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**Working Paper**

## Middle-income trap: Review of the conceptual framework

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**ADB Working Paper Series**

**MIDDLE-INCOME TRAP: REVIEW  
OF THE CONCEPTUAL FRAMEWORK**

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and Jakub Zowczak

No. 760  
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**Asian Development Bank Institute**

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**Abstract**

The aim of this study is to develop a conceptual framework for the middle-income trap (MIT). Firstly, we present an extensive literature review of what the MIT concept is, why economies become 'stuck' in the MIT, and how the idea is criticized. Secondly, we put together a list of countries stuck in the MIT according to different definitions. We contribute to the literature by concluding that there are significant inconsistencies among the prevailing definitions of the MIT. In particular, 60.2% of all countries have been classified as stuck in the trap by at least one definition, as compared to 48.4% of all countries being currently classified as middle-income by the World Bank. Furthermore, at least 36.0% of all countries have been simultaneously classified as stuck in the trap by some definitions and as escapees by others. Thirdly, we propose a framework for assessing exposure to the MIT based on the following factors: i) unfavorable demographics, ii) low level of economic diversification, iii) inefficient financial market, iv) insufficiently advanced infrastructure, v) low level of innovation, vi) weak institutions, vii) inefficient labor market. Finally, as the analysis of the MIT definitions delivers mixed results, we introduce a new concept, the convergence trap.

**Keywords:** middle-income trap, innovation

**JEL Classification:** O47, O38, O33, O21, O11, O12, O19, N30

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## 1. INTRODUCTION

The ‘middle-income trap’ (hereinafter ‘MIT’) is an increasingly popular concept used to discuss the phenomena of growth slowdowns of developing economies. However, the term still has no universally accepted definition, which limits its use in the economic discourse. Therefore, the aim of this article is to help to establish a conceptual framework for economic analysis involving the MIT concept. The article starts with a review of how the MIT has become an increasingly popular idea since its introduction almost ten years ago (Section 2). This is followed by an analysis of the five most popular types of interpretation of what the MIT is, and summaries of definitions by different researchers (Section 3). As the empirical and theoretical foundations of the MIT concept are challenged by some researchers, a survey of the critical literature is also presented (Section 4). Based on our literature review, we replicate the work of previous authors and put together a list of all countries that are stuck in the MIT according to different definitions (Section 5). The study is supported by an analysis of how different regions and the emerging markets have been affected by the MIT. Subsequently, we present a literature review of why countries become stuck in the MIT according to different researchers (Section 6). We then identify seven factors increasing the likelihood of an economy falling into the MIT and compare them to the number of times a country has been classified as stuck in the MIT according to different researchers. As the analysis of the MIT definitions delivers mixed results, we introduce a new concept, the convergence trap, and present it in the example of the Central and Eastern European countries and Germany (Section 7). Finally, we present the conclusions of our work (Section 8).

## 2. THE ORIGINS OF THE MIT CONCEPT

The term ‘middle-income trap’ was indirectly introduced by Garret (2004), who observed that the growth rates of middle-income countries had been in stagnation since the 1980s. He assumed that this occurred due to the inability of those countries to compete with, on the one hand, high-income economies (which are competitive due to high-quality knowledge economies and institutions) and, on the other hand, low-income countries (which are competitive in low-skilled tasks at the lowest possible cost).

The term ‘MIT’ was defined for the first time by Gill and Kharas (2007). In their report ‘An East Asian Renaissance,’ they presented an interpretation of the MIT as the case of middle-income countries being squeezed between low-wage poor-country competitors that dominated in mature industries and rich-country innovators that dominated in industries undergoing rapid technological change. They pointed out that after decades of strong economic growth, East Asia might find it difficult to maintain its impressive pace of convergence due to the lack of economies of scale. They suggested that strategies based on factor accumulation would most likely deliver gradually deteriorating results. Gill and Kharas (2007) further pointed at Latin America<sup>1</sup> and the Middle East as examples of middle-income regions that had been unable to escape this trap for decades.

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<sup>1</sup> In most scientific papers (e.g. Jankowska, Nagengast and Ramon 2012; Felipe, Kumar and Galope 2014) the same group of countries (originally used for comparative analysis by Gill and Kharas (2007)) is used, namely Latin American (as the victims) and East Asian (as the escapees) countries.

Since Gill and Kharas (2007), there has been a rapid growth in popularity of the MIT term in academic research. As of 1 June 2016, on IDEAS RePEc, there were as many as 67 scientific articles with the term 'MIT' in their title, while for Google Scholar, the number was 344. Among many, the most recognizable (according to the number of citations) academic papers were: Egawa (2013), Eichengreen, Park and Shin (2013)<sup>2</sup>, Islam (2015), Kharas and Kohli (2011), Kohli and Mukherjee (2011), Lin and Treichel (2012), Vivarelli (2014), Yilmaz (2014), and Yiping, Quin and Xun (2014).

The concept has been researched by international institutions, in particular the World Bank (e.g. Agenor and Canuto 2012, 2014; Agenor, Canuto and Jelenic 2012; Agenor and Dinh 2013a, b; Bulman, Eden and Nguyen 2014; Gill and Kharas 2007, 2015; Im and Rosenblatt 2013; Jimenez, Nguyen and Patrinos 2012; Lin and Treichel 2012), the Asian Development Bank (e.g. Felipe, Abdon and Kumar 2012; Felipe, Kumar and Galope 2014), the OECD (e.g. Jankowska, Nagengast and Ramon 2012, b; Koen, Herd and Hill 2013), and the International Monetary Fund (e.g. Ayiar et al. 2013).

Other international institutions do not offer their own interpretation of the MIT, but use the concept in their work. Examples include the African Development Bank (e.g. Brixiova and Kangoye 2013; Fraser-Moleketi 2015; Kaberuka 2013a, b, c), the European Commission (Bogumił and Wielądek 2014), and the European Bank for Reconstruction and Development (Berglof 2013, 2014). The United Nations has also published its own two reports focused on the MIT. The first was the Report of the Secretary General 'Development cooperation with middle-income countries' (United Nations 2013). This publication was followed by a two-day plenary discussion by the Second Committee during the 68th General Assembly in New York. The second report (Carlsen 2013) was the main subject of the 2013 Seoul Debates discussions<sup>3</sup>.

The MIT is a catchy and easy-to-interpret concept, which makes it very useful in public policy discussions. As a result, the term is very popular in the media – it is frequently mentioned by politicians and was popularized by leading economic magazines as well as notable journals (i.e. the *Financial Times*, *Forbes*, the *Times*, *The Economist*, and *The Wall Street Journal*).

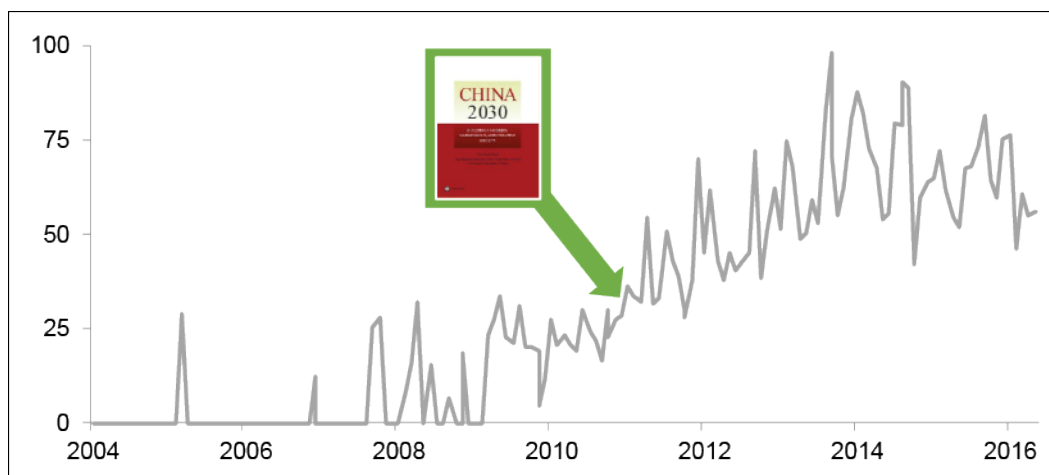
The term 'MIT' significantly gained popularity after 2011 due to the initiation of the *China 2030* program by the former President of the World Bank, Robert Zoellick (Figure 1). It was later followed by a report published in 2012, 'China 2030: Building a Modern, Harmonious, and Creative High-Income Society' (World Bank 2012). Not only did this report reintroduce<sup>4</sup> the MIT issue to the public, but it also illustrated the concept with an influential graph (presented in this paper, see Figure 5 below), which was later reused by Agenor and Canuto (2012).

Today, the term is constantly gaining popularity. More and more countries are identified as potential victims of the MIT. Economies that are perceived by the media as candidates to get stuck no longer come from the emerging market group alone (e.g. the BRIC countries, Indonesia, Malaysia, and Viet Nam), as some economists also point to countries with an upper-middle-income level (i.e. from the CEE region, such as Poland) or even high-income countries (such as Greece).

<sup>2</sup> This is the most often cited scientific paper when it comes to using thresholds to define the MIT.

<sup>3</sup> The term also served as an inspiration for some books. Kohli and Sood (2009), Lee (2013), Peerenboom and Ginsburg (2014), She (2012), Spence (2011), and Woo et al. (2012) are perhaps the most cited examples.

<sup>4</sup> The report points out that the middle-income trap was first defined by Gill and Kharas (2007).

**Figure 1: Popularity of the Term ‘Middle-income Trap’ in the Media**

Note: The reported numbers reflect the number of queries for a particular term, relative to the total number of searches done on Google over time. They do not represent absolute search volume numbers because the data are normalized and presented on a scale from 0 to 100. When there are not enough data, 0 is shown.

Source: Own elaboration based on Google Trends as of 1 June 2016.

### 3. INTERPRETATIONS OF THE MIT CONCEPT IN THE LITERATURE

There is no universal definition of the MIT. Many different interpretations of this phenomenon are popular among researchers. This is a source of confusion as some countries are seen as stuck in the trap by some researchers, while being judged as having managed to escape by others. For example, Poland is ‘trapped’ according to Woo et al. (2012) while it has so far avoided the trap according to Agenor and Canuto (2012), Ayiar et al. (2013), Bukowski, Halesiak and Petru (2013), Eichengreen, Park and Shin (2013), Felipe, Abdon and Kumar (2012), Islam (2015), Robertson and Ye (2013), and Spence (2011). The literature on the MIT has been repeatedly reviewed, most recently, *inter alia*, by Gill and Kharas (2015), Pruchnik and Toborowicz (2014), Radło and Ciesielska (2013), and Staniłko (2013).

We have divided the existing interpretations of the MIT into five categories:<sup>5</sup>

1. Nonempirical, descriptive interpretations (e.g. Gill and Kharas 2007; Kharas and Kohli 2011; Ohno 2009).
2. Fixed income thresholds (e.g. Ayiar et al. 2013; Eichengreen, Park and Shin 2013; Spence 2011).
3. Relative income thresholds (e.g. Agenor and Canuto 2012; Bukowski, Halesiak and Petru 2013; Im and Rosenblatt 2013; Robertson and Ye 2013; World Bank 2012).
4. Time thresholds (e.g. Felipe, Abdon and Kumar 2012).
5. Indices (e.g. Hawksworth 2014; Woo et al. 2012).

<sup>5</sup> We develop the work of Gill and Kharas (2015), who divided the MIT interpretations into three broad definitions: i) descriptive, ii) empirical, identifying bands of income, and iii) empirical, based on the absence of convergence to a benchmark advanced country.



The first group consists of nonempirical, descriptive interpretations of what the MIT is. The most notable examples are Gill and Kharas (2007), Kharas and Kohli (2011), and Ohno (2009). In general, they defined the trap as a situation when a country is no longer able to maintain the pace of strong convergence by continuing to use basic growth engines, most notably low wages. On the one hand, such a country is unable to compete with advanced countries that are not price-competitive but rather quality-competitive, which requires a high level of innovativeness. On the other hand, it is also unable to compete with low-income countries that have even lower wages. As a result, it finds itself stuck in the middle – hence, in the MIT. The main advantage of this interpretation is its universal usefulness. The trap here is not fixed to a certain level of income, index, relative level of income, etc. It can be applied to various economies that are (or can be) stuck in the trap<sup>6</sup>.

As an example: According to this definition, both the People's Republic of China (the PRC) (GDP per capita at 6,807 USD, PPP current prices<sup>7</sup>) and Poland (GDP per capita at 13,648 USD, PPP current prices) can be said to be stuck in the trap. After 25 years of rapid transition, Poland is believed to be the leader of convergence in the CEE region (Berglof 2014; Roaf et al. 2014). However, economic growth in Poland so far has been mainly fueled by: i) increases in total factor productivity driven mainly by the release of productivity reserves<sup>8</sup>, ii) low wages combined with a highly educated workforce, which made Poland an attractive base for outsourcing, logistic centers, and factories, iii) integration with the European Union, which resulted in the inflow of EU funds, new businesses, and institutional catch-up<sup>9</sup> and was thus labeled the 'convergence machine' (Gill and Raiser 2012).

