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KRISZTINA SŐREG

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PROTRACTED GROWTH SLOWDOWNS AND INCOME TRAPS IN THE DEVELOPMENT PATH OF EMERGING ECONOMIES

Comparative Analysis of the BRICS and CEE Economies

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TARTÓS NÖVEKEDÉSI LASSULÁSOK ÉS JÖVEDELMI CSAPDA EPIZÓDOK A FELZÁRKÓZÓ GAZDASÁGOK FEJLŐDÉSI ÚTJÁBAN

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"Economic growth without social progress lets the great majority of the people remain in poverty, while a privileged few reap the benefits of rising abundance."

John F. Kennedy, March 14, 1961

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PROTRACTED GROWTH SLOWDOWNS AND INCOME TRAPS IN THE DEVELOPMENT PATH OF EMERGING ECONOMIES

Comparative Analysis of the BRICS and CEE Economies

(Summary)

In the long term, the development path of any economy or country group is usually representing a cyclical pattern of faster, convergence-based phases and also shorter or more protracted slowdown periods occasionally combined with some stagnation episodes. In our globalized 21st century world economy, it is also typical that in the periphery regions, growth rates during the expansion and recession periods are more volatile meaning that in frames of current global capitalism, there is a higher probability that more intensive growth cycles are followed by more significant economic downturns. Current Thesis investigates growth tendencies in two special groups of emerging economies: the BRICS' – as global semi-peripheries – and some selected Central and Eastern European countries – as integrated peripheries – being defined within the research as dependent market economies. Also, it is tested whether these economies have been affected by the middle-income trap ('MIT') phenomenon which might be characterized with fast converging growth periods followed by significant recessions and thus having relevant influence on long term convergence. The research puts special emphasis on the growth trajectories of Hungary as it has produced altogether two MIT episodes since the 1950s and is currently drifting towards a very high rate of dependency within the region.

"Economic growth has thus become the crucial juncture where almost all modern religions, ideologies and movements meet. The Soviet Union, with its megalomaniac Five Year Plans, was as obsessed with growth as the most cut-throat American robber baron. Just as Christians and Muslims both believed in heaven, and disagreed only about how to get there, so during the Cold War both capitalists and communists believed in creating heaven on earth through economic growth, and wrangled only about the exact method. Today Hindu revivalists, pious Muslims, Japanese nationalists and Chinese communists may declare their adherence to very different values and goals, but they have all come to believe that economic growth is the key for realizing their disparate goals."

Yuval Noah Harari: Homo Deus: A History of Tomorrow, 2017

1. INTRODUCTION

1.1 Motivation for the research topic

There is no doubt that fast economic growth of emerging countries produced in recent decades is playing a vital role in the overall development of our world economy. Periods of significant growth and slowdown have considerable effects on global economic tendencies – and also, peripheries depend on the business cycles of the centre – and market processes in both more and less developed regions. Over the last ten years, the average growth rate of GDP per capita has been almost double that of the developed economies. It is also a well-known fact that in case of latter countries, the financial crisis of 2007-08 has had quite devastative impacts, especially regarding the protracted recession period in the European Union. However, developing economies have been much more affected by recent downturn due to the crisis accumulation process going on within the region for decades. Recessions are much more severe in emerging economies due to the previous higher growth rates.

In frames of current Thesis, the issue under scrutiny is the overall economic development of two selected groups of emerging economies: on one hand, the analysis is carried out regarding the so-called BRICS country group (Brazil, Russia, India, China and South Africa – occasionally narrowed to the BRIC classification) and on the other hand, two selected groups of the Central and Eastern Economies (CEECs) countries – an extended range of CEECs as well as the Visegrad Four economies (the Czech Republic, Hungary, Poland and Slovakia). Despite the geographical distance as well as significant socio-economic differences, both groups of countries have managed to produce relatively high growth rates and also, episodes of protracted slowdowns. However, the phenomenon of the middle-income trap (hereinafter referred to as 'MIT') and the status of dependent

market economies also serve as common elements in the specified countries, so the novelty of current research lies in the analytical framework applied to examine the presence as well as characteristics of both factors in our two focus groups regarding long term economic growth and convergence. What factors might determine the short and long-term development and catching-up of certain regions of the world? Can triggers which possibly contribute to slowdown periods, be classified according to any accurate method that might be economically legitimate for more than one nation state? What is the relationship between dependent market economies theory and the middle-income trap?

To continue, it is also important to investigate which country group and why has been performing in an efficient way during the last couple of decades in relative terms. Can asymmetric interdependencies be blamed for the long-run economic divergence of certain – usually middle-income level – countries which are struggling to catch up to the more developed economies but are failing to achieve latter goal with the current conditions of global capitalism? In order to have a more comprehensive macroeconomic approach of the issue, the Author has developed a new definition for the middle-income trap phenomenon by focusing on both exogenous as well as endogenous factors of the economic development concerning the BRICS' and the CEE economies' growth path. The research carried out in the Thesis pays special attention to the case study of Hungary since it is representing one of the most ambivalent development models within the analysed economies. Thus, it raises some further questions about the long-term development tendencies of strongly FDI-based, small and open economies.

1.2 Background, purpose and main questions of the research

The purpose of current research is to contribute to a special sphere of economic growth and development studies that is the **dependency theory approach reduced to the so-called dependent market economies perspective**. In frames of latter approach, the Author provides a new theoretical and analytical method by **combining dependent market theory with the middle-income trap phenomenon through the examination of the BRICS as well as selected CEE economies**. Although current thesis should be primarily regarded as a synthesis of an applied research involving more than five years of efforts, the Author still thought important to provide an extensive literature review in order to make the background and main purpose of the research easy to understand.

The main background of the research is provided by the classical, alternative and modern growth and development theories and their interpretation of economic growth, development of countries and the main causes of different inequalities that are accumulating due to **asymmetric interdependencies** in our globalized world economy and current form of capitalism. A strong **long-term cyclical approach** has been applied throughout the research in the attempt to find patterns of protracted growth slowdowns in the investigated dependent economies. The Author develops an alternative definition of economic dependency for the analysed country group and also presents the main **framework and preconditions of the research** carried out according to the following:

(1) The **long-term growth and economic development of our world economy has a cyclical nature**, which is connected to the cycles occurring in the return of invested capital assets and the progress of technological innovation. This phenomena was extensively studied in the early 20th century by Kondratiev (1925). However, in recent decades, globalization and the onset of the information age has greatly contributed to the decreasing duration of each cycle.

(2) **Economic growth and development are nonlinear and non-constant processes** usually cross-cut by several endogenous and exogenous factors leading to periodical crises and the evolution of new economic models or varieties of capitalism.

(3) If we would like to get a realistic picture on the prospects of economic convergence of middle-income economies, then the patterns of their development paths should be examined on a lengthy, preferably multi-decadal timescale. **The possibility of economic convergence (or the lack of it) could be only assessed after several decades of observational data become available**. To achieve this perspective, with the combination of several sources, the Author gathered time series on income levels and economic growth rates for more than 100 countries starting in the 1950s.

(4) Our **21st century world economy** might be best viewed as a **transnational monopoly-capitalism system** based on Rozsnyai's (2002) research which is dominated by the hectic activity of trans- and multinational companies (and some other relevant owners of large assets) seeking new areas for cheap resource

colonization through usually underpaid labour force and making attempts to further increase their profit rates.

(5) As a result, the world economy is predefined by **asymmetric interdependencies** manifested in the growing inequalities of development among countries and country groups. However, instead of the classical Wallerstein approach of centre, semi-periphery and periphery, the research is based on Artner's interpretation (2014, 2017 and 2018) of **global core, global periphery, global semi-periphery, integrated periphery, integrated semi-periphery and finally, immanent periphery and semi-periphery and their furtherly integrated forms**.

(6) Both examined country groups (**BRICS and CEECs**) are viewed as **two special manifestations of dependent market economies**. While former group are mainly characterised by an excessive internal market, large labour force and fair domestic savings for continuous development, the CEEC region is comprised of small open economies which are highly integrated to each other and the more developed part of the EU. The strictly defined Central and Eastern European region has 11 countries which are EU members (CEE11), together, they have a population of about 100 million. If we take into account other countries (such as Ukraine, Serbia or Albania) which are not EU members but have an association agreement, free trade agreement or candidate status, the region's population climbs up to nearly 180 million. The latter value is comparable to the market size of Brazil or Russia.

(7) **Dependent market economies are much more predestined to develop a middle-income trap phenomenon** which might further contribute to their dependency in lack of the appropriate politico-economic interventions.

(8) According to the available data, we are assuming that **in certain emerging economies with a high extent of dependency and some special conditions, an endogenous growth rate** (the constant, positive per capita growth rate achieved without external technical progress) originally developed by Ligeti (2002) **might not be realized during the next decades** and thus it puts significant obstacles to long-term convergence.

In what follows, the Author is briefly presenting the **five fundamental hypotheses** developed within current research. These are being grouped into three main theses: Thesis I. and II. are containing only one-one individual hypothesis.

THESIS I. GROWTH TENDENCIES OF THE DEVELOPING ECONOMIES

- **H1: Global semi-periphery economies** (e.g. BRICS country group) – **due to certain favourable endogenous and exogenous factors** (geographical location, high raw material and natural resource abundance, huge domestic market, beneficial demographical tendencies, "follower based" technological developments or periodically increasing/decreasing global competitiveness) – **are holding high potential of realizing a successful catching-up path and thus significantly redefine the power balance between centre and periphery economies**.

THESIS II. THE MIDDLE-INCOME TRAP PHENOMENON

- **H2: The integrated periphery economies** (e.g. Central and Eastern European Countries) – **due to their historical burden based asymmetric interdependencies** (high dependence on foreign direct investment inflows, relatively small domestic market and purchasing power, lack of natural resources and raw materials, the cumulated economic divergence since the change of the regime in case of Central and Eastern Europe and middle-income trap episodes) **are not likely to produce significant long-term convergence to the Western European centre with the current conditions of global capitalism. The relatively small-scale and in most cases, hectic development of such highly dependent market economies might be rather viewed as a special case that usually emerges only in certain economies having initial advantages**.

Meanwhile, Thesis III. is comprised from three sub-hypotheses (H3, H4 and H5). Each of them are related to specific issue regarding the long-term convergence potential of a single middle income economy or a group of greater interest:

THESIS III. CONVERGENCE PATH OF THE BRICS AND CEEC ECONOMIES IN LIGHT OF THE MIDDLE INCOME TRAP

- **H3: The growth dynamics of the BRICS countries shows strong correlation with the fluctuation of commodity prices, especially in case of the raw materials and natural resources**.

- **H4: The process of accession to the European Union** - by stimulating foreign investment to the region - **has strongly contributed to the significant pre-crisis growth as well as to the post-crisis persistent growth slowdown in Central and Eastern European Countries.**

- **H5:** Strictly in economic frames, **Hungary has been showing a significant diverging tendency from the Visegrad Four countries since the mid-2000s and thus represents a special case within the country group** having possible further implications regarding its catching-up path. Further, **based on Jánossy's trendline theory calculations, Hungary's long-term** (of almost a 100 years long period) **average GDP per capita growth rate is around 1.8 percent per year, indicating that it has been neither converging nor diverging to the most developed economies**.

❖

"Measurement aside, there are two reasons aggregate growth might matter. The first is to create jobs to assimilate the unemployed and anticipate increases in population. The second is to improve living standards. Economic logic does not require overall expansion to achieve either of these objectives. An expanding labour force can be accommodated if hours of work fall. And it's productivity growth, rather than the overall size of the economy, that drives improvements in living standards. Getting bigger doesn't necessarily yield wealth; improving productivity does."

Juliet Schor: Plenitude: The New Economics of True Wealth, 2010

2. RESEARCH METHODOLOGY AND SOURCES

2.1 Data and methods

In order to provide an extended analysis of growth slowdowns and economic growth episodes of the selected countries, the dissertation composes of both qualitative and quantitative research methods. As it has been already mentioned, Chapter 3 provides a theoretical comparison of the different economic growth related approaches and models in frames of a secondary research. On the other hand, starting with Chapters 4 and 5, the Author is introducing several empirical methods with the aim of detecting growth trajectories of the BRICS and CEECs as well as to find some middle-income trap episodes by developing a new system for latter phenomenon. The following quantitative tools have been applied within the research:

- **comprehensive micro and macro level data comparison** regarding the investigated countries' economic performance relying on the databases provided by several international organizations (see beneath) as well as the researched countries' statistical bureaus' information;

- **statistical and econometric models and analyses** (e.g. Jánossy's trendline model);

- **statistical hypothesis testing and comparison of samples** (e.g. probability of slowdown episodes, randomness testing of the order of years with slowdown periods, covariance of closing years of slowdowns within country groups, etc.);

- **prediction models such as two- and multiple variable regressions and variance analysis** (ANOVA).

In course of the Author's empirical research, the following sources have been used with the highest frequency:

- CIA – The World Factbook;
- Eurostat;
- IMF Data;
- National statistical office databases provided by the examined economies;
- OECD Statistics;
- The Fraser Institute – Economic Freedom Index;
- The Maddison Project Database;
- The World Bank – World Development Indicators;
- UNCTADSTAT;
- WEF – Global Competitiveness Reports;

2.2 Structure of the research

Following the introduction of the chosen research field as well as a methodological summary of the applied quantitative means and models, the research topic investigated in the dissertation is introduced by an extended **theoretical overview of growth theories and development studies** with a special focus on development asymmetries in frames of **Chapter 3**. From the classical approach to the modern growth theories, the Author provides a brief analysis of the most relevant statements, conditions and characteristics of economic growth, growth slowdowns and economic development based approaches which are significant from the point of view of current research topic.

Chapter 4 is representing the congestion point of both theoretical and practical approaches by introducing in details the middle-income trap concept. After presenting the recent results in the field of current scientific literature, the Author is developing an alternative definition and calculation method for the phenomenon relying on The World Bank World Development Indicators (WDI) as well as the Maddison Project Database. This section also publishes the findings of the Author regarding those countries' income trap episodes over the last almost 70 years which might be detected with the above-mentioned technique. The core of the research is provided in Chapter 5 where the

development path of the BRICS economies and Central and Eastern European countries is presented by analysing the main characteristics of economic dependency, detecting the basic triggers of growth which contributed to successful convergence episodes and revealing the critical points of the socio-economic as well as political and international environment of the countries that possibly provoked significant slowdown stages in their growth path. The final chapter (**Chapter 6**) of the dissertation serves as the concluding block of the research with referring back to the original hypotheses introduced in Chapter 1 and also the most significant findings of the Author.

"The general economic growth of the quarter of a century that followed World War II not surprisingly created many illusions. In the West, people thought that they had found in Keynesianism the definitive solution to the problem of crises and unemployment. It was thus thought that the world had entered into an era of perpetual prosperity and definitive mastery of the business cycle. In the socialist world, it was also thought that the model formula for even higher growth had been discovered which enabled Khruschev to announce victoriously that by 1980 the USSR would have overtaken the United States "in every domain." In the third world of Africa and Asia, the national liberation movements which had seized political independence, also had a battery of prescriptions which, in a mix of capitalist and socialist recipes, in doses that varied from case to case, would enable these movements to overcome "underdevelopment" in "interdependence."

Samir Amin: The Social Movements In The Periphery: An End To National Liberation? 2006

3. THEORETICAL OVERVIEW AND METHODOLOGICAL FRAMEWORK OF GROWTH AND DEVELOPMENT STUDIES

3.1 Basic theoretical approaches of economic growth

In what follows, the Author is providing a comprehensive overview of the most relevant economic approaches organized in two main sections of this Chapter. First, there is an introduction to the most significant growth theories dating back to the main concepts established by Adam Smith to nowadays' new directions and disciples until the modern interpretations of economic growth. Second, the Thesis provides a complex analysis of the most important development economics based approaches including a methodological review of the available tools and techniques for evaluating the development path of a given economy or group of countries. In both cases, the issue under scrutiny is **to find definitions, characteristics, methods, patterns and also their critics regarding economic growth, development and inequality interpretations** in order to draw an outline of the relevant changes undergone in our globalized world economy.

3.1.1 Classical approach

There have been several explanations to the economic growth and development of countries over the past decades and centuries throughout history. Among the first ones, **Adam Smith**[1], the emblematic figure of the Classical economic theory stated that **the**

[1] Scottish economist, philosopher (1723 – 1790). It is not widely known, but his writings on free market economic theory, rational self-interest and competition were very controversial in their own day.

most significant base of growth is the available labour force of a given country which is able to produce all the goods necessary for their own life as well as for purchasing some products from other nations which are scarce or not available at all. The ratio of the population holding resources and thus being able to buy more is determined by two main factors: on one hand, Smith indicates the *skills of the labour force* and on the other hand, the *number of employed and unemployed people*. Basically, Smith was the first economist highlighting the importance of human capital from the point of view of economic development in the 18th century also emphasising the importance of skilled labour force (Smith, 1776).

Smith is also driving our attention to the way **human capital productivity** might be increased by presenting three main conditions (Smith, 1776, p. 10):

1. developing skills – or "dexterities" – of labourers;
2. decreasing working time per work activity through time saving methods;
3. developing new technologies *("appropriate machinery"*) that enable labourers to carry out much more work per individual.

Besides the usual, growth-orientated analysis, "**The Wealth of Nations**" also offers some contribution to *inequality* studies relevant in current Thesis. Smith argues that certain European policies made attempts *to restrain competition regarding employment*, although there would have been capacity for more. The opposite of the above-mentioned tendency is also imposing risks towards a more equal society (increasing employment above its natural level, for example, by supporting the education of the clergy). Thirdly – and probably this is the strongest argument within the topic, – *putting obstacles into the way of free labour flow*, e.g. the special role of apprenticeship not allowing young workers to shift their field of work or some privileges of corporations such as high wages (Smith, 1776). However, the introduction of the concept of the "*invisible hand*" making the reallocation of the available resources the fairest system, raised some concerns and was often heavily criticized (Smith, 1776 & Engel, 2010).

Following Adam Smith's theory, the research aimed at economic growth was further developed among many others, by **Thomas Malthus**[2]. In his famous work entitled "**An Essay on the Principle of Population**" and published at the end of the 18th century, the

[2] In his early life, Malthus (1776-1834) was a cleric in England, but later became influential in the fields of economics and demography. Malthusian thoughts are commonplace in the environmental movement.

author is raising awareness to the strong connection between economic growth and rapid population increase. *"Population, when unchecked, increases in a geometrical ratio."* – states the essay (Malthus, 1798, p. 4). **Inequality** is thus viewed by Malthus as the **disproportionate relation between human population and production of the earth** (i.e. the scarcity of natural resources). To be more precise, securing the right to private property and introducing the institution of marriage, inequalities will certainly arise in any society according to his views (Malthus, 1798).

To continue, one of the main statements of Malthus as well as his followers was that there is a **complex relationship between the population growth rate and the standards of living** of a given economy. Malthus observed that growth in food supply, due to better practices in agriculture or a series of years with favourable weather conditions improved the well-being of the populace, but this improvement was only temporary because it led to population growth. According to some recent research, latter hypothesis may had been valid in the late 18th century, but in the last 50-100 years it is not, since in most developed economies with high standards of living birth rates are often below replacement level. The second Malthusian conclusion states that higher population contributes to falling standards of living. In this form, the statement is also doubted since there are many countries with relatively high population density being far from poor, both in Europe and Asia. There might be several other factors that equalise the negative outcome of large population or rapid population growth, so poverty will not necessarily emerge of such conditions (Weil-Wilde, 2010).

David Ricardo[3], in his famous book entitled "**On the Principles of Political Economy and Taxation**" from 1817, stated that foreign trade in itself would cause the growth of any given economy's value but it would certainly generate the volume of commodities of the country. The famous **comparative advantage theory** that he developed gives an explanation for **achieving greater economic growth**. Ricardo claims that such country might realize economic growth as the one that is able to trade its goods within the manufacture having comparative advantages. The beneficial effects of foreign trade can be utilized if there are no obstacles to the flow of goods (Ricardo, 1817). Thus, the author highlights the negative consequences of trade barriers (protectionism) from the point of view of long term economic growth and development. Another relevant outcome of the

[3] British political economist (1772 – 1823) with Hispanic Jewish and Portuguese origin. Ricardo started working with his stockbroker father in his teens, showing interest towards economics at a very young age.

Ricardian model is that **economic growth has to fall, deteriorate and finally, to come to an end** due to the fact that land is a scarce resource and it also has decreasing marginal productivity. Although in this form, several arguments might be raised towards the ending economic growth, many other economists further developed this idea. For example, *Keynes* (1936) was also inspired by the thought when explaining the possible origins of macro-stagnation that he owed to the significant aggregated demand based insufficiency in countries being partly protectionist (Formaini, 2004).

3.1.2 The Marxist and socialist critique of the classical approach

Although such classical economists as *Smith, Malthus, Ricardo, Bentham* or *Say* greatly contributed to the classical, 'laissez-faire' based economic approaches, there were many contradictions in their statements later argued by such thinkers as **Karl Marx**[4] and his followers. In his book "**A Contribution to the Critique of Political Economy**" published in 1859, Marx analyses the weaknesses of Smith's theory: Smith describes the commodities' value to be calculated by labour-time in a society where there are no classes (e.g. capitalists, labourers, etc.). *"We see then that which determines the magnitude of the value of any article is the amount of labour socially necessary, or the labour-time socially necessary for its production."* – expresses Marx in his "Capital Vol. I" work (Marx, 1958, p. 39). Marx states that it is not correct to think that the division of labour assumes individual exchange (Marx, 1859). Also, regarding Ricardo's achievements, the critique aims at the incoherent interpretation of the value and price relationship (Pilling, 1980).

However, the biggest difference between the two schools is that classical economy views **capitalist system** as being integrated into the natural law while Marxists are convinced that it **is only a temporary phase between feudalism and socialist economy**. The industrial revolution provoking a huge shift in economic thinking was creating – according to Marx – the layer of *capital owners* and the *workers exploited* (Tri, 2008). The exploitation of labourers has two consequences: capital accumulation as well as an inadequate purchasing power of the working class. Marx emphasized the role of

[4] German philosopher (1818 – 1883), possibly the most influential critic of free-markeeter classical economics. Early in his life, in 1843, Marx became stateless because of his thoughts and publications. Thereafter, he left Prussia and lived in exile with his wife and children in London for decades where he continued to develop his alternative theory of social and economic development. The reading room of the British Museum was his primary place of doing research.

decreasing profit rates which are repetitively leading to crises in case of a capitalist way of production: these crisis periods are provoking the (further) concentration of capital, wealth, and they are leading to increasing unemployment, the total social deprivation of the proletariat and finally, a *social revolution* (Fusfeld, 2002). It might be concluded that based on Marx's research, inequalities and thus the lack of development result from the appropriate functioning of industrial capitalism (Tri, 2008). After the death of Marx, **Friedrich Engels**[5] edited and published the second and third volumes of the Capital.

3.1.3 Neoclassical growth models

Neoclassical economics dates back to the second half of the 19th century and represents a new milestone in economic theory by focusing on consumption, utility, demand as well as equilibrium (Engel, 2010). The new approach was introduced by the so-called **marginal revolution** and is associated with such thinkers as **Jevons, Menger** or **Walras**. Instead of the labour based approach originating from Adam Smith, *willingness to pay* was represented by the function of value. Also, the limited definition of the traditional physical market was finally extended to the concept of resource allocation platform (Kaldor, 2019). In 1890 **Alfred Marshall**[6] published his "**Principles of Economics**" and thus greatly contributed to the development of marginalism as a second-generation thinker. During this period, *economic growth and development gained new dimensions* through the investigation of price mechanism, the importance of regulation and by realizing that in any country, all sectors and factors affect basically everything else (Marshall, 1920).

In 1928 **Charles W. Cobb**[7] and **Paul H. Douglas**[8] published their research entitled "**A Theory in Production**" which serves as a relevant base for later growth models presented in this Chapter. The authors prepared the thorough analysis of the US' growth of fixed capital in manufacturing between 1899 and 1922. The mathematically formalised, new

[5] Economist and sociologist of German origin (1820 – 1895). He was born into a wealthy family in Prussia, his father owned both English and German textile factories. Through his life he was engaged simultaneously in social sciences and doing business. In 1848, he co-authored 'The Communist Manifesto' with Marx and later even supported him financially, contributing to the completion of 'Das Kapital' in many ways.
[6] One of the most influential neoclassical economists (1842 – 1924). Was born and lived in London, England. Although he emphasized on high level of mathematics, he never intended to overshadow economics with excessive calculus.
[7] American economist (1875 – 1949), who was originally a mathematician and received his PhD in 1912.
[8] American economist (1892 – 1976), he was also a politician, member of the Democratic Party and served as a senator from Illinois for 18 consecutive years, between 1949-67.

Cobb-Douglas production function is built on two factors of production, labour and capital and might be expressed as the following:

$$Y = K^{\alpha}(AL)^{\beta} \qquad (1),$$

where Y is the macroeconomic gross output, K is the available physical capital and L is the employed labour force for the given year. A is representing the technological level of the use of the factors of production and is called *Total Factor Productivity* (TFP). The two exponents (α and β) refer to the elasticity of capital and labour utilization of gross output (Cobb-Douglas, 1928):

$$\alpha = \frac{\partial Y}{\partial K} \cdot \frac{K}{Y} \qquad (2a)$$

$$\beta = \frac{\partial Y}{\partial AL} \cdot \frac{AL}{Y} \qquad (2b)$$

During the 1950s **Robert Solow**[9] and **Trevor Swan**[10] developed a neoclassical growth model which later became well-known as the **Solow-Swan growth model**[11] and enabled to prepare the analysis of the long term economic growth process and its main factors. The base of the model is the *Cobb-Douglas production function* and it assumes that capital depreciation (δ), saving rate (s), population growth rate (n) and technological level (g) are fix constants. It is also known as the *balanced growth path* to which the given economy is converging in the long run regardless of its initial level of development and its common form is the following (Solow, 1956):

$$y = k^{\alpha} \qquad (3)$$

where $y=Y/AL$ is the output per labour applied that is equal to k=K/AL.

[9] Neoclassical growth economist (1924 –), his first studies were sociology and anthropology. After a couple of years, he returned to university and completed an economics program. Later on he became interested in statistics and econometrics. Since the 1950s, his institution is the MIT in Boston. Received the Nobel Prize in economic sciences in 1987 and four of his former PhD students, George Akerlof, Joseph Stiglitz, Peter Diamond and William Nordhaus also received such prizes based on their outstanding research.

[10] Australian economist (1918 – 1989), professor of economics at the Australian National University between 1950 and 1983, former board member of the Reserve Bank of Australia in the 1970s and '80s.

[11] The model was published in 1956 under the name of Robert M. Solow in his article entitled "*A Contribution to the Theory of Economic Growth*". In 1987 Solow won the Nobel Prize for his great contribution to economic growth. Swan also released a publication in 1956 ("*Economic growth and capital accumulation*"), yet, the two authors developed the model separately.

In frames of the model we assume first that future capital stock (K') equals the sum of present capital stock (adjusted with amortization) and the sum of the investments in an economy:

$$K' = K(1 - \delta) + I \qquad (4)$$

We also suppose that savings are realized at a constant rate, so they are representing only a certain, fix part of the total consumption of the population:

$$C = (1 + s)Y \qquad (5)$$

To continue, population growth rate is increasing at a constant value, so it might be expressed similarly to the consumption equation with N' being the future population:

$$N' = (1 + g)N \qquad (6)$$

Finally, our fourth and most relevant factor is technology which depends on capital as well as labour, thus production function is applied as what follows:

$$Y = aF(K, L) \qquad (7)$$

In his article Solow claims that *"An especially easy kind of technological change is that which simply multiplies the production function by an increasing scale factor"* (Solow, 1956, p. 85).

The model also introduces the so-called **steady-state situation** where output and capital are constant over the examined period. The model states that **countries converge to latter equilibrium in the long run**. It might be demonstrated with the following central equation of motion:

$$k^* = sf(k) - (g + n + \delta)k \qquad (8)$$

How could we define economic growth and development as well as global inequalities relying on the model? According to Solow and Swan, the main outcome based on the above-mentioned conditions is that **in the long run, only the change of technological progress can lead to overall economic growth**. So the 'g' parameter is also called as the rate of *labour-augmenting technological progress*. Physical capital is not responsible for growth since there are significant differences among countries' incomes. As for savings, we can come to a very similar consequence: yet a relatively high saving rate leads to a

higher steady-state level of Y, but it comes with a lower relative and possibly, even absolute level of consumption. Therefore, it cannot lead to persistent economic growth in the long run. Solow also predicted that economies with higher rates of population growth have lower levels of income per capita and lower levels of steady-state of capital per worker. Productivity growth improves consumption and investment simultaneously (see Fig. 1).

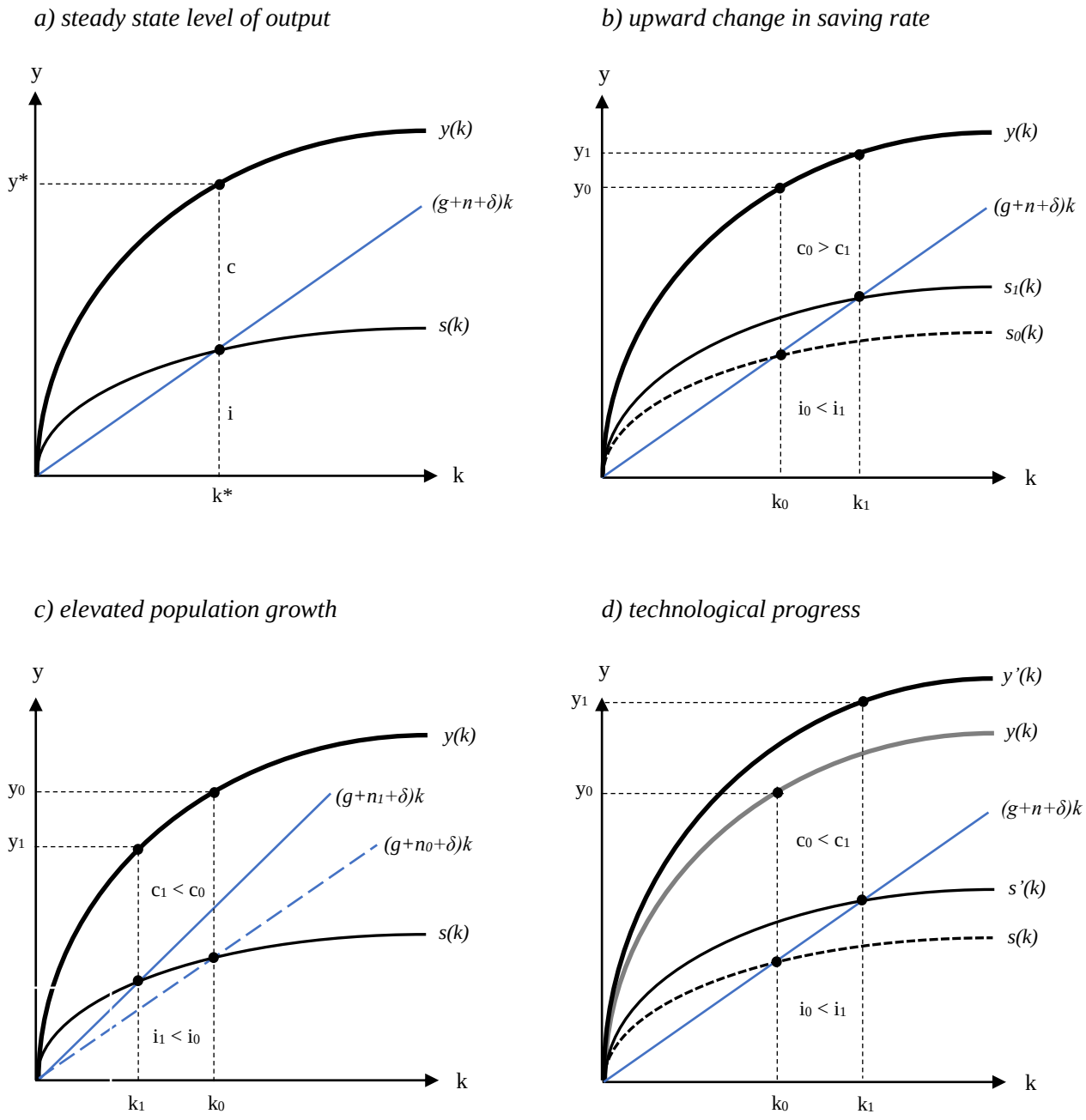


Figure 1: Equilibrium and growth from the neoclassical perspective

Source: Author's own work based on Solow (1956)

An implication of the model is that **countries with lower level of development necessarily grow faster and will finally catch up (or converge) to the developed ones** (this is the so-called *conditional convergence*). As history has shown, this hypothesis might not be accepted. In 1992, **Mankiw, Romer** and **Weil** extended the original model with the **accumulation of human capital factor** which is correlated with 's' and 'g'. The authors assume that output is the combination of physical, human capital and also labour. They also claim that **convergence in income per capita is realized over a much longer time horizon** calculating that an economy achieves its halfway to steady-state in 35 years compared to Solow's 17 years (Mankiw-Romer-Weil, 1992).

3.1.4 Alternative schools of the 20th century

As it might be noticed, the most significant changes within the mainstream economic thinking usually occur following an economic crisis or if some other relevant shock is experienced/produced by the world economy. During the 1930s, the global economy was supressed by the *Great Depression*. Industrial output fell drastically, unemployment rate was skyrocketing (in the USA, the number of jobless persons increased by more than 600% in a timespan of just three years, between 1929-32), consumption dropped due to the poverty spreading quickly among people, banks crashed and foreign trade also decreased (-70 percent of change in the US for the same period) by an unbelievably high rate (Blum-Cameron-Barnes, 1970). The previously dominating neoclassical approach lost its ground being unable to find explanations to growing unemployment, falling prices, persistent deflation and not accepting the regulatory role of the state. In 1936 **John Maynard Keynes**[12] published "**The General Theory of Employment, Interest and Money**" work in which he strongly criticized the neoclassical school and also aimed to provide an alternative vision of the economic development. Keynes realized that there is **insufficient demand, unemployment is usually current, prices should be viewed as rigid and equilibrium might be only reached through the active interventions of the state** (Keynes, 1936). Keynesianism thus represented a theory based on insufficient demand in contrast with the neoclassical belief in insufficient supply. The main intention of Keynes was to preserve liberal capitalism from crises as well as to prevent a socialist

[12] British economist (1883 – 1946), founder of the interventionist school named after him. In addition to his theoretical work, Keynes contributed to the establishment of the Bretton Woods financial system, the creation of the International Monetary Fund and the World Bank in the mid-1940s.

revolution. Thus, economic growth and development might be achieved in a more effective way. Following the two world wars, the approach became the most popular first among the centre countries of high development and later among developing nations as well (Engel, 2010). Keynes's principles have also had relevant influence on development economics formulation during the 1950s.

As it has been already mentioned, economic crises always accumulated more attention towards the long-term analysis of countries' development. Thus, the so-called **macro cycles** or waves gained more and more importance during the first half of the 1900s. During this period, evolutionist economics was on its rise and was represented among many others by **Nikolai Kondratiev**[13], a Soviet economist who is famous for analysing and presenting the well-known "**Kondratiev waves**" of expansion, stagnation and recession. These long waves were later named by *Joseph Schumpeter* based on Kondratiev's significant revelation, however, they are also named as K-waves. In 1925 he published his book entitled "**The Major Economic Cycles"** in which he explains that **the introduction of innovations as well as technologies serves as a trigger for countries to move towards a new phase of development from the declining stage** (Kondratiev, 1925).

Long-term capital cycles become even more intense in frames of global economy since they largely contribute to the expansion of global relations (Artner, 2014 & Grinin-Devezas-Korotayev, 2012). Yet, Kondratiev was not the only economist at that period to pay so much attention to the cyclical nature of economic development. After a couple of years, the **construction cycles** were specified by **Simon Kuznets**[14] who indicated an approximately 17-30 year period for latter ones (Kuznets, 1930). The cycle theory has gained more and more importance over the decades and it was extended with many factors by several other authors engaged in this field of research, although there is no consensus among economists regarding the nature of the cycles. In Hungary, cycle theory has been also actively analysed directly or indirectly by such researchers, economists as *Ferenc Jánossy, Tamás Szentes, András Bródy, Ervin Rozsnyai*, *Annamária Artner* and *Péter Szigeti*.

[13] Russian-soviet economist (1892 – 1938) proponent of economic reforms, victim of Stalin's great purge.
[14] Russian-born, American economist (1901 – 1985), who received the Nobel Prize (1971) in economic sciences for his unique and empirically based interpretation of economic growth which has led to new and much wider insight into the economic and social structure and process of development.

An alternative approach was also specified by an Austrian economist, **Joseph A. Schumpeter**[15] who contributed to the development of the evolutionary economics during the first half of the 1900s. He was examining the *long term development of capitalism* and introduced some more radical ideas, for example, that the evolution of capital is based on technological competition among firms. This idea originally came from Marx and both of them could agree that innovation might be constant since its positive effects on economic growth are only temporary due to the activity of the imitators (Fagerberg, 2003 & Schumpeter, 1954). In his book entitled "**Capitalism, Socialism & Democracy**" Schumpeter introduced his most well-known concept of **"creative destruction"** defining it as a process having a nature of *"…industrial mutation — if I may use that biological term—that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one"* (Schumpeter, 1943, p. 83).

The economist also explains what he means by **development**: it is basically **innovation which is created by using the already existing tools, resources, etc**. (Schumpeter, 1934). It is also worth mentioning that Schumpeter did never view bigger firms as an obstacle of development, competition since innovations always emerge from smaller newcomers at the market (Fagerberg, 2003). Nowadays, we can partially verify his thoughts by reflecting on start-up firms creating the seeds of new technologies, methods or services. However, trans- and multinational companies' activities might be doubted as not having any negative effect on global competition. Economic growth theory gained a new perspective in frames of a Keynesian approach by the **Harrod-Domar model** that is often applied in development economics. Similarly to the Solow-Swan model, it was developed separately by two economists: in 1939 by **Roy F. Harrod**[16] and in 1946 by **Evsey Domar**[17]. The model's two most relevant assumptions are that on one hand, **growth rate depends on the level of national saving and** on the other hand, **the capital-output ratio**. The proportion of these two factors basically result the growth rate of the gross domestic product in an economy. Regarding the definition of economic growth,

[15] Schumpeter (1883 – 1950) was born in Moravia (territory of the modern Czech Republic), later he lived in Vienna and briefly served as finance minister for Austria in 1919. As a political economist, he became a professor at Harvard University in 1932 and even obtained U.S. citizenship.
[16] British economist (1900 – 1978), besides his academic publications, he is best known for writing an excessive biography titled 'The Life of John Maynard Keynes'.
[17] Russian-born, American economist (1914 – 1997), emigrated to the USA from the far eastern Soviet Union in 1936. Later, he graduated at Harvard University and received his PhD in Economics at the same institution in 1946.

Harrod specifies three versions in his publication entitled "**An Essay in Dynamic Theory"** (Harrod, 1939):

- *warranted rate of growth*: when production is neither more (uncontrolled growth) nor less (recession) than the appropriate amount;
- *actual rate of growth*: real rate of growth within a year experienced in an economy;
- *natural rate of growth*: the highest available rate of growth generated by population increase, capital accumulation, higher level of technology and the so-called work-leisure preference schedule with the assumption of full employment.

The Harrod-Domar model is thus determining an **instable long-term economic growth path with no convergence for the countries**. There is also **no conditional convergence** since economies are not drifting towards their long-term growth path. As a result, in most cases we might experience a constantly present and growing rate of unemployment or unutilized capital capacity. If convergence could still be realized, it would be achieved only towards a **non-equilibrium growth path** (Ligeti, 2002). The Harrod-Domar model has important implications for developing countries, where (unskilled) labour is a plentiful resource but capital is not. Lower income implies a higher proportion of autonomous consumption, which does not enable a sufficient rate of saving and investment. Therefore, accumulation of physical capital remains restricted, and as the economy does not "naturally" find full employment, growth in labour force and population cannot advance the economy. Economic growth might be created by stimulating savings and elevating the saving rate (s), increasing the marginal product of capital ($MP_k = c$) or by slowing down the depreciation rate of capital stock (δ).

$$\frac{\Delta Y}{Y_0} = sc - \delta \qquad (9)$$

The formula above came from simplifying the following relation between the marginal product of capital, the initial level and the measurable annual growth of gross output, the initial capital stock, saving and depreciation rate:

$$c = MP_K = \frac{\partial Y}{\partial K} = \frac{Y_{(t+1)} - Y_t}{K_t + sY_t - \delta K_t - K_t} \qquad (10)$$

The 20th century might be truly considered a productive era concerning the development of economic growth models. In 1960, an American economist, **Walt Whitman Rostow**[18] published his famous magnum opus, "**The Stages of Economic Growth: A Non-Communist Manifesto**" and presented a **5-stage growth model** as an antithesis of Marx's theory of modern history claiming that politics, social organizations as well as culture have emerged from the economy. Rostow precisely defined the 5 stages of growth: **traditional society, preconditions to take off, drive to maturity, take off phase and** finally, **the age of mass-consumption**. From the point of view of current Thesis, the most intriguing stage is the take-off phase. Rostow emphasises that change might provoke the take-off – or it might be even called convergence – by both endogenous and exogenous factors such as new level of technological development or for example, "…*the emergence of political power of a group prepared to regard the modernization of the economy as serious, high-order political business*" (Rostow, 1960, p. 8).

In the course of the second half of the 20th century, the world could witness another significant contribution to alternative schools' theories by **Immanuel Wallerstein**[19]. In 1974, Wallerstein provided a full analysis of the world system theory in his work entitled "*The Modern World System I: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century*" as well as in many of his further publications. However, the concept of **world-system theory** or paradigm[20] was used by him only two years later[21]. In latter paper he clearly defines the main differences between the previously dominant developmentalist and the newly introduced world-system perspective. The developmentalist approach is putting the given social action into a politico-cultural

[18] American economist and political advisor (1916 – 2003). He was remarkably anti-communist and worked as a speechwriter and foreign policy advisor to U.S. President John F. Kennedy and later to Lyndon Johnson. He was influential in shaping U.S. foreign policy in the 1960s, especially in Southeast Asia. Expressed a strong support towards the Vietnam war, and never changed his views on the subject.

[19] American sociologist and economic historian (1930 – 2019). Received both his BA, MA and PhD degrees from Columbia University. However, both studied and held visiting professorial titles at many institutions around the world. From 2000 until his death in 2019, Wallerstein worked as a senior research scholar at Yale University.

[20] Different sources use both "world-system theory" and "world-systems theory" as an expression.

[21] It was first mentioned in his publication entitled "*A world-system perspective on the social sciences*" at The British Journal of Sociology in 1976.

system or unit and aims to find the differences among them. On the other hand, the world-system perspective is focusing on a context based on the division of labour and presents empirical evidence to prove if the given system is tied politically and culturally[22] (Wallerstein, 1976).

Wallerstein argues that world-systems analysis might be initiated from the mid-18th century when capitalist world economy had already been existing for two hundred years and there was an urge to create a framework of economic research, scientific analysis of countries' development (Wallerstein, 2004). The author presents that **the international division of labour based world-systems theory of semiperiphery, core and periphery economies is a social system build on strong tension caused by the frictions among different groups fighting for the interests as well as advantages**. The theory was developed to counterweight the dualist nature of development studies which became widespread following the two world wars: **Arthur Lewis**'s[23] work of "**The Theory of Economic Growth**" introduced the view that **less developed economies have only two sectors** (traditional and modern one) and further development, modernization might be achieved only through redistributing resources to the modern sector by an import-substitution based strategy (Lewis, 1955).

Wallerstein provides a much more sophisticated approach and explains the phenomenon of **inequalities being constantly present in our history with the nature of capitalism**: "*Capitalism is based on the constant absorption of economic loss by political entities, while economic gain is distributed to "private" hands*." (Wallerstein, 1974, p. 348). His research was strongly influenced by such thinkers as *Marx, Kondratiev, Schumpeter* or *Karl Polanyi* and the main concepts of modernization and dependency theory providing some new elements to latter approaches and thus criticizing their linear development approach for countries' growth paths. Wallerstein also brilliantly combines Polanyi's

[22] Wallerstein is also providing an extended analysis of the topic in his research proposal entitled as "Patterns of development of the modern world-system" developed with Terence Hopkins in 1977.

[23] Caribbean-British economist (1915 – 1991). In 1979, he was awarded the Nobel Prize in economic sciences for advancing the understanding of economic growth and development (sharing the award with Theodore Schultz). Born into an Afro-American family on the island of Saint Lucia, he excelled at school from the beginning. His initial career choice was engineering, but after 4 years, he had to make a switch to economics because at his time both the public and private sector refused to hire blacks as professionals. With a scholarship, he was the first Afro-American individual to ever gain admission to the London School of Economics in 1933. Received his PhD there in 1940. Later in his life, Lewis served as an advisor in numerous developing countries, such as Nigeria, Ghana, Trinidad and Tobago, Jamaica and Barbados.

economic organization concept with the three types of historical systems described in his book (Wallerstein, 2004, p. 17):

- *mini-systems* might be paralleled with Polanyi's reciprocity concept;
- *world empires* were based on redistribution;
- *world economies' core* is market exchange.

Regarding asymmetric development, Wallerstein seems to agree with *André Gunder Frank*'s definition according to which **both development and underdevelopment are the inevitable outcomes of the world capitalist system's true nature based on continuous contradictions as well as frictions** (Wallerstein, 1974 & Frank, 1967).

There have been many critiques directed towards the world-systems theory. For example, Wallerstein view technological development or certain geographical factors as a "deus ex machina" not providing any solid explanation to why some economies manage to upgrade to the core country status (Worsley, 1980).

Parallel with Wallerstein, there was another relevant economist carrying out research regarding economic growth and development as well as the centre-periphery relations of the world economy. **Samir Amin**[24], an originally Marxist economist of French and Egyptian origin, published the "**Accumulation on a World Scale: A Critique of the Theory of Underdevelopment**" in 1974 and examined the characteristics of the so-called **"peripheral capitalism"** and its effects practiced on colonized and newly colonized economies. Regarding the development of the more jeopardized part of the world, Amin concludes the following: "*The process of development of peripheral capitalism goes forward within a framework of competition (in the broader sense of the word) from the centre, which is responsible for the distinctive structure assumed by the periphery, as something complementary and dominated*" (Amin, 1982, p. 205). As a result of the asymmetrical integration, **the periphery country develops a dual structure** and economic growth might be even blocked (Amin, 1982).

[24] Egyptian-French economist (1931 – 2018), modern follower of the Marxist school of economics and tried to explain the underdevelopment of certain countries in an alternative way. He was a dependency theorist. Additionally, he researched on the issue of political Islam, Islamic fundamentalism and radicalism. Studied in Paris, worked as a researcher in Cairo and as a government officer in Mali and Senegal.

Giovanni Arrighi[25] also greatly contributed to the world-system theory and examined patterns of growth and cycles of global development. He insists that (capitalist) **development necessarily provokes overproduction crises**. Inequalities become common since the winners of income redistribution are definitely those who already possess high liquidity and are motivated for a rent-seeking, speculation based economic behaviour which might lead to asset price bubbles. Arrighi also drives our attention to a relevant phenomenon: **capitalist system should be viewed as a constantly changing and transferring process**. It is developing new characteristics and thus new consequences for developed and developing countries. The accumulation of capital is currently having a snowball effect through tightening competition and decreasing profit rates (Arrighi, 2009).

