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Theory of the development of regional integration and the practice of measuring their convergence effects

Theses of doctoral (PhD) dissertation

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Gödöllő
2021

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TABLE OF CONTENTS

1. BACKGROUND TO THE WORK, OBJECTIVES	1.
2. 2. MATERIAL AND METHODS	2.
3. RESULTS AND THEIR DISCUSSION	3.
3.1. Summary of the results of testing hypothesis H_0	3.
3.2. Summary of the results of testing hypothesis H_1	5.
3.3. Summary of the results of testing hypothesis H_2	5.
3.4. Summary of the results of testing hypothesis H_3	11.
3.5. Summary of the results of primary research	12.
4. CONCLUSION AND RECOMMENDATIONS	13.
5. NEW AND NOVEL SCIENTIFIC RESULTS	17.
5.1. New and novel scientific results based on secondary research (E ₁₋₉)	17.
5.2. New and novel scientific results that can be linked to the calculation of alternative indicators used in primary calculations (E ₁₀₋₁₁)	21.
5.3. New scientific results based on primary research (E ₁₂₋₁₅)	22.
6. THE AUTHOR'S PUBLICATIONS RELATED TO THE SUBJECT OF THE DISSERTATION	23.
6.1. Publications in journals	23.
6.1.1. Published in foreign language	23.
6.1.2. Published in Hungarian language	23.
6.2. Papers in conference publications	24.
6.2.1. Published in foreign language	24.
6.2.2. Published in Hungarian language	24.
6.3. Chapter in scientific book	25.
6.4. Other communication (abstract)	25.
LITERATURE CITED IN THIS PUBLICATION	26.

1. BACKGROUND TO THE WORK, OBJECTIVES

Cleveland [1965 In: Simai, 1994:271.] argues that regionalism is halfway between the point where nation-states are no longer viable and the point where the world is not yet ready to become unified. In contrast, Hitiris [1995:22] and Palánkai [2004:65] take the view that the nation has proved to be a community to which the individual is extremely strongly attached. Many countries therefore value their independence and national identity more than the chance to be more successful within the framework of a free trade agreement.

On this concept of regional integration from these two opposing sides, I for my part believe that whatever direction the world economy takes, we must strive to base our positions not on subjective feelings but on experience from reliable sources and on knowledge supported by the best available measurements. It is however a question of fact – and this is what Inotai [1989 In: Palánkai, 2011:14.] has called a 'Copernican turn' – that the development of the world economy has entered a qualitatively new phase since the second half of the 20th century, based on integration processes that can be interpreted in both global and regional dimensions.

The subject of my dissertation is the complex, multifaceted issue of regional integration and its convergence effects on economic development levels, often divisive for both the scientific and the public opinion, which I am expected to investigate objectively and without bias, using secondary ($C_{0/1}$) and primary scientific methods ($C_{0/2}$), in which I primarily seek to find an answer to the question concerning the impact of free trade agreements on the leveling-out or convergence of the economic development levels of the member states (*Figure 1*).

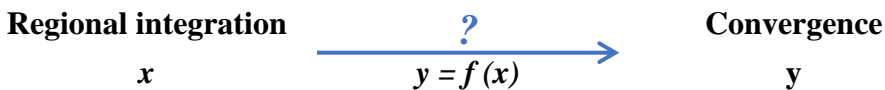


Figure 1:
Objectives of the dissertation (C_0)

Source: own objectives

2. MATERIAL AND METHODS

In the secondary literature research ($C_{0/1}$), I typically used general scientific methods such as compilation, synthesis, isolation, analysis and knowledge management.

The primary research part of my dissertation ($C_{0/2}$) was essentially aimed at testing the following hypotheses:

- H₀** Differences in economic development between the member states participating in regional integration are leveling out over the long term, in other words their economic development indicators are converging.
- H₁** However, in addition to the long-term trends (convergence) assumed in hypothesis H_0 , there may also be medium- and short-term swings (divergences).
- H₂** The higher the level of integration of regional cooperation, the more measurable the convergence of the economic development differences of its member states.
- H₃** The sole analysis of GDP indicators is suitable only to a limited extent for measuring the convergence of economic development.

During the hypothesis testing, I used a toolbox of general mathematical-statistical methods, mainly bivariate regression analysis, correlation analysis; multivariate principal component analysis; and auxiliary operations related to these procedures, such as variance analysis, standardization, aggregation, interpolation, and function transfer.

However, I could not refrain from introducing alternative indicators of my own to determine the level of regional integration (E_{10}) when testing hypothesis H_2 ¹, and to measure economic development more accurately than GDP (E_{11}) in hypothesis H_3 ², since there is no uniformly accepted theory and practice in economics regarding the components of the indices measuring these conditions, and there are many problems to be solved when examining them.

¹ **KGJM index:** Indicators of KGJM index are agricultural sector as a share of GDP, GNI, GINI index, and HDI index.

² **NKLS scale:** It provides an estimate of the level of regional integration in cases where data of sufficient number and reliability are not available or where it would be impractical to collect or calculate them for whatever reason.

3. RESULTS AND THEIR DISCUSSION

For the sake of a better overview of the topic, in this chapter, I would like to present the results of the hypothesis testing carried out in the primary research, in which I studied the following six best known/most successful free trade agreements:

1. Economic Community / European Communities / European Union (hereinafter: EGK/EK/EU)
2. North American Free Trade Agreement (hereinafter: NAFTA)
3. Southern Common Market (hereinafter: MERCOSUR),
4. Association of Southeast Asian Nations (hereinafter: ASEAN),
5. Gulf Cooperation Council (hereinafter: GCC),
6. Southern African Customs Union (hereinafter: SACU).

The theses of the literature (secondary) research are presented in *chapters 5.1 and 5.2* (E₁₋₁₁).

3.1. Summary of the results of testing hypothesis H₀

If we accept the data and methodology used in the analysis, hypothesis H₀ is proven to be "**TRUE**", since for the free trade agreements included in the analysis, it can be shown that, according to the predictions of liberal integration theories, the differences in economic development between the member states participating in regional integration are leveling out, i.e. their GDP indicators, which express their economic development, are converging.