At the same time, Poland lags behind in terms of competitiveness, innovation, and value added in comparison, for example, to the Baltic States, the Czech Republic, or Slovakia (with an average GDP per capita of around 16,565 USD<sup>10</sup>, 19,844 USD and 18,065 USD, respectively). Meanwhile, wages in Poland are higher than in Bulgaria or Romania (with an average GDP per capita of 7,498 USD and 9,499 USD, respectively). Thus, many Polish authors (Bukowski, Halesiak and Petru 2013, 2014; Geodecki et al. 2013; Petru 2014; Pruchnik and Toborowicz 2014; Radło and Ciesielska 2013; Staniłko 2013), as well as authors from international institutions such as the European Commission (Bogumił and Wielądek 2014), have pointed out that – in this regard – Poland may get stuck in between. At the same time, the PRC might find itself stuck between more advanced Asian countries like Malaysia (with a GDP per capita of 10,538 USD) and less advanced ones like India (GDP per capita of 1,498 USD).

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<sup>6</sup> Ohno (2009) has a slightly different definition. He argues that countries that fall into the MIT are stuck at the second stage of industrialization (transformation) because of insufficient investments in human capital.

<sup>7</sup> Unless mentioned otherwise, all statistics are from the World Development Indicators database (World Bank 2015).

<sup>8</sup> Broadly speaking, there are three types of productivity reserves in the former centrally planned economies. The first one was a rapid growth of effectiveness in private companies (as opposed to state-owned ones), which was possible after the market reforms that introduced privatization. The second one was inter-sector reallocation of resources, while the third one was attributed to the transfer of technologies and know-how from abroad. The first two sources of productivity growth were, in a way, one-off phenomena. Productivity growth based on absorption of foreign innovations rapidly improved productivity during the last 25 years, but it need not continue in the long run.

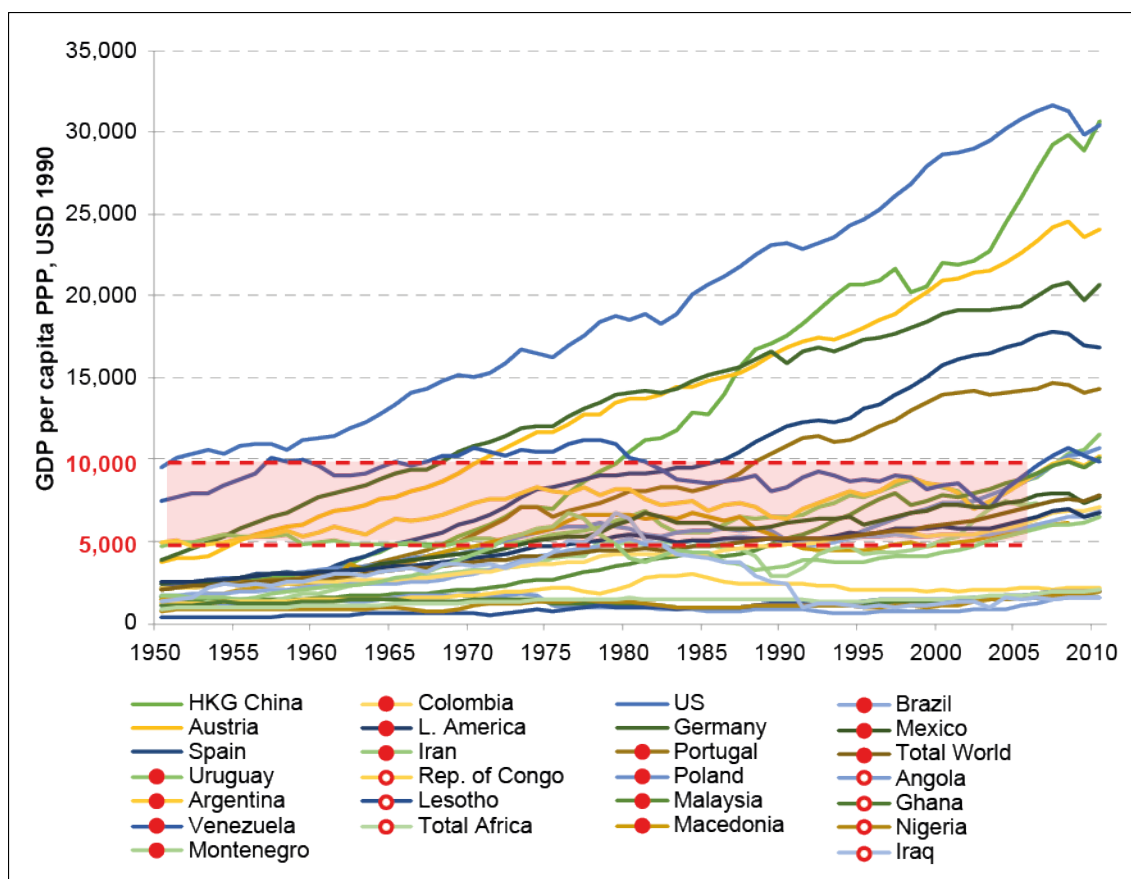
<sup>9</sup> At the same time as the advancing economic integration, the tightening and harmonizing of the Polish law, institutions, and infrastructure with European standards and requirements could be observed. All these changes accelerated the process of Poland's transformation, acting in the economic, social, and political dimensions at the same time (Piatkowski 2013).

<sup>10</sup> An unweighted average for Estonia, Latvia, and Lithuania.

The second group of definitions consists of empirical interpretations that provide a certain level of income as a threshold for the MIT. The most cited articles from this group include Ayiar et al. (2013), Eichengreen, Park and Shin (2013), and Spence (2011).

Spence (2011) was the first to suggest a fixed threshold for the MIT and proposed a range of between 5,000 USD and 10,000 USD per capita (PPP) income. He argued that this is the stage of development at which the transition to higher-income levels becomes challenging. An illustration (using the most recently available data) of this concept is shown in Figure 2.

**Figure 2: An Illustration of the MIT based on the Definition of Spence (2011)**



Source: Own elaboration, World Bank (2015), Bolt and van Zande (2014). This is an updated version of a figure that appeared in Gill and Kharas (2015).

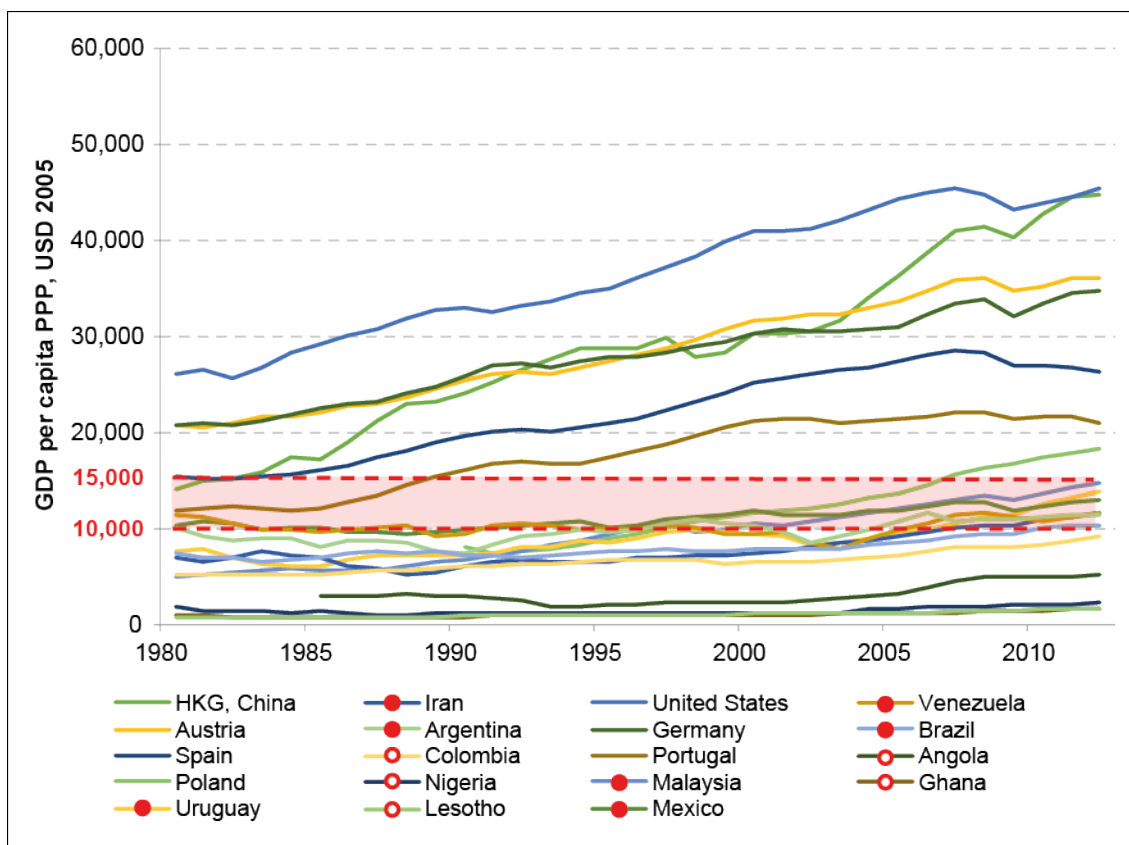
Eichengreen, Park and Shin (2013) suggested another threshold, drawing on the concept of growth slowdowns. In their NBER paper, which is perhaps the most cited scientific article on the MIT, they studied middle-income countries<sup>11</sup> that in the past half century had enjoyed an average GDP growth of at least 3.5% for several years. They defined a sudden economic slowdown<sup>12</sup> as a decline in the 7-year average growth

<sup>11</sup> Defined as having an income of at least 10,000 USD in 2005 constant international prices.

<sup>12</sup> To be more specific, Eichengreen, Park and Shin (2013) define a growth slowdown episode as one in which three conditions are satisfied: (i) growth in the preceding period is greater than or equal to 3.5% per annum; (ii) the difference in growth between the current and preceding period is greater than or equal to 2 percentage points per annum; and (iii) the country's per capita income exceeds 10,000 USD

rate of at least 2 percentage points. As a result, Eichengreen, Park and Shin (2013) identified two peaks between which the likelihood of such slowdowns is most probable: between 10,000 and 11,000 USD per capita (PPP, constant 2005 prices) and between 15,000 and 16,000 USD per capita (PPP, constant). An illustration of this interpretation of the MIT is presented below (Figure 3).

**Figure 3: An Illustration of the MIT based on the Definition of Eichengreen, Park and Shin (2013)**



Source: Own elaboration, World Bank (2015), Bolt and van Zande (2014).

