STRATEGIC ANALYSIS OF WELFARE INDICATORS IN EU MEMBER STATES THAT JOINED EU AFTER 2004 DURING 2015-2021

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Abstract. In today's economic analyses, welfare factors, which include the soft factors of competitiveness, play an increasingly important role. The reduction of social and economic inequalities and the fight against poverty are key factors in the economic strategies of countries, as social development is one of the foundations for the expansion of these factors. This makes the topic of territorial, economic and social inequality an important and topical one, which has been examined from many different perspectives over the past decades. Nevertheless, a uniformly accepted methodology for analysis across all countries has not yet been developed in the European Union. The main hypothesis of our study is that the growth of economic performance in countries is most favourable where social factors provide optimal conditions for development. Taking the conceptual framework of territorial inequality and unequal development as a starting point, our research has carried out a specific income inequality analysis between 2015 and 2021 of the countries that joined the European Union after 2004. In our analysis, we have included in our inequality model the "persons at risk of poverty or social exclusion", the "income quintile share ratio (S80/S20) for gross total disposable income" and the specially constructed values of the "GINI index". Our research has shown that social competitiveness factors can play a much more complex role than expected in shaping a country's national strategy, and that the differentiating effects of these "soft factors" can be crucial in reducing territorial disparities.

Keywords: European Union; prosperity; development; territorial inequality; income inequality.

Introduction

Growth theories that analyse the long-term economic expansion rates of individual countries go back several decades. One of the first milestones in this field was Solow's neoclassical theory, whose main conclusion is that less developed countries can achieve more dynamic economic growth than more developed countries [1; 2]. In contrast, endogenous growth theories emphasise that low levels of labour skills, technological endowments and the 'quality' of human capital can be a barrier to catching up in individual economies [3; 4]. They argue that full catching-up can only be achieved if there is a continuous transfer of technological progress between countries, while the skills of the societies of the less developed countries can also catch up with those of the developed countries [5; 6]. In addition to these research findings, a number of other studies have addressed the issue of catching up and achieving higher prosperity [7-9], including the trends in competitiveness indicators (e.g. income inequality) of regions and areas within countries with dynamic economic development [10; 11]. In this respect, the Williamson hypothesis [12] is a classic theory, according to which there is an "inverted U" relationship between countries' development and regional inequalities, i.e. regional income inequalities are lowest in underdeveloped and developed countries and highest in middle-developed countries [4].

The experience of empirical research related to growth theory has confirmed previous conclusions that, in economic terms, the more open a state's economy is and the more it has the capacity to learn about, absorb and incorporate advanced foreign technologies into its own production processes, the faster it can catch up and develop socio-economically [13; 14]. This suggests that the openness of individual economies has a marked influence on economic and social development [15; 16]. Integration into the world economy, and thus openness to the external economy, has four distinct effects on the economic competitiveness of individual nation states [1; 17]:

1. It enables a country to specialise in production activities from which it can derive a comparative advantage over its competitors.
2. The country can also benefit from Foreign Direct Investment (FDI) through deeper economic integration, which allows it to make high-priority strategic investments.
3. The possibility of opening up to capital and technology imports can also help a less developed country's economy catch up, as it can trigger the development of human capital, which can be spread to less developed regions, where it can be used to leverage skills.
4. Entering a larger market increases competition, which requires greater efficiency from individual operators. Higher capital and labour flows and a more integrated market will, among other things,

increase competition in labour and capital markets and reduce the distortive effects of regional monopolies.

These factors suggest that the pace of catching-up is more dynamic in economically more open countries [18]. At the same time, it should be pointed out that smaller countries are - by definition - more open than larger countries, as they are more dependent on exports of certain productive goods (e.g. goods, services, capital) [19; 20].

One of the most talked-about economic concepts of our time, alongside the widening of economic and social inequalities, is the "middle-income trap". Many analyses and studies have been published on how to avoid this. If we want to point out the danger of the trap, it is that the economies of those starting from a disadvantaged position compared to developed countries can catch up dynamically for a while, but at a certain point their development stalls and loses momentum. The majority of the countries we have studied are experiencing a combination of these processes, as they are the result of economic trends from which it is difficult to extricate a particular economy. This means that the country in question is still only "moderately developed" in economic terms, and its human resources are adapting to this. The literature on the causes of this phenomenon identifies a number of factors, not least the gradual exhaustion of the reserves of the labour- and resource-intensive growth model and the failure to make the transition to a knowledge- and technology-driven economic structure [1, 4; 10].

