



**European Economic Integration**

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**BUILDING AN ECONOMIC MECHANISM FOR  
DEVELOPING AND UTILISING HUMAN CAPITAL  
WITHIN THE CONTEXT OF THE VISEGRAD  
GROUP AND THE NEIGHBOURHOOD POLICY**

**Abstract**

This article examines the development of an economic mechanism for utilising human capital in the Visegrad Group countries (Poland, Czech Republic, Slovakia, and Hungary) in the context of the Neighbourhood Policy. It analyses

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the evolution of approaches to developing such a mechanism, from socio-reformist and socio-political concepts to contemporary models shaped by transformational processes, European integration, and globalisation. The scientific novelty of this study lies in identifying the fundamental principles underlying the development of a human capital utilisation mechanism, based on a comprehensive analysis of the historical and economic experience of the Visegrad Group countries and within the framework of the Neighbourhood Policy, taking into account key macroeconomic indicators. The findings can be used for further research, as well as for the development of national and corporate human capital strategies in transition economies.

### Key Words:

economic development, economic mechanism, European countries, human capital, human development, human potential, Neighbourhood policy, transition economy, Visegrad Group.

**JEL:** M12, O15.

2 formulas, 5 figures, 9 tables, 48 references.

### Problem Statement

The modern concept of the economic mechanism for utilising human capital in the countries of Central Europe extends beyond the traditional understanding of development as a system of hierarchical relationships. It is increasingly taking shape as a multidimensional platform for realising human potential, encompassing the development of employees' emotional intelligence, the utilisation of their intellectual abilities and professional skills, as well as the creation of conditions for conscious motivation to work and the fostering of loyalty to the organisation. In this regard, human capital management is crucial for establishing effective leadership and, consequently, ensuring long-term business value creation.

In today's world, human capital is seen as one of the key factors in the effective functioning of organisations, capable of delivering both social and tangible economic outcomes. Therefore, it is important to analyse the relationship between the development of human capital management concepts and the stages of eco-

economic development in countries with similar patterns of response to economic reforms, shared structural and historical features and neighbourhood policies. Their experience shows that a shift in approaches to human resource management – from administrative and bureaucratic to strategic ones – has occurred alongside changes in the economic environment and market institutions. These countries include those of the Visegrad Group: Poland, Czech Republic, Slovakia, and Hungary.

After 2022, any analysis of the economic mechanisms governing the development and utilisation of human capital in Central European countries cannot be limited solely to economic, institutional, or integration-related factors. The Russian Federation's large-scale military aggression against Ukraine has significantly altered the security environment of the European Union, increased the importance of the EU's and NATO's eastern flank, and brought to the fore issues concerning the resilience of labour markets, the adaptation of social systems, the mobilisation of professional skills, and the preservation of human capital in a context of military and political uncertainty (European External Action Service, 2022; NATO, 2022). This aspect is particularly important for the Visegrad Group countries, as they simultaneously serve as a border, logistical, humanitarian, and labour support zone for Ukraine.

### **Literature Review**

In academic research, the concept of utilising human capital has evolved from a narrowly economic interpretation of investment in people to a comprehensive interdisciplinary paradigm that combines economic theory, strategic management, human resource management, and public development policy. The seminal works of Schultz (1961) and Becker (1993) laid the foundations for human capital theory, viewing education, vocational training, and healthcare as investments that drive growth in labour productivity and national income. This approach has formed the economic basis of modern models of human resource utilisation mechanisms.

Further development of this concept involves shifting towards a strategic vision of human capital within the framework of the resource-based view of the firm. Barney's (1991) research supports the argument that human resources are a source of sustainable competitive advantage, provided they are unique, difficult to imitate, and strategically integrated into management processes. This has led to the emergence of Strategic Human Resource Management (SHRM), which views human capital utilisation practices as a coordinated system capable of influencing the long-term performance of organisations (Wright & McMahan, 1992).

Integrating human capital theory with approaches to intellectual capital and knowledge management marked an important stage in the evolution of the con-

cept. Studies by Edvinsson & Malone (1997), as well as the concept of the knowledge-creating company (Nonaka & Takeuchi, 1995), have broadened the interpretation of human capital to include not only the individual characteristics of employees, but also the organisational mechanisms for generating, disseminating, and utilising knowledge.

The European approach to the mechanism for human capital development and utilisation is based on a combination of economic, social, and institutional factors, which distinguishes it from more universalist models (Brewster, 2004). Brewster argues that HRM practices in Europe are determined not only by market mechanisms but also by national models of industrial relations and the role of the state, social partnership, and collective regulation.