Islam (2015) took a different approach by suggesting fixed-income thresholds at four points in time. He analyzed GDP per capita for the years 1980, 1990, 2000, and 2010, and classified countries into the following groups based on the World Bank’s categories: low-income (LI), lower-middle-income (MIL), upper-middle-income (MIU), and high-income (HI) countries. This methodology focused on GNI per capita thresholds, which have been updated annually by the World Bank since 1989 (so technically, Islam’s classification for 1980 was based on the thresholds from 1990). Looking at the countries’ classifications at these four points in time allowed the author to identify different patterns of development. Countries following the ‘MIU-MIU-MIU-MIU’ pattern were classified as stuck in the MIT ‘par excellence’ as they failed to reach the HI category for 30 years. The author noted, however, that the concept of the MIT does not specify exactly how many years a country needs to spend in a given category to be labeled an MIT country and whether it can temporarily move up and down

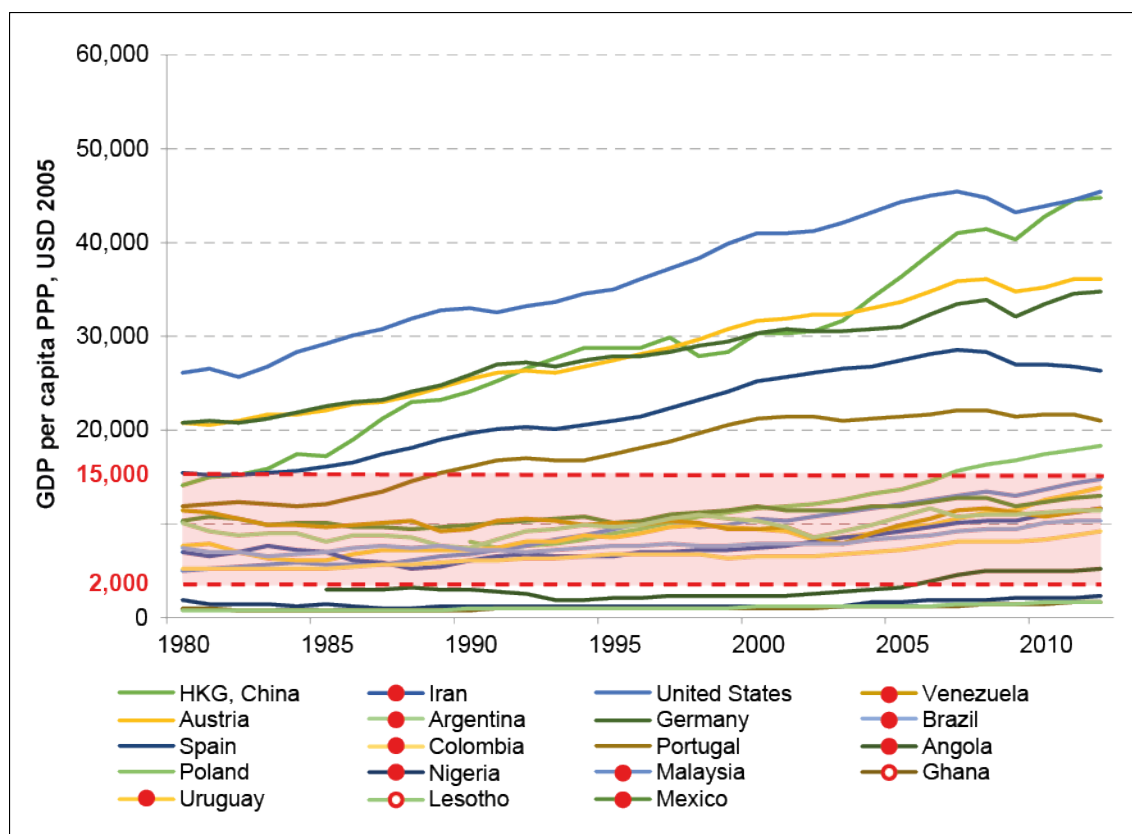
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in 2005 constant international prices. This work, in turn, is symmetrically based on the analysis of growth accelerations by Hausmann, Pritchett and Rodrik (2004).

between MIL and MIU. Thus, it is not clear how to classify countries following a more complex pattern of development.

Finally, Ayiar et al. (2013) also adopted the fixed income approach by treating the MIT as a special case of growth slowdowns and exploring their determinants. The authors interpreted growth slowdowns as sudden and sustained deviations from the growth path predicted by a basic conditional convergence framework. Based on this assumption, they suggested two thresholds: first at the level of 2,000 USD per capita (PPP, constant 2005 prices) for low-income countries and second at the level of 15,000 USD per capita (PPP, constant 2005 prices) for middle-income countries. They argued that the main reason for this choice is that the GDP per capita classification generated by these particular cutoff points is extremely close to the GNI per capita classification employed by the World Bank. An illustration of this interpretation is presented in Figure 4.

**Figure 4: An Illustration of the MIT based on the Definition of Ayiar et al. (2013)**



Source: Own elaboration, World Bank (2015), Bolt and van Zande (2014).

In general, one advantage of these empirical interpretations is their clarity and the supporting empirical work. By using a fixed threshold, one can easily judge whether a country has managed to escape the MIT. Although per capita income does not completely describe a country's level of development, it has proven to be closely correlated with other important indicators of quality of life, such as life expectancy at birth, child mortality rates, and school enrollment rates (World Bank 1989).

One weakness of the above-discussed definitions of the MIT is that at some point in time all countries will surpass the fixed income thresholds if these thresholds stay unchanged.<sup>13</sup> As a result, all countries will become high-income economies using today's absolute benchmarks, though not in relative terms. For example, according to PwC (Hawksworth and Chan 2015), in 2050 the PRC is expected to reach a GDP per capita level of 43,528 USD (PPP, in constant 2014 USD). This is well above thresholds for the MIT set by Spence (2011), Eichengreen, Park and Shin (2013), and Ayiar et al. (2013), but only at 41.6% of the US level, which is expected to reach 104,682 USD per capita (PPP). The PRC will thus remain a medium-income country in relative terms.

The third group consists of studies using a catch-up benchmark for relative income levels. The five perhaps most interesting contributions in this category were made by Agenor and Canuto (2012), Bukowski, Halesiak and Petru (2013), Im and Rosenblatt (2013), Robertson and Ye (2013), and the World Bank (2012). In these articles, the US is used as the benchmark country because: i) it is a high-income country, ii) for many researchers, it represents the technological frontier of the world, and iii) it is perceived as a country with a long-term balanced growth (Jones 2002).

In the 'China 2030' report (World Bank 2012), the threshold used to determine whether a given country is stuck in the MIT was set between 5% and 45% of the US GDP per capita. Based on this approach, it was estimated that of 101 middle-income economies in 1960, only 13<sup>14</sup> became high-income ones by 2008. The same interpretation was later used and popularized by Agenor and Canuto (2012). Figure 5 illustrates their approach using data for 2012 instead of those for 2008, as in the 'China 2030' report. This is the most commonly used figure representing the MIT concept in the media.

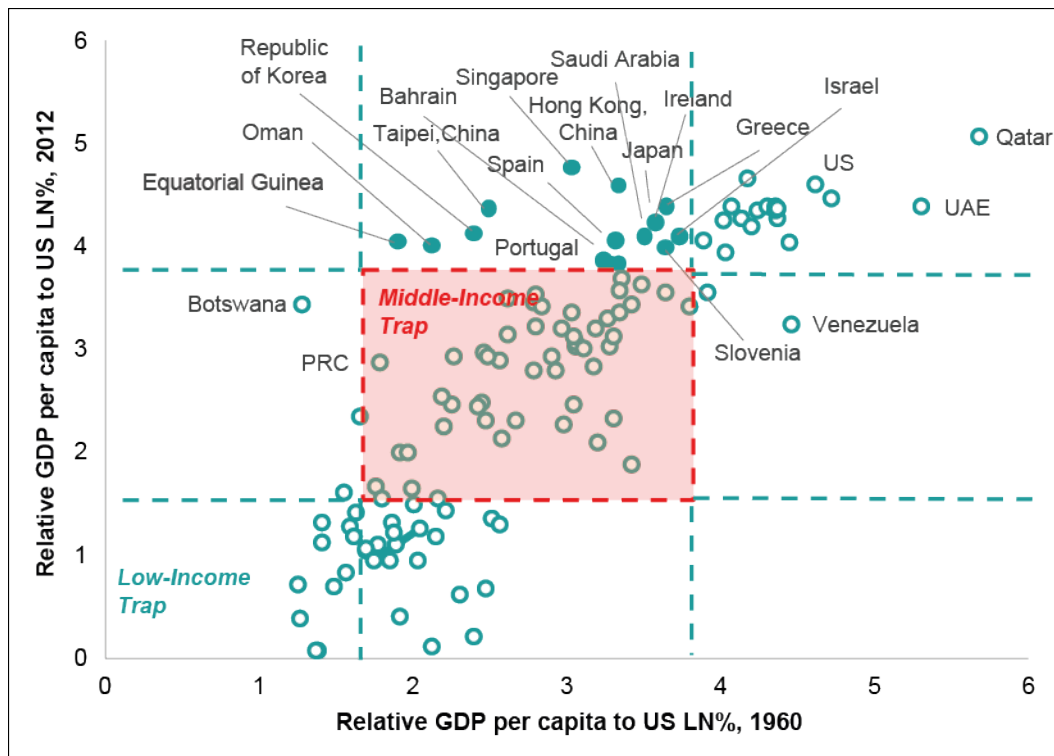
Im and Rosenblatt (2013), in turn, constructed two transition matrices using two alternative sets of relative income groups (with the US as the benchmark country). In both cases they divided countries into five relative income groups. In the first set of transition matrices, countries were classified as follows: those with incomes less than 0.15 of the US income; those between 0.15 and 0.30 of the US income; those between 0.30 and 0.45 of the US income; those between 0.45 and 0.60 of the US income; and those with income above 0.60 of the US level. In the second set, the classification was as follows: countries with an income below 1/16 of the US income; those between 1/16 and 1/8 of the US income; those between 1/8 and 1/4 of the US income; those between 1/4 and 1/2 of the US income; and those with income above 1/2 of the US level. The authors concluded that the probability of being a middle-income country and staying one is lower than the probability of being a low- or high-income country and remaining in those relative income bracket groups. They found that the second lowest category (in Matrix II) appears to be more downwardly mobile than upwardly mobile. This implies that some countries might not only be stuck in the MIT but can even be downgraded. The findings of the study of Im and Rosenblatt (2013) are presented in Table 1 below.

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<sup>13</sup> The World Bank thresholds are updated annually, with an adjustment for inflation (World Bank 2015).

<sup>14</sup> Those countries were: Equatorial Guinea; Greece; Hong Kong, China; Ireland; Israel; Japan; Mauritius; Portugal; Puerto Rico; the Republic of Korea; Singapore; Spain; and Taipei, China.

**Figure 5: An Illustration of the MIT based on the Definition of Agenor and Canuto (2012)**



Source: Own elaboration, World Bank (2015), Bolt and van Zande (2014), Penn World Table (2015). This is an updated version of a figure that appeared in Pruchnik and Toborowicz (2014) and Gill and Kharas (2015).

**Table 1: Transition Matrices based on Im and Rosenblatt (2013)**

Transition Matrix I		Transition Matrix II	
GDP per Capita Relative to US	Probability of Moving to Higher Category	GDP per Capita Relative to US	Probability of Moving to Higher Category
<0.15	5%	<1/16	7%
0.15–0.3	17%	1/16–1/8	16%
0.3–0.45	29%	1/8–1/4	18%
0.45–0.6	34%	1/4–1/2	15%

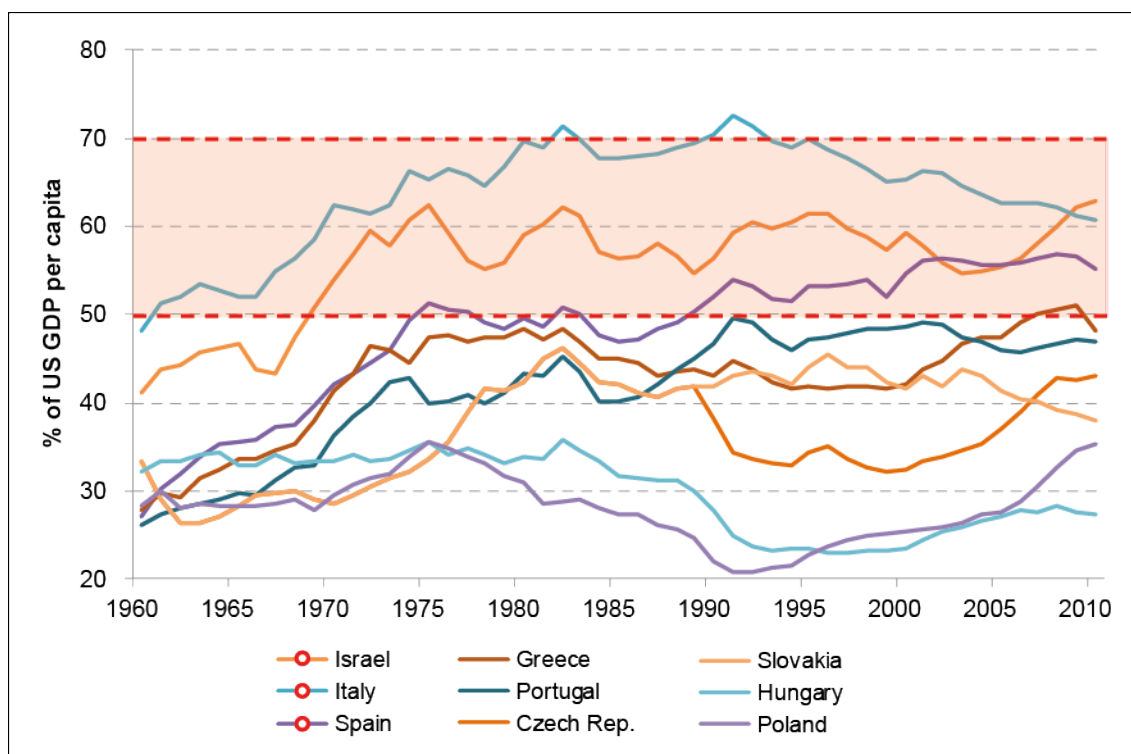
Source: Own elaboration based on Im and Rosenblatt (2013).

