less than 20% is categorized as a low-income country. In addition, Woo (2012) argues that the results outcome can be applied to a broader range from 15% to 60% of the GDP per capita of the United States. If the sample of MICs is unable to attain the living standards of the United States even in 50 years and remain within that range for the entire period, these countries will be considered as being stuck in the MIT. Agénor *et al.,* (2012) as well as another study by the World Bank (2013) are also inclined towards the relative income approach where the US is taken as a reference country. It is argued that an economy experiences an MIT if it is staying within the range of 5 to 45 percent per capita GDP of the US (in 1990 Geary-Khamis international dollars) during 1960 to 2009.

Another study by Im and Rosenblatt (2015) also uses the relative approach, where the focus is on the probability of an economy moving to the next stage of higher income. In contrast to previous studies, it divides the middle-income band into "low-middle", "middle-middle" and "high-middle". The analysis uses data for 127 countries from Maddison's database (2010) on per capita GDP over the period 1950-2008. They conclude that the movement from upper middle-income to high income is not different from the transition from lower middle-income range to the upper middle band. It is

important to note here that the rejection of this hypothesis might be caused on account of the trisection of the middle-income band. The results can become interesting if we use only two sub-categories of MIC that is lower middle-income and upper middle-income.

The differentiation between "escapees" and "non-escapees" is highlighted by Bulman *et al.,* (2017) which classify countries according to GDP per capita by low, middle and high income levels. The basis of the analysis is the relative approach where lower and upper cut-offs of middle income are set at 10% and 50% of the US PCI with the help of annual data from PWT (7.0 version). An economy is considered as non-escaped in the band of middle-income if it is not moving out of that relative income range for a longer duration from 1960 to 2009. The findings show that the growth rate of escapees is fast as compared to that of their counterpart at all income stages and in all income ranges. Based on this income classification of individual countries, ten countries escape from the MIT, including Japan, Singapore and Korea.

While questioning the qualification of the existence of MIT, the study by Ye & Robertson (2016) offers an empirically testable definition to evaluate it. Based on and compatible with the concept of club-convergence, the authors recommend a "*time-series definition*" in the context of MIT by considering the characteristics of the logarithmic deviation of GDP per capita series. To check for MIT, it uses the ADF unit root procedure for growth rate of PCI by employing data from PWT (7.1 version) for MICs. The analysis takes into account a sample of economies with PCI representing 8% to 36% relative to the United States and shows that there are 46 MICs on the list of 189 countries that are in the MIT.

A relative complex PwC ESCAPE Index is proposed by Hawksworth (2014). Guided by cross-country regressions of growth and convergence, the index is based on the combination of twenty key indicators covering five perspectives, namely growth & economic stability, social cohesion & progress, ICT, regulatory and political institutions and environmental sustainability. According to this ESCAPE Index, there are five groups of fragile countries identified, including Indonesia, India, Brazil, Turkey and South Africa, which are stuck while other economies located in the passage for avoiding and escaping from MIT consist of Malaysia, China, Saudi Arabia and Chile.

By going through the empirical literature on MIT, we find that no consensus has yet been arrived on the precise identification of MIT. Moreover, apart from the fact that the term itself is new and very recently came to common parlance, there are some issues and certain conceptual challenges while one tries to define MIT, as rightly pointed out by Im and Rosenblatt (2015).

3 Data and Methodology

This study employs the extensive and long series data on per capita income (PPP, purchasing power parity at constant US dollar) from Penn World Tables (latest available version in 2022) for 183 countries around the world over the period from 1960 to 2019 (last available year). The sample countries are further grouped into five regional categories namely, first, as East Asia and the Pacific, second, Europe and North America (ENA), third, LAC (Latin America and Caribbean), fourth, MENA (Middle East and North Africa), fifth, South Asia and finally, SSA (Sub-Saharan Africa). This section describes the analytical framework to materialize the objectives of the study which includes identification of MIT based on absolute income approach and relative income approach.

3.1 Analytical Framework

By following the prominent empirical studies, we use the absolute income approach and relative income approach to identify the MIT. Detailed descriptions are provided below.

