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Middle-Income Trap or Development Trap and its Budgetary Effects

Summary: Recently there have been debates about whether the Hungarian economy could end up in a so-called middle-income trap in the near future. Some argue this risk is on the rise. Others focus more on whether this threat is even real and how it could be avoided if indeed it is. What do we mean by middle-income trap? This isn't clarified in either Hungarian or international literature. There are doubts about whether it is even possible to measure the success of an economy and of society with the income growth indicators researchers usually use to demonstrate the trap situation, or if we should instead take a closer look at the evolution of sustainable growth indicators. The topic is made particularly important by the fact that for budgetary balance, it is important that income sources are created in a consistent and reliable way, which, besides the yearly growth rate, also depends on balanced development. This article analyzes what the literature means by middle-income trap and argues that there is no way to reliably prove a potential halt of development based on the indicators used to measure it. Therefore, it introduces new indicators also measuring growth and examines the situation of multiple countries and their development paths based on international data, using these indicators. Finally, it concludes that the Hungarian economy's growth rate could primarily be accelerated by modernizing the knowledge structure of the economy and by increasing the share of activities with a high added value and those that incorporate knowledge and innovation.

Keywords: economic structure, knowledge-based activities, innovation, productivity, competitiveness
JEL codes: O33, O38, O47

According to economic literature, ending up in a so-called middle-income trap has a significant impact on the budget, because it can entail a slowdown of the rate of increase of revenues, which can threaten balance, decrease the funds available for development and thereby impede catching up with more developed countries. But what does the literature mean by middle-income trap?

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WHAT DO WE MEAN BY MIDDLE-INCOME TRAP?

The expression 'middle-income trap' was first used by *Gill and Kharas* (2007) when analyzing the growth patterns of East Asian countries following the crisis in the 90s. They regarded countries that reached a medium level via rapid growth, but then were unable to move on and become one of the high-income economies as having fallen into the middle-income trap. They revisited the topic in 2015 (Gill, Kharas 2015) and expanded

the scope of their inquiries to include other countries, incorporating new factors as causes that could explain being stuck at a medium level. The subject had already been examined by *Garrett* (2004) earlier, who at the time talked of 'globalization's missing middle', referring to the fact that since globalization divides the global economy into fast-growing strong actors and weak ones that lag behind, the 'middle' could become vacated, i.e. the countries in the middle could end up stagnant, which could cause them to fall behind in the long term.

Ohno (2009) examined several aspects of the dangers of being stuck at a medium level. He determined that the countries most at risk were the ones that were unable to move up the value chain – which ranges from coming up with the product to marketing it –, because they continue to expect growth from assembly plants set up by foreign companies in-country. The latter thought was formulated by *Spence* (2014) as a question: how is it possible that some countries – like Japan, South Korea and Taiwan – were able to avoid the trap and enter the ranks of high-income countries, while a great majority were stuck. Spence also believes that it is those countries that base their economic growth to an excessive extent on foreign capital that have a harder time becoming developed. The countries that are successful in mobilizing their domestic resources are the ones that manage to break out of the trap or avoid it.

Virág (2016) also warns that few countries have been able to break out of their semi-developed situation. He names improving the capacity to innovate as one of the important conditions of breaking out.

Robertson and Ye (2013) raise the question of whether there is even such a thing as a middle-income trap. After a detailed analysis of 46 middle-income countries, their answer to the question is yes.

Ehl (2016) warns that the growth model of Central European countries based on cheap labor is starting to encounter obstacles and that if this is disregarded for too long, they could slide into the middle-income trap. This could be accelerated by the decrease in EU funds arriving in the region after 2020. The best solution to avoid the trap is to increase the share of activities with a high added value and to strengthen innovation for this purpose.

Csath (2018) also emphasizes that it is not conceivable to achieve a higher level of development with competition based on low cost. Instead, a competitive economic structure is needed, enabling exports with high domestic added value, which requires moving up the production-service value chain.

In reviewing a publication edited by *Dániel Palotai* and *Barnabás Virág* in an article entitled 'How to break out of the mid-level development trap', *Kolozsi* (2017), in issue 2017/1 of the Public Finance Quarterly,[1] emphasizes that the only way for the Hungarian economy to avoid ending up in a trap is to improve the balance between production factors and the ability to create value, and to enhance competitiveness.

Engel and Taglioni (2017) considered extending the value chains a viable way to avoid the middle-income trap. According to the authors, maintaining growth becomes difficult after you reach a GDP per capita value of ten thousand dollars. This is because this level can be attained relatively easily via quantitative growth, joining international chains and using them for exports, and increasing employment. But in order to reach a higher level, structural, i.e. qualitative changes are also required. One of the important conditions of this is continuous improvement of the quality of human assets. According to the authors, it is exactly because of its ability for qualitative change, strengthening innovation and knowledge and

consciously increasing the share of activities with a higher added value in the structure of the economy that China, for instance, will be able to avoid the trap.

There is no generally accepted definition of a middle-income trap – this is the conclusion we can draw from the literature. Views converge in that this is a phenomenon where, in the case of some less developed countries, after a period of rapid economic development, reaching a medium level of income – on the exact value of which opinions also differ – a slowdown may occur, which could make it more difficult to transition into the group of higher-income countries.

Alongside or in lieu of the rate of economic growth measured through the GDP, researchers also use the evolution of GDP per capita to forecast the threat of ending up in the trap. As an extension of this, beyond analyzing absolute values, they also consider a slowdown in the rate of catching up with more developed countries a symptom of ending up in the trap.

There are also many different views on the causes of ending up in the trap. As we have seen, some believe it can be explained by countries joining the value chains of foreign companies in their low added value portion. Others blame emphasis on quantitative growth. But the emergence of income and regional inequality and the lack of knowledge and innovation are also featured among the causes. However, we cannot generalize when it comes to the causes and there are also countries that have managed to avoid ending up in the trap. Among these are the Asian countries mentioned previously and, within the EU, – according to some – Poland. Analysts also don't lend proper weight to the methodological issue of larger leaps being more difficult when starting at a higher level rather than at a lower level. But what about the Hungarian economy? Is it in a trap or is it approaching a trap? What even are some good ways of measuring the risk of the Hungarian economy ending up in a trap? This paper does not purport to provide a definition of middle-income trap that the literature will deem generally accepted, so our search for the answer to the question will be driven by the criterion of how likely it is based on the analysis of a broader spectrum of data that balanced development of the Hungarian economy is sustainable. Because if this can be ensured, there is probably no risk of a trap.