The development of these concepts can be traced in contemporary empirical studies examining the role of human capital in the socio-economic progress of European countries (Plaksiuk et al., 2023). Human capital is regarded as a key factor in socio-economic growth and is analysed on the basis of international composite indices and national statistics. This study indicates a direct correlation between investment in education, science, and human capital development and the dynamics of economic development.

An important contemporary aspect of European expertise in utilising human resources is related to digitalisation and the adoption of HR innovations. The study by Tordova et al. (2025) analyses the relationship between HR innovations, human capital development, and the financial stability of multinational companies operating in Europe.

A separate group of studies comprises works on the competence-based approach to developing human capital within companies and organisations. Studies by Kolot et al. (2022) focus on European and international experiences regarding the growing importance of flexible and universal competencies that ensure the adaptability of human capital to structural changes in the labour market.

Contemporary research views human capital in close connection with systemic conditions of economic security, energy transition, and socially responsible development. In particular, a country's level of economic security is shown to create the fundamental macroeconomic conditions for the reproduction of human capital (Yakymchuk et al., 2021). Some studies emphasise that building a socially responsible bioeconomy, particularly by improving the accounting of biological assets, contributes to the sustainable development of human capital (Maksymiv et al., 2022).

Given the new security landscape in Europe, human capital should also be considered through the lens of security resilience, social adaptation, and the capacity of economic systems to absorb migration and labour market shocks. European and international institutions emphasise that Russia's war against Ukraine has caused a mass displacement on a scale not seen since the Second World

War, thereby creating new challenges regarding employment, education, vocational retraining, the recognition of qualifications, and the social integration of Ukrainian refugees in EU countries (OECD, 2023; UNHCR, 2025).

Omelchuk et al. (2021) explore the legal and institutional aspects of the European experience in establishing and developing a human capital utilisation mechanism. The authors view human capital as a strategic resource for sustainable development in the context of implementing the Europe 2020 Strategy. The study emphasises that the effective utilisation of human capital in EU countries is based on a combination of economic policy and legal frameworks, creating stable conditions for the reproduction and development of human resources. In contrast, Demchenko et al. (2023) emphasise that effective human capital management must evolve from traditional approaches towards more integrated strategies that prioritise creating conditions for the comprehensive development of people's abilities and potential as a decisive factor in the development of rural areas. The authors emphasise that the modern concept of the economic mechanism for the development and reproduction of human capital takes into account not only the economic aspects of employment, but also social motivation. This requires balancing policy instruments and incentives to support sustainable development and mitigate the urbanisation risks.

Contemporary research pays considerable attention to the measurement and analysis of human capital. The Balanced Scorecard approach (Kaplan & Norton, 1992) integrated staff development into a strategic performance measurement system, while the development of human capital analytics and international standards (notably ISO 30414) has contributed to the institutionalisation of human capital assessment at the organisational and national levels. This has made it possible to move from merely acknowledging the role of staff to quantifying their contribution to economic performance.

At the macro level, the concept of a human capital development mechanism has been developed in the studies of international organisations, in particular the World Bank (2020) and OECD (2019). Human capital indices, skills development strategies, and lifelong learning policies highlight the role of human capital as a key factor in economic resilience and adaptation to crisis-related challenges.

Contemporary literature presents the human capital utilisation mechanism as a multi-level system that combines individual investment, organisational practices, and public policy. This approach is particularly relevant for the study of transition economies, notably the Visegrad Group countries and Ukraine, where human capital is a key resource for economic recovery, convergence, and long-term development.

Therefore, **the study aims** to analyse and summarise the experience of establishing and developing an effective economic mechanism for utilising human capital in the Visegrad Group countries (Poland, Hungary, Czech Republic, and Slovakia). The analysis is conducted within the context of the Neighbourhood Pol-

ity, European integration, and the evolving EU security landscape resulting from the Russian Federation's large-scale military aggression against Ukraine. Furthermore, the study seeks to identify key principles for human potential development at both macro and micro levels. This involves considering national specifics regarding the impact of military, migration, infrastructure, and socio-labour challenges on human capital mechanisms in the region.

## Methodology

This study seeks to analyse the historical and economic preconditions leading to the establishment and development of the concept of a human capital utilisation mechanism in the Visegrad Group countries (Poland, Czech Republic, Slovakia, and Hungary) and the Neighbourhood policy. The methodological framework combines economic-historical, institutional, and comparative approaches, drawing on human capital theory and strategic human resource management (SHRM).

To achieve the aim of the study, this article employs correlation analysis to quantitatively assess the relationship between economic stability indicators and changes in the labour market in the Visegrad Group countries. Gross domestic product per capita and inflation rate were used as indicators of economic stability, while unemployment rate was used as an indicator of labour market performance.

