

# Turkish Middle Income Trap and Less Skilled Human Capital

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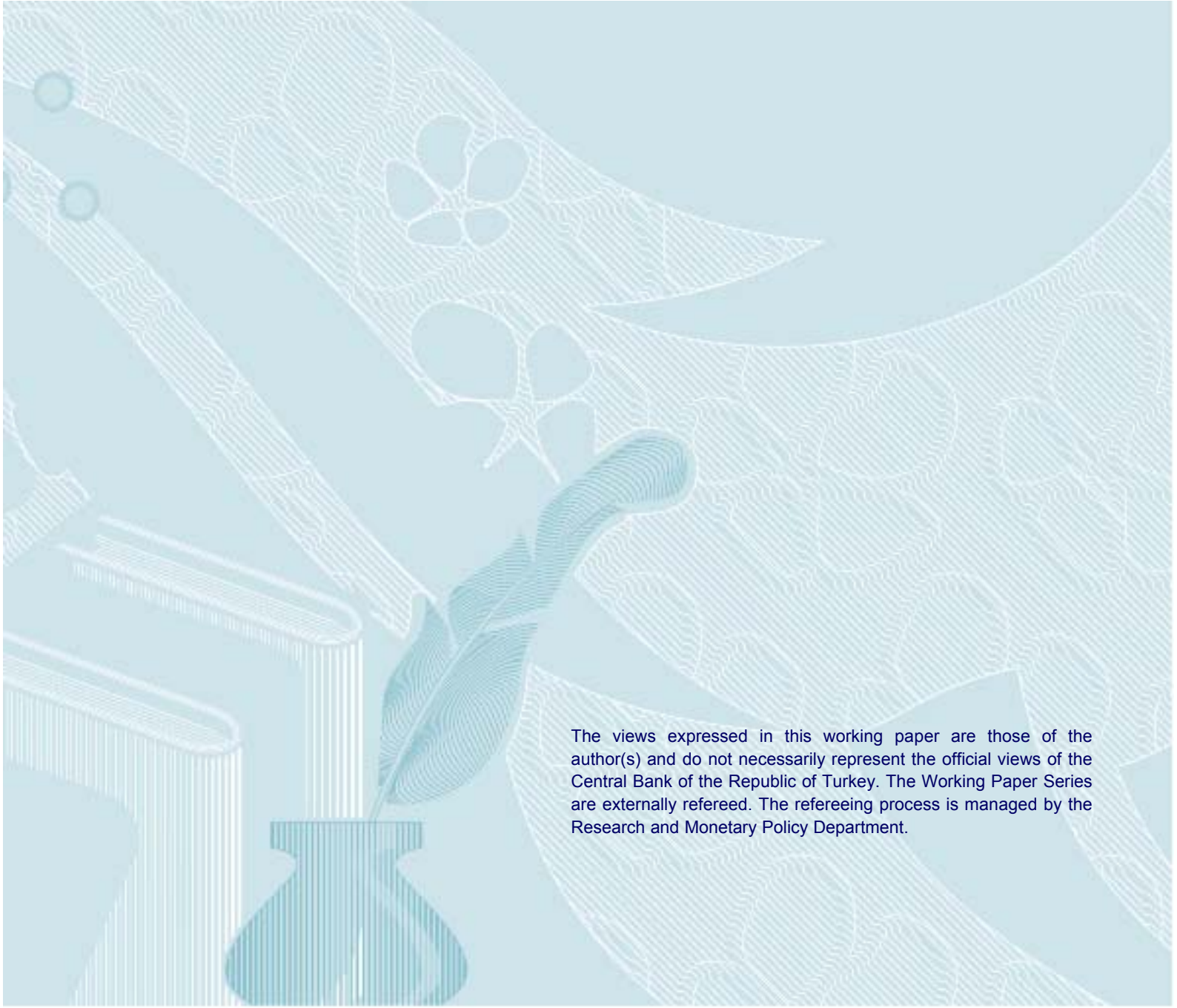
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# Turkish Middle Income Trap and Less Skilled Human Capital

Gökhan YILMAZ<sup>1</sup>

## Abstract

This paper reviews the literature on the Middle Income Trap and compares Turkey to the rest of the trapped and non-trapped (non-middle income trapped) countries. We analyze country experiences by focusing on the role of well-designed and high quality education system to avoid the trap. When we compare Turkey's human capital to human capital in non-trapped countries, we observe that Turkish education system will be critical to break out the trap. An education system that is consistent with development path of the economy could yield both "skilled and high capability human capital" and "innovative and competitive productive capacity" to overcome the trap. Our qualitative analysis also demonstrates that Turkey has not been benefitting from de-agriculturalization sufficiently. Surplus labor coming from agriculture is not being employed in the knowledge intensive manufacturing activities. Moreover, the speed of de-agriculturalization is slow, hence Turkey can't fully exploit unrepeatable gains of structural transformation. Transferring these agriculture workers into high productivity tradable activities can yield significant labor productivity and per capita income gains.

**Key words:** Economic Growth, Convergence, Middle Income Trap.

**JEL Codes:** O11, O40.

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## 1. Introduction

This paper reviews the literature on the Middle Income Trap (MIT) and compares Turkey to the rest of the trapped and non-middle income trapped countries. Although there is no consensus on the strict definition of the MIT, it usually refers to the inability of a middle income country to join group of high income countries. MIT countries are the ones who have passed the low income levels and made significant progress in the social and economic areas but couldn't reach the socioeconomic levels attained by the rich countries. They usually stagnate in middle per capita income levels for a long period of time. Non-Middle Income Trap (NMIT) countries are the ones who could pass from middle income levels to high income levels successfully.

According to the latest World Bank classification in 2013, economies in the world could be categorized as low income (\$1,035 or less), lower middle income (\$1,036 to \$4,085), upper middle income (\$4,086 to \$12,615) and high income (\$12,616 or more) by using estimates of gross national income per capita. Hence MIT countries are expected to have per capita income level of \$1,036 to \$12,616.

The World Bank (2008) discusses challenges of MIT for middle income countries. The report argues that countries often find it difficult to sustain their high growth paces as they narrow the gap with the rich world. As they mature, their comparative advantage in labor intensive commodities disappears as surplus labor declines and real wages increase. But since they aren't equipped with capabilities to produce knowledge and innovation intensive commodities to compete with high skilled manufacturers in the advanced countries, their growth rates decline and they end up being stuck in MIT.

In this paper, we investigate the role of human capital and relevant policies to break out the trap. In the MIT literature, experiences of the East Asian countries and some European countries (Spain, Portugal, Finland, and Greece) and Israel are considered as success stories. On the other side, Turkey and Latin American economies are stuck in the MIT. We will discuss experiences of both groups and we look for answers for the following research questions in this paper:

How did NMIT countries break out the trap?

What is the relative position of trapped Turkish economy in terms of convergence, schooling, innovation and structural transformation with respect to the other MIT and NMIT countries?

Our discussion demonstrates that accumulating human capital in the form of skills and ability to produce technologically sophisticated goods is quite important to abstain from the trap. In that front we argue that education system can potentially play an important role. Moreover, experiences of the graduated countries also depict that structural transformation should be managed to favor high

productivity and knowledge intensive manufacturing activities. Our qualitative analysis demonstrates that Turkey is not benefitting from de-agriculturalization sufficiently.

The rest of the paper is organized as follows. Section 2 presents literature review, countries in the trap and policies to break out the MIT respectively. Section 3 presents Turkey's relative position in terms of per capita income developments, human capital, innovation and competitiveness along with structural transformation as a trapped economy with respect to the other MIT and NMIT countries. And Section 4 concludes.

## **2. Tracking the Middle Income Trap**

### **2.1. A Brief Literature Review**

In the literature there are different approaches to evaluate the existence of the middle income trap. Some studies determine existence of the MIT as unsatisfactory relative convergence of per capita income levels on those of the rich economies (see for example Lin and Rosenblatt, 2012) and the others consider it as existence of weak or stagnating growth performance in absolute per capita income levels (see for example Abdon et al., 2012).

Eichengreen et al. (2013) consider the middle income trap as growth slowdowns in emerging markets, i.e. having high per capita growth rates at low income levels and absence of sustained growth to reach high income levels. According to the authors a "growth slowdown" depends on coexistence of three conditions: firstly, seven year average per capita income growth rate (PWT 7.1; PPP-adjusted, at 2005 constant prices) should be at least 3.5%. Secondly, minimum 2% decline in the growth rate of per capita income (between successive periods, nonoverlapping seven-year) should exist. Thirdly, slowdowns should be seen in mature economies that have minimum \$10,000 per capita income (constant and PPP-adjusted). The authors argue that growth slowdowns emerge in two different per capita income levels about \$10,000-11,000 and \$15,000-16,000; and hence high growth rate in a middle income country may lose its pace slowly rather than sharply.

Abdon et al. (2012) present a strict definition for the middle-income trap and differentiate the MIT as lower MIT and upper MIT. The paper determines four PPP-adjusted per capita income<sup>2</sup> categories as low-income below \$2,000; lower-middle-income between \$2,000 and \$7,250; upper-middle-income between \$7,250 and \$11,750; and high-income above \$11,750.<sup>3</sup> Then it classifies 124 countries for

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<sup>2</sup> Maddison Database; PPP-adjusted, at 1990 constant prices.

<sup>3</sup> According to the latest World Bank classification in 2013, economies in the world could be categorized as low income (\$1,035 or less), lower middle income (\$1,036 to \$4,085), upper middle income (\$4,086 to \$12,615) and high income (\$12,616 or more) by using estimates of gross national income per capita. Each year, these updated gross national income per capita estimates are considered as input to the Bank's operational lending activities. Abdon et al. (2012) employ a methodology to guess Geary-Khamis PPP dollar thresholds by using the 2010

1950–2010 and investigates historical per capita income changes of the countries among four income categories. Analysis on historical changes (transitions) among four income categories demonstrates that median number of years for a lower middle income country to join higher middle income group is 28 years and for a higher middle income country, it takes 14 years to become a member of high income group. And then the paper asserts that a country is in the MIT if it has been in lower middle income category for more than 28 years or if it has been in upper middle income category for more than 14 years. In other words, the middle income countries are in the trap if they perform worse than historical experiences of successful countries.

The paper also calculates that annual average per capita income growth in a lower middle income country with \$2,000 per capita income should be at least 4.7 percent to escape from falling into the lower-middle-income trap. And an upper-middle-income country with \$7,250 per capita income has to reach minimum 3.5 percent annual average growth to abstain from falling into the upper-middle-income trap. Living without the MIT means growing in a satisfactory high rate to pass the lower-middle-income segment in maximum 28 years, and the upper-middle-income segment in at most 14 years.