3.1.5 Modern growth theories: human capital and growth

It is beyond doubt that human capital – as one of the main contributors to economic growth – has been gaining more and more importance nowadays, however, it is evidently not a new phenomenon in economic theory. On logical grounds, there is no compelling reason to argue that a strong relation can be observed between the well-being of nations and the quality dimension of human capital within total population. Besides education, the research efforts focusing on the aforementioned factor, involve the examination of such fundamental issues as healthcare, labour market, current demographic trends as well technological development and the capacity for innovation of a given economy. If we had to sum up in one sentence the essence of the first human capital related studies, we would certainly have to emphasise that economic value can be primarily derived from human knowledge and labour. When it comes to (neo)classical economists, some of them managed to show that education induces such positive effects as the increase of mobility among different social classes and population growth control as well (Varga, 1998).

In order to look in greater depth into the relations between human capital and economic growth, we have to take a closer look at the development path of the factors of production. First of all, to produce economic goods, a certain combination of land, labour and (physical) capital is required. However, as it has been already mentioned, only a definite

[25] Italian economist and sociologist (1937 – 2009). After graduating at Bocconi University in Italy, he taught at universities in Rhodesia (now Zimbabwe) and Tanzania. Experiencing African colonialism and underdevelopment in person almost certainly influenced his later thoughts on economic development.

proportion of these basic factors can be available at a given time period. To continue, these components can be interchangeable, so if we take advantage of this opportunity it may largely contribute to the effectiveness of production. As an example, at the turn of the 18th and 19th century the major achievements of the Industrial Revolution enabled to substitute human and animal muscle power with fossil fuel energy. What is more, 60-70 years later machines powered by electricity instead of steam founded a new stage of economic development. As a result, world industrial output was multiplied and such social processes could be launched as urbanization or the radical changes in women's working patterns. Coming back to the three original factors of production, land had been representing less and less proportion due to the spread of mechanization. So this process had significantly contributed to the formation of technical development as a new and quite relevant factor of production.

Continuing our research in frames of growth theory, we have to mention two significant terms. The first one is the definition of labour which had been primarily stated as the dependent factor of population growth rate. Later it became associated with routine work and the physical characteristics of labour force. All in all, it can be modelled as a stock indicator. Human capital itself might be also defined as the extended qualitative dimension of labour force. This flow indicator is actually used for describing the different skills, competences and qualifications of the population in a chosen country (Ligeti-Ligeti, 2014).

Regarding human capital theories, it should be specified that no generally accepted definition has been set up which would precisely express the main characteristics of human capital. Although there have been several attempts to create such concepts, human capital studies represent such a broad spectrum and rapidly evolving branch of science that it may become a real challenge to choose the appropriate theoretical approaches for a multidisciplinary analysis. Human capital based theories might be already detected 200 years ago, yet, the fist coordinated attempt to provide a framework emerged during the 1950s when global inequalities and contradictious development patterns became obvious.

Theodore Schultz[26], an economist who significantly contributed to human capital studies expressed the following: *"What economists have not stressed is the simple truth that*

[26] American economist (1902 – 1998), who was the chairman University of Chicago Department of Economics from 1946 to 1961. Originally earned a degree in agriculture-economics in South Dakota state,

people invest in themselves and that these investments are very large" (Schultz, 1961, p. 2). He also states in his research that when examining capital that will be used for creating future services we have to divide it into a human and non-human (reproducible) part and latter is growing at a smaller rate, so relevant investments are needed to further support this tendency. Still, **the development of human capital is threatened by many factors as for example, high unemployment in certain countries, since it deteriorates human capital through destroying the skills of labourers previously gained** (Schultz, 1961).

Quantitative human capital studies are dating back as far as the post-WW2 period. Several attempts have been made to measure the aforementioned phenomenon in two basic ways: in one respect, from the point of view of market by allocating monetized value to the measured factors. On the other hand, **human capital can be modelled via education** by such indicators as different performance measurements, enrolment ratio, years spent in education, etc. (T. Kiss, 2012). In order to carry out a complex analysis, the main characteristics of labour force, innovation, technical progress, research and knowledge are also essential to include (Ligeti-Ligeti, 2014) in such research.

Regarding the relationship between human capital and economic growth, we have to highlight the work of **Ferenc Jánossy**[27], a Hungarian researcher from the second part of the 20th century, who stated in frames of his trendline theory that **human capital is the true long-term driver of economic growth**. We have to add, that **Angus Maddison** came to the same conclusion while analysing his famous historical long term series (Maddison, 1995). In his studies, Jánossy originally described human capital as **the level and scope of specialization** during the 1960s. In the long run, **the rate of economic development might be significantly affected by the obstacles imposed on the** above-mentioned **specialization's rate of change** (Jánossy, 1966 & Tarján, 2000).

he led an influential agricultural research program for decades. Besides the advancement of human capital theory, Schultz was awarded the Nobel Prize for focusing on agricultural economics in 1979.

[27] Hungarian mechanical engineer (1914 – 1997), but later he became known for his thoughts and publications in the field of economics. He left Hungary in 1920 as a 6-year old and spent his university years in Vienna, Berlin and Moscow in the 1930s. After graduation, he decided to start his engineering career in the Soviet Union, where he was arrested after false accusations in 1942 and sent to a forced labour detention camp. He struggled there as a prisoner until 1945. Finally, he got amnesty and worked two years in Maykop as an engineer for the local metallurgical plant and was able to return to Hungary in late 1946. In his country of birth, he became a government officer and helped the authorities of central planning as an expert for almost 30 years, until his retirement. In 1966, his benchmark work on post-war economic development and the determinants of long term growth rate was published. In 1975, a second and extended edition was issued.

Nowadays, human capital studies usually put forward the view that education should be interpreted as an investment since in case of individuals, higher qualification leads to higher productivity which will eventually result in the growth of incomes. However, nowadays investing in human capital can be achieved in several forms (T. Kiss, 2010): special trainings aiming at increasing the effectiveness of employees in their work, experience, special skills and competences which are gained in the process of work, encouraging migration, providing social security, covering healthcare costs, etc.

Also, there have been several indicators and indices developed for measuring the dimensions of human capital. The *World Bank* is annually publishing data in frames of the **Human Capital Index (HCI)** for 157 economies. The index assesses the amount of human capital that a child born nowadays might expect to get by age 18, with the risks of low quality health and undeveloped education existing in the country where the child lives. Its main scope is to reveal how developments in current health and education form the productivity of the workers' next generation (The World Bank, 2018).

3.1.6 The theory of the dependent market economies

Following the post-world war period, our world economy was facing a development stage full of turbulence, new economic models, growing inequalities and a shift among countries' relative position creating a bipolar world order. However, this dual structure could occur not only concerning the blocks composing of the United States and the USSR but also regarding developed (centre) economies as well as the developing (semi- or periphery) countries. As a counterbalance to the previously dominating modernization theory, the so-called **dependency theory** gained more and more perspective after the second half of the 20th century. It is relevant to define what was exactly meant by the phrase of dependency in frames of latter school. **Theotonio dos Santos**[28] explains the phenomenon as *"a situation in which the economy of certain countries is conditioned by*

[28] Brazilian economist (1936-2018), considered as one of the founders of the so-called new dependency theory. According to his views, in order to overcome its level of low development, a country must primarily reduce its dependency to other parts of the world economy, and not committing to a rapid modernisation or industrialisation, which could actually intensify its dependency to other countries. He also gave much credit to the later developed world-systems theory. Held professorships and researcher positions at various Universities in Brazil, Chile, Mexico and in the USA. Due to political changes and military coups in his own country, he lived, researched and taught in exile for years in Chile and Mexico.

the development and expansion of another economy to which the former is subjected" (dos Santos, 1970, p. 231).

Modernization theory which originated from Social Darwinism as well as Weber's and Talcott Parsons' main progressive ideas, **viewed the world system as a dual structure with a traditional and a modern sector** (usually only the European Western economies and the USA) but it gave no significance to exogenous factors concerning economic growth and development. It also states that modernization is a process that cannot be reversed, so if any less developed economy is affected by it, it will surely progress towards its own modernization (Tipps, 1973). Nevertheless, after the end of the 1960s, more and more thinkers discovered the weaknesses of the theory and worked towards a new model. Modernization theory assumes that **growth and development are linear**, so they proceed only towards one direction or end-point. Latter conclusion was heavily criticized due to the fact that development has multiple variations and scenarios (Killick, 1984). Also, the theory aimed at eliminating traditional values which are originally connected to underdevelopment (Redfield, 1956).

As a response to the weaknesses of modernization theory, after a research carried out by the Economic Commission for Latin America and the Caribbean (ECLAC) with the participation of **Raul Prebisch**, the new model of **dependency theory** was erected. He provides a framework of the necessary strategies to achieve development with such elements as a more **active fiscal policy to control the exchange rate, to open towards the inflow of foreign capital with certain conditions, to expand demand through the increase of wages and to employ protectionism and imply import substitution** (Prebisch, 1950). According to the theory, developing countries might achieve the biggest results in their growth and prosperity when they manage to detach or "delink"[29] themselves from the developed economies (Frank, 1967). It also assumes that following a significant shock (war, economic crisis, etc.), developed countries usually stabilize their economy and trade by relying on periphery nations but at the same time, the process of industrialization will fade away in the less developed economies (Frank, 1969).

As a third pillar of dependency studies, we have to mention the already presented **world-system theory** developed by **Immanuel Wallerstein**. Capitalism proceeded to a next phase since tightening globalization and international trade dismantled the relevance of

[29] See Samir Amin's book on constraints of convergence, titled Delinking (Amin, 1990).

local governments' decisions, so countries could more flexibly participate in the overall development (Reyes, 2001). In the meanwhile, parallel with the economic miracle experienced by the "Small Tigers" in East Asia, the Soviet Union was strongly drifting towards a serious crisis and what is more, the United States were also facing a contradictious phase of development due to such happenings as the war with Vietnam or the two oil crises (So, 1990). On these grounds and the dynamically developing communication and IT sector, the **theory of globalization** was taking off, however, it will not be discussed in frames of the Thesis since it is only partially connected to dependency theory's vision implied within this research. There is a growing literature on the different *varieties of capitalism* that have developed in recent decades across Europe. It is undeniable that a simple categorization of the continent's development by applying the general definitions and characteristics of capitalism – especially in case of certain regions of the European Union – is not appropriate when preparing a wide-scale economic analysis. There have been several attempts to distinguish among the socio-economic growth paths focusing on Central and Eastern Europe's transition countries. In what follows, we are briefly presenting the current, modern approaches of dependency.

From the point of view of current research, one of the most relevant classifications is the so-called **varieties of capitalism** (VoC) created by **Peter A. Hall** and **David Soskice** (2001). The authors developed the two-sided approach of political economies by distinguishing **liberal market economies** (LMEs) from **coordinated market economies** (CMEs). In the first case, companies usually operate under different competitive market arrangements following the classical supply and demand driven tendencies among the participants of the trade. Still, institutions are playing an important role in the coordination of actors' market-driven activities. On the other hand, in case of the coordinated market economies, non-market interactions are gaining more importance among the actors, so equilibrium state occurs primarily on the base of these strategic cooperations (Hall – Soskice, 2001). It is also highlighted that both types of market economies might significantly contribute to the long-term performance of the given economy. As an example, the authors provide the case of Germany as a form of CME where the extensive use of labour force and industry- or company-specific skills of the workers result a strong dependence on education as well as certain training systems (Hall – Soskice, 2001).

In contrast, in liberal market economies (e.g. the United States) education as well as training systems should be viewed as complementary "goods" to the labour markets

which work quite flexibly. According to the study, there are altogether five factors causing interdependence: financial system, corporate governance, structure of industrial relations, the already mentioned education and training system and also innovation transfer within the country (Hall – Soskice, 2001).

To continue, **Nölke** and **Vliegenthart** (2009) further developed the above-mentioned classification first of all, by **extending the analysis to** other countries besides Germany and the USA **to some selected Central and Eastern European economies** (the Czech Republic, Hungary, Poland and the Slovak Republic) and by adding the relevance of transnational companies. Also, one of the most important outcomes of the research is that in case of CEEs, there is no point in expecting long-term convergence to the developed countries in frames of the liberal approach (Nölke – Vliegenthart, 2009). The most significant element of the cited work is the introduction of the **third variety of capitalism** that is the concept of the **dependent market economies** (DMEs). In contrast with the Hall – Soskice methodology, Nölke and Vliegenthart introduced three further conditions: an extensive overall economic coordination mechanism, stable institutions having the core element of institutional complementaries and certain comparative advantages which enable a superior economic functioning compared to the socioeconomic systems. Two other important elements should also be emphasized: first, **DMEs are shaped by the investment driven decisions of the TNCs**, especially in our globalized world economy created environment. Secondly, DMEs are even more involved in the foreign capital issues of the biggest investors compared to LMEs and CMEs (Nölke – Vliegenthart, 2009). The term itself was chosen by the authors relying on Lawrence King's *"liberal dependent post-communist capitalism"* concept referring to some Latin American countries' development patterns (King, 2007, p. 309).

Other researches draw our attention to the fact that countries with different forms of capitalism naturally create some different growth scenarios and models in order to achieve stable economic growth. Also, recent economic and financial crisis has greatly contributed to the need of distinguishing some other varieties of capitalism (Hall, 2017). Hall also outlines that despite the previous expectations, **European integration has not resulted in the disintegration of forms of capitalism operating simultaneously**. Recent crisis – through the example of such countries' cases as Ireland, the Mediterranean economies as well CEE nation states – is also urged to seek some alternatives of capitalist

system instead of applying a 'best practice' based single strategy for such a heterogeneous integration as the European Union (Hall, 2017).

Following the dissolution of the Soviet Union, most post-communist countries have become quite attractive to foreign direct investments arriving from developed economies. There are certain views claiming that in this aspect, foreign capital has even become a more crucial development or growth factor than the economic and social activity within the countries. It is also possible that in some transition economies the legacy of post-communism is vivid nowadays having negative effect on the situation of the labour force. Dependent capitalism might be further defined by the capital and technology transfer of the destination countries but also by the management decisions of the investor companies that host countries have no or relatively small influence on (Sznajder Lee, 2011).

Gal and **Schmidt** present that dependent market economies have to face several negative long-run effects on financial, human as well as social capital. The **large-scale dependence on external capital** might be also viewed as a *"historical weakness"* of Central and Eastern European economies (Gal–Schmidt, 2017, p. 90). Also, the authors consider that **low- and also middle-income competitiveness maintained in these countries consequently causes a development trap**. As an outcome, some local firms emerge with a relatively high capital base but on the other hand, a large number of skilled workers migrate to more developed countries since domestic wage level is not being increased significantly over time. In the long run, human capital base will erode, some critical demographic problems may impose further threats on overall development but most importantly, further catching-up might be undermined in these countries (Gal–Schmidt, 2017).

Máté Veres explains the settled development model of transition countries – focusing mainly on Hungary – with its origin: attracting FDI was crucial after the post-soviet transformation crisis for stimulating economic growth and it was supported by the belief that technological and know-how based spill-over effects will eventually be integrated into the host country's practice being capable of producing at the same level as well as quality as the developed investor economies. Not surprisingly, it was not achieved, however, a definite **dual structure within the economy developed with a strong multinational company base and a vulnerable domestic sphere** unable to decrease their dependency (Veres, 2018).

3.2 Development asymmetries, inequalities and economic growth

Economic growth and the concept of economic development represent such elements of social sciences, which might be probably considered the oldest and most frequently researched ones. The acute need for development studies emerged after the collapse of the colonialism when the significant differences between the developed and developing economies became more and more obvious. According to **Péter Farkas**, development economics predefined the role of a potent state in order to remedy the unbeneficial effects undergoing in world economy as well as to urge economic activities (Farkas, 2002a). **Tamás Szentes**, as one of the prominent representatives of the above-mentioned discipline, states that in contrast with growth theories**, development economics is focusing on the qualitative dimension of changes in our globalized world and is basically composed of approaches that determine the catching up or the development gap of the economies and concepts which provide some possible explanations for development inequalities of the world economy** (Szentes, 1995).

3.2.1 Development economics in practice: the case of South America

Following the two world wars, the post-Keynesian reformist theory was viewing the problem of inequalities and imbalances at global level instead of the previously used nation state base. Another relevant difference was the fact that negative tendencies were presented as irreversible and not cyclical. Many representatives – such as **Prebisch, Singer** or **Myrdal** – of the discipline were convinced that *in lack of an appropriate state intervention, inequalities will continue to grow and thus market economies are drifting farther away from their steady-state development path* (Szentes, 2009).

It is also important to highlight that during the 1960s as well as the 1970s there were three relevant approaches becoming general and representing different views about socio-economic development of the globe and Latin America (Farkas, 2002a):

- The **reformist approach** that derived its core ideas on the base of Keynesianism, claimed that **global inequalities can and have to be moderated in the long term**. Instead of a passive, even "fatalist" interpretation of the world economy's functioning, it urged the development of several reforms and positioned itself against the idea of perfect market as well as comparative advantages. Its most famous representatives were *Prebisch, Singer, Myrdal* or *Furtado*.

- The **structuralist concept** of the above-specified idea emerged as the so-called Cepalist approach, deriving its name from the Spanish acronym of a regional United Nations body, the Economic Commission for Latin America and the Caribbean (ECLAC)[30]. **Cepalism** closely related to *Raúl Prebisch's* main ideas, and is best represented by *Cardoso, Faletto, Tavares, Cardoso de Mello or Sunkel*. Structuralists argued that while **the dynamic element in the developed centre was technological progress and innovation**, in the peripheries this dynamic role was taken by consumer demand. Regarding the periphery, the local population is usually engaged in imitation of consumption patterns[31] of the centre. As the periphery's productivity, and therefore, per capita income is significantly lower, high consumption accompanied with a current account deficit cannot be sustained in the long-run. External imbalance comes with insufficient domestic saving and these could be regarded as the main causes of stagnation and underdevelopment (Vernegro, 2004).

- During the 1960s, the **Latin American Dependency School** was also on its rise within Latin America. It is viewed as an independent school, however, it definitely initiated on Cepalist base following the interwar period of the 1930s. In those times, foreign trade declined and general protectionism of nation states became popular (Farkas, 2002b). Since the ECLAC policies of the post-war times failed to address growing global inequalities as well the lack of convergence between the developed world and developing countries of Latin America, there was an acute need for a new concept for the region instead of the previously used import substitution industrialisation (ISI) idea. One of the results of the dependency school was **to set external factors as the main causes of peripheral development.** These theoretical schools became so popular that they served as a base for the world-system approach of Wallerstein (1979), Amin (1990) and also some other ideas (Pakkasvirta, 2010).

[30] In Spanish, the institution is known as 'Comisión Económica para América Latina y el Caribe' (CEPAL). It was founded in 1948 as a regional, international development agency. Currently, it has more than 40 member states and is headquartered in Santiago, Chile.

[31] Imitation of consumption patterns of the most advanced countries by less developed regions is easily observable. From high-end smartphones to well-recognized fashion brands, the local populace of low and middle income economies are desperate to acquire such items similarly to their advanced counterparts. The lower their income, the more difficulties are associated with such purchases on an individual level, while on the macro-level resources are diverted from savings and investment towards overconsumption.

Development economics studies have thus become more and more integrated into other disciplines and as their main policy, urged the active role of state in decreasing global inequalities (Farkas, 2002b). The less developed countries were struggling with never ending problems since they lacked significant traits essential for catching up to the advanced centre economies. Although most of the states in South America are rich in natural resources, these developing countries did not have enough capital to "take off" from their actual level and also, yet having a large pool of available labour force, it was rather unskilled and had no access to modern production technology. It is also completely true nowadays for the region as a whole, although there were obvious shifts among the Latin American countries regarding their relative level of development. Multinational and transnational companies – as enterprises with immense capitalization liquidity[32] – often position the different stages of production and even some type of services (e.g. certain shared service centres, call centres, etc.) to the peripheries. The application of this placement strategy could in general, reduce production costs, allows more competitive pricing if needed and increase profits for shareholders at the same time.

Following the 1970s, dependency-focused development economics was temporarily overshadowed by other approaches deriving from more liberal ideas. Later on, due to such events as the South American debt crisis of the 1980s, following the two oil crises or the dissolution of the Soviet Union proceeded by regime changes in several Central and Eastern European Countries, it started to gain more ground again in the form of neo-structuralism. An interesting mixture as well as development could be experienced within this period concerning theoretical schools since dependence theories were drifting apart from giving too much significance to the role of the state, however, liberal views were communicating a more cautious state of mind towards the market processes dealing with a solution which employs a state and market based cooperation (Farkas, 2002a).

3.2.2 Development asymmetries in modern economies

Our 21st century world economy is experiencing changes at faster and faster rates due to the intensifying processes of globalization. It might also be noted that capitalism has becoming even more turbulent and recent economic crisis gained striking volumes in

[32] According to various sources, largest multinationals have their annual revenues in the hundreds of billions of USD range, which in nominal terms, is comparable to the nominal GDP of Argentina, Chile or Colombia.

many countries. Inequalities are on the rise, poverty and social deprivation also increase, so the question might be raised about the nature, core ideas of nowadays' global and most relevant development issues.

According to **Todaro and Smith**, **development economics is a discipline dealing with the process when on one hand, economies upgrade from stagnation to growth and on the other hand, from low to high income level**. Todaro and Smith also highlight the importance of finding solutions for absolute poverty and that development studies have gained a multidisciplinary nature over the past decades intertwining with not only economic but also political as well as institutional issues (Todaro-Smith, 2011).

During the second part of the 20th century, many economies started to "**take off**" in economic terms, basically in their GDP per capita level. However, at the same time, there was a significant fall back (in some cases stagnation) in certain measures of their level of development, like for example employment. Economic growth proceeded to accelerate after the millennium and inequality problems were escalating even more rapidly. Besides the usual explanation of globalization, it also derived from some bubbles emerging in the developed countries and also financial crisis (Todaro-Smith, 2011).

Since most approaches are not able to precisely describe the field of scope and pillars of development economics, some new theories have been raised to further contribute to this discipline. As an example, we have to mention the so-called **general theory of economic development** which is based on several case studies and thus offers relatively practical tools to prepare adequate economic analysis. The theory introduces and applies a very relevant term of economic discrimination which is basically the opposite of the market-based selection and refers to the case when individuals or companies as well as some other economic actors who are objects of discrimination based on such factors as prices, wages, etc. The general theory provides explanation for development and underdevelopment according to the following: **when nation states' governments, the local companies** – who might be also viewed as the capitalist layer – **as well as markets offer some pre-chosen triggers for certain potent economic players** (via the above-mentioned discrimination), **they generate development for this well-specified group**. The approach views economic development as a long-term process deriving from such elements as innovation, technological development but market failures are constant sources of challenging this process (Lee, 2018). Yet, Jwa argues that market failures

might be effectively balanced by the two other players. Due to their command-and-control policies, companies are aiming at reducing their transaction costs and also, governments are constantly working on putting pressure on the free rider behaviour by contributing to the more successful market players (Jwa, 2017).

Regarding some other contemporary development approaches, the so-called **big push model** (Fig. 2) researched by **Paul Rosenstein-Rodan** and having a strong coordination failure pre-concept (Rosenstein-Rodan, 1943). Its main idea states that **the presence of market failures may provoke long-term economic development**. If there is any coordination failure, it will probably cause protracted stagnation if no further steps are taken to work out a well-functioning strategy. According to the model, labour is the only factor of production available in the given economy. It is also assumed that workers within the traditional sector are provided the wage of 1 (W = 1) and within the modern sector they are paid a higher sum (W > 1).

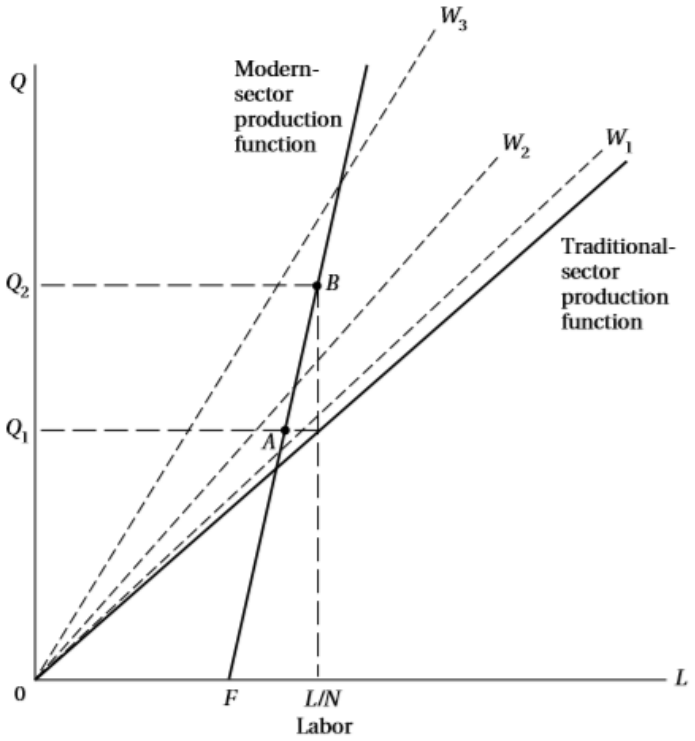


Figure 2: The Big Push Model

Source: Todaro-Smith (2011)

Workers are producing an N number of products (assuming that N is a high number). In case of the traditional sectors, labourers produce only 1 unit of a product according to the

constant returns to scale. In the modern sector, there is an increasing return to scales. Since there is no saving, Y/N results the proportion of national income spent per product in an equal way per worker (Y). The economy is closed, so there is no international trade. There is also an important condition about market structure: in the traditional sector we assume perfect competition (free entrance of participants gaining zero profit) and companies coming from the modern sectors that use developed technology are considered as monopolists. The "A" point indicated by Figure 2 shows the level of output of the modern firm after entering the market and facing only traditional companies as competitors. If demand is relatively high, "B" point might be achieved.

If the more developed, modern firm considers it profitable to invest in the production of one product, it will have similar incentives to produce the rest of the products as well. In the long run, it means that the entire market economy will become industrialized based on market forces which operate within the given country. According to the graph, it becomes evident that there are two equilibria situations showing whether the modern company enters the market and thus increases W and Q or not, so wages and output will be at a lower level. It is also a significant outcome that higher Q is more preferable but the market is not always able to achieve that point without an external push. One of the weaknesses of the model is that it is not calculating with the possibilities of technological externalities which may contribute to the development of firms that do not apply any advanced technology and just benefit from the spillover effects of other companies (Todaro-Smith, 2011).

3.2.3 Theoretical economics based explanations of the inequality and its measuring

In the course of providing a theoretical framework for economic growth and development, besides the already presented asymmetries, it is vital to include the phenomenon of economic inequality into our research. Due to the tightening processes of globalization as well as capitalist system, there is much more pressure on emerging countries' development possibilities. It is a well-known fact that income inequalities are increasing, in almost every advanced economies, and in case of some dependent market economies struggling with several socio-economic difficulties usually manifested in the lack of highly skilled labour force, high value added production for export, highly developed technology background and a strongly supported R+D sector by the local government.

Inequality studies (Fig. 3) might usually be organized according to the following main categories (Gajardo, 2016):

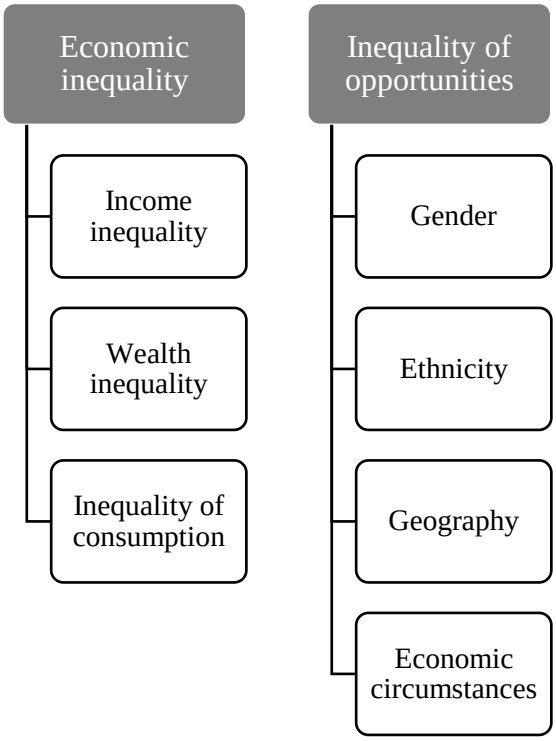


Figure 3: Main fields of inequality studies

Source: based on Gajardo (2016)

The **OECD** measures **income**[33] **inequality** based on five main components (OECD, 2019[34]):

1. The *Gini-index*: comparing the cumulative proportions of the population to the cumulative proportions of their income. It might range between 0 (if there is perfect equality) and 1 (in case of perfect inequality as the two hypothetical ends of scale).

2. The *proportion of S80/S20*: it is defined by the ratio of the average income of the 20 percent richest to the 20 percent poorest layer of the population;

[33] Income is the household's disposable income in a specified year according to the OECD definition. Thus it includes such elements as earnings, self-employment and capital income and public cash transfers. On the other hand, income taxes and social security contributions paid by households have to be deducted (OECD, 2019).

[34] OECD is regularly providing data for income inequalities as well as such factors as poverty rate, poverty gap, discriminatory family code, violence against women, women in politics and also social institutions and gender in frame of the Social and Welfare Statistics database.

3. The *proportion of P90/P10*: it is calculated by the ratio of the upper bound value of the ninth decile to that of the first decile;

4. The *ratio of the P90/P50*: the comparison of the upper bound value to the ninth decile to the median income;

5. The *ratio of the P50/P10*: the proportion of median income and the upper bound value of the first decile.

The "*inequality of opportunities*" is more frequently mentioned as social inequalities providing a much wider and comprehensive approach compared to the more precisely defined economic based method. Within the geographical group, we can distinguish among county-level, international and global data depending on the scope of our analysis (Gajardo, 2016).

To continue, the **Eurostat**[35] is publishing data for **measuring inequality and income distribution indicators** according to the following approaches:

- *At-risk-of-poverty rate (AROP)*: the proportion of people having an equivalised disposable income (minus social transfers) below the at-risk-of-poverty threshold, (it is defined as the 60 percent of the national median equivalised disposable income after paying social transfers);

- *Income quintile share ratio (QSR)*: the proportion of total income received by the 20% of the total population having the highest income (i.e. the top quintile) compared to that received by the 20% of the population having the lowest income (the so-called the bottom quintile);

[35] The above-listed definitions were developed and are regularly used by the Eurostat in frames of the Country-level overviews of the Flash Estimates of income and inequality indicators (Eurostat, 2018a).

- *Income deciles*: these are calculated according to the total equivalised disposable income. There are altogether 9 cut-point values of income which divide the population into 10 groups. Consequently, the data of all individuals are sorted based on the value of the total equivalised disposable income and after, they are divided into ten completely equal groups which include 10 percent of individuals;

- *AROP by age groups*: the ratio of people at-risk-of-poverty according to the following three main sub-groups: 0-17-year olds who thus are also known as victims of child poverty, the 18-64-year old group and finally, people over 65 years;

- *In work poverty*: those adult people (over 18 years old) who are categorized as employed on the base of their most frequent activity status and they are currently at risk of poverty.

Following the most frequently used classification, we are thus providing an outlook for the income inequalities regarding the European Union. Fig. 4 presents the Gini coefficient of EU28 economies for 2009 as well as 2018. In this case, the coefficient ranges from 0 (perfect equality) to 100 (perfect inequality). Relying on the Eurostat[36] data, it becomes evident that the coefficient has risen only in 11 countries which means that almost 40 percent of EU economies have experienced increasing income inequalities within a decade (Eurostat, 2019). According to our calculations, *the most significant change* noticed from the post-crisis period until nowadays might be spotted in *Bulgaria*, *Hungary* and *Luxembourg*. Besides the most frequently used Gini index, economic literature offers some additional tools for investigating inequalities. One of them is the **Hoover Index** also known as the Robin Hood index that might be applied to calculate the deviation from the given equal distribution. With the assumption that the society is perfectly equal, we can estimate **the ratio of income taken away from a richer group of population and given to a poorer layer of society**. Hypothetically, there is no need to reallocate resources if a society is perfectly functioning (with a value of 0). In an ideal case, it would be equal with the longest vertical line that is allocated between the Lorenz curve and a 45-degree line (Gajardo, 2016).

[36] Please note that for 2009, the Eurostat had no data available for Croatia (since it had joined the EU later).

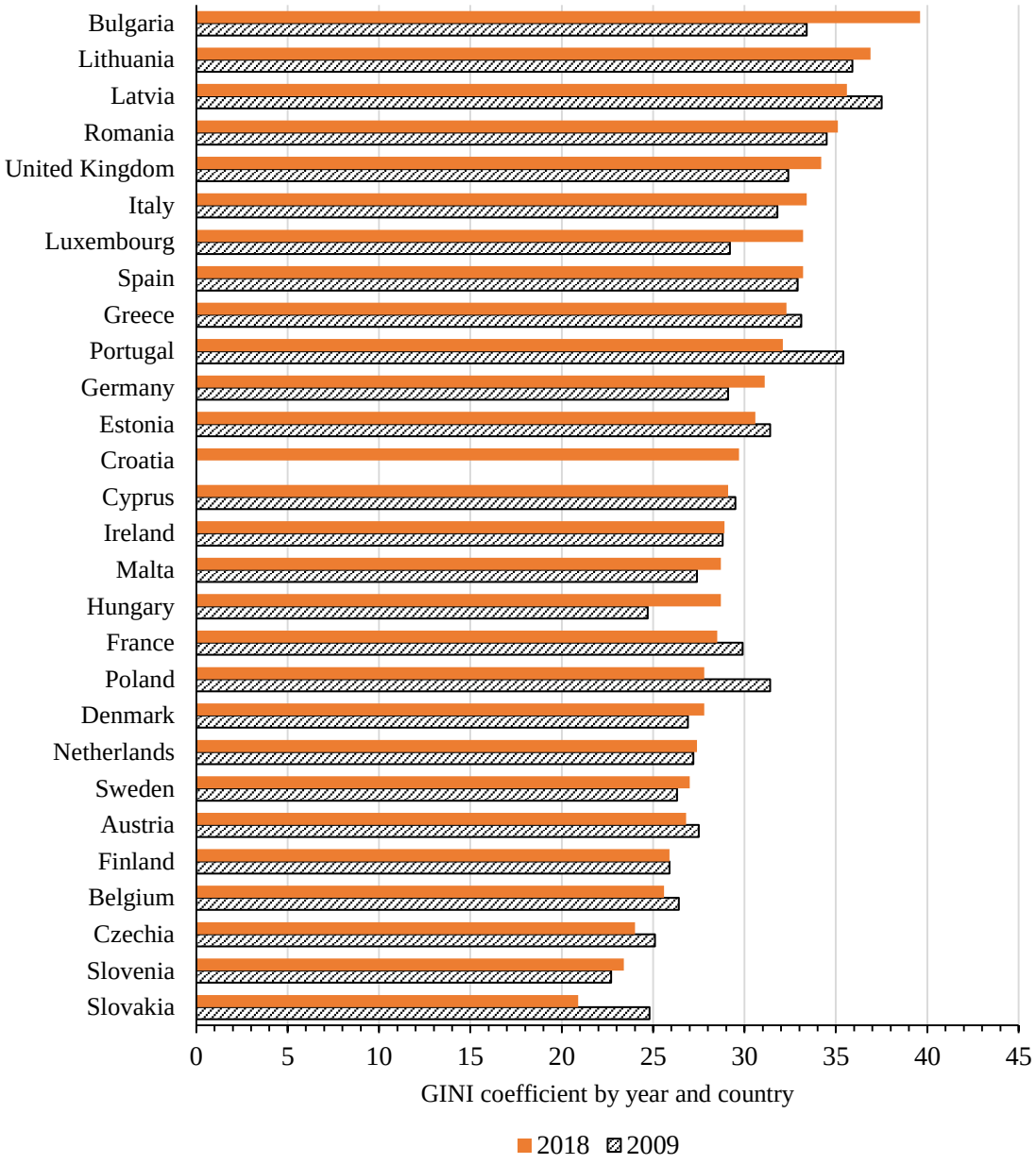


Figure 4: Gini coefficient of EU28 countries in 2009 and 2018

Source: Eurostat (2019)

The **Lorenz curve** is representing the actual quantitative relationship between the ratio of income recipients and the percentage of the total income for the given period (Lorenz, 1905). It provides us a tool to give an estimation about **which ratio of the total income is held by a certain ratio of the population**. The x-axis is the – usually cumulative – percentage of income within a given economy while the y-axis is the cumulative ratio of

population. It might be calculated according to the below-specified formula (Bellù-Liberaty, 2005, p. 2):

$$L\left(\frac{k}{P}\right) = \frac{\sum_{i=1}^{k} y_i}{Y} \ \epsilon[0;1] \qquad (11)$$

where

k=1….n is the position of every individual in the income distribution;
i=1….k is the position of every individual in the income distribution;
P is the total number of individuals in the distribution;
y_i is the income of the i^{th} individual in the distribution;
$\sum_{i=1}^{k} y_i$ is the cumulated income up to the k^{th} individual.

Fig. 5 is providing the illustration of the Lorenz curve and Gini indices in case of the global distribution of consumer goods, disposable income and wealth assets among individuals for the calendar year 2018. The curves had been calculated on the basis of the data provided by a Credit Suisse (2019) special report and the World Development Indicators database – The World Bank (2019).

While very pronounced inequalities could be observed in all cases, in relative terms, we could notice a more equal (or less unequal) distribution regarding access to consumer goods. From the Author's perspective this could be related to the fact that consumer prices vary greatly for the same type of products and services across the globe. Within less developed economies, local consumers might acquire certain goods and most of services by spending less in nominal terms. Often, substitutes and imitations of globally branded products are available at local markets and in some cases, even their overall quality is not significantly lower than goods from the well-known original manufacturer. However, distribution of income shows considerably larger disparity, and in the case of global (net) wealth, the observable level of inequality is exceptionally high. Visually, the farther a curve is located from the hypothetical equal distribution represented by the 45-degree line, the more disparity is present in the analysed category.

In 2018, the global Gini coefficient regarding per capita consumption was 0.43, in case of income and wealth, the indices were 0.63 and 0.75 respectively, indicating a very pronounced global inequality (see Fig. 5).

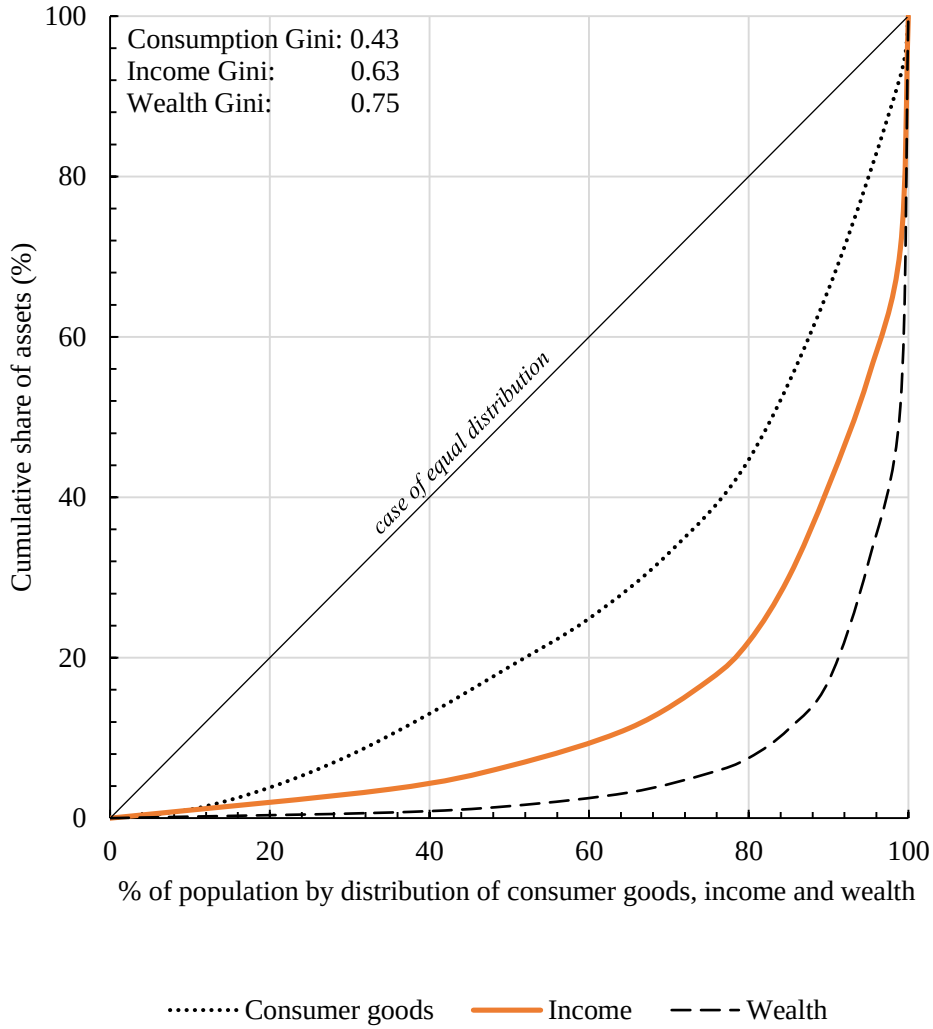


Figure 5: Representative Lorenz curves of the global inequalities in access to consumer goods, disposable income and wealth (2018)

Source: Author's own work based on Credit Suisse (2019) and The World Bank (2019)

According to the latest available figures, the most privileged 1 percent of the global population, about 76 million people consumed 7.5% of all goods and services produced by the world economy in one year, realised 29% of all disposable income globally and owned almost 49 percent of global assets. To be included in this elite group for the year 2018, someone had to reach an annual income level of more than 33,000 USD after taxes and/or accumulate a net worth of at least 750,000 USD in financial and non-financial assets. Meanwhile, there are about an additional 1 billion people in the world with a relatively high standard of living, good access to consumer goods, healthcare and education services and have at least 50,000 USD in net assets and disposable income exceeding one thousand dollars per month, or 12,000 USD per annum. This part of the

global population, which could be defined as the uppermost 15% or the global upper-middle class (excluding the highest 1 percent) has a 42.5% share of total consumption, 41% of income and 37.6% of wealth globally (Credit Suisse, 2019).

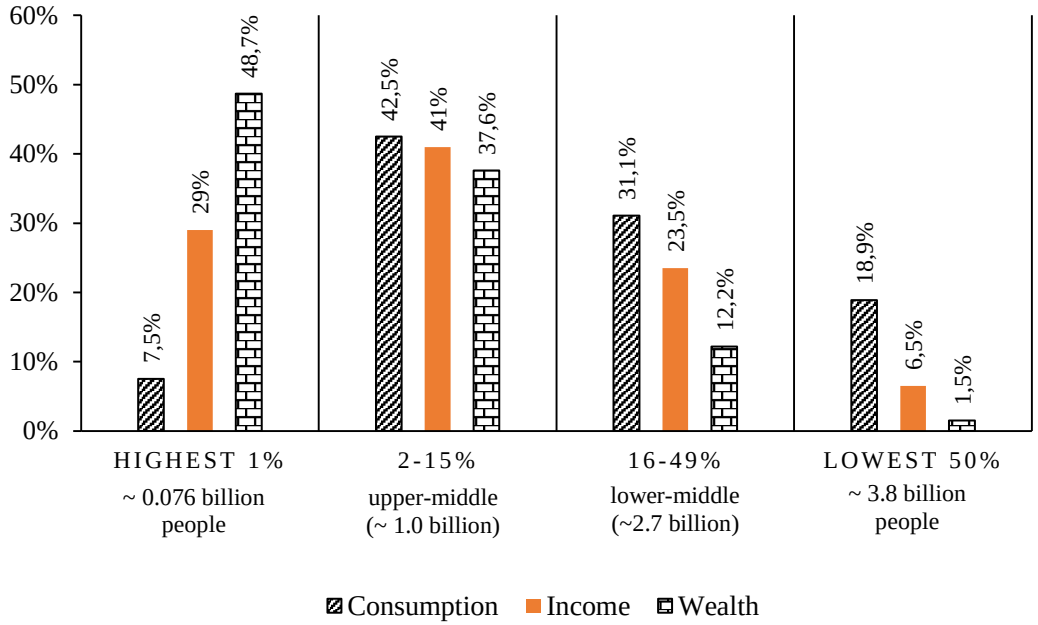


Figure 6: Distribution of resources among the global population

Source: Author's own work based on Credit Suisse (2019) and The World Bank (2019)

While international development agencies, such as the World Bank often emphasize the large reduction in (absolute) poverty over the last 20 years, it is evident from their own data that the lower half of the global population, which equals more than 3.8 billion people is still in a very deprived position. They could have access only to 18.9% of goods and services produced globally, earn as little as 6.5% of all global income, and own less than 2% of the world's total wealth (see Fig. 6.)

3.3 Growth Tendencies of the Developing Economies

There is no doubt that the fast economic growth of emerging countries is playing a vital role in the development of our world economy. Periods of significant growth and slowdown have considerable effects on global economic tendencies and market processes in both more and less developed regions. Over the last decade, the average growth rate of

GDP per capita has been almost double that of the developed economies (Ho-Mauro, 2014). It is also a well-known fact that in case of latter countries, the financial crisis of 2007-2008 has had quite devastative impacts, especially regarding the protracted recession period in the European Union.

3.3.1 The cyclical nature of growth slowdowns

There seems to be no compelling reason to argue that each cluster of emerging countries is differently integrated into world economy, has various sets of input and output factors depending on social, economic and political structure and reacts quite diversely on such external shocks as the price change of raw materials, global commercial tendencies or financial crises. **The recent economic and financial crisis** – among several other negative effects – **contributed to the asymmetric growth of disparities of peripheral economies**. Besides the Central and Eastern European Region, countries like Greece and Portugal have also been severely affected by the economic turmoil and as a result, had to apply austerity policies as well as different adjustment programmes (Lampropoulou, 2017). It is also important to examine the crisis management techniques of the nation states. In case of East Asia, efforts have been taken in order to increase export. In contrast, certain Latin American economies aimed at decreasing import. Concerning latter crisis, several countries have moved from liberal trade driven policies towards strongly protectionist actions (Demir-Sepli, 2017). When analysing the growth path of developing economies, it is a relevant question to examine **whether the given countries are affected by the so-called middle-income trap and thus possibly experiencing a long-term growth slowdown period**. Latter episode emerging in the course of economic development of certain countries might be also referred to as convergence trap. *Pruchnik* and *Zowczak* define it as the selected economy's GDP per capita level cannot produce convergence towards a more advanced nation state that is used as a reference economy (Pruchnik-Zowczak, 2017).

Besides such standard approaches already presented in the first part of Chapter 3 as the Kondratiev waves, Kuznets's construction cycles, Schumpeter's creative destruction and Wallerstein's world-system theory, there are some other (in most cases completely contemporary) relevant studies and methods aiming at modelling the cyclical nature of economic growth.

Ervin Rozsnyai, a Hungarian philosopher, poet, writer and economist created the concept of **transnational monopoly-capitalism** which is the current manifestation of the capitalist system and also the third form of imperialism following the private and state monopolist phase (Rozsnyai, 2002). The phenomenon was further developed by *Péter Farkas* (2006) as well as *Annamária Artner* (2006 and 2018). Rozsnyai also presented the so-called **"junction-crisis"** which is a **massive capitalist crisis that might be overcome either by an "internal leap" – a change within the given socioeconomic system –, or by a systemic change**. It also causes the crisis of the previously dominant technological paradigm and thus the institutional structure will be massively affected (Rozsnyai, 2002). **Ferenc Jánossy** contributed to cyclical growth studies with his famous **trendline theory** in form of his long time series based revolutionary method with the result of being able to predict the significant growth slowdown and recession occurring during the 1970s. His theory will be presented in details in Chapter 3.3.2 as well as throughout the Thesis that strongly relies in his approach when analysing certain economies' development stages.