The Pearson correlation coefficient was used to determine the strength and direction of the linear relationship between the variables. It is calculated using the following formula:

$$r = \frac{n(\sum XY - (\sum X)(\sum Y))}{\sqrt{(n\sum X^2 - (\sum X)^2)(n\sum Y^2 - (\sum Y)^2)}} \quad (1)$$

The Spearman rank correlation coefficient was also used to identify monotonic relationships. It is calculated using the following formula:

$$\rho = 1 - \frac{6 \sum D_i^2}{n(n^2 - 1)} \quad (2)$$

where  $\sum D_i^2$  is the sum of squared differences between ranks for each

pair of observations.  $n$  is the total number of observations (pairs).

Correlation analysis is useful for studying the establishment and develop-

ment of the economic mechanisms for utilising human capital, as it allows the identification of patterns in the relationship between economic growth and the functioning of labour market. It is also essential for conducting comparative analysis of national development models in the Visegrad Group countries and within the framework of the Neighbourhood Policy.

The study uses a historical-genetic method to identify the key stages in the evolution of the human capital development mechanism; comparative analysis to compare national models of the mechanism for utilising human capital in the V4 countries; and macroeconomic analysis to assess the relationship between human capital development and the dynamics of GDP per capita, unemployment, and inflation. In addition, content analysis of EU strategic and regulatory documents and national development programmes was used to evaluate the role of public policy and European integration.

The empirical base of the study consists of works by classical and contemporary researchers in the field of human capital, as well as statistical and analytical data from the OECD and the World Bank.

## **Research Results**

### **Characteristics and historical background of the development of the modern concept of the economic mechanism for utilising human capital in Poland**

The Visegrad Group was established in 1991 as a mechanism for political and economic coordination among the countries of Central Europe on their path towards Euro-Atlantic integration. Despite the occasional political differences between member states, the term Visegrad Group remains relevant today in both academic discourse and the practice of regional cooperation. Recent studies increasingly emphasise that the V4 should be viewed not merely as a political alliance, but as a model of successful socio-economic transformation capable of adapting to the challenges posed by crises.

It should be noted that the list of factors determining the successful implementation of modern personnel management mechanisms in the Visegrad Group countries is considerably broader, since it is shaped by both historical and economic preconditions for the development of national economies. The shared post-socialist legacy, the stages of transformational reforms, integration into the European Union and the response to external crises have shaped the specific evolution of approaches to the economic mechanisms for utilising human capital.

For the Visegrad Group countries, the security dimension after 2022 has become an additional factor driving the transformation of the mechanisms for human capital development. Poland, Czech Republic, Slovakia, and Hungary have

been directly affected by the military and humanitarian consequences of the Russia-Ukraine war: from hosting large numbers of internally displaced persons to reviewing approaches to social protection, education, healthcare, professional integration, and the use of skilled labour (Council of the European Union, 2025). Therefore, contemporary models of human capital development in the V4 should be assessed not only against criteria of economic convergence with the EU, but also in terms of their ability to ensure social and labour resilience amid prolonged security tensions.

Poland is a prime example of a country that has successfully implemented strategies for socio-economic transformation and has managed to integrate mechanisms for the effective use of human capital into its national development model.

Throughout the 20th and 21st centuries, Poland has seen a gradual evolution in approaches to developing mechanisms for utilising human capital, reflecting global trends in this field. Conventionally, four key phases can be identified:

1. The operational phase (1900–1945) (Boiechko, 2016).
2. The tactical or management phase (1945–1980) (Zbiegień-Maciąg, 2006).
3. The strategic phase (since the 1980s).
4. The quasi-linear phase (since the 1990s).

Preparations for EU accession spurred a shift from an administrative model of mechanisms for utilising human resources to strategic ones with a focus on boosting labour productivity, developing skills, and enhancing labour mobility. A significant amount of European funding was channelled into modernising education, vocational training, and labour market infrastructure, which had a direct impact on the quality of the workforce (Rieznikov, 2025).