Robertson and Ye (2013) question existence of the MIT and present a testable definition to judge it. They test for presence of the MIT by employing Augmented Dickey Fuller unit root specification for per capita income growth rate (PWT 7.1; PPP-adjusted, at 2005 constant prices) of the middle income countries. Their sample includes countries having 8%-36% of the U.S. per capita GDP (46 out of 189 countries are middle income countries). According to their methodology, long term forecasts of per capita income levels stay in middle income band stubbornly, do not demonstrate tendency to move upper or lower income bands. Their approach enables to discriminate between middle income traps and other short run developments.

Woo (2012) employs a catch-up index to determine existence of the MIT by calculating relative per capita income levels in the Maddison database. The author argues that the MIT countries have relative income range of 20%-55% of the U.S. per capita GDP (Maddison Database; PPP-adjusted, at 1990 constant prices). The rich economies have relative shares more than 55% and low income economies have relative shares less than 20%.

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World Bank thresholds (\$1,005 or less, \$1,006 to \$3,975, \$3,976 to \$12,275, \$12,275 or more) to utilize the longer term Maddison data set.

## 2.2. Countries in the Trap

Our paper will categorize the MIT countries by criteria suggested by Robertson and Ye (2013). We think that their approach has some advantages. For instance, they utilize an econometric approach instead of ad hoc definitions to determine MIT countries; and their approach enables to discriminate between middle income traps and other short run developments. Moreover their findings on which countries are trapped consistent with findings of other papers in the literature. The authors claim that countries having 8%-36% of the U.S. per capita GDP (PPP-adjusted, 2005 constant prices) are in the MIT. Hence we determine a country is stuck in the MIT if it has 8%-36% of the U.S. per capita GDP in 1960 and/or 2010.

Our methodology enables us to cover initially very poor (having income level short of lower bound of the MIT region, 8%) but converging economies (having income level in the MIT region) such as Botswana, Cape Verde, China, Egypt, Equatorial Guinea, India, Indonesia, Morocco, Sri Lanka, Thailand and initially rich (having income level more than upper bound of the MIT region, 36%) but now the MIT economies such as Argentina, Jamaica and Venezuela. Table 1 demonstrates 57 countries in our set with their relative per capita GDP levels in 1960 and 2010.

<b>Table 1: Middle Income Trapped and Graduated Countries (Relative per capita income w.r.t the U.S.; percentage)</b>					
<b>Countries</b>	<b>1960</b>	<b>2010</b>	<b>Countries</b>	<b>1960</b>	<b>2010</b>
Algeria	0.27	0.15	<b>Japan</b>	<b>0.36</b>	<b>0.76</b>
<b>Argentina</b>	<b>0.39</b>	<b>0.30</b>	Jordan	0.18	0.11
Bolivia	0.17	0.09	<b>Korea</b>	<b>0.11</b>	<b>0.64</b>
Botswana	0.04	0.23	Malaysia	0.09	0.29
Brazil	0.16	0.20	Mauritius	0.15	0.25
Cameroon	0.09	0.04	Mexico	0.32	0.29
Cape Verde	0.06	0.09	Morocco	0.05	0.09
Chile	0.24	0.30	Namibia	0.18	0.12
China	0.02	0.17	Nicaragua	0.16	0.06
Colombia	0.19	0.18	Nigeria	0.10	0.04
Costa Rica	0.32	0.28	Panama	0.14	0.26
<b>Cyprus</b>	<b>0.22</b>	<b>0.45</b>	Papua New Guinea	0.09	0.07
Dominican Republic	0.15	0.18	Paraguay	0.12	0.10
Ecuador	0.17	0.15	Peru	0.23	0.18
Egypt	0.06	0.12	the Philippines	0.09	0.08
El Salvador	0.22	0.15	<b>Portugal</b>	<b>0.27</b>	<b>0.48</b>
Equatorial Guinea	0.04	0.34	Romania	0.09	0.23
Fiji	0.13	0.10	Senegal	0.09	0.04
Gabon	0.32	0.24	<b>Singapore</b>	<b>0.28</b>	<b>1.35</b>
Ghana	0.08	0.05	South Africa	0.26	0.18
<b>Greece</b>	<b>0.36</b>	<b>0.61</b>	Sri Lanka	0.04	0.10
Guatemala	0.19	0.15	Syria	0.10	0.09
Haiti	0.10	0.03	<b>Taiwan</b>	0.12	0.78
Honduras	0.14	0.09	Thailand	0.06	0.19
<b>Hong Kong</b>	<b>0.21</b>	<b>0.94</b>	<b>TURKEY</b>	<b>0.21</b>	<b>0.25</b>
India	0.05	0.08	Uruguay	0.32	0.28
Indonesia	0.04	0.10	<b>Venezuela</b>	<b>0.46</b>	<b>0.22</b>
Iran	0.27	0.23	Zambia	0.09	0.04
<b>Jamaica</b>	<b>0.42</b>	<b>0.21</b>			

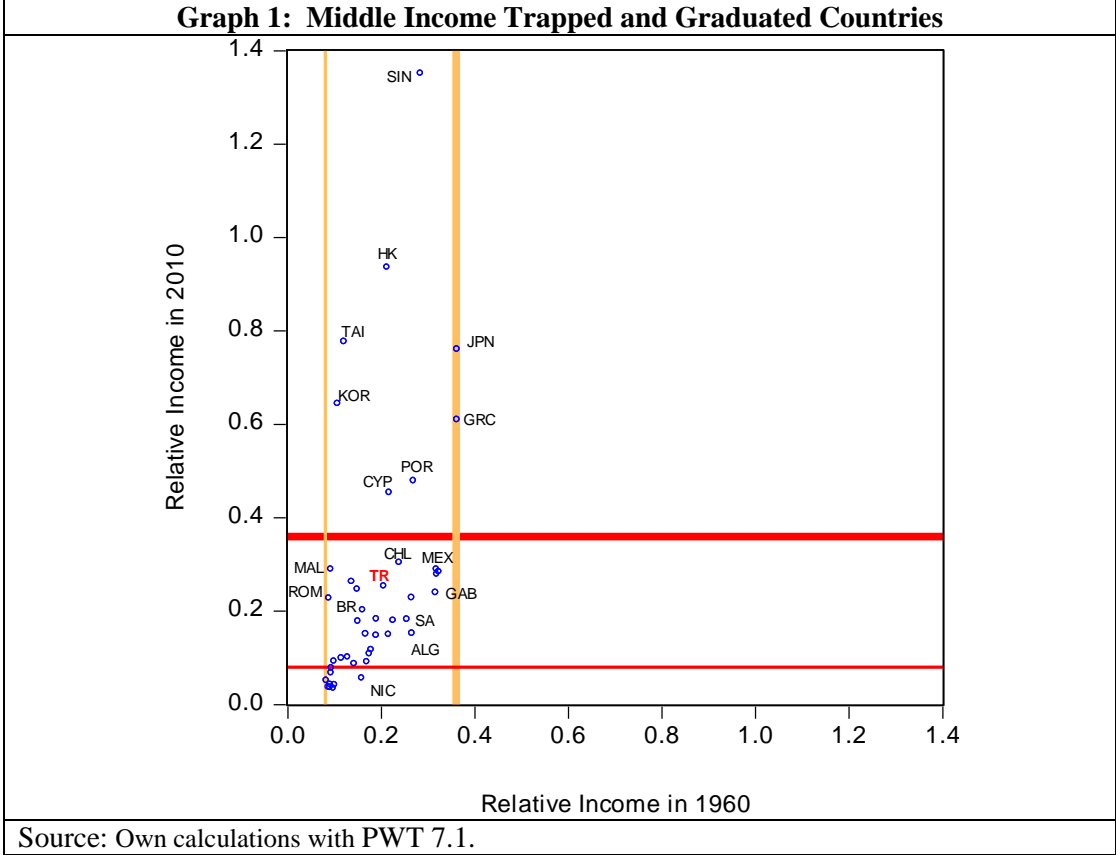
Source: Own calculations with PWT 7.1.

Table 1 shows that only 8 out of 57 countries (red countries in the table) reached more than 36% of the U.S. per capita GDP in 2010, breaking out the MIT. These countries are Cyprus, Greece, Portugal, Hong Kong, Japan, Korea, Singapore and Taiwan. On the contrary, relative per capita income levels in Argentina, Venezuela and Jamaica have declined during 1960-2010. These countries had “higher than 36%” relative per capita income levels in 1960, while the related levels were in the MIT range of 8%-36% in 2010

Alternatively, we can only investigate evolution of the “trapped countries as of 1960” and their relative per capita income levels in 2010. This reduces number of countries in the set from 57 to 44. Graph 1 depicts “1960 relative per capita income levels” and “2010 relative per capita income levels” of these 44 countries. In other words, Graph 1 only includes trapped countries as of 1960 and their relative per capita income levels in 2010. The red and orange lines show limits of our (8%-36%) middle income trap range.



Analysis based on a narrower country set does not change our set of the graduated countries determined earlier. While the countries (Cyprus, Greece, Portugal, Hong Kong, Japan, Korea, Singapore and Taiwan) mentioned above, 8 out of 44 countries, have reached higher income levels, Cameroon, Ghana, Haiti, Nicaragua, Nigeria, Papua New Guinea, Senegal and Zambia (again 8 out of 44 countries) have fallen from the MIT region to low income trap region (having relative per capita income level less than 8% in 2010). And according to our classification, the rest of the 28 countries, are stuck in the MIT. These are Algeria, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Fiji, Gabon, Guatemala, Honduras, Iran, Jordan, Malaysia, Mauritius, Mexico, Namibia, Panama, Paraguay, Peru, the Philippines, Romania, South Africa, Syria, Turkey and Uruguay. In other words, majority of the MIT countries in 1960 is stuck in the MIT as of 2010, only about 1 out of 6 countries could have avoided from the MIT along with about 1 out of 6 middle income countries fell into lower income level.



**2.3. Country Experiences and Policies to Break-out the MIT**

In the MIT literature, the East Asian countries of Korea, Taiwan, Hong Kong, Singapore, Japan and some European countries such as Spain, Portugal, Finland, Greece and Israel from the Middle East are considered as success story. On the other side, Turkey and Latin American economies of Chile,

Colombia, Mexico, Argentina, Venezuela, Malaysia, Indonesia and Brazil are stuck in the MIT. The former countries have reached high per capita income growth rates for decades and climbed up higher per capita income levels and the latter group couldn't have reduced the per capita income distance with rich economies.

Kanchoochat and Intarakumnerd (2014) review the MIT literature and classify it into three groups by considering policy advices to overcome the MIT (Table 2). The first group asserts that the MIT stems from absence of getting education and institutions right and favors a state with minimum role. The second group claims that inability to change export composition by considering comparative advantage is the main culprit and prefers the state as a facilitator. And third one argues that a proactive state to achieve industrial upgrading is required to eliminate the MIT. The last group thinks that the state should support endeavors in the economy to copy, adapt and innovate technology in late industrializing economies.