Annamária Artner (2017) argues that cycles are functioning along the same mechanism and logic: during the **innovation phase**, a completely **new form of technology is developed** which necessarily provides the innovative firm competitive advantages. As a result, **profit rate grows and unit labour costs decline**. Competitors will make attempts to imitate the new approach to extend their falling market share (e.g. nowadays the Chinese Huawei's certain high-end smartphones are practically presenting an alternative to iPhone and these are even available on more rational prices). As next, the **extensive stage** is launched when innovation becomes more frequent and **previous technologies will deteriorate in their value as well as profit rates**. So thus, the long waves are strongly based on the technological paradigm.

However, in some cases, **development might progress at the same period in centre and periphery countries**, e.g. bubble burst leading to the financial crisis of 2007-2008 (Artner, 2014).

Erzsébet Szalai's[37] (2006) research shows that the so-called **new capitalism**[38] **is currently in a massive crisis phase**. It might also be viewed as an end stage of a long

[37] Erzsébet Szalai is a Hungarian sociologist, university professor and doctor of the Hungarian Academy of Sciences with over 200 publications as well as several prizes.
[38] New capitalism is referred to the period of 2001 until nowadays by Szalai (2006).

wave. Latter downturn might be witnessed in such regions as the Central and Eastern European economies and is provoked by the region's geographical as well as historical background. This assumption is identical with the Author's second hypothesis. As a solution, Szalai is presenting an *alternative form of socialism* (Szalai, 2006). The fact that there are more and more *alter-globalist movements* nowadays also shows that capitalism is producing strong symptoms of crisis. These movements usually compose of young intellectuals from the developed economies which despite their university education background, have not managed to find their carrier path in the system of overproduction (of skilled labour force) and thus seek for alternative ways of utilizing their future high value added activities (Szalai, 2005).

Finally, cyclical growth approaches might not be explained fully without the main theory and methodology of current Thesis, the **middle-income trap phenomenon** that will be presented in details in Chapter 4 according to the existing literature as well as the Author's own interpretation and methods.

3.3.2 Methodology of the Jánossy's trendline theory

Regarding economic growth approaches, we have to highlight the results of **Ferenc Jánossy**, a Hungarian researcher from the second part of the 20th century, whose famous trendline theory states that the accumulation of human capital is the true long-term driver of economic growth. Based on his previously established theory, in 1966 Jánossy prepared a forecast according to which a significant slowdown in economic growth had to be expected in the 1970s, since until that time, the Hungarian economy had achieved such a level of development where it would have been in the process of gradual economic growth in case of no damage related to World War II. According to the theory, **post-war economic boom does not end when production achieves its pre-war level but when the volume of output corresponds to the trendline of long-term economic development**. In other words, in case a given economy's development had been stable before the war, the pre-war growth level will be achieved following the reconstruction period. However, Jánossy's most important statement is that human capital represents the essential driving force of long-term economic growth. Essentially, its accumulation determines the slope of the trendline, which – regarding the phenomenon of economic growth as exponential – is linear on a logarithmic scale (Jánossy, 1966 & Tarján, 2002).

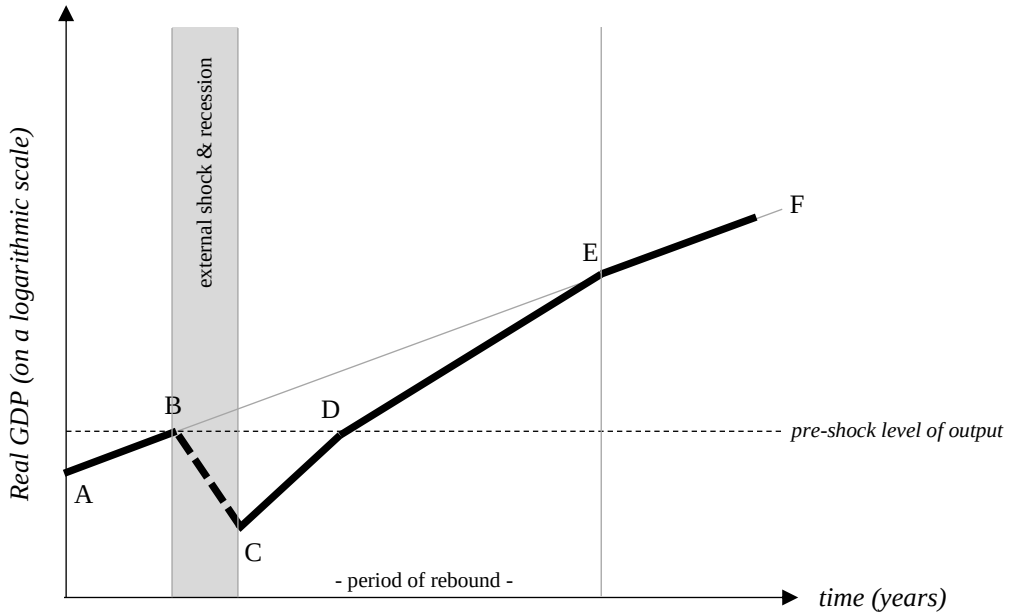


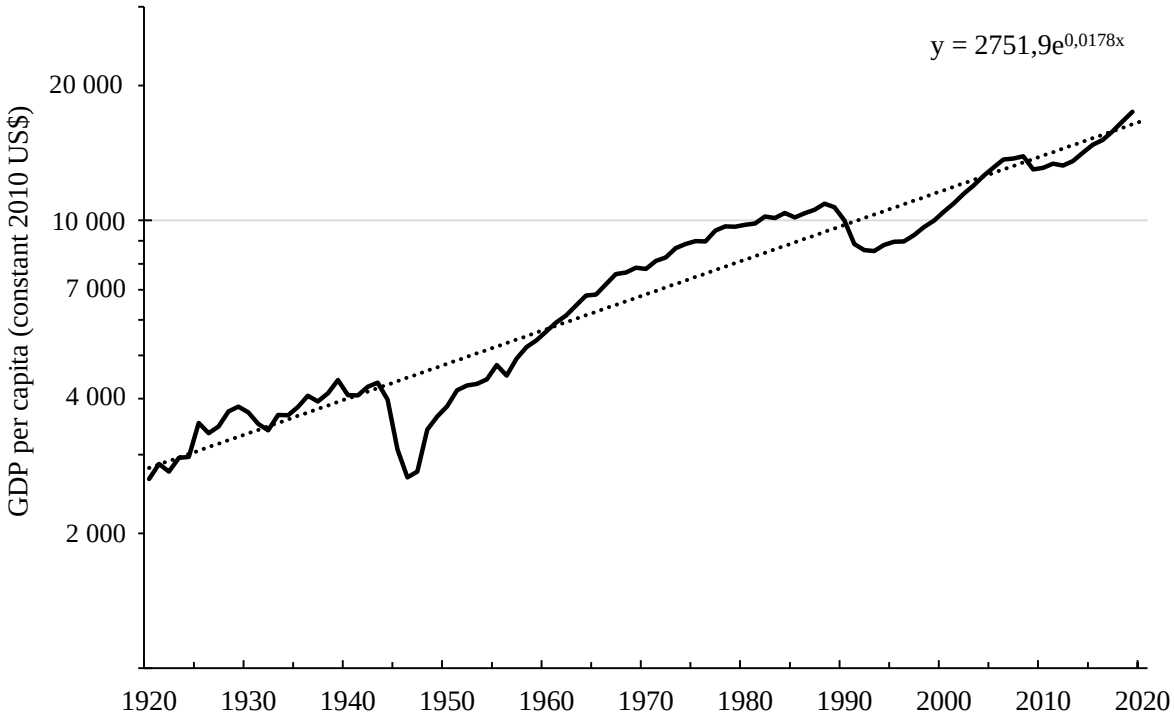
Figure 7: Effect of an external shock on growth path according to Jánossy's model

Source: based on Jánossy (1966) & Tarján (2002)

The following schematic figure (Fig. 7) represents one of the main implications of the trendline theory. Assuming a constant rate of long-term potential growth and utilizing a logarithmic scale, a straight line between points 'A' and 'F' would represent a theoretical undisturbed path of development. However, after a few years of 'normal' growth (represented by 'AB') a sudden external shock – such as a financial crisis, political turmoil, social unrest, war damage or a severe natural disaster – occurs, leading to a recession until point 'C' is reached. Following the recession period, a relatively quick rebound is likely to emerge in the first couple of years, with a slight slowdown in growth rates after exceeding the pre-shock level of output ('D'). However, an elevated rate of expansion continues further, as 10-15 additional years could be needed to return to the undisturbed development path.

In what follows, we are going to present the main implications Jánossy's trendline theory in case of Hungary for the period of the last 100 years, 1920 to 2019 by relying on the annual data provided by the Hungarian Central Statistical Office (KSH, 2020), the Maddison Project (2010) and also the World Bank (2019). The data from different sources reflect the path of development. Additionally, a preliminary value is included for both the expected 2019 level of real GDP and growth rate – see Appendix 1 for the details.

a) Hungarian GDP per capita (PPP) at constant prices, in 2010 US dollars



b) Annual rates of Hungarian GDP growth for 100 years (%)

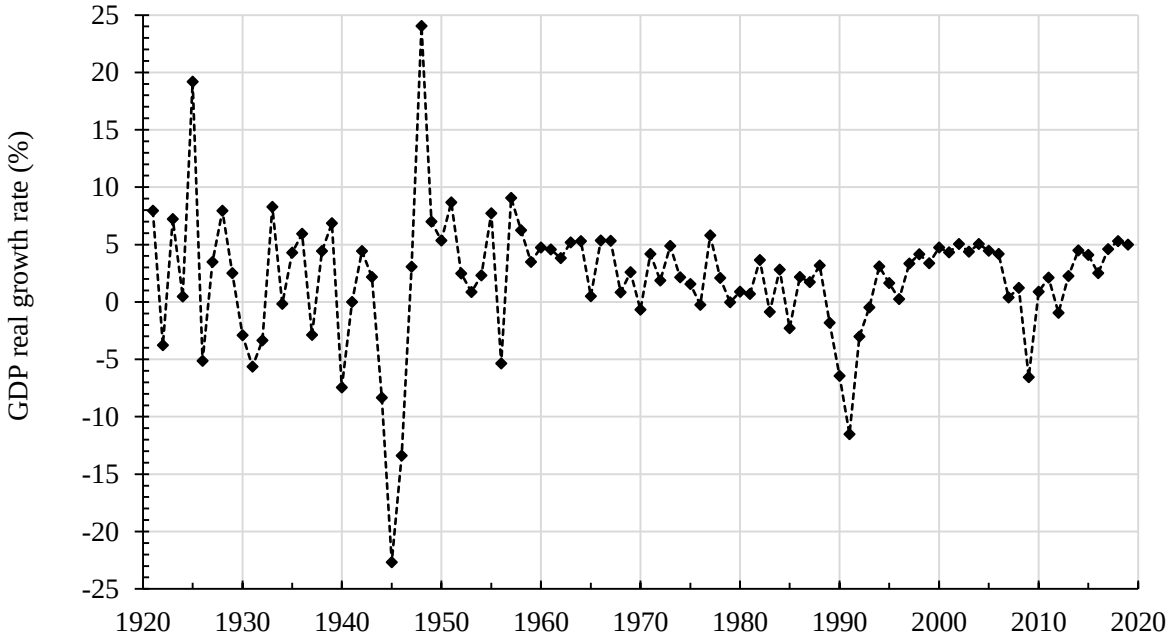


Figure 8: Empirical estimation of Hungary's long-term rate of economic growth

Source: authors calculation based on data provided by the Central Statistical Office of Hungary (abbreviated as KSH, 2020), the World Bank (2019) and the Maddison Project (2010)

In Fig. 8 Hungary's trendline of economic growth as well as its annual GDP growth rate (1920-2019) is illustrated. Part *a)* represents the evolution of Hungarian GDP/capita in real terms and expressed in 2010 U.S. dollars all the way back to 1920. While the long series were constructed by merging three different and partially independent datasets, these were in a surprisingly good agreement with each other. Regarding part *b),* **it might be observed that there is no significant change in the multi-decadal rate of annual GDP per capita growth**, its arithmetic mean remains around 2 percent throughout the examined period. However, year-on-year volatility of growth rates has decreased considerably in the last hundred years, as the relative weight of agriculture (which is producing highly variable output) has become smaller and smaller.

In accordance with Jánossy's results, we can observe a nearly constant growth rate in the very long run, the essentially unchanged overall trend since the country became a sovereign state in the early 20th century, strongly supports his hypothesis that on large timescales, development paths are determined by the accumulation of human capital. It can be noted that **Hungary's long term (century-scale) per capita growth rate is 1.78 percent annually**, estimated by applying an exponential trendline to the real GDP series. According to data provided by Maddison (2010), the global economy achieved similar per capita growth rates in the long run (estimated at 1.5-2.0% per year). **Therefore, we can conclude that Hungary, as a CEE country has been neither converging nor diverging to the more developed economies of Europe**. On such basis it would be interesting to examine whether long-term convergence can be ever achieved in the future. What seems evident is that the main preconditions of a successful convergence were never fulfilled in the last 100 years. It seems very likely that a breakpoint type change in the Hungarian trendline, and therefore, **a successful convergence would be only be possible if there is a shift in the fundamental (preferably both internal and external) driving forces of human capital accumulation and technological progress**.

The most significant events of turmoil, and then, elevated rates of growth linked to reconstruction – as predicted by Jánossy (1966) – are clearly observable. There are altogether 4 relevant severe recession phases, namely the 'great depression' of 1929-33, the Second World War, the transformation crisis following the collapse of the former Eastern bloc in the early 1990s, and the aftermath of the 2007-08 global financial crisis. It can also be seen that after the above-mentioned break points, an economic rebound occurred in all cases, gradually returning the output to its pre-shock development path.

The events occurred during the 1950s, mainly the collectivization efforts of the central government and the 1956 revolution caused a temporary slowdown in the post-war rebound. The main prediction of Jánossy (1966), that very high growth observed in the late 1950s and early '60s have to dissipate after the economy just reached its long-term, 'unshocked' development path, was proven to be correct by the observable slowdown in the following decades. However, even after the slowdown in the mid-1970s and the stagnation of the 1980s are taken into account, income levels between 1960 and 1989 were constantly higher than what might be suggested by the long-term trendline.

All in all, Hungary remains a middle income economy without a real prospect neither for convergence, nor divergence as its long term rate of expansion remains similar to the global average. The question rises, whether the recent years' economic growth might break this tendency. **Over a ten-year period of 2008-2018, the rate of GDP per capita growth was 1.81 percent annually, which is identical with the 1990-2008 long term rate of 1.82%.** In the last 5 years, the observed (4-5 % per year) expansion of the Hungarian economy was comparable to a decade-long period of prosperity starting in 1997 and ending around 2007. The recent pattern fits completely into the centennial overall trend and could only be regarded as a rebound – or more precisely, an upward correction – after a recession and stagnation following the global financial crisis of 2008. The higher growth rates of these, more recent years are not exceptional from any point of view. Historically, increments over 4 percent annually were typical and absolutely normal during periods of rebound and general prosperity (see Fig. 8/b). Still, if we take into account the vast amount of external financing available for fuelling the expansion of the Hungarian economy within this recent period in the form of EU transfers, remittances of citizens working abroad, a moderate inflow of foreign capital and a low-interest environment on international financial markets, a 10-year growth rate of only a few hundreds of a percent higher than the 100-year average would hardly come as unexpected.

"The rapid economic growth of so-called emerging markets is one of the leading storylines of our age and arguably the most important economic development affecting the world's population in the first decade of the 21st century. It has lifted millions of households out of poverty. It has accounted for the vast majority of global growth in a period when the advanced countries have been economically challenged and financially troubled. For some time now the question on everyone's mind has been how long this rapid growth can continue, in emerging markets in general and the group's largest and most economically dynamic member, China, in particular."

Eichengreen-Park-Shin: Growth Slowdowns Redux: New Evidence on the Middle-Income Trap, 2013

4. THE MIDDLE-INCOME TRAP PHENOMENON

4.1 Income traps or convergence plateaus: facts and misconceptions

Besides the well-known growth paradigms, growth economics is dealing with several development related issues becoming more and more popular nowadays. Although the question of why certain countries may produce a more successful path of development than others, have always been among the most researched cases or hypotheses, income trap or poverty trap episodes surveyed in different economies of the world have undoubtedly come in the focus of economists' attention during the last couple of years.

The phenomenon of the so-called **middle-income trap** – later referred to as '**MIT**' – is certainly representing such an issue within development and growth studies. In the second half of the 20th century several emerging economies have managed to start an accelerating increase in their rate of per capita economic growth, as a result of which most of them became able to catch up to a middle-income level. Subsequently, a significant percentage of these economies have 'run out' of rapid and of course, unsustainable growth. As a next step, a certain amount of them has had to face very slow progress or even stagnation for many years, sometimes decades – known as the middle-income trap.

Among the first ones, **Indermit Gill** and **Homi Kharas** examined and identified the main features of the MIT in 2007 in frames of their World Bank publication entitled *"An East Asian renaissance: ideas for economic growth"*. According to the research, **in order to realize a successful development path, economies of scale should be utilized effectively**. Following the decline in diversification being the result of shifting towards production and employment, investment may also shrink while innovation gains more and more importance and finally, education will focus on providing future workers

important skills essential for the use of modern technologies (Gill & Kharas, 2007). In 2015 the authors continued their research in a paper entitled *"The Middle-Income Trap Turns Ten"* highlighting that **middle-income countries were defined as a group stuck between economies of low development being competitive in low wages and high work intensity related to traditional industries as well as developed countries being leaders in IT and other technology intensive sectors and reproducing high quality human capital**. What is also important to outline, Gill and Kharas are drawing our attention to the fact that originally, middle-income trap emerged as a result of not having an appropriate 'solution pack' for countries which were unable to continue their catching-up process and not as a completely new phenomenon to analyse in development economics. Of course, not every middle-income country is predestined to achieve this disadvantageous status, so the concept should not be applied as an inevitable outcome but as a possibility or rather threat for certain middle-income economies producing a protracted growth slowdown (Gill & Kharas, 2015).

In order to make a classification of different MIT approaches, three main groups can be detected (Gill & Kharas, 2015):

- *Institutional and policy based approaches* providing development scenarios for middle-income economies;
- *Long-term data based empirical approaches* defining different intervals for countries being stuck in the middle-income trap;
- *Methods and strategies driven by the lack of convergence* towards a more developed – reference – economy that is in most cases the United States.

Though there is a significant number of economies being (or had been previously) stuck in low income status, in current paper we are dealing with the more critical cases of middle-income countries unable to move forward due to internal or/and external socio-economic factors. So why are there much more developing economies failing to continue their upgrading path towards the high-income club compared to their low-income fellows struggling to achieve the middle-income category? It is also possible that the middle-income group has to face more complex obstacles since carrying out structural transformation while maintaining high growth is not easy to deal with. As usual, developing economies do not have enough highly qualified human capital rate within total population as well as a supportive institutional background (Fortunato-Razo, 2014).

4.2 The definition, methodology and critique of the middle-income trap

When examining the income trap related economic literature, we should not ignore the publication of **Nelson** entitled *'A Theory of the Low-Level Equilibrium Trap in Underdeveloped Economies'*. Nelson claimed that **in case economic growth is characterized with increasing per capita income, the given country becomes unable to continue its growth and as a consequence, it will be stuck in a so-called low-level equilibrium trap**. The model created by the author shows that the actual socio-political environment has such a strong influence on development that the above-mentioned trap can be escaped despite the underdeveloped ways of production and also the lack of the "government investment programs" (Nelson, 1956, p. 904). To minimize the possibility of the trap, it is important to increase the ratio of active population, to support new entrepreneurships or to give more field for capital accumulation for investors or as Nelson originally concluded, *"...policies directed toward eliminating social inertia may play an important role in loosening the trap"* (Nelson, 1956, p. 904).

In their 2006 paper **Hausmann, Rodriguez** and **Wagner** define crises or **growth collapses** as ***"periods of continuous negative average growth"*** (Hausmann et al, 2006, p. 5). The authors especially highlight the difficulties of analysing crises of long duration because in most cases, data are not available for the entire examined period. As a result, the effects and magnitude of such recessions are inexact and significantly underestimated. Concerning **developing economies**, there is a **much higher probability for them to experience a crisis with long duration** compared to developed countries. On one hand, studying the outbreak of a crisis, the authors came to a conclusion that **negative changes in export produced the most significant correlation in developing economies**. On the other hand, the duration of a recession composes a much complicated task: in latter case the study reveals that it strongly depends on *"the measure of the density-weighted value of a country's alternative export basket"*. (Hausman et al, 2006, p. 22)

Continuing our research in the field of development traps, the categorization of **Paul Collier** in his "**Bottom Billionaire**" book, has become also relevant in economic literature. Using a comprehensive approach of economic, political, social and geographic factors, Collier distinguishes four main groups while focusing on the poorest countries and social groups of the world: **conflict trap, natural resource trap, the trap of being landlocked with bad neighbours and the trap of bad governance in a small country** (Collier, 2007). As a possible solution to break out, for developed economies the author

suggests to provide a ‘big push’ aid for the poorest region that is temporary and large, e.g., contributing to the development of technology, human capital and competitive export structure in order to prevent the so-called Dutch disease problem (Collier, 2007). **Azariadis** outlines that different traps usually function as *“self-reinforcing mechanisms”* and thus may prevent further economic growth. These can be driven by market or institution generated failures (Azariadis, 2005, p. 297). To go deeper into details, **income related traps can occur in less developed countries** since the appropriate, present-day technologies are not adopted effectively to the 21st century needs and thus provoke long-term stagnation (Azariadis, 2005).

In frames of an IMF working paper **Aiyar, Duval, Puy, Wu** and **Zhang** identify **growth slowdowns as extended terms of stagnation which show considerable differences compared to the preceding standard of a given economy**. Their research also brings evidence that **in case of middle-income countries there is a much higher probability to undergo growth slowdowns** than in other income groups (Aiyar et al, 2013).

The available evidence seems to suggest that growth slowdowns leading to income traps in the majority of cases occur in forms of single episodes. However, there are countries where growth slowdowns evolve gradually one after another (e.g. Japan in the 1970s and in the 1990s). To continue, there is a third type of stagnation: following a significant growth slowdown, a considerable increase is experienced as the effect of certain state reforms. Nevertheless, a second wave of growth slowdown takes place, like for example in Argentina (Eichengreen et al, 2012). A year later **Eichengreen, Park** and **Shin** released a new publication concerning the middle-income trap where **slowdown episodes** are presented along with their possible correlates: **significant growth in the previous term, disadvantageous demographic characteristics, high rate of investment leading to unsustainable growth and an undervalued exchange rate** (Eichengreen et al, 2013).

As it has been already mentioned, researches made in field of growth slowdowns experienced in middle-income economies are not a novelty. In 2004, **Geoffrey Garrett** published an analysis focusing on the complex growth problems which are widespread in middle-income countries. Garrett highlights that **supporters of globalization have no grounds to give a solid explanation for the stagnation going on in several middle-income countries**. As a possible solution for catching-up, the author suggests these **economies to “tech up”** and thus become active participants of the global market and knowledge (as well as human capital) based economy (Garrett, 2004).

Agenor develops quite an important claim that income and poverty traps have to be properly distinguished. Poverty traps are determined as self-generating phenomena in accordance with Azariadis's result, which largely contribute to the long-term maintenance of poverty and usually emerge in a very low income per capita environment (Agenor, 2016). However, the **MIT occurs after a period of high increase of GDP** and thus better standards of living will be available for people (Agenor, 2016).

Among the possible triggers of MIT we have to mention productivity patterns: **there is a strong correlation between the low level of total factor productivity (TFP) and the development of an income trap**. As for emerging economies, we have to add that productivity slowdowns are driven by the insufficient method of imitating foreign technologies instead of applying innovation. Thus the country becomes unable to catch up to the more developed income group (Cherif-Hasanov, 2015).

Eva Paus, focusing mainly on Latin American studies, has made an observation concerning the available MIT literature: on one hand, many authors suggest that **structural changes are the main triggers** of it as well as the characteristics of the global, external environment. On the other hand, several specialists agree that **growth slowdowns show no pattern at all**, thus the time, frequency or the country itself are not of primary importance (Paus, 2014).

One of the most popular categorizations regularly used in MIT analyses, is the **World Bank's country classification by income**. The four groups are determined on the basis of GNI per capita. For the 2020 fiscal year, economies were defined as follows (Fig. 9.):

- *Low-income countries*: with GNI per capita of $1025 or less (31 economies);
- *Lower-middle income countries*: with GNI per capita between $1026 and $3995 (47 economies);
- *Upper-middle income countries*: with GNI per capita between $3996 and 12375 (60 economies);
- *High-income countries*: with GNI per capita of $12376 or more (80 economies).

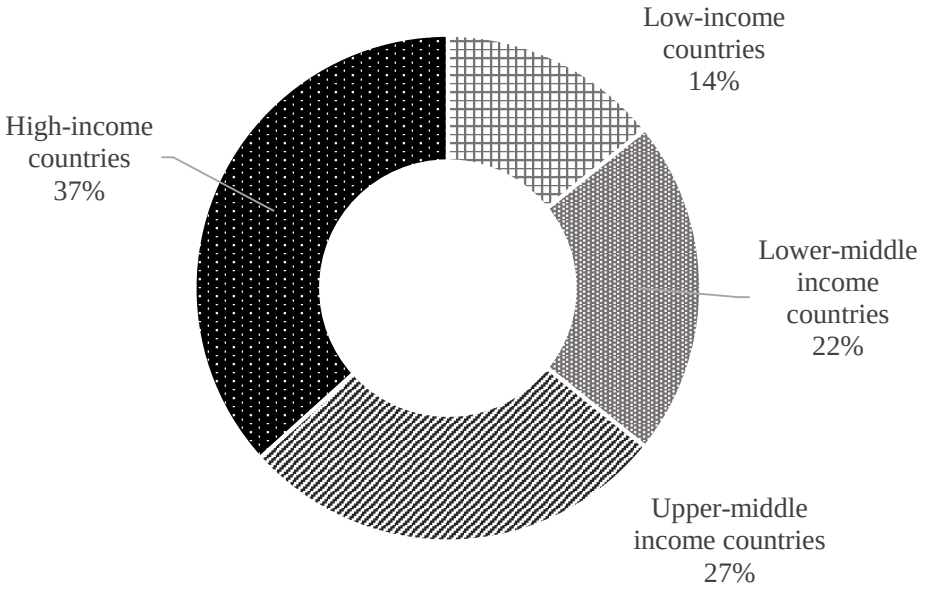


Figure 9: Distribution of economies in the world by income in 2018
Source: The World Bank (2020)

4.3 An empirical approach to define the middle-income trap

One alternative characterization to find countries in the world economy which are experiencing a MIT phenomenon is the one developed by **Felipe, Abdon** and **Kumar**: the researchers consider a country being stuck in a **lower-middle-income trap** if it had previously spent **at least 28 years as a lower-middle-income group member**. In case of being for **at least 14 years as an upper-middle-income country** allows to suppose that the economy is in **an upper-middle-income trap** (Felipe et al, 2012).

Ito puts forward the view that a middle-income trap may occur when the growth rate of an emerging economy drops to the rate of the most developed countries before the income level in the examined economy could achieve a threshold comparable to the advanced countries (Ito, 2016).

4.3.1 Preconditions and characteristics of the MIT phenomenon

The research presented in this dissertation is based on gathering very long series of real GDP per capita for almost every countries in the world by relying on two sources. Firstly, there is the ‘classical’ version of national accounts data and historical estimates collated

by **Angus Maddison**[39], which is available online from the **Groningen Growth and Development Centre**, University of Groningen, Netherlands (Maddison Project, 2010). This source contains more than 130 individual countries since at least 1950. Values are in Geary-Khamis[40] dollars expressed in 1990 constant prices. Sometimes, estimates of real per capita incomes are going back to the 19th century. The above cited version of the dataset ends in 2008. Secondly, there is well-known **World Development Indicators dataset** of the World Bank which gets multiple updates in every year and contains the main economic indicators – including per capita GDP and its dynamics – until nowadays (The World Bank, 2019).

World Bank (WDI) data is also available in constant prices, but it must be noted that benchmarks for price level comparisons could change by regular annual updates. For example, at the beginning of this research in 2013, per capita GDP by year and by country were available in 2005 US dollars. In the most recent updates however, the 2005 benchmark is no longer supported, international income comparisons are available in post-crisis price levels reflected by the years of 2010 and 2011. In order to preserve continuity, all the individual values from all sources were converted to a constant 2011 price level. If there was any data overlap, the mean of the two sources was applied by the Author. In most cases, the two data sources were in good agreement with each other, the main issue was the problem with different benchmark years, which had to be controlled carefully. The WDI (national accounts based) series for some countries are available since 1960, but in most cases, the starting data is somewhere between 1970 and 1995. Considerable, 5-10% magnitude differences between the Maddison and WDI series emerged in case of some low-income, developing economies where data quality is certainly an issue, especially for the earlier times.

In 2018, a new release for the Maddison dataset was published after many years of extensive background work by the authors (The Maddison Project, 2018). It could be mainly considered as an extension, but one important change is that it provides two

[39] British economist and economic historian (1926-2010), who specialised in gathering quantitative data of country-level, regional and global economic progress. Worked as a professional for many decades at the OECD and in earlier times, at its predecessor – the Organisation for European Economic Cooperation since 1953. As a development advisor, he visited many countries outside the European continent, such as Brazil, Ghana, Guinea, Mongolia and Pakistan. Maddison was a real pioneer in the field of reconstruction of national accounts data back in time from various sources of information. From 1978 until his death, he was a Professor at the University of Groningen, the Netherlands.

[40] More widely known as international dollars. Actually, it is a hypothetical unit of currency that has the same purchasing power parity that the U.S. dollar had in the United States at a given year (OECD, 2003).

different long-term series for most countries. One of them relies on the old, well-known methodology and is preferred by the Author on the concept of backward compatibility. The second type of series are based on multiple benchmarks and its methodology is described in a supplementary working paper (Bolt et al, 2012). As both datasets are currently providing generally longer time series, data overlaps have become more common, enabling to get possibly more precise results for the developing countries. By utilizing both data sources, and in addition, historical national accounts data for the Middle-Eastern smaller states published by Barlow (1982), a reconstruction of both absolute and relative income levels for the 1950-2018 timespan, including 166 countries becomes possible (Fig. 10).

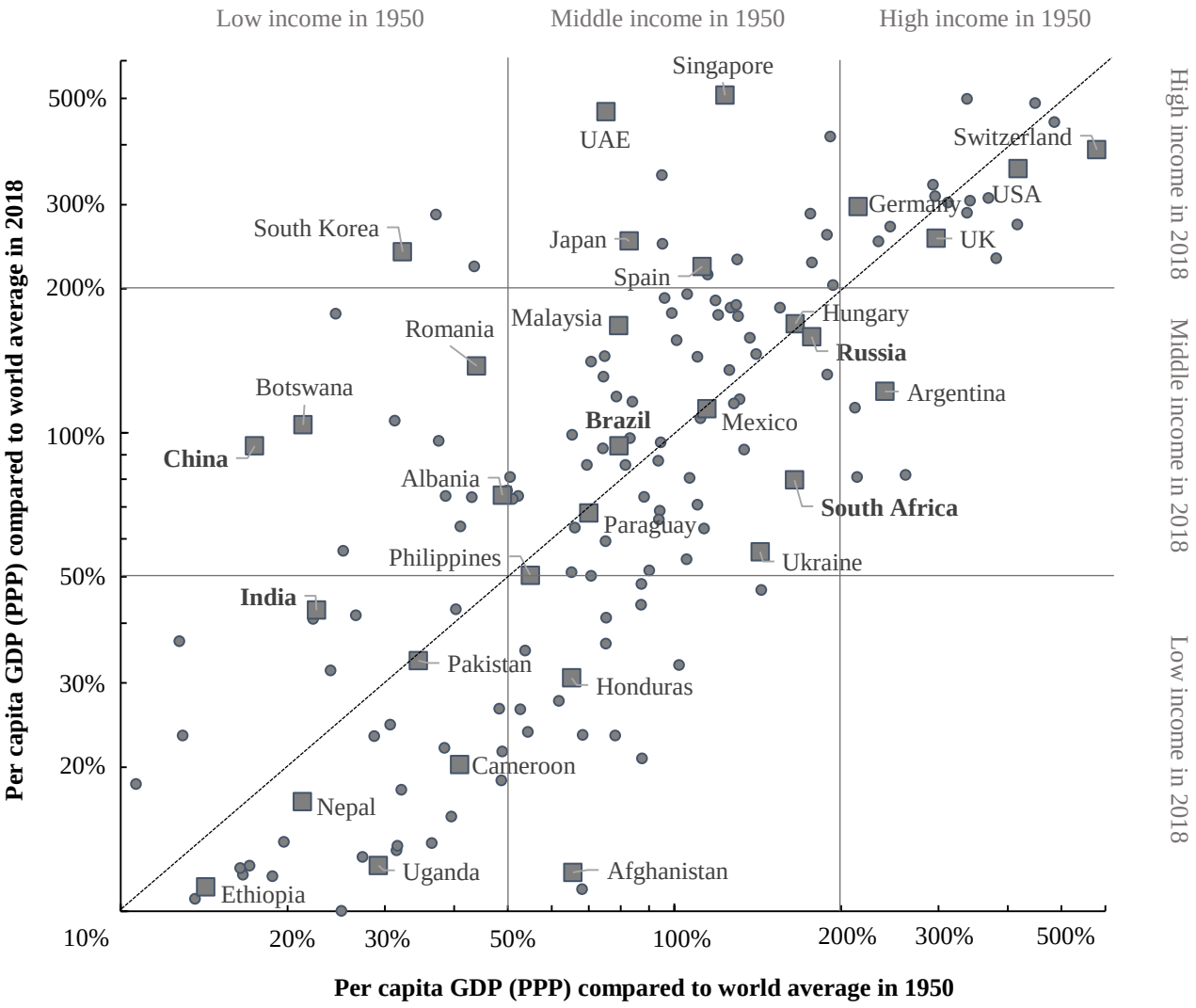


Figure 10: Changes in relative income levels by country, between 1950 and 2018

Source: author's calculations based on data provided by World Bank (2019), Maddison (2018) and to a lesser extent, Barlow (1982)

The very long run growth performance of most countries (with the exception of some small island nations and a few African states) within the world economy is presented by Fig. 10. The horizontal axis indicates the relative level of development measured in 1950, while the vertical one shows the same parameter for each country in 2018. A 45-degree line crosses the chart area, and functions as a division between economies which were capable to achieve higher rates of per capita growth than the world average and improve their relative positions in the hierarchy of the global economy, and the diverging ones whose level of development remained below average. Successful emerging economies such as China, Singapore, South Korea or to a lesser extent Malaysia, Spain, Albania and Romania could be found in the left-upward part. Definitions of relative income levels, which are represented by the 3x3 matrix on the chart, are discussed later in this chapter.

After having presented some relevant MIT terminology, in what follows, we are applying the following **conditions to detect middle-income trap episodes** (Sőreg, 2017a):

a) First of all, it is relevant to determine the **income categories** used for classifying individual economies. Relying on the World Bank data as well as the Maddison series, we are comparing the per capita Gross Domestic Product of the given country to the estimated global average per capita GDP in the same year. As a result, in current research those countries are considered as **low-income group** members which have **per capita incomes less than 50 percent of world average**. **Between a relative income levels of 50.1 % to 100 %**, an economy will belong to the **lower-middle income** group. **From 100.1 to the 200 percent** relative level, countries are identified as **upper-middle income** economies. **Above 200%** of global average per capita income, we are dealing with **high income group** members, which represent the most developed countries. In addition to these, some further criteria should be developed in order to identify protracted slowdown periods as well as possible middle-income trap phenomena. The Author finds the standard World Bank classification method problematic since over many decades, average per capita output of the global economy could change significantly. Moreover, it does not account for the effect of U.S. dollar inflation, which could be very pronounced on a multi-decadal timescale. Applying fixed benchmarks over very long time to align countries into income groups might lead to erroneous conclusions. Relative levels of income, as a percentage of the world average would better represent the position of any country over time, compared to others;

b) **Therefore, per capita GDP adjusted for purchasing power parity (PPP) of a middle-income economy has to achieve at least 50.1% of world average and maximum the double of it –** see all the data included in Appendix 2;

c) Regarding the approach of identifying countries which are experiencing the MIT phenomenon, the basic methodology was laid down by Felipe et al (2012) and Ito (2016). Any country with a position located in middle of the above chart (Fig. 10.), and close to the division line between emerging and non-emerging economies, has experienced sometimes in its past, or experiencing nowadays a middle-income trap situation. **The per capita growth rate of some countries – including Mexico, Colombia, Russia, Hungary, the Philippines – which could be considered middle-income by the definition discussed above, are almost identical to the 68-year global average**. These countries were unable to show a long-term convergence, or divergence and therefore, emerge as candidates for studying the MIT phenomenon;

d) As the definition of a protracted growth slowdown, we are looking for a timespan of zero or negligible per capita growth in a middle-income economy. **The slowdown period, which must be at least 10 years in length, is preceded by an era of faster-than-usual economic growth**. Moreover the given country is likely to follow **a catching-up path** before the protracted slowdown occurs, producing **at least 3 % per capita GDP growth annually as a 10-year average**;

e) **The protracted growth slowdown** is better regarded as a **stagnation** (or an extended period with minuscule growth) and not as a rapid recession. Periods of economic turmoil caused by internal or external shocks – such as a currency crisis, debt crisis, political turmoil, war or civil unrest – should not be classified as slowdown periods;

f) During the **minimum 10-year long growth slowdown**, the **per capita GDP growth rate is close to zero with a decadal average of less than one percent per year**;

g) The **uppermost income level where the middle-income trap could be observed is around 2.1-2.3 times the value of the per capita world GDP**. This value approximately conforms to the current level of development of the Czech Republic, Spain, Estonia or Slovenia.

4.3.2 MIT episodes throughout the world economy: presentation of the results

After defining the main features of the middle-income trap, some concrete episodes of latter phenomenon are going to be presented in Table 1 where besides listing the affected economies we might also analyse the duration and magnitude of growth period, slowdown phase as well as the post-MIT rate of growth.

In the last 10-15 years, economic literature already specified has provided ample support for the assertion that income traps represent a serious threat for the development of emerging economies. Although several studies criticize the trap and give no long-term significance on its effects on countries' convergence, **the question is still arising whether the phenomenon experienced in middle-income level countries is indeed, a serious development problem or rather an artificial classification calculated in different ways and thus interpreted in contradictious scenarios**. Although there is no standard definition for the MIT, it is a fact that more and more attention is being paid to the topic in academic literature.

The following results have been concluded regarding the MIT phenomenon:

- *1)* In the process of establishing a new definition of MIT, we have managed to reveal altogether **34 cases of significant growth slowdowns between 1950 and the mid-2010s** (see both Table 1 and Appendix 3) which have been associated with middle-income trap episodes. As it might be noted, there are **three BRICS (Brazil, Russia and South Africa) and two CEE (Hungary and Poland) economies affected by the phenomenon.** However, the issue of its main triggers still remains open. Some further research in this area may focus on developing prediction models about the development trajectories of middle-income countries experiencing long slowdowns.

- *2)* The **most protracted slowdown phases** lasting over 30 years were detected in **the Philippines, Gabon, Namibia** and the **Fiji**, while the **shortest episodes** with the

minimally required, 10 years duration emerged in **Tunisia, Belize, Serbia, Spain** and **Hungary**. According to the results, **only Hungary and Portugal were affected by the MIT phenomenon more than once** since 1950. The economic environment of Hungary will be specified in more details throughout Chapter 5. Meanwhile, the average length of a slowdown period was about 19 years regarding the listed cases.

- *3)* It might be noted the **post-MIT (rebound) period is usually holding a higher-than-average per capita growth rate** than the global average for the same period. The latter has a long-term mean of about 1.5% per year.

- *4)* Slowdown phases associated with MIT periods can be also spotted as minor **plateaus** in the development path of countries when plotting growth rates. However, it is not evident the status of being a dependent market economy is the one that provokes an income trap or whether it would be true the other way around.

- *5)* We might also come to a conclusion in light of our calculations that **40 percent of countries belonging to the middle-income group in 1950 are nowadays in the same category, 10-10% shifted places between lower-middle and upper-middle income group, 20% managed to upgrade to the high income category, and also 20% fell to the poorest layer of low income group**.

- *6)* There is no significant relationship between the rate of pre-slowdown growth and the relative level of development of a given country (per capita level of GDP of the country compared to the world average of per capita GDP).

- *7)* There is a weak negative relationship between the pre-slowdown level of growth and average rate of expansion in the post-stagnation period. After coming out of a slowdown, upper-middle income countries are tending to have more moderate per capita expansion rates compared to members of the lower-middle income group.

- *8)* A negative relationship is observed between the pre-stagnation average growth rate and the following length of the MIT period. **Middle-income economies achieving very high growth rates sustained for multiple decades seems less susceptible to protracted slowdowns.**

Table 1: Growth and slowdown periods of middle-income countries

		Pre-MIT growth period			Slowdown period						Post-MIT growth rate		
		start year	*end year*	*%/year*	*start year*	*end year*	*length (yr)*	*%/year*	*income level*	*income group***	*start year*	*end year*	*%/year*
Sub-Saharan Africa	**South Africa***	1962	1974	3.20	1975	2001	27	-0.32	136%	UM	2002	2018	1.72
	Gabon	1951	1972	4.50	1973	2010	38	0.67	197%	UM	2010	2014	3.29
	Namibia	1954	1965	4.25	1966	2001	36	-0.30	106%	UM	2002	2014	3.54
	Seychelles	1959	1993	3.59	1994	2004	11	0.39	150%	UM	2005	2014	4.42
Europe	**Albania**	1951	1973	3.64	1974	1989	16	0.48	57%	LM	1993	2014	6.02
	Greece	1951	1978	5.75	1979	1994	16	0.25	235%	H	1995	2007	3.35
	Poland*	1953	1975	3.72	1976	1989	14	-0.11	141%	UM	1992	2014	4.19
	Hungary*	1957	1978	3.57	1979	1989	11	0.92	185%	UM	1994	2005	3.61
	Hungary*	1994	2005	3.61	2006	2015	10	0.82	177%	UM	slowdown ended in 2015		
	Malta	1986	2000	4.72	2001	2013	14	0.99	211%	H	slowdown ended in 2014		
	Russia (Soviet Union)*	1952	1973	3.63	1974	1990	17	0.76	215%	H	1999	2014	4.89
	Portugal	1951	1973	5.88	1974	1984	11	0.84	169%	UM	1985	2000	3.58
	Portugal	1985	2000	3.58	2001	2014	14	-0.01	225%	H	slowdown ended in 2015		
	Spain	1951	1974	5.10	1975	1984	10	0.65	224%	H	1985	2007	2.63
	Serbia	1951	1979	4.79	1980	1989	10	0.65	133%	UM	2000	2014	3.96
Latin America	**Argentina**	1964	1974	3.42	1975	2002	28	-0.22	173%	UM	2003	2014	4.79
	Barbados	1961	1980	4.38	1981	1993	13	0.06	131%	UM	1994	2007	2.15
	Belize	1986	2004	4.36	2005	2014	10	0.36	65%	LM	*in 2019, still in slowdown*		
	Brazil*	1967	1986	4.21	1987	2003	17	0.49	114%	UM	2004	2013	2.95
	Costa Rica	1962	1979	3.61	1980	2002	23	1.03	87%	LM	2003	2014	3.09
	Dominican Republic	1966	1977	5.65	1978	1991	14	0.78	56%	LM	1992	2014	3.91
	Ecuador	1969	1978	4.43	1979	2003	25	0.29	84%	LM	2004	2014	2.98
	Jamaica	1951	1970	5.54	1971	1985	15	-1.54	120%	UM	1986	1995	2.63
	Colombia	1967	1980	3.11	1981	2002	22	1.04	76%	LM	2003	2014	3.25
	Mexico	1951	1981	3.49	1982	1995	14	-0.54	151%	UM	1996	2007	2.00
	Panama	1953	1971	4.09	1972	1996	25	0.76	101%	UM	1997	2014	4.57
	Paraguay	1961	1989	3.34	1990	2005	16	0.14	59%	LM	2006	2014	3.43
	Peru	1960	1974	2.96	1975	1992	18	-1.67	91%	LM	1993	2014	3.76
	Trinidad and Tobago	1951	1980	4.39	1981	1997	17	-1.32	219%	H	1998	2014	4.38
MENA	**Algeria**	1963	1979	5.42	1980	1990	11	-0.41	117%	UM	2001	2014	2.09
	Jordan	1973	1986	5.53	1986	2000	15	-1.09	98%	LM	2001	2014	2.93
	Tunisia	1960	1981	4.52	1982	1991	10	1.01	56%	LM	1992	2014	2.95
Asia	**Fiji**	1967	1979	4.63	1980	2014	35	0.85	64%	LM	slowdown ended in 2015		
	Philippines	1951	1963	3.09	1964	2002	39	1.01	51%	LM	2003	2014	3.56

*Countries selected for the narrow approach of Thesis that experienced the MIT phenomenon at least once since 1950.

**Signifies the income group of each country at the beginning of slowdown, LM: lower-middle income; UM: upper-middle income; H: high income group in the specified year.

Source: own calculations based on The World Bank (2019) and Maddison Project (2010)

In what follows, we are going to present a model created to detect the basic features of the slowdown episodes in the examined middle-income economies by applying statistical tests (Appendix 4) to examine whether there is a significant relation between two chosen variables. Basically, **6 main sets of premises will be tested concerning the randomness of the occurrence of protracted slowdowns observed in middle-income economies**. By the application of statistical hypothesis testing, we can calculate the probability that these slowdown events are not occurring completely randomly among different countries, and to some extent, they are interrelated. What is more, we are also using the analysis of variance to examine the initial and final years' slowdown characteristics.

Condition 1:

- *h0***: slowdown periods occurring with the same probability in each year, i.e. a discrete uniform distribution of slowdown per year can be assumed.**
- *h1***: The expected value of slowdown episodes in each year is not equal**.

Since our p-value is 0.003, we have to accept the statement indicated in the counter hypothesis *(h1).* In certain periods, like for example during the 1970s and early 80s, there used to be significantly more slowdowns in world economy. We can also assume that this anomaly is not an incidental amplitude since the probability of its occurrence by chance is very low, only 0.3 percent in a 50-year timespan (see Fig. 11).

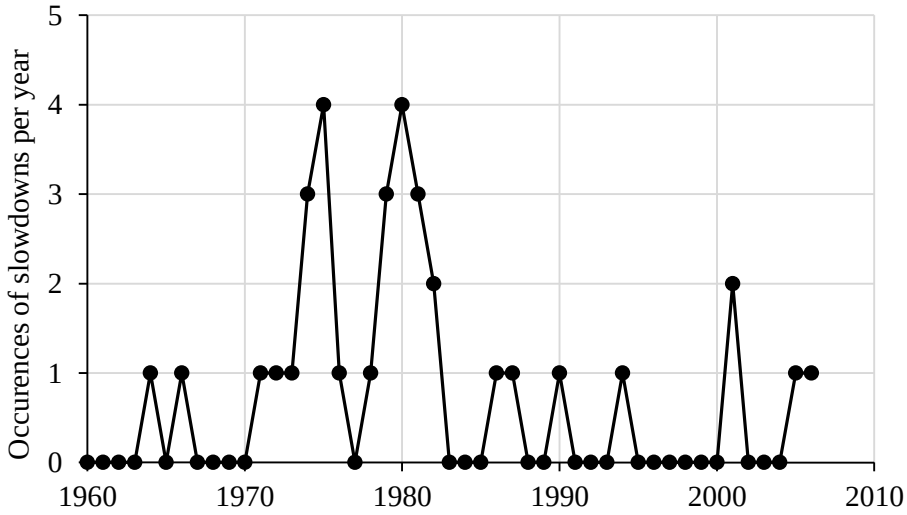


Figure 11: The distribution of the initial dates of protracted growth slowdown periods, until 2015

Source: author's calculations based on The World Bank (2019) and Maddison (2010)

As a next step, a Wald-Wolfowitz test was carried out:

Condition 2:

- *h0*: **the order of years with at least one observed slowdown and without any of these is incidental.**
- *h1*: **the order of years with slowdown period onsets and without is not random**.