Another interesting study was conducted by Robertson and Ye (2013). Based on the work of Aten, Heston and Summers (2012), they set up a table of middle-income countries (middle 40% ranked by income in PPP in USD). This corresponded to a range of 8% to 36% of US GDP per capita (PPP, international USD; this is close to the 5% to 45% suggested by the World Bank (2012)). According to their study, in 2007 there were 46 middle-income countries (out of 189 countries in total). Based on their empirical work, 19 out of these 46 countries are stuck in the trap<sup>15</sup>.

<sup>15</sup> The countries stuck in the MIT according to this definition were the following: Botswana, Bulgaria, Costa Rica, El Salvador, Guatemala, Honduras, Iran, Iraq, Jordan, Lebanon, Mexico, Peru, Panama, Romania, South Africa, Syria, Thailand, Tunisia, and Turkey.

In turn, Bukowski, Halesiak and Petru (2013) described the MIT as a ‘zone of difficulties,’ defined individually for different countries depending on their economic history, income levels, and aspirations. The authors concentrated on Poland and set up an MIT range of between 50% and 70% of US GDP per capita (PPP, constant prices). Out of the three articles that represent the relative benchmark threshold mentioned in this section, this one is the most simplistic – it is based neither on solid empirical research or a literature review. However, it is also the easiest to interpret for policymakers. An illustration of this concept of the MIT is presented in Figure 6.

**Figure 6: An Illustration of the MIT based on the Definition of Bukowski, Halesiak and Petru (2013)**  
(%)



Source: Own elaboration, World Bank (2015), Bolt and van Zande (2014). This is an updated version of a figure that appeared in Pruchnik and Toborowicz (2014).

The fourth group consists of articles where the definition is based on the number of years it takes a country to move from one income category to another. Such an approach was suggested by Felipe, Abdon and Kumar (2012). They identified the threshold as 28 years in the lower-middle-income group (range between 2,000 and 7,500 USD per capita, PPP, constant prices 1990; average pace of growth 4.8% annually) or 14 years in the upper-middle-income group (between 7,500 and 11,500 USD per capita, PPP, constant prices 1990; average pace of growth 3.5% annually). A country exceeding these threshold numbers of years would be classified as a country that is stuck in the MIT. According to Felipe, Abdon and Kumar (2012), in their sample of 38 lower-middle-income countries and 14 upper-middle-income countries in 2010, 35 in total could be identified as countries that were stuck in the trap.

The fifth group consists of studies that constructed original indices in order to evaluate whether a country had fallen into the trap. Here, the two most common indices are the Catch-Up Index and the ESCAPE Index. It is worth noting that while these indices are an interesting attempt to quantify the MIT, they are very simplistic. None of them have undergone strict statistical testing. They also give inconsistent results (e.g. they classify the PRC differently).

In a similar vein, Woo et al. (2012) proposed the Catch-Up Index (CUI). They suggested that a country is stuck in the MIT when it shows no tendency to converge to the global economic leader (i.e. the US). The CUI has a rather simple construction: It is derived by dividing a given country's income level by the US income level. Countries with a CUI over 55% are classified as high-income ones whereas those with a CUI below 20% are called low-income countries; the rest are middle-income ones. The authors claimed that unless the PRC changes its policies it will fall into the MIT and will share the fate of Malaysia (which they classified as a country stuck in the trap).

The more complex ESCAPE Index was suggested by PwC in 2014. A team of economists led by Hawksworth (2014) designed the ESCAPE Index in order to give an indication of how well different emerging markets were placed to escape the trap. The index combines 20 key indicators across five dimensions: i) economic growth and stability, ii) social progress and cohesion, iii) communications technology, iv) political, legal, and regulatory institutions, and v) environmental sustainability. According to the ESCAPE Index, countries that are on the right track to escape the trap include the PRC, Chile, Malaysia, and Saudi Arabia, while Brazil, India, Indonesia, South Africa, and Turkey constitute the fragile five that will be stuck.

## 4. CRITICISM OF THE MIT CONCEPT IN THE LITERATURE

As the MIT concept has become more popular among economists, media, and policymakers, some have started challenging its validity, pointing to a lack of solid empirical evidence and theoretical foundation. The debate was opened not by a scientific paper but by an article published by *The Economist* (2013) titled 'The Middle-income claptrap.' In the article, it was pointed out that – perhaps – there was no reason to single out the middle-income levels because potential growth traps could be found at any income level. A lively discussion followed among researchers who tested the concept empirically. Most cited in this regard are perhaps Im and Rosenblatt (2013), who pointed out that, although the MIT is useful for guiding policy discussion, there is no statistical evidence of its existence. Robertson and Ye (2013) came to the opposite conclusion. However, later research (i.e. Bulman, Eden and Nguyen 2014; Felipe, Kumar and Galope 2014) supported the findings by Im and Rosenblatt (2013) that – empirically – there is no such thing as the MIT.

Im and Rosenblatt (2013) find little evidence supporting the existence of the MIT. The authors explored both the absolute and relative thresholds of the trap. With transitional matrix analysis, they found little support for the idea. However, they also stressed that the concept is useful for guiding policy discussions because it accurately defines the challenges faced by countries at that stage of development. Furthermore, they noted that the MIT concept attracted economists' attention to the limited number of middle-income countries that had been successful in attaining a developed country status. However, they also suggested that a certain amount of realism should be added to the discussion. They pointed out that the identification of the small group of fast-growing middle-income escapees could lead to a form of 'outlier worship.' The objective of



continually growing at 7% or 10% could lead to unsustainable policies that eventually would create the trap-like pattern of dismal growth that middle-income countries are trying to avoid in the first place. Gradualism may be more sustainable and less risky, especially for upper-middle-income countries.

In their most recent study, Felipe, Kumar and Galope (2014) also doubted the existence of the MIT. They suggested that the concept is problematic because it is not well defined and has not been studied theoretically. They tested the existence of the MIT and did not find sufficient evidence that it did in fact exist. They cited the initial example of a group of countries presented in Gill and Kharas (2007) to stress that while the East Asian economies moved up across income groups faster, this did not mean that Latin American countries did not move up. In fact, the authors argued, they did, but at a slower pace.

Bulman, Eden and Nguyen (2014) were also skeptical of the existence of the MIT. They argued that countries that used to grow fast (in general) continued to grow fast and did not get stuck at any specific level of income. However, they also noted that some middle-income countries did remain stagnant with low growth of relative income, and that, in general, transitioning from a middle-income to a high-income country is challenging.

Pritchett and Summers (2014) also suggested that the MIT makes little economic sense. The authors argued that while more and more countries are said to be stuck in the MIT, this merely reflects the mean reversion of their growth rates. As a result, some policymakers might see their domestic economies trapped and they might accordingly implement policies to address the challenges of the 21st century, while for some countries, there are still 19th century problems to address. The authors singled out two particular reasons why the MIT concept was overstated. First, they pointed out (similarly to Felipe, Kumar and Galope (2014) and others) that conceptually it is difficult to understand what the MIT truly means. Second, they provided new empirical evidence that rapid growth is a much more powerful predictor of the likelihood of deceleration than the level of income as such.

On the other hand, Robertson and Ye (2013) found strong empirical evidence of the existence of the MIT. They provided their own, statistically testable definition of the phenomenon: The MIT can be thought of as a situation when long-term income forecasts show no tendency to converge to country levels or diverge below the middle-income band. They found that the growth trajectories of a large number of middle-income countries were consistent with what would be expected if they were in the MIT. As a result, the authors argued that the concept stands up to scrutiny in a statistical sense.

## 5. COMPARATIVE STUDY OF MIT DEFINITIONS

Based on the literature review in the previous sections, we have conducted a comparative study of the definitions of the MIT. We have replicated the work of previous researchers and checked for each of 186 countries<sup>16</sup> whether it can be classified as stuck in the MIT according to different definitions based on the most recent data. We selected ten frequently cited definitions that are both replicable and accurate, i.e. we did not examine the 'descriptive' definitions that usually do not cover all existing countries or do not specify rules for classifying countries. The results of our analysis are presented in Table A.1 in the Appendix, which shows, for a total of 186

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<sup>16</sup> For the analysis, we chose 186 countries with reliable GDP per capita (PPP) data.

countries for which we had reliable data about GDP per capita (PPP), whether they are stuck in the MIT according to the different definitions.

We have found significant inconsistencies between the definitions (see Table A.1). Firstly, most of the countries under study (112 out of 186 countries, i.e. 60.2%) have been classified as stuck in the MIT according to at least one definition. By comparison, 48.4% of all countries are currently classified as middle-income by the World Bank (2015). Secondly, at least 67 out of 186 countries (i.e. 36.0% of all countries) have been classified inconsistently as 'stuck' in the MIT by some definitions and as 'escapees' from the trap by others. This largely results from the considerable difference in inclusivity between the definitions, ranging from 3.2% in the case of the definition proposed by Bukowski, Halesiak and Petru (2013) to 39.8% in the case of the one proposed by Agenor and Canuto (2012) (i.e. respectively 3.2% and 39.8% of all countries were classified as trapped according to these definitions). This suggests that the concept can be interpreted very broadly and no single definition is sufficient to judge whether a country is stuck in the trap.

Only one country, South Africa, has been classified as trapped by the highest number of six out of nine definitions (i.e. after excluding Jankowska, Nagengast and Ramon (2012)), which considers Latin American economies). Six countries<sup>17</sup> (i.e. 3.2% of all countries) have been classified as trapped by five definitions, in line with the literature, which often points to the same countries as those exposed to the MIT. The PRC, which is frequently considered in the context of the MIT in the literature, has been classified as stuck by two definitions, those of Eichengreen, Park and Shin (2013) and Agenor and Canuto (2012).

Based on our comparative study, we have also prepared a regional analysis of the MIT. The classification is based on the regional groups proposed by the World Bank (2015) and includes all income groups. We have checked in which regions the share of 'trapped' countries is the highest, and how many definitions out of nine classify countries in the region as trapped in the MIT.

Our analysis shows that the Latin America and Caribbean region is the most affected by the MIT (see Table 2). Some 90.6% of the countries in this region are classified as 'trapped' by at least one definition of the MIT. Moreover, countries in this region are 'trapped' according to, on average, 2.4 definitions, the highest score of all regions. This is consistent with the conclusions of some researchers (in particular Felipe, Kumar and Galope (2014), Gill and Kharas (2007), and Jankowska, Nagengast and Ramon (2012)). By contrast, North America and Sub-Saharan Africa are the least affected regions with, respectively, 0% and 43.5% of countries classified as 'trapped.'

The results confirm the finding that Latin America and the Caribbean has been the most affected region while North America, Western Europe, and Central Africa have been the least affected. Importantly, the countries classified as trapped by a high number of definitions (5 or 6) are located in different parts of the world, which suggests that the concept of the MIT can be applied to different regions. The results of our study are presented on a map in Figure 7. A darker color corresponds to more definitions classifying a given country as stuck in the MIT<sup>18</sup>.

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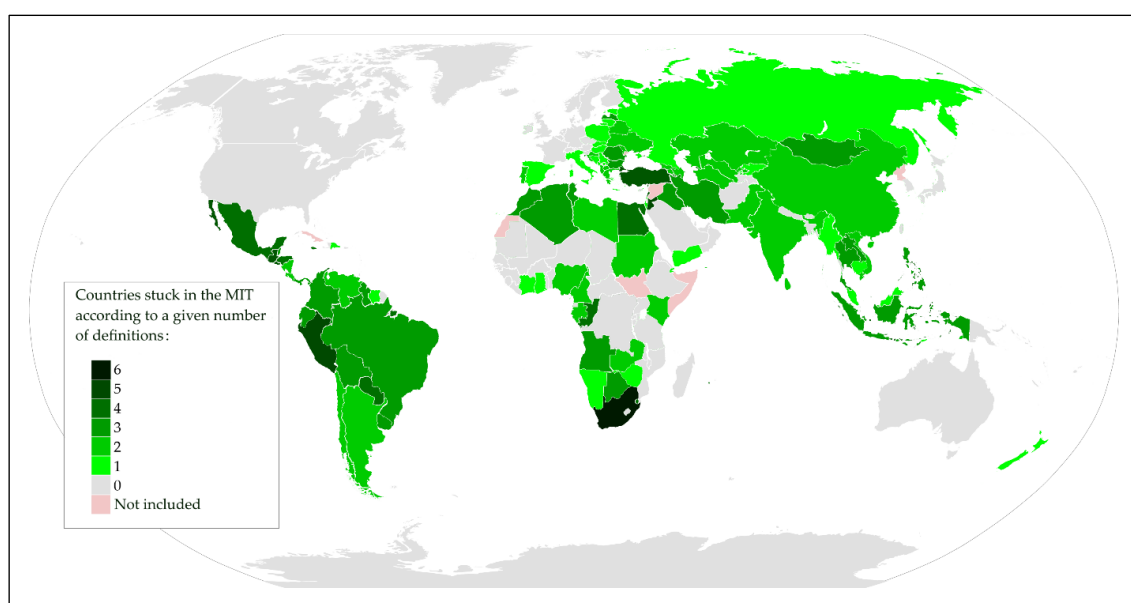
<sup>17</sup> These are: El Salvador, Guatemala, Jordan, Lebanon, Peru, and Turkey.