**Table 2: A Summary of Three Bodies of the Middle Income Trap Literature**

	<b>Major Causes of MIT</b>	<b>The Role the State should play</b>
<b>Getting education and institutions right.</b>	Inadequate quality of education and institutions.	Minimum. To make the right incentive systems; investing more in education and R&D.
<b>Changing export composition by following comparative advantage.</b>	Inadequate capabilities to produce and export higher technology products.	Facilitating. To support industries in which a country possesses comparative advantage.
<b>Industrial upgrading by the proactive state.</b>	Inappropriate and insufficient role of the state in enhancing capabilities to produce and export higher technology products.	Proactive. To focus on capability accumulation and deliberate attention to advancing industrial upgrading.

Source: Kanchoochat and Intarakumnerd (2014).

The authors investigate convergence experiences of the first tier (Taiwan, Korea and Singapore) and second tier (Malaysia, Thailand, and the Philippines) newly industrializing economies in East and Southeast Asia. While first tier countries have broken out the MIT, the second tier countries live in the MIT. The authors argue that comparing these two sets of the countries demonstrates that an elaborated education system and state interventions (mainly selective industrial policies) are required to overcome the MIT. In terms of education system, its relevance and quality are high priority and it

should be designed by considering national development strategy. Moreover, policy makers should focus on dynamic selective industrial policies to transform productive structure by increasing local value added in exports and production. In other words, selective industrial policies with explicit success and failure criteria, exit strategy and learning mechanisms should be designed to guide and support growth enhancing structural transformation.

Abdon et al. (2012) also evaluate importance of structural transformation, ingredients of exports, and role of diversification in the economy to avoid from the MIT. The paper aims to understand what makes countries to reach successfully higher income levels without living in the MIT and what makes them unsuccessful and stuck in the trap. The authors compare upper MIT countries with high income countries. Upper MIT countries are less diversified (having small number of export goods with revealed comparative advantage), exporters of more standard products (low originality of their export goods). Moreover, sophistication level of their potential exports are low (there is no much room for further structural transformation).

These findings are consistent with the literature on economic development that highlights importance of ability to produce and export new and sophisticated goods (e.g., Hidalgo et al., 2007; Hausmann et al., 2005). For development, economies should accumulate capabilities along with innovative and high productive production capacity.

Similar to Kanchoochat and Intarakumnerd (2014), Felipe (2012) analyzes Korea, Malaysia and the Philippines by employing classification in Abdon et al. (2012) as high income, upper MIT and lower MIT country respectively. He discusses that success story of Korea depends on its dynamic revealed comparative advantage vision. He argues that Korean government has played a proactive role and aimed to get competitiveness in complex and highly connected products (machinery, metals, and chemicals) by employing sector specific industrial policies. In other words, Korea has endured painful new capabilities building process, the others (countries in the MIT) have ignored gaining comparative advantage in sophisticated and well-connected products. The author argues that Korea could avoid from falling into product trap (growth reducing commodities). According to Felipe (2012), countries want to avoid from product trap should focus on the products exported by relatively richer countries (i.e., highly sophisticated) and highly connected with other products in their economies (i.e., highly transferrable capacity building). In that respect, premature de-industrialization (losing importance of industry in the economy without having significant amount of mature industrial productive capacity) of some middle income countries may exacerbate the MIT concerns. De-industrialization may not yield a fertile ground for increasing sophistication, enhancing diversification and high product connectedness in manufacturing industry (Felipe, 2012).

Some studies in the literature try to evaluate importance of human capital, political regime changes, external factors, technology content of exports and financial stability on the growth slowdowns. For

instance Eichengreen et al. (2013) consider effects of these determinants on keeping middle income countries in the trap. They find educational attainment and technology content of exports are the most related variables with growth slowdowns. With regards to human capital, they state importance of having more attendees and graduates with secondary and higher education compared to getting high schooling at the primary education. They conclude that human capital with secondary and tertiary education reduces the likelihood of a slowdown. By accumulating human capital in the form of skills and ability to produce technologically sophisticated goods and services, middle income countries can abstain from the trap. The authors also argue that middle income countries with moderate human capital endowments could reach temporary higher growth rates by focusing on low value added chains of global production networks. But they will be challenged in soon by low cost and late industrializing countries and they can't move high value added activities or even keep their existing market shares in the world economy. In other words, they will end up themselves in the MIT. They also argue that middle income countries with high tech export share are more resistant to likely slowdowns. These countries can continue to create value added by coping with pressures coming from late industrializer low cost countries. They can avoid vicious cycle of price cuts competition and try to improve technology absorbing and innovation capacities.

Absorbing imported technology and then internalizing it by considering local conditions and finally employing it in the production of export goods with high domestic input share entail qualified human capital. And such a production structure enables the country to climb up technology ladder and get higher value added.

Eichengreen et al. (2013) categorize Malaysia and Thailand as the MIT countries, and Korea as a successfully graduated high income country. They argue that Korean success story comes from existence of secondary and tertiary education and its high quality graduates with skills and abilities that economy needs.

Another informative study that considers the MIT as a special case of growth slowdowns<sup>4</sup> is Aiyar et al. (2013). They use conditional convergence framework of growth theory to detect growth slowdowns. The authors define the MIT as decreasing and then stagnating growth momentum of once fast growing country and failing to climb up income levels of rich countries. They identify that sharp declines in productivity growth were effective in the past growth slowdowns. The paper also demonstrates that growth slowdowns are more likely to occur in middle income countries and argues that growth slowdowns originate from institutional, demographic, infrastructural, economic policy making variables.<sup>5</sup> They treat Latin American economies (Brazil, Mexico, Peru) as trapped and East

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<sup>4</sup> PWT 7.1; PPP-adjusted, at 2005 constant prices.

<sup>5</sup> Aiyar et al. (2013) considers Turkey as an advanced country with Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New

Asian (Taiwan Province of China, Korea) economies as successful countries that avoided from the MIT.

An earlier study of Kharas and Kohli (2011) argue that middle income countries should focus on increasing share of capital and skill intensive manufacturing and high productive service sector in the economy to ward off exposure of the MIT. They emphasize productivity differences among service sector activities. The paper argues that nontradable services such as house cleaning or hair cutting are infertile for productivity improvements and market expansion, but sophisticated financial, consulting, health and environmental services present a fertile ground to support productivity improvements.

Jimenez et al. (2012) consider the role of human capital development in different convergence performances of Malaysia, Thailand and Korea. The paper discusses that along with quantity of education (enrollment rates and years of schooling), quality and relevance of education are quite important. They argue that middle income countries should give emphasis on science, technology, engineering and mathematics training with sound upper secondary and higher education systems. By doing so, they can move from low value added assembly manufacturing jobs to more productive well paid activities. They assert that a growth supporting education system coordinates the level and quality of education with the economy's industrialization and modernization process; gives special emphasis on the curriculum and the quality of education at each levels, considers skills gaps in the labor market and presents equal opportunity in education for different income and population groups. The paper claims that Malaysia and Thailand have rendered satisfactory amount of schooling access especially at primary levels, but they couldn't improve quality of their education system compared to Korea. And their relatively low quality education is one of the main determinants of why they have stagnated before reaching high income levels.

The World Bank (2008) discusses thirteen economies (Botswana, Brazil, China, Hong Kong-China, Indonesia, Japan, Korea, Malaysia, Malta, Oman, Singapore, Taiwan-China, and Thailand) that have succeeded long term high growth rates in the postwar period. The Report argues that in each country experience, policy makers gave special emphasis on improving human capital by schooling of their inhabitants. The report also pays attention that while economies of Hong Kong-China, Japan, Korea, Malta, Singapore and Taiwan-China have reached to the rich world per capita income levels, many of the others such as Malaysia, Thailand, and Indonesia could not have continued to high growth performance and stuck in the middle income levels.

Jankowska et al. (2012) compare performances of the Asian Newly Industrialized and Latin American economies to overcome the MIT and argue importance of the structural transformation and economic structure in generating sustained per capita income growth. The authors identify that the countries,

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Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and the United States. According to the growth slowdown criteria used in the paper, Turkey hasn't experienced it.

except for natural resource exporter or land-abundant (Australia, New Zealand), could have escaped from the MIT by changing their economic structure in favor of manufacturing. They claim that incomplete structural transformation of Latin American economies prevented their manufacturing sector to absorb a significant share of the workers coming from the weakening agricultural sector.<sup>6</sup> And low employment generation in manufacturing sector was the result of unfavorable developments in education, innovation and market structure. Moreover, the paper also argues that weak employment generation in manufacturing causes movement of surplus labor from agriculture to service sector. And ascending service employment share rises informality in the economy while suffering convergence process. In other words, the paper argues that unsatisfactory convergence experience of Latin America is somewhat related to its absence of growth enhancing (productivity boosting) structural transformation. They compare Latin America with Korea and argue that managing and benefitting from structural transformation depends on general framework conditions such as human capital accumulation, quality of infrastructure and innovation incentives.

With regards to human capital accumulation policies, the paper determines that Korean policymakers gave strategic priority to high quality education policies to shape factor endowments and to push comparative advantage towards higher productivity and skill-intensive industries. They designed a dynamic education system by considering structural transformation process of Korean economy. For instance, the policymakers aimed universalization of primary education to support emerging light manufacturing activities in the 1960s, then they emphasized on secondary and vocational schooling in the 1970s while heavy industries and chemicals were gaining importance, and they prioritized tertiary education with special emphasis on engineering fields in the 1980s when structural transformation in favor of ship building, electronics and machinery was aimed. In the following decades, tertiary education was tailored to increase role of technology intensive products in the economy and the government allocated significant amount of funds to support R&D activities. Moreover, the policymakers have always concerned forward and backward linkages among industries during the Korean structural transformation process. Coordination of education system with upgrading productive capacity has emerged well paid jobs for educated labor in diversifying and upgrading Korean manufacturing industry. Compared to Korean case, quality of education in Latin America was low and it was less consistent with its development path.

Altug et al. (2008) argue unsatisfactory per capita income growth performance of the Turkish economy. They investigate sources of long term economic growth for Turkey and find that per capita output growth originates mainly from capital accumulation. They also call attention to relatively slow evolution of reallocation of resources from low productive agriculture to high productive nonagricultural activities. They argue that slow pace of structural transformation and absence of long

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<sup>6</sup> Similar to Turkey with significant employment share in agriculture (See Altug, 2008).

term high sustained per capita growth could be linked to the low rates of saving and low (physical and human) capital accumulation along with unfavorable institutional environment. The authors think that the Turkish institutional environment has supported getting privileges from governments. The institutional environment could not present relatively high incentives for individuals to accumulate painful human capital and businessmen to get risky productivity enhancing investments. It hasn't supported efficient resource allocation and has reduced expected payoffs of entrepreneurship. Therefore, the environment could not support economy's convergence and structural transformation process by lowering its relative human capital and technology absorbing capacity. Along with these unfavorable institutional environment, Turkish political economy considerations have also harmed economy's growth and structural transformation process. As an example, the authors argue that politically directed agricultural and export subsidies have slowed resource allocation in favor of more productive economic activities. With regards to human capital accumulation, the authors claim that efforts to improve human capital endowment in Turkey were late and/or incomplete to support per capita income growth and structural transformation compared to the East Asian and Southern Europe countries.

