

# Middle income trap: a comparison between BRICS countries and Turkey<sup>1</sup>

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**Abstract:** The concept of the middle income trap takes place among the frequently discussed issues in the growth literature in the last periods. There are a number of countries in the world, which cannot move to the high income economic level and which squeeze to the middle income trap. These countries overcome the low income category with a rapid growth, however, when they reached the middle income level, they began to get slower and came to a deadlock depending on inadequate productivity. The aim of this study is to examine the concept of the middle income trap and make a comparison in terms of Turkey and BRICS countries (Brazil, Russia, India, China, South Africa). In the comparison, few factors were taken into consideration, such as human capital, education and innovation. Although Turkey has significantly proceeded in the growth recently, it is not able to reach the high income level, because its existing human capital and innovation level do not seem to be enough. In conclusion, based on results of the comparison with BRICS countries, some necessary suggestions for Turkish policies are presented, in order to rid of the risk of middle income trap.

**Keywords:** middle income trap, human capital, innovation, BRICS, Turkey

**JEL codes:** O11, J24, O31, O50

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## 1. Introduction

The concept of middle income trap takes place among the frequently discussed issues in the growth literature in the last periods. While some countries sustain their growth processes without facing any obstacle, why do some countries stick with in a certain income level? As much as what the concept expresses, at what income level this trap will be fallen into is also among the other questions of the discussion, because there is no a common view in both the definition of middle income trap and classification of incomes. In spite of this, middle income trap is a phenomenon presenting the cases of countries, which generally caught acceleration in their growths until they reach middle income level but, when just reached this income band, which experience stagnation and cannot jump to the group of countries with a high income position.

In the literature of development economy, a “poverty trap” is generally used to explain why a large number of poor countries fail to become middle-income, and why poverty persists from generation to generation. In return to this, middle income trap attracted very little attention compared to five years ago. The reason for neglecting them is that the developing countries think that they will achieve the high income level after overcoming the obstruction of poverty for one time. However, this thought had been invalid in the real life in most of the middle income countries. In contrast to this, GDP per capita of many middle income countries always fluctuate on middle income band but it can in no way pass to the high income level (Zeng and Fang, 2014: 1017).

Yeldan et al. (2012) stated that the case mentioned in their studies was not valid for every country. They stated, that as a result of examinations, the developed countries faced the most rapid increase in income, not the poor countries; and that it almost remained constant in the most of the developing countries. Between the years 1970-2000, when the growth performances of the developed, developing, and less developed countries, it was stated that there was no compliant state to the convergence hypothesis and, as a result of this, that middle income trap would not be a limitation valid for all countries. When looking from a historically point of view, fewer middle income countries have entered the high income country group. This case shows that at middle income level, economic growth is rather difficult. In middle income countries, income (and wages) increased in a measure that overcomes the low skilled and demanding intensive labor works; however, middle income countries have not developed their national innovations yet, and do not have the sufficient physical and human capital accumulation to enable them to compete

with high income countries. In view of this, these countries need the new policy designs to proceed to high income level (Jankowska et al, 2012: 9; Im and Rosenblatt, 2013: 2).

In this study, middle income trap will be examined in terms of Turkey and BRICS countries. In the study it was scrutinized, whether Turkey and BRICS countries are at the risk of middle income trap. In addition, a comparison was made by taking into consideration the human capital and innovation levels of countries. The study consists of three dimensions. First, the definitions and basics of middle income trap and then, Turkey and BRICS countries are discussed in terms of middle income trap. Later, these countries are compared to each other, considering their human capital and innovations. This study has completed with the results of assessment and policy recommendations that take place.

## **2. Conceptual Framework of Middle Income Trap**

The concept of middle income trap was first discussed in the report of World Bank, entitled “An Eastern Asian Renaissance: Ideas on Economic Growth”. According to this report, middle income countries grow slower compared to the rich or poor countries. After this report had been published, middle income trap became an issue that is increasingly discussed between economists. Generally, it is used for exemplifying the situations of some Latin American and Asian countries and in reaching a judgment about the economic situation of China (Cai, 2012: 49). Although the studies concentrate on these countries, meanwhile, the concept caused the other countries to question their own growth processes. In this report, it was stated that middle income countries differentiate from the other groups of countries, and that growth rates in these countries are lower than those in some rich or poor countries and this case leads the convergence hypothesis to lose its validity in the world. Middle income countries stuck with in between two different structures of countries. One structure is the poor countries that are dominant in the sectors that reached a certain level and has advantage of low wage, and the second structure consists of innovative rich countries following the technological development (Gill and Kharas, 2007:4).

In the report of World Bank, entitled “China 2030”, it is seen that in the period of post-Second World War, many countries rose to the group of the middle income countries. However, a few countries rose to the group of high income countries. On the other hand, most countries,

despite their rapid rises in the growth and efficiency at the beginning, experienced a sharp fall, and these countries stuck with in the income level, termed middle income trap. IMF calculated that in a certain five years time, the probability of a middle income country to experience growth slowdown was 1,5 times higher than the for low or high income countries. This common recession presents the convergence deficiency of the countries in the 20th century. As a matter of fact, in 1960, only 13 of 101 middle income countries reached the high income status of World Bank classification (China 2030, 2013: 12; Berliner et al., 2013: 6; Agénor et al., 2012:1).

Middle income trap is an important economic problem, experienced especially by middle income countries. Middle income trap is a phenomenon presenting the state of the countries, which grew rapidly until a certain point, experience recession while reaching the middle income level, and cannot proceed to the position of high income country. Latin American countries that were highly rich one century ago experienced an important economic recession after Second World War. The case of these countries is a good example for middle income trap. When these economies reached a certain development level, their growth slowed down or even stopped. In contrast to these countries, so called Asian Tigers – Taiwan, Hong Kong, Singapore, and South Korea, which were poorer than South American Countries, experienced a surprising growth after the Second World War. Their GDP per capita reached the level of the developed countries and these countries became a symbol of achievements. These development paths raised the following question: “Why did some countries escape from the trap and some countries stuck with in the trap?” (Chen and Dai, 2015: 2; Aiyar et al., 2013:3).

According to Cai (2012), when a country passed to the position of a middle income country, following a long growth process, and it cannot proceed to the position of a high income country, it means that this country fell into the middle income trap (Cai, 2012: 53). According to a similar definition, middle income trap happens when the economic growth and income per capita in a country reach the middle income level and they enter the recession process. The best examples for this are Latin American countries. For this reason, the middle income trap was qualified as the “Latin American Disease” (Xue et al., 2014: 1).