The strongest, almost functional, relationship between regional integration and the convergence of GDP is found for ASEAN and the EGK/EK/EU member states. The coefficient of determination expressing the strength of the relationship between regional integration and the convergence of GDP (R^2 , which can vary between 0 and 1 depending on to what ratio the independent variable determined by the dependent variable) is 0.9801 for ASEAN and 0.9675 for the EGK/EK/EU. A decreasingly strong to medium strong correlation can be measured among countries of MERCOSUR ($R^2 = 0.8493$), SACU ($R^2 = 0.7252$), GCC ($R^2 = 0.7208$) and finally NAFTA ($R^2 = 0.6881$) (*Table 1, column 3*).

Table 1:

The relationship between regional integration and GDP dispersion in the EU and the world's major free trade agreements in the long, medium and short term

Free trade agreements	Period under review	The link between regional integration and long-term GDP convergence	Medium and short-term GDP divergence*
EU	1958-2019.	strong, almost functional ($R^2 = 0,9675$)	1959, 1960, 1964, 1974 , 1976, 1979 , 1982 , 1983 , 1984 , 1985 , 1986, 1993, 1994, 2000, 2009 , 2010 , 2013, 2015
ASEAN	1992-2019.	strong, almost functional ($R^2 = 0,9801$)	1993, 1998, 2010 , 2011
MERCOSUR	1991-2019.	strong ($R^2 = 0,8493$)	1992, 1993, 1994 , 1996, 1997 , 1998 , 2003, 2004, 2005, 2006, 2007, 2010 , 2011, 2015
SACU	1969-2019.	medium strong ($R^2 = 0,7252$)	1971, 1975 , 1979 , 1981 , 1994, 1995, 1996, 1997, 1999, 2002, 2006, 2007, 2008 , 2010 , 2011, 2013, 2014, 2016, 2017, 2018, 2019
GCC	1981-2019.	medium strong ($R^2 = 0,7208$)	1989., 1994, 1997, 1999, 2002, 2004, 2006, 2010 , 2011, 2017, 2018, 2019
NAFTA	1991-2019.	medium strong ($R^2 = 0,6881$)	1994 , 1996, 1997 , 2000, 2006, 2007, 2008 , 2010 , 2011, 2012, 2016

**Main triggers of divergence of years set in bold typeface:* global financial crisis (2008-2009), oil price explosions (1973-1974, 1979-1980, EK, SACU), Asian financial crisis (1997-1998, ASEAN, MERCOSUR, NAFTA), Mexican financial crisis (1994, NAFTA, MERCOSUR)

Source: own calculation based on data from Maddison [2003], World Bank [2020]

3.2. Summary of the results of testing hypothesis H₁

With the methodological criticisms maintained, hypothesis H₁ also proved to be **"TRUE"**, since in the case of the free trade agreements included in the analysis it can be shown that in the medium and short term, in accordance with the theorems of regulatory integration, hypothesis H₀ does not necessarily hold, and we can encounter swings, divergences.

GDP fluctuations in the opposite direction to the long-term trend can be observed in all the regional integrations studied, and their timing/periods can be more or less successfully matched with the recessionary trends described in the literature review. Of these crises, the global financial crisis of 2008-2009 is perhaps worth highlighting, since the divergence effect can be clearly detected in the data series of all the communities studied, with a 1 year difference in line with methodological peculiarities, but also worth mentioning are the two oil price explosions of 1973-1974 and 1979-1980, which affected the then already existing EK and SACUT, or the Asian financial crisis of 1997/1998, which affected the Asian-American communities (ASEAN, MERCOSUR, NAFTA). The traces of the 1994 financial crisis in Mexico can also be clearly seen in the short-term divergence index of NAFTA and MERCOSUR, which includes countries in the scope of the recession, notably Argentina. (*Table 1, column 4*).

3.3. Summary of the results of testing hypothesis H₂

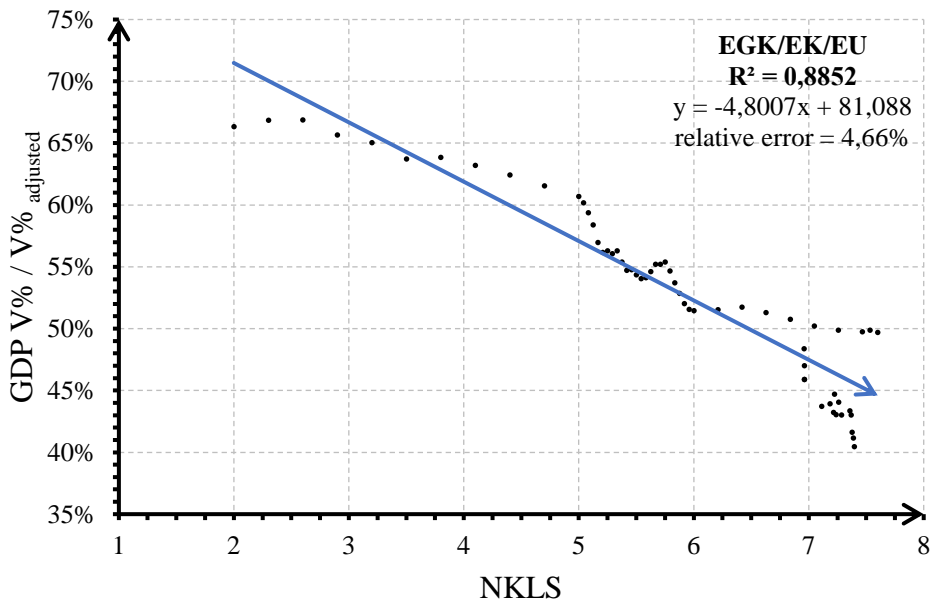
All in all, assuming the data included in the analysis and methodology used, hypothesis H₂ is also proven to be **"TRUE"**, as it can be shown that the higher the level of integration of the free trade agreements included in the analysis, the more the convergence of the economic development differences between the member states can be measured.