3.1.1 Identification of MIT by using Absolute Income Approach

In order to achieve the first objective of the study, we attempt to precisely identify the exact breakpoints defining as duration years reflecting a prominent and aggravated slowing-down in the growth of PCI. To start with and for the sake of comparison, the criterion proposed by Eichengreen

et al., (2012, 2014) is followed where a wave of growth slowdown (henceforth, GS) reflected through the slow growth of GDP satisfies the two conditions, at the same time as;

$$g_{t-n,t} \geq 0.035 \qquad \dots C1$$

$$g_{t-n,t} - g_{t,\ t+n} \geq 0.02 \qquad \dots C2$$

Where $g_{t\text{-}n,\ t}$ is mean the value of growth of PCI between two periods, t-n and t. Similarly, $g_{t\text{-}n,t}$ and $g_{t,t+n}$ is the average growth rate of PCI between *t-n* and *t* and the average growth rate of PCI income during the period *t* & *t+n* respectively. On the analogy of Eichengreen *et al.,* (2012 and 2014), n is fixed equal to seven. Condition (*C1*) defining seven years of mean value of growth rate earlier than breakdown year is required for having value of 3.5% and above. Condition (*C2*) implies the drop-down in GS to be equal and above 2 percent of mean value of growth-rate over the last seven years immediately after the year in which the break took place. This criteria ensures that GS is sustained and sizeable to be considered as MIT.

By following the Andrianjaka *et al.,* (2019)[1], third modified condition is added up to restrict the MIT for time-specific as the country meet and satisfying the first two criteria is placed in the lower-middle & upper-middle income range by using income classification of the World Bank.

$$\$2000 \leq y_T < \$7250 \quad or \quad \$7250 \leq y_T < 11{,}250 \qquad \dots C3$$

For taking into account and addressing the issue of growth slowdown duration as well as number of slowdown episodes, we attempt to opt and make by combining the two methods as proposed by Eichengreen *et al.,* (2012, 2014) and Andrianjaka *et al.,* (2019) for the identification of countries in the MIT.

3.1.2 Identification of MIT by using Relative Income Approach

There are two fundamental issues with absolute income approach. First, any positive movement in growth take the country in attaining the high-income status gradually. However, the income-gap with respect to the leading countries could widen over time, as advanced countries are also continuously moving on the growth path. Second, it is quite challenging and difficult to keep on updating the cut-off thresholds of absolute income frequently as to show the evolution of income over time.

Apart from the theoretical reasons, the usage of relative income approach is more suitable and appropriate to determine the existence of MIT. From a theoretical point of view, the main reason for an MIT is the failure of the timely transition from low-wage to high-wage growth strategies and these wages are determined internationally on a relative scale. In this perspective, we focus and study the dynamics of relative incomes associated with different stages of growth.

Following Woo (2012), Bulman *et al.,* (2017), World Bank (2013), Ye & Robertson (2016), we can broadly categorize the relative income approach on MIT into two sub-approaches; narrow/pragmatic approach (20%-35%) and broader/pessimistic approach (8%-55%). The former with the consensus of the middle-income bracket of a country's relative income to frontier, that is, the income level of the United States. The later take the broader perspective by considering the extreme cases emerging from the existing empirical literature on MIT.

[1] Eichengreen *et al.,* (2014) added the condition as to GDP per capita must be greater than USD 10,000. However, Agénor (2017) and Andrianjaka *et al.,* (2019) have highly criticized on the ground that this threshold is too high since it would evacuate from the analysis a bunch of lower middle-income countries that may be trapped in low growth equilibrium akin to MIT.