Country experiences demonstrate that living in the trap may have two interlinked determinants. Firstly, low human capital endowment in a typical MIT country may trigger low productivity (per capita income) growth and unfavorable structural transformation. And secondly, unfavorable structural transformation may limit human capital accumulation. In other words, these two factors may feed each other and trigger a vicious cycle in the economy.

### **3. Turkey's Relative Position**

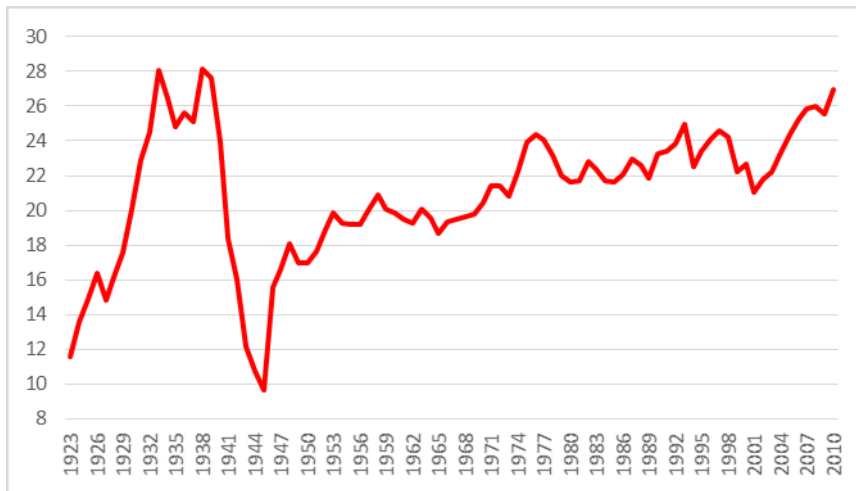
#### **3.1. Convergence Experience**

Our findings in the previous section indicates that Turkey is stuck in the MIT. To have better idea about unsatisfactory convergence experience of Turkish economy<sup>7</sup> with the rich world (the U.S. per capita income level is used as a proxy), we can look at Graph 2. The graph depicts that Turkey reached the highest relative per capita income level in 1938 and the average figure was 21% in 1923-2010.

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<sup>7</sup> See Üngör (2013) for convergence experience of Turkey.

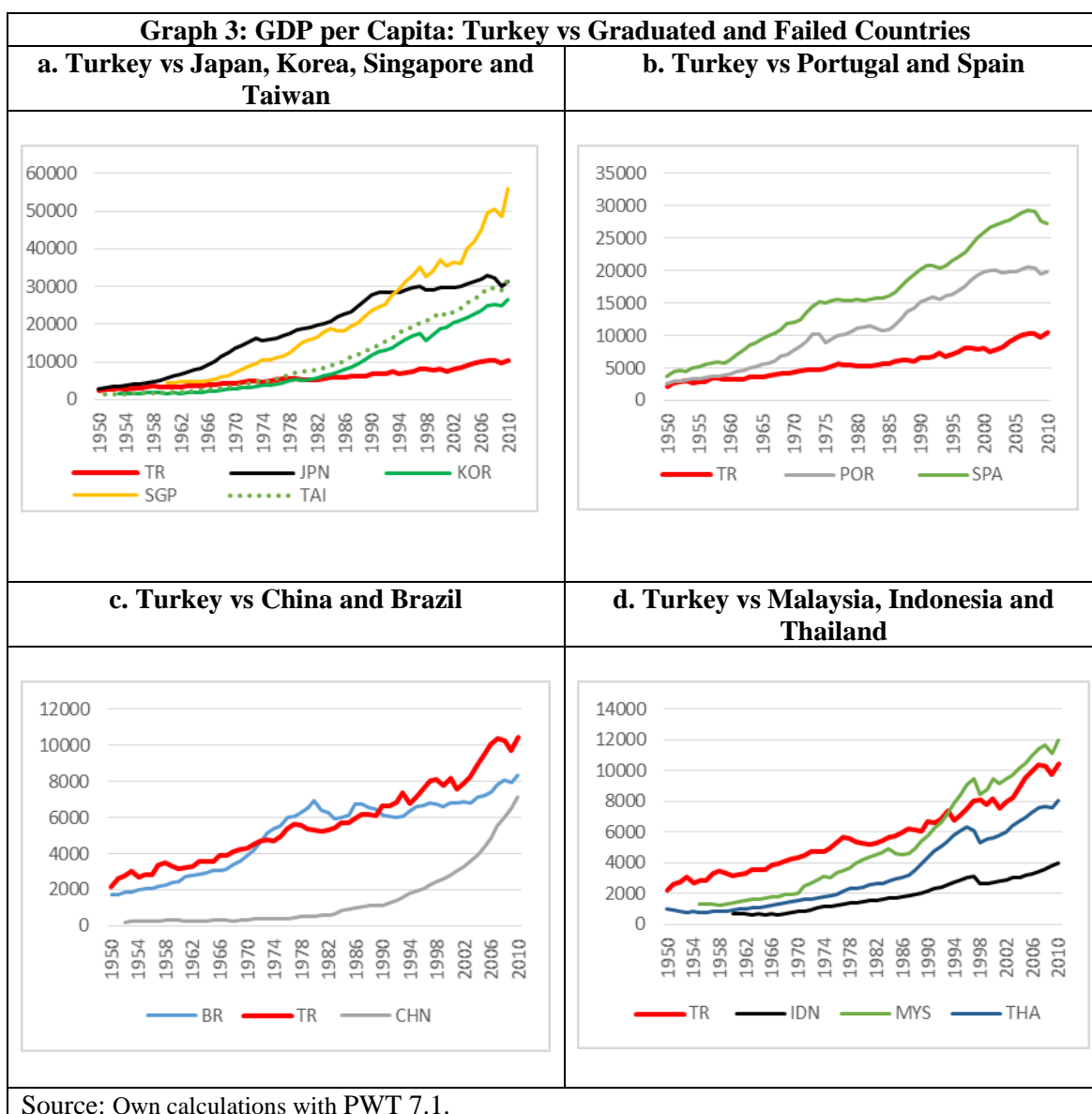
**Graph 2: Turkish Relative Per Capita Income (%)**



Source: Own calculations with Maddison Database.

Turkish per capita income developments evolved differently compared to successfully graduated countries (Graph 3.a and 3.b). Graduated countries could increase their per capita income levels progressively. Their average per capita income growth rates were higher than that of the U.S. On the contrary, Turkey's per capita income path is similar to paths of the MIT countries of Brazil, Malaysia and Thailand (Graph 3.c and 3.d). Presumably, Chinese per capita income level will exceed Turkish per capita income level in coming years.





Consistent with our findings, studies in the MIT literature also argue that Turkey is a member of the MIT countries. For instance, according to Abdon et al. (2012), Turkey graduated from low income to lower middle income category in 1955 and then it took 50 years to reach upper middle income group in 2005. Considering “28 year-historical experiences” of graduated countries<sup>8</sup> from lower middle to upper middle income makes clear low growth performance of the Turkish economy. In those 50 years, the average per capita income growth rate<sup>9</sup> of Turkish economy was 2.6 percent while the median

<sup>8</sup> China (1992, 17, 7.5%), Malaysia (1969, 27, 5.1%), Republic of Korea (1969, 19, 7.2%), Taipei-China (1967, 19, 7%), Thailand (1976, 28, 4.7%), Bulgaria (1953, 53, 2.5%), Turkey (1955, 50, 2.6%), Costa Rica (1952, 54, 2.4%) and Oman (1968, 33, 2.7%). Figures in the parantheses demonstrates “year the country became lower middle income, time spent and the average income per capita growth rate as a lower middle income country” respectively (Abdon et al. 2012).

<sup>9</sup> Maddison Database; PPP-adjusted, at 1990 constant prices.

number of the same figure (for the countries in the paper) was 4.7 percent. Turkish performance (in terms of time spent and the average per capita income growth rate) was the third worst out of 9 countries that become lower middle income after 1950 and reached to upper middle income (Abdon et al. 2012). The authors claim that although Turkey was not in upper middle income trap in 2010 since it has 8 years more to reach upper income level, it has exposure of falling into the trap. The challenge ahead of Turkey is to get about 4.7% average per capita income growth rate as of 2010 to avoid from falling into the trap. The paper determines that Turkish average per capita income growth rate was about 2.3% in 2000-2010 and it should accelerate growth rate significantly. The paper sets 28 years for a lower middle income country to reach upper middle income level and 14 years for an upper middle income country to get high income level as historical averages. In other words, according to historical averages, a lower middle income country should be high income country in maximum 42 years for the absence of MIT. Turkey, with 50 years to reach upper middle income group and 8<sup>th</sup> year in upper middle income category as of 2013, has spent 58 years and still trying to reach the high income category. In other words, Turkey seems as one of the (upper) MIT countries.

Some studies in the literature equate existence of middle income trap with growth slowdowns in middle income countries. For instance, Eichengreen et al. (2013) employ Penn World Tables 7.1. and identify two per capita income levels of \$10,000 and \$15,000 at which slowdowns observed empirically. According to Penn World Tables 7.1, 2010 per capita GDP for Turkey is about \$10,438 (PPP-adjusted, at 2005 constant prices) and it is almost in the range of the smaller growth slowdown income range of \$10,000-11,000.<sup>10</sup>

According to Robertson and Ye (2013), the MIT countries have 8%-36% of the U.S. per capita GDP<sup>11</sup> and they determine 46 out of 189 countries as middle income countries. The authors argue that Turkey is stuck in the MIT with its \$10,438 per capita GDP (about 25% of the U.S. per capita GDP). Their analysis also demonstrates that mean growth rate of per capita relative income in Turkey is not statistically different from zero in 1950-2010 (absence of relative convergence). Similarly, Woo (2012) determines Turkey, having about 25% of the U.S. per capita GDP, is a member of the middle income trapped countries.

Yeldan et al. (2012) provide a discussion of the MIT in Turkey within a regional perspective. They categorize Turkey into 26 regions in which gross regional income differs and investigate existence of the MIT in each region by considering differences in sectoral technology levels, human capital endowments etc. The authors claim that 6 high income regions are far away from the MIT, 12 middle

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<sup>10</sup> According to PWT 7.1, average per capita income growth rate was about 2.8% in Turkey in 2000-2010. Compounding 2010 per capita income level of \$10,438 with 2.8% annual growth rate yields \$11,338 in 2013.