I came to the same conclusion using the following three different methods for hypothesis testing:

1. During the integration development of a given free trade agreement, bivariate testing of the aforementioned NKLS scale (E₁₀) and the relative dispersion of GDP indicators (further referred to as V%) for the cases of the EGK/EK/EU, ASEAN, and GCC (*Figure 2-4*).
2. In the comparison of the six selected regional integrations with each other, based on the ranking of the coefficients of determination describing the relationship between regional integration in years and convergence (*Figure 5*).

3. And also on the basis of the ranking of the coefficients of determination describing the relationship between regional integration and convergence between the EGK/EK/EU, ASEAN and the GCC, as estimated by the NKLS (*Figure 6*).

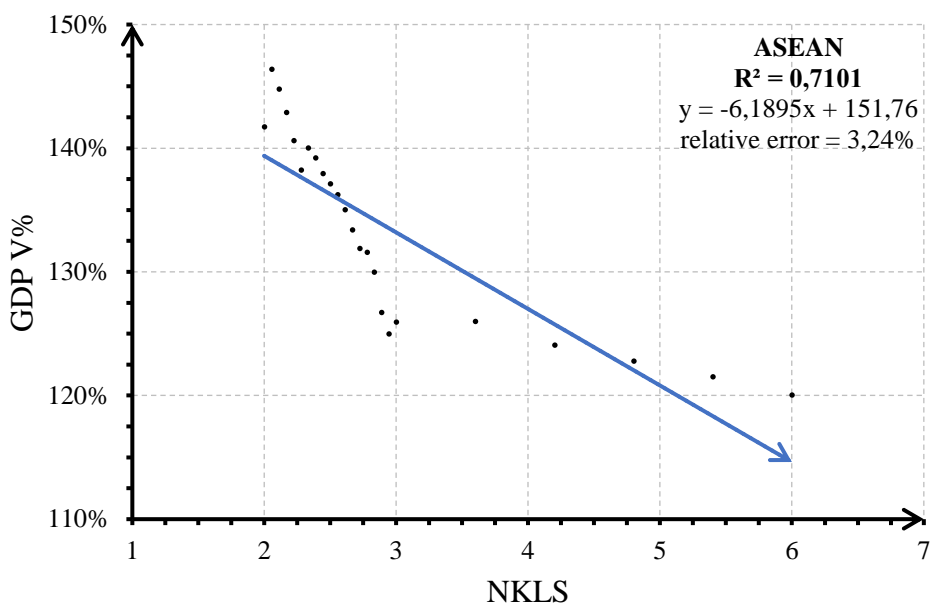
Although the application of all three methods is subject to minor or major limitations (e.g. not all integrations included in the study can be analyzed with methods 1 and 3), the consistency of their results supports the thesis statement.



NKLS 0 = discrimination, *NKLS 10* = universal free trade

Figure 2:
Evolution of convergence in GDP of the member states of the EGK/EK/EK
in the context of the development of regional integration
from 1958 to 2019

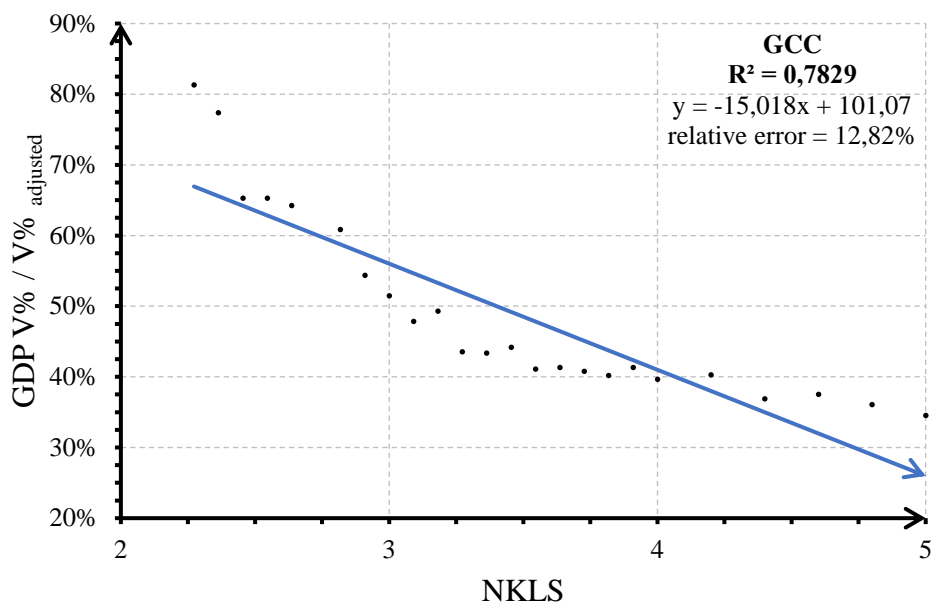
Source: own calculation based on data from Maddison [2003], World Bank [2020]



NKLS 0 = discrimination, *NKLS 10* = universal free trade

Figure 3:
 Evolution of convergence in GDP of the member states of the ASEAN
 in the context of the development of regional integration
 from 1992 to 2015