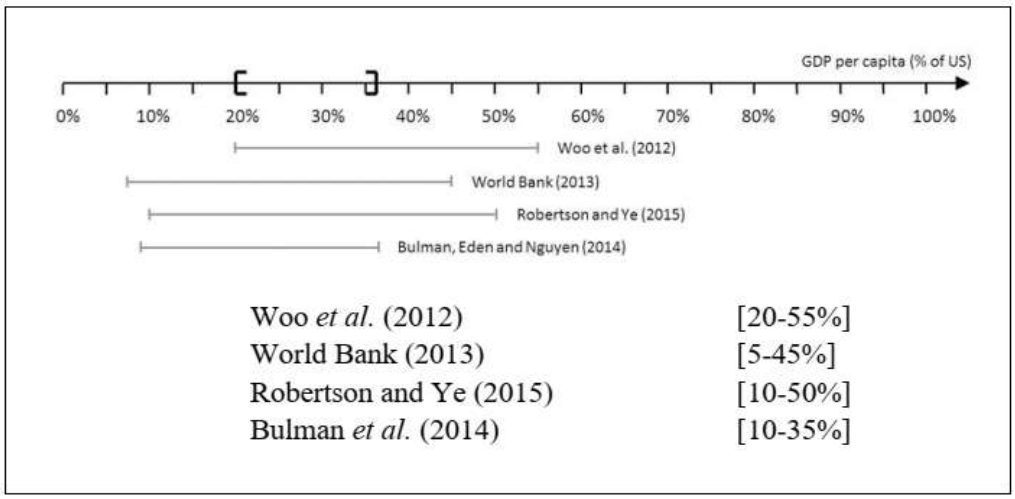

Figure 1
A Depiction of Summary about Relative Income Approaches
Source: Author's Own and adapted from Glawe and Wagner (2019)

This study attempts to fill the gap in the literature by identifying the MIT using relative income approach which is more precise having theoretical underpinning in the context of growth convergence phenomena. We follow the latest criteria proposed by Lee (2020) which identifies MIT as "those countries are considered MIT countries whose per capita income lies between 5 percent to 40 percent relative to the United States".

4 Results and Discussion

In this section, we present results for identification of MIT based on two approaches namely, absolute income approach and relative income approach. The results are reported and discussed as follows.

4.1 Result for Identification of MIT using Absolute Income Approach

Our identification based on the absolute income approach is followed by the World Bank's classification of economies based on their absolute PCI categories. To take into account and address the issue of duration of growth slowdown as well as its quantity, we attempt to opt and combine the both methods as proposed by Eichengreen *et al.,* (2012, 2014) and Felipe *et al.,* (2012) for the identification of countries in the MIT. The former focuses on the growth slowdown and its magnitude while the latter gives more considerations to the length of growth slowdown. First, we examine the PCI growth over time for a large sample of economies to identify the GS episodes using identical conditions of breakpoint and its time span, as in Eichengreen *et al.,* (2014). Second, like in Felipe *et al.,* (2012), we believe that spells of GS in median GDP growth thus recognized correspond to the MIT if they fall within the slowdown duration threshold. By combining the two approaches, we sought to identify the subset of countries identified with prolonged episodes of middle-income downturns and the subset of country years, apart from long periods of slowdown.

So, we start by following the first criteria and restrict the sample to the point where the 7-years mean value of growth-rate prior to the GS is at least 3.5 percent or above for the calculated annual growth rate series for individual countries. By imposing the second criteria, we calculate the 7-years mean value of growth-rate after GS year and take the difference with the former seven-year average to find the difference which should be at least two percentage point. Third, we further restrict the sample to the years where the seven years before and after the slowdown, the PCI belongs to the lower-middle & upper-middle income classifications of the World Bank.

Once all three criteria are met, the summary of the findings based on absolute income approach reveal that there appears as many as 607 episodes of growth slowdowns are experienced by 100 countries at

the lower and upper middle-income levels over the sample period. The summary of these growth slowdowns is provided in Table 1, which is further segregated over parts and regions of the world showing concerns of growth slowdowns, at large. Most of them are located in East Asia and Pacific (11 countries), Europe and North America (17 countries), Latin America and the Caribbean (23 countries), the Middle East and North Africa (13 countries countries) and South Asia (7 countries) and Sub-Saharan Africa (28 countries).

Starting from East Asia and the Pacific, the episodes of PCI slowdown are frequently experienced by many East Asian countries like Indonesia (16 number of times), Thailand (12 number of times), Malaysia (10 number of times), Fiji (9 number of times) China (7 number of times), Philippines (7 number of times) Korea, Rep. (6 number of times) and Myanmar (5 number of times). Other countries have also gone through the economic slowdown occasionally and these include Lao PDR, Vietnam and Cambodia.