ARE THERE ANY SIGNS OF THE HUNGARIAN ECONOMY ENDING UP IN A MID-LEVEL DEVELOPMENT TRAP?

Are there any signs of the Hungarian economy ending up in a mid-level development trap based on traditional indicators and what other indicators can be used to measure development?

First of all , we need to point out that traditional growth indicators recommended by the literature should be used because of their acceptance as a general basis for analysis, but we must be aware that we cannot get a reassuring image of development and especially not of its sustainability based on these. One of the reasons for this is that economic growth by itself is less than development, therefore, the evolution of growth does not give a comprehensive image of the sustainable development of a country. This is especially true if, in the country in question, the share of foreign capital is significant and therefore, part of the profits generated – which is part of the GDP – can be repatriated freely by companies. In Hungary, the share of foreign-based companies in the national economy in general and in the processing industry in particular is extremely high. This is what we see in *Figure 1*. This in turn increases the likelihood of profits being repatriated. According to the data of the Hungarian Central Statistical Office, property

income payable to foreign owners grew from 4472 billion forints in 2008 to 5319 billion in 2017, a 19 per cent increase. The 2017 value amounts to 13.9 per cent of the GDP.

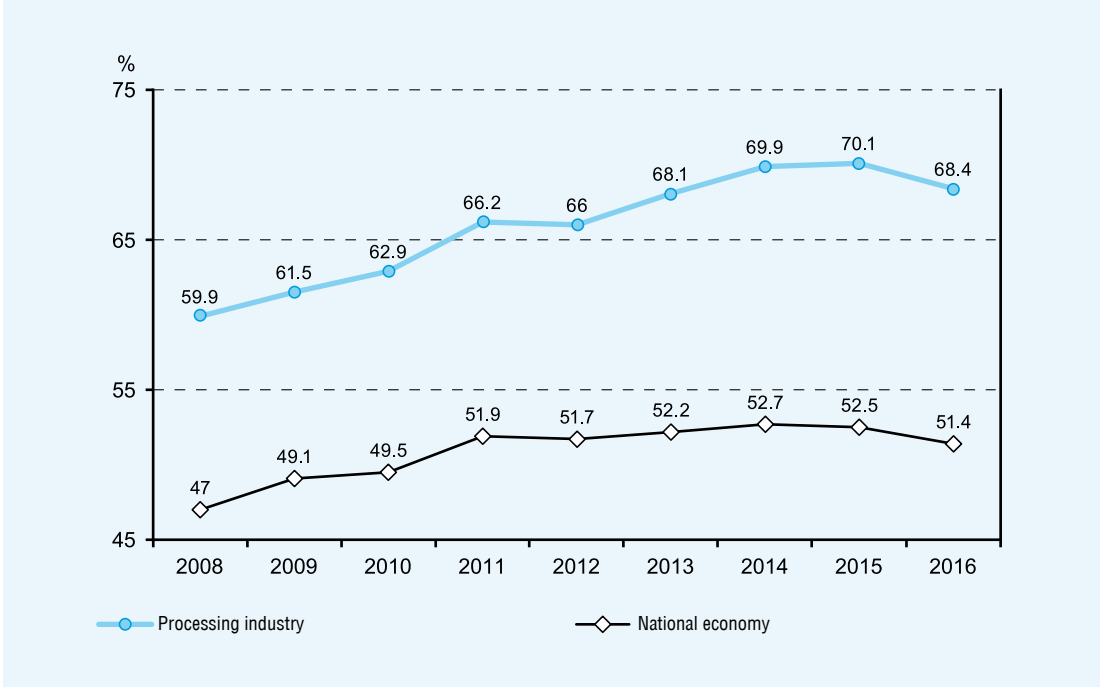
On the other hand, as economists have long since proved it, the GDP indicator no longer fully satisfies the need to measure an economy's performance reliably. There are several reasons for this, which we will not discuss in detail in this paper. One of the reasons is doubtless the fact that growth does not necessarily translate to development. Another reason is the transborder activities of global companies, whose local results cannot be objectively assessed using the GDP indicator. This is because global companies, with the use of transfer pricing, optimize tax payment, which can distort results shown in a given location. This means that it can even be dangerous to formulate recommendations on how to shape economic policy based primarily on the evolution of the GDP and GDP growth target values. For this reason, it is not advisable to speak of an income trap, instead, we should analyze the risk of getting into a development trap. As a result, beyond the growth indicators used in the literature, it is a good idea to also examine a few indicators showing levels of development. In light of this, in this paper – beyond growth indicators – two other development indicators, which can be regarded as particularly important in Hungary's case:

- our competitiveness ranking and
- the evolution of life expectancy

will also be examined. Examining competitiveness rankings is justified because these are determined by researchers via a joint analysis of numerous economic and social indicators.

Figure 1

SHARE OF VALUE ADDED BY FOREIGN-CONTROLLED NON-FINANCIAL CORPORATIONS IN THE NATIONAL ECONOMY (2008–2016)



Source: Hungarian Central Statistical Office

Applying the life expectancy indicator is justified on account of a knowledgeable and healthy population being a basic prerequisite of a country's development, which can also create the conditions of economic growth. What other development indicators should be analyzed can, of course, be a matter of debate. However, this debate is not among the subjects of this paper. We chose the two indicators mentioned because of their importance.

WHAT DOES THE DATA TELL US?

Here, we will first analyze the evolution of the Hungarian economy with the growth indicators used in the literature to then examine the image outlined by the two development indicators. Together, the two development indicators along with the GDP-based indicators will provide a far more reliable image of our development level and if it's improving and improving fast enough, or if it seems to be stuck at a certain level.

The evolution of the GDI per capita value

The most widely accepted view holds that countries that are unable to exceed ten thousand dollars per year per capita – in terms of either GDP or GNI – for a prolonged period may be at risk of falling into the trap.[2] In *Table 1*, we see the evolution of GDP per capita in the V4 countries and a few other countries between 2004 and 2017. We chose 2004 as the starting point of the timeline, because that is the year we joined the EU. The values are in euros.