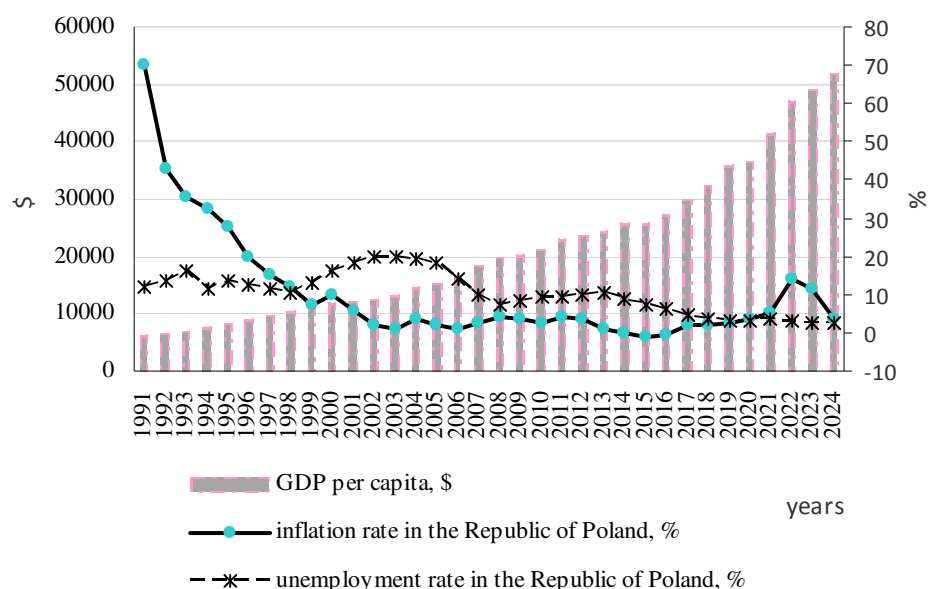
The active promotion of labour mobility within the EU is a distinctive feature of the Polish model for utilising human capital.

The trend in GDP per capita between 2000 and 2024 demonstrates a close correlation between economic growth and the development of human capital. Despite the downturn during the global financial crisis of 2008–2012, Poland demonstrated high adaptability thanks to its flexible labour market and investment in human capital. The pandemic has posed a challenge to Poland's employment system. In 2021, inflation rate reached 6.2%, and unemployment rate stood at 6.4%. However, these changes have been accompanied by structural shifts: the rise of remote working, the growing importance of flexible forms of work (the gig economy, freelancing), and a reconsideration of human resources strategies to focus on emotional well-being, adaptability, and innovation. Accordingly, GDP per capita has more than tripled, and the level of economic convergence with the EU has increased from 25% of the European average in 2004 to around 50% in 2024 (Figure 1).



Figure 1

**Trends in GDP per capita, inflation rates, and unemployment rates in Poland for the period 1991–2024**



Source: based on World Bank (n.d.-a, n.d.-b, n.d.-c, n.d.-d).

In Poland's case, changes to the security situation in the EU after 2022 have a direct impact on the economic mechanism for developing and utilising human capital, as the country simultaneously serves as an eastern security outpost for the EU and NATO, a logistical hub supporting Ukraine, and a main destination for Ukrainian refugees. While the mass influx of people from Ukraine has increased the labour supply, partially alleviating the labour shortage, it has also placed greater strain on the education, healthcare, housing, and social integration systems. In this context, the Polish human capital model takes on the characteristics of a security-adaptive model, in which tools for employment, language integration, recognition of qualifications, and social support must be aligned with the long-term needs of labour market and the risks posed by future waves of migration (OECD, 2023a; National Bank of Poland, 2024).

The Pearson correlation analysis was used to assess the relationship between economic stability and changes in the labour market in Poland.

The following was used as an indicator of economic stability:

- Gross Domestic Product per capita (\$);
- inflation rate (%).

The following was used as an indicator of labour market performance:

- unemployment rate (%).

The Pearson correlation coefficient ( $r$ ) is used to determine the direction and strength of the linear relationship between variables and ranges from  $-1$  to  $+1$ . To test the stability and monotonicity of the relationship between economic stability and labour market indicators in Poland, the Spearman rank correlation coefficient ( $\rho$ ) was applied (Table 1).

Table 1

**The correlation between economic stability and labour market indicators in Poland based on the Pearson correlation coefficient and the Spearman rank correlation coefficient**

Indicators	Spearman correlation coefficient ( $\rho$ )	Pearson correlation coefficient ( $r$ )
GDP per capita – unemployment rate	$-0.815$	<b><math>-0.810</math></b>
GDP per capita – inflation rate	$-0.550$	<b><math>-0.437</math></b>

Source: authors' calculations.

The results obtained indicate a strong inverse correlation between GDP per capita and unemployment rate in Poland ( $r = -0.810$ ). This suggests that an increase in the population's economic well-being is accompanied by a significant decrease in unemployment, confirming the effectiveness of converting human capital into economic growth.

The correlation between GDP per capita and inflation rate is moderately inverse ( $r = -0.437$ ), suggesting a correlation between macroeconomic stability and economic growth. However, it is less pronounced than with labour market indicators. This suggests that controlling inflationary processes is an important factor in achieving economic stability, but not the decisive one.