In Europe and Central Asia, the most affected countries include Bosnia and Herzegovina (10 number of times) Romania (9 number of times), Portugal (7 number of times), Tajikistan (7 number of times), Albania (6 number of times), Ukraine (6 number of times), Armenia (5 number of times), Cyprus (4 number of times), Turkiye (4 number of times). On the other hand, the least affected countries are Bulgaria, Georgia, Kyrgyz Republic, Poland, Hungary, Greece, Azerbaijan and Uzbekistan.

The largest region in terms of number of countries as well as highly frequent slowdown traps is Latin American and the Caribbean. In the region, the countries that have experienced the longest episodes of growth slowdown are Guyana (19 number of times), Brazil (13 number of times), Ecuador (10 number of times), Dominican Republic (9 number of times), Belize (8 number of times), Colombia, Panama, Peru, St. Lucia, St. Vincent and the Grenadines (7 number of times, each), Bolivia (6 number of times) and Paraguay (5 number of times). Less affected countries include the British Virgin Islands, Chile, Dominica, Argentina, Haiti, Nicaragua, Costa Rica, and Jamaica.

The Middle East and North Africa region has also seen the growth slowdown in PCI and countries experiencing a high number of slowdown episodes are Morocco (22 number of times), Syria (13 number of times), Tunisia (13 number of times), Jordan (11 number of times), Malta (10 number of times), West Bank and Gaza (10 number of times), Iran (9 number of times), Iraq (9 number of times), Egypt (7 number of times), Yemen (7 number of times) and Lebanon (6 number of times). However, a few occasional slowdowns also appear in Djibouti and Algeria. Many economies in the South Asian region have also experienced prolonged periods of economic slowdown and these includes Bhutan (6 number of times), India (5 number of times), Maldives (5 number of times) and Pakistan (5 number of times) while a smaller number of slowdowns appear in Bangladesh, Nepal and Sri Lanka, as well.

The least developed region of sub-Saharan Africa has suffered severely from the phenomenon of slowdown of incomes. The list of countries is long and prominent countries include Nigeria (17 number of times), Zimbabwe (14 number of times), Congo, Rep. (13 number of times), Eswatini (10 number of times), Sudan (10 number of times), Zambia (10 number of times), Botswana (8 number of times), Angola, Equatorial Guinea and Mauritania (7 number of times, each), Cameroon (6 number of times) and Tanzania (5 number of times). Other countries also include Ghana, Mauritius, Comoros, Gambia, Namibia, Senegal, Sierra Leone and Uganda.

Table 1

Identification of MIT Based on Absolute Income Approach

East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
Cambodia	Albania	Argentina	Algeria	Bangladesh	Angola
China	Armenia	Belize	Djibouti	Bhutan	Benin
Fiji	Azerbaijan	Bolivia	Egypt	India	Botswana
Indonesia	Bosnia and Herzegovina	Brazil	Iran	Maldives	Cabo Verde
Korea, Rep.	Bulgaria	British Virgin Islands	Iraq	Nepal	Cameroon
Lao PDR	Cyprus	Chile	Jordan	Pakistan	Chad
Malaysia	Georgia	Colombia	Lebanon	Sri Lanka	Comoros
Myanmar	Greece	Costa Rica	Malta		Congo, Rep.
Philippines	Hungary	Dominica	Morocco		Côte d'Ivoire
Thailand	Kyrgyz Republic	Dominican Republic	Syria		Equatorial Guinea
Vietnam	Poland	Ecuador	Tunisia		Eswatini
	Portugal	Guyana	West Bank and Gaza		Gabon
	Romania	Haiti	Yemen		Gambia
	Tajikistan	Jamaica			Ghana
	Turkiye	Nicaragua			Lesotho
	Ukraine	Panama			Mali
	Uzbekistan	Paraguay			Mauritania
		Peru			Mauritius
		St. Kitts and Nevis			Namibia
		St. Lucia			Nigeria
		St. Vincent and the Grenadines			São Tomé and Principe
		Suriname			Senegal
		Turks and Caicos Islands			Sierra Leone
					Sudan
					Tanzania
					Togo
					Uganda
					Zambia

Source: Calculated using Penn World Tables 10.0 (latest available version in 2022)