Table 1 shows that between 2004 and 2017, each of the countries examined improved its GDP per capita, but the rate at which this occurred – shown by the last column – differs significantly. The values of more developed countries usually grew slower. This is understandable, since – as we have mentioned before – it is much more difficult to make a larger leap forward when starting at a higher level. This is what we see in the case of Austria and Denmark, for example. The Hungarian values, however, grew slowly in the 14 reference years. Among V4 countries, catch-up was slowest in Hungary. But based on this, can we conclude that the Hungarian economy is heading towards a middle-income trap or a development trap? If we look at data from the past 5 years, we see that Hungary's and Poland's expansion are the largest, followed by the Czech Republic, with Slovakia coming in last. This shows that Hungarian data improved quickly over the past few years, there has been no slowdown or stagnation. But it is also true that over the entire time frame, development was slower than in other V4 countries, which can primarily be ascribed to the effects of the 2008–2009 financial crisis, which impacted us the most heavily. Based on these trends, we can therefore not conclude that we are in or are heading towards any kind of trap. Nevertheless, the slower catch-up may call for caution. Furthermore, we must also consider that part of the GDP produced exits the country in the form of repatriated profits, thereby not contributing to improvements in competitiveness, which in turn is one of the important conditions of sustainable development.

The Catch-Up Index

In *Figure 2*, we see the GDP per capita of the V4 counties and of Latvia, Lithuania and Romania as a percentage of the EU average in any given year. This indicator is often called a catch-up index. The source of the data is Eurostat and the first available value was for 2006.

Table 1

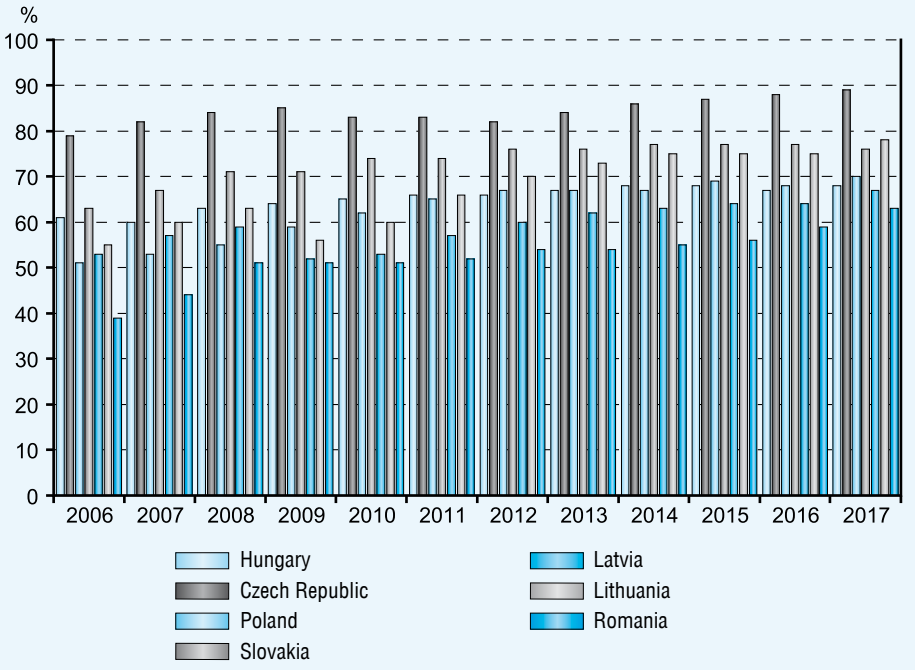
GDP PER CAPITA
(2004–2017, EUROS/CAPITA, CHAIN INDEX SERIES, 2010)

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Percentage change (%) 2017/2004
EU28	24,400	24,800	25,600	26,200	26,200	25,000	25,500	25,800	25,700	25,700	26,100	26,600	27,000	27,600	13.1
Hungary	9,500	9,900	10,300	10,400	10,500	9,800	9,900	10,100	10,000	10,200	10,700	11,000	11,300	11,800	24.2
Czech Republic	12,800	13,600	14,500	15,200	15,400	14,600	14,900	15,200	15,100	15,000	15,400	16,200	16,500	17,200	34.4
Poland	7,300	7,500	8,000	8,500	8,900	9,100	9,400	9,900	10,000	10,200	10,500	10,900	11,200	11,800	61.6
Slovakia	9,300	9,900	10,800	11,900	12,600	11,900	12,400	12,900	13,100	13,200	13,600	14,100	14,600	15,600	61.3
Latvia	7,300	8,100	9,200	10,200	9,900	8,600	8,500	9,200	9,700	10,000	10,300	10,700	11,000	11,700	60.3
Lithuania	7,300	8,000	8,700	9,800	10,100	8,700	9,000	9,800	10,300	10,800	11,300	11,600	12,000	12,700	74.0
Romania	4,900	5,200	5,600	6,100	6,700	6,400	6,200	6,400	6,500	6,700	7,000	7,300	7,700	8,200	67.3
Austria	33,200	33,700	34,700	35,900	36,300	34,800	35,400	36,300	36,400	36,200	36,200	36,200	36,300	37,100	11.7
Denmark	43,800	44,400	46,000	46,200	45,700	43,200	43,800	44,200	44,200	44,400	44,900	45,300	45,800	46,500	6.9

Source: Hungarian Central Statistical Office and own calculations

Figure 2

GDP PER CAPITA (PPS)
COMPARED TO THE EU28 AVERAGE



Source: Self-edited based on Eurostat

What do we see in Figure 2? The catch-up values, which shows the difference between the percentage position in 2017 and 2006, indicates that countries that started lower have caught up with the EU average faster. This holds true for Latvia, Lithuania, Romania and Poland. Poland's catch-up was not impeded by the economic crisis, it even sped up during the years of the crisis. Hungary shows the lowest catch-up at 7 percentage points. This data shows a trend similar to what we saw in Table 1 in that relative values also show Hungary's catch-up being the slowest, but we detect no definitive trend of Hungary approaching a trap. However, we can once again conclude that compared to others, our catch-up is slower.

The Evolution of GDP

Let's look at the indicator that is typically used, the percentage change of GDP compared to the previous year. This data demonstrates growth dynamism. What's beneficial is the growth being consistent and not characterized by significant fluctuations, such as large drops.