Traditionally, the concept “trap” is used rather for defining the state of a stable economic equilibrium, which cannot be changed by the short-term external factors, than for a comparative static equilibrium state. In other words, trap is the state that when the effect of a factor helping to increase income per capita is spread, the other limitative factors come into play and these

limitative factors turn income per capita again into its previous level. For example, according to (Thomas Robert Malthus), a pessimistic economist, the relationship between population increase and economic development expresses Malthusian trap or Malthusian equilibrium. Because of this, middle income trap has also a relationship with Malthusian and Dual Structure Model by Lewis. In fact, Dual Economy developed by Arthur Lewis is an only transition state between Poverty Trap by Malthus, and Solow Neoclassic Growth Model and it is a common state for the developed countries (Cai, 2012: 50-51). Lewis put forward the dual (bilateral) economic approaches in economic development the first time in the article that titled "Economic Development with Unlimited Supplies of Labor ". Lewis separated poor economies into two sectors, a "modern"/capitalist/industrial sector, and a backward/ traditional/agricultural (and traditional services') sector. Labor migrates across sectors to equate expected utility from each activity. In modern industry, labor is paid the value of its marginal product. The difference between the net value of output and the wage bill equals profits, some fraction of which is reinvested. In the traditional sector, farmers, artisans, and traders effectively behave as tiny monopolistic competitors, each receiving an average product. For other than a few fortunate individuals, the amount earned is equal to a subsistence-plus level that is roughly constant, while marginal product is zero. Economic growth thus occurs by reinvestment of modern sector profits and drawing workers from the traditional to the modern sector (Becker and Craige, 2007: 196).

The middle income trap, as the neoclassic model suggests, is not only a natural result of decreasing marginal return of physical capital investments. The common view about a slowdown seen in growth is that this is based on the Lewis type of the development process (Agénor et al. 2012: 2). In other words, Lewis turning point is a point, when labour supply turns into the labour shortage. Industrialization leads to an incremental transfer of surplus of the rural labour force into the non-agricultural sectors. As a result, rural labour force decreases and, finally, expires (Xue et al, 2014: 24). When looking from this point of view, after the first stage of a rapid development, the factors revealing high growth and their advantages disappear when the middle or high income levels are reached. For these reason, the growth needs some new resources in order to provide such a level of income per capita that will lead a sustainable advantage (Agénor et al. et al., 2012: 2). The countries in a middle income trap developed economies based on a labour-intensive production with low added value. In many cases low cost labour force among the rural population that is not employed moves to the urban areas. Most of the rural population is included in the

labour force and production continues to increase and the wages also increase. Relatively easy resources for growth, stimulated by capital movement, lose their stimulating power, technologies become mature and gradually become older. As a result, low technology and capital accumulation, based on unskilled labour force and natural resources, lose their acceleration. Thus, such an economy loses its comparative advantage against the less developed countries. It is emphasized that after reaching this level, which is called the middle income threshold, the resources of growth shouldn't be any longer obtained from the productivity gains or from the new capital investments. The focus should be on the capital intensive and demanding skill works. Increasing the productivity is possible by the education of human capital, R&D investment, and institutional reforms (Yeldan et al., 2012: 12-13; Carnovale, 2012: 4-8).

Along with the concept of the middle income trap, the subject of discussion is at which income level an economic slowdown is experienced. There are different income classifications in various studies. For example, Xue et al. (2013) assume that when GDP per capita reaches a value between \$ 5, 000 and \$ 12,000, GDP growth gets slower, the economic growth is able to lose its power, and the economy enters the slowdown process.

Eichengreen et al. (2011) evaluated the middle income trap by means of the three main criteria: (i) income per capita rises to \$ 16,740, based on the fixed prices from 2005; (ii) income per capita reaches 58% of the USA level; (iii) the share of the manufacturing industry in total revenues of a country reaches 23%.

The studies carried out on slowdown of growth point out that the middle income trap can be observed in countries, which stick with in the average income level per capita of \$ 16,700 (in 2005 prices), and in which the growth rate of income per capita regresses from 5.6% to 2.1% (Agénor et al., 2012:1).

Woo (2012) investigated growth slowdown in China in his study carried out by the way of using an index called Catch-Up Index (CUI). CUI is calculated as the rate of income level of a country compared to the income level of the USA. The index was calculated for the period 1960-2008. The countries with the index value higher than 50% were classified as high income countries; those with the index between 55% and 20% as middle income countries; and those with the index value lower than 20% as low income countries. The dataset used in the study was obtained from Maddison Project database calculated by Maddison (2010). According to CUI, in the period of 2007-2008 China became a middle income country. Now, China needs some new

strategies to reach high income level. However, it is emphasized that the issues such as an independent judgment, free press, and democratic election are considered not only liberating labour force market or developing financial sector

Felipe et al. (2012), in the period of 1950-2010, divided 124 countries into four groups, and investigated historically income transitions, durations, and growth rates. They grouped the countries in those, whose GDP per capita was less than \$ 2,000 as low income countries; in those being between \$ 2, 000 and 7,250 as lower middle income countries, those being between \$ 7,250 and \$ 11,750 as upper middle income countries, and those being higher than \$ 11.750 as high income countries. The data of GDP per capita used in the study (according to the purchasing power parity with 1990 prices) were obtained from Maddison Project database calculated by Maddison (2010). Among 124 countries in the study, 40 were in the category of low income country; 52 – middle income country; and 32 – high income country.

In determining the middle income level, when classification made by World Bank according to GNP per capita (Atlas Method) is considered, classification for 2015 is as follows: low income countries for economies having GDP per capita of \$ 1,045 and less, middle income countries for economies having GDP per capita between \$ 1,045 and 12,746; and high income countries for economies having GDP per capita higher than \$ 12,746 (World Bank, 2015).

When the countries in the middle income group do not have the innovative economic order, supported by human capital and technological infrastructure, they not only lose their dominances in the labour sector, but also they enter the recession i.e. stick with in middle income trap, losing the sustainable growth process (Tho, 2013: 109-110). Aiyar et al. (2013) examined the determinatives of the middle income trap for 11 periods (five years periods) including the range of 1955-2009 for totally 138 countries on the basis of Asian and Latin American countries. The relationship of the annual growth rate of GDP per capita with the institutions, demography, infrastructure, macroeconomic environment and policies, production structure, commercial structure, and the other variables was investigated. It was determined that the most important variables in the middle income trap were the sudden decreases and outflows in gross capital inflows, and poor export diversity.