<sup>11</sup> PWT 7.1; PPP-adjusted, at 2005 constant prices.

income regions have risk of falling into it and 8 lower income regions are even in poverty trap. They assert that Turkey as a whole live in the MIT.<sup>12</sup>

### **3.2. Human Capital: Schooling Quantity and Quality**

Having a world class skilled and capability human capital, and highly innovative and competitive productive capacity are the main determinants to break out the MIT (see for example Eichengreen et al., 2013; Felipe, 2012; Abdon et al., 2012; Hidalgo et al., 2007; Hausmann et al., 2005 etc.).

It is noteworthy to see that both of “skilled and high capability human capital” and “innovative and competitive productive capacity” are mainly determined by education system in the country. For instance, a well-designed and high quality education system improves human capital, facilitates and promotes research and development, and support diffusion of frontier technologies (Hanushek and Wößmann, 2010). Neoclassical growth models demonstrate that education system can increase the human capital, labor productivity and hence transitional growth toward a higher equilibrium level of output. Moreover, endogenous growth models show that education can enhance the innovative capacity in the economy and promote diffusion and implementation of new frontier technologies and processes in the economy. And all these factors increase capabilities in the economy and hence ability to produce and export high-tech commodities.

By considering their importance, in this section, we present some information about Turkish human capital by considering its schooling quantity and quality. According to our findings up to now, Cyprus, Greece, Portugal, Hong Kong, Japan, Korea, Singapore and Taiwan graduated from the MIT. We demonstrate relative position of Turkey compared to the selected graduated economies. In our comparisons, we exclude Hong Kong because of its special administrative city state nature; and Greece (and hence Cyprus) because of its quite different economic structure (highly service sector nature) than Turkey. Moreover, we also include some developing countries such as China, Brazil and a developed country of Spain<sup>13</sup> in our country set to have better idea about Turkey’s relative status.

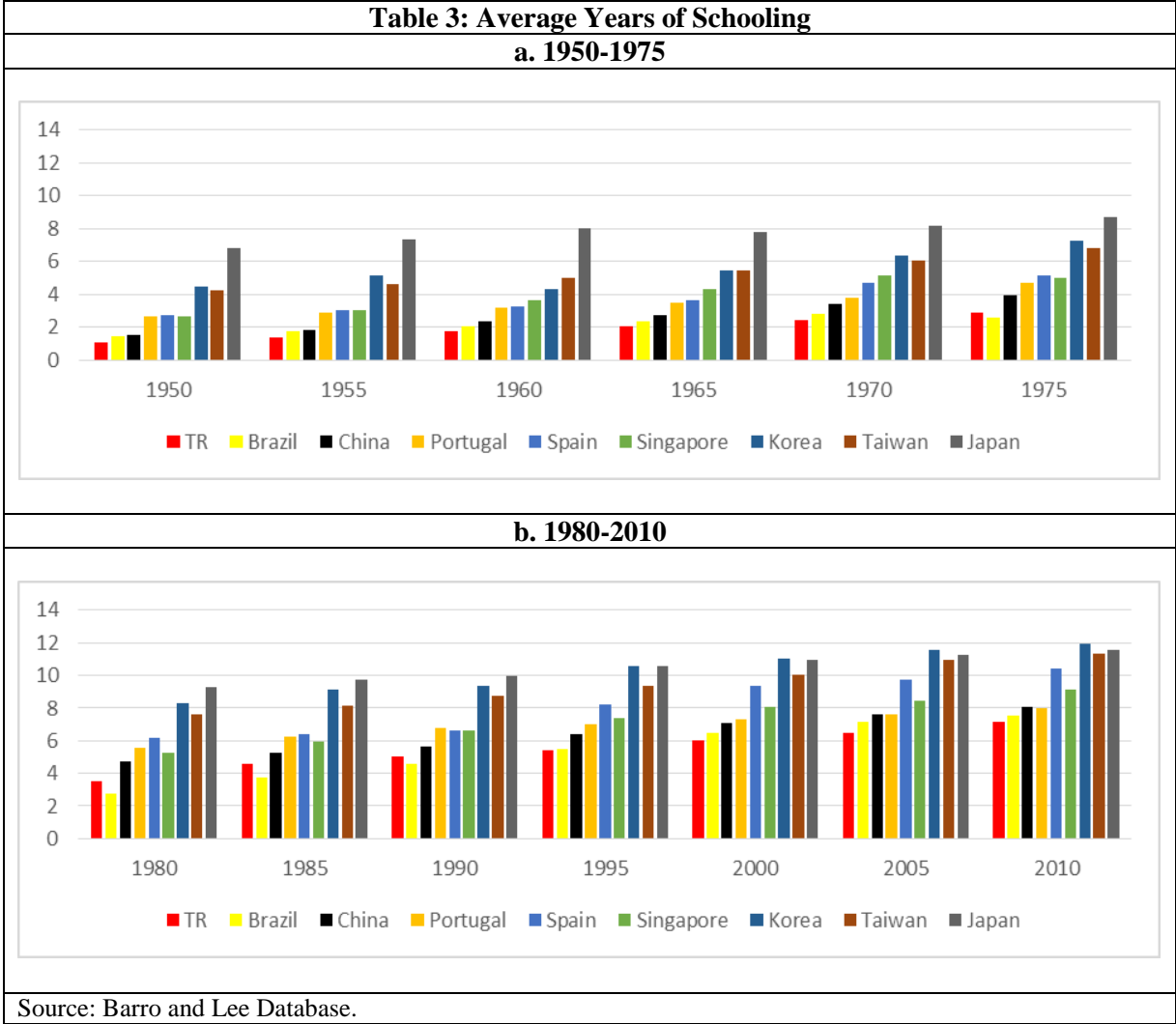
Since Turkey’s “population below age 15” share is the highest across OECD countries, education is quite important to shape and enrich its human capital endowment. Table 3 demonstrates educational attainment for population aged 15 and over in the selected countries for 1950-2010. The top three

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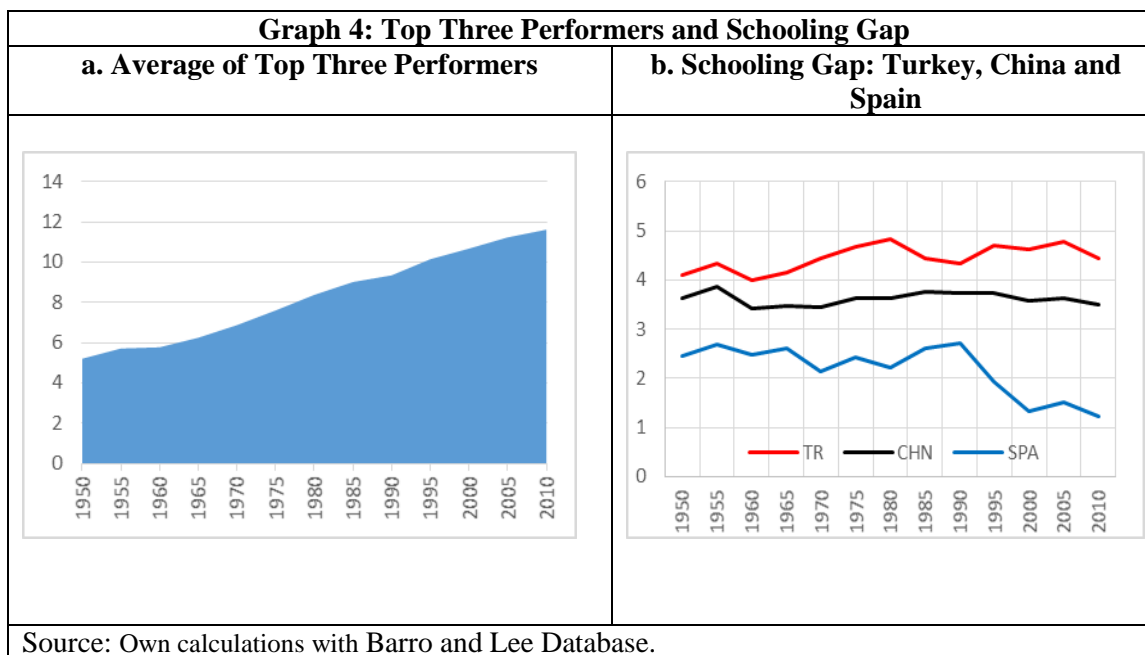
<sup>12</sup> Turkish MIT issue also takes attention of columnists. See, for example, Yeldan (2012, 2013 and 2014) and Sak (2010).

<sup>13</sup> We think that Spain is one of the most similar high income economies to Turkey in terms of geographic, demographic and economic factors.

performers are always Japan, Korea and Taiwan, and the worst two performers are the MIT countries of Turkey and Brazil. Since 1995, Turkey has the lowest average years of schooling in the country set.



In the analysis period, the mean of average schooling in Japan, Korea and Taiwan has increased significantly (Graph 4.a). However, Turkish schooling gap (the difference between mean of top three performers and Turkey) has widened (Graph 4.b). While the China could have kept the gap steadily, Spain has reduced the gap significantly.



Hence, we observe that Turkey can't present sufficient quantity of schooling (educational attainment for population aged 15 and over) compared to the selected countries and its gap has not diminished in the last 60 years.

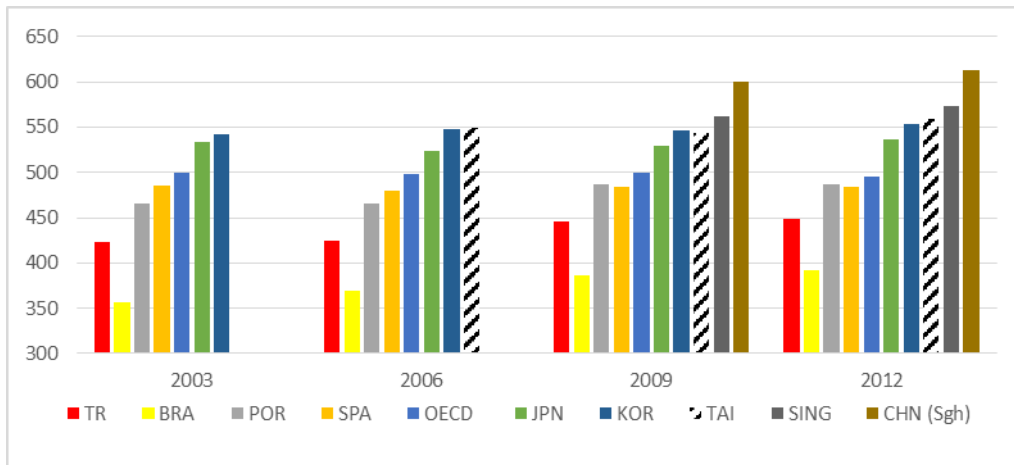
We argue that, not just quantity, presumably quality of education is more important for graduation from the MIT as the Korean experience clearly demonstrates. Along with Korean experience, Hanushek and Wößmann (2010) analyze the relationship among international test results, quantity of schooling and economic growth for a set of countries and they argue that quality of the education is more important than quantity of schooling in terms of economic growth.