What does the data in Table 2 tell us? First of all, we see the variability of values. The 2007–2009 crisis did not affect Poland, while in 2009, out of all V4 countries, Hungary suffered the largest GDP decrease. Only Latvia and Lithuania displayed higher amounts of GDP loss. It is also evident that more developed countries, because of a higher base

Table 2

RATE OF REAL GDP GROWTH AS A PERCENTAGE OF PREVIOUS YEAR

Country	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EU28	3.3	3.1	0.5	–4.3	2.1	1.8	–0.4	0.3	1.8	2.3	2.0	2.4
Hungary	3.9	0.4	0.9	–6.6	0.7	1.7	–1.6	2.1	4.2	3.5	2.3	4.1
Czech Republic	6.9	5.6	2.7	–4.8	2.3	1.8	–0.8	–0.5	2.7	5.3	2.5	4.3
Poland	6.2	7.0	4.2	2.8	3.6	5.0	1.6	1.4	3.3	3.8	3.1	4.8
Slovakia	8.5	10.8	5.6	–5.4	5.0	2.8	1.7	1.5	2.8	4.2	3.1	3.2
Latvia	11.9	10.0	–3.5	–14.4	–3.9	6.4	4.0	2.4	1.9	3.0	2.1	4.6
Lithuania	7.4	11.1	2.6	–14.8	1.6	6.0	3.8	3.5	3.5	2.0	2.4	4.1
Romania	8.1	6.9	9.3	–5.5	–3.9	2.0	2.1	3.5	3.4	3.9	4.8	7.0
Austria	3.5	3.7	1.5	–3.8	1.8	2.9	0.7	0.0	0.7	1.1	2.0	2.6
Denmark	3.9	0.9	–0.5	–4.9	1.9	1.3	0.2	0.9	1.6	2.3	2.4	2.3

Source: Eurostat

value, have a harder time attaining a higher growth rate year over year. This is what we see in the case of Austria and Denmark, for example. In the past 4 years, all V4 countries have been putting on a good performance, only less developed Romania gained a significant edge over them in 2017. Based on the examination of annual GDP growth data, like before, there is no sign of any of the V4 countries approaching a trap. This is because there is no systematic GDP decrease and they are also not characterized by durable, long-term stagnation. Unequal performance, however, is not beneficial in terms of sustainability.

In summary,based on typical growth indicators used in the literature, Hungary also shows no signs of any imminent emergency. The causes of a catch-up that is slower than in other V4 countries need to be sought. Now let's move on to the assessment of the evolution of the two development indicators.

Life expectancy at birth

This data point is also important from the point of view of economic growth, because how long the population can work matters. Therefore, it is worth analyzing the evolution of the available working age population as a factor of economic growth. In *Table 3*, we see the life expectancy data of a few countries in the region along with Austria, and the EU28 average and their evolution between 2004 and 2015.

What conclusion can we draw from this data? Life expectancy in Hungary is increasing faster than the EU average, but despite this, according to the latest data available from 2016, it is still worse than Czech, Slovak and Polish data and is also 4.8 years lower than the EU average. The fastest increase was experienced by Latvia and Romania, which had the lowest life expectancies in 2004. We can thus say that the Hungarian data points are neither particularly good nor particularly bad. But in

Table 3

LIFE EXPECTANCY AT BIRTH (IN YEARS, 2004–2016)

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Growth: 2004–2016
EU28	78.4	78.5	78.9	79.1	79.4	79.6	79.9	80.2	80.3	80.5	80.9	80.6	81.0	2.6
Hungary	73.0	73.0	73.5	73.6	74.2	74.4	74.7	75.1	75.3	75.8	76.0	75.7	76.2	3.2
Czech Republic	75.9	76.1	76.7	77.0	77.3	77.4	77.7	78.0	78.1	78.3	78.9	78.7	79.1	3.2
Poland	74.9	75.0	75.3	75.4	75.6	75.9	76.4	76.8	76.9	77.1	77.8	77.5	78.0	3.1
Slovakia	74.2	74.1	74.5	74.6	74.9	75.3	75.6	76.1	76.3	76.6	77	76.7	77.3	3.1
Latvia	70.9	70.6	70.6	70.8	72.1	72.8	73.1	73.9	74.1	74.3	74.5	74.8	74.9	4.0
Lithuania	72.0	71.0	71.0	70.7	71.7	72.9	73.3	73.7	74.1	74.1	74.7	74.6	74.9	2.9
Romania	71.4	72.5	72.5	73.1	73.5	73.7	73.7	74.4	74.4	75.1	75.0	75.0	75.3	3.9
Austria	79.3	80.1	80.1	80.3	80.6	80.5	80.7	81.1	81.1	81.3	81.6	81.3	81.3	2.0

Source: Hungarian Central Statistical Office, Eurostat

order to catch up with the EU average, life expectancy would need to improve faster. This would entail further benefits: people would be able to work longer, which would have a significant impact on the budget. It should be pointed out that there are significant differences between the life expectancy of men and women. The data is significantly worse for men than it is for women. There are also big regional differences. For instance, in Budapest – according to the Hungarian Central Statistical Office's most recent data from 2017 – the average life expectancy of men at birth is 74.27 years, while in Nógrád county it is only 69.99 years. Furthermore, healthy life expectancy is, for both sexes, lower than the average value. We know that increases in average healthy life expectancy also have an impact on the budget, because they reduce healthcare spending. On the whole, the evolution of life expectancy is at the same time also a factor that affects competitiveness.

Changes in Terms of Competitiveness Ranking

A sustained deterioration or long-term stagnation of competitiveness can signal a downturn in development. If this appears to be the case in a country, further deep analysis is of course required, given that competitiveness is a complex economic and social phenomenon that depends on many factors. Let's examine the ranking of the V4 countries over the past 11 years based on the analysis of the two most widely known of all competitiveness rankings: that of the IMD (Institute for Management Development, Lausanne, Switzerland) and that of the WEF (World Economic Forum, Geneva, Switzerland).

The number of countries examined by the IMD varied between 55 and 63, while those examined by the WEF varied between 133 and 148 between 2008 and 2018. What is most apparent at first when looking at *Table 4* is that the direction of change is not always the same in both institutions' rankings. This is due to differing methodologies, the number of indicators used, and the ratio of data derived from statistical data versus questionnaire surveys. What is also obvious is that the only country that shows obvious improvement at both institutions in the 11-year time frame is Poland. Czech data, reflecting the best competitiveness ranking, can be regarded as balanced. Changes in Hungarian data vary. Slovakia displays the most significant fluctuations. But the rankings show no general deterioration appearing in either data set. However – with the exception of Poland – they also show no improvement. Therefore, yet again in the case of these rankings, we must seek the causes that result in Hungary still being fairly low in competitiveness rankings. This analysis is not disrupted by the results inferred by the two institutions showing different directions of movement. Indeed, deep analyses can lead us to the common causes that explain slower advancements. With that being said, these rankings still don't indicate that any of the V4 countries, from the point of view of competitiveness, is at risk of falling into a development trap in the near future.