<sup>18</sup> Maps in full resolutions are available upon request.

**Table 2: Regional Analysis of the MIT**

Region	Countries 'Trapped' According to at least One Definition (%)	Average Number of Definitions by which Countries are 'Trapped'	Median Number of Definitions by which Countries are 'Trapped'
Latin America and Caribbean	90.6	2.4	3.0
South Asia	62.5	1.1	2.0
East Asia and the Pacific	53.3	1.0	1.0
Europe and Central Asia	61.2	1.1	1.0
Middle East and North Africa	63.2	1.8	1.0
Sub-Saharan Africa	43.5	1.0	0.0
North America	0.0	0.0	0.0

Source: Own elaboration, World Bank (2015).

**Figure 7: Countries Classified as 'Stuck' in the MIT by a Given Number of Definitions**

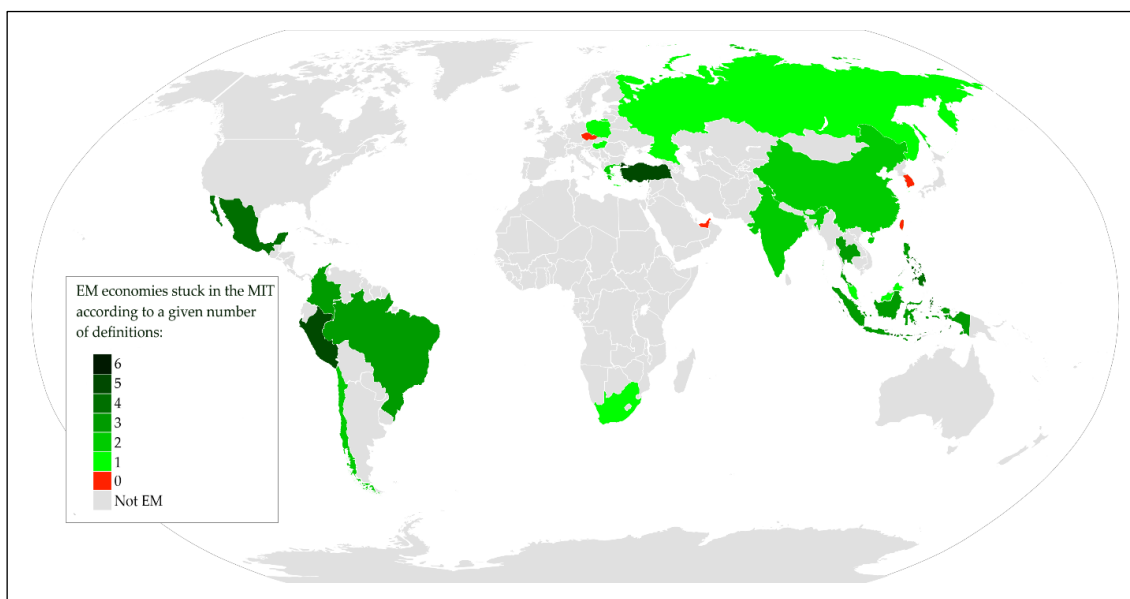
Source: Own elaboration.

Finally, we have analyzed the extent to which emerging market economies have been affected by the MIT. Emerging markets are often cited as being most exposed to the trap (Agenor, Canuto and Jelenic 2012; CNBC 2013; Deino 2014; Financial Times 2015; Singh 2013). Mody (2004) noticed that emerging countries undergo a volatile process of economic transition from being 'developing' to 'developed' and often find it challenging to reshape their competitive model. Deino (2014) pointed out how the initially dynamic GDP growth in emerging markets slows down after easily accessible reserves of productivity are exhausted. Then, rising wages push labor-intensive activities out to other countries, while the emerging markets lack the infrastructure and institutions needed to reach the next stage of economic development.

However, similarly to the MIT, there is no single agreed-upon definition of ‘emerging markets.’ Definitions vary, focusing on factors such as economic openness, GDP growth, infrastructure, investment risk, regulatory environment, or market capitalization. We have decided to follow the definition of emerging markets suggested by Russell Investments (2015), which classifies 21 economies as emerging<sup>19</sup>.

The results suggest that the EM economies might be the most exposed to the MIT. Firstly, 81.0% of the EM economies in our sample (20 out of 21 countries) have been classified as stuck in the trap according to at least one definition, as compared to 60.2% of countries classified in this way for the whole sample. Secondly, the EM economies in our sample were stuck according to, on average, 2.24 definitions, while for the whole sample the average number is 1.34. The results of the study are presented on a map in Figure 8.

**Figure 8: Emerging Market Economies Classified as Stuck in the MIT by a Given Number of Definitions**



Source: Own elaboration, Russell Investments (2015).

## 6. OVERVIEW OF FACTORS CONTRIBUTING TO THE MIT.

In this section, we analyze the causes of the MIT. Since the comparative study in Section 5 did not give a clear answer as to which countries are stuck in the trap, we now focus on factors that increase the probability of a growth slowdown at the middle-income level.

<sup>19</sup> These are: Brazil; Chile; the PRC; Colombia; the Czech Republic; Greece; Hungary; India; Indonesia; Malaysia; Mexico; Peru; the Philippines; Poland; the Russian Federation; South Africa; the Republic of Korea; Taipei,China; Thailand; Turkey; and the United Arab Emirates. The definition of EM by Russell Investments (2015) uses a combination of economic criteria (such as relative income, development status, country risk) and market criteria (such as FX restrictions) based on indicators released by the World Bank, the IMF and *The Economist*.

Similarly to the lack of consensus on what the MIT is, the question of why countries fall into the trap is still an open one. Researchers point to many different factors. Perhaps the most cited in the literature is the slowdown of productivity growth, suggested by Eichengreen, Park and Shin (2013). It seems that a consensus is emerging around this explanation. However, there are strong discrepancies as to the underlying reasons for slow productivity growth. Here, researchers point to a wide range of factors regarding i) institutions, ii) inequality, iii) output structure, iv) export structure, v) trade linkages, vi) infrastructure, vii) access to finance, viii) education, ix) labor market, x) demographics, and xi) public policy<sup>20</sup>, among others.

Felipe, Abdon and Kumar (2012) suggested that there is no key factor that makes countries stuck in the trap – this can be attributed to a variety of conditions. They argue that i) a low level of diversification of the economy, ii) a low level of human and physical capital, iii) weak legal and institutional conditions, iv) a prevalence of low sectoral development relationships with other sectors, and v) low diversification of exports and export of unsophisticated goods increase the probability of a country becoming trapped.

On the other hand, Jankowska, Nagengast and Ramon (2012) suggested that countries could be locked in the MIT due to their lack of ability to adapt to rapid urbanization. They applied a production space approach to a sample of Asian and Latin American countries<sup>21</sup> estimating the impact of diversification into new sectors (extensive, widening strategy) and of increasing a country's export share to current highly sophisticated sectors (intensive, deepening strategy). The authors found that countries managed to increase the number of industries in which they reveal a comparative advantage. However, significant differences in the evolution of the countries' product spaces emerged, with a country like the Republic of Korea standing out and others like Brazil and Mexico lagging behind.

Jankowska, Nagengast and Ramon (2012) concluded that Latin American countries are stuck in the MIT due to their industrial structure, which cannot adapt to excessive urbanization caused by the direct inflow of rural labor to service sectors. They pointed out that urbanization in Asian countries is more gradual and coordinated (Asian countries are moving up the value chain of production step by step). Furthermore, the authors argued that a proper economic strategy is also a very important factor.

Eichengreen, Park and Shin (2013) conjectured that countries get stuck in the trap because of a lack of productivity. In their work they found that what increased the probability of growth slowdowns were: i) a high rate of investment before reaching the critical level of development (threshold), ii) undervalued domestic currency, and iii) a relatively low proportion of high-tech (high-value-added) products and services in exports. To be more specific, Eichengreen, Park and Shin (2013) estimated that 85% of growth slowdown is due to total factor productivity (TFP), and only 15% to capital accumulation.

Agenor and Canuto (2012, 2014), similarly to Eichengreen, Park and Shin (2013), pointed out that productivity slowdowns are a major cause of the MIT but offer a different explanation. In their first work on the MIT (Agenor and Canuto 2012), they argued that factors that determine productivity growth include individual decisions to acquire skills, access to different types of public infrastructure, and knowledge network

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<sup>20</sup> The list of factors present in the literature is much longer; some economists also point to factors such as CO2 emissions, for example.

<sup>21</sup> Using similar groups of countries to those in Gill and Kharas (2007).

externalities. As such, they argued that i) a lack of access to advanced infrastructure<sup>22</sup>, ii) weak enforcement of property rights<sup>23</sup>, and iii) dysfunctional labor markets<sup>24</sup> can increase the probability of falling into the MIT.

In their later work (Agenor and Canuto 2014) they emphasized the role of access to finance and product innovation. The authors argued that easy access to finance for innovative activities can in turn help countries climb the ladder to high-income status. They stressed that inadequate access to finance has an adverse effect on innovation, directly (through the financing of fewer R&D projects) as well as indirectly (as fewer individuals may choose to invest in the skills necessary to work in the R&D field). A more general approach to studying how financial liberalization and the MIT are related was chosen by Yiping, Quin and Xun (2014). They found that, for a middle-income country, repressive policies on credit, bank entry, the securities market, and capital accounts significantly inhibit economic growth.

Ayiar et al. (2013), similarly to Felipe, Abdon and Kumar (2012), pointed out that not only does the economic structure determine whether a country gets stuck in the trap but institutional (and other) conditions are also equally important. In their work, they examined how the level of i) institutions, ii) infrastructure (communication and roads), iii) regional integration (measured by trade), iv) demography, v) macroeconomic environment and policies, and vi) economic structure (output composition) determines the chances of falling into the trap. They recognized that all are important factors, with the most important being i) poor quality of the legal system and poor enforcement of contracts and property rights, ii) excessive growth of the public sector and overregulation of markets (labor, product, and credit markets), iii) low share of high-tech goods in exports, and iv) unfavorable demographics (high age dependency ratio). In their work they constructed a rather simple yet powerful Trap Map for middle-income countries that shows potential risks.

Egawa (2013) argued that income inequality is also a factor that increases the possibility of being stuck in the trap. In order to assess the relationship between income inequality and the trap, the Kuznets hypothesis and the basic-needs approach were used. The author suggested that a low-income country could accelerate its economic growth with the worsening of income distribution as an engine. However, a middle-income country will experience a decreasing growth rate if it fails to narrow the income gap between the top and bottom income groups. Furthermore, his work suggested that the basic-needs approach is also applicable in practice, and that improved access to secondary education is important. A similar conclusion, that persistent and high inequality (the inequality trap) can result in the MIT, was presented in work done by Islam (2015).

In the most recent research conducted by Bulman, Eden and Nguyen (2014) most of the above-mentioned factors suggested by previous studies are confirmed as important – with a few notable exceptions. They agreed with the growing consensus that factors like i) productivity growth, ii) proper macroeconomic management, iii) openness, iv) income equality, and v) industrialization characterize the escapees from the trap.

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<sup>22</sup> They argue that improving access to advanced infrastructure boosts productivity and wages in the design sector, which attracts more labor and triggers a shift in labor supply, magnifying – at least temporarily – the benefits associated with exploiting the existing stock of ideas.

<sup>23</sup> They point out that a poorly functioning system to administer patents and enforce property rights may create a deadweight loss for the economy and make it more likely for countries to be caught in the middle-income trap.

<sup>24</sup> According to the authors, by exacerbating the misallocation of talent, labor market distortions may make it more likely that the economy will end up in a lower-growth equilibrium.

However, the authors did not find evidence supporting Agenor and Canuto (2014) that innovation increases growth in middle-income countries. Similarly, they did not see a clear association between education and growth in the same income group (contrary to findings by, for example, Egawa (2013)).

Based on the literature review, we compiled a list of seven factors most often associated with the slowdown. For each factor, we explained the way in which it influences the likelihood of falling into the MIT. We also cited evidence supporting this association. Subsequently, we identified measurable indicators associated with each factor. Our approach built upon other studies that analyzed the correlations between specific factors and the likelihood of being stuck in the trap, most notably by Agenor and Canuto (2012), Ayiar et al. (2013), Eichengreen, Park and Shin (2013), and Felipe, Abdon and Kumar (2012). In five cases, as indicators we used pillars of the Global Competitiveness Index prepared by the World Economic Forum (2014). We decided to use the index because it provides a credible assessment of an overall area of the economy (as opposed to simple indicators based on a single series of data).