In the last period, the worries about the middle income trap become increasingly widespread among middle income countries. The worry in these countries is related to the problem, that the policies raising them from the low income to middle income cannot raise them

from middle income to high income and that they stick with in this trap. Hence, middle income countries, providing a growth that will be sustainable and will strengthened themselves, are searching policies that will take them to the level of high income country (Bulman et al., 2014: 2).

According to Berliner et al. (2013), middle income countries, to avoid this trap, should take into consideration the following points:

- They should see the free trade as a friend not as an enemy. These countries, to utilize free trade, should focus on their own comparative advantages, make investments on these areas, and become the domestic producers ready for the conditions of free trade.
- The supportive role of government: in the middle income countries, whose high growth rate continues, innovation was supported and the emergence of new product processes has been encouraged. The free trade regions in the leadership of government encouraged the foundation of new industrial companies. In the same time, the stability in economy was dealt with; the unnecessary and fashion old arrangements were demolished and all old information impeding the competition, discriminations, and barriers were eliminated. Governments gave support to the institutions for competitive economies.
- Transition from the physical accumulation of factors to an economy based on productivity: The countries escaping middle income trap made a long-term and planned investments in the educational system. Innovation eliminated the barriers. The monopolies and cartels were reduced to the minimum level. Bureaucratic problems (taxing, access to credit etc.) were removed; the accesses of firms to the market; making transactions, and leaving were developed; and creative destruction became necessary for the economies to grow efficiently.
- It was a shift from the central economy planning to the decentralized planning.

The countries reaching middle income level, changing their strategies, should concentrate on demand oriented policies. In this stage, the production approach towards the quality, price, and choices of consumers emerges. In this period, the efforts of the domestic firms to become global branding the framework of these factors appear. Although product diversity has so great importance for middle income countries, in this period, being able to specialise on the certain products and catch the understanding of innovation and information intensive production have a great importance (Kharas and Kohli, 2011: 285). Avoiding middle income trap requires strong



institutions in both private and public sectors. Innovation always takes place in the first order among factors providing the high and sustainable growth. Innovation economy provides growth, which will be based on high productivity, and which is measured with a total factor productivity; and this enables the competition in the global markets. In countries, which cannot be closed in the middle income trap, the growth of factor productivity has been high for many years. These countries, in terms of product cycle, moved from labour intensive products to high technology products (Jitsuchon, 2012: 17). Innovation and product differentiation became more important for meeting the needs of market. These skills and abilities of companies are also important for the domestic market. Middle income countries, to make the growth sustainable, should develop relatively large population of middle class that will pay for quality and a differentiated product. This extra profit margin also respectively encourages investments, branding and new product developments in the market, and, thus, higher growth is provided (Kharas and Kohli, 2011: 286). According to Gürsel and Soybilgin (2013: 2), the main factor that will prevent a country from falling into the middle income trap is labour productivity. Besides this productivity, investments should include technological advancements, levels of education and skills of the employees should increase, and, in general, the wheels of economy should rotate effectively (increase in effectiveness of economic government and institutions). Countries which cannot increase the productivity by the way of innovation, cannot move to the high income level. In other words, they fall into the middle income trap (Öz, 2012: 2).

### **3. Middle Income Trap: The Situation of BRICS Countries and Turkey**

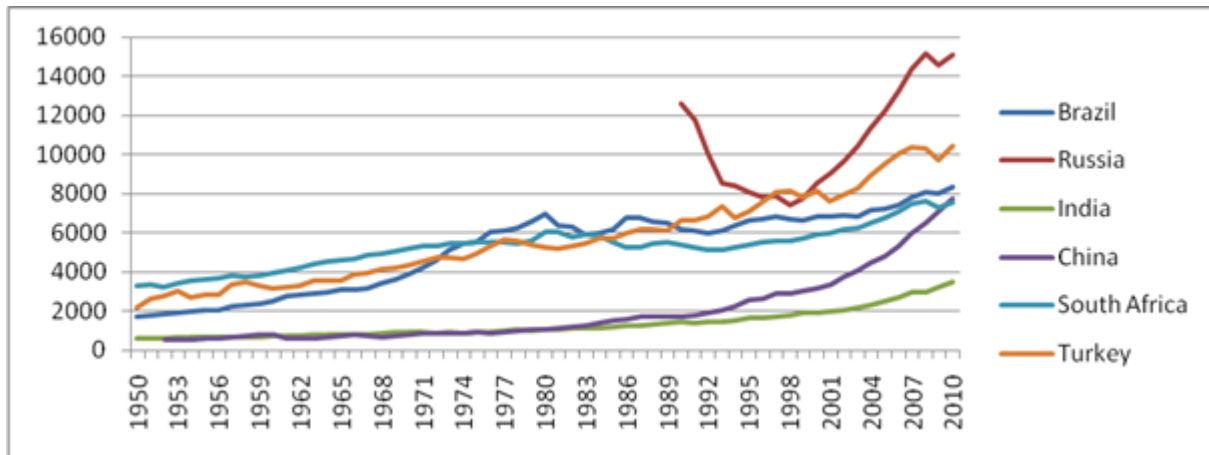
The definition of BRIC was firstly used in 2001 by Jim O'Neill, an economist, the head of board of directors of Goldman Sachs. For this definition, are titled "The World Needs Better Economic BRICs" was published. The name "BRIC" was formed from initials of English names of countries building the group: Federative Republic of Brazil, the Russian Federation, the Republic of India, and the People's Republic of China. In the leadership of Brazil, Russia, India, and China, the group, taking place in the global scheme, later took the name of BRICS with the addition of Republic of South Africa. With South Africa attracting attention mainly by its richness in terms of raw materials, a voice from the continental African be brought in the group and cooperation with this country is one of main targets of BRIC countries. Although each BRICS country has

idiosyncratic features, their common points are the economies and population they have (Elbasan, 2011). All BRICS countries are newly industrialized and have the status of a developing country. In addition, the global effectiveness of these countries is gradually increasing. For this reason, from the global, economic, and financial running point, they want to follow the process to make decision and increase their effectiveness, especially in terms of their global financial position (Tüysüzoğlu, 2013). BRICS countries, called the five main market economies, attract attention with their process of rapid recoveries and growth after 2008-2009 Crisis (Vandemoortele et al. 2013). Export based economies of BRICS countries differ from each other. Brazil, Russia, and South Africa are exporters of mining products and energy and, in the last ten years, rising prices of these products contributed to the economic developments in these countries (oil and natural gas account for 58% of Russian export, while South Africa is the fifth largest coal exporter). China, in order to be able to increase its share in manufacturing sector, and India to increase its share in services, are in the effort to keep their labour cost slow (Centre for The Study of Governance Innovation, 2013). Thanks to high level of production and national income, and to the export volume in the last years in terms of its potential and competitive power, BRICS economies are an important element of threat for Turkey and for the other countries, their rivals in terms of factor equipment. Turkey also follows the increasing economic performance of BRICS countries (due to the fact that Turkey is among the leading countries having the highest economic growth rate), what leads to escalation of global competitive wars between the countries (Erkan, 2012: 103).