CONCLUSIONS BASED ON THE INDICATORS EXAMINED

So far, besides GDP, GDP per capita and GDP per capita compared to a developed country – the comparison being based on the EU average in our case –, we also examined two further characteristics, life expectancy and changes in competitiveness rankings. Our justification for examining the latter two was that GDP-based indicators only give an image of the evolution of economic growth in the best of cases. However, as we pointed

Table 4

COMPETITIVENESS RANKINGS OF V4 COUNTRIES (2008–2018)

Years	Hungary		Czech Republic		Poland		Slovakia	
	IMD	WEF	IMD	WEF	IMD	WEF	IMD	WEF
2008	38	62	28	33	44	53	30	46
2009	45	58	29	31	44	46	33	47
2010	42	52	29	36	32	39	49	60
2011	47	48	30	38	34	41	48	69
2012	45	60	33	39	34	41	47	71
2013	50	63	35	46	33	42	47	78
2014	48	60	33	37	36	43	45	75
2015	48	63	29	31	33	41	46	67
2016	46	69	27	31	33	36	40	65
2017	52	60	28	31	38	39	51	59
2018	47	48	29	29	34	37	55	41

Source: Own compilation based on the IMD and WEF studies for each year

out, GDP indicators suffer from serious weaknesses, which means that they don't even measure real economic growth accurately (for instance: Stiglitz, Sen, Fitoussi, 2010, Csath, 2018). GDP per capita or its comparison to the EU average can also not provide an objective image of the real income situation, because a significant portion of the GDP often exits the country where it was produced as repatriated profits. Therefore, these indicators cannot provide a reliable image of the potential for social and economic growth. Life expectancy and competitiveness ranking, on the other hand, are characteristics that also measure social and economic development. Naturally, other indicators describing the evolution of development levels could also be examined. However, this paper does not purport to present all indicators that can potentially measure development. It only aims to prove that there is no proof of the opinion featured in the literature according to which GDP, GDP per capita growth or comparison of the latter to a developed country allows us to determine whether a country is approaching a development trap. We may point out that the literature has a difficult time dealing with the fact that there are countries which transitioned seamlessly from a lower income level to a higher income level, whereas others have come to a halt. Income as a development indicator, like we have suggested before, cannot be a good measure of development in the age of global value chains because the profits generated move freely between the place of production and the company headquarters. Repatriated profits cannot be a source of national development. Based on this, it can be proven that attempting to examine the changes in levels of development with the use of multiple indicators can provide a more reliable image of the status and changes of an economy and a society than simply considering its mid-level development. We can thereby uncover larger

connections before voicing our opinion on whether a country's development is balanced, slowing down or approaching some kind of trap. However, encountering slowdowns or stagnation in the area of development calls for a more comprehensive study.

Based on the five factors we examined, we can conclude that neither the GDP-based indicators typically examined in the literature nor the 2 development indicators we chose provide sufficient grounds to state that V4 countries, including Hungary, are at an imminent risk of falling into a trap. However, in Hungary's case, we must take note of decelerating trends, whose causes need to be examined. First and foremost, factors contributing to low competitiveness rankings should be examined. If we examine the individual indicators used to determine competitiveness rankings and further data relating primarily to the structure of the economy, we find other causes of these issues, including a low level of added value produced, weak innovation and a low level of productivity resulting from these. These are the subjects we will concern ourselves with next.

PRODUCTIVITY AND INNOVATION IN SECTOR-SPECIFIC CONTEXTS

In one of his early works, *Porter* (1996) underlines the importance of micro-level productivity as a condition of improving competitiveness. *Atkinson* (2013) points out that an important condition of increasing productivity within the structure of economy is an increase in the share of sectors producing services and products containing a high level of knowledge and of added value along with improvements in the productivity of all sectors. For this, it is important to strengthen the overall capacity for innovation, the first step of which is dismantling barriers to innovation. The second is to build a support system for innovation. The properties of sectoral structures obviously influence available job opportunities and consequently the knowledge intensity of production and the potential for increasing productivity. Therefore, let's examine the properties of the Hungarian economy's structure with the help of a few indicators.

Occupational structure, value chain, wages

The potential for economic growth and social development is determined both by available jobs and the professional requirements those fulfilling them are expected to meet. Harmony between job opportunities and knowledge levels influences the performance of employees. If they hold a job where their skills are not at all required, we speak of underemployment, which is a loss both to society and to the economy. On the other hand, from the proportion of jobs requiring various level of knowledge, we can infer the proportion of the different portions of the value chain present in Hungary. It is likely that those employees who work at a higher professional level work in a portion of the value chain that provides higher added value, whereas untrained workers perform simple jobs with low added value. Occupational distribution also reflects income distribution.

In *Figure 3*, we examine the number of people employed in three occupational groups in 9 countries alongside the EU average as a percentage of total employment in the 20 to 64 age group in 2017. When defining occupational groups, we use the International Labor Organization (ILO)'s classification, which divides professions up into 10 major groups. 4 of these 10 describe intellectual work and 5 describe physical work. The 10th category encompasses military occupations.

From the intellectual group we chose so-called highly-trained professional occupations.