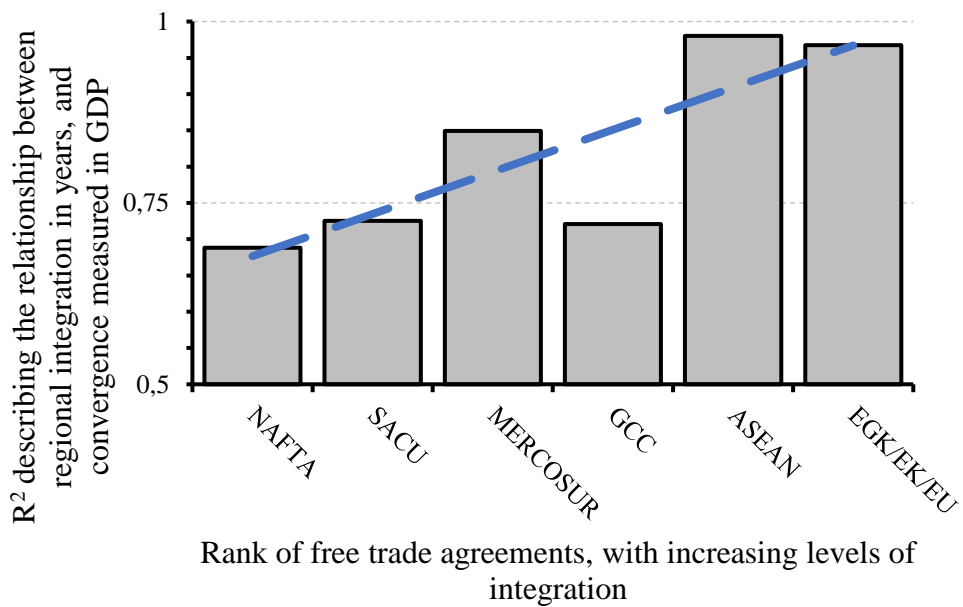
Source: own calculation based on data from Maddison [2003], World Bank [2020]



NKLS 0 = diszkrimináció, *NKLS 10* = univerzális szabadkereskedelem

Figure 4:
Evolution of convergence in GDP of the member states of the GCC
in the context of the development of regional integration
from 1984 to 2008

Source: own calculation based on data from Maddison [2003], World Bank [2020]



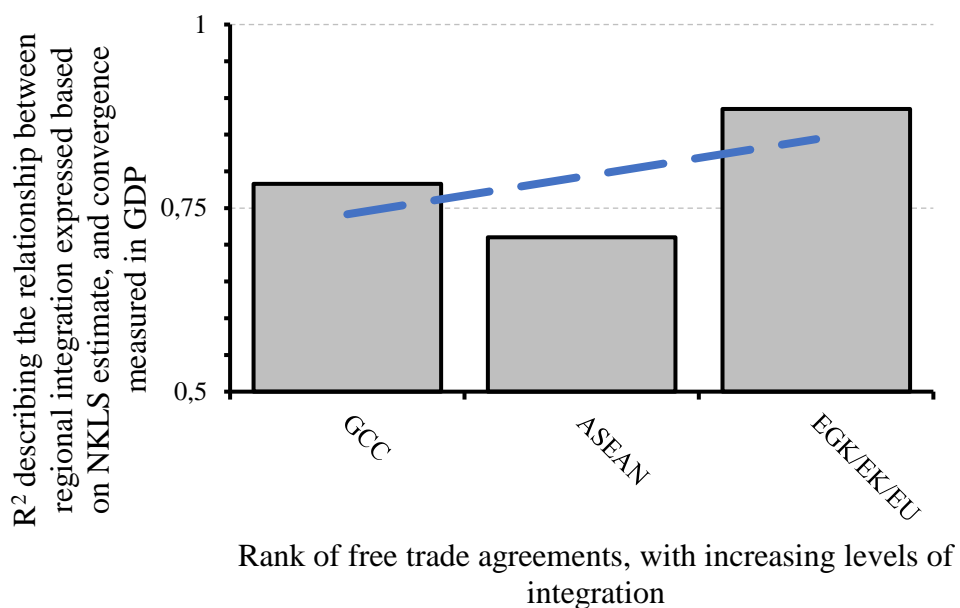
The estimate of NKLS (currently):

NAFTA = 3⁺ (free trade area⁺), SACU = 4⁺ (customs union⁺),
 MERCOSUR = 5⁻ (common market⁻), GCC = 5⁺ (common market⁺),
 ASEAN = 6⁻ (single market⁻), EGK/EK/EU = 8⁻ (economic and monetary union⁻)

Figure 5:

The stages in the development of regional integration,
 and the convergence of economic development of the member states
 in the light of the world's major free trade agreements

Source: own calculation based on data from Maddison [2003], World Bank [2020]



The estimate of NKLS (currently):

GCC = 5⁺ (common market⁺), ASEAN = 6⁻ (single market⁻),

EGK/EK/EU = 8⁻ (economic and monetary union⁻)

Figure 6:

Development stages of regional integration expressed in terms of NKLS estimates, and the convergence of economic development of the member states in the light of GCC, ASEAN, and EGK/EK/EU

Source: own calculation based on data from Maddison [2003], World Bank [2020]

3.4. Summary of the results of testing hypothesis H₃

Hypothesis H₃ – that GDP indicators alone are of limited use for measuring the convergence of economic development – was tested using the so-called complex economic welfare indicator (hereafter: KGJM), which *will be described in Section 5.2.E₁₁*.

If we accept the applicability of this index, the results for the EK/EU, NAFTA, MERCOSUR, ASEAN, and the GCC suggest that GDP, although not a perfect indicator, is as well suited as the KGJM index for measuring convergence, as the differences between the R² describing the relationships between GDP variation coefficient and the KGJM index variation coefficient of regional integration are not significant.

The situation is different, however, in the case of SACU, where the coefficients of determination calculated on the basis of GDP and KGJM differ significantly not only in terms of their values but also in their direction. While the GDP index shows convergence, the KGJM index shows divergence between SACU member states. The statement of hypothesis H₃ can therefore be classified as "**FALSE/TRUE**" in my opinion, subject to methodological criticisms (*Table 2*).

Table 2:

Comparison of convergence/divergence of economic development levels in terms of KGJM* and GDP in the light of the major regional integration member states of the world and Hypothesis H₃

Regional integration	Period under review	R ² KGJM*	R ² GDP	R ² KGJM - GDP	H ₃
EK/EU	1990-2018.	0,9416 convergence	0,9603 convergence	-0,0187	FALSE
NAFTA	1991-2016.	0,6455 convergence	0,6762 convergence	-0,0307	FALSE
MERCOSUR	1993-2018.	0,8368 convergence	0,9147 convergence	-0,0779	FALSE
ASEAN	1995-2018.	0,9718 convergence	0,9843 convergence	-0,0125	FALSE
GCC	2001-2018.	0,9317 convergence	0,8722 convergence	+0,0595	FALSE
SACU	1990-2015.	0,9198 divergence	0,4579 convergence	-1,3777	TRUE

**Components of KGJM:*

Agricultural sector as a share of GDP, GNI, GINI index, HDI index

Source: own calculation based on data from Maddison [2003], World Bank [2020], UN Development Program

3.5. Summary of the results of primary research

Thus, if we accept the data included in the analysis and the methodology used in the study, we can conclude that the differences in economic development between the member states participating in regional integration are leveling out and converging in the long run (H₀); however, in the medium and short term, we find the opposite, swings and divergence (H₁).