In latter case the p-value achieved 0.071, so at the 0.05 and 0.01 standard significance levels *h0* should be still accepted (it is only rejected on the 0.1 level). On this basis, the random nature of the process cannot be excluded.

Regarding the final years of observed slowdown periods globally, similar tests can be implemented:

Condition 3:

- *h0*: **slowdown episodes are terminated with the same probability in each year having a discrete uniform distribution.**
- *h1*: **the probability of slowdown episodes' ending is not equal each year**.

The p-value is 0.282, so at all (0.01, 0.05 and 0.1) standard significance levels we have to accept the statement indicated in *h0*. Therefore, we cannot rule out randomness regarding the endings of protracted growth slowdowns in different countries. As we could observe, there were two distinct spikes[41] in the occurrence of slowdown period endings around 1989 and 2002. Unusual, non-random patterns are hardly detectable (Fig. 12.)

To continue, we may also examine some hypotheses using again the Wald-Wolfowitz test:

Condition 4:

- *h0*: **years with and without growth slowdown period endings follow each other randomly.**
- *h1*: **the above-mentioned years do not follow each other incidentally**.

[41] The first uptick in the series seems to be coincident with the collapse of the Eastern bloc in 1989, while the second one follows the 'soft landing' of the U.S economy after 2001.

After having our analysis done, since in latter case p-value is showing high confidence (0.008), we are rejecting *h0* and therefore, randomness at all standard significance levels.

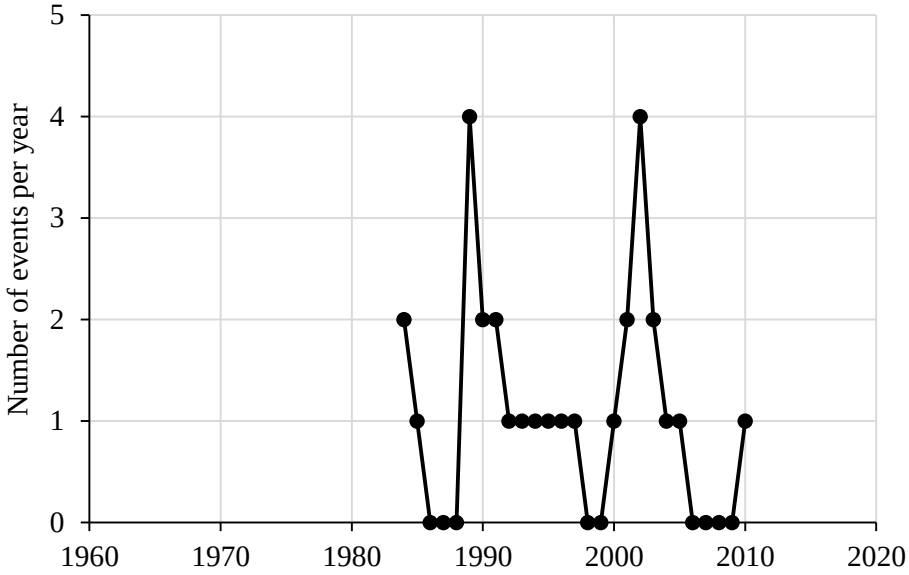


Figure 12: The distribution of the closing dates of protracted growth slowdown periods, until 2015

Source: author's calculations based on The World Bank (2019) and Maddison (2010)

To sum up, null hypothesis (of randomness) was still acceptable in 2 out of 4 cases indicating that in most episodes there is not enough evidence to reject the random character of slowdown occurrence. The only cases where incidence can be excluded is the strong concentration of initial years concerning growth slowdowns in the second half of the 1970s and at the beginning of the 1980s. In latter period there used to be significant slowdown tendencies in 3-4 different countries. Secondly, the time series of growth slowdown endings is clearly not a random series. Thus we may consider that during this term there were also some exogenous effects besides the usual structural inner causes.

However, the available facts seem to suggest that slowdown could still be observed when the exogenous effect had already ceased (e.g. rapid increase of oil prices during the seventies). The end of slowdown processes does not show any regularity, so it can be presumed that it has a random nature.

As a next step, we are aiming at revealing the relationship among regions of world economy by applying the analysis of variance (ANOVA). Taking into account the already detected MIT countries, the following groups have been analysed: Europe, Latin America, the Middle East and North Africa, Sub-Saharan Africa and Southeast Asia.

Our first set of hypotheses on the starting and final years of growth periods is indicated below:

Condition 5:

- *h0*: **there is no connection between country groups and the initial years of growth slowdowns.**
- *h1*: **there is covariance in case of starting years of slowdowns within the above-defined country groups**.

As a result, p-value turns out to have a considerably high, 0.589 value – which means a strong confirmation of the null hypothesis of randomness at all standard significance levels. Regarding these results, large-scale interdependence can be excluded.

On the basis of the previous assumptions, we are going to check what the case is regarding the closing years of economic slowdown periods:

Condition 6:

- *h0*: **no relation can be observed between the final years of slowdowns as well as the indicated country groups.**
- *h1*: **there is some covariance of closing years of slowdowns within country groups**.

Very similar results are obtained after having tested our hypotheses: since a relatively high p-value (0.257) was observed again, *h0* is acceptable by a wide margin and at all standard significance levels.

In light of the latter hypothesis testing we may conclude that differences between initial and closing years of slowdown periods cannot be explained by belonging to a certain country group or a certain region of the world economy, such as Europe, Latin America, the Middle East and North Africa, Sub-Saharan Africa or Southeast Asia. In other words, the starting and final years of a protracted growth slowdown and also its duration may be considered as a random phenomenon, varying from country to country. This statement is somewhat contradicting the former conclusions of dependence theories according to which counties' development is significantly converging within regions of the globe.

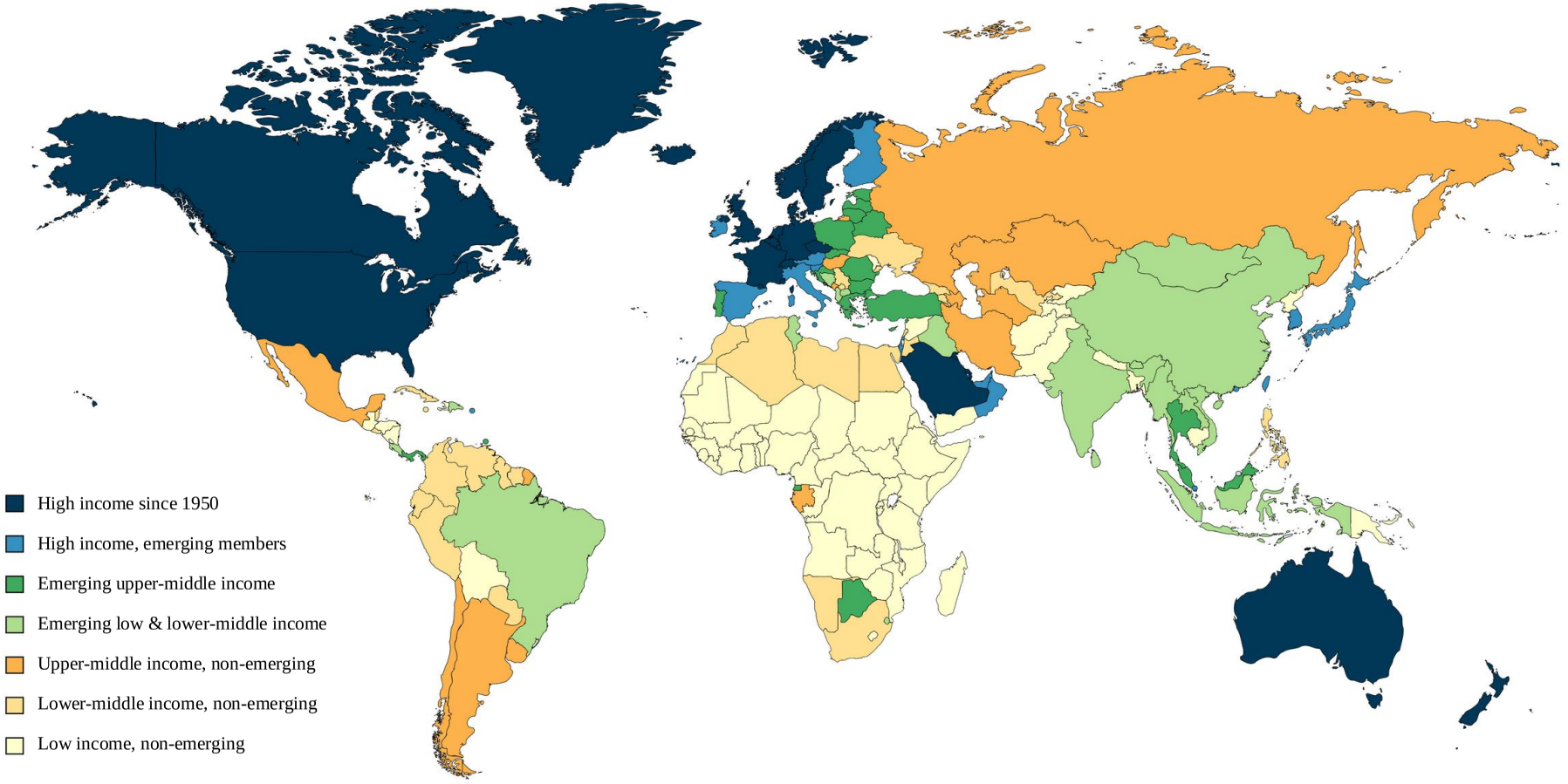


Figure 13: A proposed categorization of all countries by their observed convergence path, 1950-2018

Source: Author's calculations based on The World Bank (2019), Maddison (2018) and Barlow (1982)

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In Chapter 4, a new alternative for classifying economies by their relative level of development was presented by the Author. Countries were assigned with ‘low income’, ‘lower-middle income’, ‘upper-middle income’ or ‘high income’ status on the basis of their per capita GDP in purchasing power parity terms for every year since 1950, which was then compared to the global average. Upper-middle income economies, for example, had relative per capita GDP levels between 100.1 and 200.0 percent of the global mean. On Fig. 13, this methodology of classification was refined further. Long term convergence, or the lack of it on a multi-decadal timescale was taken into account in order to create 7 separate country groups in addition to the original four income thresholds.

Globally, there are only 20 countries where local per capita income levels were always more than 2 times higher than the world average. Within this narrow club, besides the most advanced Western European states, USA, Canada, Australia and New Zealand, we may find three wealthy oil exporters in the Middle East (including Saudi Arabia) and although it might be surprising, but the Czech Republic as a CEE country is also belonging there. In 1950, Czech territories had higher income levels than what was observable during those times in neighbouring Austria. The second group is being formed by probably the most successful economies of the last 70 years, altogether 16 countries mostly in Europe and Eastern Asia, such as Singapore, Japan, South Korea, Israel, the United Arab Emirates, Ireland, Slovenia, Spain or Finland. No country in Africa was able to gain access into this group, and there is only one small island state from the Latin American region: Puerto Rico.

The third and fourth newly-formed country group consists of the emerging economies. All the countries, which were capable to significantly (with a threshold of at least 20 percentage points) improve their relative income level received an ‘emerging’ status. Three countries from the BRICS group could be classified as emerging ones: China, India, and to a lesser extent, Brazil has shown some catch-up since the 1950s to present time. Most of such economies are located in Southeast Asia or on the Eastern periphery of Europe (the CEE region). Latin America has very few countries which could be considered as emerging markets, while Africa has 3 such nations, namely Tunisia, Equatorial Guinea and Botswana. The latter has quite a unique economic history within the Sub-Saharan region, stated out as one of the world’s poorest nations and between the 1960 and 1990 it was the fastest growing economy (Lewin, 2011) of the world. Actually, the only emerging upper-middle income country in the Southern Hemisphere.

The 5th, 6th, and 7th group of countries represent non-emerging regions of the world. Among these economies, some could be considered as upper-middle, lower-middle and low income regarding their relative level of development in 2018, hence they were categorized into 3 subgroups. Most of non-converging and low income countries are located in the African continent. With the exception of its northernmost and southernmost parts, most of Africa remained very poor and unfortunately, there are no signs of improvement in this aspect. A few low income nations, such as Pakistan, Afghanistan or Yemen are located in the Middle East, some others (Bolivia, Haiti) in Latin America.

A significant percentage of all post-Soviet economies and quite a number of Latin American countries are classified as lower-middle or upper-middle income nations, with no observed convergence to the more advanced parts of the world economy since 1950. In the Central and Eastern European (CEE) region there are 4 countries, which were unable to produce any convergence or catch-up in the last 70 years. This small grouping on the old continent includes Hungary, Serbia, Montenegro and Ukraine. In the latter two cases, long-term rate of per capita income growth was less than the global average, producing a significant deterioration in relative level of development.

In the case of Hungary and Serbia, multi-decadal per capita growth rates between 1950 and 2018 were compared to the global mean, and thus, led to the conservation of upper-middle income status for Hungary and lower-middle income threshold for Serbia. **This phenomenon further emphasizes our previous conclusion that Hungary among the twenty-eight countries of the European Union should be regarded as a 'special case'**, as it experienced and possibly, still experiences the middle-income trap. Curiously, it is the only country in the EU28 which is neither belonging to the high income category, nor exhibits any meaningful convergence to the advanced part of the Union.

"'Economic dependence' is a term that is widely used to portray the relationship of inequality between the underdeveloped countries and the advanced, prosperous countries on which the former depend for technical and industrial know-how."

Olayinka Sonaike and Bode Olowoporoku: Economic Dependence: The Problem of Definition, 1979

5. CONVERGENCE PATH OF THE BRICS ECONOMIES AND CENTRAL AND EASTERN EUROPEAN COUNTRIES IN LIGHT OF THE MIDDLE-INCOME TRAP

5.1 Comparing the BRICS country group and the CEE economies

In current Thesis the main research focuses on the growth and development based comparison of two selected country groups: on one hand, the BRICS[42] economies and on the other hand, the Central and Eastern European (CEE) countries[43]. Despite the significant geographical distance, socio-economic, historic and political differences, these countries still have some very relevant characteristics in common: both regions compose of emerging countries as well as dependent market economies and latter features have strongly affected their long term growth path. Although they have definitely improved their absolute and relative position within the world economy and thus might be viewed as (partial) winners of globalization, parallel with their development phases a deepening dependency has been established that also negatively correlates with economic convergence.

As in case of the **BRICS** countries which in current research are viewed as **global semi-periphery economies** (Artner, 2014), we are examining whether – due to certain

[42] The Thesis is applying in certain cases both the **BRIC** (Brazil, Russia, India, China) and the **BRICS** (South African Republic – SAR extended group) classification depending on the research methods used, so occasionally we might get a more extended set of results by analysing the five countries together. In other cases, it is rational to exclude the SAR from the calculations as it is presenting a relatively smaller proportion of Gross World Product compared to the four BRICs.

[43] Although economic literature relies on a various set of countries ranked as **CEECs**, the Author is – similarly to the BRIC-BRICS method – is carrying out various analytical research to a broader and a narrower group of these economies depending on the scope of the calculations. In all cases, it is explained in the related chapters why exactly the given selection was made. The narrowest group of the CEECs in current Thesis that receives special emphasis is the Visegrad Four – **V4** (the Czech Republic, Hungary, Poland and Slovakia), while the extended group of **CEE11** in case of certain calculations refers to Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. Finally, there is an even wider definition of the Central and Eastern European region, which all in all includes 20 post-socialist economies, regardless of their EU membership status (**CEE20**). This approach is only used as a base for comparison between the CEE region and the BRICS countries.

favourable endogenous and exogenous factors (geographical location, high raw material and natural resource abundance, huge domestic market, beneficial demographical tendencies, "follower based" technological developments or periodically increasing/decreasing global competitiveness) – they are capable of realizing successful catching-up and thus significantly redefine the power balance between centre and periphery economies. How can dependency be measured in relation with economic growth? This Chapter is aiming at investigating this issue by assuming that the growth dynamics of the BRICS countries shows strong correlation with the fluctuation of commodity prices, especially in case of the raw materials. Also, the structure of the export is another relevant manifestation of economic dependency, as it will be later demonstrated.

On the other hand, the representative group of **Central and Eastern European countries** as **integrated periphery economies** (Artner, 2014) under analysis being – with some exceptions – small and open economies. Within the period of socialism, these nations experienced robust economic growth during the 1960s and early 1970s as it is evident from historical reconstructions. In contrast, the last 15 years before the collapse of the 'Eastern Bloc' in 1989 brought a protracted slowdown and stagnation to the CEE region (The Maddison Project, 2018). Still, **the post-regime change period and the access to the EU granted a unique atmosphere for rapid growth and convergence**. The question rises regarding its long-term nature: **have CEECs managed to fully recover from their dependency based past and upgrade to the centre EU economies?** If not, how will it possibly shape their growth path and is there any outlier country that was the most affected by the combination of divergence period of socialism as well as a deep stagnation phase provoked by the economic crisis and later enhanced by unbeneficial politico-economic decisions? Current Thesis focuses on these important questions.

If we apply the broadest approach to define the CEE region, 20 countries could be identified within a vast area of about 2.2 million square kilometres, bordered by the EU15 from the west, by Russia from the east and finally, by Greece and Turkey from the southeast. As we may conclude from multiple aspects, **the (broader) CEE region's economic, demographic, geographical and political importance is comparable to Brazil or Russia**, and it certainly represents more influence globally than the South African Republic alone. According to our classification methodology, the BRICS is mostly comprised of middle income economies: in 2018, Brazil, China and South Africa

belonged to the lower-middle income category, while Russia was classified as an upper-middle income country. The only exception was India, where despite the impressive economic growth in recent decades, per capita incomes are still remain below 50 percent of the global average, which signifies a low income status. Similarly to the BRICS group, most of Central and Eastern European nations are middle income economies. There are only a few intra-regional exceptions: on one hand, the Czech Republic and Slovenia are high income economies, on the other hand, the Republic of Moldova, as Europe's poorest nation is still a low income country.

Regarding the broader CEE region, to overall level of integration of its 20 nation-states should be considered very high: 11 countries are EU members, while both Albania, Serbia, Montenegro, North Macedonia are recognized as official candidates. The two remaining countries in the Balkans, Bosnia-Herzegovina and the disputed territory of Kosovo have a Stabilization and Association Agreement with the EU – so they might be viewed as potential candidates (European Commission, 2019). Further to the east, the post-soviet Republic of Moldova has very strong ties to Romania, signed an Association Agreement (AA) in 2014, and joined the DCFTA (Deep and Comprehensive Free Trade Area) shortly 0eafter. This important event was immediately followed by an AA between the EU and Ukraine. In the latter country, which is the largest and most populous in the CEE region, DCFTA access was also implemented[44] by the beginning of 2016. As of early 2020, Belarus is the only state within the aforementioned region where neither an AA, a free trade agreement nor a candidacy for official membership has taken place.

Despite the fact that the broader CEE region has a large number of small and medium-sized independent states, we might conclude that these economies are highly integrated and could be viewed together as the eastern periphery of developed Europe. Moreover, they have similar economic structure, common trading partners and finally, all of these countries went through the very same rapid transition from a socialist system into a market economy after 1989. All these common characteristics support the idea to consider them together for the purpose of comparison with the BRICS country group.

In 2018, the CEE20 nations together had an estimated population of 177.9 million, which is considerably lower than the previous number of 183 million inhabitants recorded in

[44] On the topic of EU association and DCFTA access of Moldova and Ukraine, see Van der Loo (2017) and Wolczuk (2017).

2008, a decade earlier. **The Central and Eastern European countries are struggling with a constantly shrinking population, which is a unique characteristic in comparison to Western Europe or the BRICS group.** This phenomenon could be attributed to a multitude of causes: first, fertility rates are significantly below replacement in all the 20 countries – actually, with around 1.4-1.5 children per woman they are even lower than the average Western European level. In addition, low birth rates are accompanied locally with higher crude mortality rates and lower life expectancy than in Western Europe (The World Bank, 2019). Secondly, there is a tendency of mass emigration towards the more developed regions of Europe, especially among highly qualified citizens, foreign language speakers, tradesmen and the younger generation as a whole. Finally, loss of population due to (selective) emigration could not be offset by encouraging immigration from other regions of the world: partly because such programs are generally not supported by an increasingly ethno-nationalist electorate[45] in most of these countries, and partly because the CEE region is unable to attract a greater number of immigrants due to its economic backwardness and meagre quality of life compared to Western Europe.

Still, despite its shrinkage, **Central and Eastern European population remains comparable to the population living in Brazil or Russia**. Regarding local population density, the broader CEE region has about 81 inhabitants for every square kilometre – which is lower than India or China, but considerably higher than Russia, Brazil and South Africa. **Within the last decade, GDP per capita growth rates in the wide-CEE region remained below the global average**. In absolute terms, between 2008 and 2018, regional GDP has grown by an average of 1.9 percent each year, compared with the 2.1% annually in per capita terms. This tendency has caused a fall in the CEE region's share of world GDP: if the latter is expressed in nominal U.S dollars, the ratio of local economic output to global output was 2.9% in 2008, while ten years later, it has contracted to 2.3%. Brazil and Russia exhibited similar tendencies, however, the overall importance of China and India within the world economy has increased dramatically from 2008 to 2018 (Table 2).

[45] Apart from the frequent news feeds on Hungarian, Polish or Ukrainian right-wing nationalism appearing in the mainstream media, this field is widely discussed in the academic literature as well. In Central and Eastern Europe, nationalist and far-right movements are shaping important political decisions in numerous countries. These groups are considered ethno-nationalist, as they are equating national origin with ethnicity and they desire to maintain or protect the traditional ethnic character of their nation by severely restricting immigration and minority rights. See Ahonen (2007) as an earlier, and Bonikowski et al (2018) as a contemporary reference.

Table 2: Global economic importance of the CEE region compared to the BRICS

	CEE20	BRICS				
	region	Brazil	Russia	India	China	South Africa
Change in population						
2008 estimate (mln.)	*182.8*	192	142.7**	1200.7	1324.7*	49.7
2018 estimate (mln.)	*177.9*	209.5	144.5**	1352.6	1392.7*	57.8
10-yr growth rate (%)	*-0.27***	0.88	0.13	1.19	0.5	1.52*
density/km2 in 2018	*80.9*	24.6	8.4**	411.5*	145.1	47.3
Share of world GDP, nominal						
in 2008 (%)	*2.9*	2.7	2.6	1.9	7.2*	0.4**
in 2018 (%)	*2.3*	2.2	1.9	3.2	15.8*	0.4**
Share of world GDP, PPP-based						
in 2008 (%)	*3.7*	3.2	4.1	5.7	12.7*	0.7**
in 2018 (%)	*2.7*	2.2	2.7	6.8	16.5*	0.5**
Level of development						
Human Capital Index (2017)	*0.648*	0.56	0.729*	0.44	0.673	0.406**
Life expectancy (2017)	*75.4*	75.5	72.1	69.2	76.5*	63.5**
GDP per capita, PPP (2018)	*20 577*	14 283	25 213*	6 888**	16 182	12 215
EoDB score (2019)	*73.7*	59.1**	78.2*	71.0	77.9	67.0
Railroad per 10.000 people (km)	*5.4*	1.6	5.9*	0.5**	0.5**	3.6
GDP real growth rates (2008-2018)						
in absolute terms (%)	*1.9*	1.2	0.6**	7.1	7.9*	1.6
in per capita terms (%)	*2.1*	0.3	0.5	5.8	7.4*	0.1**
Trade openness (% of GDP)						
in 2008	*51.3**	13.6**	26.7	26.7	28.8	32.8
in 2018	*60.5**	14.6**	25.8	21.7	19.1	40.2
change in percentage points	*+9.2**	+1.0	-0.9	-5.0	-9.7**	+7.4
Foreign direct investments						
net FDI inflow 2008-2018, bln. $	*355.5*	640.1	-114.3**	255.0	1 205*	5.3
per capita stock in 2008 ($)	*2 620**	1 363	300	62**	715	470
per capita stock in 2018 ($)	*4 691**	4 305	-495**	243	1 545	496

Values for the CEE20 region are weighted averages and sums
**Maximal value of an indicator for the BRICS country group and CEE20*
***Minimal value of an indicator for the BRICS country group and CEE20*

Source: author's calculation based on The World Bank (2019)

All in all, during the last decade, Central and Eastern Europe achieved more per capita GDP growth than Russia, Brazil and South Africa in per capita terms, but the region progressed slower than the world average. Global growth rates were primarily elevated due to the fact that between 2008 and 2018, the expansion of China, India, the Philippines, Indonesia and other Southeast Asian states were robust. Regardless, average income levels within the CEE20 region, if they are expressed in PPP terms, remained above most of the BRICS countries (Russia was the only exception from this perspective, where per capita GDP is still about 20 percent higher). Regarding some other measures of development, the weighted Human Capital Index of the CEE region is slightly above the median of the BRICS group with a value of 0.65, just following Russia (0.73) and China (0.67). Human capital was – not surprisingly – the least abundant in India and South Africa in 2017. Life expectancy at birth for the calendar year of 2017 in the CEE20 group was 75.4 years, about 3 years more than the BRICS median (72.1 years). The total in-group variance was smaller than the observable difference between the best and the worst performer of the BRICS. Ease of Doing Business (EoDB) scores, with a theoretical range from 0 to 100, were scattered between 59.1 and 79.8. Again, the CEE weighted average is just slightly above the BRICS median (The World Bank, 2019).

It must be added that when using PPP based growth data for the CEE region, some contradictious outcomes might be noticed towards the level of development and growth of these economies by wrongly assuming more positive tendencies, and a higher standard of living than the reality. As an example, the healthcare system in the region is obviously not a perfect substitute of the Western European alternative, however, PPP data assumes that they are identical in quality. It is also true for several other services, where a significant 'quality gap' may exist. **Prices of food and most consumer goods are on the other hand, show little difference between the CEE region and Western Europe**[46]. When comparing them to the available incomes of the population expressed in euros, it becomes evident that the standards of living are still very far from the Western European level. However, local governments in CEE usually prefer illustrating economic growth in

[46] To illustrate this with a recent example based on near real-time data, the consumer price gap between Cologne (Germany) and Warsaw (Poland) for January 2020 was the following: Warsaw had 4.6 percent lower prices for clothing, the difference was -16.9% in case of gasoline, -17.6% for new cars, -22.6% for housing (monthly rent), -24.0% for food and other groceries, -24.3% for sports and entertainment, -25.7% for private childcare, -28.2% for utilities and -38.2% for restaurants (Numbeo, 2020). Meanwhile, nominal and PPP per capita GDP values for Germany and Poland provided by The World Bank (2019) are implying a considerably larger, 45% to 55% difference in consumer price levels, which seems highly unrealistic.

PPP values (which do reflect changes in exchange rates over time) in local currencies thus being able to show a more advantageous development path of the country that is indeed, far from the truth. Also, the relatively high real GDP growth rate achieved after 2010 in certain CEEs is not only misleading from the research's point of view but also has no significance in the long run convergence of the countries as it has been already highlighted. On such grounds, the Author applied not only a PPP but a nominal price based method in the calculations. The questionable assessment of CEE price levels could be an explanation to the observed higher per capita income levels (in PPP terms, at least) in Central and Eastern Europe compared to the BRICS median, while other indicators of development does not show such a pronounced difference.

Alternatively, the surplus in per capita GDP of the CEE countries compared to the BRICS median might come from the extensive presence of trans- and multinational companies, and their foreign direct investments in the region. These firms are contributing significantly to the local economic output. As in most years annual returns on foreign-owned capital assets are only partly reinvested in their destination country, this results in a reduced local GNI compared to the GDP through remittances of foreign companies. A very high, 51-60 percent trade to GDP ratio in the CEE region, which is more than 2 times higher than the same indicator for Brazil, Russia or India and could be primarily associated with the activity of foreign enterprises in the region, supports this hypothesis. Similarly, the CEE per capita FDI stock stood higher both in 2008 and 2018 than in any BRICS economy. Only Brazil has relatively comparative per capita FDI stock levels, as a result of a recent surge in local FDI inflow rates after 2008 (see Table 2).

5.2 The economic growth path and post-crisis slowdown of the BRICS countries

Since the 1970s, due to the accelerating processes of economic globalization, a bunch of countries – the so-called emerging economies – have managed to produce a remarkably dynamic growth path. Such factors as huge internal and external market, constantly growing population and thus labour force, an abundance of natural resources and development of the manufacturing industry functioning according to the economies of scale have created an export-led growth scenario in countries like *Brazil, Russia, India,* and *China* and (hereafter referred to as '**BRIC**' economies).

5.2.1 Growth path of the BRICS economies

The original classification of these economies was created by **Jim O'Neill** in 2001 in frames of the **Goldman Sachs** report in the evaluation of the world economy's size. However, when relying on the PPP weighting against the current GDP, it might be seen that these four emerging economies are representing a truly significant part of our global economies. In 2001, China was the second biggest and India the fourth biggest economy of the world.

In 2010, as the fifth economy, *South Africa* was also included to the group by joining next year's forum (so the group thus upgraded to the **'BRICS'** organization) where they expressed their will to work towards reforms in international financial system and to create a tight cooperation in several other fields. The group is holding annual meetings (the BRICS Forum) and also established the previously entitled BRICS Development Bank which is now referred to as the multilateral New Development Bank. It was set up with the aim *"…to support infrastructure and sustainable development efforts in BRICS and other underserved, emerging economies for faster development through innovation and cutting-edge technology. The bank will partner nations through capital and knowledge, achieving development goals with transparency and empathy and creating an equal opportunity for the development of all countries"* (NDB, 2019).

The world economy experienced **the period of the great moderation[47] between 1990 and the beginning of the financial crisis** when a relatively **stable and predictable** (with some exceptions as the September 11 events and 'dotcom bubble') **economic growth** could be experienced. Also, this phase of economic development was dominated by the USA as a world leader in economic and political terms. At the end of this period, the four **BRIC economies produced a very rapid and high economic growth** benefitting from the general rise in commodity prices. However, the crisis of 2008 radically changed the picture creating a hectic, multicentre-based and turbulent global economic environment. It might be supported by such recent events globally as the US-China 'trade war', Russia's

[47] Starting from the second half of the 1980s and ending with the outbreak of the global financial crisis in 2008, there was a twenty-year long period of exceptional economic stability both in the United States and on global level. Just following the collapse of the 'Eastern Bloc' in 1989-91, the U.S. became a hegemonic power both in economic and political terms. The following period brought unprecedented economic prosperity from the perspective that no considerable recession was observable neither in the U.S nor worldwide (although on local level, they happened). Actually, the phrase 'Great Moderation' referred to a reduction in the volatility of business cycle fluctuations – possibly due to a better flow of information after advancements in information technology – which was regarded as the primary culprit behind stable and uninterrupted growth for a really long time (Coric, 2011).

neo-expansionist policies and EU-USA sanctions imposed on its economy, a general destabilization period in Brazil and the growing economic power of India which managed to suppress China in rates of growth. With the exception of Russia, **the BRIC did not show relevant signs of downturn during the first years of the crisis** and it further enhanced their catching-up path. Yet, following 2014, when oil prices started to plummet, Brazil and Russia experienced a significant shock combined with the effects of recession having the highest dependence on oil and gas exports (Sőreg, 2017a).

Currently, the economic growth of Russia is still slow combined with recent periodic stagnations and high inflation. **Brazil has developed some relevant domestic tensions starting as a political turmoil due to the country's recent economic crisis. The election of the new president, Bolsonaro** could be regarded as an aftermath of the recession and internal tensions. Meanwhile, China is to some extent, affected by the 'trade wars' with the USA and the saturation of global markets with the Chinese products, although it puts much effort into developing such high tech companies as the Huawei in the smartphone industry as well as space exploration. On such base, it is almost certain that **China's growth will further moderate**, still it will remain at an impressively high 4-5% level compared to 1.5-2% per year in the developed world. India has a much lower level of income and due to this fact, it might be able to maintain very high growth in the next decades. Although birth rates in **India** have started to decrease, it still **has a very excessive labour force advantage compared to China, so it will surely support its future rapid growth**. This advantage will remain constantly on the side of India within the foreseeable future. There are speculations that at the second half of the 21st century India might overcome China to become the world's largest economic power.

The most dependent market economy among the BRIC(S) group is definitely Russia with the highest exposure to commodity prices, especially regarding oil, natural gas and precious metals. Also, Vladimir Putin's expansionist policies have adverse effects on both economic and diplomatic relations. Nevertheless, it seems that nowadays there is already a growing amount of young people who are attempting to oppose the current Russian regime and would like to put the country on a different path. Latter actions will have effects probably in the very long run for Russia, and its relations with its nearest neighbours, especially the European Union and Ukraine. South Africa is more or less at the same level of economic dependency than Russia having a very high exposure to raw materials and commodity exports, although with a more diverse portfolio.

In frames of our analysis the selected fast-growing economies are below (Fig. 14) examined from 2001 until the third quarter of 2019, including a most-likely forecast until 2020 relying on the data of the economic growth indicators of the World Development Indicators, the Harvard Atlas of Economic Complexity, the International Monetary Fund's quarterly data of commodity prices and the national bureaus of statistics of the BRICS countries.

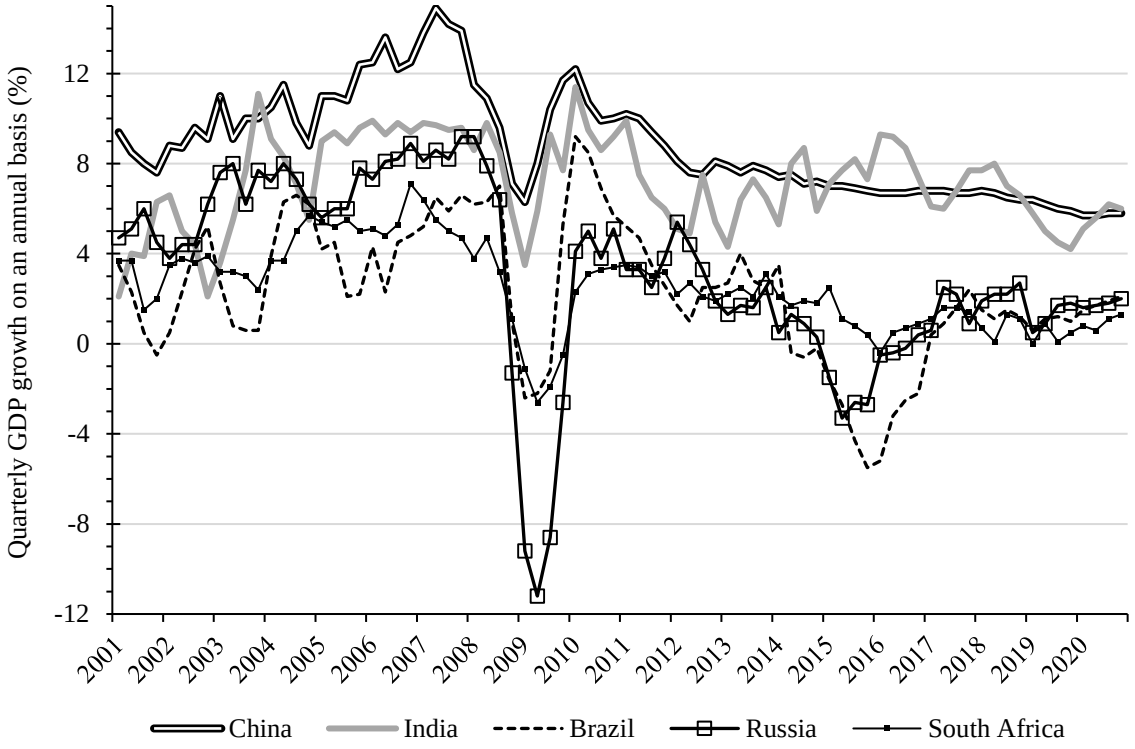


Figure 14: Real quarterly GDP growth rate of the BRICS economies (2001-2020)

Source: author's calculations based on the National Bureau of Statistics of China, Ministry of Statistics and Programme Implementation (MOSPI) and OECD as a secondary source, Instituto Brasileiro de Geografia e Estatística (IBGE), Federal State Statistics Service (ROSSTAT) and the Statistics South Africa. Forecast for 2020 is based on IMF (2019).

Since half of the examined economies were closely affected by the Asian Financial Crisis starting in 1997, it shall be taken into account that its impacts had been already lessened by the turn of the millennium. On the other hand, the closing element of our calculations is the post-crisis period following the 2008 financial crisis having regard to the fact that most BRICS economies have produced a significant growth slowdown after 2013. In the selection process of the examined time period the availability of quarterly data has also played a crucial role: latter condition can also be satisfied when searching for the above-

mentioned data between 2001 and 2019. What is more, there are ten years to review before the crisis of 2008, thus having a chance to identify the possible relations concerning fast economic growth and its further slowdown episodes.

Between 2013 and 2016, growth dropped by half in case of China (7.2%). The lowest results have been produced by Brazil achieving a -0.9 percent average followed by Russia's -0.6%. In South Africa the situation has also notably worsened (1.5%), while India is making an exception with its 7.1% average growth since it's the only economy being able to reach higher growth rate compared to the 2001-2004 average (6%). Moreover, India's economic growth did not show signs of slowdown between 2009 and 2018 while every other member of the BRICS group has been coping with this problem. Regarding the USA's performance, it has successfully exceeded the pre-crisis rate of expansion with its 2.1 percent average quarterly growth (The World Bank, 2019).

There have been several scientific debates concerning the slowdown of certain emerging economies but one of the most important questions is whether these countries are producing only a temporary fall in their GDP growth path or it can be assumed that the above-mentioned tendency is rather a completely new and long-lasting phenomenon than a short, internally or externally driven episode. In order to find some possible answers, we are going to create a model that may allow us making predictions in this field.

5.2.2 Recent slowdown characteristics of the BRICS group

According to the data, one of the main characteristics of the current slowdown undergoing in the BRICS countries is that it could be viewed as synchronous and protracted. Furthermore, the phenomenon might have been observed particularly in case of the biggest members of the fast-growing economies. However, what is much more significant, is the assumption that this tendency shows a high degree of likelihood to continue in a longer term as well since such factors as import, export, investment or private consumption has been showing deceleration after 2010 (Didier et al, 2016). The authors also highlight that when examining the main sources of the slowdown, we have to take a closer look on both external and internal economic and socio-political processes. A couple of years after the financial crisis of 2008 quite disadvantageous circumstances could develop leading to the beginning of the growth slowdown. However, after 2014 the primer factors of the deepening economic deceleration have become the internal

processes of the countries, like for example increasing inflation and short-term interest rate (Didier et al, 2016).

Qureshi et al (2015) suggest that in the short run, emerging countries will probably have to face unbeneficial macroeconomic environment that will certainly not contribute to further rapid growth scenarios creating a situation in which growth slowdowns may gain a strong structural dimension as well. The study reveals that in case of the emerging economies **one-third of the growth deceleration is driven by** the above-mentioned **structural changes** and the remaining **two-thirds of the process may have occurred due to the relatively slow recovery of the developed countries** (Qureshi et al, 2015).

As reported by **Naude, Szirmai** and **Haraguchi** (2016), processes undergoing in one of the fastest growing countries have played a significant role in the overall slowdown trajectory. China's GDP growth rate dropped by half after 2014 compared to years right after the financial crisis. The authors conclude that such an outcome should serve as an example of the inefficient model when a country bases its growth completely on export. After a certain point, adapting technological methods of the more developed economies in itself becomes insufficient because only innovation and the high value added products and services can contribute to the achieving a higher income level group and to sustain long-term economic growth (Naude et al, 2016). Another problem to mention is **the decreasing volume of manufacturing in such countries as Brazil, South Africa or Russia**. Since this sector of the economy used to employ large numbers of people providing a low level but constantly paying living, the currently ongoing growth slowdown has affected masses of labourers leading to the further **deepening of poverty** and thus several other negative socio-economic outcomes (Naude et al, 2016).

In frames of his growth studies **Nicholas Kaldor** aimed at explaining the possible reasons of unequal development emerging in different countries. In contrast with the Keynesian approach, Kaldor specified that on one hand, **the output of economies depends much more on the availability of natural resources than on the effective demand**. In a short run, the supply of goods and services should rather be considered inelastic and is not affected by the positive changes of monetary demand. On the other hand, **there is a strong correlation between technical progress and the rate of capital accumulation**. Kaldor argues that when more capital is invested in a worker, the introduction of a more developed technology can be expected. To continue, technologies of advanced level will probably lead to the use of more capital (Kaldor, 1957).

When analysing the development of emerging economies, considerable attention has to be paid to the **role of productivity growth**. Explanations focusing on latter phenomenon represent a wide variety in economic literature. For instance, neoclassical approaches give equal importance to each sector in frames of productivity studies compared to the structuralists who consider manufacturing industry as the main driver of innovation, growing – static and dynamic – returns of scale and thus productivity increase of a given economy. However, after a higher than average income per capita has been realized (the so-called maturity stage in economic development of the country), manufacturing industry will be inevitably composing a smaller part within Gross Domestic Product (Nassif et al, 2013).

In current research - with partial modifications - we accept the two conditions listed in *United Nations' Discussion Paper* and set a third one regarding the growth path of the BRICS economies (Nassif et al, 2013):

- In a given country **significant structural changes largely contribute to economic development**. Moreover, the export of high value added products plays a critical role in the catching-up of emerging economies.

- **The catching-up process of a developing country** – especially in its early phase – **strongly relies on the ability to develop a diversified and export orientated manufacturing industry** that will employ a large proportion of the active population.

- In case the above-mentioned conditions are fulfilled, **the possibility of the middle-income trap may significantly decrease**. Felipe, Abdon and Kumar concluded the following remark about the upgrading path of developing economies: *"…countries that have attained upper-middle-income (...) status or high-income (...) had, in general, more diversified, sophisticated, and non-standard export baskets at the time they were about to make the jump than the countries stuck in the middle-income trap today."* (Felipe et al, 2012, pp. 46-47.)

In 2013 UN researchers made an attempt to estimate the so-called **Kaldor-Verdoorn coefficient** in case of Brazil. According to the results, Brazil is indeed capable of a long-

term economic growth. Moreover, its manufacturing sector is functioning in frames of dynamic economies of scale, as it had already been studied by Kaldor in 1966. **Nassif**, **Feijó** and **Araújo** estimated that between 1990 and 2010 the Kaldor-Verdoorn coefficient achieved a relatively high value (0.52) and thus they managed to show that the growth of manufacturing industry contributes greatly to the increase of labour productivity in Brazil (Nassif et al, 2013).

However, in 1970 Kaldor turned his attention from global economic growth approaches towards some regional issues in his paper published in the Scottish Journal of Political Economy. Among several other conditions his model is based on the hypothesis that **export growth entails regional growth**. At national and regional level as well Kaldor considered export the most important element of aggregate demand (Kaldor, 1970; Thirlwall, 2013). On such base, *Chapter 5.2.6* is also dealing with the significance of export structure analysing the BRICS' economies dependence on commodity price changes and export structure.

5.2.3 Overview of the BRICS economies' performance

In order to draw conclusions concerning the fast-growing countries' economic slowdown, it is important to examine their current role played in global economy. As Table 3 shows, the five emerging countries have indeed, quite a significant effect in world economy: on one hand, their total GDP as a percentage of world's total gross domestic product was around 30% in PPP terms for the year 2016. Within the last few years, their relative importance has grown further. Now, in 2020 it is reaching one-third of global economic output. On the other hand, with more than 3.1 billion of people, these economies represent more than a third (about 41.5%) of global population.

Population growth exhibits a slowing tendency in China, India and Brazil. While population growth is moderating in all the 3 above-mentioned countries, in India, it still exceeded 1 percent per year between 2013 and 2018, compared to a Chinese ratio of just 0.51%. During the decade of the 2020s, India is likely to become the most populous country in the world. However, Russia's population is stagnating and in the next decade, a net decrease in the number of its inhabitants is regarded more probable than population growth. Regarding the actual size of the BRICS economies, in 2018, China was the largest economy of the world if we take into account the different purchasing power parities of

each national currency. The Chinese total economic output of about 25,400 billion US dollars exceeded the overall output of the other 4 BRICS members. India could be regarded as the 3rd largest, Russia as the 6th largest, and Brazil as the 8th largest economy globally. Differences in per capita income levels are significant: GDP per capita in the most developed member country (Russia) was about 3.5 times higher than in India which has just upgraded into the 'Lower-Middle Income' category of the World Bank classification. Meanwhile, China, Brazil and South Africa had very similar per capita income levels in the 13,700 – 18,200 U.S. dollars range.

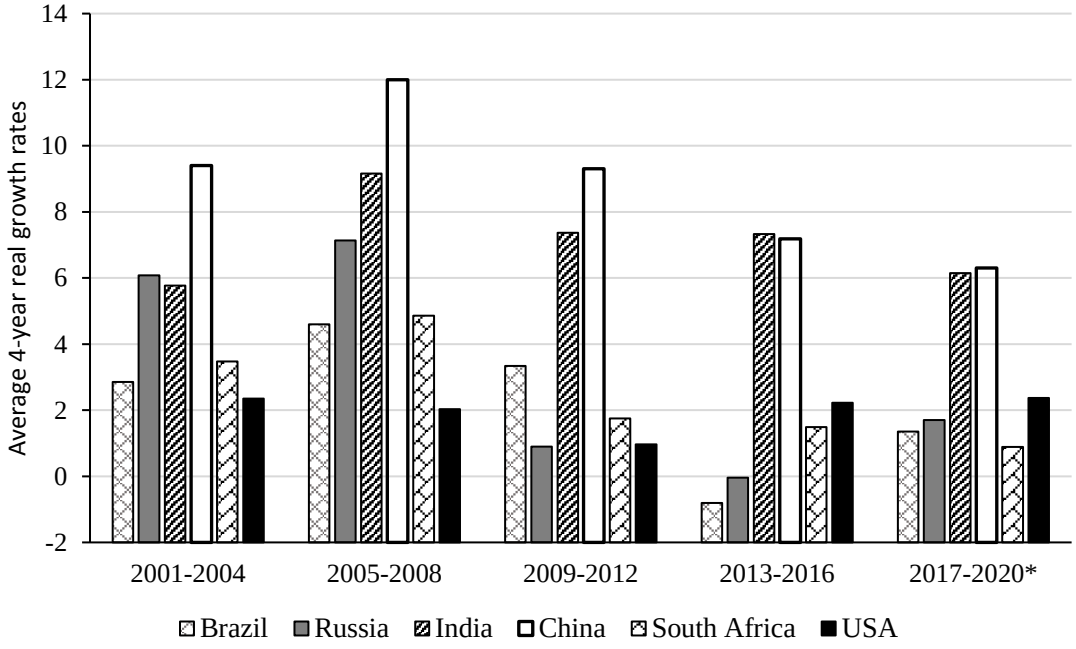
Table 3: Comparative analysis of the BRICS economies' performance

	Brazil	Russia	India	China	South Africa	Total
GDP, total (USD bln. nominal, 2018)	1 869	1 658	2 719	13 608	368	20 222
GDP, total (USD bln. PPP, 2018)	3 372	4 051	10 501	25 399	791	44 114
% of global output	2.5%	3.0%	7.7%	18.6%	0.6%	32.4%
World Ranking in 2015 (PPP)	8	6	3	1	30	-
POPULATION (millions, 2018)	209.5	144.5	1 352.6	1 392.7	57.8	3 157.1
Pop. growth rate % (y/y) 2013-2018	0.82	0.13	1.09	0.51	1.48	0.78
GDP per capita (USD, PPP, 2018)	16 096	27 147	7 763	18 237	13 687	13 932
World Ranking in 2018 (PPP)	79	53	120	76	90	-
EXPORTS in 2018, (USD bln.)	275	508	537	2 651	110	4 081
EXPORTS per capita (USD, 2018)	1 313	3 516	397	1 903	1 903	1 294
Exports (% of 2018 GDP)	14.8%	30.7%	19.7%	19.5%	29.9%	20.2%

Source: The World Bank (2019), Harvard Atlas of Economic Complexity (Hausmann et al, 2016)

However, the **average trade openness** of these countries is still **relatively low** (20.2% in 2018) with the exception of Russia and South Africa which are achieving an export to GDP ratio of 30% (see Table 3). In the last two decades, the external balance on goods and services trade has been strongly positive in China and Russia while it has been neutral or slightly positive in case of the other 3 members. Hence, export-based data show larger openness than an import-based or a combined external trade indicator. Currently, Russia has the highest level of per capita exports with a value of 3,500 U.S dollars, followed by China and South Africa, where per capita exports are hovering around 1,900 USD annually. India's exports are the fastest growing, but their value is still very low with only 400 USD per inhabitant in each year.