In summary, higher value-added production and hence higher welfare and a reduction in social disparities can be achieved in countries that are more open to both the learning and the application of new production technologies.

Materials and methods

Our study focuses on the correlation analysis of welfare indicators in the thirteen EU Member States that joined the EU after 2004. Our analysis is carried out over the period 2015-2021. Due to limited data availability, this period was chosen. Almost all of the indicators under study are available for these years – at the time of finalising the manuscript – except for Slovak (SK) income data for 2021. The relevant concepts [21] and indicators we used for the correlation analysis were:

- At-risk-of-poverty or social exclusion rate [22]: the proportion of people in the total population who are affected by at least one of relative income poverty, severe material and social deprivation or very low work intensity.
- Income quintiles [23]: quintiles of the population ranked by annual net income per capita. In our analysis, we used the incomes of the population in the top and bottom quintiles to calculate the S80/S20 indicator.

Closely related to the definition of the concepts, the income inequality of the countries under study is presented for the period 2015-2021 using the complex Gini index [24]:

$$G = \frac{\sum_i \sum_j |x_i - x_j|}{2\bar{x}n^2},$$ (1)

where x_i – absolute income indicator in region i;
x_j – absolute income index in region j;
n – number of regions.

The Gini index (symbol: G) is one of the most controversial indicators, yet it is one of the most commonly used non-dimensional measures of income inequality. The Gini index has a value between 0 and 100 (Value set: $0 \leq G \leq 100$), where 0 indicates a perfectly uniform distribution and 100 a concentration at a single point, i.e. a higher value implies greater inequality.

Results and discussion

The goal of the countries that joined the European Union in 2004 or later – most of them post-socialist countries - was, and still is, to catch up with the more advanced EU Member States in terms of living standards. In addition, reducing social and economic disparities and improving the living conditions of social groups at risk of poverty is an additional national strategic objective in all member states. In the present study, we have analysed the process of economic catching-up through changes in

indicators of social well-being in addition to the dynamics of catching-up. Figures 1 and 2 show the relationship between the share of people at risk of poverty exclusion (x-axis) and income inequality (y-axis) based on data for 2015 and 2021.
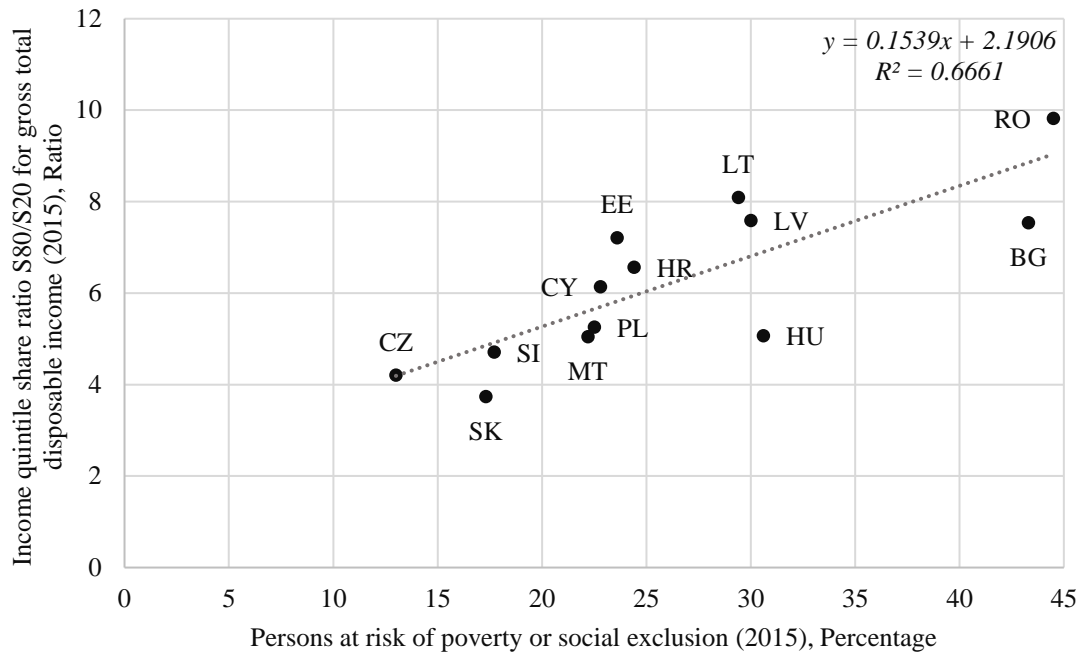
Note (1), Abbreviations of country names: BG: Bulgaria, CY: Cyprus, CZ: Czechia, EE: Estonia, HR: Croatia, HU: Hungary, LT: Lithuania, LV: Latvia, MT: Malta, PL: Poland, RO: Romania, SI: Slovenia, SK: Slovakia.