4.2 Result for Identification of MIT using Relative Income Approach

This section analyses the growth performance of MICs from the perspective of income convergence path based on relative income approach. There are a few empirical studies which adopt the relative income approach and rank income groups based on PCI relative to the United States. Among others, the World Bank (2013) that classifies the median income range as around 5% to 45% of US income per capita (in 1990 PPP dollars) for the period 1960 to 2008. Woo (2012) defines the LDCs as those whose PCI is between 20 and 55 percent of the PCI of United States (in 1990 PPP dollars) between 1960 and 2008. In Bulman *et al.,* (2017), the median income range is specified between 10% and 50% of US GDP per capita for the period 1960 to 2008 (in 2005 PPP dollars), while it is between 8% and 36% with respect to income per capita of the United States (in 2005 PPP dollars) in the analysis by Ye and Robertson (2016).

Following the latest criteria proposed by Lee (2020), we divide countries into three categories with respect to PCI, namely low income, middle income, and high income. First, LICs are with GDP per capita less than 5% of the US. Second, MICs have GDP per capita between 5%-40% relative to the US. Third, high-income countries having more than 40% GDP per capita PPP relative to US GDP per capita. For each country in the sample, we analyze the income transitions between groups and test the income trap hypothesis. Based on relative income approach, Table 2 presents the list of countries identified as being stuck in the middle-income level over the sample period from 1960 to 2019.

The overview of data reveals that out of the sample of 183, only 109 countries have data on PCI with availability of complete series starting from 1960 to 2019. It is also observed that in 1960, there were 12, 75 and 22 countries belonging to the low, middle, and high-income categories respectively, while in 2019, there are 23, 51 and 35 countries for each corresponding category in 2019. This shows that although many MICs have been able to transition to the high-income category or remain at low-income level over the period of time. However, almost two third of the MICs or almost half of the sample, failed to move out of middle income status and stay there over prolong period of time. The countries in the sample have experienced different spells of growth slowdown and we select only those countries that have gone through long and aggravated episodes of slowdown with at least thirty years during the sample period. Results based on the relative income approach indicate that there are sixty countries that are at the middle-income level got trapped over a long period of time in the transition phase.

The results for identification of MIT using relative income approach are presented in Table 2 and are further separated over parts and regions of the world showing concerns of growth slowdowns, at large. Most of identified countries are located in East Asia and the Pacific (8 countries), Europe and North America (7 countries), Latin America and the Caribbean (29 countries), the Middle East and North Africa (13 countries) and South Asia (5 countries) and Sub-Saharan Africa (26 countries). The East Asian and Pacific region has countries like Fiji, the Philippines and Thailand that remain at the middle-income level despite spending sixty years in this income bracket. Two other countries, namely Indonesia and Malaysia, spend fifty-six and fifty-three years respectively in the MIT while China is still there in the MIT range for forty-eight years and the Republic of Korean is also there for thirty two years. The findings show that most of the Europe & Central Asia region remains relatively less affected by MIT. However, Romania and Turkiye remain in the middle-income range for fifty-seven and fifty-one year respectively and successfully moved out of it in 2017 and 2011 by crossing the 40% threshold.

One of the most affected regions identified in the MIT is the Latin America & Caribbean region. Fourteen countries in the region have remained in the MIT for sixty years and show no tendency to move out of it. These countries include Argentina, Bolivia. Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Jamaica, Nicaragua, Paraguay, Peru and Uruguay. Other countries that stay in the MIT bracket are Chile and Mexico, spending fifty-six and fifty-five years respectively while Panama and Venezuela have not been able to move out of MIT range even after fifty-four and forty-nine years respectively.

The results of income transition based on the relative approach show that in the Middle East & North Africa region, four countries failed to move out of middle-income level over a period of sixty years, namely Iran, Jordan, Morocco, and Tunisia. Other countries in the region include Algeria, Syria and Egypt, which stay in the middle income range for a period of fifty-five, forty-three and forty years respectively. In the South Asian region, three countries failed to move out of the middle-income category and stay there for a long period of time. Pakistan and Sri Lank spend the entire sample period in the middle income bracket, while India spend thirty-three years in this range.