As indicated in Fig. 15, **the largest amplitude of growth can be detected in Brazil** which – after a period of prosperity between 2001 and 2012 – has undergone a severe recession in 2014-2015 along with Russia. After the global financial crisis of 2008, economic growth in South Africa slowed down considerably, from the previous level of 4-5 percent annually to only 0.9-1.8% per year. The latter values are below the long-term growth rate of the U.S., but unlike Brazil and Russia, the South African economy avoided significant recessions in the last 20 years. Meanwhile, the mean rate of expansion of the Chinese economy became smaller and smaller in each successive for-year period. Before the 2008 global crisis, annual growth rates over 10 percent in China were common. After 12 years, mean Chinese growth is only around 6.1 percent per year, which is, of course, still incredibly high compared to the more advanced part of the world. The USA (whose growth rates are only used here as a benchmark for the developed world) and India seems to be the least affected by the recent slowdown tendencies in the global economy, with slight to zero moderation in their expansion rates.



**Note: observational data ends in the third quarter of 2019. At the end of the timescale, a forecast published in World Economic Outlook was used – see IMF (2019).*

Figure 15: Comparison of the four-year average growth rates in different countries (4 years = average of 16 quarters)

Source: author's calculations based on the National Bureau of Statistics of China, Ministry of Statistics and Programme Implementation (MOSPI) and OECD as a secondary source, Instituto Brasileiro de Geografia e Estatística (IBGE), Federal State Statistics Service (ROSSTAT), the Statistics South Africa, the U.S. Bureau of Economic Analysis and IMF(2019)

5.2.4 Possible triggers of growth slowdowns

Examining the possibility of a middle-income trap phenomenon, which is according to the Author's definition, has already happened in case of Brazil, Russia and South Africa, in current study we agree with the presumption according to which **in case of certain BRICS countries growth slowdown was driven by external factors between 2010 and the beginning of 2014**, and is being strongly influenced by country-specific factors in the following period.

- Taking into consideration the short-term effects of the global crisis[48] of 2008, **global trade** was one of the first global sectors to mirror the slowdown tendencies of the economies (World Bank Group, 2016). In 2009, the world's share of exports of goods and services as a percentage of Gross World Product fell to 26.6% while a year earlier it was around 30.8%. In 2012 the level of 2008 was almost achieved (30.7%) but since then a gradual deceleration has been going on. According to the latest data, it fell to 29.3 percent in 2015 and most researches made prognoses for some further decrease (World Bank Group, 2016). Actually, data from the following years contradicted this forecast, as global trade openness has slightly increased again, reaching 30.1% in 2018. (The World Bank, 2019). As of early 2020, the overall effect of the recent U.S. – China 'trade war' is still unknown.

- Besides the observed trends in global trade, **commodity prices have also started their significant fall 4-5 years after the beginning of the global financial crisis**: in case of oil and metals and at least 50 percent magnitude decline was experienced while in the food and agribusiness sector a 30% fall was detected until 2016, compared to 2011 price levels (World Bank Group, 2016, pp. 182-183.).

- As a third major factor, we have to mention the **shrinking ratio of investments** driven by the growing risk regarding several uncertainties developed by the financial crisis of 2008 (World Bank Group, 2016, p. 183.).

[48] Academic literature discussing the relevant causes of the 2008 global financial and economic crisis is immense, and there are quite a number of (somewhat contradicting) explanations regarding the most influential factors. What seems straightforward, is that during the final years of the 'Great Moderation' growth period preceding the crisis, there was an excessive growth in demand for riskier assets on financial markets, as returns on investments considered as more or less secure were falling. Nevertheless, the U.S economy's hegemonic position was the primary reason that the effects of a domestic real estate turmoil and subprime mortgage crisis were globalized.

While the EU was struggling with deep recession starting from late 2008, the **BRICS countries** (especially India and China) **were set as an example of regions less sensible to the negative effects of the crisis during its first years**. However, after 2014 the above-mentioned statement could no longer be supported since most of these emerging economies – with exception of India – started to show signs of slowdown episodes.

As it has been already mentioned, **since 2014 the internal, country-specific factors have been gaining more and more importance regarding the deceleration of growth in the examined BRICS economies**. One of the most significant effects is the total factor productivity (TFP) decrease, or more precisely a slowing increase in TFP (The World Bank Group, 2016). In case of the emerging countries, year 2014 can be proclaimed the weakest one compared to the 18-yr average before the crisis of 2008 (Didier et al, 2016).

5.2.5 Analysing growth slowdowns through a commodity price-based cross-correlation model

As mentioned earlier, it has become evident that 5-6 years after the financial crisis of 2008 certain, previously fast-growing middle-income countries were producing slowing economic growth. This statement is particularly true for the economies being huge suppliers of raw materials. In the light of the above, it can be assumed that **their previous growth had been based on the increase of raw material prices**. In current study according to our hypothesis, the growth dynamics of the BRICS countries shows strong correlation with the fluctuation of commodity prices, especially in case of the raw materials. The more a given economy's performance is based on exporting unprocessed goods, the more dependent its future growth becomes on these type of external factors.

In order to create our model, we have used the so-called **Combined Commodity Price Index** (Appendix 5) published by the IMF concerning the five examined economies. The index is composed of the following categories (IMF, 2016):

- *Fuel and energy (1)*: crude oil, natural gas and coal;
- *Food and beverage (2)*: cereals, vegetable oils, meat, seafood, sugar, bananas, oranges, coffee, tea and cocoa;
- *Agricultural raw materials (3)*: timber, cotton, wool, rubber and hides;
- *Metals and ores (4)*: copper, aluminium, iron ore, tin, nickel, zinc, lead, uranium.

It has to be highlighted that the above-mentioned commodity price indices are shown in nominal terms in the global market. So the *Combined Commodity Price Index is not adjusted for inflation*, thus the price changes will likely be more positive than negative in the long run. The aggregated index was created to demonstrate the change of certain raw material prices expressed in US dollars. To show the frequency of positive and negative price changes, we have created the following histograms based on quarterly data for 20 years, from the 3rd quarter of 1996 to the 2nd quarter of 2016 (Fig. 16):

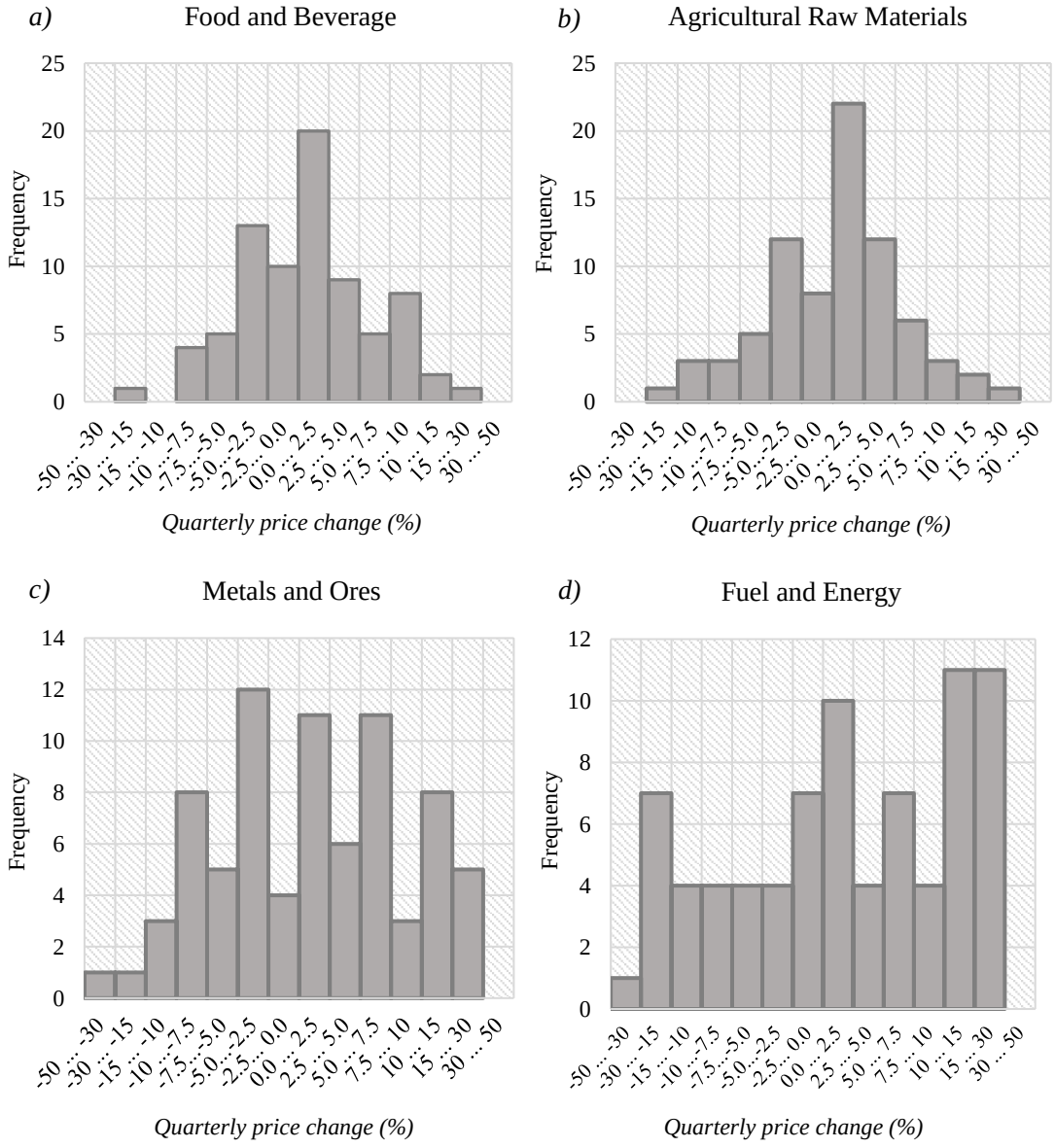


Figure 16: Frequency and distribution of quarterly commodity price changes in the world economy (1996-2016)

Source: author's calculations based on IMF (2016)

As can be seen from Fig. 16, a hypothetical normal distribution of quarterly price changes cannot be ruled out in case of *a) 'Food and Beverage'*, and *b) 'Agricultural Raw Materials'*. On the other hand, the distribution of price changes are certainly non-normal for *c) 'Metals and Ores'*, and *d) 'Fuel and Energy',* nevertheless, a somewhat similar pattern might be observed among these samples, even if their distribution should be regarded as an irregular one.

The large differences in standard deviation expresses the different volatilities of the examined groups. Not surprisingly, **oil prices can be considered as the most volatile ones while food prices are the least likely to change rapidly**. The prices of agricultural raw materials could be also viewed as more or less stable, while prices of metals and ores have more volatility.

On the basis of the monthly published data we have developed quarterly averages to gain the percentage change relative to the previous quarter. In the applied method sub-indices have been correlated to each other to illustrate their level of independence from one another. It has been found that these **sub-indices only moderately correlate with each other** (approximately 0.4 – 0.6) showing that each and every index has an individual set of information - that is the reason why they should be analysed separately.

In Table 4 we have illustrated the *cross correlation between the four groups of commodity price indices*. The strongest relation (a Pearson coefficient of 0.654) can be found between metals and ores compared to agricultural raw materials while the weakest one occurs in case of fuel and energy confronted with the food and beverage category.

Table 4: Cross correlation between commodity price indices

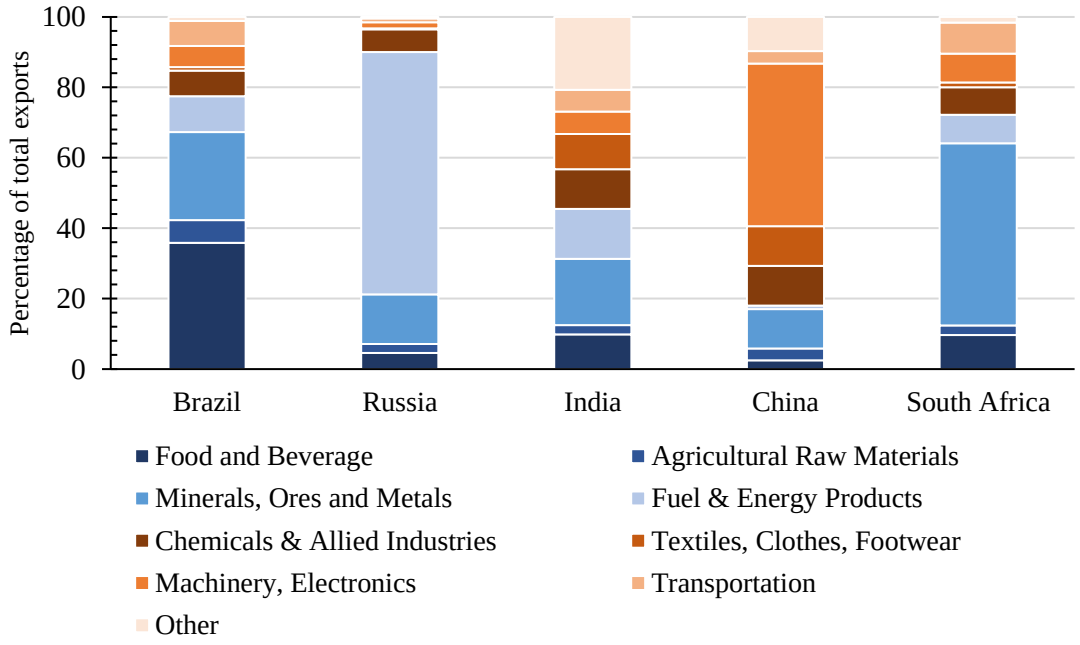
	Food and Beverage	Agricultural Raw Materials	Metals and Ores	Fuel and Energy
Food and Beverage	1			
Agricultural Raw Materials	0.499	1		
Metals and Ores	0.507	0.654	1	
Fuel and Energy	0.496	0.566	0.590	1

Source: author's calculations based on IMF (2016)

5.2.6 Significance of the export structure: which country shows more exposure to commodity prices?

In order to further investigate the possible causes of growth slowdowns regarding the world's fastest developing and biggest economies, **it is crucial to examine each country's exports as well as its exposure to the already mentioned commodity price changes right before the slowdown, represented by the export structure in 2014.**

As follows from Fig. 17, due to the high ratio of fuel, energy products, minerals, ores and metals **Russia represented the most exposed economy to commodity prices in 2014** petroleum oils (crude as well as refined) were exported with a value of 319 billion US dollars. Natural gas and coal are also composing a significant part of the Russian export: altogether worth almost 60 billion dollars. In our comparison **Russia is followed by Brazil**, where the most important exported goods were iron ore (34.3 billion USD), soya beans (24.6 billion USD), petroleum oils (19.5 billion USD), beet sugar (9.34 billion USD) and poultry meat (7.24 billion USD) in year 2014 (Hausmann et al, 2016). As it has been stated earlier, these two economies undergone quite severe recessions which clearly corresponds to the radical fall of fuel and energy prices beginning in 2014.



**Unprocessed or low value-added products are indicated by blueish colors, while orange indicates non-commodity type of exports.*

Figure 17: Export structure of the BRICS in 2014

Source: calculations based on Harvard Atlas of Economic Complexity – Hausmann et al (2016)

In accordance with Fig. 17, **Brazil is followed by South Africa, a country concentrating its export mainly on precious metals** achieving a 29.8 billion dollar volume in 2014 (Hausmann et al, 2016). **India is the first country where the exposure to commodity prices can be considered moderate** since the highest values are being produced thanks to the computer software activity reaching 75 billion US dollars in 2014. Refined petroleum oils are the second largest segment of Indian export (53.5 billion $) while diamonds and jewellery of precious metals were exported with a value of 37.5 billion dollars. Our ranking is closed by **China, a country being the most independent of commodity prices**: here the export structure is the most diversified one. The first place goes definitely for personal and portable computers (193 billion dollars) followed by several groups of electronical goods as well as different parts and accessories for vehicles. Along with machinery and electronics, textiles, clothes and footwear are also contributing to the country's high volumes of export. To sum up, India and China have managed to keep their relatively independent position concerning commodity prices because they were able to create and further develop their high value added and very competitive products in global markets. The IT industry of India alone has contributed to the country's balance of trade with about 75 billion dollars of software exports. What is this, if not the evidence of a successful catching-up path of certain emerging economies? On such grounds, we might **partly agree** with the **third hypothesis** of the Thesis assuming that **the growth dynamics of the BRICS countries shows strong correlation with the fluctuation of commodity prices, especially in case of the raw materials since less dependent economies as India and China are affected at a much smaller magnitude of the commodity prices' volatility.**

5.2.7 Dependence of the biggest emerging economies

By 2016, it has become evident that there was an ongoing significant and synchronous economic growth slowdown in the previously fast-growing middle-income countries. From the research that has been carried out, we have moved a step closer to confirm that there is a strong relation between a country's export structure, its exposure to commodity prices and economic growth. The example of Brazil and Russia serves as an indicator that *in case of a global crisis falling commodity prices are likely to break a steep growth path sustained in a preceding time period and may lead to protracted stagnation* thus preventing the given country from upgrading to a higher

income group. It is also important to outline that although years of such recession are primarily driven by external, global factors, stagnation itself is reinforced by a set of local, endogenous factors. What is more, we have to take into account that such a tendency will certainly have a strong and quite negative effect on other developing as well as developed countries of the world which in a long term may further contribute to a global economic turmoil (Huidrom et al, 2016).

Regarding, once more, the original set of countries analysed in our research, it is interesting to examine **the correlations of growth patterns within the BRICS economies**, as we have illustrated in Table 5:

Table 5: Cross-correlation of economic growth in the BRICS economies

	China	India	Brazil	Russia	South Africa
China	1				
India	0.576	1			
Brazil	0.646	0.351	1		
Russia	0.479	0.254	0.602	1	
South Africa	0.603	0.329	0.648	0.830	1

Source: author's calculations based on the National Bureau of Statistics of China, Ministry of Statistics and Programme Implementation (MOSPI) and OECD as a secondary source, Instituto Brasileiro de Geografia e Estatística (IBGE), Federal State Statistics Service (ROSSTAT) and the Statistics South Africa

From Table 4 it can be seen that **the strongest relation has developed between Russia and South Africa**. Although geographically these two emerging economies are in completely different regions of the world, their **export dependence on energy and raw materials represents a significant intersection**. India, again, appears as an outlier country having relatively weak relations with other BRICS members. Its weakest connection can be detected towards Russia. Thus a parallel can be drawn between an emerging country's high rate of independence and long term economic growth[49]. Clearly, some further research will be needed in order to make conclusions regarding the possible solutions from local governments and policymakers which would focus on the softening

[49] Other approaches, like Amin (1990) reached the same conclusions about these forms of (resource) dependency and its effects on prospects for long term economic growth.

of the negative effects of the recession as well as developing strategies of GDP growth stimulation.

5.2.8 Long-term economic growth in the largest emerging economies

On the basis of Jánossy's trendline theory, in what follows, we are going to examine the long-term economic growth of certain developing economies. First of all, the development of the BRIC country group is illustrated in Fig. 18 using the GDP per capita (constant 2010 US$) data provided by the World Development Indicators database from 1960 to 2016 with the exception of Russia, where information was available only after 1989.

As a next step, it is important to take a look at the **equation of the trendlines** in case of the four biggest emerging economies (Appendix 6).

Brazil: $$y_{j(B)} = 4095.3e^{0.020j} \quad (12)$$

India: $$y_{j(I)} = 234e^{0.031j} \quad (13)$$

China: $$y_{j(C)} = 93.2e^{0.0729j} \quad (14)$$

Russia: $$y_{j(R)} = 6255.9e^{0.021j} \quad (15)$$

By comparing the exponent values of the above-listed countries we may see that **China and India represent the most classical type of fast-growing emerging economies having a high-slope exponential growth function**. In China, the long-term economic growth rate in per capita terms is 7.29 percent while in India it is 3.1% over 58 years. Both Brazil and Russia have been producing an average 2.0-2.1 percent per capita growth in each year, so these two BRIC economies seem to be less dynamically growing countries. However, long-term average per capita growth rates of the world economy for the same period were just around 1.5 percent annually, which was exceeded by all the 4 nations above. Curiously, during the first years after the recent global economic crisis BRIC's performance was more than positive. **In 2009**, **Brazil** was even on the front page of The Economist ("Brazil takes off") as having a **5 percent annual growth rate**:

concerning the downturn, Brazil *"was among the last in and the first out"* and it was also predicted to achieve an even higher growth rate in the short run (The Economist, 2009). However, predictions were not proved by reality. In 2013, the same magazine informed about **Brazil's decay starting as early as 2012** ("Has Brazil blown it?") with a 0.9 percent growth rate, high unemployment and corruption, decreasing wages and several other social tensions (The Economist, 2013).

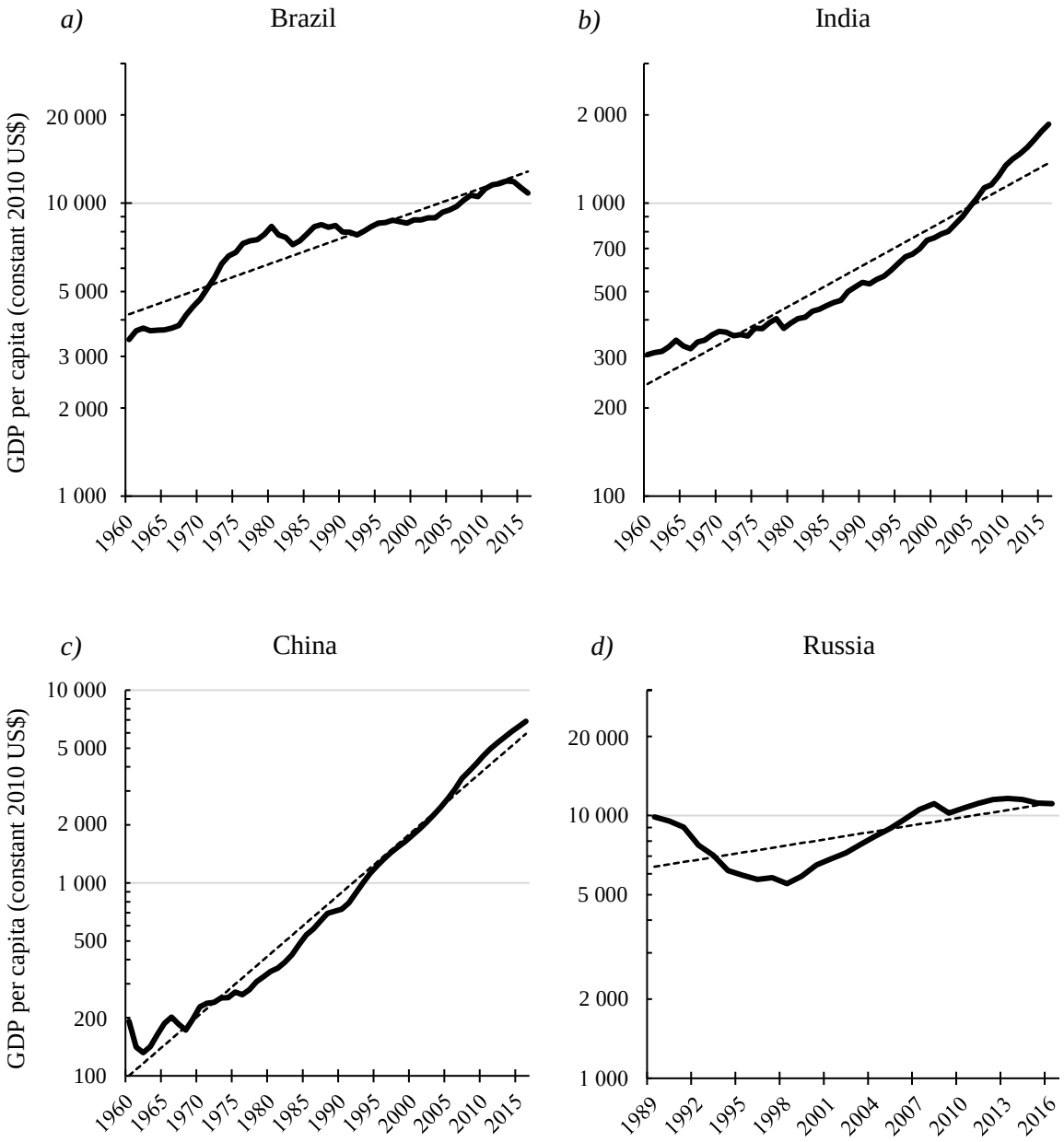


Figure 18: Long-term economic growth (GDP per capita, constant 2010 USD) of the BRIC countries visualized on a logarithmic scale from 1960 to 2016

Source: author's calculations on base of The World Bank (2019)

As for **India**, this country has the most outstanding growth path, especially during the recent crisis and recession period. **Between 2007 and 2016, it experienced its lowest rate in 2009 (3.89%) and one year later, in 2010 it managed to achieve 8.48 percent as an annual GDP growth rate** (The World Bank, 2019). Practically, there were no negative growth rates in India over the crisis period. As a possible explanation for latter phenomenon, we may add that among other BRICS countries, India is the only member where the exposure to commodity prices is quite moderate. The highest values were produced thanks to the computer software activity with 75 billion US dollars in 2014. On the other hand, **Brazil and Russia are very exposed to commodity prices while China is the most independent from these factors and consequently, the less volatile economy** (Sőreg, 2017a).

As a conclusion, based on results presented throughout Chapter 3, it might be rational to **partly agree with the first hypothesis of the Thesis** stating that some **global semi-periphery economies** (e.g. BRICS country group) – **due to certain favourable endogenous and exogenous factors are holding high potential of realizing a successful catching-up scenario and thus significantly redefine the power balance between centre and periphery economies.** By "some", we are reflecting to **China's and India's performance**, which is thankfully to their large domestic market, immense labour supply and other specific advantages, less dependent on external factors.

5.3 Dependent market economies of Central and Eastern Europe

It is beyond doubts that the Central and Eastern European region has been viewed as a special case within development economics as well as overall European growth studies. Central and Eastern European Countries, post-communist economies, transition countries or emerging economies – all of the above-mentioned phrases are referring to a region of Europe which has experienced a 'rough' and contradictious development path following the regime change. The collapse of the Soviet Union definitely contributed to a rapid shift leading to a transition crisis and then, a period of significant economic growth accompanied with a high Foreign Direct Investment (FDI) inflow. **The process of transition from socialist to capitalist system is considered unique in economic history since it was carried out within a relatively short period of time and it did not come into action driven by an economic revolution** (Lane, 2007).

János Kornai argued that this *special status* derived from the following elements (Kornai, 2005):

- the transition towards economic capitalism and political democracy was undergoing at a full spectre involving every sphere, sector of these economies;

- it is outstanding that in most of the cases, these systematic changes were developing peacefully[50] without violence although not without conflicts;

- the process was completed in 10-15 years, which is considered as a truly short period for such a fundamental change.

To continue, there was also a remarkable difference compared to other countries which developed a capitalist system. In case of the CEECs, there was no temporary phase to create bourgeois as well as private ownership that might have served as a solid background for a democracy. Instead, **the state was the ultimate holder of resources and coordinator of market processes** (Lane, 2007).

As a next step, the 2004 **enlargement of the European Union** with 10 economies opened further possibilities for the region's development followed by the 2007 access of Romania as well as Bulgaria and in 2013, Croatia. Latter phase was characterized by the **highest ever net FDI inflow to CEE** but the financial and economic crisis of 2007-2008 has had devastative effects on these nation states. Following ten years after the economic turmoil, the region more or less has successfully – although not fully – recovered. It is still considered a beneficial destination for foreign investment but still, it seems that the most significant FDI inflow cycle has already achieved its saturation point, especially in certain economies. Is it still the prolonged effect of recent crisis or is there something else that might have negatively been imprinted on the convergence of the country group?

Within the region, we have to mention **Hungary** which represented an outlier factor compared to other CEECs. It was the country where the signs of privatization could have

[50] Within the Central and Eastern European region, there are some exceptions which are contradictory to the statement of universal peaceful regime changes by Kornai (2005): in Romania, Nikola Ceausescu's reign was overturned by a violent revolution in late 1989, claiming around a thousand lives. In former Yugoslavia, the fall of the socialist state was followed by a series of ethnic conflicts and wars for independence between 1991 and 2001. According to the International Center for Transitional Justice, these armed conflicts resulted in the death of around 140,000 people and up to 4 million citizens were displaced.

been spotted the first, a couple of years before the regime change. This phenomenon is often entitled as the **spontaneous privatization**. Unfortunately, it caused several social tensions since it was completely uncoordinated and unregulated. In many cases, the previously state owned companies were transferred to private hands for symbolic prices, so thus a large proportion of state-owned assets was acquired by those who were able to quickly respond to the new conditions. This process also became the base for handicapping the next generation whose families were not able to get a slice of the economic pie. Latter phenomenon is quite similar to the enclosure system developed in England during the 15-16th century as a way of original accumulation of capital following the feudalism. However, it has to be emphasised that capitalists getting their position in such way are in most cases not competitive at international level. They have not managed to develop such product or service that would have been globally competitive. On such basis, we have to conclude that **Central and Eastern economies might not be classified according to the original Varieties of Capitalism method**.

Is it correct to assume that the CEE region has been still affected by the political and economic transition which followed the collapse of the 'Eastern Bloc' and the dissolution of the both politically and economically weakened Soviet Union? The Author is convinced that it is indeed, still struggling with certain consequences of the process. Kornai (2005) is providing some further evidence in this aspect. When socialism started to gain momentum in the region, it inherited a system where there had been an abundance of certain resources, for example the labour force that had been barely utilized previously in an effective mode. The flexible labour surplus represented an initial benefit for the functioning of the system during the extensive growth phase[51]. Nevertheless, the accelerating growth had evaporated labour surplus turning it into an acute 'lack' during the intensive phase of economic growth.

The objects of the regime change set as their mission to complete the following conditions (Lane, 2007):

- to lay grounds of a free market that enables the free competition of products and services which may thus take part in global competition;

[51] In Hungary, as it has been demonstrated within the preceding chapters, the extensive growth phase of the socialist economy could be dated between 1956 and the mid-1970s.

- to ensure free competition, the previously state-owned assets had to be privatized in the process of developing the previously non-existent entrepreneur layer and privately owned companies;

- to find solutions to the main aspects of the transition crisis, which was the moderate the extremely high unemployment rate resulted from the massive recession, and suddenly increasing social inequalities leading to a widespread poverty of the population.

Did the former satellite countries manage to complete their goals? Although free market was established providing free competition, **the level of economic development has not allowed most CEECs to create high value added and globally competitive goods**. From the beginning of the 1990s, and especially after the 2004 access to the European Union, the region was practically flooded by foreign direct investments boosting economic growth and attracting trans- and multinational companies. However, **there was no ground for local companies to mature and become internationally potent**. The third promise was the hardest to deal with and we have to admit, that in certain aspects, it could not have been fully satisfied yet, especially in countries like Hungary. Due to several reasons, there are still many issues to worry about concerning unemployment rates, work conditions of the labour force as well as poverty and social inequalities.

In current Thesis, the growth path of the CEECs – besides the long term development of the countries being relevant within the MIT research – is examined compared to their previous, usually pre-crisis performance and not their relative position within the EU. On such grounds, **the relatively high real GDP growth rate produced after 2010 in certain CEEs is not only misleading** from the research's point of view but also has **no significance in the long run convergence of the countries**, as it will be shown and as was already indicated in frames of Hungary's long-term development trendline. Briefly, it might be interpreted as a **statistical noise or a moderate rebound in productivity after the 2008 crisis**. Further, emerging economies' growth rate is usually high compared to advanced countries' performance, so it would be a methodological inconsistence to claim it as a sign of future convergence or growing level of development.

5.3.1 Economic performance of the extended CEEC group

By assuming that **higher growth might be followed by deeper recession in certain regions of world economy**, for a stronger empirical evidence, in current Chapter we are extending the scope of research in certain aspects of the "narrow" pool of CEECs to Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Romania, Slovakia and Slovenia. As outlined in Figure 19, the horizontal axis corresponds to the average real GDP growth rate between 1996 and 2008, and the vertical axis is the maximum observable decline of GDP between 2008 and 2013, compared to the pre-crisis level. It is obvious that in most countries 2009 was the year of the deepest recession, nevertheless, in Romania and Latvia GDP decline had lasted until 2010 and in Slovenia as well as Croatia until 2013. Latter two countries experienced recession of the longest duration, while the lowest values could be observed in the Baltic States. In case of the rest CEECs, lower economic growth has been accompanied by a medium scale recession period with the exception of Poland.

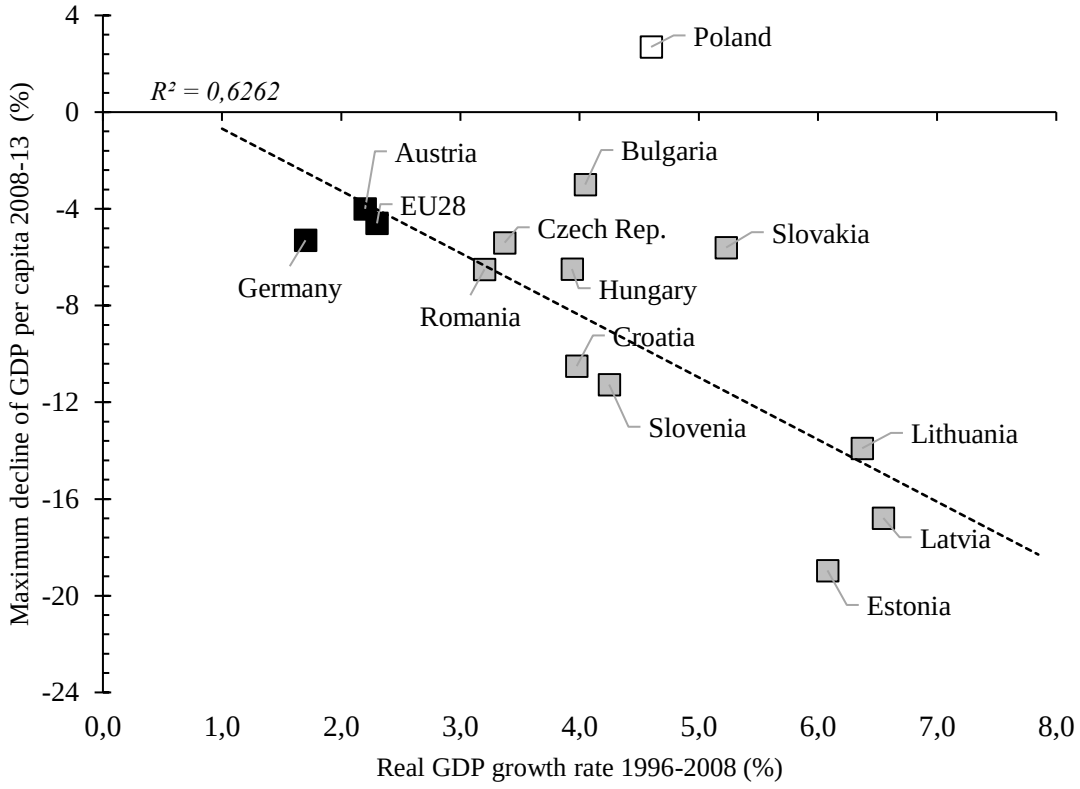


Figure 19: Pre-crisis growth rates and the maximum depth of recession in CEECs compared to given advanced economies

Source: Author's calculations from The World Bank (2019) and Eurostat (2020)

Regarding Fig. 19, Germany and Austria, as well as the broader EU28 average were added to make some comparisons with the examined region. Before the crisis of 2008-09, long term average economic growth hardly achieved 2 percent in Germany and was slightly above 2.1% in Austria. However, recession seemed to be relatively benign in these two economies (a 4.0-5.0% fall of total GDP) and lasted only for one year. In the EU28 as a whole, the average pre-crisis growth rate was 2.3 percent and the recession reached -4.5% in 2009. We may conclude that **although the CEEC region was capable of a relatively rapid growth before the economic turmoil, recession turned out to be quite severe within the subgroup,** especially when compared to the more developed part of the European continent. In this respect, Poland comes as a clear outlier where no recession occurred.

We also suppose that **more growth was realized in countries where the initial income level had been lower at the end of the transformation crisis following 1995**. In order to illustrate this relation, we have created Fig. 20 relying on The World Bank (2019) and Eurostat (2020) data. The scope of the analysis was also extended with three additional countries – the Baltic States – with the aim to get a more far-reaching overview of the region.

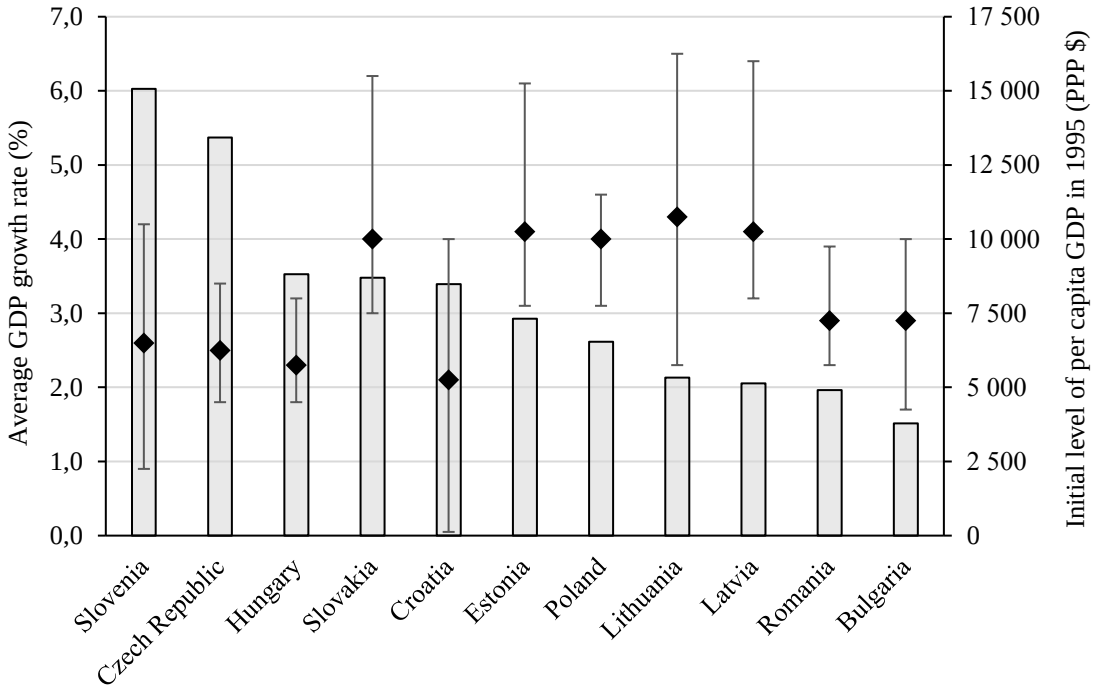


Figure 20: Initial income levels and long-term growth rates in the CEECs

Source: Author's calculations from The World Bank (2019) and Eurostat (2020)

Regarding Fig. 20, grey columns represent constant GDP per capita in 1995, just after the transformation crisis, expressed in PPP based US dollars. It could be regarded as an initial level of development. **Black bars of Fig. 20 indicate the difference in pre-crisis and post-crisis average growth rates**, **while black rhombuses stand for the very long term average growth rates between 1996 and 2016.** The lower part of the black lines below the rhombuses represent the post-crisis growth from 2010 to 2016, while the upper stages show pre-crisis growth (1996-2008).

In this approach, 2009 is considered as a year of recession and therefore, not included in the calculation of pre-crisis and post-crisis rates of expansion. **There were two economies where initial income levels were considerably higher in 1995 than in most of the other countries: Slovenia and the Czech Republic**. In the case of Hungary, Slovakia and Croatia differences were minimal. We can also find that both **Bulgaria and Romania were the poorest countries within the group in 1995 and they still represent the lowest level of development within CEEC11 nowadays**.

It can be also added that each country's per capita growth has slowed after the 2008-2009 global economic turmoil: **the most significant decrease was experienced in Slovenia, Croatia and the three Baltic States**. In Hungary and the Czech Republic both before and after the recent crisis economic growth was relatively slow. On the contrast, Poland has produced the most stable growth: 4.6 percent before the crisis and above 3 percent nowadays. **Between 1996 and 2008, Hungary had the lowest rate of per capita growth observed in CEEC-11** was of an annual 3.1 percent magnitude, while it was the highest in the Baltic countries and Slovakia, exceeding 6 percent annually (see Fig. 20).

After the crisis, the average growth rates of the CEEC countries remained in the 1-3.5 percent per year range and as it has been already stated, Poland is currently representing one of the most dynamically growing economy of the region. Croatia and Slovenia are experiencing very low rates of expansion, while Hungary and the Czech Republic are performing below the regional average. We may conclude that in general, those economies have produced faster growth that had dealt with lower income levels.

The scatterplot in Fig. 21 was created to investigate the fourth hypothesis of the Thesis, i.e. **the economic integration as well as the process of EU accession played a key role in the pre-crisis, relatively high growth and post-crisis deep recession of the CEECs**.

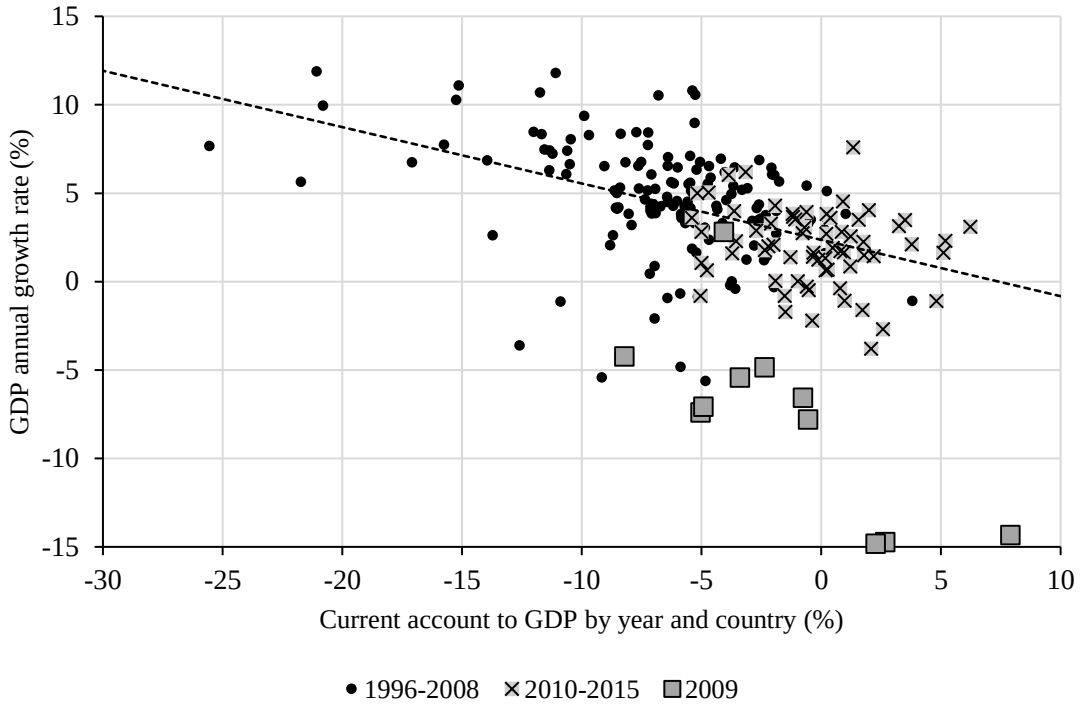


Figure 21: Relation of annual GDP growth rates to external balance

Source: Author's calculations from The World Bank (2019) and Eurostat (2020)

In Fig. 21, data for annual GDP growth rate and current account balance are included for all CEEC-11 countries, divided to three distinct timespans. The first one, is the pre-crisis period of prosperity from 1996 to 2008, the second one is containing the post-crisis years (2010-2015), and finally, 2009 is presented separately as a year of external shock and recession. There are altogether 220 data points (20 years x 11 countries). Pre-crisis and post-crisis data pairs are illustrated with different markers. It can be seen that the relation between annual GDP growth rate and current account to GDP is relatively strong. What is more, the direction and slope of the relation did not change before and after the 2008 financial crisis since no structural break is detectable (see Appendix 7 and Appendix 8).

Table 6 includes some hypothetical predictors GDP growth in the CEE11 region. The coefficient of the current account balance has a -0.408 value meaning that if current account balance decreases by one percentage point, GDP growth rate will increase by about 0.4 percentage point. Of course, some other parameters have also been tested in our model. For example, net FDI inflow indicates the balance of FDI inflow and outflow compared to GDP percent in the given year. Latter factor is positive almost in every period. The coefficient is 0.139 that practically corresponds to the current account balance

effect, although with a less pronounced slope. To continue, in case of the change in trade to GDP ratio, the relation is also significantly positive with a p-value is 0.0046. The situation is quite similar regarding the change in Economic Freedom Index (Fraser Institute, 2017): significant at all standard levels. As a conclusion, practically all **external economic dependence indicators show a strong and significant relation with annual GDP growth in CEECs**, **while current account balance has the largest partial effect.**

Table 6: Regression on GDP growth in the CEE11 group for 1996-2015 (excl. 2009)

	coefficient	*std. error*	*p-value*	*sig.*	*95% confidence interval*		*partial effect*
Current Account Balance	-0.408	0.049	< 0.00001	***	-0.505	-0.310	13.0%
Net FDI Inflow	0.139	0.066	0.0375	**	0.008	0.269	4.3%
Change in trade to GDP ratio	0.154	0.054	0.0046	***	0.048	0.259	3.5%
Change in Economic Freedom Index	3.524	1.251	0.0051	***	1.057	5.991	3.8%

Source: calculations from The World Bank (2019), Eurostat (2020) and Fraser Institute (2017)

Based on our results, we are **accepting the fourth hypothesis** of the Thesis stating that **the process of accession to the European Union** - by stimulating foreign investment to the region - **has strongly contributed to the significant pre-crisis growth as well as to the post-crisis persistent growth slowdown in Central and Eastern European Countries** as the pre-crisis growth rates and the maximum depth of recession have revealed**.**

5.3.2 Economic performance of the selected CEECs: the Visegrad Four countries

Current Chapter investigates the main growth tendencies of selected Central and Eastern European Countries through the lens of economic dependency. The analysis is carried out by distinguishing 7 out of 11 countries in the region into two basic groups: on one hand, we are focusing on the classical **Visegrad Four economies** (later referred to as the '**V4**' – the Czech Republic, Hungary, Poland and the Slovak Republic) and on the other, three

Balkan countries (the '**B3**' – Bulgaria, Croatia and Romania) – altogether seven nation states within the Central and Eastern European region. Within the analysis, most attention is paid to the case of the Hungarian economic growth since as it will be demonstrated, it has undeniably representing an outlier factor in many aspects. Our first hypothesis states that – strictly in economic frames – Hungary has been showing a diverging tendency from the Visegrad group in recent years. On such basis, in given approaches it is examined in the context of the B3 countries' development.