Fig. 1. **Correlation between income inequality and poverty risk in the selected countries, 2015**
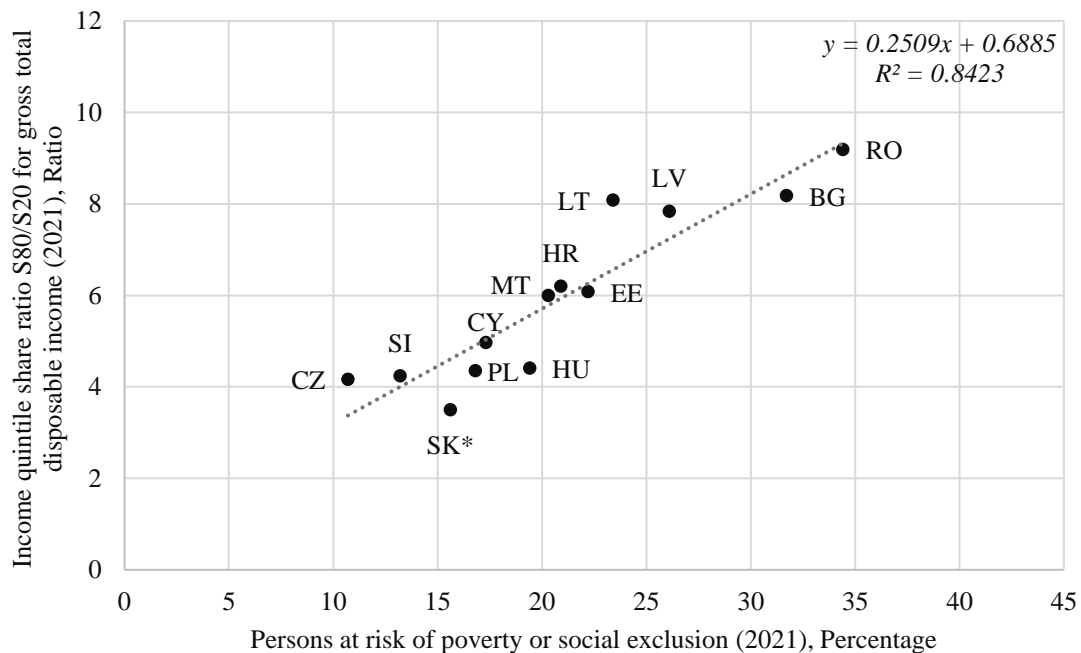
Note (1), The abbreviations of the country names are given below Figure 1. *Note (2),* SK data for 2020.

Fig. 2. **Correlation between income inequality and poverty risk in the selected countries, 2021**

Our analysis shows that the correlation between the top (S80) and bottom (S20) income quintiles and the poverty and social exclusion rates is strong in both 2015 ($R^2 = 66.6\%$) and 2021 ($R^2 = 84.2\%$). Our analysis shows a significant increase in the correlation value from 2015 to 2021 (+17.6%), which is reflected in the improving trends in the social competitiveness indicators of the countries included in the study individually, as well as in the improving values of the data for the 13 countries treated aggregately. Income inequalities have not decreased in only 5 countries (BG, CZ, LV, LT, MT), while at the same time the at-risk-of-poverty rates have been on a downward trend in all countries. The most striking improvements in the position of the countries surveyed were in Bulgaria, Hungary and Romania, here the at-risk-of-poverty rate fell by more than 10% in each country (Figure 1, Figure 2).

Taking all this into account, it is clear that the issue of reducing social and economic exclusion was a priority in the economic strategies of the countries studied during the period, but when analysing the changes in the level of decile, no significant convergence can be observed compared to the more developed countries of the EU. This can be explained primarily by the development of energy-intensive industries, which are the main drivers of secondary sector development. In the case of the countries under review, the trap of medium development is becoming increasingly evident.

Closely related to our results presented in the previous two graphs, in Table 1 we have examined the pooled Gini index values for the countries analysed and the EU27 between 2015 and 2021.