The Spearman correlation coefficient values obtained confirm the existence of a strong inverse monotonic relationship between GDP per capita and unemployment rate in Poland ( $\rho = -0.815$ ). This points to a consistent trend: as economic prosperity increases, unemployment rate falls steadily, regardless of any short-term fluctuations in the figures.

The correlation between GDP per capita and inflation rate is moderately inverse ( $\rho = -0.550$ ), suggesting a stable but less pronounced relationship between economic growth and price stability. This confirms that inflation is an important, albeit indirect, factor in economic stability.

Correlation analysis confirms that labour market is a key channel through which human capital influences economic stability. Poland is characterised by a strong correlation between employment levels and economic growth. This suggests that an effective economic mechanism for utilising human capital should be regarded as a fundamental principle of socio-economic development (Table 2).

Table 2

**Tools, principles, and foundations for the development of an economic mechanism for utilising human capital in Poland**

Foundations	Principles	Tools
<ul style="list-style-type: none"> <li>– <b>People-centred approach;</b></li> <li>– <b>Integration with an economic strategy;</b></li> <li>– <b>European convergence;</b></li> <li>– <b>Crisis adaptability.</b></li> </ul>	<ul style="list-style-type: none"> <li>– investment orientation (education, retraining, healthcare);</li> <li>– labour market flexibility;</li> <li>– social partnership and inclusion;</li> <li>– long-term economic value creation.</li> </ul>	<ul style="list-style-type: none"> <li>– vocational training, employment subsidies;</li> <li>– education reform and dual training;</li> <li>– EU funds usage to promote skills development and regional employment;</li> <li>– promotion of innovative and highly skilled work;</li> <li>– mobilising migrant labour potential.</li> </ul>

Source: compiled by the authors.

This correlation analysis methodology will also be used to analyse macro-economic relationships in other Visegrad Group countries.

Over the period under review, Poland has developed an integrated model of mechanisms for utilising human capital, combining European employment standards, active government labour market policies, and a strategic approach to workforce development. This has proven to be one of the key factors behind its steady economic growth and successful convergence with Western European countries.

### **Historical and Economic Background to the Development of the Modern Concept of Human Capital Management in Hungary**

The concept of a human capital development mechanism in Hungary has deep historical roots, dating back to the second half of the 19th century. The development of human resources management in Hungary began following the Austro-Hungarian Compromise of 1867. The Age of Dualism (1867–1918) is considered as one of the most dynamic phases of economic growth in historical Hungary: per capita national income grew by an average of 2.5% annually. This period saw the decline of traditional industrial forms (guilds and manufactories) and the emergence of large-scale mechanised industry, laying the foundations for the development of an industrial society (Gulyás & Turcsányi, 2017).

Growth in industrial production and the number of employees led to the emergence of the first elements of a socially oriented labour utilisation mechanism (Vincze, 1971). Meanwhile, the foundations of Western-style human resource management were being established in the public sector, notably through the adoption of Act I of 1883 (the so-called Qualifications Act), which regulated the procedure for filling civil service posts on the basis of professional eligibility.

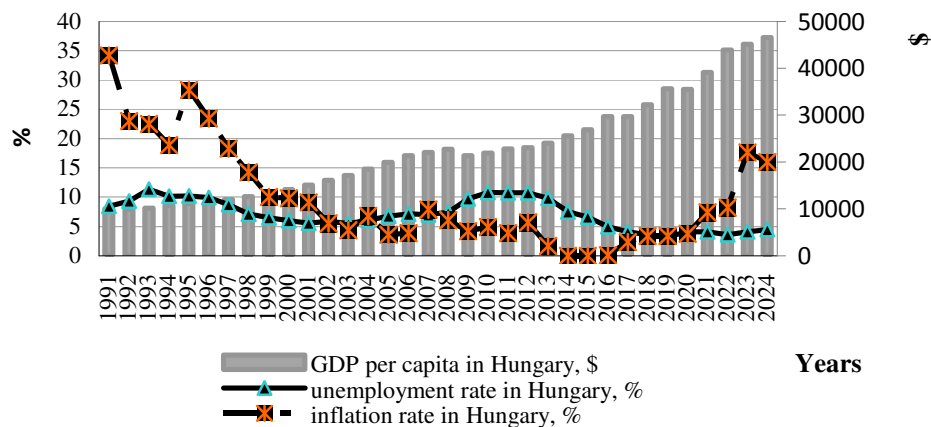
In the 20th century and particularly following the transition to a market economy in the early 1990s, historically established approaches to utilising labour evolved into a modern human capital utilisation mechanism. The initial phase of market reforms was accompanied by high inflation and rising unemployment, leading to a predominantly adaptive nature of human resources policy – through programmes of retraining, social protection, and employment.