Table 7: Main economic indicators of the V4 countries (2006/07-2017/18)

	I.		**GDP per capita, PPP (current international $)**								
	2007	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*
Czech Republic	26120	27845	27594	27694	28797	29047	30486	32263	33469	34749	**36327***
Hungary	19027	20679	20648	21556	22841	23094	24463	25525	26148	26701	*28108*
Poland	**16785****	18310	19243	21069	22851	23833	24719	25612	26578	27420	29122
Slovakia	21161	23692	23055	24987	25835	26647	27898	28928	29522	30460	31616
	II.		**GDP growth rate (annual. %)**								
	2007	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*
Czech Republic	5.60	2.68	-4.80	2.27	1.78	-0.80	-0.48	2.72	5.31	2.59	4.29
Hungary	0.43	0.86	**-6.60****	0.68	1.66	-1.64	2.10	4.23	3.37	2.21	3.99
Poland	7.03	4.25	2.82	3.61	5.02	1.61	1.39	3.32	3.84	3.06	4.81
Slovakia	**10.80***	5.63	-5.42	5.04	2.82	1.66	1.49	2.75	3.85	3.32	3.40
	III.		**FDI net inflow (as a % of GDP)**								
	2007	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*
Czech Republic	**4.74***	0.96	0.95	2.37	1.14	2.98	-0.18	1.93	-1.08	3.95	2.63
Hungary	1.78	0.89	0.63	2.93	1.32	2.16	0.11	2.60	2.22	2.24	1.35
Poland	4.07	1.86	1.84	1.85	2.59	1.21	0.80	2.38	2.13	0.93	1.23
Slovakia	3.96	4.11	**-1.09****	0.98	2.78	3.22	-0.28	-0.64	0.12	0.74	1.99

IV.	**WEF Global Competitiveness Ranking** (of 140 countries)			
	2006-2007	*2011-2012*	*2015-2016*	*2018*
Czech Republic	**29****	38	31	**29****
Hungary	41	48	63	48
Poland	48	41	41	37
Slovakia	37	**69***	67	41

**Maximal value of the country group between 2007 and 2017*
***Minimum of the country group between 2007 and 2017*

Source: Author's calculations based on The World Bank World Development Indicators (2019) and the WEF Global Competiveness Reports

To continue, referring to the net FDI inflows to the region as well as some other phenomena, our second hypothesis states that integrated peripheries (Artner, 2014) – due to certain asymmetric interdependencies – are not likely to produce significant economic convergence to the centre economies within the current conditions of global capitalism and their strongly FDI based growth path. In current analysis, we have chosen a group of CEE countries which is not often analysed in such combination in relevant literatures: Hungary, Croatia, Romania and Bulgaria. Latter decision is based on the fact that in case of Hungary – after having checked some indices and growth tendencies – it becomes evident that during recent years economic convergence has not been realized. Also, when making comparison with the classic Visegrad Four economies, Hungary – in certain aspects – represents an outlier country, as it will be later viewed on the base of our data.

As a first brief analysis, we are presenting some selected data about the V4 economies evaluating their country-based development for the period between 2007 and 2017-18 depending on the availability of the data (Table 7). First of all, the **GDP per capita in purchasing power parity** terms was examined. The lowest value was produced by Poland in 2007 (16,785 USD), while the highest amount was realized in the Czech Republic in 2018 (36,327 USD). The average of the four economies for the period is 25,966 USD. As it might be seen, the Czech and the Slovak Republic maintained the highest levels during the entire interval. Hungary and Poland have been usually at the bottom of the group, however, **from 2011 Hungary has been constantly the weakest performer** among the four economies. With current data and economic conditions, this trend might become even more persistent. The absolute winner of the four is definitely the Czech Republic: due to its tight foreign trade activity with Germany it has always been the most stable economy of the region, even before the dissolution of the Soviet Union. Next, we compared the **annual Gross Domestic Product growth rate** of the V4. It has to be highlighted that financial crisis has been quite severe in all of the analysed economies having a typical double-dip recession phase in 2012. **The lowest value for the period could be experienced in Hungary having -6.6 percent annual growth** (2009) and also in 2012 (-1.64%).Recession has also been the most protracted in this country. The average of the group is 2.47 percent between 2007 and 2017 that has in case of Hungary, produced the lowest percentage (1.03%). Only in 2016 did Hungary change places with the Slovak economy becoming the second slowest country. The fastest growth rate might be observed in Poland (3.7 percent as an average).

Third, we also collected the data referring the **net Foreign Direct Investment** (FDI) **inflows as a percentage of GDP** by calculating the difference between net inflows and net outflows provided by the World Bank's World Development Indicators database. Generally, **CEECs received proportionally the highest amounts of FDI following the regime change by becoming attractive destination countries for investors gaining advantages of privatization**. The second largest wave emerged after the accession to the European Union, as it will be later presented but since the two peaks, in most cases stagnation or rather decrease might be detected. **The lowest average for the period has been produced by the Slovak Republic** and the second lowest rate by Hungary. During the first two years of crisis, the smallest percentage of net FDI inflows had been directed to Hungary. The lowest value bottomed in 2013 (0.11%) and since 2014, Hungary has been undergoing a gradual decrease in FDI inflows.

As a forth indicator, we have relied on the World Economic Forum provided **Global Competitiveness Report** choosing 4 periods. Instead of presenting the **Global Competitiveness Index** itself, we have rather collected the selected country ranks from the 140 economies the WEF is publishing on a yearly base. The overall **highest competitiveness has been** obviously **produced by the Czech Republic** achieving the 29th place among 140 countries in 2006-2007 and in 2018. The Slovak republic held the highest rank within the V4 group during the double-dip recession period. Along with the Slovaks, Hungary is also among the weakly performing economies: in 2018 it was positioned to the 48th place and thus being the least compatible country in the region.
On base of our previous findings, it was rational to take a closer look at a different combination of Central and Eastern European economies and examining whether Hungary's economic performance is might be closer to such countries as **Bulgaria, Croatia and Romania** (Table 8).

Similarly to the first set of countries, we have started the comparison of the economies with the **PPP based GDP per capita**. The **lowest average as well as the absolute lowest data point has been produced by Bulgaria**. It has to be added that currently Bulgaria is the poorest economy of the EU. According to the Eurostat, the severe material deprivation rate was the highest in Bulgaria in 2016 (over 30 percent), although it significantly decreased from its 2008 rate (over 40%). In this aspect, Bulgaria was followed by Romania, the fourth place was held by Hungary, while Croatia was 8th (Eurostat, 2018b). Within the examined country group, the highest average per capita GDP might be

detected in Hungary: 23,526 USD. It has been also achieving the biggest amount of GDP per capita in each of the listed year followed by Croatia's performance. As for the **annual real GDP growth rate**, it might be visible that current country group has also been severely affected by the recent crisis. The **lowest value was experienced by Croatia in 2009** (-7.29 percent) and Hungary's falling back (-6.60%) was the second most relevant. The largest average percentage of GDP growth rate is maintained by Bulgaria: as taking off from the lowest point when entering the EU, it has been realizing the fastest increase among the four. Croatia and Hungary are rather closer to a more balanced growth rate that also indicates some stagnation close tendencies in certain periods.

Table 8: Main economic indicators of the 'B3' and Hungary (2006/07-2017/18)

			I. GDP per capita, PPP (current international $)								
	2007	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*
Bulgaria	**12801****	14329	14146	14934	15676	16208	16571	17534	18186	19500	20948
Croatia	18787	20251	19474	19233	20758	21157	21807	22077	23008	24524	26288
Hungary	19027	20679	20648	21556	22841	23094	24463	25525	26148	26701	**28108***
Romania	13793	16727	16493	16966	17908	18932	19797	20623	21632	23868	26657
			II. GDP growth rate (annual. %)								
	2007	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*
Bulgaria	7.34	6.02	-3.59	1.32	1.91	0.03	0.49	1.84	3.47	3.94	3.81
Croatia	5.28	2.04	**-7.29****	-1.47	-0.34	-2.30	-0.49	-0.09	2.40	3.54	2.92
Hungary	0.43	0.86	-6.60	0.68	1.66	-1.64	2.10	4.23	3.37	2.21	3.99
Romania	6.86	**8.26***	-5.91	-2.81	2.01	2.08	3.51	3.41	3.87	4.80	7.26
			III. FDI net inflow (as a % of GDP)								
	2007	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*
Bulgaria	**29.05***	16.87	6.81	2.48	2.81	2.56	2.95	0.37	5.00	1.33	2.12
Croatia	7.03	5.50	2.90	2.13	2.49	2.75	1.89	3.02	0.36	4.16	2.53
Hungary	1.78	0.89	0.63	2.93	1.32	2.16	**0.11****	2.60	2.22	2.24	1.35
Romania	5.36	6.25	2.68	1.79	1.26	1.90	2.05	1.80	1.85	2.65	2.63

	IV. **WEF Global Competitiveness Ranking** (of 140 countries)			
	2006-2007	*2011-2012*	*2015-2016*	*2018*
Bulgaria	72	74	54	51
Croatia	51	76	77	68
Hungary	**41****	48	63	48
Romania	68	**77***	53	52

**Maximal value of the country group between 2007 and 2017*
***Minimum of the country group between 2007 and 2017*

Source: Author's calculations based on The World Bank World Development Indicators (2019) and the WEF Global Competiveness Reports

Our third factor was the **FDI inflow as a proportion of the GDP**. As a parallel with the V4, it can be highlighted that a decreasing amount of foreign investments is directed to the region. As an average for the 2007-2017 period, the four economies received 3.54 percent. **In case of five separate years** (including the latest data available for 2017), **the lowest values were experienced by Hungary**, so latter might also be viewed as a slow-down phase as well the growing dependency of its economy. It seems that by far, Bulgaria and Croatia are the most prominent countries from foreign investors' aspects. Relying on the data of the **Global Competitiveness Reports** for the selected periods, it is quite obvious that **Bulgaria, Croatia and Romania are lagging behind the V4's ranking**: Bulgaria and Romania are categorized as upper-middle income countries representing several risk factors for the potential investors and also, high-value added production for export is also marginal within the region. In 2018, the lowest rank in FDI inflow in the Balkan group was held by Hungary which at the same time, produced the highest value of the same indicator among the V4 economies.

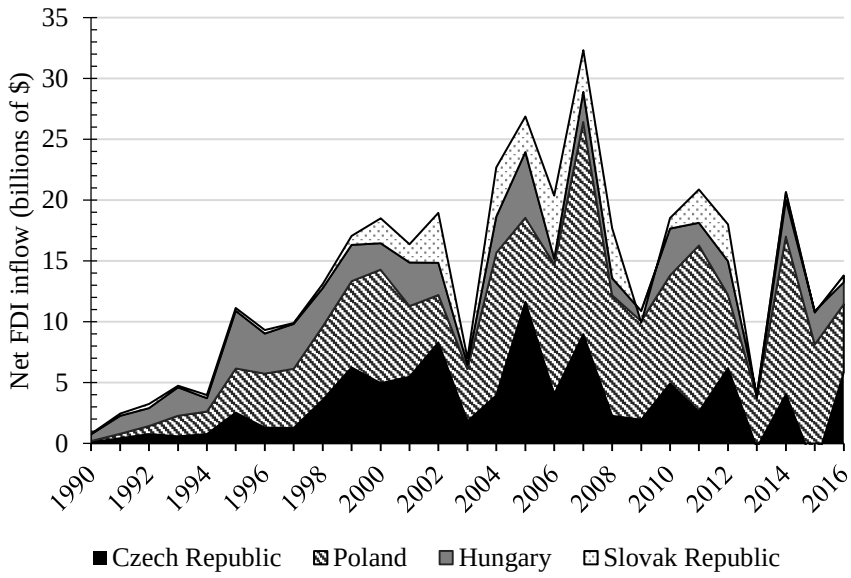
On base of the above-specified indicators it might be concluded that – especially in recent years – **Hungary's economic performance is on one hand, represents an outlier case in the Visegrad Four comparison and on the other, slightly approaches the overall level of the B3 countries meaning that its dependency is probably becoming even deeper**.

5.3.3 Evaluation of foreign direct investment tendencies and effects

In current research we are assuming that a given economy's long-term convergence might be accomplished if significant current account deficit is not accumulating after a relatively longer growth period. A protracted current account deficit period usually contributes to the increase of external indebtedness. Besides, FDI inflows tend to leave a shrinking proportion of capital for the domestic sector (for both local firms and households). After certain time, the expansion of the foreign property rate starts to increase the difference between Gross Domestic Product and Gross National Income (GNI). Concerning massive Foreign Direct Inflows – and at a smaller rate, portfolio investments as well as debt financing – the possibility of a currency crises should be considered. As an example, three such episodes might be presented: the Mexican peso crisis in 1995, the East Asian crisis

of 1997-98 and also the Argentinian crisis of 1998-2002. It might be noted that latter economies had middle-income level status during the specified periods and also, in each case crises emerged after previous a high growth phase. Fig. 22 is indicating the annual and cumulative net FDI in current prices in billion USD for the period of 1990 to 2016.

a) Net FDI inflow to the V4 country group (billions of USD, current prices)



b) Net FDI stock of the V4 country group (billions of USD, current prices)

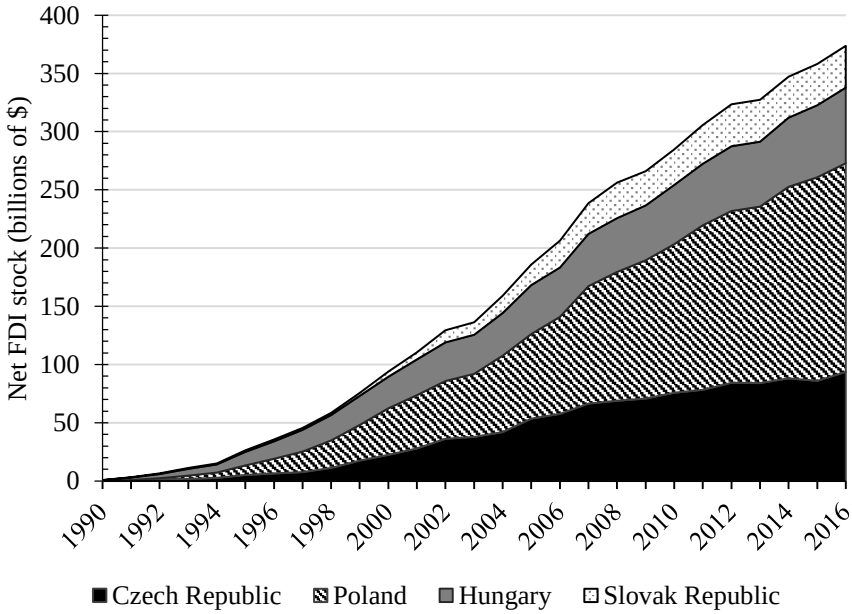


Figure 22: Annual FDI inflows and cumulative stocks at current prices of the V4 countries (in billions of USD, 1990-2016)

Source: Author's calculations based on The World Bank (2019) and the UNCTADSTAT (2019)

Fig. 22 *a)* illustrates the **difference between FDI inflow and outflow in current prices** (billion USD) calculated relying on the data of the WDI as well as the UNCTADSTAT. The total amount of net inward FDI in case of the four V4 economies primarily depend on the size of each country's domestic market. Latter explains the highest FDI stock volume that has developed in Poland since with its 38 million population, it is representing more than 60 percent of the V4 group. Poland is followed by the Czechs due to the relatively strong interpenetration with the German economy. After Hungary, the Slovak Republic has the smallest FDI balance. On the base of net FDI inflows, three different phases might be distinguished for the period of 1990 and 2016:

- The **first period** lasted **from the regime change until 2003** representing the transition interval before the accession to the European Union. Its main components were the *change of the regime, the transition crisis and a relatively high economic growth driven development*. Although FDI inflows definitely started to emerge within the region, most foreign investors were rather awaiting the EU access programmed for 2004;

- The **second phase** could be defined for the period **between 2004 and 2008**, with latter date as the beginning of the financial and economic crisis in Central and Eastern Europe. The accession to the EU greatly contributed to *significant foreign direct investment inflows* as well as the appearance of several *MNCs and TNCs* by eliminating trade borders among the countries. For example, in 2007, the biggest FDI balance was achieved by Poland (17.45 billion USD) compared to its previous performance (10.67 billion USD in 2006 and 6.91 billion USD in 2005).

- The **third stage** has begun after the crisis years, **following 2012**. As Fig. 22. *a)* proves that *in all four countries* quite a remarkable *downturn period was taking place relating FDI* but also within the overall economic performance of the Visegrad Four. In the Czech Republic, net FDI balance decreased from 6.18 billion USD in 2012 to near-zero in 2013. Since recession was severe in the region, it surely had an effect on investors' decisions who – on the base of several indicators and forecasts – considered Central and Eastern Europe a more risky region. The third stage is still being in process nowadays: although recession has been already overcome, its long-term negative effects are still having influence on FDI.

Fig. 22 *b)* is capturing the **cumulative net FDI inflows towards the V4** in billion dollars for the same investigated period. The proportion of FDI inflows had been relatively high for 10-15 years following the change of the regime. FDI stock is still increasing, although its inflow rate has been definitely slowing down. It is also important to investigate the cumulative net FDI stock per capita in current USD. In contrast with our previous findings where Poland held the first place due to its high population, latter country is having the lowest per capita FDI value since it has a bigger domestic market compared to other V4 economies. In 2016, the per capita net FDI stock was 4,751 USD. The Hungarian and Slovakian values were almost at the same level in recent years (6,551 and 6,404 USD per capita), while it is the highest in the Czech Republic (8,703 USD per capita). The Czechs have been holding the first position since 2002 and we should also add, that GDP per capita is also the highest there (The World Bank, 2019 & UNCTADSTAT, 2019).

In Fig. 23, we attempted to visualize **the change of net FDI inflows as a percentage of GDP for V4 and B3 countries** from 2016 to 2017 in order to present the short-term trend in the two country groups. First of all, it might be noted that **a decrease in net FDI inflows was produced by the Czech Republic, Hungary, Croatia** and at a very small rate, **Romania**. The biggest increase was realized in the Slovak Republic. Let's also add the fact to our analytical approach that the Slovaks were the first to introduce the euro in 2009 and the whole process was carried out in a smooth and successful way following a dual circulation period of both currencies (European Commission, 2009).

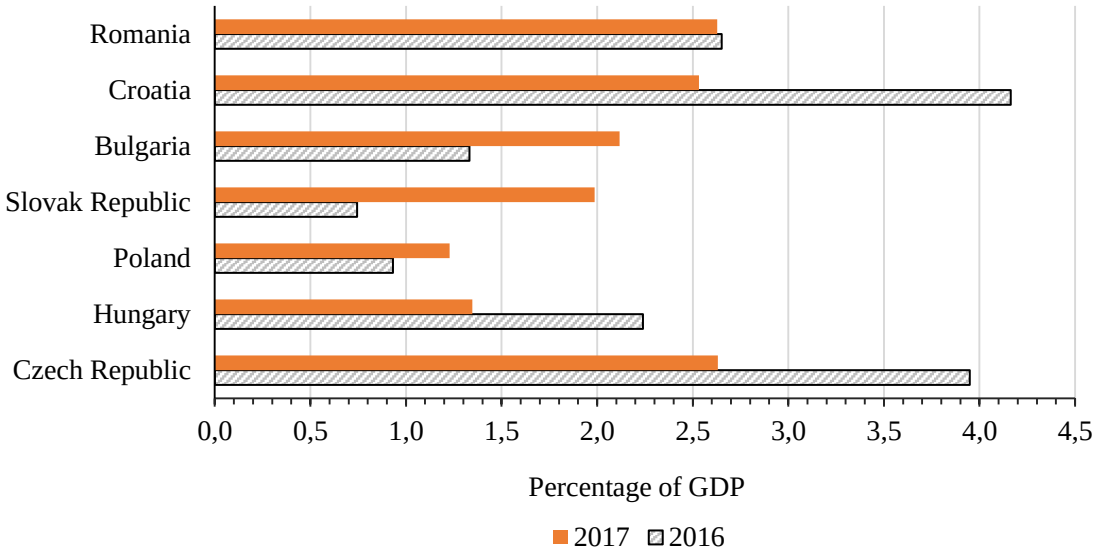


Figure 23: Net FDI inflows as a percentage of GDP for V4 and B3 countries

Source: Own calculations based on The World Bank (2019) and UNCTADSTAT (2019)

Fig. 23 might also serve as an evidence of our observation about a **general decline in FDI towards the CEE region**. It seems that currently only Poland, the Slovak Republic, Romania and Bulgaria are still representing beneficial foreign investment possibilities.

When considering the main aspects of future investors, it might be useful to check some of their analyses. As an example, the Trade Portal developed by the *Santander Bank* has concluded the following characteristics about **Hungary's business environment**: among the first, the report highlight the fact that besides the devastative effects caused by the crisis, the biggest trading partners of Hungary (i.e. Germany and the United Kingdom) divested at a higher rate than investing in 2017. Regarding some other relevant risk factors, the **high debt-to-GDP ratio** is mentioned (72.9 percent by 2017) as well as the **introduction of several new taxes** having negative effects on entire industries: instead of implementing long-run structural reforms, the Hungarian government had only developed a **short-term business approach** by minimizing certain, most crucial risk factors. What is more, the Hungarian currency has lost its value over the past 10 years at quite a high rate and only marginal research and development focused innovations have been carried out. **Energy dependency** is also significant and the banking sector is really vulnerable even after 10 years following the economic crisis. Last but not least, corruption has relevantly developed in previous period and the current government's negative attitude towards the European Union are also greatly contributing to the fall of FDI inflows (Santander Trade Portal, 2019). After taking into consideration such aspects, it becomes even clearer why Hungary might be analysed more effectively together with the B3 countries instead of the traditional V4s.

5.3.4 The role of trans- and multinational companies in the CEE country group

As an extension to our previous, FDI focused chapter, in current section of our Thesis we are providing a brief overview of the regional TNC and MNC presence and activity. In 2016, *Deloitte* published a full report entitled "*Central Europe Top 500 – An era for digital transformation*" for the period of 2006 and 2016 (Deloitte, 2016). On the other hand, *Coface* also carried out investigation regarding CEE economies titled "*The singularity of political risk in Central and Eastern Europe"* (Sielewicz, 2018). These two reports will serve as a base for our analysis due to the poor availability of data in this special sphere. First of all, on the base of the analyses it might be noted there are

nowadays two significant factors having relevant effect on the inward investment to the region: political risks arising from local tendencies as well as economic ones. However, the CEE region is still considered less risky than some other emerging markets. In terms of freedom and civil liberties, **Hungary and Poland are viewed as the most instable countries** according to the Coface publication. As an overall tendency, the **Central and Eastern European economies have become quite "Eurosceptic"** with the Czech Republic as the third most Eurosceptic country within the EU (Sielewicz, 2018, p. 1).

Table 9: Freedom rating of selected CEECs (2019)

	2018 score (max. 100)	Category
Czech Republic	91	Free
Hungary	*70*	*Partly Free*
Poland	84	Free
Slovakia	88	Free
Bulgaria	80	Free
Croatia	85	Free
Romania	81	Free

Source: based on the Freedom House (2019)

According to the Freedom House's recent report (see Table 9), the freedom rating for year 2018 is the lowest in case of Hungary among our examined economies. What is more, Hungary is currently the only economy being rated as *"Partly Free"* within the entire European Union (70 scores). It is part of the same group as for example, Ukraine, Bosnia-Herzegovina, Serbia, Macedonia, Albania and Montenegro within Europe. This one aspect in itself, is serving as a strong signal for foreign investors when implementing decisions on capital allocation within the region.

It is a well-known fact, that **CEE economies are highly dependent on the activity of foreign and in certain cases, local** (e.g. MOL in Hungary) **multi- and transnational companies**. In order to check the current status, we may take a look at the dynamics of the revenues of the top 500 companies in the area: since 2012, after a smaller decrease, revenues have been rather stagnating within the region – around 685 billion EUR in 2015 as the latest data (Sielewicz, 2018). The median revenue change was the biggest within the real estate sector (19%) between 2014 and 2015 and also within manufacturing (7.4%). In the country approach, the Checks experienced a 6.9 percent median revenue

change while in Hungary latter achieved 6.1% for the same period largely due to the appearance of such multinationals as the Mercedes and the extended activity of Audi. According to the Deloitte research, the following three sectors are represented at a highest rate by foreign companies: **consumer business and transportation, manufacturing as well as energy and resources** (Sielewicz, 2018). The report also provides the top 500 list of the biggest companies by revenue in Central and Eastern Europe. Within the top 10 firms, Poland represented the biggest share with four companies (PKN Orlen, Jeronimo Martins Polska, PGNiG and PGE) and Hungary was the second biggest player with three companies (MOL, Audi Hungaria Motor and GE Infrastructure CEE) followed by two firms' revenues in the Czech Republic (Sielewicz, 2018, p. 50).

The presence of foreign companies within the region is crucial – and thus also contributes to the further growth of dependency of the countries – from the point of view of employment. In 2014, foreign-owned firms provided approximately 25 percent of jobs within the private sector and 53 percent within latter's value added production in case of Hungary with the exception of the agricultural and financial sector (OECD, 2017, p. 3).

As for the B3s, it can be outlined that this subregion despite the obviously higher risks within their business environment, might still provide significant advantages for the investing companies on the base of more dynamics in GDP, lower labour costs and higher dependency on FDI itself compared to the V4 countries. On the other hand, in the European Union as a whole, and especially in CEE countries which strongly rely on TNC and MNC presence, labourers who fall out of this "circle" (e.g. in lack of qualification, foreign language skills, etc.), tend to move towards some precarious types of employment that will further deteriorate their financial background. Such precarious – or atypical – forms of employment might be the following: part-time work, self-employment, zero-hour contracts or even undeclared forms of labour (Artner – Sőreg, 2018).

5.3.5 Economic dependence on the biggest trading partners' performance

As the third factor of our definition for dependent market economies, we are applying a trade based approach by investigating **the relationship between Central and Eastern European Countries' and their most relevant trading partners' economic interactions**. Relying on Table 10's report on the most significant trading partners of the V4 and B3 economies, it can be concluded that **both in import and export terms**

Germany is representing the most important trading country – in absolute as well as relative terms – **for all seven economies**. On such basis, Germany's overall economic performance has strong influence on its Central and Eastern European partners including acceleration and decrease periods in its development path. Besides Germany, the following countries are also relevant import partners: **China, Austria** and **Italy**.

Table 10: Largest import and export partners of the V4 and B3 countries (2017)

	Main import partners (%)		Main export partners (%)			Main import partners (%)		Main export partners (%)	
Czech Republic	Germany	*29.8*	Germany	*32.8*	**Bulgaria**	Germany	*12.3*	Germany	*13.5*
	Poland	*9.1*	Slovak Rep.	*7.8*		Russia	*10.3*	Italy	*8.3*
	China	*7.4*	Poland	*6.1*		Italy	*7.3*	Romania	*8.2*
	Slovak Rep.	*5.8*	France	*5.1*		Romania	*7.1*	Turkey	*7.7*
	Netherlands	*5.3*	UK	*4.9*		Turkey	*6.2*	Greece	*6.5*
Poland	Germany	*27.9*	Germany	*27.4*	**Croatia**	Germany	*15.7*	Italy	*13.4*
	China	*8*	Czech Rep.	*6.4*		Italy	*12.9*	Germany	*12.2*
	Russia	*6.4*	UK	*6.4*		Slovenia	*10*	Slovenia	*10.6*
	Netherlands	*6*	France	*5.6*		Hungary	*7.5*	Bosnia & Herz.	*9.8*
	Italy	*5.3*	Italy	*4.9*		Austria	*7.5*	Austria	*6.2*
Slovak Republic	Germany	*19.1*	Germany	*20.7*	**Romania**	Germany	*20*	Germany	*23*
	Czech Rep.	*16.3*	Czech Rep.	*11.6*		Italy	*10*	Italy	*11.2*
	Austria	*10.3*	Poland	*7.7*		Hungary	*7.5*	France	*6.8*
	Poland	*6.5*	France	*6.3*		Poland	*5.5*	Hungary	*4.7*
	Hungary	*6.4*	Italy	*6.1*		France	*5.3*	UK	*4.1*

	Main import partners (%)			Main export partners (%)	
Hungary	Germany	*26.2*	**Hungary**	Germany	*27.7*
	Austria	*6.3*		Romania	*5.4*
	China	*5.9*		Italy	*5.1*
	Poland	*5.5*		Austria	*5*
	Slovak Rep.	*5.3*		Slovak Rep.	*4.8*

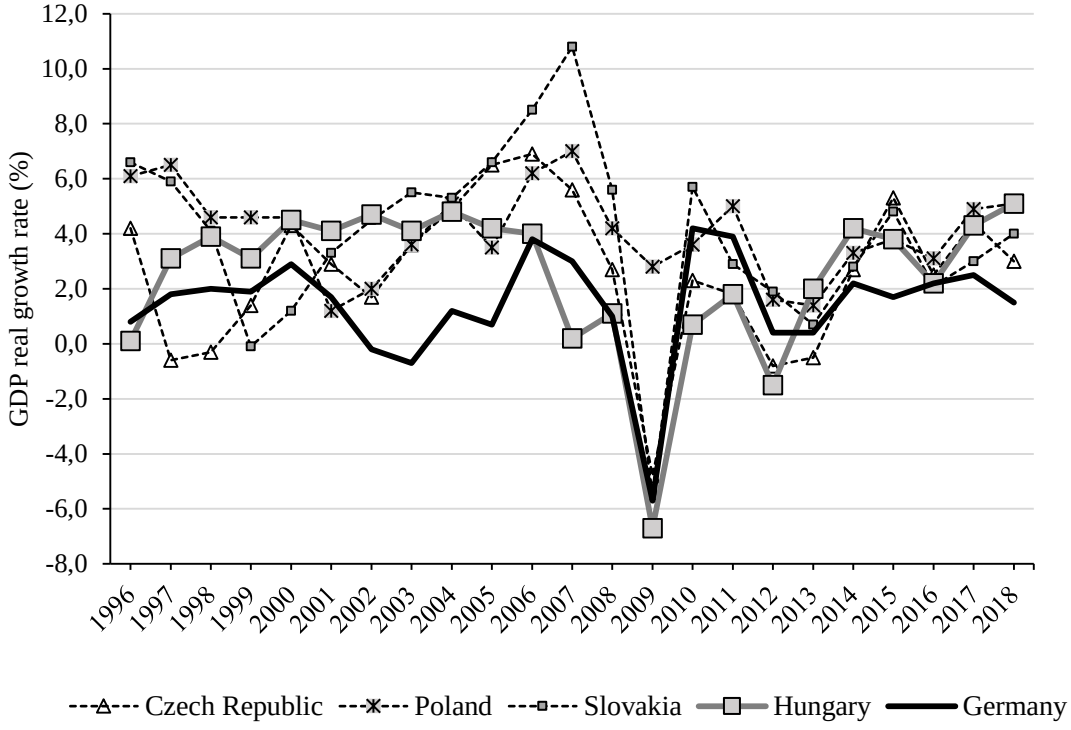
Source: Data based on the CIA World Factbook (2019)

We may also note that in the B3 countries some extra-EU economies are also playing a vital role in trade, as for example Russia, Turkey and Bosnia-Herzegovina. Although Germany is also the top trading partner within latter mini region, we have to add that – due to historical as well as geographical reasons – its total share is much lower than in case of the Visegrad economies. Relying on Table 8's data, we have also made a short analysis of market concentration by using the *Herfindahl-Hirschman Index (HHI)* for the

top 5 export partners of the V4 and B3 economies. As a result, **the highest dependency can be detected in the Czech Republic** (HHI: 1,224) **followed by Poland** (HHI: 888.1) **and Hungary** (870.5). The least dependent country is the Slovak Republic, having only 699.2 points as it might be seen by the smallest proportion of export to Germany (20.7 percent). After preparing the same calculation for **the B3 countries**, we may see that the region is **less dependent on export activity than the Visegrad economies**. The least dependent country is Bulgaria (419.92 points), the second most favourable place is held by Croatia (575.24 points) and the highest HHI has been indicated in Romania (739.58 points). When applying latter method, the World Factbook database provided by the CIA was used for all the calculations (CIA, 2019).

In order to detect such dependence, we have illustrated one of the main economic indicators, the annual real GDP growth rate for examining the German and V4 relationship. Germany has been maintaining tight trade relations with CEE since the 1970s German Ostpolitik (Farkas, 2016). It is quite obvious that the four countries' growth rate has been following the German trend through trade interactions. In 2009, after the economic and financial crisis had reached the region, Germany experienced a relevant fal in GDP (-5.62 percent) reaching the second deepest recession among the five examined countries. However, Germany managed to avoid the double dip type of recession that occurred **Hungary and the Czech Republic** as it only experienced a slowdown. Latter two economies are being **the most dependent on the German performance**. It has been also concluded by other researches that the V4's growth has been undergoing more rapidly than it could have been explained only by their initial incomes since their active and long-term participation in the German supply chain might have a strong effect on latter statement (Farkas, 2016). FDI inflows arriving from Germany are having immense contribution on the CEECs manufacturing industry development. **The largest amounts of FDI inflow stock concentrates on the Polish and Hungarian economy** (Farkas, 2016). After having seen the core issue of trade-driven dependency, a question might arise about the future tendencies. As evident from Fig. 24 part *a)*, the course of development of all V4 countries are very closely following the overall prospects of the German economy, especially since 2010. Before the 2008 global financial crisis, growth paths of the V4 countries were significantly less homogeneous. Some countries, such as Slovakia, achieved very high rates of economic growth in the pre-crisis period, while others developed more slowly but steadily.

a) Comparison of annual GDP real growth rates of the V4 countries (1996-2018)



b) Share of the CEE11 countries and Hungary alone from total EU28 GDP (1996-2018)

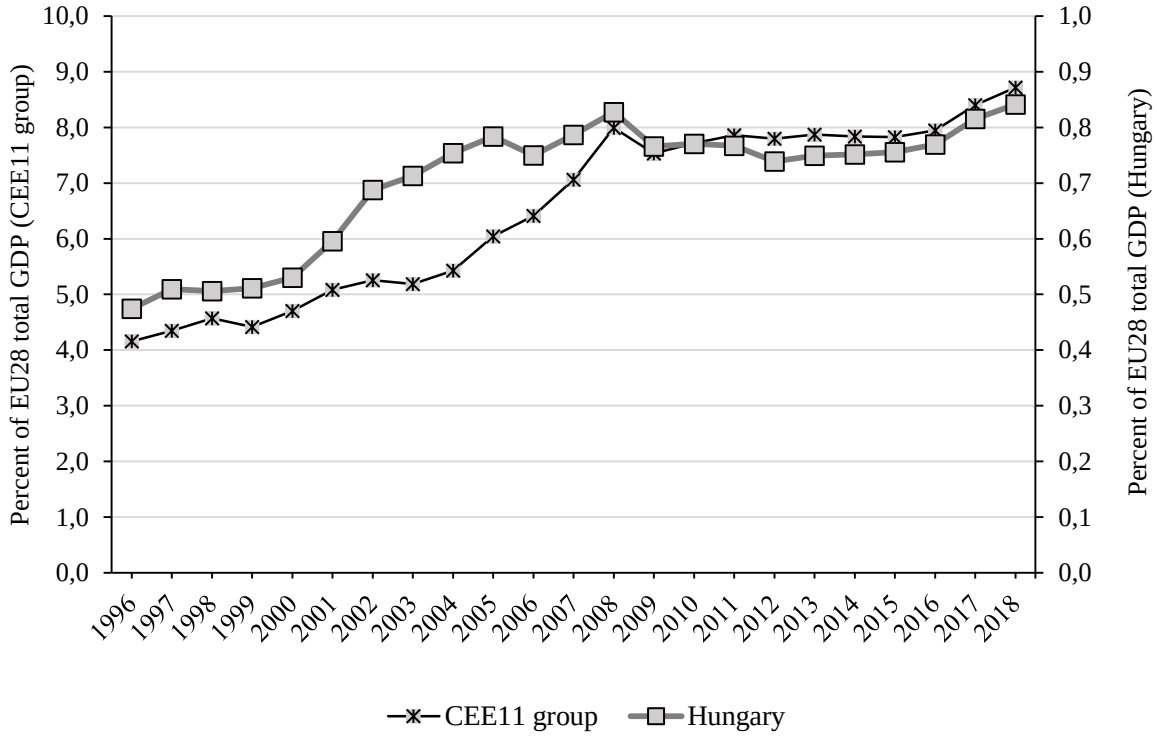


Figure 24: Growth performance of CEE countries compared to Germany and EU

Source: Author's calculations based on Eurostat (2020)

The very pronounced connection between Germany and the Visegrad group in the 2010s suggests that these economies became increasingly dependent on German foreign capital and investment over these period. **Between 2008 and 2018, among the V4 country group, Hungary has the lowest annual rate of growth with a long-term average of just 1.5 percent per year. However, it still exceeded the similar indicator for the German economy (1.3%).** Still, it remained below all the other V4 members' expansion rates. Actually, it was slightly less than the Czech 10-year average of 1.6 percent, and considerably lower than Slovakia (2.2%) and Poland (3.5%), according to the Eurostat data. Part *b)* represents the multi-decadal change in the overall share of CEE11 and Hungarian (total) GDP within the EU28, denominated in euros and expressed in current prices for each year. During the period starting in the mid-1990s and ending in 2018, the CEE11 groups' share of EU28 nominal GDP has risen from about 4 percent to more than 8.5% until the end of the examined period. **Hungarian share is, by a rule of thumb 1/10th of the total CEE11 output**, it has risen from 0.5% in 1996 to 0.8% in 2018. Before the 2008 global financial crisis, Hungary performed generally better in terms of increasing its relative weight within the EU28 as a whole, than the CEE11 countries altogether. **Meanwhile, since 2008, the slowdown of convergence in Central and Eastern Europe becomes clearly visible, as the CEE11's share from the EU28 nominal GDP has shown almost no increase in the past decade.** This is in sharp contrast with the pre-crisis times, when these countries converged quickly to the more advanced part of Europe. In the last 10 years until 2018, the lack of convergence in case of the Hungarian economy is even more evident than for other members of the CEE11.

What might happen if the biggest trading partners – and primarily Germany – lose their interest in further tightening of commercial relations due to some social, political or negative economic scenarios based reasons? It is sure that latter possible outcome would have a devastative effect on the further growth of transition economies. Still, it doesn't have to be forgotten that trade relations have dual nature: Germany is also heavily relying on its CEE country base.

In our 21st century world economy, social, political and economic development tendencies as well as power shifts have been undergoing at faster rates than ever due to the concentration of globalization all across the main regions of the world. Still, it might be noticed that certain country groups or individual economies have become even more vulnerable than a couple of decades ago. Current Chapter has made an attempt to present

the recent growth path of a special country club that has been experiencing quite a contradictious development scenario. Although in our analysis, we emphasized on only seven countries – the Czech Republic, Hungary, Poland and Slovakia (as the V4) as well as Bulgaria, Croatia and Romania (as the B3) – within the classical CEE region, it has been proven that even within such a small group, development and economic growth might produce significantly different variations.

The Chapter introduced a new definition for the **phenomenon of dependent market economies** through the example of the V4 and B3 groups by assuming that such **economic dependency arises and might become even more concentrated in the long run if first, relying on the inflow of FDI becomes the core of short- as well as medium-term economic growth, second, when the presence of foreign multi- and transnational companies is having a growing influence on the given country's performance** (e.g. having crucial labour market effects) **and third, when the relatively high share of total exports is connected to one or a couple of trading partners over the years and thus the economic performance of the top trading countries** – for example, Germany – **is having relevant influence on the development of the exporter**. By analysing all three aspects, we may conclude that *the examined economies might definitely be considered as highly dependent market economies having on one hand, the historical burden of the post-communist regime and on the other, in some cases (e.g. Hungary), a short-run orientated vision of further development*. Of course, the magnitude of such dependency may vary but in the long run, it can have a truly negative effect on the catching-up or convergence to the more developed countries.

Within the research, we have been paying a special attention to **Hungary** since its growth path turned out to be the most contradictious in the group. Due to certain endogen factors, **its performance has generally slowed down in recent years and it has also developed a dual structure of economy with a strong multinational and transnational based sector highly integrated into world economy and a weak domestic market that is not competitive on international level** due to low value added production and the lack of high quality human capital base. This is the main reason why we have compared Hungary's main economic indices and tendencies separately to the three Visegrad countries and the Balkan economies. Similarly, Dénes Bank introduces a new, extended interpretation of DMEs with the **"double-dependent market economies"** in case of Hungary where the main sources of extremely high dependence are the *"hierarchies*

inside the multinational companies and the dependent nature of relationships with the government" (Bank, 2018). On the base of our calculations as well as several other researches results, the first assumption stating that Hungary has been showing a diverging tendency from the Visegrad group in recent years, has been thus proven. What is more, after having examined the recent growth path of CEE economies, **the second hypothesis of the Thesis stating that integrated peripheries** – due to certain asymmetric interdependencies – **are not likely to produce significant long-term economic convergence to the centre economies with the current conditions of global capitalism and a strongly FDI based growth path they have developed, is also accepted**. Besides, latter processes might **increase the possibility of the** so-called **middle-income trap** phenomenon, as we have demonstrated in *Table 2*. According to certain studies, such trap was already experienced by **Poland** (between 1976 and 1989) as well as two times by **Hungary** (between 1979-1989 and 2006-2015) within the CEE region (Sőreg, 2018b).

What might be the next step for the CEE region in order to become a competitive economic country group attracting significant foreign investors but not narrowing its development path on latter factor as the only strategy? First of all, policy makers should gradually restructure current growth scenarios by adopting a long-term approach to development: *instead of the continuation of "marketing" the CEE region for multinational firms as a large pool of cheap labour force specializing in mainly assembling activities, economic policy should focus on the increase of R+D investments as well as large-scale human capital development*. We believe that the main inputs are given for these intentions. Secondly, certain economies (e.g. Hungary) should start to decrease the social and political tensions developed in recent years and instead of diverging from the European Union's core policies, values and centre economies, introduce structural reforms to dissolute the dual economy that is definitely functioning as a crisis phenomenon in the long term. As an outcome, the **fifth hypothesis** of the Thesis **is accepted** assuming that **Hungary has been showing a significant diverging tendency from the Visegrad Four countries since the mid-2000s and thus represents a special case within the country group.**

❖

6. CONCLUSIONS

After having presented each relevant element of the research, we are hereby summarizing the most relevant concluding remarks of the dissertation by providing results for the 5 hypotheses originally developed. According to the Author's point of view, the novelty of the presented research could be emphasized by the following points: firstly, **a new and hopefully more accurate approach was presented for the categorization of countries into different income levels**, which, instead of relying on an absolute benchmark, uses the relative per capita income levels as a percentage of global average per capita GDP in every year to assign each country into four different income groups. **Secondly, an improved definition for protracted growth slowdowns and the middle income trap (MIT) was created**, which takes into account pre-slowdown growth rates, slowdown magnitude and length, relative income levels and post-slowdown rates of expansion simultaneously. **Finally, protracted growth slowdowns were examined on a very extensive timescale, starting from 1950** in order to catch long term trends for middle-income economies regarding their convergence or divergence from the more advanced parts of the world. A lengthy timescale is also beneficial from the point of view that it might reveal important changes among the composition of the low, lower-middle, upper-middle and the high income groups on a multi-decadal perspective.

Thesis I. concerned the long term prospects of economic growth and the possibility of convergence in the largest semi-periphery economies of the globe, especially the BRICS country group:

THESIS I. GROWTH TENDENCIES OF THE DEVELOPING ECONOMIES

Hypothesis 1: **Global semi-periphery economies** (e.g. BRICS country group) – **due to certain favourable endogenous and exogenous factors** (geographical location, high raw material and natural resource abundance, huge domestic market, beneficial demographical tendencies, "follower based" technological developments or periodically increasing/decreasing global competitiveness) – **are holding high potential of realizing a successful catching-up scenario and thus significantly redefine the power balance between centre and periphery economies.**

Result 1: **The hypothesis was partially accepted** according to results provided in *Chapter 5.2.8* since in the narrow approach (BRIC group), **only China and India has been showing** such **a relevant catching-up tendency** with minor fall-back episodes due to factors as an economic crisis. Brazil is currently dealing with several endogenous socio-economic problems and its recent development path also shows quite high dependence on the global market prices of raw materials. What is more, Russia's development course is completely contradictious due to having extremely high natural resource dependency, severe domestic implications (e.g. a prolonged low-intense conflict with Ukraine and the burden of EU-US sanctions' affecting its economy) and the country is also struggling with domestic setbacks, such as lack of high quality infrastructure, rampant corruption and ineffective institutions. In the wider sense (BRICS approach), the South African Republic is a complete outlier within the group and this is why it has been only touched upon a few times within the research. Besides a considerably large domestic market and abundance in certain natural resources, its overall growth performance is far from the other four countries' average.

Thesis II. referred to the middle income trap phenomenon, with an emphasize on some development issues which are considered specific to the Central and Eastern European (CEEC) region of the global economy:

THESIS II. THE MIDDLE-INCOME TRAP PHENOMENON

Hypothesis 2: **The integrated periphery economies** (e.g. Central and Eastern European Countries) – **due to their historical burden based asymmetric interdependencies** (high dependence on foreign direct investment inflows, relatively small domestic market and purchasing power, lack of natural resources and raw materials, the cumulated economic divergence since the change of the regime in case of Central and Eastern Europe and middle-income trap episodes) **are not likely to produce significant long-term convergence to the Western European centre with the current conditions of global capitalism. The relatively small-scale and in most cases, hectic development of such highly dependent market economies might be rather viewed as a special case that usually emerges only in certain economies having initial advantages**.

Result 2: **The hypothesis was accepted** – as specified in results of *Table 1* and *Chapter 5.3*'s findings – since the CEECs (as a country group) still haven't managed to produce full convergence to the EU centre economies in the recent 30 years. **Consistent vulnerability to internal and external shocks, strong FDI dependency, relatively low rate of economic growths in the long run and a special peripheral geographic location between the more developed part of Europe and some authoritarian powers of the 'East', like Russia or Turkey are definitely presenting a risk for a successful convergence path**. Also, the proximity of the Eastern regimes as well as Hungary's increased openness to the 'East' might pose certain geo-political risks on the region. Although there have been positive examples like the Czech Republic, it can be concluded that these economies are performing relatively better due to some special comparative advantages (as the tight trade relations and proximity to Germany, etc.). On the other end of the scale, Hungary might be viewed as an absolute loser of current economic circumstances with the highest dependency indicators among the CEEC countries. **In Hungary, two middle-income trap episodes were detected** within the Author's calculations. Although Poland develops faster, it also had a MIT event. The **occasional and unsystematic growth phases might not be supported in the long term,** especially in the examined Visegrad Four region. Latter country group owes its previous success to the significant amount of subsidies provided by the European Union (so it might be viewed as part of a strong FDI inflow based stage of development), the benefits spilling off from the biggest trading partners' positive performance during economic prosperity phases, the relatively low stage of development emerging after the regime change, an unbeneficial model of producing low value added products and services by a labour force with extremely low wages (that is also threatened by intensifying automatization) making the countries attractive places to invest for transnational monopolist capital owners and finally, the significant and growing amount of incomes partially transferred to the mother countries of expats living in more developed economies of the Union. However, most of these are currently fading away, so in the short run, they have greatly contributed to the region's instability and further dependency. With the exception of increasing remittances, other components of growth will surely shrink in the near future, so it will be vital to introduce long term oriented strategies based on comparative advantages and high value added activities disrupting economic dependency.