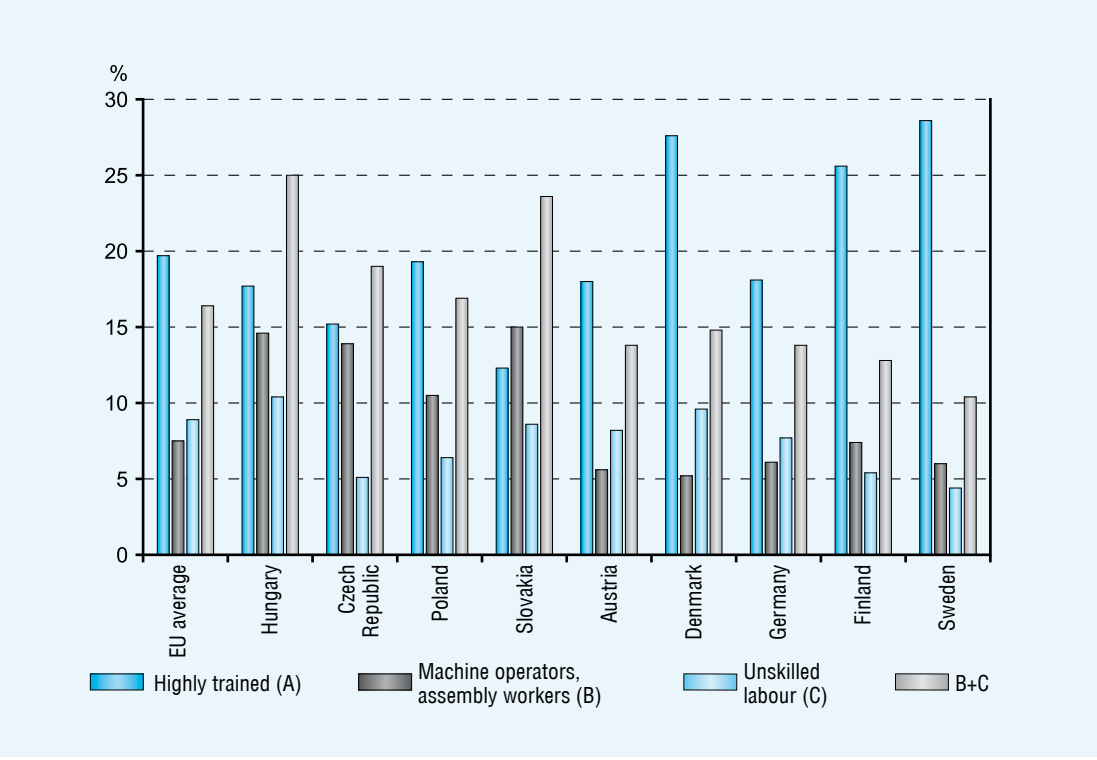
These include the areas of science, technology, information communication, healthcare, business, law and culture. The proportion of people working in these areas reflects the base of knowledge society, the potential for creating great value.

We selected two of the physical groups: machine operators and assembly workers, who are close to the categories of semiskilled and skilled labor and people performing so-called elementary, simple jobs, belonging to the category of unskilled labor. People working in these areas perform the parts of work processes that create less added value. Employment rates in the latter two is particularly important in that these are the first jobs that will be replaced by robotization. It is obvious that an important condition of sustainable growth and development is making sure that work processes create the most added value possible. This also carries with it longer value chains and higher wages. Jobs that require knowledge typically offer more opportunities to perform research and development along with innovative work. Finally, the creation of increased added value and innovation are the most important sources of productivity growth.

Figure 3 shows that when it comes to the proportion of jobs requiring highly trained people, Denmark, Finland and Sweden, which also rank highest in competitiveness rankings, are among the best with percentage values that far exceed the EU average. Among V4 coun-

Figure 3

EMPLOYMENT RATES (HIGHLY-TRAINED, MACHINE OPERATOR AND ASSEMBLY WORKER, AND UNSKILLED LABORER GROUPS, 20–64 AGE GROUP, 2017)



Source: Own calculations based on Eurostat

tries, Poland is first with Hungary coming in second.

Slovakia has the highest proportion of people working as machine operators and assembly workers. This value is exactly double that of the EU average. However, Hungary comes in as a close second to Slovakia. It is worth pointing out that there is a large gap between the values of the V4 and of other countries examined, which demonstrates the high proportion of assembly work processes that are strongly typical of our region. As far as the proportion of unskilled labor employed is concerned, Hungary is far ahead with an extremely high value. If we consider the proportion of the two physical fields jointly, Hungary again comes out ahead at 25 per cent. We are followed by Slovakia at 23.6 per cent.

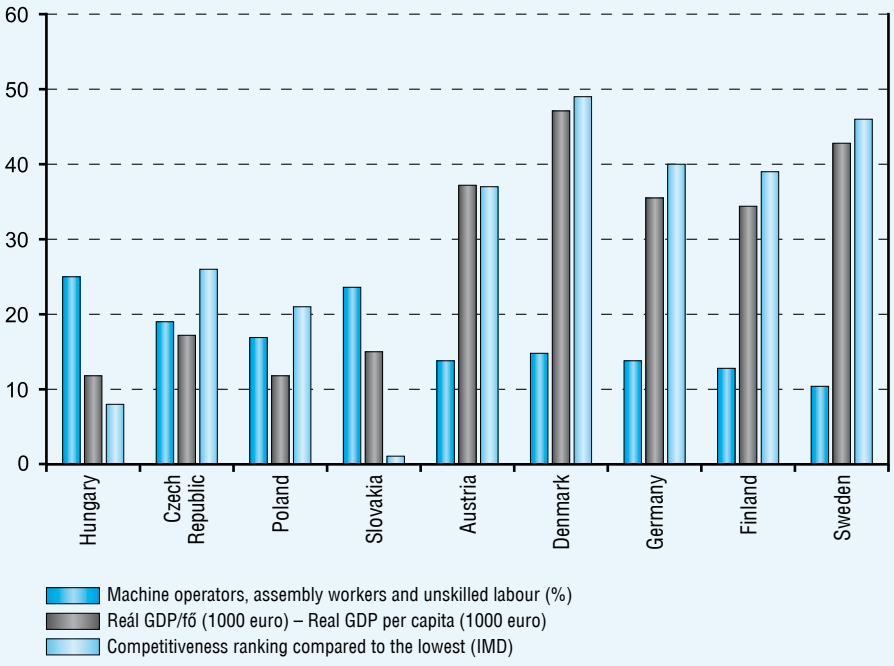
When speaking of the high proportion of unskilled labor, we must also mention that the government increased the employment of unskilled people partly with a community work program and partly with programs aiming to assist in the transition from community work to the primary labor market. At the same time, as *Kádár, Nagy and Právitzné* (2019) point out, a clear correlation can be demonstrated between higher educational attainment and employment opportunities on the labor market. Therefore, employing the unskilled segments of the population, which continue to be significant in numbers, in various regions is contingent on training. We should also note that this is equally desirable from the standpoint of improving competitiveness, because it enhances the quality of human assets.

This data evidently provides no information on professional underemployment, i.e. how typical it is for assembly jobs to be performed by employees with a higher level of knowledge and qualifications. One thing, however, is clear: in the occupational structure, the proportion of people working jobs that require a lower level of knowledge is higher than that of professional workers. We must naturally also not forget that we only looked at the employment rates of 3 of the major occupational groups and the other 7 also have highly trained workers. By the way, according to the Hungarian Central Statistical Office's most recent data from July to September of 2018, 57 per cent of all people employed can be considered physical workers, with intellectual workers only making up 43 per cent. If there are not enough jobs requiring a high level of knowledge, there is a risk of highly trained people seeking work in other countries. This translates to a loss of human capital, if these professionals don't return home. This is what *Pálfi* (2018) refers to in his study, where he reports his findings based on a survey conducted among Hungarians working abroad. The survey proves that the proportion of those with university degrees is much higher among Hungarians working abroad than among workers in Hungary. One of the most prevalent reasons, second only to higher wages, for seeking work abroad was not being able to find a job matching their qualifications, abilities and interests and thereby not being able to have a vision of the future.