Hungary's accession to the European Union in 2004 was a key factor in the institutional modernisation of this sector. Investments from EU funds have contributed to the modernisation of the education system, the development of vocational skills, and the rise in labour mobility (OECD, 2024b). These developments were immediately reflected in the growth in GDP per capita and the decrease in unemployment, confirming the close link between economic performance and the effective management of human capital (Figure 2).

In the 2010s and 2020s, Hungary's approach to utilising human capital was characterised by a focus on increasing the economic activity of the population, attracting foreign investment, and developing the workforce in high-tech sectors. The growth in GDP per capita during this period was accompanied by a fall in unemployment to record lows, demonstrating the effectiveness of combining economic policy with instruments of the mechanism for utilising human capital. Meanwhile, the sharp rise in inflation in 2022–2023 has called for adjustments to employment models and a review of social and labour mechanisms in order to maintain real incomes.

Figure 2

**Trends in inflation, unemployment, and GDP per capita in Hungary for the period 1991–2024**



Source: based on World Bank (n.d.-a, n.d.-b, n.d.-c, n.d.-d).

For Hungary, the consequences of the Russia-Ukraine war are reshaping the mechanism for developing human capital, primarily through cross-border, humanitarian, and energy-economic channels. Unlike Poland and Czech Republic, Hungary has not become a major hub for the long-term resettlement of Ukrainian refugees. However, its geographical proximity to Ukraine and its participation in the Europe-wide temporary protection scheme have increased the importance of institutional coordination and displaced persons' access to the labour market, healthcare, and education. For the economic mechanism for utilising human capital, this means that employment policies must be combined with measures to promote social adaptation, professional mobility, and the protection of vulnerable groups, in particular women with children, those whose educational pathways have been interrupted, and workers in need of retraining (IOM, 2024; UNHCR, 2024; EMN & OECD, 2024).

To interpret the interaction between macroeconomic indicators and human capital, we use correlation analysis (Table 3).

Table 3

**The Pearson and Spearman coefficients for Hungary**

Indicators	Pearson coefficient (r)	Spearman rank correlation coefficient (ρ)
GDP per capita – unemployment rate	–0.665	–0.617
GDP per capita – inflation rate	–0.425	–0.605

Source: authors' calculations.

The results of the correlation analysis indicate a moderate inverse relationship between GDP per capita and unemployment rate in Hungary. The values of the Pearson ( $r = -0.665$ ) and Spearman ( $\rho = -0.617$ ) correlation coefficients suggest that economic growth is accompanied by a fall in unemployment. However, this relationship is less pronounced than in some other Visegrad Group countries.

The correlation between GDP per capita and inflation rate is moderately inverse, with the Spearman coefficient ( $\rho = -0.605$ ) exceeding the Pearson coefficient ( $r = -0.425$ ). This suggests a strong monotonic correlation between economic growth and price stability, as well as the possible influence of non-linear factors and macroeconomic shocks on inflation trends.

Hungary tends to have a less stable and more variable relationship between economic stability and labour market indicators, which may be a consequence of the structural characteristics of its economy and its high sensitivity to inflationary fluctuations. This emphasises the importance of a comprehensive approach to the development of a human capital development mechanism alongside macroeconomic stabilisation policies (Table 4).

Table 4

**Foundations, principles, and tools for the development of an economic mechanism for utilising human capital in Hungary**

Foundations	Principles	Tools
<ul style="list-style-type: none"> <li>– <b>Institutional continuity;</b></li> <li>– <b>State-centrism;</b></li> <li>– <b>Economic adaptability;</b></li> <li>– <b>European integration.</b></li> </ul>	<ul style="list-style-type: none"> <li>– high level of investment in human capital (education, skills, health);</li> <li>– priority of employment over passive social support;</li> <li>– flexibility of employment forms and labour remuneration;</li> <li>– social stability and control over inflation-related risks;</li> <li>– effectiveness and accountability of government programmes.</li> </ul>	<ul style="list-style-type: none"> <li>– employment and retraining programmes;</li> <li>– tax and fiscal incentives for job creation;</li> <li>– investment of EU funds in skills and education development;</li> <li>– support for industrial and innovation-related employment;</li> <li>– modernisation of the civil service and the system of professional standards.</li> </ul>

Source: compiled by the authors.