List of factors most often associated with the MIT:

1. **Unfavorable demographics.** Several papers empirically documented a negative impact of unfavorable demography on economic growth. People of working age are on average more productive than the elderly and contribute to higher savings rates. As an indicator of a country's demographic burden, we used the old-age dependency ratio, which, research suggests, is positively associated with the probability of a growth slowdown (Ayiar et al. 2013; Bloom and Canning 2004).
2. **Low level of economic diversification.** Researchers often pointed out that the economic structure plays a significant role in a country's transition to the high-income level. Economies at the middle-income level have to move up the value chain in order to maintain their high growth rates. As a proxy of the level of sophistication in the economic structure, we used the share of high-technology products in exports, which, research suggests, is negatively associated with the probability of falling into the MIT (Eichengreen, Park and Shin 2013; Felipe, Abdon and Kumar 2012; Jankowska, Nagengast and Ramon 2012).
3. **Inefficient financial market.** Developed financial markets play a major role in stimulating innovations and supporting a country's transition to the high-income level (Agenor and Canuto 2014). As an indicator of the financial markets' efficiency we use the financial market development component (8th pillar) of the Global Competitiveness Index (World Economic Forum 2014), which, research suggests, is negatively associated with the probability of a growth slowdown. The pillar is composed of indicators such as: i) availability of financial services, ii) availability of venture capital, and iii) ease of access to loans.
4. **Insufficient advanced infrastructure.** The quality of infrastructure plays a major role in escaping the MIT. Both Agenor and Canuto (2012) and Ayiar et al. (2013) pointed out that access to advanced infrastructure is necessary to raise the productivity in the design sector and stimulate innovations. Particularly important are high-speed communications networks. As a proxy of the quality of infrastructure, we use the infrastructure component (2nd pillar) of the Global Competitiveness Index (World Economic Forum 2014), which, research suggests, is negatively associated with the probability of a growth slowdown. The pillar is composed of indicators such as the quality of: i) electricity infrastructure, ii) telephony infrastructure, and iii) transport infrastructure.

5. **Low level of innovation.** The innovative capacity of a country is the most cited factor associated with escaping the MIT (e.g. Agenor and Canuto 2014). As an indicator of a country's innovativeness, we use the innovation component (12th pillar) of the Global Competitiveness Index (World Economic Forum 2014), which, research suggests, is negatively associated with the probability of a growth slowdown. The pillar is composed of indicators such as: i) capacity for innovation, ii) spending on R&D, and iii) university-industry collaboration.
6. **Weak institutions.** Developed (transparent and efficient) legal systems, contract enforcement, and property rights are strongly associated with a reduced probability of a growth slowdown episode (Agenor and Canuto 2012; Ayiar et al. 2013; Felipe, Abdon and Kumar 2012). As an indicator of the quality of a country's institutional framework, we use the institutions component (1st pillar) of the Global Competitiveness Index (World Economic Forum 2014), which, research suggests, is negatively associated with the probability of a growth slowdown. The pillar is composed of factors such as: i) efficiency of legal framework, ii) property rights protection, and iii) quality of government regulation, which are essential to stimulate innovation and design activities.
7. **Inefficient labor market.** An inefficient labor market may discourage hiring, which increases the likelihood of falling into the MIT. According to Agenor and Canuto (2012), labor market distortions discourage the seeking of higher education with adverse consequences for growth. As an indicator of the labor market efficiency, we use the labor market component (7th pillar) of the Global Competitiveness Index (World Economic Forum 2014), which, research suggests, is negatively associated with the probability of a growth slowdown. The pillar consists of indicators such as: i) efficient use of talent, ii) flexibility of wage determination, and iii) hiring and firing practices.

In Table A.2 in the Appendix, we present the results of a study comparing countries in terms of risks associated with the MIT. A country name written in bold indicates it was ranked as an emerging market by the Russell Investments Index. A shaded numerical cell indicates that the country was in the bottom 20% of all examined countries for a given characteristic. In this situation, underdevelopment in a given area may present a significant obstacle to economic growth in the future and increases the probability of an economic slowdown.

## 7. CONVERGENCE TRAP

As our analysis of the MIT delivered mixed results, in the following section we introduce a new term, the 'convergence trap.' It is defined as a situation where a country's GDP per capita level fails to converge toward the GDP per capita level of a more advanced reference economy (e.g. Germany may be a reference economy for the CEE region). The convergence trap is characterized by similar challenges to those in the MIT, i.e. productivity slowdown and insufficient competitiveness. Hence, it may well describe the obstacles often faced by countries experiencing the middle- to high-income transition.

However, the convergence trap is identified in a different way than the MIT and is not specific to middle-income countries. The MIT has been defined using either: (i) descriptive interpretations, (ii) fixed income thresholds, (iii) income thresholds relative to the US, (iv) time thresholds, or (v) indices. In contrast, the convergence trap is defined relative to a country-specific reference economy (not necessarily the US) and not for a specific level of income. The benchmark economy is identified for a given country as a regional value chain leader with relatively higher per capita income and



more advanced technology. Hence, the convergence trap definition develops the work of Agenor and Canuto (2012) and Im and Rosenblatt (2013). Determining whether a country is stuck in the convergence trap is, however, subject to a comparison with an economy that shares close economic links and similar characteristics with the country in question.

We present the convergence trap concept in the example of the Central and Eastern European<sup>25</sup> (CEE) countries relative to Germany. We choose Germany as a benchmark economy for the CEE region for the following reasons. Firstly, it is the largest economy in Europe (both in terms of GDP and population) and acts as the gravity center of the economic activity of the EU (Baldwin and Lopez-Gonzalez 2015). Therefore, most of the CEE economies are strongly involved in the value chains of the multinational German corporations. Secondly, Germany is arguably the most advanced large economy in Europe and an innovative technological frontier for most European countries. Thirdly, Germany has a long history of developed institutions (Shin 2013). Finally, it is well diversified in terms of exports and GDP composition, which, according to Agenor and Canuto (2012), is an important feature of advanced economies.

The CEE region has experienced strong economic convergence toward the European Union (EU) in the past 25 years. Between 1992 and 2014, the unweighted average of GDP per capita in the CEE region relative to Germany rose from 32% to 48%. This progress has usually been attributed to the market reforms implemented in the early 1990s, and subsequently the accession to the EU (Gill and Raiser 2012). Currently, some of the CEE economies are classified as upper-middle-income by the World Bank (Bulgaria, Romania) while others are classified as high-income (Czech Republic, Hungary, Poland, Slovakia).

However, the strong growth and convergence experienced by the CEE region in the past 25 years is not without precedent. Such processes had already been experienced in other parts of Europe, yet some economies – most notably Greece, Portugal, and Spain (hereinafter: GPS) – found themselves stuck at certain levels of development at some point (Figure 9).

The first rapid catch-up episode of GPS economies took place in the period 1960–1973 due to the opening of their economies to foreign trade and investments, economic integration with Western Europe, and some market reforms (Lieberman 2005). During this period the average GDP per capita of GPS countries relative to Germany increased from 40% to 62%.

This catch-up episode was, however, followed by a period of economic slowdown in 1974–1985, during which the average income in GPS relative to Germany stagnated at around 60%. The slowdown was due to a combination of adverse external conditions, such as the oil price shock, and internal policies, such as the expansion of the welfare state (Lieberman 2005)

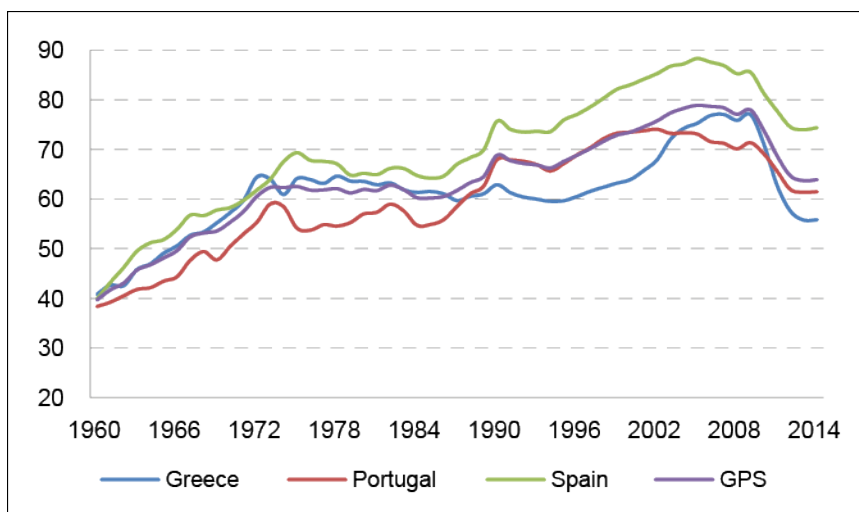
By 1986, GPS had joined the European Economic Community (EEC), which resulted in an increased inflow of foreign investment, and the adoption of some more restrictive fiscal and monetary policies (Barry 2003). The second rapid catch-up episode occurred between 1999 and 2008. It can be attributed to several factors: (i) further integration with the EU, (ii) the period after the launch of the EMU when the financing costs in these countries reached historically low levels both for the private and the public sector, and (iii) favorable global circumstances in the early 2000s, i.e. the ‘great moderation’ (European Commission 2012; Lane 2012). By 2008, the average standard of living in GPS relative to Germany had reached 78%.

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<sup>25</sup> These are: Bulgaria, the Czech Republic, Hungary, Poland, Romania, and Slovakia.

However, the global financial crisis that erupted in 2008 and the euro area sovereign debt crisis that began two years later both put an end to those favorable developments. As a result, GDP per capita in GPS relative to Germany decreased back to around 64%, i.e. the level last observed in the late 1980s. The experience of GPS shows that economic growth based on credit expansion does not ensure stable convergence.

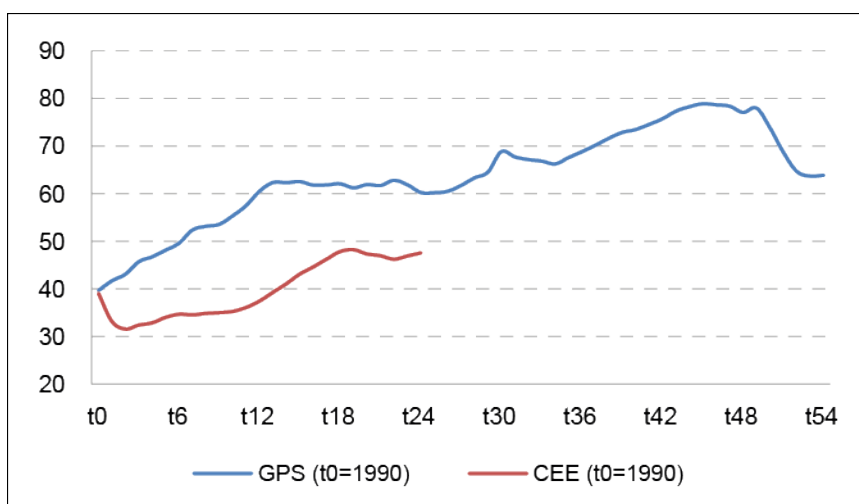
**Figure 9: GDP per Capita of Greece, Portugal, and Spain Relative to Germany and Their Unweighted Average (GPS)**



Source: Own elaboration, World Bank (2015), Bolt and van Zande (2014).

From a long-term perspective, the convergence path of the CEE countries over the period 1990–2014 strongly resembles that of GPS from the 1960s to the 1980s (Figure 10). It is thus worth considering not only whether the CEE region is stuck in the convergence trap but also whether it will avoid the convergence trap in the coming decades.

**Figure 10: Unweighted Average of GDP per Capita of the GPS and CEE Countries Relative to Germany**



Source: Own elaboration, World Bank (2015), Bolt and van Zande (2014).

## 8. CONCLUSIONS

As the concept of the MIT becomes increasingly popular among researchers and policymakers around the world, there is a growing need to develop a coherent framework for its analysis. The MIT concept is a useful tool for analyzing the growth dynamics of developing countries, with a focus on sustaining economic growth in the long run. It is also a catchy term that may help in discussing the public policy in countries that find themselves at risk of a growth slowdown in the midst of a rapid economic 'catch-up.'

The theoretical foundations of the MIT have been created by researchers who analyzed the importance of productivity in sustaining economic growth in the long run. The idea that middle-income countries ultimately find themselves 'trapped' between high-income economies (competing with innovation) and low-income countries (competing with cheap labor) is a convincing one. The empirical evidence, although ambiguous, provides numerous examples of economies experiencing this type of difficult transition.

However, a growing number of interpretations of the MIT phenomenon make it increasingly difficult to discuss the MIT with clarity. As at least 36.0% of all countries have been inconsistently classified as stuck in the MIT by some definitions and as 'escapees' from the trap by others, it is well-nigh impossible to assess the situation of most countries unambiguously. Consequently, contradictory definitions may misguide policymakers toward implementing inadequate strategies.