In *Figure 4*, the first two columns show the two physical employment rates in each country. The second column shows the real GDP per capita (1000 euros/capita), while the third shows the distance from the 2018 IMD competitiveness ranking of Slovakia, which came in 55th, the lowest of all countries examined here. We chose the latter solution for better demonstrability. According to this, the larger the distance, the better the competitiveness ranking. This means that the lowest values in the figure translate to the worst competitiveness rankings. Therefore, Slovakia's worst position (value 0) is followed by the second

Figure 4

PROPORTION OF PEOPLE EMPLOYED IN MACHINE REPAIR, ASSEMBLY AND UNSKILLED JOBS COMPARED TO GDP PER CAPITA (THOUSAND EUROS, REAL GDP/CAPITA) AND COMPETITIVENESS RANKING (2018)



Source: Own calculations based on Eurostat

worst, Hungary (8). Among V4 countries, the Czech Republic is ranked highest in terms of competitiveness (26). Among all countries, Denmark is most competitive. (49). We can also observe that the lower the two physical employment rates, the higher the GDP per capita and the better the competitiveness ranking (the column is higher). A clear correlation can be demonstrated between the three indicators: decreasing physical employment rates translates to an increasing GDP per capita and growing competitiveness, which demonstrates that a country competes not with its low costs, but with knowledge and innovation.

The results would clearly be more convincing if we also represented timelines and the connections between them. This will be done in the continuation of this research. However, based on one-year data alone, we can say that in all likelihood, for further development or in order to avoid a trap, if you will, an important factor is changing the knowledge structure of the economy, i.e. the evolution of the proportion of higher added value, higher knowledge activities and the length of value chains. The entirety of the V4 group of countries is also lagging behind countries with more developed economies. This correlates with the fact that developed countries typically outsource simple assembly activities to our region. This means that higher added value portions of value chains are kept at home by developed countries, while simpler,

lower added value portions are outsourced to less developed countries. This also explains why a high proportion of less innovative jobs makes it more difficult to enhance competitiveness and thereby speed up the catch-up to more developed countries. The question then is: what would be needed for less developed countries to catch up faster or, in our case, to make sure the development trap is avoided, if you will?

Previously, we have mentioned that research and development along with innovation are activities that create higher added value. If we look at the innovation performance of the countries examined, which is examined comprehensively by the European Union's innovation scoreboard, we see that, for quite a while, those countries typified by a high proportion of sectors creating higher added value have been most innovative. In other words: these countries compete with knowledge and creativity, not cheapness, which also means that their economies have longer value chains and therefore, research and development along with innovation is done in-country. In 2018, for example, Sweden, Denmark and Finland topped the EU 28's innovation list. Hungary comes in 21st. Among the V4, the Czech Republic is ranked highest, coming in 18th. (European Commission, 2018). In Hungary's case, regional data is also of interest. According to the analysis, out of the seven Hungarian regions, four saw the innovation index decrease between 2011 and 2017, two saw an increase and it remained unchanged in one (European Commission, 2017). What we see in Figure 4 is that it is the Czech Republic that has the highest GDP per capita, which could correlate with a longer value chain and the stronger innovative activity that goes along with it. And innovation is as much a condition of shifting towards knowledge-based competition as it is of increasing productivity.

Some more data on Hungary: the contribution of information communication and professional-scientific-technical activities to the gross value added

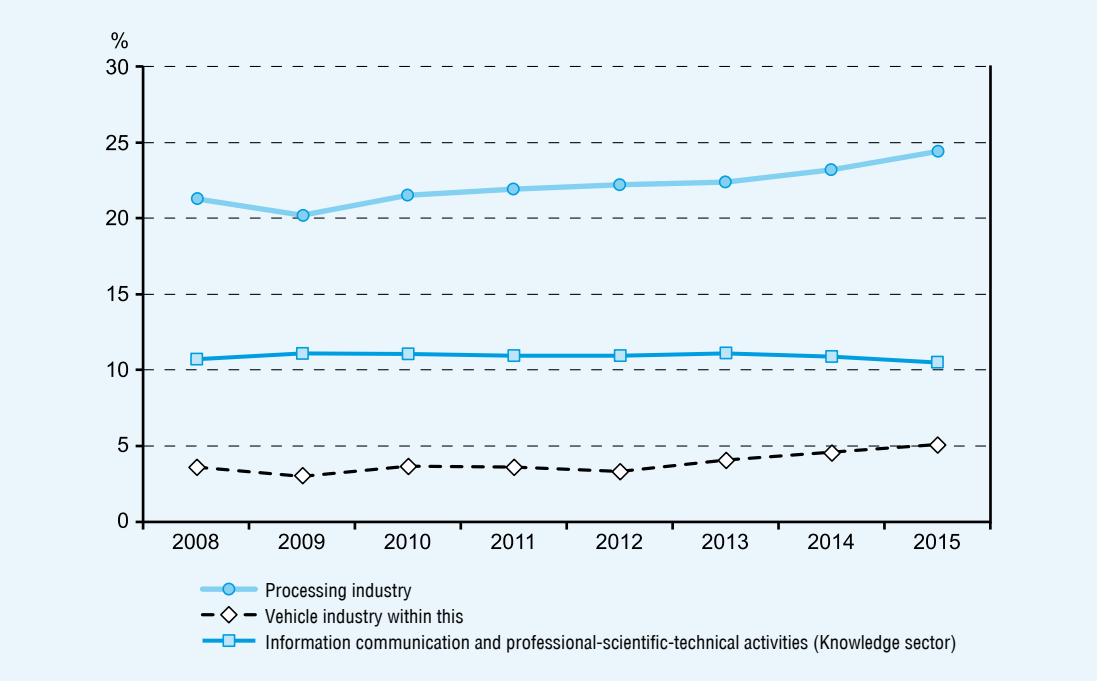
The Hungarian Central Statistical Office's detailed timelines – classified according to the TEÁOR'08 classification system – show the gross value added by various sectors and subsectors, i.e. the new value produced in Hungary. Let's focus on two areas that are particularly important when it comes to innovation, knowledge-based competition and increasing productivity – information communication and professional-scientific-technical activities – and let's have a look at how their share changes between 2008 and 2015. (The most recent published data is from 2015.) For comparison's sake, let's juxtapose the evolution of the share of vehicle manufacturing – increasingly characterized by assembly – and the entirety of the processing industry, where, on average, 29.3 per cent of the production value from January to the end of May 2018 was generated by the vehicle industry.