Table 1

Gini coefficient in the EU27 (2020) and in the selected countries between 2015-2021

Country	2015	2016	2017	2018	2019	2020	2021
EU27 (2020)	30.8	30.6	30.3	30.4	30.2	30.0	30.1
BG	37.0	37.7	40.2	39.6	40.8	40.0	39.7
CY	33.6	32.1	30.8	29.1	31.1	29.3	29.4
CZ	25.0	25.1	24.5	24.0	24.0	24.2	24.8
EE	34.8	32.7	31.6	30.6	30.5	30.5	30.6
HR	30.4	29.8	29.9	29.7	29.2	28.3	29.2
HU	28.2	28.2	28.1	28.7	28.0	28.0	27.6
LT	37.9	37.0	37.6	36.9	35.4	35.1	35.4
LV	35.4	34.5	34.5	35.6	35.2	34.5	35.7
MT	28.1	28.6	28.2	28.7	28.0	30.3	31.2
PL	30.6	29.8	29.2	27.8	28.5	27.2	26.8
RO	37.4	34.7	33.1	35.1	34.8	33.8	34.3
SI	24.5	24.4	23.7	23.4	23.9	23.5	23.0
SK	23.7	24.3	23.2	20.9	22.8	20.9	-

Note (1), The abbreviations of the country names are given below Figure 1. *Note (2),* SK data for 2021 is not available. *Note (3),* EU27 data before 2020 is estimated data.

Looking at the changes in the Gini index of nation states between 2015 and 2021, it is clear that the countries with the highest share of people exposed to poverty are those with Gini index values above the EU-27 average in all years examined (BG, EE, LT, LV, RO). Based on the data analysis of our survey, it can be said that among the 13 Member States surveyed, there are only 5 (CZ, HR, HU, PL, SI) that have never exceeded the EU27 aggregate Gini index value in any of the 7 years surveyed (Table 1).

In connection with the values analysed in Table 1, we thought it worthwhile to look at the income differences between the EU Member States in terms of the different amounts of wages. According to Eurostat [25], the average hourly wage of employees in the EU27 Member States (taking data from enterprises with 10 or more employees) was 29.1 EUR in 2021. The lowest income levels were found in Bulgaria (7.0 EUR), Romania (8.5 EUR) and Hungary (10.4 EUR), while the highest average hourly earnings per employee were found in Denmark (46.9 EUR), Luxembourg (43.0 EUR) and Belgium

(41.6 EUR). Further exacerbating the income competitiveness situation of the 13 countries we surveyed, our findings show that the median hourly wage in 2021 was only 11.5 EUR in the countries we surveyed. If we compare our results with the median hourly wages of the 14 countries excluded from the EU-27 study, we find a more than threefold increase (37.4 EUR) compared to the countries we studied. This makes it clear that increasing the socio-economic competitiveness of the EU Member States that joined the EU after 2004 and reducing the degree of catching-up with developed countries can be addressed by significantly reducing socio-economic inequalities. The results of our research suggest that there is a close link between the degree of social disparities and the dynamics of economic growth, as social catching-up is clearly dependent on the direction of change in economic factors. In this context, it is important to note that the "soft" factors of competitiveness are increasingly coming to the fore among the determinants of economic competitiveness and dynamism, and that these factors are fundamentally redefining the developmental directions of current national economic strategies. It can be argued that the strong differentiating effects of welfare indicators should play a prominent role in the future strategic reduction of territorial disparities.

Conclusions

1. The results show that there is a strong correlation between income inequality and the at-risk-of-poverty rate in 2015 ($R^2 = 66.6\%$) and 2021 ($R^2 = 84.2\%$) in the 13 countries studied.
2. Our analysis shows that the at-risk-of-poverty rate decreased from 2015 to 2021 in all EU Member States surveyed, with the largest decreases in Bulgaria (-11.6%), Hungary (-11.2%) and Romania (-10.1%). However, it should be highlighted that these three countries had the lowest incomes in the EU in 2021.
3. In conclusion, although the socio-economic indicators of the 13 countries under review have shown an improving trend over the period, strategically important improvements (e.g. raising the level of skills of the workforce, knowledge-based economy - R&D&I developments) are needed to bring these improving trends close to the level of development of the above-average EU countries in the future. Building on this analysis, we will continue our research in the future, with a focus on labour market trends and income inequalities in EU Member States.
4. We believe that the countries under analysis should put more focus on reducing social disparities between regions. This could be achieved through closer cooperation between the 13 countries (e.g. strengthening V4 cooperation), which could mean a more targeted and diversified use of EU resources in the next programming period (2023-2027). But this also needs further investigation.

Author contributions

Conceptualization, L.B. and K.J.; Data collection and Methodology, L.B.; Formal analysis, K.J.; Investigation, L.B. and K.J.; Writing-review and editing, K.J.; Visualization, L.B. All authors have read and agreed to the published version of the manuscript.

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