While looking at the last 60 years development performance, it can be observed that the income gap between Turkey and central countries is not closed. During this time, Turkey succeeded in establishing a manufacturing industry. The country has moved from the position of exporter of agricultural products to the exporter of industrial products, and the share of services has risen in its economy. But all these developments did not enable to close the gap between Turkey and developed countries. Today, Turkey belongs to the group of middle income countries (Tuncel, 2014:57). The production structure of Turkey is based on excessive capital and intensive technologies. Due to such factors as imported capital, need for machinery, equipment, and technology and, in addition, energy deficit, the growth of the production structure of Turkish economy is dependent on the excessive import, and it is based on the use of labour and capital. In 2000s, Turkey, as a country which was excessively dependent on the imported capital in puts,

had an excessively fluctuating growth process, which can grow in so far as it can finance Turkish import. Otherwise it would be dragged to the crisis. Besides this, the growth model, which is followed in Turkey, leads to a gradual shift in the distribution of investment and resource from real producers to the services sector, and industry loses its acceleration (Yeldan et al., 2012: 15). According to Tuncel (2014), Turkey lost its advantageous position in favor of many countries, with which it competes in the global scale in terms of costs of labour force. These countries are both countries from Latin America and newly industrializing Asian and Eastern Europe countries. Particularly China, with its low cost labour force advantage in essentially industries such as textile, ready clothing, toys, and metal wares, reached a position of a production centre for the world. Moreover, China, thanks to its self-sufficient industrialization policies, has also an intensive technological ability, which will allow producing many sorts of product. Therefore, China will continue to strengthen its position of a production centre for the world economy, and will rise to the position of the producer and exporter of technological products, not only due to the low costs of labour force, but also due to technological accumulation it has (Tuncel, 2014:62).

**Figure 1. GDP Per Capita: Turkey vs. BRICS**

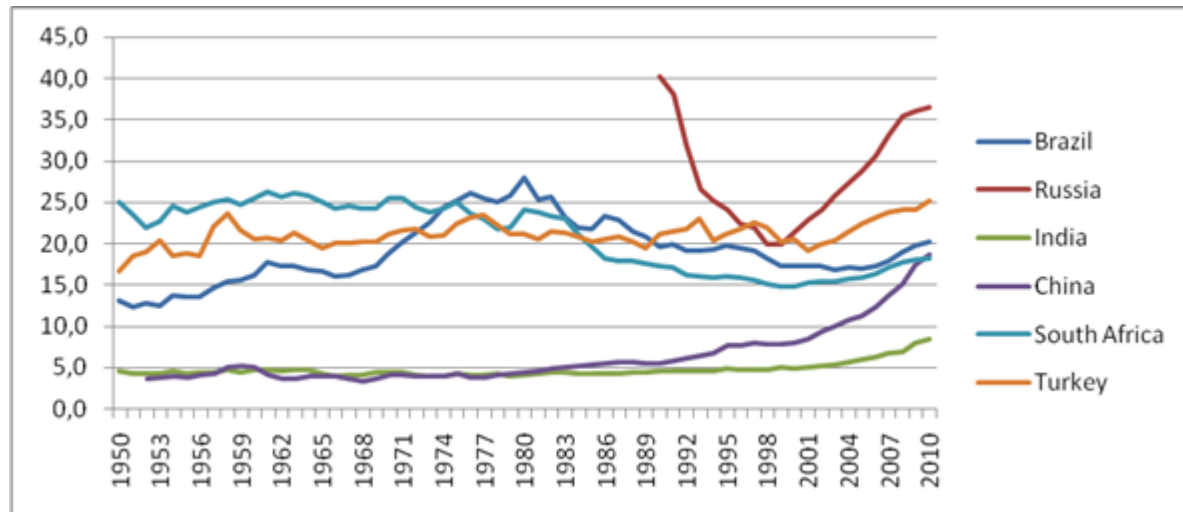


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Figure1 presents GDP per capita in Turkey and BRICS countries, according to purchase power parity, with 2005 fixed prices. China and India are among the countries with rapid increase in income per capita. In both countries this rapid rise they experienced in income per capita is remarkable, although the rates of population growth are relatively high. Low wage rates in 1980s and 1990s are the most important factor causing that at the present days China is in the position

of the biggest manufacturer of the world (Zhang et al, 2013: 152). Russia also rapidly increased its GDP per capita. In Brazil, fast increase was visible until 1980s; however, the pace of growth of GDP per capita was slower. After 1990s, more fluctuations occurred. South Africa exhibited a stable trend, while Turkey experienced a more fluctuated growth compared to other countries. In 2005, Turkey could move to the position of upper middle income country.