Thus, the human capital utilisation mechanism in Hungary has evolved from reactive social protection measures in the 1990s to a strategic system integrated into the state's economic policy. Macroeconomic trends confirm that investment in human capital has become a key factor in stabilising the economy, increasing productivity, and improving competitiveness of the Hungarian economy.

The concept of human capital management in the Czech Republic took shape against the backdrop of profound political and economic transformations and was closely linked to trends in key macroeconomic indicators. Over the past few decades, human resource management has evolved through three key stages, reflecting changes in the utilisation and development of human capital (Kocianová, 2012).

### **Historical and Economic Background to the Development of the Modern Concept of Human Capital Management in the Czech Republic**

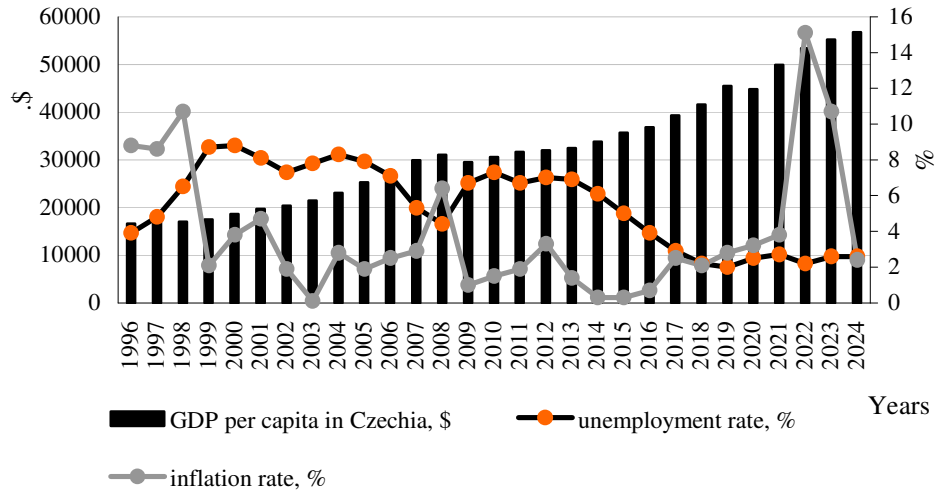
The first stage, covering the 1970s and 1980s, was characterised by a bureaucratic approach to human resources management. Human capital was managed in a centralised manner and was predominantly administrative and politically motivated. In these circumstances, human resources management failed to fulfil its role in boosting labour productivity and hindered the effective utilisation of labour potential (Pospíšil' 2019).

The second stage began in the early 1990s, following radical political and economic changes. The operational approach to human resource management emerged against a backdrop of rapid liberalisation and the abandonment of centralised regulation.

Since the mid-1990s, a strategic approach to human capital management has taken shape in the Czech Republic (Keeley, 2007). The transition to strategic human resource management coincided with the stabilisation of macroeconomic indicators, growth in GDP per capita, and a steady decline in unemployment rate, particularly following the country's accession to the European Union in 2004 (Figure 3).

Czech Republic's accession to the European Union in 2004 marked a key milestone in the development of the modern concept of an economic mechanism for utilising human capital. As evidenced by the trend in GDP per capita, the economy showed steady growth between 2004 and 2008, accompanied by falling unemployment and stable inflation. During this period, the mechanism for utilising human capital acquired a strategic dimension and became an integral part of the state's economic policy.

Figure 3

**Trends in GDP per capita, inflation, and unemployment in the Czech Republic for the period 1991–2024**

Source: based on World Bank (n.d.-a, n.d.-b, n.d.-c, n.d.-d).

The global financial crisis of 2008–2009 led to a temporary slowdown in economic growth and an increase in unemployment, emphasising the importance of proactive government policy in labour market. The implementation of employment and human capital investment programmes has contributed to a rapid recovery in economic momentum. In subsequent years, particularly between 2014 and 2019, Czech Republic had one of the lowest unemployment rates in the European Union, demonstrating the effectiveness of its economic model for utilising human capital and the high level of labour force mobilisation.

The period from 2020 to 2023, marked by the COVID-19 pandemic and inflationary shocks, demonstrated the resilience of the Czech system for developing and utilising human capital (Table 5).

The results of the correlation analysis indicate a strong inverse relationship between GDP per capita and unemployment rate in the Czech Republic. The values of the Pearson ( $r = -0.782$ ) and Spearman ( $\rho = -0.720$ ) coefficients confirm that economic growth is accompanied by a significant and steady reduction in unemployment, suggesting that labour market and the mechanisms for utilising human capital are functioning highly effectively.