Thesis III. had three sub-hypotheses, each of them related to a more specific issue regarding the long-term convergence potential of a single middle income economy of greater interest or a wider group of such countries:

THESIS III. CONVERGENCE PATH OF THE BRIC AND CEEC ECONOMIES IN LIGHT OF THE MIDDLE INCOME TRAP

Hypothesis 3: **The growth dynamics of the BRICS countries shows strong correlation with the fluctuation of commodity prices, especially in case of the raw materials.**

Result 3: **The hypothesis was partially accepted** after having applied the Combined Commodity Price Index in *Chapter 5.2.6*. According to the results, Russia represents the most exposed economy within the BRICS and **only India might be viewed as a country with a development path being independent of the global commodity markets**. It also means that **less dependent economies as India and China are affected at a smaller magnitude of the commodity prices' volatility.** There is thus a strong relation between a country's export structure, its exposure to commodity prices and economic growth but the negative outcomes might be moderated by developing a more resistant and stable economy. The example of Brazil and Russia serves as a conclusion that in the aftermath of a global economic crisis falling commodity prices are likely to break a steep growth path sustained in a preceding time period and may lead to protracted stagnation thus preventing the given country from upgrading to a higher income group. It is also indicating that the emergence of the new cycle is slower than usual.

Hypothesis 4: The process of accession to the European Union - by stimulating foreign investment to the region - **has strongly contributed to the significant pre-crisis growth as well as to the post-crisis persistent growth slowdown in Central and Eastern European Countries.**

Result 4: **The hypothesis was accepted** based on calculations of *Chapter 5.3.1 and Figure 14*, since latter coherence is significant, especially in case of current account balance and foreign direct investment inflow. Subsequently, **larger external imbalance and more inflow of foreign capital contributes to greater GDP increase**, however, the net international investment positions of the examined countries will likely deteriorate within the same period. It also means that these economies are much more vulnerable than the more advanced EU Member States and may experience much more severe recession episodes following external shocks. What is more, **recovery periods tend to be much longer** and thus, more devastating for their domestic economic processes.

Hypothesis 5: Strictly in economic frames, **Hungary has been showing a significant diverging tendency from the Visegrad Four countries since the mid-2000s and thus represents a special case within the country group** having possible further implications regarding its catching-up path. Further, **based on Jánossy's trendline theory calculations, Hungary's long-term** (of almost a 100 years long period) **average GDP per capita growth rate is around 1.8 percent per year**, indicating that it has been neither converging nor diverging to the most developed economies.

Result 5: **The hypothesis was accepted** in accordance with *Chapter 5.3.5*, since according to the Author's calculations, Hungary was producing the lowest GDP per capita in PPP in 2017 within the V4 group, had the second lowest net FDI inflow, having the lowest ranking result based on WEF's Global Competitiveness Report and having a very disproportionate foreign trade dependency on its main trading partner (Germany) compared to the other 3 Visegrad countries. Due to its **dual economic structure, strong dependency on foreign capital as well as EU subsidies, cheap labour force pool and low value added production**, it has developed a **high exposure to external shocks as well as endogenous socio-political changes** unbeneficial for long term economic growth. Also, as it has been specified in *Chapter 3.3.2*, Hungary's long-term (98 year-long) average growth rate is 1.77 percent indicating that **it has been neither converging nor diverging to or from the most developed economies of the region**.

CLOSING REMARKS

In our 21st century world economy, social, political and economic development tendencies as well as power shifts have been undergoing at faster rates than ever. This mainly occurs due to level of globalization, increasing concentration of assets and resources and the fast flow of information through all regions of the world. Still, it might be noticed that certain country groups or individual economies have become even more vulnerable than a couple of decades ago. The main aim of the research was to analyse the economic growth path of such economies and to detect those standard or non-standard factors which might have greatly contributed to the slowdown phases in recent decades.

(1) The Author used a new method for developing an alternative concept of the middle-income trap phenomenon and to examine the given countries' overall economic performance in details. There have been **34 cases of** significant growth slowdowns between 1950 and 2016 which have been associated with **middle-income trap episodes** among which there were three BRICS (**Brazil, Russia and South Africa**) and in Europe, two CEE (**Hungary and Poland**) economies affected by the trap.

(2) As the research proceeded, it turned out that the main difference between the fastest emerging economies and the transit countries of the CEEC region is that **certain countries within the BRICS group (China and India)** – although also having some dependence on global prices of natural resources – **seem to be much more successful regarding long-term convergence and more resistant to economic crisis as well as recession compared to such highly dependent economies as Russia, South Africa and to some extent, Brazil**. Besides such evident characteristics as huge domestic market or raw material abundance, it is much more important that certain latter countries didn't experience such a shock as the regime change of the CEECs thus imposing a historical burden of furtherly growing dependency on inward FDI as well as other features.

(3) It was also presented that **there is a contradictious and hectic development path in case of the CEE11 country group** (and more specifically, the Visegrad Four region) and what is more, **Hungary is representing an outlier economy** regarding long term economic convergence currently balancing between the V4 and the

Balcanic Three (B3) countries' level of development being the only economy within the region that had previously experienced two MIT episodes. Due to certain endogenous factors, its performance has generally slowed down in the recent 10-15 years and it has also developed a dual structure of economy with a strong multi- and transnational based branch. These internationally-backed firms are highly integrated into global economy in contrast with the weak domestic sectors in the CEE countries, which are not competitive on international level due to low value-added production and the lack of proper know-how, innovative technologies and a high quality human capital base.

(4) All in all, **CEECs are** thus **highly dependent market economies trapped by the short-term strategies raised towards attracting more foreign capital to the region and maintaining a wide pool of cheap labour force** – also being threatened by growing automatization – **lacking the access to modern technology** that makes them unable to develop high value added production of goods and services necessary for global competitiveness as well as long term economic growth and convergence. **The future possibility of catching-up will massively depend on the CEECs' ability to become more independent of FDI** and moderate all the still existing pressures of the sudden collapse of previous political and economic regime that currently prevents them from true convergence.

(5) As of early 2020, the post-socialist development model in the CEE region is almost certainly getting closer to its own limits: there are obvious reasons why the previously massive growth based on FDI inflows and a relatively cheap, but still skilled labour force lost its momentum after the 2008 economic crisis. Firstly, the abundance of cheap labour is already shrinking within the region on one hand, due to the very low local birth rates and on the other hand, because of mass emigration of mostly skilled workers and young people towards the more developed parts of Europe. Moreover, immigration from other regions is insufficient to replace to net loss in workforce for various reasons. These processes together initiated an increase in real wage levels, thus reducing the region's attractiveness for low value-added activities, such as assembly departments of electronics, the (German) automotive industry and shared service centres. Secondly, regardless the lately observable

processes within Central and Eastern Europe, foreign investors are rather interested in other regions of the world economy, such as Southeast Asia and to a lesser extent, Latin America. Finally, following 2021, the EU is planning to relocate significantly less funding towards the CEE region, which used to be one of the main drivers of local economic growth through large-scale investments in infrastructure and other assets.

(6) On such basis, it might be concluded that **these dependent market economies will have to rearrange their model of economic development. Unless major changes in economic policy take place, these countries will probably have to face an increased risk of experiencing the middle income trap phenomenon.** Further, it is also evident that among the investigated larger economies of BRICS group, only the model of China and India was proven to be really successful in the 21st century.

(7) After having carried out an extended research on the topic, it would be rational for all the CEE11 countries to massively invest in the further accumulation of human capital, and latter, according to recent international comparisons, is not significantly better than in most BRICS countries. This statement is also true in case of R&D capabilities and critical infrastructure. Therefore, spending on education, healthcare, innovation and infrastructure should be a top priority accompanied by a myriad of anti-corruption measures (in order to increase the effectiveness of these development programs). It would be also crucial to find some sectors with relevant comparative advantages and being committed their advancement.

(8) Among the policy priorities, it should be also advised to intensify the level of economic integration within the broader CEE region, which could be achieved by adding some new, currently non-EU economies to the local cooperation. As an example, Ukraine is the most populous sovereign state in the area with over 40 million inhabitants, and it is also the largest country between Western Europe and Russia. For the CEE11 economies, which are already members of the EU, it would be regarded as a significant opportunity to support Ukraine's European integration and to bring their own foreign direct investments there. Latter step would have massive advantages for both the investor and for the recipient country as well.

(9) Since the development of emerging economies has been representing a topical issue, some future research should be carried out concerning the possible catching-up strategies for certain middle-income economies. It should be also investigated more thoroughly what governments as well as public institutions should imply as strategies in order to maintain stable economic growth especially in country groups with such a special development pattern as the CEECs being so vulnerable on the periphery of the EU. Crisis management in emerging economies is also a relevant issue to discuss since the higher level of dependency on external processes. Regarding the BRICS, it would be vital to model their future rate of economic growth because due to their size of economy, the effect on other regions' development is also quite significant. However, the lack, reliability and quality of the data are one of the main limitations of such researches.

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SUPPLEMENTARY MATERIAL

Appendix 1. Hungarian (reconstructed) per capita GDP since 1869 at fixed prices

YEAR	Katus (2012)	Maddison (2010)		The World Bank (2019)		**AGGREGATE SERIES**		
	1869=100	1990 G-K $	1913=100	2010 USD	1991=100	1869=100	2010 USD	%/year
1869	100.0					100.0	1 345	-
1870	106.4					106.4	1 431	6.4
1871	108.2					108.2	1 455	1.7
1872	108.9					108.9	1 465	0.6
1873	107.0					107.0	1 439	-1.7
1874	109.7					109.7	1 476	2.5
1875	114.6					114.6	1 542	4.5
1876	112.4					112.4	1 512	-1.9
1877	120.1					120.1	1 615	6.9
1878	145.4					145.4	1 956	21.1
1879	127.7					127.7	1 718	-12.2
1880	134.5					134.5	1 809	5.3
1881	143.8					143.8	1 934	6.9
1882	163.9					163.9	2 205	14.0
1883	156.5					156.5	2 105	-4.5
1884	158.6					158.6	2 133	1.3
1885	160.2					160.2	2 155	1.0
1886	154.8					154.8	2 082	-3.4
1887	168.5					168.5	2 267	8.9
1888	167.0					167.0	2 246	-0.9
1889	159.9					159.9	2 151	-4.3
1890	172.6					172.6	2 322	7.9
1891	181.0					181.0	2 435	4.9
1892	178.3					178.3	2 398	-1.5
1893	188.0					188.0	2 529	5.4
1894	183.2					183.2	2 464	-2.6
1895	197.5					197.5	2 657	7.8
1896	197.6					197.6	2 658	0.1
1897	184.2					184.2	2 478	-6.8
1898	191.8					191.8	2 580	4.1
1899	197.2					197.2	2 653	2.8
1900	196.3					196.3	2 640	-0.5
1901	192.6					192.6	2 591	-1.9
1902	201.1					201.1	2 705	4.4
1903	207.5					207.5	2 791	3.2
1904	188.6					188.6	2 537	-9.1
1905	209.4					209.4	2 817	11.0
1906	224.9					224.9	3 025	7.4
1907	211.8					211.8	2 849	-5.8
1908	217.8					217.8	2 930	2.8
1909	221.0					221.0	2 973	1.5
1910	231.9					231.9	3 119	4.9
1911	234.2					234.2	3 150	1.0
1912	242.9					242.9	3 267	3.7
1913	242.6	2 098	100.0			242.6	3 263	-0.1
1914		2 037	97.1			235.6	3 169	-2.9
1915		1 879	89.6			217.3	2 923	-7.8

YEAR	Katus (2012)	Maddison (2010)		The World Bank (2019)		**AGGREGATE SERIES**		
	1869=100	1990 G-K $	1913=100	2010 USD	1991=100	1869=100	2010 USD	%/year
1916		1 861	88.7			215.2	2 895	-1.0
1917		1 832	87.3			211.9	2 850	-1.6
1918		1 809	86.2			209.2	2 814	-1.3
1919		1 600	76.3			185.0	2 489	-11.6
1920		1 709	81.5			197.6	2 658	6.8
1921		1 718	81.9			198.7	2 672	0.5
1922		1 744	83.1			201.7	2 713	1.5
1923		1 808	86.2			209.1	2 812	3.7
1924		1 912	91.1			221.1	2 974	5.8
1925		2 279	108.6			263.6	3 545	19.2
1926		2 162	103.1			250.0	3 363	-5.1
1927		2 237	106.6			258.7	3 480	3.5
1928		2 415	115.1			279.3	3 757	7.9
1929		2 476	118.0			286.3	3 851	2.5
1930		2 404	114.6			278.0	3 739	-2.9
1931		2 268	108.1			262.3	3 528	-5.6
1932		2 192	104.5			253.5	3 410	-3.3
1933		2 374	113.2			274.5	3 692	8.3
1934		2 370	113.0			274.0	3 686	-0.2
1935		2 471	117.8			285.8	3 844	4.3
1936		2 618	124.8			302.8	4 073	5.9
1937		2 543	121.2			294.1	3 955	-2.9
1938		2 655	126.6			307.1	4 131	4.4
1939		2 838	135.3			328.2	4 414	6.9
1940		2 626	125.2			303.7	4 085	-7.4
1941		2 626	125.2			303.7	4 085	0.0
1942		2 743	130.8			317.2	4 267	4.4
1943		2 806	133.8			324.5	4 365	2.3
1944		2 572	122.6			297.4	4 001	-8.3
1945		1 989	94.8			230.0	3 094	-22.7
1946		1 721	82.0			199.0	2 677	-13.5
1947		1 774	84.5			205.1	2 759	3.1
1948		2 200	104.9			254.4	3 422	24.0
1949		2 354	112.2			272.2	3 662	7.0
1950		2 480	118.2			286.8	3 858	5.3
1951		2 695	128.5			311.6	4 192	8.7
1952		2 762	131.7			319.4	4 296	2.5
1953		2 786	132.8			322.1	4 333	0.9
1954		2 850	135.9			329.6	4 434	2.3
1955		3 070	146.3			355.0	4 776	7.7
1956		2 906	138.5			336.0	4 520	-5.4
1957		3 169	151.1			366.5	4 930	9.1
1958		3 367	160.5			389.4	5 237	6.2
1959		3 484	166.1			402.9	5 420	3.5
1960		3 649	173.9			422.0	5 676	4.7
1961		3 816	181.9			441.3	5 936	4.6
1962		3 962	188.9			458.2	6 163	3.8
1963		4 168	198.7			482.0	6 483	5.2
1964		4 388	209.2			507.4	6 826	5.3
1965		4 410	210.2			509.9	6 859	0.5
1966		4 646	221.5			537.3	7 227	5.4
1967		4 894	233.3			565.9	7 613	5.3
1968		4 934	235.2			570.6	7 675	0.8
1969		5 062	241.3			585.4	7 874	2.6
1970		5 028	239.7			581.4	7 821	-0.7
1971		5 238	249.7			605.7	8 148	4.2

YEAR	Katus (2012)	Maddison (2010)		The World Bank (2019)		**AGGREGATE SERIES**		
	1869=100	1990 G-K $	1913=100	2010 USD	1991=100	1869=100	2010 USD	%/year
1972		5 336	254.3			617.0	8 300	1.9
1973		5 596	266.7			647.1	8 704	4.9
1974		5 716	272.5			661.0	8 891	2.2
1975		5 805	276.7			671.3	9 029	1.6
1976		5 791	276.0			669.6	9 007	-0.2
1977		6 126	292.0			708.4	9 529	5.8
1978		6 253	298.1			723.1	9 727	2.1
1979		6 251	298.0			722.9	9 724	0.0
1980		6 306	300.6			729.3	9 810	0.9
1981		6 351	302.7			734.4	9 878	0.7
1982		6 583	313.8			761.3	10 240	3.7
1983		6 525	311.0			754.6	10 150	-0.9
1984		6 710	319.8			775.9	10 437	2.8
1985		6 557	312.5			758.2	10 199	-2.3
1986		6 699	319.3			774.7	10 421	2.2
1987		6 814	324.8			788.0	10 600	1.7
1988		7 031	335.1			813.1	10 937	3.2
1989		6 903	329.0			798.3	10 738	-1.8
1990		6 459	307.9			746.9	10 047	-6.4
1991		5 694	271.4	8 858	100.0	658.5	8 858	-11.8
1992		5 528	263.5	8 589	97.0	638.6	8 590	-3.0
1993		5 507	262.5	8 550	96.5	635.6	8 550	-0.5
1994		5 678	270.7	8 814	99.5	655.2	8 814	3.1
1995		5 772	275.1	8 958	101.1	665.9	8 958	1.6
1996		5 861	279.4	8 980	101.4	667.6	8 980	0.3
1997		6 146	293.0	9 281	104.8	690.0	9 281	3.4
1998		6 464	308.1	9 666	109.1	718.6	9 666	4.1
1999		6 756	322.0	9 991	112.8	742.7	9 991	3.4
2000		7 132	340.0	10 465	118.2	778.0	10 466	4.8
2001		7 444	354.8	10 917	123.2	811.6	10 917	4.3
2002		7 789	371.3	11 467	129.5	852.5	11 467	5.0
2003		8 137	387.8	11 970	135.1	889.9	11 970	4.4
2004		8 548	407.5	12 575	142.0	934.8	12 575	5.1
2005		8 913	424.9	13 134	148.3	976.5	13 135	4.5
2006		9 284	442.6	13 685	154.5	1 017.4	13 685	4.2
2007		9 419	449.0	13 740	155.1	1 021.5	13 740	0.4
2008		9 500	452.8	13 909	157.0	1 034.1	13 910	1.2
2009				12 998	146.7	966.3	12 998	-6.6
2010				13 114	148.0	974.9	13 114	0.9
2011				13 390	151.2	995.5	13 390	2.1
2012				13 261	149.7	985.9	13 261	-1.0
2013				13 559	153.1	1 008.0	13 559	2.2
2014				14 166	159.9	1 053.1	14 166	4.5
2015				14 745	166.5	1 096.2	14 746	4.1
2016				15 114	170.6	1 123.7	15 115	2.5
2017				15 810	178.5	1 175.4	15 810	4.6
2018				16 648	188.0	1 237.7	16 648	5.3
2019**				17 480	197.3	1 299.5	17 480	5.0

* Between 1869 and 2019, the average rate of per capita GDP growth in Hungary was 1.72% per year. In the last 30 years, the observed long term mean was 1.64 percent which is statistically indistinguishable from the multi-centennial trend.

**According to provisional data provided by the Central Statistical Office (KSH, 2020), Hungarian per capita GDP has risen by about 5.0 percent in 2019.

Appendix 2. Classification of countries by their relative level of development

NOTE: the values below for 191 countries were estimated from the merging of two independent data sources: Maddison (2010) and The World Bank (2019). Countries where protracted slowdown period(s) were detectable are highlighted with (*).

COUNTRY	Ratio of local per capita GDP to global average Income levels: L = low; Lm = lower-middle; Um = upper-middle; H = high.											
	1950		**1970**		**1990**		**2000**		**2010**		**2019****	
Afghanistan	0.272	L	0.164	L	0.101	L	0.083	L	0.126	L	0.121	L
Albania *	0.499	L	0.546	Lm	0.438	L	0.468	L	0.747	Lm	0.783	Lm
Algeria *	1.138	Um	1.045	Um	1.012	Um	0.883	Lm	0.973	Lm	0.961	Lm
Andorra	---	-	5.203	H	3.196	H	3.120	H	2.940	H	2.419	H
Angola	1.378	Um	1.268	Um	0.468	L	0.335	L	0.479	L	0.432	L
Antigua and Barbuda	---	-	0.797	Lm	1.685	Um	1.663	Um	1.548	Um	1.507	Um
Argentina *	2.267	H	1.742	Um	1.117	Um	1.289	Um	1.424	Um	1.286	Um
Armenia	---	-	---	-	0.367	L	0.251	L	0.490	L	0.560	Lm
Australia	3.229	H	2.821	H	2.816	H	3.046	H	3.127	H	3.069	H
Austria	1.638	Um	2.436	H	3.079	H	3.343	H	3.263	H	3.079	H
Azerbaijan	---	-	---	-	0.837	Lm	0.384	L	1.201	Um	1.129	Um
Bahamas. The	---	-	2.801	H	2.385	H	2.226	H	1.725	Um	1.538	Um
Bahrain	4.976	H	4.903	H	3.450	H	3.868	H	3.054	H	3.016	H
Bangladesh	0.286	L	0.174	L	0.130	L	0.146	L	0.190	L	0.236	L
Barbados *	---	-	1.293	Um	1.276	Um	1.263	Um	1.152	Um	0.900	Lm
Belarus	---	-	---	-	0.794	Lm	0.628	Lm	1.182	Um	1.123	Um
Belgium	2.352	H	2.536	H	2.966	H	3.149	H	3.071	H	2.929	H
Belize *	---	-	0.329	L	0.508	Lm	0.621	Lm	0.618	Lm	0.575	Lm
Benin	0.321	L	0.178	L	0.144	L	0.143	L	0.137	L	0.139	L
Bhutan	---	-	0.158	L	0.229	L	0.310	L	0.491	L	0.568	Lm
Bolivia	1.162	Um	0.551	Lm	0.364	L	0.376	L	0.402	L	0.457	L
Bosnia and Herzegovina	---	-	---	-	0.292	L	0.530	Lm	0.688	Lm	0.690	Lm
Botswana	0.177	L	0.193	L	0.835	Lm	0.923	Lm	0.996	Lm	1.106	Um
Brazil *	0.782	Lm	0.822	Lm	1.016	Um	0.981	Lm	1.101	Um	0.979	Lm
Brunei Darussalam	---	-	10.68	H	7.572	H	6.410	H	5.318	H	4.739	H
Bulgaria	0.490	L	0.775	Lm	0.913	Lm	0.760	Lm	1.151	Um	1.227	Um
Burkina Faso	0.111	L	0.089	L	0.083	L	0.093	L	0.107	L	0.113	L
Burundi	0.142	L	0.119	L	0.101	L	0.062	L	0.055	L	0.048	L
Cabo Verde	0.150	L	0.113	L	0.165	L	0.335	L	0.447	L	0.429	L
Cambodia	0.129	L	0.095	L	0.094	L	0.119	L	0.190	L	0.239	L
Cameroon	0.390	L	0.257	L	0.295	L	0.221	L	0.217	L	0.227	L
Canada	2.771	H	2.647	H	2.840	H	2.904	H	3.064	H	2.974	H
Central African Republic	0.248	L	0.162	L	0.097	L	0.073	L	0.074	L	0.050	L
Chad	0.310	L	0.185	L	0.109	L	0.085	L	0.144	L	0.129	L
Chile	1.179	Um	0.898	Lm	0.881	Lm	1.226	Um	1.458	Um	1.540	Um
China	0.066	L	0.064	L	0.150	L	0.318	L	0.715	Lm	0.991	Lm
Colombia *	0.850	Lm	0.676	Lm	0.759	Lm	0.724	Lm	0.825	Lm	0.911	Lm
Comoros	---	-	0.188	L	0.157	L	0.120	L	0.107	L	0.100	L
Congo. Dem. Rep.	0.358	L	0.264	L	0.136	L	0.049	L	0.050	L	0.055	L
Congo. Rep.	0.582	Lm	0.429	L	0.523	Lm	0.398	L	0.401	L	0.373	L
Costa Rica *	0.760	Lm	0.758	Lm	0.761	Lm	0.842	Lm	0.972	Lm	1.040	Um
Cote d'Ivoire	0.560	Lm	0.565	Lm	0.323	L	0.257	L	0.201	L	0.234	L
Croatia	---	-	---	-	1.695	Um	1.346	Um	1.505	Um	1.471	Um
Cuba	1.930	Um	0.990	Lm	1.343	Um	0.970	Lm	1.391	Um	1.464	Um
Cyprus	1.206	Um	1.515	Um	2.208	H	2.528	H	2.553	H	2.207	H
Czech Republic	2.024	H	2.047	H	1.967	Um	1.824	Um	2.135	H	2.159	H

Ratio of local per capita GDP to global average

COUNTRY	Income levels: L = low; Lm = lower-middle; Um = upper-middle; H = high.											
	1950		**1970**		**1990**		**2000**		**2010**		**2019****	
Denmark	3.030	H	3.073	H	3.319	H	3.644	H	3.312	H	3.235	H
Djibouti	0.784	Lm	0.592	Lm	0.300	L	0.179	L	0.201	L	0.232	L
Dominica	---	-	0.360	L	0.654	Lm	0.696	Lm	0.781	Lm	0.679	Lm
Dominican Republic *	0.512	Lm	0.457	L	0.542	Lm	0.713	Lm	0.856	Lm	0.991	Lm
Ecuador *	0.917	Lm	0.684	Lm	0.733	Lm	0.633	Lm	0.700	Lm	0.717	Lm
Egypt. Arab Rep.	0.517	Lm	0.394	L	0.579	Lm	0.646	Lm	0.754	Lm	0.722	Lm
El Salvador	0.862	Lm	0.719	Lm	0.443	L	0.483	L	0.473	L	0.491	L
Equatorial Guinea	0.123	L	0.163	L	0.100	L	0.941	Lm	2.559	H	1.676	Um
Eritrea	---	-	---	-	---	-	0.124	L	0.081	L	0.081	L
Estonia	---	-	---	-	1.303	Um	1.280	Um	1.634	Um	1.848	Um
Ethiopia	0.110	L	0.092	L	0.064	L	0.053	L	0.081	L	0.112	L
Fiji *	----		0.583	Lm	0.559	Lm	0.555	Lm	0.534	Lm	0.557	Lm
Finland	1.735	Um	2.130	H	2.831	H	3.001	H	3.018	H	2.780	H
France	2.025	H	2.470	H	2.895	H	2.987	H	2.772	H	2.628	H
Gabon *	1.398	Um	1.693	Um	1.921	Um	1.534	Um	1.167	Um	1.140	Um
Gambia. The	0.317	L	0.296	L	0.241	L	0.211	L	0.191	L	0.152	L
Georgia	---	-	0.764	Lm	0.788	Lm	0.281	L	0.447	L	0.526	Lm
Germany	1.697	Um	2.595	H	3.082	H	3.159	H	3.025	H	3.067	H
Ghana	0.496	L	0.346	L	0.187	L	0.191	L	0.228	L	0.264	L
Greece *	1.079	Um	1.971	Um	2.032	H	2.138	H	2.163	H	1.668	Um
Greenland	---	-	2.198	H	2.771	H	2.863	H	2.839	H	2.748	H
Grenada	---	-	0.361	L	0.736	Lm	0.831	Lm	0.842	Lm	0.867	Lm
Guatemala	0.833	Lm	0.627	Lm	0.501	Lm	0.523	Lm	0.505	Lm	0.508	Lm
Guinea	0.190	L	0.159	L	0.132	L	0.131	L	0.125	L	0.138	L
Guinea-Bissau	0.107	L	0.177	L	0.160	L	0.121	L	0.108	L	0.105	L
Guyana	---	-	0.545	Lm	0.317	L	0.437	L	0.417	L	0.479	L
Haiti	0.535	Lm	0.256	L	0.203	L	0.148	L	0.114	L	0.114	L
Honduras	0.534	Lm	0.369	L	0.315	L	0.284	L	0.295	L	0.299	L
Hungary *	1.613	Um	1.790	Um	1.663	Um	1.540	Um	1.688	Um	1.783	Um
Iceland	2.029	H	2.003	H	2.954	H	3.008	H	3.022	H	3.229	H
India	0.220	L	0.175	L	0.187	L	0.233	L	0.335	L	0.424	L
Indonesia	0.305	L	0.245	L	0.454	L	0.500	L	0.637	Lm	0.741	Lm
Iran. Islamic Rep.	1.365	Um	1.784	Um	1.116	Um	1.139	Um	1.366	Um	1.287	Um
Iraq	0.376	L	0.549	Lm	0.742	Lm	1.051	Um	0.990	Lm	1.155	Um
Ireland	1.628	Um	1.600	Um	2.202	H	3.498	H	3.380	H	4.264	H
Israel	1.190	Um	1.784	Um	2.045	H	2.310	H	2.235	H	2.250	H
Italy	1.537	Um	2.391	H	3.067	H	3.162	H	2.741	H	2.403	H
Jamaica *	0.635	Lm	1.008	Um	0.717	Lm	0.683	Lm	0.604	Lm	0.560	Lm
Japan	0.830	Lm	2.021	H	3.004	H	2.915	H	2.691	H	2.629	H
Jordan *	0.703	Lm	0.554	Lm	0.625	Lm	0.629	Lm	0.715	Lm	0.581	Lm
Kazakhstan	---	-	---	-	1.250	Um	0.836	Lm	1.476	Um	1.585	Um
Kenya	0.307	L	0.209	L	0.231	L	0.181	L	0.183	L	0.199	L
Kiribati	---	-	0.395	L	0.143	L	0.155	L	0.130	L	0.129	L
Korea. Dem. Rep.	0.335	L	0.420	L	0.442	L	0.162	L	0.135	L	0.130	L
Korea. Rep.	0.262	L	0.366	L	1.143	Um	1.787	Um	2.285	H	2.416	H
Kosovo	---	-	---	-	---	-	0.400	L	0.598	Lm	0.646	Lm
Kuwait	---	-	---	-	3.972	H	6.474	H	5.674	H	5.153	H
Kyrgyz Republic	---	-	---	-	0.342	L	0.179	L	0.210	L	0.224	L
Lao PDR	0.248	L	0.165	L	0.168	L	0.214	L	0.317	L	0.414	L
Latvia	---	-	---	-	1.397	Um	0.935	Lm	1.366	Um	1.655	Um
Lebanon	2.378	H	1.563	Um	0.549	Lm	0.914	Lm	1.085	Um	0.811	Lm
Lesotho	0.097	L	0.092	L	0.128	L	0.141	L	0.183	L	0.203	L
Liberia	0.449	L	0.365	L	0.097	L	0.113	L	0.083	L	0.081	L
Libya	2.064	H	12.01	H	2.943	H	1.886	Um	2.220	H	0.956	Lm
Lithuania	---	-	---	-	1.671	Um	1.072	Um	1.563	Um	1.884	Um

Ratio of local per capita GDP to global average

COUNTRY	Income levels: L = low; Lm = lower-middle; Um = upper-middle; H = high.											
	1950		**1970**		**1990**		**2000**		**2010**		**2019****	
Luxembourg	5.063	H	4.159	H	5.660	H	7.031	H	6.907	H	6.641	H
Macedonia. FYR	---	-	---	-	0.939	Lm	0.735	Lm	0.842	Lm	0.887	Lm
Madagascar	0.585	Lm	0.396	L	0.189	L	0.145	L	0.122	L	0.112	L
Malawi	0.115	L	0.093	L	0.073	L	0.076	L	0.081	L	0.079	L
Malaysia	0.836	Lm	0.630	Lm	1.037	Um	1.403	Um	1.584	Um	1.805	Um
Maldives	---	-	0.229	L	0.466	L	0.615	Lm	0.879	Lm	1.020	Um
Mali	0.183	L	0.133	L	0.125	L	0.126	L	0.141	L	0.136	L
Malta *	---	-	0.701	Lm	1.631	Um	2.224	H	2.101	H	2.272	H
Mauritania	0.399	L	0.483	L	0.275	L	0.244	L	0.258	L	0.252	L
Mauritius	0.649	Lm	0.421	L	0.745	Lm	0.971	Lm	1.200	Um	1.351	Um
Mexico *	1.276	Um	1.312	Um	1.334	Um	1.388	Um	1.217	Um	1.227	Um
Micronesia. Fed. Sts.	---	-	0.282	L	0.272	L	0.273	L	0.251	L	0.233	L
Moldova	---	-	---	-	0.632	Lm	0.200	L	0.295	L	0.341	L
Mongolia	0.406	L	0.402	L	0.503	Lm	0.401	L	0.579	Lm	0.776	Lm
Montenegro	---	-	---	-	---	-	0.844	Lm	1.028	Um	1.044	Um
Morocco	0.465	L	0.313	L	0.385	L	0.387	L	0.486	L	0.504	Lm
Mozambique	0.117	L	0.099	L	0.047	L	0.055	L	0.078	L	0.088	L
Myanmar	0.091	L	0.081	L	0.072	L	0.111	L	0.278	L	0.365	L
Namibia *	1.010	Um	0.850	Lm	0.561	Lm	0.563	Lm	0.653	Lm	0.716	Lm
Nepal	0.192	L	0.136	L	0.117	L	0.131	L	0.150	L	0.169	L
Netherlands	2.506	H	3.035	H	3.174	H	3.617	H	3.471	H	3.291	H
New Zealand	3.582	H	2.595	H	2.362	H	2.419	H	2.427	H	2.463	H
Nicaragua	0.820	Lm	0.784	Lm	0.292	L	0.294	L	0.299	L	0.345	L
Niger	0.292	L	0.197	L	0.088	L	0.065	L	0.061	L	0.063	L
Nigeria	0.725	Lm	0.537	Lm	0.330	L	0.264	L	0.383	L	0.376	L
Norway	3.086	H	3.149	H	4.202	H	4.991	H	4.688	H	4.418	H
Oman	0.281	L	2.950	H	3.443	H	3.784	H	3.413	H	2.707	H
Pakistan	0.305	L	0.260	L	0.300	L	0.293	L	0.307	L	0.318	L
Palau	---	-	1.636	Um	1.582	Um	1.110	Um	0.912	Lm	1.094	Um
Panama *	0.884	Lm	0.962	Lm	0.772	Lm	0.915	Lm	1.177	Um	1.482	Um
Papua New Guinea	---	-	0.257	L	0.158	L	0.160	L	0.163	L	0.213	L
Paraguay *	0.776	Lm	0.526	Lm	0.779	Lm	0.687	Lm	0.733	Lm	0.785	Lm
Peru *	1.004	Um	0.890	Lm	0.516	Lm	0.553	Lm	0.759	Lm	0.856	Lm
Philippines *	0.501	Lm	0.449	L	0.394	L	0.364	L	0.420	L	0.501	Lm
Poland *	1.198	Um	1.186	Um	0.991	Lm	1.268	Um	1.639	Um	1.800	Um
Portugal *	0.927	Lm	1.448	Um	1.979	Um	2.236	H	2.047	H	1.878	Um
Puerto Rico	1.103	Um	1.753	Um	2.184	H	2.669	H	2.554	H	2.452	H
Qatar	---	-	---	-	---	-	9.661	H	9.635	H	8.685	H
Romania	0.788	Lm	1.042	Um	1.124	Um	0.897	Lm	1.315	Um	1.502	Um
Russian Federation *	1.986	Um	2.132	H	2.028	H	1.209	Um	1.756	Um	1.684	Um
Rwanda	0.163	L	0.108	L	0.085	L	0.069	L	0.106	L	0.126	L
Samoa	---	-	0.447	L	0.359	L	0.372	L	0.407	L	0.408	L
Sao Tome and Principe	---	-	0.276	L	0.234	L	0.186	L	0.207	L	0.214	L
Saudi Arabia	3.266	H	5.834	H	4.195	H	3.725	H	3.420	H	3.460	H
Senegal	0.643	Lm	0.368	L	0.228	L	0.208	L	0.209	L	0.214	L
Serbia *	0.747	Lm	0.989	Lm	1.076	Um	0.683	Lm	1.006	Um	1.028	Um
Seychelles *	1.069	Um	0.899	Lm	1.397	Um	1.588	Um	1.533	Um	1.768	Um
Sierra Leone	0.229	L	0.211	L	0.123	L	0.078	L	0.091	L	0.095	L
Singapore	1.250	Um	1.368	Um	3.430	H	4.507	H	5.500	H	5.842	H
Slovak Republic	---	-	---	-	1.407	Um	1.312	Um	1.840	Um	1.940	Um
Slovenia	---	-	---	-	1.858	Um	1.936	Um	2.136	H	2.030	H
Solomon Islands	---	-	0.175	L	0.176	L	0.149	L	0.134	L	0.144	L
Somalia	0.149	L	0.088	L	0.060	L	0.041	L	0.044	L	0.045	L
South Africa *	1.660	Um	1.397	Um	0.973	Lm	0.835	Lm	0.901	Lm	0.843	Lm
Spain *	1.372	Um	1.975	Um	2.338	H	2.585	H	2.427	H	2.293	H

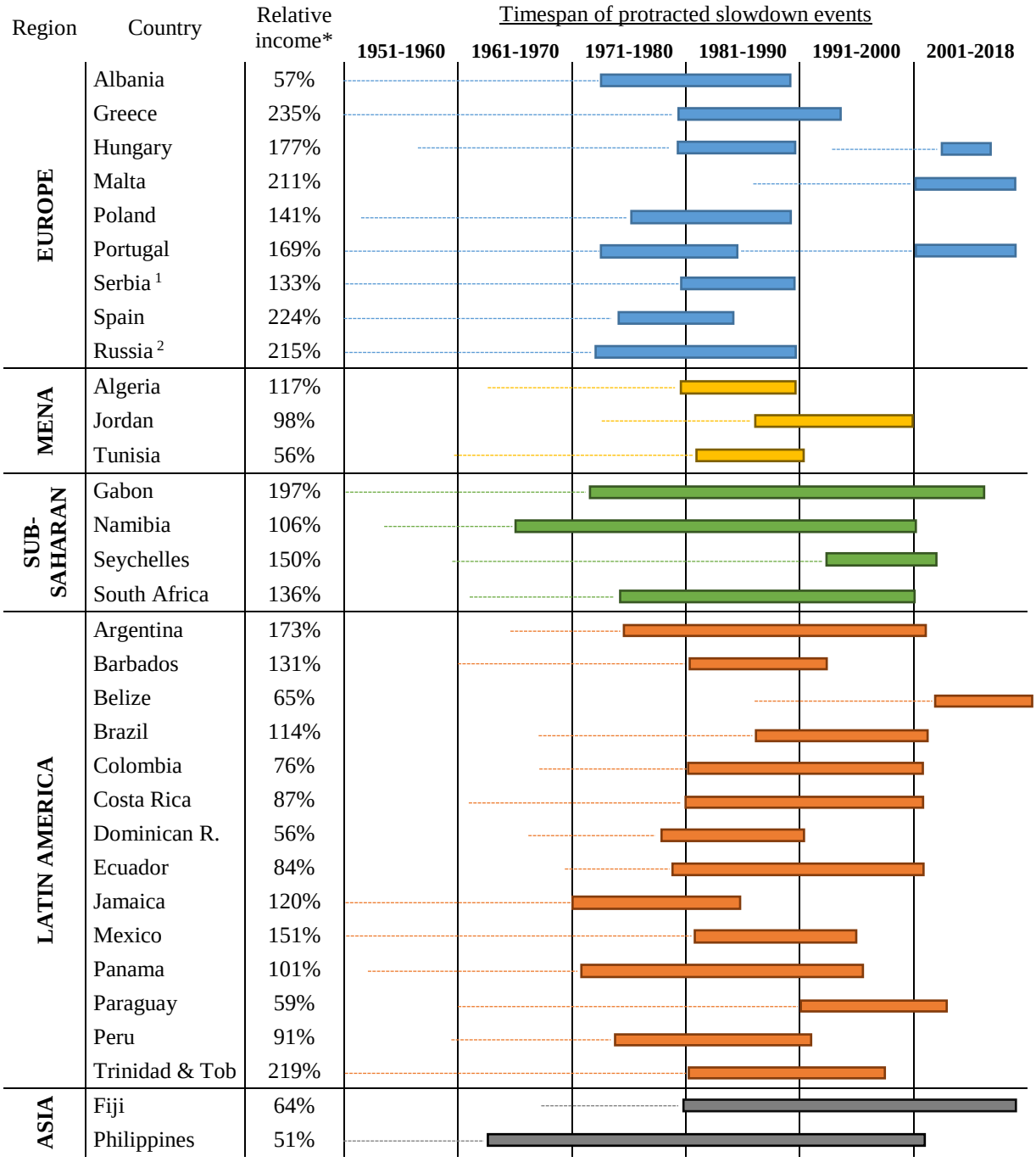
COUNTRY	Ratio of local per capita GDP to global average Income levels: L = low; Lm = lower-middle; Um = upper-middle; H = high.											
	1950		**1970**		**1990**		**2000**		**2010**		**2019****	
Sri Lanka	0.412	L	0.287	L	0.355	L	0.477	L	0.640	Lm	0.790	Lm
St.Kitts and Nevis	---	-	0.575	Lm	1.401	Um	1.643	Um	1.542	Um	1.590	Um
St.Lucia	---	-	0.443	L	0.784	Lm	0.859	Lm	0.792	Lm	0.709	Lm
St.Vincent and the Grenadines	---	-	0.396	L	0.562	Lm	0.652	Lm	0.748	Lm	0.723	Lm
Sudan	0.438	L	0.258	L	0.173	L	0.200	L	0.256	L	0.301	L
Suriname	---	-	1.478	Um	1.044	Um	0.853	Lm	1.079	Um	0.945	Lm
Swaziland	0.216	L	0.333	L	0.553	Lm	0.531	Lm	0.621	Lm	0.636	Lm
Sweden	2.723	H	2.961	H	3.033	H	3.169	H	3.276	H	3.226	H
Switzerland	4.923	H	5.026	H	4.733	H	4.370	H	4.206	H	3.978	H
Syrian Arab Republic	0.352	L	0.291	L	0.345	L	0.377	L	0.407	L	0.172	L
Tajikistan	---	-	---	-	0.358	L	0.102	L	0.159	L	0.190	L
Tanzania	0.273	L	0.200	L	0.152	L	0.135	L	0.168	L	0.187	L
Thailand	0.287	L	0.336	L	0.654	Lm	0.791	Lm	1.016	Um	1.084	Um
Timor-Leste	---	-	---	-	---	-	0.114	L	0.134	L	0.156	L
Togo	0.177	L	0.195	L	0.128	L	0.106	L	0.093	L	0.104	L
Tonga	---	-	0.276	L	0.351	L	0.396	L	0.372	L	0.351	L
Trinidad and Tobago *	1.079	Um	1.436	Um	1.072	Um	1.578	Um	2.353	H	2.029	H
Tunisia *	0.447	L	0.411	L	0.551	Lm	0.651	Lm	0.786	Lm	0.750	Lm
Turkey	0.956	Lm	0.969	Lm	1.120	Um	1.193	Um	1.352	Um	1.632	Um
Turkmenistan	---	-	---	-	0.821	Lm	0.461	L	0.755	Lm	1.146	Um
Tuvalu	---	-	---	-	0.233	L	0.264	L	0.242	L	0.262	L
Uganda	0.216	L	0.149	L	0.076	L	0.092	L	0.119	L	0.122	L
Ukraine	---	-	---	-	1.031	Um	0.414	L	0.591	Lm	0.500	Lm
United Arab Emirates	18.36	H	15.62	H	11.03	H	8.893	H	4.168	H	4.624	H
United Kingdom	2.465	H	2.258	H	2.608	H	2.872	H	2.777	H	2.742	H
United States	3.714	H	3.232	H	3.617	H	3.930	H	3.725	H	3.699	H
Uruguay	1.826	Um	1.102	Um	0.967	Lm	1.109	Um	1.292	Um	1.394	Um
Uzbekistan	---	-	---	-	0.298	L	0.213	L	0.315	L	0.414	L
Vanuatu	---	-	0.221	L	0.251	L	0.243	L	0.222	L	0.194	L
Venezuela. RB	3.137	H	2.569	H	1.436	Um	1.256	Um	1.271	Um	0.925	Lm
Vietnam	0.240	L	0.147	L	0.143	L	0.222	L	0.334	L	0.407	L
West Bank and Gaza	0.189	L	0.201	L	0.261	L	0.317	L	0.303	L	0.317	L
Yemen. Rep.	0.342	L	0.253	L	0.337	L	0.344	L	0.344	L	0.181	L
Zambia	0.573	Lm	0.482	L	0.230	L	0.183	L	0.251	L	0.255	L
Zimbabwe	0.378	L	0.367	L	0.277	L	0.254	L	0.145	L	0.172	L

* Middle-income economies with at least one protracted growth slowdown episode.

**Values for 2019 are provisional – based on extrapolating data for the 2015-2018 period.

Appendix 3. Identifying protracted growth slowdowns in middle income countries

NOTE: slowdown periods are indicated with rectangles, while the dashed line marks the pre-slowdown growth phase. Middle-income economies were assigned to five geographical groups – Europe (1), Middle East and North Africa – MENA (2), Sub-Saharan Africa (3), Latin America (4) and Asia (5).



* Local GDP per capita as a % of world average at the beginning of a protracted slowdown period (typically between 50 and 200 percent, to uppermost occurrence was 235%)

[1, 2] At the time of the slowdown, Serbia was still part of the former socialist republic of Yugoslavia, while modern day Russia was the largest administrative division within the Soviet Union.

Appendix 4. Statistical hypothesis testing for randomness in slowdown periods

Condition 1:

- *h0*: slowdown periods occurring with the same probability in each year, i.e. a discrete uniform distribution of slowdown per year can be assumed.
- *h1*: The expected value of slowdown episodes in each year is not equal.

Within the examined period, N=34 onsets of slowdown were observable, all of them occurred between the early 1960s and 2006.

The number of consecutive years: r = 47.

Expected value is the same for all years (p = 34/47 ~ 0.723). The test statistic is the following:

year	observed events	expected value	χ^2 test statistic	year	observed events	expected value	χ^2 test statistic
1960	0	0.723	0.723	*1984*	0	0.723	0.723
1961	0	0.723	0.723	*1985*	0	0.723	0.723
1962	0	0.723	0.723	*1986*	1	0.723	0.106
1963	0	0.723	0.723	*1987*	1	0.723	0.106
1964	1	0.723	0.106	*1988*	0	0.723	0.723
1965	0	0.723	0.723	*1989*	0	0.723	0.723
1966	1	0.723	0.106	*1990*	1	0.723	0.106
1967	0	0.723	0.723	*1991*	0	0.723	0.723
1968	0	0.723	0.723	*1992*	0	0.723	0.723
1969	0	0.723	0.723	*1993*	0	0.723	0.723
1970	0	0.723	0.723	*1994*	1	0.723	0.106
1971	1	0.723	0.106	*1995*	0	0.723	0.723
1972	1	0.723	0.106	*1996*	0	0.723	0.723
1973	1	0.723	0.106	*1997*	0	0.723	0.723
1974	3	0.723	7.165	*1998*	0	0.723	0.723
1975	4	0.723	14.841	*1999*	0	0.723	0.723
1976	1	0.723	0.106	*2000*	0	0.723	0.723
1977	0	0.723	0.723	*2001*	2	0.723	2.253
1978	1	0.723	0.106	*2002*	0	0.723	0.723
1979	3	0.723	7.165	*2003*	0	0.723	0.723
1980	4	0.723	14.841	*2004*	0	0.723	0.723
1981	3	0.723	7.165	*2005*	1	0.723	0.106
1982	2	0.723	2.253	*2006*	1	0.723	0.106
1983	0	0.723	0.723	**TOTAL**	**34**	**34**	**76.588**

After estimating degrees of freedom as DF = r – α – 1, where α stands for the number of parameters of the hypothesized distribution, we should get DF = 47 – 0 – 1 = 46. The chi-squared test statistic could be obtained with the following formula:

$$\chi^2 = \sum_{i=1}^{r} \frac{(f_i - F_i)^2}{F_i}$$

Substituting the above test statistic of 76.588 and DF, we get a **p-value = 0.0031.**

Therefore, h0 is rejected on all standard significance levels. The probability of the onset of a growth slowdown is not uniform within the above timeframe.