The aim of this paper was to help to develop a coherent framework for analysis of the MIT. We did this by conducting an extensive literature review and comparing different approaches to the subject. This analysis can be a step towards formulating a more precise definition of the MIT. It can also be a good reference point for future research into the subject.

The meaning of this study is also predictive. The cumulative number of definitions classifying a country as stuck in the MIT across the board of definitions might give a better indicator of a given country's status than the results of any single definition. Similarly, a set of key characteristics most often associated with the MIT by researchers might be a useful tool for assessing the risks of falling into the MIT for any given country.

This analysis can be developed further. An econometric study comparing the number of times a country has been trapped in the MIT to the set of key characteristics may help to identify the most relevant indicators. The study may also be improved by distinguishing those countries that have overcome the MIT from those that still need to go through this stage. Finally, by incorporating new research it might be possible to identify the key areas associated with the risk of falling into the MIT with a higher level of confidence.

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## APPENDIX

Table A.1: Countries Classified as ‘Trapped’ according to Different Definitions of the MIT

Country	Fixed Income Definitions					Relative Income Definitions			Time Definition	Index Definition	Number of Definitions Confirming MIT
	S*	E	I	A	AC	RY	J**	B	F	W	
Afghanistan											0
Albania					AC				F		2
Algeria				A	AC					W	3
Angola	S				AC				F		3
Antigua and Barbuda										W	1
Argentina			I				J**			W	2
Armenia	S				AC						2
Australia											0
Austria											0
Azerbaijan		E			AC						2
Bahrain											0
Bangladesh											0
Barbados									F	W	2
Belarus		E			AC						2
Belgium											0
Belize	S			A					F		3
Benin											0
Bhutan	S										1
Bolivia	S				AC				F		3
Bosnia and Herzegovina					AC						1
Botswana		E	I			RY					3
Brazil			I		AC		J**			W	3
Brunei											0
Bulgaria					AC	RY				W	3
Burkina Faso											0
Burundi											0
Cambodia					AC						1
Cameroon				A	AC						2
Canada											0
Cape Verde	S										1
Central African Republic											0
Chad											0
Chile					AC		J**			W	2
China, People's Rep. of		E			AC						2
Colombia		E			AC		J**			W	3
Comoros											0
Costa Rica					AC	RY					2
Croatia					AC					W	2
Cyprus											0
Czech Republic											0
Democratic Republic of the Congo											0
Denmark											0
Djibouti					AC						1
Dominica											0
Dominican Republic		E			AC						2
Ecuador				A	AC				F		3
Egypt		E		A	AC				F		4

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Table A.1 *continued*

Country	Fixed Income Definitions					Relative Income Definitions			Time Definition	Index Definition	Number of Definitions Confirming MIT
	S*	E	I	A	AC	RY	J**	B	F	W	
El Salvador	S			A	AC	RY			F		5
Equatorial Guinea											0
Eritrea											0
Estonia										W	1
Ethiopia											0
Fiji	S								F		2
Finland											0
France											0
FYR Macedonia					AC					W	2
Gabon			I		AC						2
Georgia	S				AC						2
Germany											0
Ghana					AC						1
Greece								B		W	2
Grenada									F		1
Guatemala	S			A	AC	RY			F		5
Guinea											0
Guinea-Bissau											0
Guyana	S			A					F		3
Haiti											0
Honduras				A	AC	RY			F		4
Hong Kong, China											0
Hungary										W	1
Iceland											0
India	S				AC						2
Indonesia				A	AC				F		3
Iraq		E			AC	RY					3
Ireland											0
Islamic Rep. of Iran					AC	RY				W	3
Israel								B			1
Italy								B			1
Ivory Coast					AC						1
Jamaica	S			A	AC				F		4
Japan											0
Jordan		E		A	AC	RY			F		5
Kazakhstan					AC					W	2
Kenya				A	AC						2
Kiribati											0
Korea, Rep. of											0
Kuwait											0
Kyrgyz Rep.					AC						1
Lao PDR	S			A	AC						3
Latvia			I		AC					W	3
Lebanon		E			AC	RY			F	W	5
Lesotho											0
Liberia											0
Libya				A	AC						2
Lithuania			I								1
Luxembourg											0
Madagascar											0
Malawi											0
Malaysia										W	1
Maldives		E		A							2
Mali											0

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Table A.1 *continued*

Country	Fixed Income Definitions				Relative Income Definitions				Time Definition	Index Definition	Number of Definitions Confirming MIT
	S*	E	I	A	AC	RY	J**	B	F	W	
Malta											0
Marshall Islands											0
Mauritania					AC						1
Mauritius			I		AC					W	3
Mexico					AC	RY	J**		F	W	4
Micronesia											0
Moldova	S				AC						2
Mongolia		E		A	AC						3
Montenegro					AC						1
Morocco	S				AC				F		3
Mozambique											0
Myanmar	S										1
Namibia					AC						1
Nepal											0
Netherlands											0
New Zealand								B			1
Nicaragua				A	AC						2
Niger											0
Nigeria	S				AC						2
Norway											0
Oman											0
Pakistan	S				AC						2
Palau											0
Panama					AC	RY				W	3
Papua New Guinea				A							1
Paraguay	S			A	AC				F		4
Peru		E		A	AC	RY	J**		F		5
Philippines	S				AC				F		3
Poland										W	1
Portugal								B		W	2
Qatar											0
Republic of Congo	S			A	AC				F		4
Romania					AC	RY				W	3
Russian Federation										W	1
Rwanda											0
Samoa	S										1
San Marino											0
São Tomé and Príncipe					AC						1
Saudi Arabia											0
Senegal											0
Serbia					AC						1
Seychelles			I							W	2
Sierra Leone											0
Singapore											0
Slovak Republic										W	1
Slovenia											0
Solomon Islands											0
South Africa			I	A	AC	RY			F	W	6
Spain								B			1
Sri Lanka					AC				F		2
St. Kitts and Nevis										W	1
St. Lucia			I						F	W	3
St. Vincent and the Grenadines									F		1

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Table A.1 *continued*

Country	Fixed Income Definitions					Relative Income Definitions			Time Definition	Index Definition	Number of Definitions Confirming MIT
	S*	E	I	A	AC	RY	J**	B	F	W	
Sudan				A	AC						2
Suriname		E									1
Swaziland	S			A	AC				F		4
Sweden											0
Switzerland											0
Taipei, China											0
Tajikistan											0
Tanzania											0
Thailand					AC	RY				W	3
The Bahamas										W	1
The Gambia											0
Timor-Leste	S										1
Togo											0
Tonga	S			A					F		3
Trinidad and Tobago											0
Tunisia					AC	RY			F		3
Turkey			I		AC	RY			F	W	5
Turkmenistan		E			AC						2
Tuvalu											0
Uganda											0
Ukraine	S				AC						2
United Arab Emirates											0
United Kingdom											0
United States											0
Uruguay			I		AC					W	3
Uzbekistan	S				AC						2
Vanuatu											0
Venezuela							J**		F	W	2
Viet Nam	S				AC						2
Yemen				A							1
Zambia					AC				F		2
Zimbabwe				A							1

Note: A country's name written in bold indicates it was classified as an emerging market economy by Russell Investments (2015).

\*A = Ayiar et al. (2013); AC = Agenor and Canuto (2012); B = Bukowski, Halesiak and Petru (2013); E = Eichengreen, Park and Shin (2013); F = Felipe, Abdon and Kumar (2012); I = Islam (2015); J = Jankowska, Nagengast and Ramon (2012); RY = Robertson and Ye (2013); S = Spence (2011); W = Woo et al. (2012).

\*\*Jankowska, Nagengast and Ramon (2012) consider only Latin American countries and their definition was not included in the cumulative result.

Source: Own elaboration, Bolt and van Zande (2014), International Monetary Fund (2016), Penn World Table (2015), World Bank (2015).

Table A.2: Emerging Markets and Indicators Associated with the MIT

Country	Demographics*	Economic Structure	Finance	Infrastructure	Innovation	Institutions	Labor Market	#MIT
Afghanistan	4.65	n/a	n/a	n/a	n/a	n/a	n/a	0
Albania	15.91	0.51	3.39	3.52	2.73	3.38	4.02	2
Algeria	6.84	0.19	2.72	3.12	2.60	3.41	3.15	3
Angola	4.77	n/a	2.50	2.01	2.12	2.61	3.52	3
Antigua and Barbuda	10.42	0.00	n/a	n/a	n/a	n/a	n/a	1
Argentina	17.06	9.84	3.04	3.54	3.04	2.79	2.97	2
Armenia	14.93	2.88	3.71	3.83	2.95	3.82	4.20	2
Australia	22.13	12.91	5.41	5.60	4.41	5.14	4.30	0
Austria	27.59	13.72	4.45	5.80	4.82	5.09	4.45	0
Azerbaijan	7.71	13.42	3.77	4.12	3.33	3.96	4.59	2
Bahrain	3.00	0.15	4.65	5.19	3.32	4.70	4.67	0
Bangladesh	7.34	0.17	3.77	2.45	2.58	2.96	3.67	0
Barbados	15.81	15.27	4.63	5.32	3.56	4.64	4.60	2
Belarus	19.58	4.40	n/a	n/a	n/a	n/a	n/a	2
Belgium	28.36	11.36	4.53	5.61	4.89	5.08	4.27	0
Belize	6.42	0.00	n/a	n/a	n/a	n/a	n/a	3
Benin	5.29	1.23	n/a	n/a	n/a	n/a	n/a	0
Bhutan	7.24	12.41	3.45	3.49	2.85	4.47	4.69	1
Bolivia	8.23	9.43	3.33	3.00	3.15	3.53	3.58	3
Bosnia and Herzegovina	22.74	2.30	n/a	n/a	n/a	n/a	n/a	1
Botswana	5.86	0.38	4.22	3.19	2.97	4.47	4.56	3
Brazil	11.31	9.63	4.30	3.98	3.31	3.47	3.83	3
Brunei Darussalam	6.47	15.24	n/a	n/a	n/a	n/a	n/a	0
Bulgaria	29.50	7.96	4.17	4.06	2.94	3.32	4.24	3
Burkina Faso	4.65	13.68	3.14	2.01	2.89	3.28	4.22	0
Burundi	4.51	2.75	2.37	2.01	2.46	2.92	3.89	0
Cambodia	8.64	0.19	3.80	3.05	2.79	3.25	4.63	1
Cameroon	5.96	3.74	3.51	2.47	3.27	3.53	4.11	2
Canada	22.93	14.06	5.35	5.74	4.54	5.43	5.20	0
Cape Verde	7.96	0.60	3.36	3.14	2.98	3.89	3.59	0
Central African Republic	6.74	0.04	n/a	n/a	n/a	n/a	n/a	0
Chad	4.82	n/a	2.74	1.67	2.34	2.66	3.72	0
Chile	14.88	4.90	4.88	4.56	3.54	4.82	4.36	2
China, People's Rep. of	12.54	26.97	4.30	4.66	3.91	4.22	4.55	2
Colombia	9.63	7.39	4.01	3.66	3.21	3.32	4.08	3
Comoros	5.13	7.34	n/a	n/a	n/a	n/a	n/a	0
Costa Rica	10.40	43.32	3.74	4.08	3.78	4.26	4.29	2
Croatia	27.95	8.00	3.91	4.72	3.10	3.59	3.86	2
Cyprus	17.72	7.15	3.81	4.70	3.72	4.39	4.61	0
Czech Rep.	25.36	14.70	4.45	4.75	3.67	3.77	4.26	0
Democratic Republic of the Congo	5.47	n/a	n/a	n/a	n/a	n/a	n/a	0
Denmark	28.46	14.25	4.72	5.59	5.06	5.35	4.99	0
Djibouti	6.53	n/a	n/a	n/a	n/a	n/a	n/a	1
Dominica	n/a	8.83	n/a	n/a	n/a	n/a	n/a	0
Dominican Republic	10.11	2.67	3.70	3.26	2.96	3.29	3.85	2
Ecuador	10.45	4.36	n/a	n/a	n/a	n/a	n/a	3
Egypt	9.28	0.52	3.19	3.20	2.65	3.41	3.08	4
El Salvador	11.38	4.44	3.78	4.34	3.50	3.44	3.64	5
Equatorial Guinea	4.73	n/a	n/a	n/a	n/a	n/a	n/a	0