Table 2

Identification of MIT Based on Relative Income Approach

East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
China	Albania	Antigua and Barbuda	Algeria	Bhutan	Angola
Fiji	Bulgaria	Argentina	Djibouti	India	Benin
Indonesia	Turkiye	Belize	Egypt, Arab Rep.	Maldives	Botswana
Korea, Rep.	Hungary	Bolivia	Syria	Pakistan	Cabo Verde
Malaysia	Poland	Brazil	Iran	Sri Lanka	Cameroon
Mongolia	Portugal	Chile	Iraq		Comoros
Philippines	Romania	Colombia	Jordan		Congo, Rep.
Thailand		Costa Rica	Lebanon		Côte d'Ivoire
		Dominica	Morocco		Equatorial Guinea
		Dominican Republic	Tunisia		Zimbabwe
		Ecuador	West Bank and Gaza		Eswatini
		Grenada			Gabon
		Guatemala			Gambia
		Guyana			Ghana
		Honduras			Guinea
		Jamaica			Sudan
		Mexico			Zambia
		Nicaragua			Kenya
		Panama			Lesotho
		Paraguay			Mauritania
		Peru			Mauritius
		Uruguay			Namibia
		St. Kitts and Nevis			Nigeria
		Venezuela, RB			São Tomé and Principe
		St. Lucia			Senegal
		St. Vincent and the Grenadines			South Africa
		Suriname			

Source: Calculated using Penn World Tables 10.0 (latest available version in 2022).

The sub-Saharan Africa region has many countries that have failed to make substantial progress in improving PCI and have failed to move out of the lower middle income bracket. Countries that were unable to make an income transition, even over the entire sample period, include Cameroon, Ghana, Mauritania, Mauritius, Namibia, Senegal and South Africa. Prolonged episodes of transition failure also include Cabo Verde spending fifty-seven years, while Comoros and the Congo Republic spend fifty-six years in the middle income range. Other countries with a duration of fifty years and above in the MIT range include Gabon, Gambia and Lesotho, while countries which spend forty years and above include Ivory Coast, Botswana, Kenya, Guinea Equatorial, Zimbabwe, Guinea and Nigeria. Furthermore, two other countries, namely Zambia and Benin, were also unable to make sufficient progress in PCI and stay there for thirty-eight and thirty-one years respectively.

5 Conclusion

Economic growth and human welfare, from the perspective of cross-country differences of income are among the core and fundamental concerns of economists, researchers and policy makers. In recent decades, while some countries have experienced steady growth, others have not been able to maintain a high growth rate and have become stuck at the middle-income level. The challenge of getting stuck when an economy makes the necessary transition to reach high-income status is a critical problem facing middle-income economies, home to 5.7 billion people worldwide. Keeping in view the implications of paramount nature, this study analyzes the episodes of persistent and aggravated growth slowdown commonly known as MIT.

In order to navigate the prolonged growth slowdowns, this study has two main objectives. With the help of extensive and long series data on per capita income from Penn World Table for 183 countries over the period 1960 to 2019 and based on various criteria's, we identify the MIT using two different approaches. First, we employ absolute income approach which uses three criteria for growth slowdown and its duration. Second, in the relative income approach, the growth catch-up process of convergence with reference to the leading economy is evaluated over time.

The findings based on the absolute income approach show that among the sample of countries, there are ninety-three countries who have been identified and have fallen into MIT. The results based on the relative income approach identify around sixty countries identified and entering the MIT. Based on two identification approaches employed, the results of the analysis conclude that a larger group of countries has been trapped by either of the identification approach and that many other low and upper middle-income countries may find themselves at risk of a growth slowdown, a pre-condition for being stuck into the MIT.

Furthermore, based on two approaches, the results of the present study confirm the existence of middle-income trap in different parts of the world mostly in East Asia, Latin America and the Middle East regions. Findings of the study are beneficial for policy implications regarding strategies to counter the presence of inertia and growth slowdown in income transition in MICs which may be helpful to a great extend in confronting the MIT challenge in developing stage. In addition, the concept itself may be quite helpful in terms of diagnosing the development situation.

Based on various criteria to identify a country as stuck in the MIT across the board of approaches could provide a better indicator of the status of a given country than the results of a single approach. Also, key characteristics of a country that are frequently associated with MIT by researchers could be a helpful instrument for estimating the risks of falling into MIT. But, this type of analysis is beyond the scope of this study. However, along these lines, an interesting avenue for future research could prove fruitful.

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