Condition 2:

- *h0*: the order of years with at least one observed slowdown and without any of these is incidental.
- *h1:* the order of years with slowdown period onsets and without is not random.

Between 1960 and 2006, there were 20 years when at least one slowdown was observed globally, while the other 27 years were passed without such event(s).

We may carry out a Wald–Wolfowitz runs test for our two-valued data sequence:

year	slowdown occurrence	sequence number
1960	0	1st
1961	0	
1962	0	
1963	0	
1964	1	2st
1965	0	3rd
1966	1	4th
1967	0	5th
1968	0	
1969	0	
1970	0	
1971	1	6th
1972	1	
1973	1	
1974	1	
1975	1	
1976	1	
1977	0	7th
1978	1	8th
1979	1	
1980	1	
1981	1	
1982	1	
1983	0	9th...
1984	0	...9th
1985	0	
1986	1	10th
1987	1	
1988	0	11th
1989	0	
1990	1	12th
1991	0	13th
1992	0	
1993	0	
1994	1	14th
1995	0	15th
1996	0	
1997	0	
1998	0	
1999	0	
2000	0	
2001	1	16th
2002	0	17th
2003	0	
2004	0	
2005	1	18th
2006	1	
TOTAL	**n_1 = 20** **n_2 = 27**	**r = 18**

The test statistic is normally distributed, with its two parameters (μ and σ) estimated as follows:

$$\mu_r = \frac{2n_1n_2}{n_1 + n_2} + 1 = 23.98$$

$$\sigma_r = \sqrt{\frac{2n_1n_2(2n_1n_2 - n_1 - n_2)}{(n_1 + n_2)^2(n_1 + n_2 - 1)}} = 3.313$$

$$z_r = \frac{r - \mu_r}{\sigma_r} = -1.805$$

Substituting the above test statistic of z = -1.503, we get a (two-tailed) **p-value = 0.071**

In this case, h0 should be accepted on the 0.05 and 0.01 standard significance levels (but it is rejected on the 0.1 level). Therefore, the random nature of the process cannot be excluded.

Condition 3:

- *h0*: slowdown episodes are terminated with the same probability in each year having a discrete uniform distribution.
- *h1:* the probability of slowdown episodes' ending is not equal each year.

A total of N=29 slowdown endings occurred between 1984 and 2010. Number of consecutive years: r = 27.

Expected value is the same for all years (p = 29/27 ~ 1.074). The test statistic is the following:

year	observed events	expected value	χ^2 test statistic	year	observed events	expected value	χ^2 test statistic
1984	2	1.074	0.798	*1998*	0	1.074	1.074
1985	1	1.074	0.005	*1999*	0	1.074	1.074
1986	0	1.074	1.074	*2000*	1	1.074	0.005
1987	0	1.074	1.074	*2001*	2	1.074	0.798
1988	0	1.074	1.074	*2002*	4	1.074	7.971
1989	4	1.074	7.971	*2003*	2	1.074	0.798
1990	2	1.074	0.798	*2004*	1	1.074	0.005
1991	2	1.074	0.798	*2005*	1	1.074	0.005
1992	1	1.074	0.005	*2006*	0	1.074	1.074
1993	1	1.074	0.005	*2007*	0	1.074	1.074
1994	1	1.074	0.005	*2008*	0	1.074	1.074
1995	1	1.074	0.005	*2009*	0	1.074	1.074
1996	1	1.074	0.005	*2010*	1	1.074	0.005
1997	1	1.074	0.005	**TOTAL**	**29**	**29**	**29.655**

Degrees of freedom (DF) is considered to be 26 in the latter case.

Substituting the above test statistic of 29.655 and DF, we get a **p-value = 0.282.**

The statement indicated in h0 is still accepted. We cannot rule out randomness regarding the endings of slowdown periods in different countries.

Condition 4:

- *h0:* years with and without growth slowdown period endings follow each other randomly.
- *h1:* the above-mentioned years do not follow each other incidentally.

Between 1984 and 2010, there were 18 out of 27 years when a slowdown ending was observed, while the other 9 years were eventless.

Once again, we apply the Wald–Wolfowitz runs test for our two-valued data sequence.

$$\mu_r = \frac{2n_1n_2}{n_1+n_2} + 1 = 13$$

$$\sigma_r = \sqrt{\frac{2n_1n_2(2n_1n_2 - n_1 - n_2)}{(n_1+n_2)^2(n_1+n_2-1)}} = 2.253$$

$$z_r = \frac{r-\mu_r}{\sigma_r} = -2.663$$

Substituting the above test statistic of z = -2.219, we get a (two-tailed) **p-value = 0.008**

In this case, h0 should be rejected on all standard significance levels (including the very strict 0.01 level). This makes the random nature of the process extremely unlikely.

year	slowdown occurrence	sequence number
1984	1	1st
1985	1	
1986	0	2nd
1987	0	
1988	0	
1989	1	3rd
1990	1	
1991	1	
1992	1	
1993	1	
1994	1	
1995	1	
1996	1	
1997	1	

year	slowdown occurrence	sequence number
1998	0	4th
1999	0	
2000	1	5th
2001	1	
2002	1	
2003	1	
2004	1	
2005	1	
2006	0	6th
2007	0	
2008	0	
2009	0	
2010	1	7th
TOTAL	**n_1 = 18** **n_2 = 9**	**r = 7**

Condition 5:

- *h0*: there is no connection between country groups and the initial years of growth slowdowns.
- *h1:* there is covariance in case of starting years of slowdowns within the above-defined country groups.

Individual slowdown events were divided into five country groups: Europe (1); Latin America (2); Middle East & Northern Africa (3); Sub-Saharan Africa (4); Southeast Asia (5). A comprehensive variance analysis was done by applying the ANOVA method.

Summary statistics – **starting years of slowdown periods**

Groups	*N of events*	*Sum of values*	*Average date*	*Variance*	*Range (yrs)*
Europe	11	21819	1984	157.1	34
Latin America	14	27737	1981	73.9	32
Middle East & N.A.	3	5948	1983	9.3	6
Sub-Saharan Africa	4	7908	1977	143.3	28
Southeast Asia	2	3944	1972	128.0	16

ANOVA

Source of variation	*Sum-of-squares*	*df*	*Variance*	*F-value*	*P-value*
Between Groups	306.1	4	76.53	0.714	**0.589**
Within Groups	3107.8	29	107.16		
Total	3413.9	33			

As a result, p-value turns out to have a considerably high**, p = 0.589**.

This leads a strong confirmation of the null hypothesis of randomness at all standard significance levels. **Regarding these results, large-scale interdependence in case of these country groups can be excluded.**

Condition 6:

- *h0*: no relation can be observed between the final years of slowdowns as well as the indicated country groups.

- *h1*: there is some covariance of closing years of slowdowns within country groups.

Again, individual slowdown events were divided into five country groups listed above. Then, ANOVA method was applied.

Summary statistics – **ending years of slowdown periods**

Groups	*N of events*	*Sum of values*	*Average date*	*Variance*	*Range (yrs)*
Europe	11	21951	1996	153.1	31
Latin America	14	27980	1999	53.2	30
Middle East & N.A.	3	5981	1994	30.3	10
Sub-Saharan Africa	4	8016	2004	18.0	9
Southeast Asia	2	4016	2008	72.0	13

ANOVA

Source of variation	*Sum-of-squares*	*df*	*Variance*	*F-value*	*P-value*
Between Groups	466.9	4	116.74	1.405	**0.257**
Within Groups	2408.8	29	83.06		
Total	2875.7	33			

As a result, p-value turns out to have a considerably high**, p = 0.257**.

This leads a strong confirmation of the null hypothesis of randomness at all standard significance levels. Regarding these results, there is no enough evidence for large-scale interdependence.

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SUMMARY – results of hypothesis testing for randomness

List of conditions	Null hypothesis (h0)	p-value	Acceptance of h0 α = 0.01	α = 0.05	α = 0.10
1	Slowdown periods occurring with the same probability in each year, i.e. a discrete uniform distribution of episodes can be assumed.	0.003 ***	--- (rejected)		
2	The order of years with at least one observed slowdown and without any of these is incidental.	0.071 *	**yes**	**yes**	--- (rejected)
3	Slowdown episodes are terminated with the same probability in each year having a discrete uniform distribution.	0.282	**yes**	**yes**	**yes**
4	Years with and without growth slowdown period endings follow each other randomly.	0.008 ***	--- (rejected)		
5	There is no connection between country groups and the initial years of growth slowdowns.	0.589	**yes**	**yes**	**yes**
6	No relation can be observed between the final years of slowdowns as well as the indicated country groups.	0.257	**yes**	**yes**	**yes**

Appendix 5. Quarterly commodity prices and performance of the BRICS group

5.1. Changes in primary commodity prices, estimates are based on IMF(2016)

Year		Quarterly global commodity price change (%), w.r.t the previous quarter				
		Aggregate prices	Agricultural Raw Materials	Food & Beverage	Metals & Ores	Fuel & Energy
1997	Q1	-1.25	0.00	4.02	9.53	-7.81
	Q2	-4.51	-3.40	1.65	0.35	-11.00
	Q3	-2.68	-5.27	-6.17	-0.18	0.59
	Q4	-2.19	-4.12	-2.08	-8.22	0.32
1998	Q1	-11.77	-8.08	-2.57	-7.64	-21.58
	Q2	-2.03	3.17	0.34	-3.45	-5.97
	Q3	-5.19	-5.14	-7.63	-3.94	-3.05
	Q4	-5.47	-6.31	-3.01	-4.11	-8.08
1999	Q1	-2.67	3.32	-4.64	-5.05	-2.34
	Q2	9.72	-0.38	-4.24	6.69	29.99
	Q3	10.75	3.58	-2.67	9.86	23.85
	Q4	8.56	5.03	0.99	4.60	15.19
2000	Q1	7.60	-0.38	2.82	7.14	12.39
	Q2	1.10	1.68	2.41	-5.91	1.87
	Q3	4.73	-1.53	-5.50	3.28	11.50
	Q4	-0.03	-0.03	-2.46	-3.68	1.67
2001	Q1	-4.89	1.29	2.06	0.17	-9.83
	Q2	1.21	5.38	1.23	-3.94	1.26
	Q3	-5.24	-12.27	2.92	-8.66	-6.54
	Q4	-14.54	-7.98	-7.53	-3.58	-21.52
2002	Q1	3.84	2.71	1.37	5.66	5.17
	Q2	10.29	7.92	2.58	0.67	17.42
	Q3	5.77	6.56	9.55	-3.27	5.49
	Q4	0.93	-0.53	1.43	2.51	0.74
2003	Q1	8.92	-3.92	0.73	5.82	16.75
	Q2	-8.13	-2.94	-1.65	-0.58	-13.27
	Q3	3.31	2.85	-2.39	5.31	5.88
	Q4	6.03	3.54	9.30	11.57	4.01
2004	Q1	9.21	1.61	8.41	17.67	9.51
	Q2	7.13	-1.00	4.39	0.01	11.60
	Q3	5.23	1.65	-7.60	2.86	12.08
	Q4	2.26	-3.67	-4.46	6.23	4.97
2005	Q1	6.85	1.91	6.52	11.03	6.93
	Q2	6.35	0.23	2.05	0.16	9.80
	Q3	10.81	1.64	-0.39	2.49	16.90
	Q4	-1.84	0.31	-1.06	9.99	-4.05
2006	Q1	7.18	2.93	5.05	17.50	6.48
	Q2	11.39	4.66	7.82	23.12	10.88
	Q3	1.02	1.69	-0.87	4.95	0.61
	Q4	-6.89	0.36	0.66	6.09	-12.48
2007	Q1	-0.12	5.39	3.93	0.68	-2.22
	Q2	10.77	0.22	3.68	14.40	13.41
	Q3	5.14	-6.80	7.13	-8.83	9.82
	Q4	12.20	2.96	7.27	-6.55	18.81

Year		Quarterly global commodity price change (%), w.r.t the previous quarter				
		Aggregate prices	Agricultural Raw Materials	Food & Beverage	Metals & Ores	Fuel & Energy
2008	Q1	11.49	3.18	17.79	10.70	10.75
	Q2	18.25	1.64	6.42	0.94	25.90
	Q3	-2.87	0.40	-4.31	-8.45	-1.94
	Q4	-40.52	-15.36	-25.57	-32.62	-46.59
2009	Q1	-14.62	-14.26	2.44	-9.03	-20.92
	Q2	15.50	-0.80	9.90	12.00	20.29
	Q3	10.53	14.89	-1.82	25.10	12.02
	Q4	8.46	8.13	1.60	10.67	10.26
2010	Q1	4.99	8.36	1.29	14.47	3.83
	Q2	2.52	6.47	1.77	5.04	1.78
	Q3	-1.13	0.44	7.51	-3.76	-3.19
	Q4	12.72	13.95	10.87	16.03	12.42
2011	Q1	14.59	15.34	11.39	10.92	16.40
	Q2	5.86	1.86	-0.03	-2.77	10.04
	Q3	-4.52	-7.06	-3.93	-3.60	-4.62
	Q4	-4.34	-11.84	-9.11	-16.14	0.12
2012	Q1	5.93	0.54	2.11	5.08	7.50
	Q2	-5.71	0.77	0.12	-5.45	-7.67
	Q3	-0.35	-3.49	7.64	-8.06	-0.84
	Q4	-0.78	0.14	-3.43	4.24	-0.90
2013	Q1	2.83	0.83	0.65	7.15	2.88
	Q2	-4.34	2.87	0.86	-11.46	-5.11
	Q3	3.08	-1.43	-4.17	0.29	6.02
	Q4	-1.45	3.46	-2.87	0.91	-1.86
2014	Q1	0.03	1.20	4.67	-4.21	-0.60
	Q2	1.42	0.38	3.26	-3.41	1.75
	Q3	-5.25	-2.94	-7.41	0.52	-5.70
	Q4	-16.79	-2.55	-4.73	-7.32	-22.79
2015	Q1	-19.24	-3.44	-5.72	-10.77	-27.12
	Q2	4.12	-2.80	-3.28	-1.38	9.60
	Q3	-12.19	-9.50	-1.13	-10.70	-17.06
	Q4	-9.56	-2.95	-5.37	-8.50	-12.67
2016	Q1	-11.17	-4.06	1.61	-1.09	-20.90
	Q2	17.16	5.34	8.73	5.08	28.29

5.2. Quarterly GDP growth of the BRICS group and the United States (1997-2020)

Source: Author's calculations based on the National Bureau of Statistics of China, Ministry of Statistics and Programme Implementation (MOSPI) and OECD as a secondary source, Instituto Brasileiro de Geografia e Estatística (IBGE), Federal State Statistics Service (ROSSTAT) and the Statistics South Africa. As a benchmark, U.S. data was provided by the National Bureau of Economic Analysis. 2019 Q4 values are preliminary. Forecast for 2020 is based on the World Economic Outlook, as published in IMF (2019).

Year		Annual GDP growth rates for each quarter (%)					
		China	India	Brazil	Russia	South Africa	USA
1999	Q1	8.8	6.2	0.8	-1.8	1.1	4.8
	Q2	7.8	7.5	-0.4	3.2	1.9	4.6
	Q3	7.6	6.9	-0.6	11.5	2.8	4.6
	Q4	6.7	7.3	2.2	12.1	3.7	4.7
2000	Q1	8.6	7.8	4.4	11.4	3.6	4.2
	Q2	9.0	5.2	4.0	10.2	3.4	5.3
	Q3	8.8	5.3	4.6	10.5	5.2	4.1
	Q4	7.5	3.6	4.6	8.3	4.5	2.9
2001	Q1	9.4	2.1	3.5	4.7	3.7	2.3
	Q2	8.5	4.0	2.3	5.1	3.7	1.1
	Q3	8.0	3.9	0.5	6.0	1.5	0.5
	Q4	7.6	6.3	-0.5	4.5	2.0	0.2
2002	Q1	8.8	6.6	0.5	3.8	3.5	1.3
	Q2	8.7	5.0	2.3	4.4	3.8	1.3
	Q3	9.6	4.4	4.2	4.4	3.6	2.2
	Q4	9.1	2.1	5.2	6.2	3.9	2.1
2003	Q1	11.0	3.6	2.7	7.6	3.2	1.8
	Q2	9.1	5.5	0.8	8.0	3.2	2.0
	Q3	10.0	7.7	0.6	6.2	3.0	3.3
	Q4	10.0	11.1	0.6	7.7	2.4	4.3
2004	Q1	10.5	9.1	3.9	7.2	3.7	4.3
	Q2	11.5	8.3	6.3	8.0	3.7	4.2
	Q3	9.8	7.1	6.6	7.3	5.0	3.4
	Q4	8.8	5.5	6.2	6.2	5.7	3.3
2005	Q1	11.0	9.0	4.2	5.6	5.4	3.9
	Q2	11.0	9.4	4.5	6.0	5.2	3.6
	Q3	10.8	8.9	2.1	6.0	5.5	3.5
	Q4	12.4	9.6	2.2	7.8	5.0	3.1
2006	Q1	12.5	9.9	4.3	7.3	5.1	3.4
	Q2	13.6	9.3	2.3	8.1	4.8	3.1
	Q3	12.2	9.8	4.5	8.2	5.3	2.4
	Q4	12.5	9.4	4.8	8.9	7.1	2.6
2007	Q1	13.8	9.8	5.2	8.1	6.4	1.5
	Q2	14.9	9.7	6.5	8.6	5.5	1.8
	Q3	14.2	9.5	5.9	8.2	5.0	2.2
	Q4	13.9	9.6	6.6	9.2	4.7	2.0
2008	Q1	11.5	8.6	6.2	9.2	3.8	1.1
	Q2	10.9	9.8	6.3	7.9	4.7	1.1
	Q3	9.6	8.5	7.0	6.4	3.2	0.0
	Q4	7.1	5.8	1.0	-1.3	1.1	-2.8

Year		Annual GDP growth rates for each quarter (%)					
		China	India	Brazil	Russia	South Africa	USA
2009	Q1	6.3	3.5	-2.4	-9.2	-1.1	-3.3
	Q2	8.0	5.9	-2.2	-11.2	-2.6	-3.9
	Q3	10.4	9.3	-1.2	-8.6	-1.9	-3.0
	Q4	11.7	7.7	5.3	-2.6	-0.5	0.2
2010	Q1	12.2	11.4	9.2	4.1	2.3	1.7
	Q2	10.7	9.5	8.5	5.0	3.1	2.8
	Q3	9.9	8.6	6.9	3.8	3.3	3.2
	Q4	10.0	9.2	5.7	5.1	3.4	2.6
2011	Q1	10.2	9.9	5.2	3.3	3.5	1.9
	Q2	10.0	7.5	4.7	3.3	3.4	1.7
	Q3	9.4	6.5	3.5	2.5	3.0	0.9
	Q4	8.8	6.0	2.6	3.8	3.2	1.6
2012	Q1	8.1	5.1	1.7	5.4	2.2	2.7
	Q2	7.6	4.9	1.0	4.4	2.7	2.4
	Q3	7.5	7.5	2.5	3.3	2.1	2.5
	Q4	8.1	5.4	2.5	1.9	1.9	1.5
2013	Q1	7.9	4.3	2.7	1.3	2.2	1.6
	Q2	7.6	6.4	4.0	1.7	2.5	1.3
	Q3	7.9	7.3	2.8	1.6	2.1	1.9
	Q4	7.7	6.5	2.5	2.5	3.1	2.6
2014	Q1	7.4	5.3	3.5	0.5	2.1	1.4
	Q2	7.5	8.0	-0.4	1.3	1.7	2.7
	Q3	7.1	8.7	-0.6	0.9	1.9	3.1
	Q4	7.2	5.9	-0.2	0.3	1.8	2.9
2015	Q1	7.0	7.1	-1.6	-1.5	2.5	4.0
	Q2	7.0	7.7	-2.7	-3.3	1.1	3.3
	Q3	6.9	8.2	-4.3	-2.6	0.8	2.4
	Q4	6.8	7.3	-5.5	-2.7	0.4	1.9
2016	Q1	6.7	9.3	-5.2	-0.5	-0.4	1.6
	Q2	6.7	9.2	-3.2	-0.4	0.5	1.3
	Q3	6.7	8.7	-2.5	-0.2	0.7	1.6
	Q4	6.8	7.4	-2.2	0.4	0.9	2.0
2017	Q1	6.8	6.1	0.4	0.6	1.1	2.1
	Q2	6.8	6.0	0.9	2.5	1.6	2.2
	Q3	6.7	6.8	1.6	2.2	1.6	2.4
	Q4	6.7	7.7	2.4	0.9	1.4	2.8
2018	Q1	6.8	7.7	1.5	1.9	0.7	2.9
	Q2	6.7	8.0	1.1	2.2	0.1	3.2
	Q3	6.5	6.2	1.5	2.2	1.3	3.1
	Q4	6.4	5.6	1.2	2.7	1.1	2.5
2019	Q1	6.4	5.8	0.6	0.5	0.0	2.7
	Q2	6.2	5.6	1.1	0.9	0.9	2.3
	Q3	6.0	5.1	1.2	1.7	0.1	2.1
	Q4	6.0	4.7	1.7	2.0	0.5	2.3
2020*	Q1	5.7	5.1	1.5	1.6	0.8	1.9
	Q2	5.7	5.6	1.7	1.7	0.6	2.0
	Q3	5.8	6.2	1.9	1.8	1.1	1.7
	Q4	5.8	6.0	2.1	2.0	1.3	1.7

* Values for Q1-Q4 of 2020 are forecasts, based on the World Economic Outlook – IMF (2019).

5.3. Testing the relationship between economic growth of the BRICS and commodity prices

5.3.1		GDP growth rate regressed on aggregate commodity prices (with q0-q4 lags)				
		q0	q1	q2	q3	q4
Brazil	slope	0.118	0.200	0.211	0.149	0.049
	R^2	0.120	0.332	**0.361**	0.177	0.019
	p-value	0.003	<0.00001	<0.00001	0.00029	0.251
	sig.	***	***	***	***	n.s
India	slope	0.094	0.085	0.034	-0.001	-0.038
	R^2	**0.137**	0.107	0.017	<0.001	0.020
	p-value	0.0016	0.0057	0.289	0.969	0.238
	sig.	***	***	n.s	n.s	n.s
China	slope	0.094	0.100	0.071	0.039	0.014
	R^2	0.181	**0.197**	0.099	0.029	0.004
	p-value	0.0002	0.00012	0.0078	0.155	0.607
	sig.	***	***	***	n.s	n.s
Russia	slope	0.153	0.285	0.286	0.224	0.092
	R^2	0.091	**0.306**	0.300	0.182	0.031
	p-value	0.011	<0.00001	<0.00001	0.00023	0.146
	sig.	**	***	***	***	n.s
South Africa	slope	0.045	0.082	0.102	0.087	0.056
	R^2	0.053	0.172	**0.263**	0.185	0.076
	p-value	0.056	0.00036	<0.00001	0.0002	0.021
	sig.	*	***	***	***	**

5.3.2		GDP growth rate regressed on sectoral commodity prices (with q1-q2 lags)							
		Fuel & Energy		Food & Beverage		Agricultural Raw Materials		Metals & Ores	
		Crude Oil, Natural Gas, Coal		*Cereal, Vegetable & Fruit crops, Coffee, Tea, Cocoa*		*Timber, Cotton, Wool, Rubber, Hides*		*Copper, Aluminium, Iron Ore, Other metals and Uranium*	
		q1	q2	q1	q2	q1	q2	q1	q2
Brazil	slope	0.126	0.136	0.229	0.246	0.315	0.296	0.169	0.214
	R^2	0.259	0.285	0.183	0.218	0.307	0.271	0.236	**0.382**
	p-value	<0.00001	<0.00001	0.0002	0.00005	<0.00001	<0.00001	0.00002	<0.00001
	sig.	***	***	***	***	***	***	***	***
India	slope	0.043	0.009	0.137	0.054	0.155	0.088	0.130	0.121
	R^2	0.055	0.003	0.117	0.019	0.133	0.043	**0.250**	0.218
	p-value	0.051	0.676	0.0037	0.258	0.0019	0.086	0.00001	0.00005
	sig.	*	n.s	***	n.s	***	*	***	***
China	slope	0.054	0.036	0.154	0.111	0.129	0.098	0.120	0.113
	R^2	0.114	0.048	0.199	0.107	0.123	0.071	**0.287**	0.256
	p-value	0.0042	0.068	0.00011	0.0058	0.003	0.025	<0.00001	<0.00001
	sig.	***	*	***	***	***	**	***	***
Russia	slope	0.211	0.203	0.251	0.286	0.288	0.340	0.203	0.255
	R^2	**0.326**	0.288	0.099	0.132	0.116	0.162	0.154	0.245
	p-value	<0.00001	<0.00001	0.0079	0.0019	0.0039	0.0006	0.0008	0.00001
	sig.	***	***	***	***	***	***	***	***
South Africa	slope	0.054	0.068	0.085	0.103	0.102	0.124	0.074	0.106
	R^2	0.146	0.220	0.077	0.117	0.099	0.146	0.139	**0.286**
	p-value	0.0011	0.00004	0.020	0.0037	0.008	0.0011	0.0014	<0.00001
	sig.	***	***	**	***	***	***	***	***

Appendix 6. Estimating the long-term growth trendlines for the BRIC economies

	GDP per capita in constant 2010$ - World Bank (2019)				
	Brazil	India	China	South Africa	Russia
1960	3 425	304	192	4 543	---
1961	3 668	309	141	4 598	---
1962	3 747	312	132	4 756	---
1963	3 671	324	142	4 974	---
1964	3 690	341	164	5 231	---
1965	3 697	325	187	5 409	---
1966	3 746	318	202	5 507	---
1967	3 825	336	185	5 757	---
1968	4 150	340	173	5 847	---
1969	4 438	355	197	5 969	---
1970	4 706	365	228	6 121	---
1971	5 109	363	238	6 216	---
1972	5 587	353	241	6 151	---
1973	6 216	356	254	6 261	---
1974	6 618	352	254	6 470	---
1975	6 798	375	272	6 411	---
1976	7 288	373	263	6 392	---
1977	7 444	391	279	6 231	---
1978	7 504	404	308	6 265	---
1979	7 825	374	327	6 345	---
1980	8 339	390	348	6 599	---
1981	7 788	404	361	6 777	---
1982	7 654	408	388	6 579	---
1983	7 226	428	424	6 293	---
1984	7 439	434	481	6 451	---
1985	7 860	447	539	6 222	---
1986	8 315	458	578	6 085	---
1987	8 445	466	635	6 081	---
1988	8 277	500	696	6 205	---
1989	8 391	519	714	6 217	9 867
1990	7 986	536	731	6 058	9 534
1991	7 967	531	788	5 853	9 033
1992	7 797	549	889	5 587	7 717
1993	8 027	564	1 001	5 517	7 056
1994	8 319	590	1 118	5 563	6 177
1995	8 548	622	1 228	5 616	5 919
1996	8 598	657	1 335	5 750	5 715
1997	8 750	671	1 444	5 804	5 804
1998	8 644	699	1 542	5 745	5 506
1999	8 555	747	1 646	5 794	5 876
2000	8 778	762	1 772	5 946	6 491
2001	8 777	785	1 906	6 053	6 851
2002	8 924	802	2 066	6 200	7 209
2003	8 911	850	2 259	6 306	7 770
2004	9 309	903	2 473	6 511	8 361
2005	9 495	971	2 738	6 768	8 928
2006	9 762	1 045	3 069	7 054	9 687
2007	10 245	1 130	3 488	7 333	10 532
2008	10 658	1 157	3 805	7 464	11 090
2009	10 540	1 237	4 142	7 247	10 220
2010	11 224	1 346	4 561	7 362	10 675
2011	11 559	1 416	4 972	7 493	11 122
2012	11 671	1 475	5 336	7 546	11 493
2013	11 912	1 550	5 722	7 617	11 616
2014	11 866	1 647	6 108	7 627	11 494
2015	11 322	1 758	6 497	7 604	11 145
2016	10 826	1 861	6 894	7 503	11 099
1960-1989 annual exponent:					
	0.036	0.016	0.054	0.009	---
1990-2016 annual exponent:					
	0.017	0.050	0.087	0.014	0.025
1960-2016 annual exponent:					
	0.020	0.031	0.073	0.005	0.021

Appendix 7. Basic data for the multiple linear regression model applied on CEE11

Year		Independent variables				Dependent variable
		Current account to GDP (%)	FDI inflow % of GDP	% change in trade to GDP	Change in EF index	GDP real growth rate (%)
1996	BG	0.16	1.36	1.27	0.15	1.6
	CZ	-6.18	1.92	-1.24	0.20	4.3
	HR	-4.61	1.97	2.24	0.24	5.9
	HU	-3.72	7.08	2.46	0.17	0.0
	PL	-2.04	2.78	0.90	0.25	6.1
	RO	-6.91	0.71	2.21	0.34	3.9
	SI	0.26	0.77	0.08	0.25	3.5
	SK	-7.51	1.09	1.99	0.29	6.8
	EE	-8.39	1.99	-4.55	0.27	5.3
	LA	-4.69	7.19	8.02	0.31	2.4
	LT	-8.62	1.82	4.13	0.29	5.1
1997	BG	3.81	4.52	-8.49	0.15	-1.1
	CZ	-5.88	2.04	1.78	0.20	-0.7
	HR	-10.49	1.23	3.78	0.24	6.6
	HU	-4.12	7.84	5.79	0.17	3.3
	PL	-3.61	3.05	2.50	0.25	6.5
	RO	-5.87	3.42	1.18	0.34	-4.8
	SI	0.24	1.46	1.35	0.25	5.1
	SK	-7.09	0.27	2.16	0.29	6.1
	EE	-11.09	2.40	9.79	0.27	11.8
	LA	-5.29	8.61	-0.72	0.31	9.0
	LT	-9.70	3.16	3.42	0.29	8.3
1998	BG	-0.42	3.67	-4.12	0.15	3.5
	CZ	-1.97	5.39	-0.24	0.20	-0.3
	HR	-5.38	3.06	-4.89	0.24	1.9
	HU	-7.12	6.47	6.24	0.17	4.2
	PL	-3.96	3.46	3.09	0.25	4.6
	RO	-6.95	4.86	-4.63	0.34	-2.1
	SI	-0.53	1.00	0.22	0.25	3.3
	SK	-7.13	1.12	-7.81	0.29	4.0
	EE	-8.52	9.95	2.37	0.27	4.1
	LA	-9.05	4.02	0.99	0.31	6.5
	LT	-11.55	8.26	-5.18	0.29	7.5
1999	BG	-4.83	5.94	5.90	0.15	-5.6
	CZ	-2.26	9.61	0.81	0.20	1.4
	HR	-6.42	5.94	0.60	0.24	-0.9
	HU	-7.91	6.07	3.25	0.17	3.2
	PL	-7.36	4.18	-1.32	0.25	4.6
	RO	-3.58	2.83	3.22	0.34	-0.4
	SI	-3.07	0.26	-2.07	0.25	5.3
	SK	-3.80	2.45	-2.28	0.29	-0.2
	EE	-5.14	3.52	-6.78	0.27	-0.9
	LA	-8.69	4.38	-5.29	0.31	2.6
	LT	-10.88	3.64	-7.42	0.29	-1.1
2000	BG	-5.35	7.59	-6.32	0.13	5.0
	CZ	-4.38	8.04	6.03	0.18	4.3
	HR	-2.31	4.65	4.54	0.24	3.8
	HU	-8.46	4.61	11.67	0.16	4.2
	PL	-6.02	5.43	3.38	0.27	4.6
	RO	-3.62	2.80	5.39	0.36	2.4
	SI	-2.69	0.35	5.53	0.27	4.2
	SK	-2.38	6.98	5.67	0.31	1.2
	EE	-5.26	5.70	-9.18	0.29	10.6
	LA	-3.66	4.00	0.94	0.32	5.4
	LT	-5.85	3.25	4.23	0.29	3.8

Year		Independent variables				Dependent variable
		Current account to GDP (%)	FDI inflow % of GDP	% change in trade to GDP	Change in EF index	GDP real growth rate (%)
2001	BG	-5.69	5.68	0.51	0.56	4.2
	CZ	-4.86	8.13	0.51	0.08	3.1
	HR	-2.87	3.72	2.39	-0.28	3.4
	HU	-5.84	6.65	-3.14	0.28	3.8
	PL	-3.12	3.05	-1.36	-0.08	1.2
	RO	-5.47	2.88	1.39	0.07	5.6
	SI	0.15	1.78	0.43	0.23	2.9
	SK	-5.68	4.91	6.46	-0.08	3.3
	EE	-5.20	5.48	0.07	0.07	6.3
	LA	-6.00	1.07	2.37	-0.01	6.5
	LT	-4.68	3.58	5.14	-0.05	6.5
2002	BG	-1.95	5.36	-1.94	0.50	6.0
	CZ	-5.22	10.14	-3.88	0.13	1.6
	HR	-6.93	1.45	1.19	0.17	5.2
	HU	-6.40	3.92	-6.39	-0.28	4.5
	PL	-2.79	1.96	1.42	0.14	2.0
	RO	-3.30	2.44	1.28	0.47	5.2
	SI	1.03	6.40	-0.61	-0.06	3.8
	SK	-5.57	11.69	-0.71	0.02	4.5
	EE	-10.64	2.08	-1.28	0.09	6.1
	LA	-5.47	2.17	-1.60	0.24	7.1
	LT	-5.05	4.87	3.40	0.29	6.8
2003	BG	-4.85	9.82	1.91	0.24	5.1
	CZ	-5.83	1.83	1.78	0.04	3.6
	HR	-6.15	4.88	1.00	0.11	5.6
	HU	-8.03	0.43	-0.71	0.18	3.8
	PL	-2.52	1.97	4.26	-0.12	3.6
	RO	-5.53	3.01	0.23	0.35	5.5
	SI	-0.73	-0.59	-0.61	0.11	2.8
	SK	-0.60	1.15	2.04	0.12	5.4
	EE	-11.34	7.76	-0.41	0.15	7.4
	LA	-7.22	1.96	0.74	-0.14	8.4
	LT	-6.80	0.76	-1.12	0.01	10.5
2004	BG	-6.40	11.03	7.01	-0.04	6.6
	CZ	-3.75	3.31	9.36	-0.05	4.9
	HR	-4.33	2.21	-0.15	0.06	4.1
	HU	-8.53	2.85	3.31	0.03	5.0
	PL	-5.43	4.60	0.89	0.32	5.1
	RO	-8.37	8.36	1.85	0.07	8.4
	SI	-2.59	0.82	4.63	0.02	4.4
	SK	-7.61	7.09	6.94	0.64	5.3
	EE	-11.35	5.79	3.82	0.07	6.3
	LA	-11.68	3.52	4.47	0.08	8.3
	LT	-7.63	2.20	1.80	0.24	6.6
2005	BG	-11.22	13.43	3.29	0.14	7.2
	CZ	-2.07	8.55	4.11	0.04	6.4
	HR	-5.46	3.45	-0.10	0.13	4.2
	HU	-7.00	4.80	2.22	-0.02	4.4
	PL	-2.61	2.26	-0.47	0.08	3.5
	RO	-8.57	6.19	-2.14	0.81	4.2
	SI	-1.87	-0.24	4.21	0.03	4.0
	SK	-8.17	4.64	4.26	0.04	6.8
	EE	-9.90	16.09	3.00	-0.02	9.4
	LA	-11.74	3.45	3.56	0.01	10.7
	LT	-7.24	1.33	6.59	-0.04	7.7

Year		Independent variables				Dependent variable
		Current account to GDP (%)	FDI inflow % of GDP	% change in trade to GDP	Change in EF index	GDP real growth rate (%)
2006	BG	-17.09	22.10	5.71	0.13	6.8
	CZ	-2.57	2.60	2.78	0.05	6.9
	HR	-6.43	6.03	0.67	0.07	4.8
	HU	-7.07	0.39	10.92	-0.07	3.9
	PL	-4.03	3.09	3.76	0.05	6.2
	RO	-10.45	8.50	0.06	-0.21	8.1
	SI	-1.76	-0.54	4.82	0.07	5.7
	SK	-7.72	7.36	8.68	-0.04	8.5
	EE	-15.24	3.98	0.10	0.01	10.3
	LA	-21.07	6.96	-0.11	0.14	11.9
	LT	-10.61	5.18	3.29	0.09	7.4
2007	BG	-25.55	28.82	5.66	0.02	7.7
	CZ	-4.74	4.75	1.41	0.14	5.5
	HR	-7.24	7.03	-0.40	0.07	5.2
	HU	-7.15	1.79	3.12	0.02	0.4
	PL	-6.39	4.06	1.44	-0.08	7.0
	RO	-13.95	5.50	-1.73	0.54	6.9
	SI	-4.19	-0.69	3.53	-0.03	6.9
	SK	-5.37	3.96	0.82	0.01	10.8
	EE	-15.75	4.40	-0.93	-0.12	7.7
	LA	-20.80	6.29	-2.35	-0.07	9.9
	LT	-15.14	3.46	-3.83	0.08	11.1
2008	BG	-21.72	16.79	0.83	0.07	5.6
	CZ	-1.87	0.96	-3.05	0.04	2.7
	HR	-8.82	5.49	-0.14	0.11	2.1
	HU	-6.95	0.89	1.50	0.05	0.9
	PL	-6.71	1.86	0.05	0.14	4.2
	RO	-12.00	6.41	-2.74	-0.25	8.5
	SI	-5.30	-0.45	-1.17	0.06	3.3
	SK	-6.25	4.11	-2.37	0.00	5.6
	EE	-9.16	2.56	1.13	-0.08	-5.4
	LA	-12.59	3.06	-1.96	-0.07	-3.6
	LT	-13.72	3.42	6.00	-0.10	2.6
2010	BG	-1.91	2.48	5.04	0.01	0.1
	CZ	-3.55	2.38	7.76	0.05	2.3
	HR	-1.50	2.13	1.57	-0.10	-1.7
	HU	0.27	2.95	6.84	0.04	0.7
	PL	-5.40	1.85	3.44	-0.04	3.6
	RO	-5.05	1.77	4.80	-0.15	-0.8
	SI	-0.11	0.25	7.26	-0.20	1.2
	SK	-4.70	0.98	8.71	0.05	5.0
	EE	1.76	6.93	13.58	0.12	2.3
	LA	2.08	1.50	10.98	-0.05	-3.8
	LT	-0.32	2.18	13.50	-0.08	1.6
2011	BG	0.47	2.81	7.28	0.07	1.9
	CZ	-2.20	1.14	4.77	0.04	2.0
	HR	-0.60	2.50	2.69	0.22	-0.3
	HU	0.81	1.33	4.52	0.07	1.7
	PL	-5.17	2.58	2.49	0.12	5.0
	RO	-5.00	1.25	4.26	0.04	1.1
	SI	0.19	1.73	5.89	0.01	0.6
	SK	-5.00	2.78	8.44	0.01	2.8
	EE	1.33	10.74	11.77	-0.08	7.6
	LA	-3.16	4.90	6.01	0.11	6.2
	LT	-3.87	3.21	9.99	0.03	6.0

Year		Independent variables				Dependent variable
		Current account to GDP (%)	FDI inflow % of GDP	% change in trade to GDP	Change in EF index	GDP real growth rate (%)
2012	BG	-0.98	2.56	3.51	0.00	0.0
	CZ	-1.52	2.98	4.38	0.16	-0.8
	HR	-0.37	2.75	0.70	0.03	-2.2
	HU	1.72	2.17	-0.69	-0.05	-1.6
	PL	-3.72	1.21	1.12	0.08	1.6
	RO	-4.78	1.90	0.32	0.13	0.6
	SI	2.58	1.30	1.70	0.01	-2.7
	SK	0.95	3.22	4.09	-0.10	1.7
	EE	-1.93	2.20	1.54	-0.06	4.3
	LA	-3.64	3.27	3.24	0.22	4.0
	LT	-1.19	0.70	4.92	0.02	3.8
2013	BG	1.22	2.94	2.47	-0.07	0.9
	CZ	-0.53	-0.18	0.22	-0.08	-0.5
	HR	0.98	1.90	1.46	-0.06	-1.1
	HU	3.78	0.11	-0.91	-0.03	2.1
	PL	-1.29	0.80	0.68	-0.10	1.4
	RO	-1.08	2.04	0.19	0.13	3.5
	SI	4.81	0.15	1.22	-0.12	-1.1
	SK	1.80	-0.28	2.11	-0.03	1.5
	EE	-0.34	1.25	-1.71	-0.02	1.4
	LA	-2.72	1.64	-1.70	0.09	2.9
	LT	1.56	0.61	2.14	0.17	3.5
2014	BG	0.18	2.09	0.63	0.07	1.3
	CZ	0.21	1.93	5.37	0.12	2.7
	HR	0.78	3.05	2.46	0.14	-0.4
	HU	1.99	2.55	2.69	0.06	4.0
	PL	-2.10	2.38	1.52	0.21	3.3
	RO	-0.69	1.80	1.28	0.14	3.1
	SI	6.23	1.63	0.29	0.29	3.1
	SK	1.23	-0.71	-1.68	0.09	2.6
	EE	0.86	3.23	-2.20	0.14	2.8
	LA	-1.99	1.57	-1.40	0.16	2.1
	LT	3.50	0.04	-3.40	0.22	3.5
2015	BG	0.39	3.56	-1.45	0.02	3.6
	CZ	0.91	-0.59	0.53	0.00	4.5
	HR	5.11	0.36	2.75	0.01	1.6
	HU	3.24	1.57	1.09	-0.06	3.1
	PL	-0.61	2.06	1.13	-0.09	3.9
	RO	-1.18	1.85	-0.06	-0.02	3.7
	SI	5.18	3.20	0.71	-0.01	2.3
	SK	0.22	-0.01	2.26	-0.13	3.8
	EE	2.20	-2.47	-4.09	0.15	1.4
	LA	-0.78	2.35	-0.99	-0.06	2.7
	LT	-2.36	1.91	-3.75	0.01	1.8
2009 (excl.)	BG	-8.22	6.83	-15.57	0.12	-4.2
	CZ	-2.37	0.95	-5.41	-0.04	-4.8
	HR	-5.04	2.90	-6.12	0.06	-7.4
	HU	-0.76	0.63	-6.72	0.07	-6.6
	PL	-4.06	1.84	-2.76	0.16	2.8
	RO	-4.92	2.76	-2.98	0.13	-7.1
	SI	-0.55	-1.36	-10.76	0.01	-7.8
	SK	-3.39	-1.09	-13.11	-0.18	-5.4
	EE	2.67	2.56	-10.44	-0.07	-14.7
	LA	7.90	0.61	-2.59	-0.14	-14.3
	LT	2.27	-0.63	-10.15	0.11	-14.8

Data source: calculations based on The World Bank (2019), Eurostat (2020) and Fraser Institute (2017).

Appendix 8. Detailed results of the CEE11 multiple linear regression

NOTE: the multiple regression model explained below was originally published in Soreg (2018b). In current Thesis, an updated version of this original research was included.

To determine the extent of economic dependence of the CEE11 countries, the Author has developed the following approach: the model aims to explain 20 years of panel data, namely the annual economic growth of 11 Central and Eastern European (CEE) economies between 1996 and 2015. Out of 11 times 20 (=220) data points, the 2009 crisis year was excluded as an outlier. Only the years with relative economic prosperity were examined.

Independent variables:
- Current account to GDP ratio, expressed in %
- Net FDI inflow per year, as a % of GDP
- Annual change in trade to GDP ratio, in percentage points
- Annual change in Economic Freedom (EF) index (unitless)

Dependent variable:
- GDP growth rate, % per year

The constant (β_0) parameter in this model was assumed to be zero.

Our regression model could be expressed as the following: $\hat{y} = \hat{\beta}_1 x_1 + \hat{\beta}_2 x_2 + \hat{\beta}_3 x_3 + \hat{\beta}_4 x_4 + \varepsilon$

RESULTS

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.7883
R^2	0.6214
Adjusted R^2	0.6110
Standard error	3.0903
Observations	209

ANOVA

	df	*Sum-of-squares*	*Variance*	*F-value*	*p-value*
Regression	4	3213.78	803.45	84.13	4.42×10^{-42}
Residual	205	1957.76	9.550		
Total	209	5171.54			

	coefficient	*standard error*	*t-stat*	*p-value*	*95% conf.interval*	
Intercept	0	---	---	---	---	---
X Variable 1	-0.408	0.049	-8.242	2×10^{-14}	-0.505	-0.310
X Variable 2	0.139	0.066	2.094	0.03752	0.008	0.269
X Variable 3	0.154	0.054	2.864	0.00461	0.048	0.259
X Variable 4	3.524	1.251	2.816	0.00533	1.057	5.991

ACKNOWLEDGEMENTS

The results of current Thesis have been developed in the course of an almost 6-year period of an intense research path full of challenges, dilemmas as well as personal and professional development phases. Although there is no such thing as a totally completed analysis or perfectly concluded manuscript, after years spent with analysing economic growth and its often inscrutable changes, I am finally experiencing some imperfect but still, definite completeness regarding the research topic that I had chosen before applying for a PhD program.

At the end of this long and exciting scientific journey, the only thing left is to express my gratitude to those who greatly contributed to what I am currently holding in my hands. First of all, I would like to thank my scientific supervisor, Dr. Annamária Artner for her never-ending encouragement, dedication to improve my research and also the myriad of advices and critical remarks aimed at bringing out the best of what I'd thought as already concluded. I am strongly convinced that without her efforts, the dissertation as well as my previous publications would never be that accurate and multidimensional. Her personality, immense knowledge and professionalism has been inspiring me for years to proceed, maintain scientific curiosity, not making compromises regarding my persuasions and not allowing myself excuses in hard work.

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28th February 2020

Jogi nyilatkozat

NYILATKOZAT

Alulírott Sőreg Krisztina jelen nyilatkozat aláírásával kijelentem, hogy a
Tartós növekedési lassulások és jövedelmi csapda epizódok a felzárkózó gazdaságok fejlődési útjában című

PhD értekezésem

önálló munkám, az értekezés készítése során betartottam a szerzői jogról szóló 1999. évi LXXVI. törvény rendelkezéseit, valamint a Széchenyi István Gazdálkodás- és Szervezéstudományok Doktori Iskola által előírt, a doktori értekezés készítésére vonatkozó szabályokat, különösen a hivatkozások és idézések tekintetében.[52]

Kijelentem továbbá, hogy az értekezés készítése során az önálló kutatómunka kitétel tekintetében a programvezetőt illetve a témavezetőt nem tévesztettem meg.

Jelen nyilatkozat aláírásával tudomásul veszem, hogy amennyiben bizonyítható, hogy az értekezést nem magam készítettem, vagy az értekezéssel kapcsolatban szerzői jogsértés ténye merül fel, a Nyugat-magyarországi Egyetem megtagadja az értekezés befogadását.

Az értekezés befogadásának megtagadása nem érinti a szerzői jogsértés miatti egyéb (polgári jogi, szabálysértési jogi, büntetőjogi) jogkövetkezményeket.

Sopron, 2020 .....

……..

doktorjelölt

[52] **1999. ÉVI LXXVI. TV. 34. §** (1) A MŰ RÉSZLETÉT – AZ ÁTVEVŐ MŰ JELLEGE ÉS CÉLJA ÁLTAL INDOKOLT TERJEDELEMBEN ÉS AZ EREDETIHEZ HÍVEN – A FORRÁS, VALAMINT AZ OTT MEGJELÖLT SZERZŐ MEGNEVEZÉSÉVEL BÁRKI IDÉZHETI.
36. § (1) nyilvánosan tartott előadások és más hasonló művek részletei, valamint politikai beszédek tájékoztatás céljára – a cél által indokolt terjedelemben – szabadon felhasználhatók. Ilyen felhasználás esetén a forrást – a szerző nevével együtt – fel kell tüntetni, hacsak ez lehetetlennek nem bizonyul.