**Figure 2. Per Capita Income relative to the USA (%): Turkey vs. BRICS**

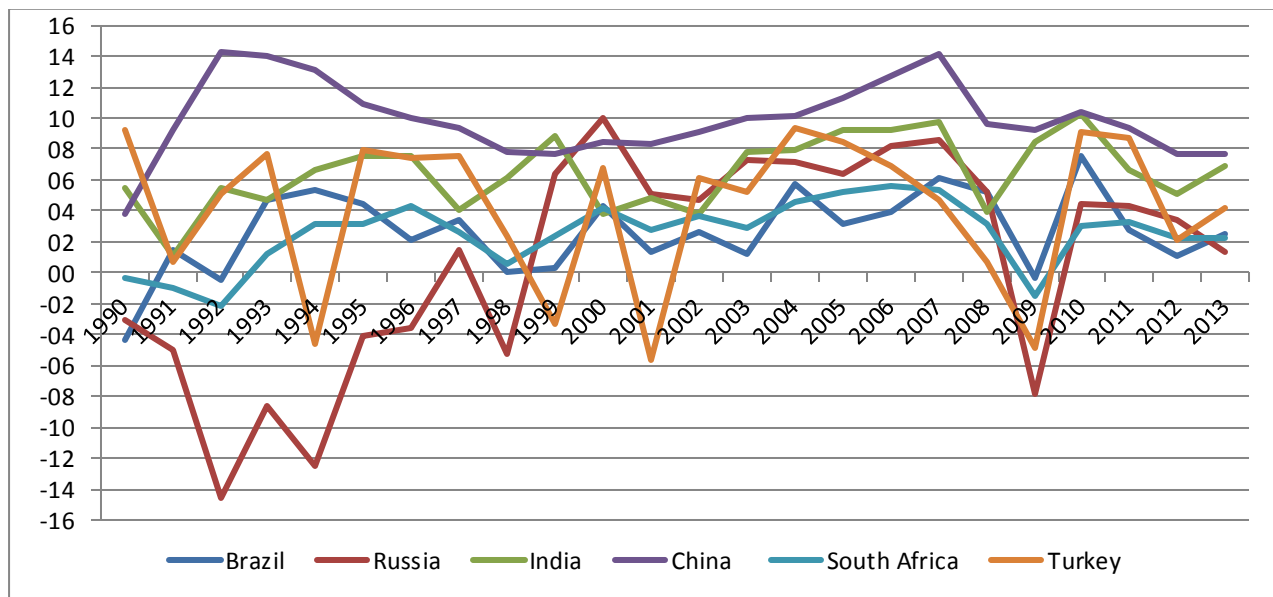


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Figure 2 presents incomes per capita of BRICS and Turkey as a share of income per capita of the USA. In the studies carried out on the middle income trap, the relative income is the mostly preferred classification. For example, Bulman et al. (2014) suggested the income classification as follows: according to the purchasing power parity, countries, whose GDP per capita equals to 10% or less of GDP per capita in the USA are in the category of low income countries; those with values of 10% - 50% of GDP per capita in the USA are middle income countries; and those with values above 50% are high income countries. In addition, the authors divided middle income as lower middle income and upper middle income. In this division, the rate of 30 % is accepted as threshold value. If we make an evaluation according to this study, only Russia is included in the upper middle income group. India belongs to the low income group, while Turkey, China, Brazil, and South Africa to the lower middle income group. For example, according to Robertson and Ye (2013), countries having an income between 8% and 36% of GDP per capita of the USA are considered middle income countries. According to the World Bank definition of middle income, countries, that had an income between 5.5% and 44% of GDP per capita of the USA in 1960, and

succeeded in raising to 45% and more in 2005, are the ones that avoided the middle income trap(Öz, 2002). In 1960, Brazil had the rate of 16.1%; India – 4.7%; China –5%; South Africa – 25.5%; and Turkey –20.6%. However, in 2008these rates accounted for18.9% for Brazil; 36.4%for Russia; 6.9% for India; 15.2% for China; 17.8% for South Africa; and 24.1%forTurkey.In this case, if we keep Russia out of evaluation, the other countries could not avoid the middle income trap. Yılmaz (2014) argues that China will exceed GDP per capita of Turkey in the next years.

**Figure 3. Annual GDP Growth Rate: Turkey vs. BRICS**



Resource: Elaborated by utilising PWT 7.1

In Figure 3, the growth rates of Turkey and BRICS countries are presented. China and India attracted attention with high growth rates they experienced during this period. Chinese economy, growing about three times faster than the world economy in the last thirty years, obtained a serious success. In addition, in 2010, it became the second largest economy of the world, following Japan (Zeng and Fang, 2014: 1014). However, after 2002, a slower growth pace began. Long-term performance of Brazil is like in a typical Latin American country. Recently, despite improvements it experienced in its growth, it cannot show the rapid growth that will converge the developed countries (Kharas and Kohli, 2011: 283). Russia, after the negative growth rates in 1990s, succeeded in catching the high growth rate in 2002. Brazil, South Africa, and Turkey have more fluctuated and lower growth rates compared to these countries. Due to 1994, 2001 National

Crises and the global crisis experienced in 2009, Turkey experienced break down – the growth rate fell to 4.7% in 1994; 5.7% in 2001; and 4.8% in 2009. However, in 2010, Turkish economy grew by 9.2% and this was followed by the growth of 8.5% in 2011.

**Table 1. Between 1950 and 2010, the periods of income classification: Turkey vs. BRICS**

	Brazil	Russia	India	China	South Africa	Turkey
Number of years spent as low income country	8	-	53	41	-	5
Number of years spent as lower middle income country	52	13	8	17	50	51
Number of years spent as upper middle income country	-	6	-	2	-	6
Total	60	19	61	60	50	62

Resource: Felipe et al, 2012 and New Maddison Project Database

Table 1 shows the situation of countries according to the income classification in the period 1950-2010. According to this table, Brazil has remained for 52 years in the position of lower middle income country and South Africa for 50 years. Since the data of Russia were taken for post 1990, the number of years is lower. Russia spent 13 years as a lower middle income country, and then it moved to the upper middle income group. In this case, since Russia has remained in the lower middle income group for less than 28 years, it can be said that it did not stick within the lower middle income trap. India remained a low income country for 53 years, and it became a lower middle income country in 2003. According to Felipe et al. (2012), the necessary threshold value for the countries to get rid of the lower middle income trap is an annual growth of income per capita by minimum 4.7 %, and to avoid the upper middle income group is an annual growth of income per capita by 3.5 %. In addition, the countries should come out from the lower middle income group after maximum 28 years and from the upper middle income group after maximum 14 years. Otherwise, they stick within the middle income trap. According to this study; Turkey is a country that faced the lower middle income trap. It is seen that China came out from the lower middle income group in a short time of 17 years compared to the other countries in table. While China gained the status of a lower middle income country in 1992, it moved to the upper middle income group in 2009. Within a time of 17 years, its average growth rate accounted for 7.5 %.