The higher the level of integration of a free trade agreement, the better the measure of long-term convergence (H₂), for which the GDP indicator is not a perfect measure, but – as we will see later (chapter 4) – its distorting effect on economic development is not significant (H₃) under average economic performance and without excessive dependence on external capital.

4. CONCLUSION AND RECOMMENDATIONS

According to hypothesis H_0 , the differences in economic development between the member states participating in regional integration will level out in the long run, i.e. their economic development indicators will converge (E_{12}). On the basis of the primary calculations, if we accept the data included in the study and the methodology used, we can reasonably assume that hypothesis H_0 holds **TRUE** as predicted by liberal integration theories.

J1 In pursuing the topic further, I also consider it worthwhile to consider measuring long-term differences in economic development between regional integrations, which could help to monitor whether the development of the world economy is moving from regionalism towards global integration, or whether, on the contrary, it is likely to lead to the isolation of free trade agreements or the strengthening of nation states.

However, under hypothesis H_1 , in addition to the long-term trends (convergence) assumed in hypothesis H_0 , there may also be medium- and short-term divergences. (E_{13}). Based on the primary calculations, if we accept the data and methodology used in the study, we can reasonably assume that hypothesis H_1 holds **TRUE** according to the theorems of regulatory integration theory. Economic inequalities are likely to level out only in the long run, presumably as a result of market automatisms and economic policy choices.

J2 In further exploration of the topic, I think it is worthwhile to consider a precise exploration of the causal relationship between medium and short term divergence anomalies and global economic/regional recessions, which is important to improve the capacity to adapt to crises, as its limited effectiveness is one of the main criticisms of the EU/GMU.

J3 I also consider it worthwhile to examine to what extent the divergence caused by economic inequalities and imperfections in the medium and short term is compensated in the long term by market automatisms and to what extent by economic policy decisions. In the short term, the importance of this is also to be found in the motivation to increase the efficiency of crisis management, and in the long term in the examination and avoidance of the medium-term development trap.

According to hypothesis H_2 , the higher the level of integration of regional cooperation, the more the convergence of the economic development

*differences of its member states can be measured (E₁₄). On the basis of the primary calculations, if we accept the data included in the study and the methodology used, we can reasonably assume that hypothesis H₂ holds **TRUE**. I would also point out that calculations using several methodologies, including NKLS estimation, support this conclusion.*

- J4** In further elaboration of this topic, I consider it worthwhile to consider revising the NKLS scale over time, with a view to introducing/refining the levels of integration that may be newly created or already existing.
- J5** I also suggest the use of quantitative or more accurate qualitative measures instead of the NKLS scale, as this method can be recommended as an "emergency" solution based on estimation.

The conditional statement of *hypothesis H₃* states that *the ability to measure the convergence of economic development through a stand-alone analysis of GDP indicators is limited (E₁₄)*. On the basis of the primary calculations, if we accept the data included in the analysis and the methodology used, we can reasonably assume that hypothesis H₃ is partly **FALSE** and partly **TRUE**. At first sight, the results may seem rather contradictory, since if the long-run convergence analysis is not carried out with GDP but with the KGJM index instead – despite the common perception that GDP distorts economic development – there is a surprising similarity between the EK/EU, NAFTA, MERCOSUR, ASEAN, and GCC when testing hypotheses H₀ and H₃. However, the results for SACU, which has a relatively significantly lower average GDP and member states that are significantly dependent on South Africa's investment (BLNS countries), differed not only in magnitude but also in direction, which suggests to me that the likely result is, that, although it is not a perfect indicator of convergence, the GDP index does not have a significant distorting effect on economic development under average economic performance, and is as applicable as the SACU index, but in extreme cases, for both low and high performing countries, it can have a disinformative effect. It is also important to note that this trend can be measured among the five other free trade agreements included in the study (Figure 7).

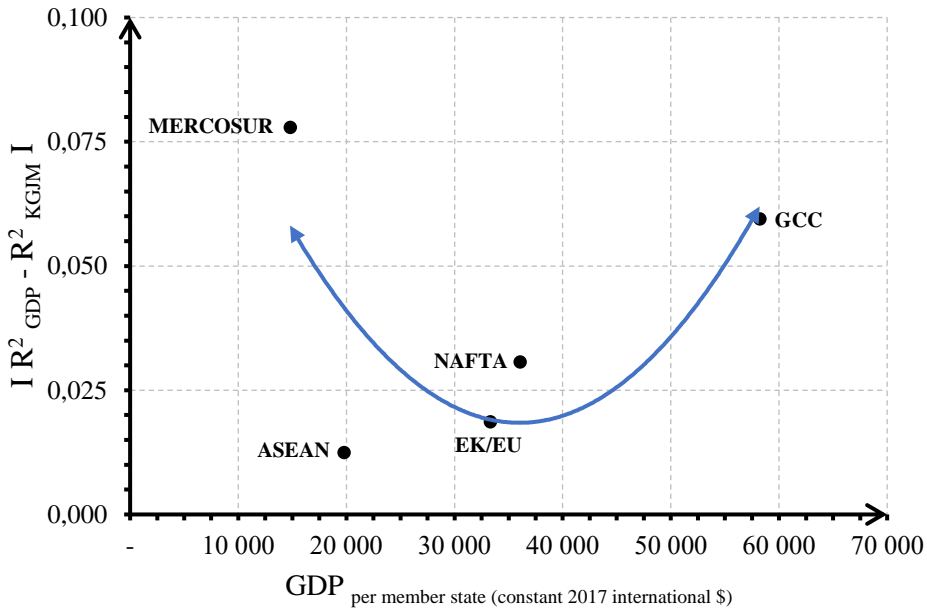


Figure 7:

Difference between the convergence/divergence of economic development levels in terms of KGJM* and GDP in the light of the EK/EU (1990-2018), NAFTA (1991-2016), MERCOSUR (1993-2018), ASEAN (1995-2018), and the GCC (2001-2018)

Source: own calculation based on data from World Bank [2020]

- J6** In further work on the topic, I consider it worthwhile to further investigate the bivariate relationship between GDP and the KGJM index to determine the exact nature of the hypothesized bias between the measures, as the present calculations suggest that under average economic performance and not extreme dependence on external capital, the disinformative effect of GDP on economic development is not significant, but in extreme cases it may become significant.
- J7** I believe that further work on this topic would be constructive in selecting indicators for the KGJM index, especially by including additional potential measures, their principal component analysis, and by using professional reasoning, using the results of the bivariate analysis of GDP/NKLS data – to revise and weight them in order to measure real economic development (ultimately national wealth) and convergence as accurately as possible and to effectively test and avoid the medium-term development trap.

As far as the practical applications of the theses developed in this dissertation are concerned, overall, with their help and by further developing the topic, I can say that I envisage:

- A1** we can get closer to understanding, measuring and forecasting the global and regional integration profile of the world (economy) and its changes
- A2** we could make free trade agreements and the capacity of national economies to adapt to crises more effective; and
- A3** it may also be worth considering to help investigate and avoid the middle-income trap.

5. NEW AND NOVEL SCIENTIFIC RESULTS

5.1. New and novel scientific results based on secondary research

E1 By the definition of globalization, I mean the global integration of economic and other phenomena and processes on a geographical basis, with a voluntarily created regional structure, made possible by technological, especially information technology, development, and the ideologies associated with them.

[new scientific result]

E2 If the above concept is accepted, regional integration can be derived as a voluntary structure of global integration with economic and other dimensions covering a defined geographical area, between nation states, on a voluntary basis, with economic and other dimensions, made possible by technological, especially information technology developments.

[new scientific result]

E3 However, the concept of regional integration can also be derived, among other things, by synthesizing general findings of systemic isolation and integration theories such as:

- The regional integration of systems, partly economic and partly other (e.g. social, political, cultural), i.e. covering a defined geographical unit, primarily involving nation states.
- It is an economic, social, political and cultural phenomenon with historical foundations, which is based on democratic principles and is achieved through a process of organic unification in several stages, in which the member states voluntarily transfer part of their national sovereignty to the community level in order to achieve their objectives.

[new scientific result]

E4 Based on the integration theories processed in the course of secondary research and their further elaboration, it can be concluded that the different types of regional integration differ mainly in the liberalization of the so-called four freedoms of goods, services, capital and labor. At the lower levels of regional integration, the primary economic policy objective is to achieve the flow of freedoms between member states. At the lowest level (preferential zone), participants achieve the liberalization of trade in goods and then other freedoms – services, capital and labor –

across borders (common market) by reducing and then eliminating tariffs between themselves (free trade area) and finally by applying uniform tariffs to third countries (customs union). Cooperation can then enter a new phase of development by further stimulating the cross-border flow of freedoms already achieved and by exploiting the resulting benefits to the greatest possible extent (single market, economic, monetary and political union).

In my view, the common market plays a watershed role, as it provides the opportunity for the free movement of persons between countries, enabling individuals to become "citizens" of the given regional cooperation, and through it the liberalization of economic and other non-economic (social, political cultural, etc.) entities as a "fifth freedom".

[scientific result with novel content]

- E5** Technological progress in the context of the so-called fifth freedom and, more broadly, of global integration, which is also a key element of globalization, could lead to a reduction in social and cultural differences, which could increase the potential range of neighboring countries and the optimal area of the free trade agreement.

[scientific result with novel content]

- E6** The most integrated free trade agreement in the world is the EU, and within it the member states of the economic and monetary union (hereinafter: GMU), constituting the Eurozone. In addition to the liberalization of the four freedoms, the goal of the GMU is to harmonize national economic policies and achieve exchange rate stability through the introduction of a single currency, the euro. According to the 'impossible trinity' theory, in order to answer the question of why a nation state would give up its autonomous monetary policy and submit to the central bank regulations of another state, decision-makers have to weigh up three priorities:

1. ensuring free flow of capital,
2. the possibility of fixing exchange rates,
3. maintaining an autonomous monetary policy (by ensuring a floating exchange rate in line with the supply and demand conditions in the currency market).

However, according to the Mudell-Feleming theorem, two of these three goals can only be achieved at the expense of the third. In contrast, Benczes [2011:188] argues that the EU common market ensures the free movement of capital between its member states; while the GMU ensures

the irrevocable fixing of exchange rates and the subsequent transition to a single currency. With the latter, the GMU countries have given up their autonomous monetary policies, while at the same time establishing a central bank as a supranational institution – the European Central Bank – which will guard the internal exchange rate stability of the euro area, with the euro itself floating against the other major currencies. In my view, however, this only seemingly resolves the so-called Mudell-Feleming model, since while the first two objectives – free movement of capital and a fixed exchange rate – were considered *at the level of the member states*, the third – autonomous monetary policy (floating exchange rate) – was considered at the *community level*. If the "impossible trinity" is viewed only from the perspective of the GMU, as a hypothetical country, it is easy to see that floating and fixing exchange rates cannot be achieved simultaneously.

[new scientific result]

- E7 It is also important to note that the GMU only partly corresponds to our conceptual attributes of economic and monetary union. The possible directions of development of the EU/GMU and reform efforts towards further integration of finance and other areas (e.g. "real" GMU, fiscal union, banking union) may lead to new, as yet undefined, steps of integration.