To evaluate quality of education in Turkey, we benefit from the OECD's PISA Test Results.<sup>14</sup> Table 4 shows the PISA Test results for various years. Turkey is the second worst performer in mathematics, reading and science tests among the countries under investigation. It's noteworthy to see that Turkey's 15-year-olds always got lower than average (of the OECD members) scores in the reading, mathematics and science assessments of the PISA Tests. Moreover, the East Asian countries (Japan, Korea, Singapore and Taiwan) and China always got the highest scores.

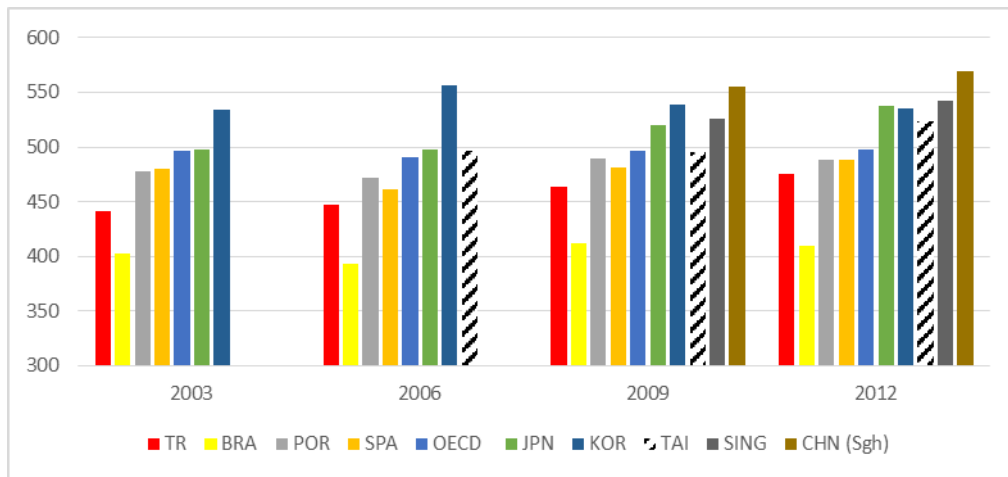
<sup>14</sup> According to the OECD (2012): "Programme for International Student Assessment (PISA) assesses the extent to which 15-year-old students have acquired key knowledge and skills that are essential for full participation in modern societies. The assessment, which focuses on reading, mathematics, science and problem-solving, does not just ascertain whether students can reproduce what they have learned; it also examines how well they can extrapolate from what they have learned and apply that knowledge in unfamiliar settings, both in and outside of school." (PISA 2012 Results in Focus Report, p.3)

**Table 4: Mean Scores of the PISA Tests: Turkey vs Selected Countries**

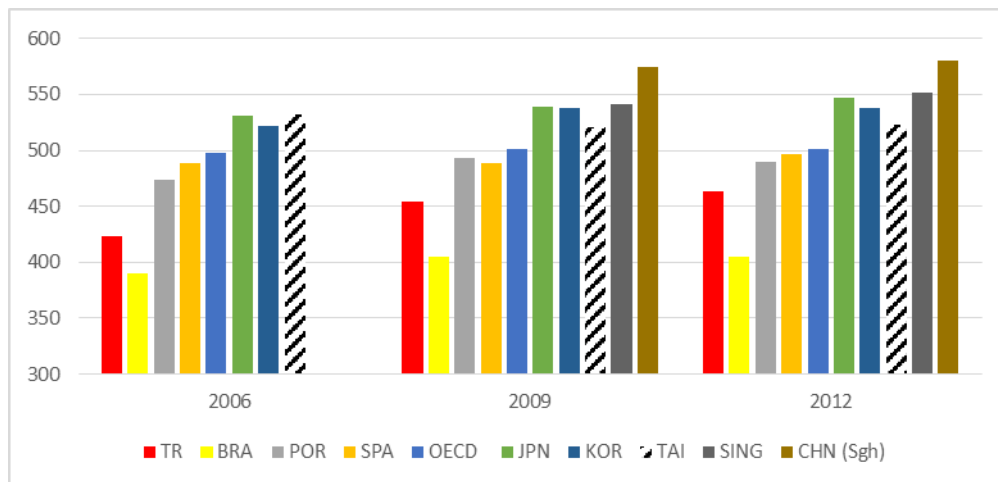
**a. Math Scores**



**b. Reading Scores**

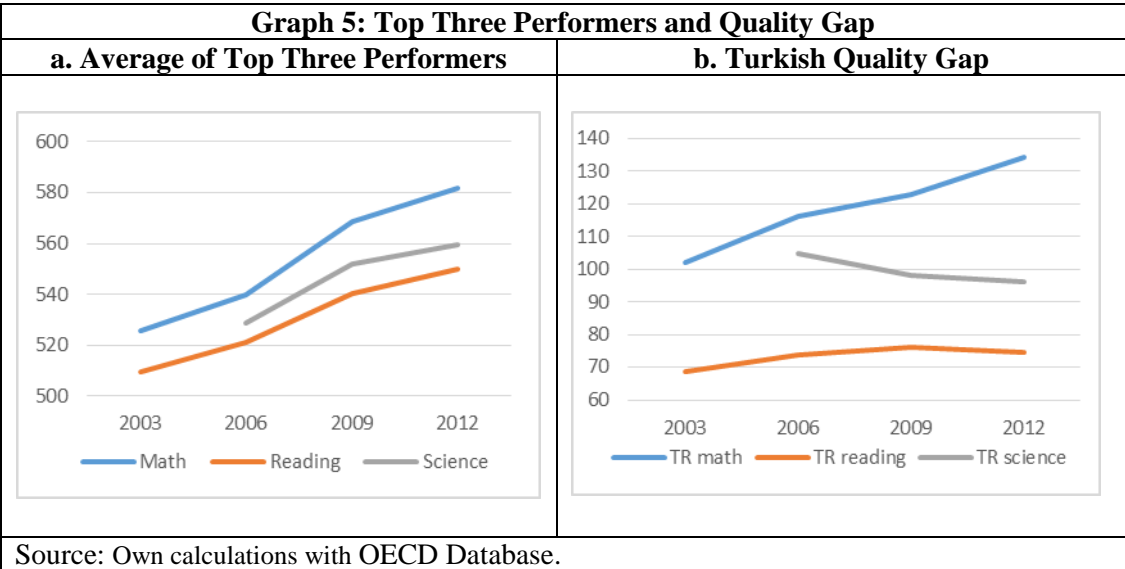


**c. Science Scores**



Source: OECD.

Our analysis shows that educational system in Turkey can play a pivotal role in its development path. Educating its human capital more both quantitatively and qualitatively, Turkey can break out the MIT. In addition to the schooling gap, Turkish human capital also suffers from quality gap in the education system. In the PISA tests, the mean scores of top three performers in all three test subjects increased significantly (Graph 5.a). Unfortunately, Turkey could not increase its scores on mathematics and reading especially compared to top three performers. Hence, Turkish quality gap (the difference between mean score of top three performers and Turkey) for mathematics has increased significantly, for reading deteriorated, and for science improved moderately (Graph 5.b). These results demonstrate that there is significant room for improvement in higher and more quality educational attainment.<sup>15</sup>



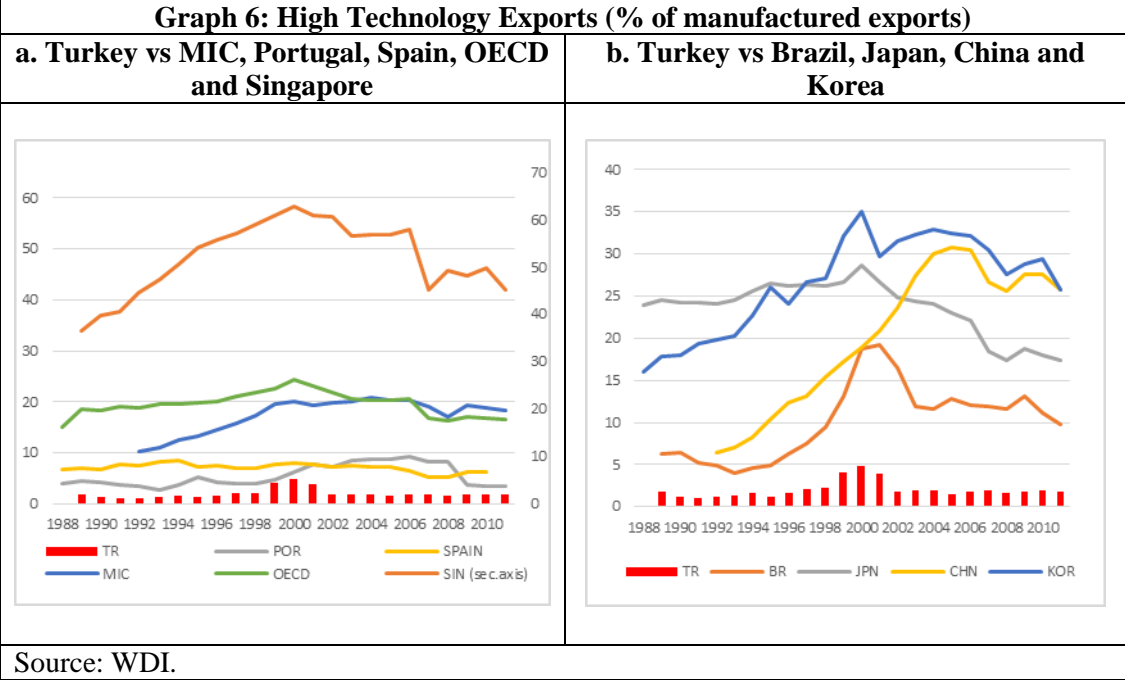
### 3.3. Innovation and Competitiveness

To have better idea about relative capability, innovation and competitiveness in the Turkish economy, we utilize some indicators used in the MIT literature such as technology content of exports, share of R&D expenditures to GDP, number of researchers per million. Economies having significant high-tech export shares are supposed to tackle with the MIT concerns and to climb up higher segments of value added chain by competing with advanced economies. Countries with high-tech export shares are thought as they have similar skills, human capital and capabilities as in the advanced countries.

According to the World Bank’s World Development Indicators (WDI), high-technology exports are products with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery. With regards to our selected countries, Turkey has the lowest

<sup>15</sup> The World Bank (2011) argues that Turkey has achieved almost universal participation in primary education but its quality of education is low and Turkey needs to improve it. Moreover, it declares that Turkey has significant gaps among different provinces along with high class sizes and less skilled new teachers.