**Table 2. The Periods of Income Classifications: Turkey vs. BRICS (1990-2013)**

	Brazil	Russia	India	China	South Africa	Turkey
Number of years spent as low income country	-	-	17	8	-	-
Number of years spent as lower middle income country	4	12	7	12	4	11
Number of years spent as upper middle income country	20	9	-	4	20	13
Number of years spent as low income country	-	2	-	-	-	-

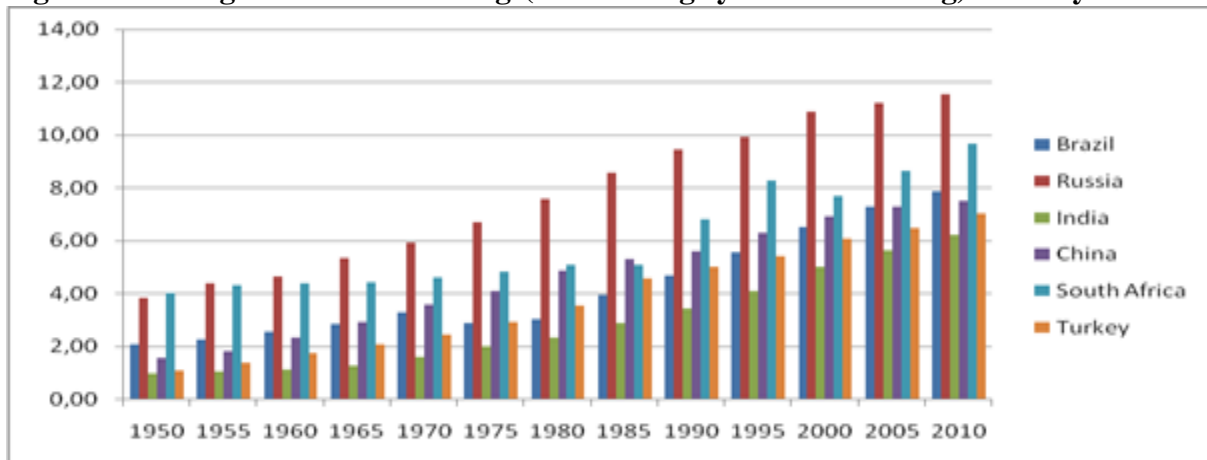
Resource: WDI data were compiled and formed by inspiring from Felipe (2012).

Table 2 presents numbers of years that countries have spent in particular income groups according to the World Bank income classification in years 1990-2013. Brazil has been in the middle income band for 20 years as a lower middle income country and for 4 years as an upper middle income country. Russia spent 12 years as a lower middle income country and 9 years as an upper middle income country. Russia is in the position of a single country among BRICS countries that has moved to the group of high income countries. India spent 17 years as a low income country, and in 2007, it reached the position of a lower middle income country and has spent 7 years in this position. During this time, China has spent 8 years as a low income country and 12 years as a lower middle income country. In 2010, China gained the status of an upper middle income country. South Africa has spent 4 years as a lower middle income country and 20 years as an upper middle income country. However, during this period, South Africa has followed a fluctuated course. Turkey has spent 7 years as a lower middle income country, and in 1997, it moved to the position of an upper middle income country. However, in 1999, it moved back again to the level of a lower middle income country. Then it spent the year 2000 as an upper middle income country, but as a result of the crisis experienced in 2001, in the years 2001-2003 Turkey was a lower middle income country. And then, in 2004, it moved again to the upper middle income level. It totally experienced a growth process of 11 years as a lower middle income and of 13 years as an upper middle country.

Yeldan et al. (2012) evaluated Turkey in terms of the middle income trap. In the study, in which a regional examination was carried out regarding Turkey, they stated that there were income inequalities between regions, that the regions converged to each other, and that Turkey generally carried risk in terms of the middle income trap. According to Gürsel and Soybilgin

(2013), it is difficult for Turkey to follow the growth performance from the past period. Due to the reasons such as the slowdown of increase in the current deficit and labour productivity, economy is in the threshold of the middle income trap.

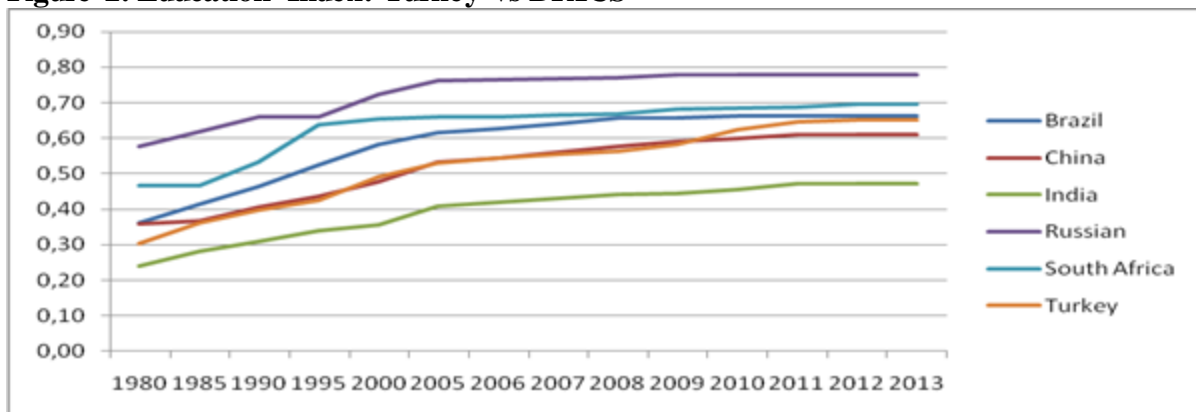
**Figure 1. Average Years of Schooling (+15: average years of schooling): Turkey vs. BRICS**



Resource: Barro and Lee Database, 2015

Figure 4 presents the average years of schooling in analyzed countries. In the period 1950-2010, there is an increasing tendency in all countries. In 2010, Russia was first in the ranking and Turkey was fifth.