[new scientific result]

- E8 The processes of regional integration are interpreted in terms of integration theories, which seek to understand the laws behind the phenomena that lead to integration. What these concepts have in common, however, is their eclecticism and the fact that none of them is able to provide a complete definition of integration. I therefore propose to interpret them in the context of model-dependent realism and value judgments brought up in natural sciences.

Model-dependent realism is based on the idea that our brain interprets the signals from our sensory organs and uses them to create a model of the world. However, we can model the same physical situation and other situations in the everyday world – including, in my view, regional integration – in different ways, each of which may contain different basic elements and be based on different concepts. If two such theories predict the same events, then we cannot regard one as more real than the other and can choose between them at will. There is therefore no concept of reality independent of worldview or theory. Hawking [2011:13-14,54,57-58,70.] In economics, theorizing differs from theorizing in natural and

other sciences in that the concepts that are constructed always include a normative element that someone or someones considers to be good, necessary, right. This element is known as *value judgment*, Magas [2007:12.] which is manifested through the ratification of the provisions of international treaties concluded on the basis of social and political authority in regional cooperation, into national legal systems, and through direct acts of the organizations created as a result.

[scientific result with novel content]

- E9 Although integration theories, which are to be interpreted within the framework of the concepts of model-dependent realism and value judgment, cannot be separated from each other by sharp boundaries, they can, in my opinion, be divided into two parts, depending on whether they establish certain regularities by observing regional cooperation from the outside (e.g. liberal or regulatory theories) or whether they apply the theorems known from international economics with minor or major modifications as a research methodology (e.g. customs union theories). While the criticism of the former is that we have only a few examples of mature integration and therefore cannot draw scientifically relevant conclusions, since this would require starting from a large number of variations; Puchala [1984:198], the criticism of the latter is that integration analysis is only part of other disciplines (e.g. international economics) and therefore not justified to be treated as a separate discipline (as integration economics or European studies). Palánkai [2004:25.] For my part, however, I do not consider it necessary to question or even deny the legitimacy of integration theories, despite the fact that the conclusions of observational theories take some 'cases' into account. Indeed, their multifaceted vision – interpreted in the context of model-dependent realism and value judgments – can help us to better understand and judge the nature of integration. The scientific soundness of their conclusions is, in my view, debatable, and it might therefore be more appropriate to classify these theories under the heading of philosophy rather than the economics of integration or European studies. The situation is different, however, with views based on accepted theorems and findings of other disciplines, such as the doctrine of comparative advantage or the Heckscher-Ohlin model, which are subject to criticisms of varying degrees. The scientific soundness of these concepts can, in my opinion, be deduced from the validity of the basic theorems of the disciplines used, but it is another question (of detail) whether this so-called applied science is regarded as a separate discipline or as part of another discipline.

[new scientific result]

5.2. New and novel scientific results that can be linked to the calculation of alternative indicators used in primary calculations

According to Palánkai [2011:93,99.], when measuring global and regional integration we often face the lack and/or unreliability of statistical data, – which I have encountered in my primary calculations – and even small changes in the factors (indicators) considered can lead to radical changes in the final result. Among others, Csath [2001:189-195, 2021a:www., 2021b:19,41,89-90] points out that if we want to know the real development of the economy, we cannot rely on the examination of GDP, a single indicator that distorts the true values. To overcome these problems, I have developed and used an estimation-based method (NKLS) and a complex indicator of economic welfare (KGJM) to test my hypotheses.

E10 The *NKLS scale* provides an estimate of the level of regional integration in cases where data of sufficient number and reliability are not available or where it would be impractical to collect or calculate them for whatever reason. The estimation procedure is based on a so-called International Trade Liberalization Scale (NKLS) with levels from 0 to 10,³ taking into account all available data. This methodology has been used to test hypothesis H₂.

[new scientific result]

E11 I selected the indicators of the *KGJM index* from the literature sources I have processed, Botos [2013:77.], Csath [2001:189-195.], Kovács [2010:466.], Palánkai [2011:91-100.], and from the available indicators recommended by myself, using principal component analysis – supplemented by other professional considerations – namely:

1. *Agricultural sector as a share of GDP* (expressed as a %);
2. *GNI* (per capita, at purchasing power parity and at fixed 2017 international dollar exchange rate);
3. *GINI index* (expressed as a %);
4. *HDI index* (given in coefficient form);

and then aggregated them by fixing their minimum/maximum values to form the final indicator used to prove hypothesis H₃.

[scientific result with novel content]

³ **NKLS 0** = discrimination, **1** = most favoured nation, **2** = preferential system / preferential zone, **3** = free trade area, **4** = customs union, **5** = common market, **6** = single market, **7** = economic union, **8** = monetary union, **9** = political union, **10** = universal free trade

5.3. New scientific results based on primary research

If we accept the data and methodology used in the study, the hypothesis testing carried out in the course of the primary research, the six most well-known/successful free trade agreements examined, – namely: EGK/EK/EU, NAFTA, MERCOSUR, ASEAN, GCC, SACU, – lead to the following theses:

E12 Liberal integration theories predict that the differences in economic development between the member states participating in regional integration will level out in the long run, i.e. their economic development indicators will converge (H_0).

[new scientific result]

E13 In the medium and short run, however, according to the theorems of regulatory integration, hypothesis H_0 does not necessarily hold true, and we may encounter swings, divergence (H_1).

[new scientific result]

E14 The higher the level of integration of regional cooperation, the more measurable the convergence of the economic development differences of its member states (H_2). This assumption is supported by calculations based on various methodologies, such as the NKLS estimation described in E10.

[new scientific result]

E15 Stand-alone analysis of GDP indicators is of limited use for measuring the convergence of economic development (H_3). Instead, complex economic welfare or national wealth indicators can be recommended (J_7).

[new scientific result]

Finally, I think it is important to stress that my dissertation approaches the topic from only one – and far from the only one – point of view, and its findings are valid only if we accept the credibility of the cited literature, the reliability of the data used, the scientific methodology applied and the conclusions drawn from it. In addition, I believe that it is worth considering the views of others, even if they are contrary to those set out herein.