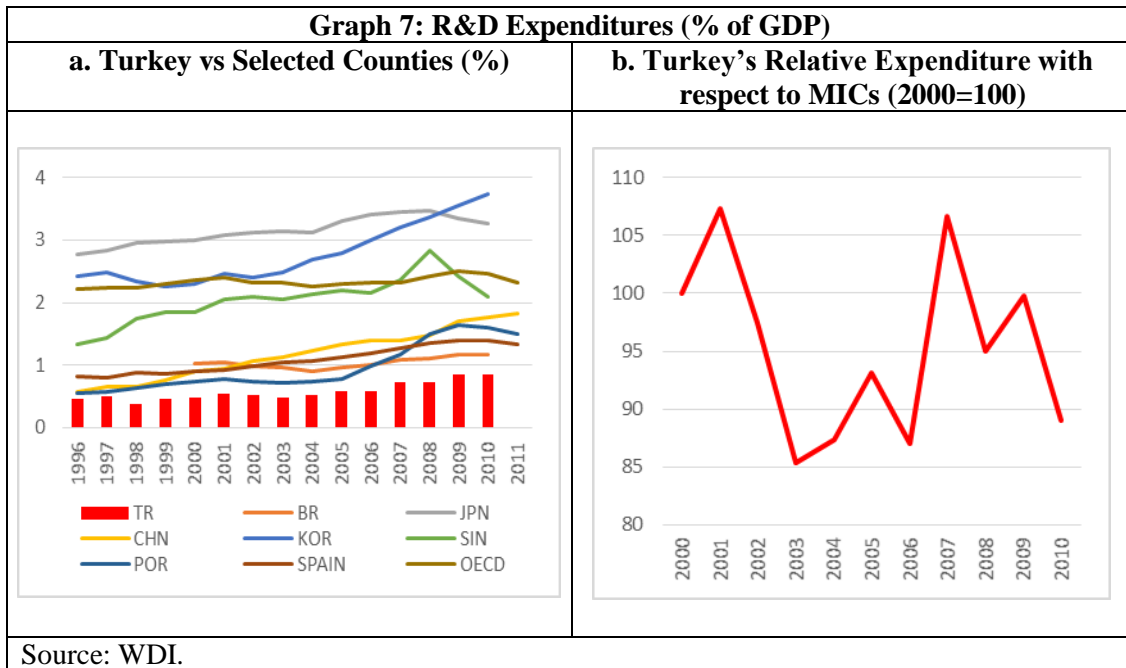
high-tech export share (% of manufactured exports) in the analysis period (Graph 6.a and 6.b). It is noteworthy to see that Turkey’s share was lower than average share of middle income countries (MICs). Turkey had the highest shares in 2000 (4.8%), 1999 (4.1%) and 2001 (3.9%) respectively.



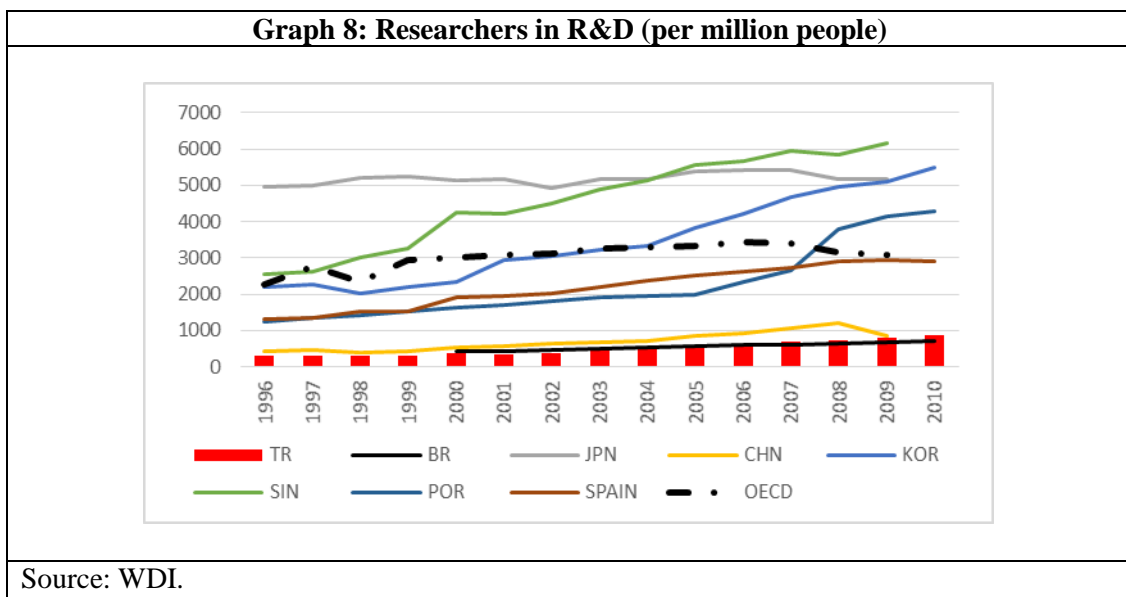
In the literature, share of R&D expenditures to national income is used to infer how much innovation, creativeness and new knowledge are emphasized in the economy. It is expected that frontier technological developments occur frequently in economies with high R&D share. Expenditures for R&D consist of current and capital expenditures (public and private) on creative work undertaken systematically to increase knowledge, including knowledge of humanity, culture, and society, and the use of knowledge for new applications. R&D covers basic research, applied research, and experimental development (The World Bank WDI).

Graph 7.a demonstrates ratio of R&D expenditure to GDP in Turkey and selected economies. Turkey has stayed behind all the countries in our set. Turkey’s ratio has increased in the last years but compared to middle income countries, it is still short of average of MICs (Graph 7.b). Furthermore, it is striking that increase in R&D expenditures in the last years couldn’t enhance Turkey’s high-tech export ability (Graph 6.b).





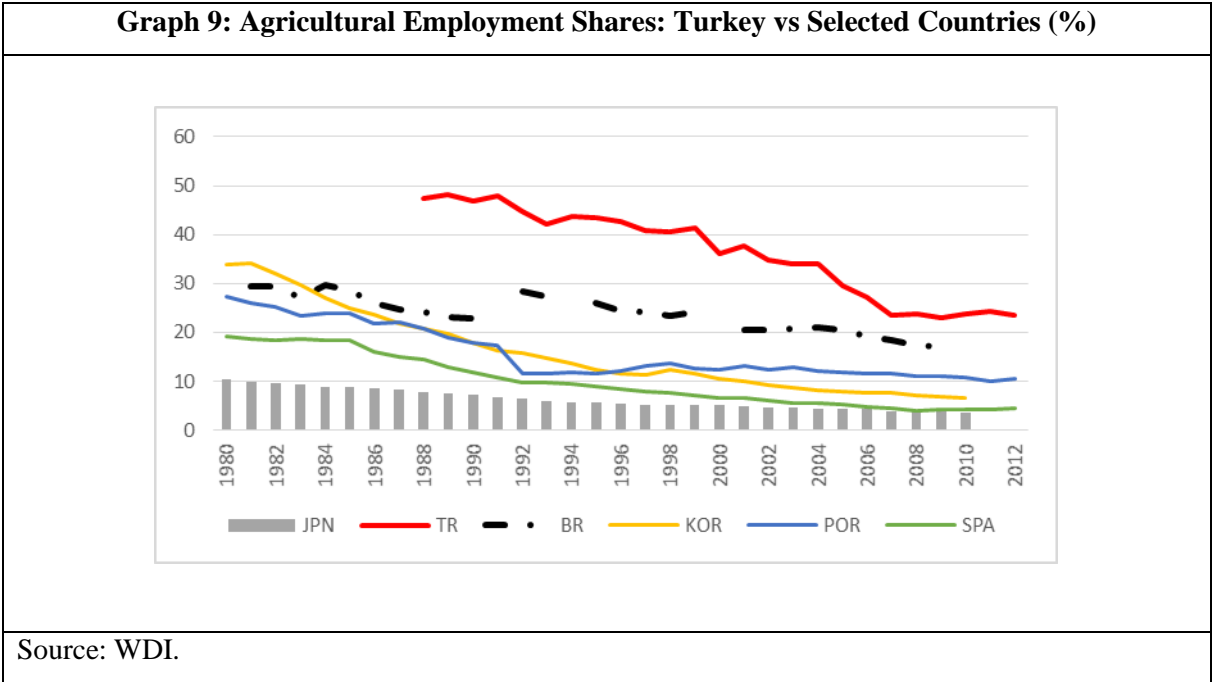
Lastly we present number of researchers in R&D per million indicator. According to the World Bank WDI, researchers in R&D are professionals engaged in the conception or creation of new knowledge, products, processes, methods, or systems and in the management of the projects concerned. Graph 8 depicts that number of researchers in R&D per million in MIT countries of Turkey and Brazil are less than the figures of successfully graduated countries.



In the past, short lived and limited technological progress (TFP growth) and especially physical accumulation (Altug et al., 2008) have enabled Turkey to take place in the class of middle income countries. To go ahead, Turkey should focus on structural measures to improve educational attainment and its quality along with setting rule based systems and institutions to enhance total factor productivity. With regards to human capital, policy makers should design an education system that prioritizes skill and capability formation required for technology and innovation driven economic growth. This is the unique way to escape from growth loses momentum in maturing economies and hence to make a transition from resource accumulation led growth to productivity and innovation driven growth. Both growth theory and empirical evidence makes clear that without having world class human capital it would not be possible to break out the MIT.