**Figure 2. Education Index: Turkey vs BRICS**



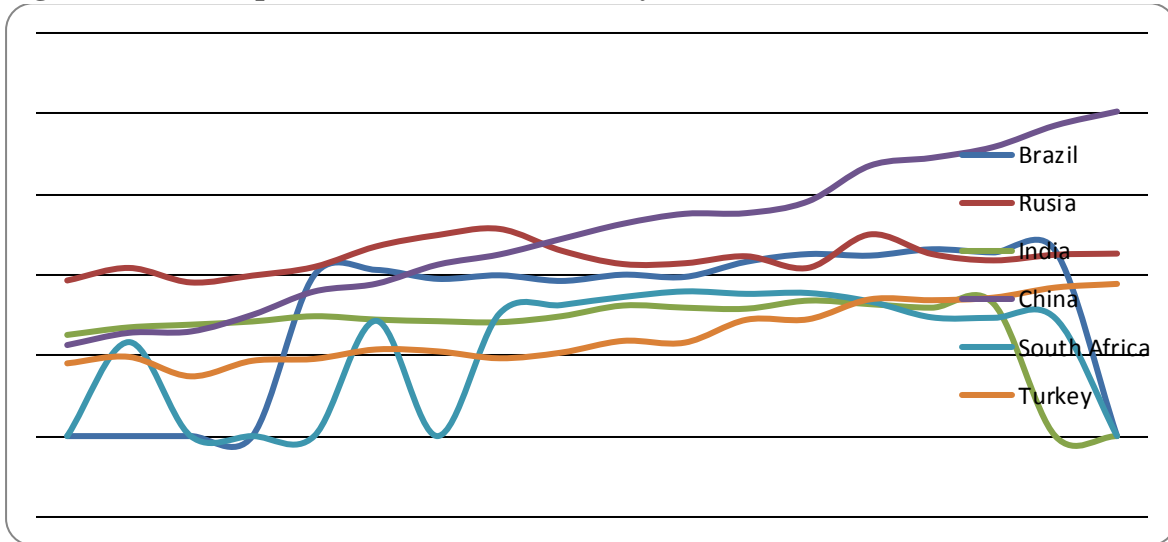
Resource: HDR, 2013

Figure 5 presents the education index, published by the United Nations in the Development Program. Education Index is calculated by taken into consideration the average years of schooling and expected years of schooling. Index takes on a value from 0 to 1 and the closer it is



to 1, the higher the education index increases. All countries increased their index values in the years 1980-2013. Russia has the highest education index, and India the lowest. In Turkey, the value of the index has increased. However, when it is compared to the other countries, it is seen that it follows an average course.

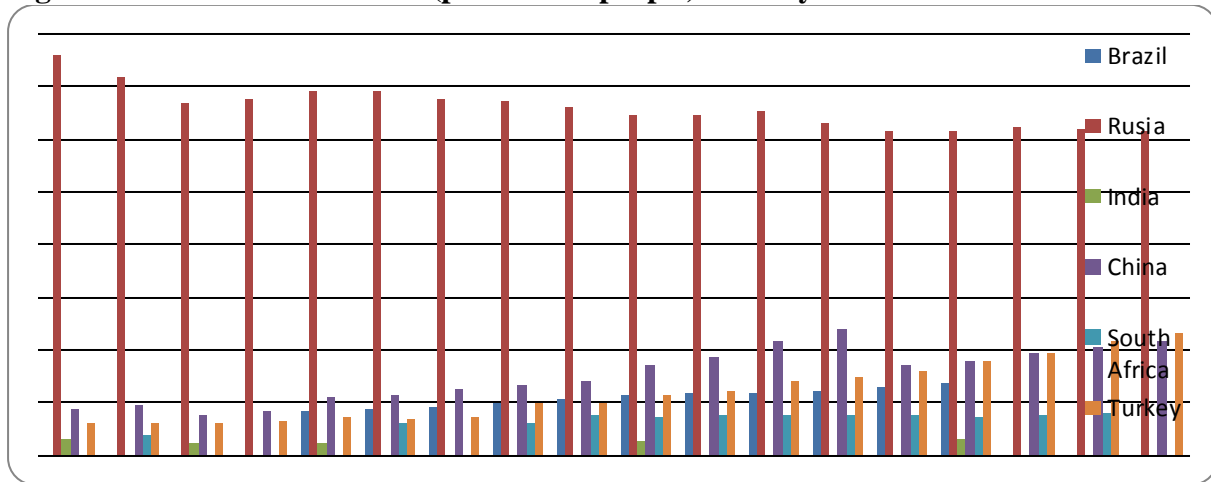
**Figure 3. R&D Expenditures (GDP %): Turkey vs. BRICS**



Resource: Elaborated by utilizing WDI data.

Figure 6 presents expenditures on R&D as a share of GDP. In 1996, China had a share of 0.6 % and Russia of 1%. In the years 1996-2012, the share of expenditures on R&D in China's GDP, increased to 2 % and China reached the first position in the ranking. Russia followed a horizontal course without any big change in its share level from 1996 and has a lower position than China. Although there was also a positive tendency in India and Brazil, it can be considered low. In South Africa, expenditures on R&D as a share of GDP were rather constant with a tendency to decrease. Finally, a positive tendency in Turkey can be observed in the analyzed period. In 1996, the share in Turkey accounted for 0.5%, and it increased to the level of about 0.9 % in 2011.

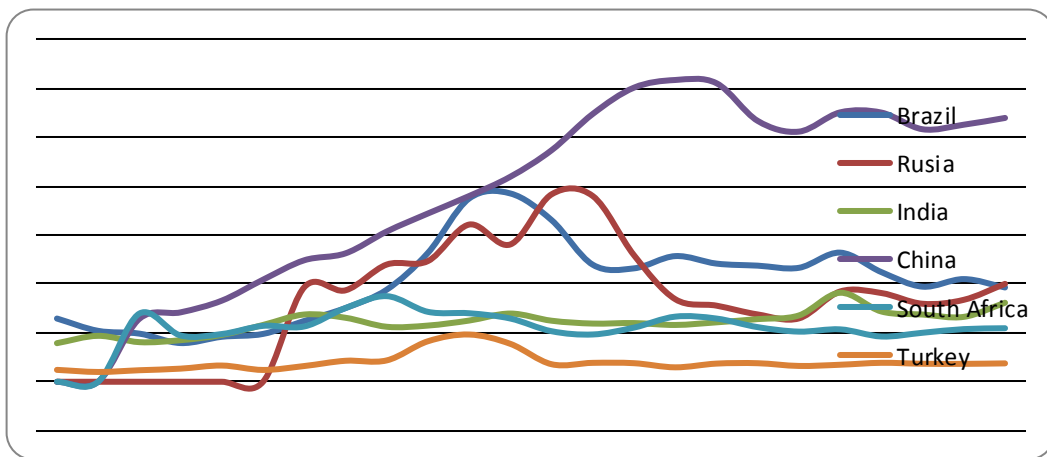
**Figure 4. Researchers in R&D (per million people): Turkey vs. BRICS**



Resource: Elaborated by utilizing WDI data.