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Table A.2 *continued*

Country	Demographics*	Economic Structure	Finance	Infrastructure	Innovation	Institutions	Labor Market	#MIT
Eritrea	4.21	18.21	n/a	n/a	n/a	n/a	n/a	0
Estonia	27.73	10.50	4.67	4.85	3.95	4.96	5.02	1
Ethiopia	6.34	2.37	3.33	2.49	2.87	3.46	4.15	0
Fiji	8.60	2.22	n/a	n/a	n/a	n/a	n/a	2
Finland	30.95	7.21	5.55	5.60	5.78	6.08	4.69	0
France	28.82	25.84	4.79	6.03	4.74	4.68	4.27	0
FYR Macedonia	17.81	3.66	4.49	3.73	3.28	4.26	4.21	2
Gabon	9.03	3.00	3.57	2.86	2.68	3.72	4.23	2
Georgia	21.66	2.59	3.90	4.31	2.71	4.21	4.49	2
Germany	32.33	16.08	4.76	6.09	5.47	5.23	4.57	0
Ghana	5.94	4.88	4.15	3.03	3.31	3.85	3.94	1
Greece	30.52	7.54	2.97	4.88	3.18	3.64	3.74	2
Grenada	10.71	8.05	4.44	4.17	3.07	3.34	4.07	1
Guatemala	8.33	4.74	n/a	n/a	n/a	n/a	n/a	5
Guinea	5.65	0.12	2.85	1.78	2.25	2.81	4.05	0
Guinea-Bissau	5.18	3.93	n/a	n/a	n/a	n/a	n/a	0
Guyana	5.71	0.11	3.81	2.94	3.42	3.54	3.90	3
Haiti	7.45	3.54	2.81	2.03	2.28	2.81	4.15	0
Honduras	7.43	2.45	4.17	3.18	3.23	3.37	3.51	4
Hong Kong, China	19.62	12.25	5.91	6.69	4.38	5.63	5.57	0
Hungary	25.64	16.34	3.93	4.56	3.50	3.67	4.17	1
Iceland	19.75	15.47	4.03	5.54	4.19	5.11	4.94	0
India	8.13	8.07	4.34	3.58	3.53	3.84	3.81	2
Indonesia	8.03	7.05	4.45	4.37	3.93	4.11	3.81	3
Iraq	5.53	0.09	n/a	n/a	n/a	n/a	n/a	3
Ireland	18.69	22.42	4.15	5.32	4.68	5.40	4.82	0
Islamic Republic of Iran	7.61	4.12	3.05	4.15	3.13	3.36	3.01	3
Israel	17.60	15.61	4.87	4.99	5.56	4.32	4.27	1
Italy	33.26	7.25	3.35	5.43	3.73	3.37	3.29	1
Ivory Coast	5.70	1.34	3.86	3.41	3.28	3.64	4.21	1
Jamaica	12.18	0.67	4.40	3.75	3.22	3.71	4.28	4
Japan	42.11	16.78	4.98	6.13	5.54	5.47	4.73	0
Jordan	5.73	1.60	4.06	4.11	3.64	4.48	4.02	5
Kazakhstan	9.98	36.87	3.70	4.25	3.14	4.02	4.90	2
Kenya	4.91	5.70	4.77	3.27	3.69	3.73	4.68	2
Kiribati	6.57	0.69	n/a	n/a	n/a	n/a	n/a	0
Korea, Rep. of	17.25	27.10	3.81	5.74	4.83	3.70	4.07	0
Kuwait	3.29	1.43	3.88	4.28	2.86	4.02	3.78	0
Kyrgyz Republic	6.33	5.29	3.73	2.80	2.48	3.21	4.02	1
Lao PDR	6.21	n/a	3.69	3.38	3.14	3.92	4.59	3
Latvia	28.06	13.01	4.63	4.61	3.27	4.13	4.82	3
Lebanon	12.27	2.21	3.65	2.62	2.75	2.71	3.68	5
Lesotho	7.01	0.31	3.27	2.77	2.87	3.86	4.16	0
Liberia	5.56	n/a	n/a	n/a	n/a	n/a	n/a	0
Libya	7.43	n/a	1.95	2.88	1.98	2.62	3.41	2
Lithuania	22.74	10.33	4.09	4.73	3.62	4.01	4.33	1
Luxembourg	21.00	8.10	5.10	5.73	4.85	5.69	4.87	0
Madagascar	5.11	0.58	2.85	2.10	3.09	3.13	4.53	0
Malawi	6.26	5.97	3.82	2.21	2.80	3.74	4.63	0
Malaysia	8.07	43.57	5.60	5.46	4.67	5.11	4.80	1
Maldives	7.37	0.00	n/a	n/a	n/a	n/a	n/a	2
Mali	5.49	1.25	3.32	3.15	3.10	3.18	3.89	0
Malta	24.81	38.55	4.56	4.88	3.60	4.46	4.32	0
Marshall Islands	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0

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Table A.2 *continued*

Country	Demographics*	Economic Structure	Finance	Infrastructure	Innovation	Institutions	Labor Market	#MIT
Mauritania	5.60	n/a	2.50	2.59	2.41	2.76	3.07	1
Mauritius	12.75	0.56	4.74	4.74	3.22	4.60	4.33	3
Mexico	10.05	15.92	4.14	4.19	3.31	3.40	3.71	4
Micronesia	6.86	n/a	n/a	n/a	n/a	n/a	n/a	0
Moldova	16.08	2.36	3.70	3.68	2.53	3.22	4.11	2
Mongolia	5.55	15.85	3.22	2.92	2.94	3.44	4.48	3
Montenegro	19.66	n/a	4.26	4.10	3.37	3.96	4.24	1
Morocco	7.46	n/a	4.02	4.38	3.11	4.21	3.81	3
Mozambique	6.40	6.55	3.14	2.36	2.76	3.16	3.88	0
Myanmar	7.56	13.35	2.58	2.05	2.34	2.80	4.21	1
Namibia	5.88	1.72	4.43	4.17	3.10	4.19	4.31	1
Nepal	8.55	0.30	3.90	2.15	2.62	3.22	3.80	0
Netherlands	26.83	20.41	4.55	6.25	5.25	5.53	4.73	0
New Zealand	21.84	10.25	5.73	5.30	4.42	6.09	5.24	1
Nicaragua	7.45	0.37	3.56	3.20	2.68	3.31	3.84	2
Niger	5.54	52.45	n/a	n/a	n/a	n/a	n/a	0
Nigeria	5.17	2.74	4.06	2.13	2.82	3.01	4.53	2
Norway	24.68	19.12	5.34	5.16	4.85	5.74	4.97	0
Oman	3.94	3.41	4.69	5.01	3.29	5.06	4.39	0
Pakistan	7.05	1.88	3.99	2.66	3.12	3.21	3.43	2
Palau	n/a	19.31	n/a	n/a	n/a	n/a	n/a	0
Panama	11.44	0.05	4.83	4.77	3.65	3.83	4.06	3
Papua New Guinea	4.98	3.45	n/a	n/a	n/a	n/a	n/a	1
Paraguay	8.95	7.49	3.74	2.70	2.44	2.90	3.79	4
Peru	10.05	3.57	4.49	3.54	2.76	3.26	4.33	5
Philippines	6.39	47.11	4.37	3.49	3.48	3.86	4.03	3
Poland	21.19	7.71	4.60	4.24	3.26	4.02	4.14	1
Portugal	28.74	4.26	3.65	5.66	4.08	4.43	4.09	2
Qatar	1.14	0.13	5.18	5.51	4.88	5.90	5.05	0
Republic of Congo	6.26	1.57	n/a	n/a	n/a	n/a	n/a	4
Romania	21.91	5.72	4.12	3.65	3.28	3.56	4.04	3
Russian Federation	18.50	10.01	3.50	4.82	3.29	3.45	4.42	1
Rwanda	4.39	4.35	4.26	3.14	3.46	5.21	5.08	0
Samoa	9.03	0.64	n/a	n/a	n/a	n/a	n/a	1
San Marino	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
São Tomé and Príncipe	5.97	14.12	n/a	n/a	n/a	n/a	n/a	1
Saudi Arabia	4.26	0.70	4.66	5.19	3.80	4.97	4.25	0
Senegal	5.50	2.72	3.80	2.93	3.39	3.81	4.23	0
Serbia	21.14	3.63	3.50	3.93	2.89	3.21	3.73	1
Seychelles	11.12	3.35	3.65	4.50	3.25	4.04	4.44	2
Sierra Leone	4.76	31.08	3.36	2.07	2.58	3.37	4.01	0
Singapore	14.49	46.99	5.84	6.54	5.18	5.98	5.69	0
Slovak Republic	18.51	10.31	4.50	4.21	3.18	3.33	3.95	1
Slovenia	25.71	6.22	2.85	4.88	3.64	3.81	3.93	0
Solomon Islands	5.96	12.63	n/a	n/a	n/a	n/a	n/a	0
South Africa	8.67	5.47	5.37	4.29	3.64	4.50	3.80	6
Spain	27.08	7.67	3.76	6.01	3.69	3.82	3.92	1
Sri Lanka	13.23	0.99	4.41	4.02	3.57	3.93	3.29	2
St. Kitts and Nevis	n/a	0.12	n/a	n/a	n/a	n/a	n/a	1
St. Lucia	13.13	16.88	n/a	n/a	n/a	n/a	n/a	3
St. Vincent and the Grenadines	10.50	n/a	n/a	n/a	n/a	n/a	n/a	1

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Table A.2 *continued*

Country	Demographics*	Economic Structure	Finance	Infrastructure	Innovation	Institutions	Labor Market	#MIT
Sudan	5.86	0.70	n/a	n/a	n/a	n/a	n/a	2
Suriname	10.14	6.50	3.35	3.61	2.60	3.37	3.74	1
Swaziland	6.00	n/a	4.00	3.26	2.86	3.94	3.86	4
Sweden	31.14	14.00	5.25	5.55	5.37	5.43	4.79	0
Switzerland	26.69	26.55	5.29	6.18	5.70	5.60	5.75	0
Taipei, China	n/a	n/a	4.91	5.82	5.10	4.84	4.59	0
Tajikistan	5.21	n/a	3.40	2.65	3.17	3.90	4.25	0
Tanzania	6.20	5.42	3.72	2.26	3.03	3.49	4.39	0
Thailand	13.93	20.09	4.61	4.58	3.28	3.66	4.24	3
The Bahamas	11.25	0.00	n/a	n/a	n/a	n/a	n/a	1
The Gambia	4.54	7.32	3.74	3.27	3.11	4.29	4.54	0
Timor-Leste	6.50	9.78	2.69	2.14	2.41	3.21	3.68	1
Togo	4.96	0.22	n/a	n/a	n/a	n/a	n/a	0
Tonga	10.29	6.53	n/a	n/a	n/a	n/a	n/a	3
Trinidad & Tobago	13.31	0.10	4.33	4.51	2.99	3.46	3.97	0
Tunisia	10.52	4.94	3.35	3.80	3.01	3.70	3.51	3
Turkey	11.20	1.88	4.21	4.55	3.42	3.90	3.48	5
Turkmenistan	6.09	n/a	n/a	n/a	n/a	n/a	n/a	2
Tuvalu	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
Uganda	4.89	1.87	3.81	2.28	3.06	3.29	4.66	0
Ukraine	21.15	5.89	3.54	4.16	3.16	2.98	4.12	2
United Arab Emirates	0.55	3.20	4.94	6.30	4.41	5.69	5.14	0
United Kingdom	27.57	7.65	5.07	6.01	4.96	5.44	5.26	0
United States	21.61	17.76	5.35	5.82	5.49	4.69	5.30	0
Uruguay	22.15	8.66	3.78	4.47	3.15	4.68	3.37	3
Uzbekistan	6.35	n/a	n/a	n/a	n/a	n/a	n/a	2
Vanuatu	6.63	53.97	n/a	n/a	n/a	n/a	n/a	0
Venezuela	9.76	1.13	2.91	2.65	2.39	2.15	2.55	2
Viet Nam	9.41	28.21	3.77	3.74	3.12	3.51	4.37	2
Yemen	5.08	0.36	2.17	1.90	2.11	2.65	3.23	1
Zambia	5.11	2.37	4.37	2.67	3.42	4.12	4.06	2
Zimbabwe	6.71	3.61	3.44	2.54	2.63	3.31	3.25	1

\*Demographics = Old-age dependency ratio (% in 2015) based on World Bank (2015).

Economic structure = Share of high-technology exports (% in 2013) based on World Bank (2015).

Finance = Financial market pillar (Index 1 worst – 7 best) based on World Economic Forum (2014).

Infrastructure = Infrastructure pillar (Index 1 worst – 7 best) based on World Economic Forum (2014).

Innovation = Innovation pillar (Index 1 worst – 7 best) based on World Economic Forum (2014).

Institutions = Institutions pillar (Index 1 worst – 7 best) based on World Economic Forum (2014).

Labor market = Labor market pillar (Index 1 worst – 7 best) based on World Economic Forum (2014).

#MIT = Number of definitions confirming MIT based on Table A.1.

Source: Own elaboration, World Bank (2015), World Economic Forum (2014).