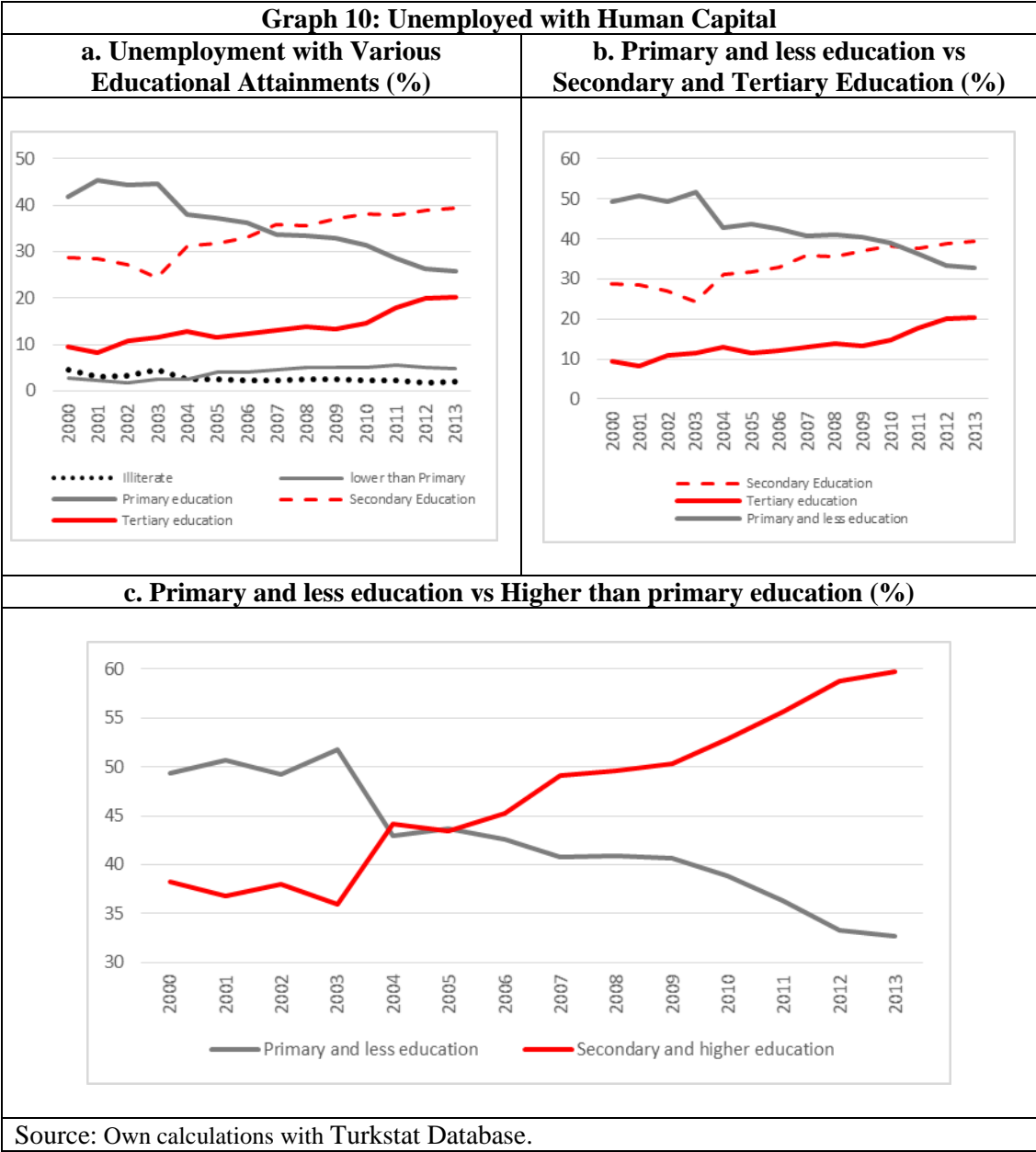
### 3.4. Structural Transformation

Having satisfactory structural transformation along with productivity gains help economies to reach higher per capita income levels (McMillan and Rodrik, 2011). In that respect, we claim that structural transformation in Turkey is not supporting to break out the MIT sufficiently. Although de-agriculturalization yields structural change productivity gains by employing surplus labor in nonagricultural activities, they are not employed in high productivity and knowledge intensive manufacturing activities. Moreover, speed of de-agriculturalization is slow, hence Turkey can't fully exploit unrepeatable gains of structural transformation. Agriculture has still significant employment share (about one fourth) compared to the selected countries (Graph 9). Transferring these agriculture workers into high productive activities can yield significant productivity and per capita income gains.



For instance, İmrohoroglu et al. (2013) show that if Turkey had inherited Spanish agricultural productivity growth from 1968 to 2005, de-agriculturalization would have been much faster and the growth rate of aggregate GDP per capita would have been much higher in Turkey.

Moreover, Turkey is not enough benefitting from its current young population because of its limited and/or irrelevant skills. It seems that there is skill mismatch in the economy to upgrade productive capacity. Graph 10 demonstrates percentages of unemployed people in terms of their educational background. In the economy, composition of unemployment has been changing especially since 2003. While share of less educated unemployed people in total unemployed has been decreasing, ratio of higher educated people has been climbing up (Graph 10.a, b and c).

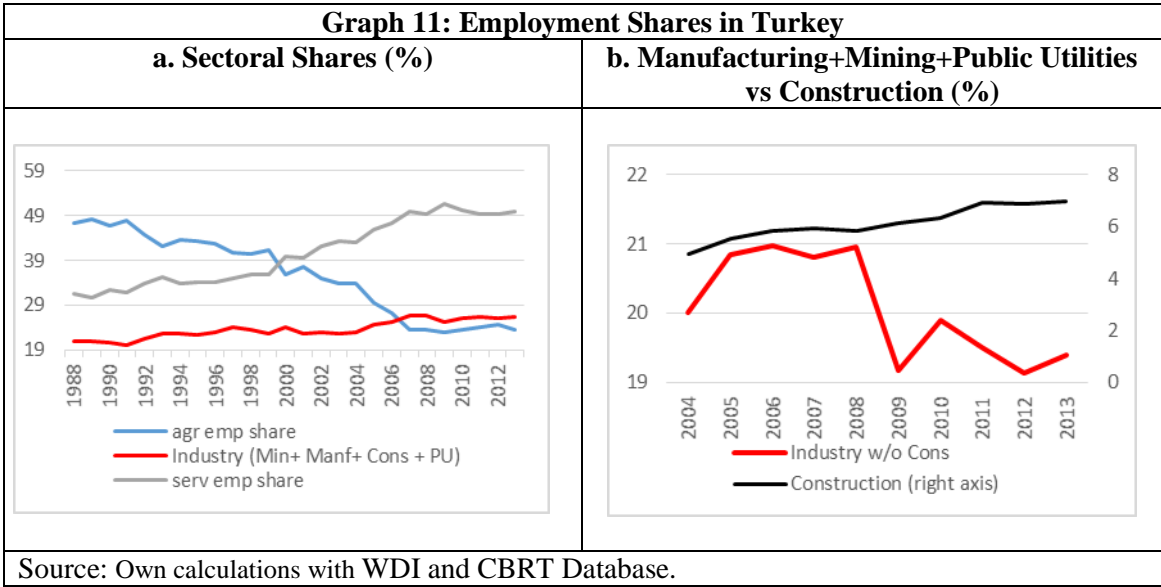


This is a highly worrisome situation since economy can generate jobs for low income and low human capital workers easily compared to high income and high human capital workers. Annual average gross wage of a worker with tertiary education is almost three times higher than wage of a worker with primary and less education (Table 4).

<b>Educational Attainment</b>	<b>Annual Average Gross Wage in 2006 (TL)</b>	<b>Relative Wages in 2006*</b>	<b>Annual Average Gross Wage in 2010 (TL)</b>	<b>Relative Wages in 2006*</b>
<b>Primary Education and less</b>	9,676	100	13,099	100
<b>Secondary Education</b>	12,592	130	16,912	129
<b>Tertiary Education</b>	27,310	282	35,383	270

\*Wage of worker having primary and less education is equalized to 100 in relevant year.  
 Source: Turkstat.

In other words, the economy has been supporting employment opportunities in low wage (low productivity) service sector along with construction sector of Turkish economy. And hence employment share in low human capital construction sector has been increasing (Graph 11).



Slow pace of de-agriculturalization, ongoing de-industrialization along with increasing construction employment share are not helping Turkey to break out the trap when we consider role of manufacturing as an engine of growth in the NMIT countries. In other words, immature de-industrialization should be risking Turkey into a vicious cycle of the MIT. As discussed by Felipe

(2012), erosion of industrial productive capacity without having significant amount may not yield a fertile ground for escaping from the MIT. Declining manufacturing capacity means less sophistication, diversification and product connectedness. Along with importance of manufacturing productive capacity, policy makers should avoid from falling of Turkish economy into low productivity nontradable services trap. Services with high productivity and market expansion potentials should be prioritized (Kharas and Kohli, 2011). Policymakers should take measures to increase relatively high productivity employment prospects in manufacturing sector and education policies are the foremost among them.

Structural transformation path with increasing share of high productivity activities should be elaborated. In that respect, any modern sector could be used to exploit high productivity gains. Moreover, welfare enhancing equitable economic growth occurs frequently in industrial activities. In the words of UNCTAD (2010, p.107): “the importance of manufacturing for economic development relates, on the supply side, to its potential for strong productivity growth, and on the demand side, to the high income elasticity of demand for manufactures. The productivity growth potential in manufacturing activities derives from their growing tendency towards specialization, learning and agglomeration economies, as well as from static and dynamic economies of scale. As labor and capital move into these activities, average productivity in the economy climbs. This further enhances the demand for services and industrial products, which generates profitable new investment opportunities in these areas and growing demand for labor.”

#### **4. Conclusion**

The MIT is the main challenge for the developing countries. We determine that while Cyprus, Greece, Portugal, Hong Kong, Japan, Korea, Singapore and Taiwan could graduate from the MIT; Cameroon, Ghana, Haiti, Nicaragua, Nigeria, Papua New Guinea, Senegal and Zambia have fallen from the MIT region to low income trap region. The rest of the countries in our analysis is stuck in the MIT. Trapped countries are Algeria, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Fiji, Gabon, Guatemala, Honduras, Iran, Jordan, Malaysia, Mauritius, Mexico, Namibia, Panama, Paraguay, Peru, the Philippines, Romania, South Africa, Syria, Turkey and Uruguay. In other words, majority of the MIT countries in 1960 is still stuck in the MIT as of 2010, only about 1 out of 6 countries could have avoided the MIT.

Experiences of graduated countries demonstrate that accumulating human capital in the form of skills and ability to produce technologically sophisticated goods are quite important to avert the trap. Moreover experience of the graduated countries also depicts that structural transformation should be managed to favor high productivity and knowledge intensive manufacturing activities to escape from the MIT.

Currently, it is clear that Turkish education system should be upgraded to break out the MIT. There is significant room for improvement especially in higher quality educational attainment. A well designed education system that is consistent with development path of the economy could yield both “skilled and high capability human capital” and “innovative and competitive productive capacity” in the economy to leap over the MIT.

Less skilled human capital may exacerbate incomplete structural transformation challenges. And incomplete structural transformation may prevent the manufacturing sector from absorbing significant share of the workers of the weakening agricultural sector. It may also trigger employment generation in low productivity activities such as labor intensive manufacturing sectors, nontradable service activities and construction as in Latin America and Turkey. Hence, MIT countries may find themselves in low labor productivity trap.

Our qualitative analysis demonstrates that Turkey as a middle income trapped country is not benefitting from de-agriculturalization sufficiently. Surplus labor coming from agriculture is not being employed in the knowledge intensive manufacturing activities. Moreover, speed of de-agriculturalization is slow, hence Turkey can't fully exploit unrepeatably gains of structural transformation. Transferring these agriculture workers into high productivity tradable activities can yield significant labor productivity and per capita income gains.

To sum up, our discussion demonstrates that living in the trap may have two interlinked determinants. Firstly, low human capital endowment in a typical MIT country may trigger low productivity (per capita income) growth and unfavorable structural transformation. And secondly, unfavorable structural transformation may limit human capital accumulation. In other words, these two factors may feed each other and trigger a vicious cycle in the economy.

In that respect, we think that analyzing productivity developments in trapped and nontrapped countries may yield further insights.

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