The added value of the processing industry has been showing an increasing trend since 2008, see *Figure 5*. The vehicle industry, however, whose proportion in terms of average production value corresponds to almost one third of the processing industry's output, represents a much smaller proportion in terms of locally added new value. The reason for this is that the vehicle industry is characterized by significant intermediate consumption and assembly. Intermediate consumption is the value of products and services – often imported in the case of companies engaged in assembly activities – purchased from other production units, which are used for the production of new products and services, which means there is no locally generated value.

It is apparent, however, that the proportion of information communication in the gross

Figure 5

PROPORTION OF DIFFERENT SECTORS OF THE NATIONAL ECONOMY IN THE GROSS VALUE ADDED (2008–2015)



Source: Own calculations based on the Hungarian Central Statistical Office's data

value added along with professional, scientific and technical activities, which are important parts of the knowledge sector, showed a slight decrease. An international comparison indicates that countries with knowledge-based competition and an innovative economy have a higher and increasing proportion of these activities. The role of information communication companies is highly important when it comes to modernizing the economy and improving competitiveness, because IT knowledge is a condition of the spread of digitalization and it is also an important source of increasing productivity in both the economy and society. Information communication is itself a knowledge-based sector, this is why it is important for the number of information communication companies and of the people employed by them to increase in the economy.

The first two columns of *Table 5* show the evolution of the number of information communication companies and the people employed by them from 2011 to 2016. The third column shows the amount of gross value added per capita by the people employed in the sector. The fourth column shows the order based on the digital intensity index of the EU's DESI study (DESI, 2018). The digital intensity index shows the prevalence of digital technologies in business life. Table 5 compares the V4 countries, 4 other countries and the EU average.

One thing shown by the table is that the proportion of information communication companies and of the people employed by them grew considerably in each country. In terms of company numbers growth, Austria and Hungary showed the lowest increase,

Table 5

THE EVOLUTION OF THE NUMBER OF INFORMATION COMMUNICATION COMPANIES AND OF THE PEOPLE EMPLOYED BY THEM BETWEEN 2008 AND 2016 (%), THE VALUE ADDED PER CAPITA OF THE SECTOR (THOUSAND EUROS, 2017) AND RANKING ACCORDING TO THE DIGITAL INDEX

Country	Companies	Employment rate	GVE/capita (2017, thousand euros)	Ranking according to the digital intensity index
	evolution (2008–2016, %)			
Hungary	12.4	20.2	41.8	24
Czech Republic	16.5	14.6	59.1	20
Poland	56.9	34.7	50.4	22
Slovakia	39.1	20.9	53.6	19
Estonia	56.6	23.1	42.9	10
Slovenia	43.5	13.9	61.4	16
Germany	33.0	18.7	105.3	8
Austria	7.6	12.2	106.9	11
EU average	30.4	15.0	98.0	17

Source: Own calculations based on Eurostat

whereas the lowest increase in terms of employment was displayed by Austria and Slovenia. At the same time, the gross value added per employee in 2016 was highest in Austria and lowest in Hungary. According to the digital intensity index ranking, Slovakia was first among V4 countries, followed directly by the Czech Republic. The V4 are all significantly lagging behind Germany and Austria. In our region, Estonia is ranked highest – in 10th place. This data tells us that for continuous development and in order to successfully join digitalization, the information communication field must be strengthened in Hungary. This would at the same time have a significant impact on structural modernization, would increase the proportion of knowledge-based jobs and – as a sector that generates high add-

Table 6

SUMMARY OF THE CHARACTERISTICS DESCRIBING THE THREAT OF A HUNGARIAN DEVELOPMENT TRAPL

Criterion	Downturn	Stagnation	Fluctuation	Slow improvement
Evolution of GDP				×
Evolution of GDP per capita				×
Catch-up index		×		
Evolution of life expectancy				×
Evolution of competitiveness rankings			×	
Evolution of innovation ranking		×		

Source: Own editing

ed value and that pays well – it would increase budget revenues.

SUMMARY, CONCLUSIONS

The analyses show that based on the indicators in the literature that generally indicate the risk of getting into a middle-income trap, Hungary is likely not at imminent risk of getting into a trap. However, like we have proven in the article, we cannot get a convincing image of the long-term sustainability of the development of a country in the first place if we don't expand the scope of the areas and indicators examined. The number of indicators applied in the article and analyses could of course be further expanded. Longer timelines could be examined, and mathematical methods could be used to analyze the level of correlations.

However, even without doing so, we can draw the conclusion visible in *Table 6*, which is that while the Hungarian economy is not at imminent risk of approaching a trap, i.e. of experiencing a downturn, but there is a detectable threat to the rate of our catch-up because of the slowdown of our development, which could also negatively affect budgetary balance. This is why an in-depth analysis of the deeper causes of slow development and changing competitiveness rankings that don't improve fast enough is warranted. Of these, the article focused mainly on the structure of the economy, the diversification of its knowledge content and a few characteristics of innovativeness and productivity. The analyses show that in order to speed up the catch-up and for sustainable development , we need to:

- make value chains longer,
- increase the proportion of domestic activities generating a high added value,
- strengthen the knowledge sector of the economy,
- increase the proportion of knowledge-based jobs offering innovative tasks,
- strengthen the capacity for innovation,
- strengthen the information communication sector,
- increase the knowledge level of the low-skilled,
- improve the digital capabilities of the economy and of society.

This also means that balanced development cannot be reached by further incentivizing FDIs alone even if, in the future, foreign companies establish more of their research-development activities in Hungary. A strong innovative and knowledge-based domestic economic sector is necessary, which, with a long-term vision, can create full value chains and reinvest an appropriate share of ownership profits locally, including not just investments in machinery, but also in innovation and knowledge. This direction of development would not only improve competitiveness, but it would also enhance the quality of life and, in connection with it, by increasing life expectancy, strengthen the ability of the economy and of society to weather crises.

Notes

[1] Dániel Palotai, Barnabás Virág: Competitiveness and growth. Central Bank of Hungary 2016

[2] The World Bank, for instance, distinguishes between a lower middle-income and an upper middle-income level. It defines the lower level as being 1026 to 4035 dollars while the upper level as being 4036 to 12475 dollars per capita.

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