Figure 7 presents the number of researchers working in R&D per million inhabitants. Russia attracts attention with the rate it has. The high number of researchers in Russia compared to the other countries decreased but it shows a stable tendency in the last few years. China can be considered the second country with the highest number. There is a stable increase in the number of researchers in China; however the pace of growth is low. Following China, it can be mentioned about the positive tendency that Turkey has. The number of researchers in Turkey is continuously increasing. In India, this number remained very low and followed a constant course. It can be argued that the number of researchers is very low in South Africa, but it is higher than in India and did not face any fluctuations in the period analyzed.

**Figure 5. High Technology Exports (% of manufactured goods exports): Turkey vs. BRICS**



Resource: Elaborated by utilizing WDI data.

Figure 8 presents data regarding the advanced technology export in countries as a share of the total manufactured goods export. China takes the highest position with the biggest share of high technology export. After the peak point in 2005, China experienced a decrease in the share of high technology export, but it is at similar level in the last few years. Although Brazil and Russia reached the biggest share of high technology export in the total export of manufactured goods at the beginning of 2000s, it has decreased in the next years. There is a low acceleration in South Africa and India, though it can be mentioned about a positive sloped graph. Turkey remained at a very low level in terms of share it has. After a peak of 4.8 %, experienced in 2000, there was a decrease to its previous level and Turkey followed a horizontal course.

**Table 3. Patent Applications (Residents): Turkey vs. BRICS**

Years	Brazil	Russia	India	China	South Africa	Turkey
1996	2611	18014	1661	11628	757	189
1997	2756	15106	1926	12672	355	203
1998	2491	16454	2247	13751	200	207
1999	2816	19900	2206	15626	138	276
2000	3179	23377	2206	25346	895	277
2001	3439	24777	2379	30038	966	337
2002	3481	23712	2693	39806	983	414
2003	3866	24969	3425	56769	922	489
2004	4044	22985	4014	65786	956	682
2005	4054	23644	4721	93485	1003	928
2006	3956	27884	5686	122318	866	1072
2007	4194	27505	6296	153060	915	1810
2008	4280	27712	6425	194579	860	2221
2009	4271	25598	7262	229096	822	2555
2010	4228	28722	8853	293066	821	3180
2011	4695	26495	8841	415829	656	3885
2012	4798	28701	9553	535313	608	4434
2013	4959	28765	10669	704936	638	4392

Resource: Elaborated by utilizing WDI data.

Table 3 presents data regarding the number of application of patents. China has an absolute advantage against the other countries with a rapid increase in the number of application of patents, especially after 2005. Russia is the second position among all analyzed countries. South

Africa drawing a negative sloped curve and it is very inadequate. It can be observed that Brazil, India, and Turkey, even though they have different numbers of applications, have a positive sloped graph with a low pace of growth.

#### **4. Conclusion**

In this study, there was an attempt made to examine Turkey and BRICS countries in terms of the middle income trap, which has become an often discussed issue recently. To realize the goal of the paper, the conceptual framework of the middle income trap was given first, and then the situation of countries was described and analyzed. Using the literature and the value of GDP per capita, it was examined, whether they are in the middle income trap.

After 1950, Turkey has belonged to the lower middle income group for over 50 years. It moved to the upper middle income group in 2004 according to the classification made by the World Bank. Turkey could obtain high growth rate after the fluctuated growth process it experienced in the period 1980-2000. However, it is seen that this is not enough.

When the studies carried out are also taken in to consideration, it can be observed that Turkey carried a high risk in terms of the middle income trap. When analyzing BRICS countries, it can be argued that China will not stick with in the middle income trap and carries a low risk. Russia, compared to the other countries, including Turkey, is the most successful country, as it reached the status of a high income country in 2012. Like Turkey, also Brazil and South Africa are the countries that have been in the middle income trap for a long time. India moved from a low income level to a lower middle income level in 2007.

Comparison made between BRICS countries and Turkey in terms of selected variables such as human capital and innovation shows that the most successful countries are China and Russia. Especially the share of advanced technology in the manufactured goods export is remarkable in China. In addition, China became the 28th country in 2014 global completion ordering. China, in the position of the manufacturer of the world, causes a threat to Turkey. Turkey's position is average, compared to BRICS countries in terms of human capital and innovation. However, this average position will not be enough for Turkey to reach the high income level in the future. Hence, the necessary knowledge, skill level and innovation ability remain inadequate in Turkey to move to the high income countries. The country needs an

effective economy, industry and innovation policies. High human capital is created thanks to the healthy interaction between economic agents. An effective policy should lead to an effective cooperation between universities, public institutes and firms. Improving the institutional and technological infrastructure is quite important. Manufacturing industry in Turkey is dependent on the import of intermediary goods. Providing a domestic production of intermediary goods, producing high value added goods, providing product diversity in export, improving human capital, adopting the innovation culture, providing technological infrastructure, and eliminating the bureaucratic barriers that prevent industry from making innovation are possible by the way of supporting the firms. The investment in education must be increased and educational system must be reformed, so that it could attract more employees with high level of knowledge and skills and who adapt to the new technologies. Middle income trap is not an unavoidable end for Turkey. If the necessary policies are applied effectively; Turkey can escape from this trap.

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### ***Pułapka średniego dochodu: porównanie Turcji i państw BRICS***

#### ***Streszczenie***

Pojęcie pułapki średniego dochodu zajmuje miejsce wśród najczęściej poruszanych kwestii w literaturze poświęconej wzrostowi gospodarczemu. Istnieje wiele krajów, które nie są w stanie przejść do poziomu wysokiego dochodu i które utknęły w pułapce średniego dochodu. Państwa te pokonały barierę niskiego dochodu wskutek gwałtownego wzrostu, jednak gdy doszły do poziomu średniego dochodu, ich gospodarki zaczęły rosnać w wolniejszym tempie i napotkały impas wynikający z nieodpowiedniej produktywności. Celem niniejszego artykułu jest przeanalizowanie zagadnienia pułapki średniego dochodu i porównanie pod tym względem Turcji oraz państw BRICS (Brazylia, Rosji, Indii, Chin i Republiki Południowej Afryki). W celu dokonania porównania uwzględniono takie czynniki, jak kapitał ludzki, edukację i innowację. Choć Turcja wykazała ostatnio znaczącą stopę wzrostu, istniejący kapitał ludzki i innowacje wydają się niewystarczające do przejścia do wysokiego dochodu. We wnioskach, w oparciu o porównanie z krajami BRICS, zaprezentowano sugestie dla polityki Turcji w celu uniknięcia pułapki średniego dochodu.

***Słowa kluczowe:*** pułapka średniego dochodu, kapitał ludzki, innowacja, BRICS, Turcja.