6. THE AUTHOR'S PUBLICATIONS RELATED TO THE SUBJECT OF THE DISSERTATION

6.1. Publications in journals

6.1.1. Published in foreign language

SZABÓ Barna: The concept of globalisation In: *Európai Tükör: Az Integrációs Stratégiai Munkacsoport kéthavonta megjelenő folyóirata* 24 (1) pp. 19-42., 24 p. (2021)
[publications directly related to the subject of the dissertation]

BARCZA Attila, CSAPÓ János, DÁVID Lóránt Dénes, FODOR Gyula, REMENYIK Bulcsú, **SZABÓ Barna:** Overtourism in Budapest: Analysis of spatial process and suggested solutions In: *Regional Statistics* 11 (3) pp. 1-19. , 19 p. (2021)
[publications indirectly related to the subject of the dissertation]

SZABÓ Barna: Grouping of misconduct types in case of VAT fraud In: *Magyar Rendészet* 19 (1) pp. 101-116., 17 p. (2019)
[publications indirectly related to the subject of the dissertation]

6.1.2. Published in Hungarian language

SZABÓ Barna: Liberális- VS. regulációs integrációelméletek, azaz konvergencia, vagy divergencia In: *Multidiszciplináris kihívások, sokszínű válaszok (MKSV)* **Accepted, pending publication.**
[publications directly related to the subject of the dissertation]

SZABÓ Barna: A karusszel típusú csalások elleni küzdelem fegyvernemei és azok célpontjai In: *Magyar Rendészet* 20 (1) pp. 179-189., 11 p. (2020)
[publications indirectly related to the subject of the dissertation]

SZABÓ Barna: Nemzetközi bűnügyi együttműködés a regionális integráció fejlődése során In: *Magyar Rendészet* 18 (3) pp. 163-177., 15 p. (2019)
[publications directly related to the subject of the dissertation]

SZABÓ Barna: A XXI. század világgazdasági eseményeinek hatása az Európai Unió integrációs folyamataira és a mezőgazdasági munkamegosztásra In: *Gazdálkodás* 62 (3) pp. 228-244., 17 p. (2018)
[publications directly related to the subject of the dissertation]

SZABÓ Barna: Regionális együttműködések fejlettséget kiegyenlítő hatásai In: *Gazdálkodás* 52 (1) pp. 46-54., 9 p. (2008)
[publications directly related to the subject of the dissertation]

6.2. Papers in conference publications

6.2.1. Published in foreign language

KISS József, **SZABÓ Barna:** The effect of the regionalism on the national economical development of the regional associating countries In: *XLVIII. Georgikon Napok Paper: ArtNo*, 5 p. (2006)
[publications directly related to the subject of the dissertation]

6.2.2. Published in Hungarian language

SZABÓ Barna: A regionális integráció formai kereteinek elmélete és gyakorlata In: *XIII. Ifjúsági Tudományos Fórum Pannon Egyetem Georgikon Paper: ArtNo*, 5 p. (2007)
[publications directly related to the subject of the dissertation]

SZABÓ Barna: A globalizáció hatása az Európai Unió tagállamok nemzetgazdasági fejlettségkülönbségeire (1958-2000) In: *XII. Ifjúsági Tudományos Fórum Pannon Egyetem Georgikon Paper: ArtNo*, 4 p. (2006)
[publications directly related to the subject of the dissertation]

SZABÓ Barna: A globalizáció hatása az Észak-Amerikai Szabadkereskedelmi Egyezmény (NAFTA) nemzetgazdaságainak fejlettség különbségeire (1994-2000) In: *Klausz, Melinda (szerk.): Tudás és versenyképesség pannon szemmel: Pannon Gazdaságtudományi Konferencia tanulmánykötet I. Veszprém, Magyarország: Pannon Egyetemi Kiadó* pp. 297-301., 5 p. (2006)
[publications directly related to the subject of the dissertation]

SZABÓ Barna: A globalizáció hatása a fogyasztói árak alakulására (az Európai Unió kibővülésének tükrében) In: *Perényi, Á (szerk.): A globalizáció hatása a hazai és nemzetközi társadalmi folyamatokra: A BME Műszaki Menedzsment Gazdálkodás- és Szervezéstudományi Doktori Iskola I. országos konferenciájának előadásai* Budapest, Magyarország: BME GTK pp. 117-124., 8 p. (2004)
[publications indirectly related to the subject of the dissertation]

SZABÓ Barna, TÉGLA Zsolt: A hidrokultúrák uborkatermesztés gazdasági jellemzői In: *VIII. Nemzetközi Agrárökonómiai Tudományos Napok* Gyöngyös, Magyarország pp. 137-137., 1 p. (2002)
[publications indirectly related to the subject of the dissertation]

6.3. Chapter in scientific book

SZABÓ Barna: A technikai-, és az információtechnológia fejlődés globális integrációban betöltött szerepe, és az állami szerepvállalással való közvetett kapcsolata In: *Csaba, Zágon; Szabó, Andrea (szerk.): Közös kihívások – egykor és most* Budapest, Magyarország: Magyar Rendészettudományi Társaság Vám- és Pénzügyőri Tagozat pp. 229-242., 14 p. (2020)
[publications directly related to the subject of the dissertation]

SZABÓ Barna: A regionális integrációk fejlődési lépcsőfokai az Európai Unió tükrében In: *Zsámbokiné Ficskovszky, Ágnes (szerk.): Biztonság, szolgáltatás, fejlesztés, avagy új irányok a bevételi hatóságok működésében* Budapest, Magyarország: Magyar Rendészettudományi Társaság Vám- és Pénzügyőri Tagozat pp. 242-257., 16 p. (2019)
[publications directly related to the subject of the dissertation]

6.4. Other communication (abstract)

SZABÓ Barna: A globalizáció hatása a makrogazdasági mutatók alakulására In: *Gazdálkodás* 49 (14) számú külön kiadás pp. 13-13., 1 p. (2005)
[publications directly related to the subject of the dissertation]

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