Table 5

**The Pearson and Spearman coefficients for the Czech Republic**

Indicators	Pearson coefficient (r)	Spearman rank correlation coefficient (ρ)
GDP per capita – unemployment rate	–0.782	–0.720
GDP per capita – inflation rate	0.118	–0.069

Source: authors' calculations.

The correlation between GDP per capita and inflation rate is weak and statistically insignificant ( $r = 0.118$ ;  $\rho = -0.069$ ). This shows that economic growth is relatively independent of short-term fluctuations in inflation and points to a high level of macroeconomic stability and effective monetary policy.

Among the Visegrad Group countries, the Czech Republic demonstrates one of the most balanced models of interaction between economic stability and labour market, creating favourable conditions for the development and implementation of a long-term mechanism for utilising human capital (Table 6).

Table 6

**Foundations, principles, and tools for the development of an economic mechanism for utilising human capital in the Czech Republic**

Foundations	Principles	Tools
<ul style="list-style-type: none"> <li>– <b>Institutional continuity;</b></li> <li>– <b>Market autonomy of organisations;</b></li> <li>– <b>European integration;</b></li> <li>– <b>Social balance;</b></li> <li>– <b>Strategic importance.</b></li> </ul>	<ul style="list-style-type: none"> <li>– continuous learning, skills development;</li> <li>– professionalism and depoliticisation of personnel decisions;</li> <li>– adaptability to economic cycles and crises;</li> <li>– cooperation and partnership between the state, businesses, and employees;</li> <li>– effectiveness and focus on labour productivity;</li> <li>– long-term economic value creation.</li> </ul>	<ul style="list-style-type: none"> <li>– support for employment;</li> <li>– well-developed system of vocational and dual education;</li> <li>– strategic personnel planning at company level;</li> <li>– investment of EU funds in human capital development;</li> <li>– motivational and HR practices aimed at mobilising and developing competencies;</li> <li>– support for innovation-related and high-quality employment;</li> <li>– social dialogue and collective bargaining institutes.</li> </ul>

Source: compiled by the authors.

The situation in the Czech Republic has changed since 2022 following Russia's large-scale invasion of Ukraine. These changes were driven by the high concentration of Ukrainian beneficiaries of temporary protection relative to the country's total population and the rapid integration of some displaced persons into labour market. This has increased the importance of mechanisms for recognising professional skills, providing language training, integrating children into the education system, and preventing the de-skilling of highly qualified workers. For the Czech human capital model, the war in Ukraine has become a factor not only in terms of the humanitarian response but also in terms of the structural adjustment of employment policy against the backdrop of chronic labour shortages. This requires balancing the short-term recruitment of workers and the long-term development of skills (OECD, 2023b; OECD, 2023c).

Therefore, the economic mechanism for developing and utilising human capital in the Czech Republic has emerged through a gradual evolution from the socially oriented mechanisms of the transition period to a strategic model integrated into the state's economic policy. Trends in key economic indicators confirm that investment in human capital has become one of the key drivers of the country's sustainable economic growth and competitiveness.

### **Historical and Economic Background to the Development of the Modern Concept of Human Capital Management in Slovakia**

The economic mechanism for developing and utilising human capital in Slovakia has been shaped by profound socio-economic transformations linked to the dissolution of Czechoslovakia, the transition to a market economy, and the country's subsequent integration into the European Union. Between 1990 and 2024, approaches to human capital management evolved in tandem with key macroeconomic trends, including inflation, employment, and GDP per capita (Baláž, 2007).

In the early stages of its transition in the 1990s, the Slovak economy was characterised by macroeconomic instability, which manifested itself in high inflation and rising unemployment. The main focus was on preserving jobs, providing social protection for workers, and offering basic retraining programmes.

Gradual macroeconomic stabilisation in the late 1990s and early 2000s provided the conditions for a shift towards a more systematic approach to developing and utilising human capital. An important institutional foundation for the development of the modern concept of human capital in Slovakia is the enshrinement of sustainable development principles in legislation. In particular, Article 6 of Law No. 17/1992 defines sustainable development as a framework model of public policy that directly influences approaches to human resource management. In accordance with government decisions, in particular Government Resolution No. 655/1997, the evaluation of strategies and programmes relating to the staffing of enterprises and

organisations is based on a set of fundamental principles, which are compulsory for state institutions and are in line with the UN's general approaches.

Taken together, these principles form a people-centred and balanced model of the human capital utilisation mechanism, which combines:

- prioritising human resources development and healthcare;
- efficient and rational use of resources;
- preventing and minimising long-term risks;
- social, intergenerational, and territorial justice;
- participation, solidarity, and subsidiarity in managerial decision-making;
- ethical and socially and environmentally responsible management practices.

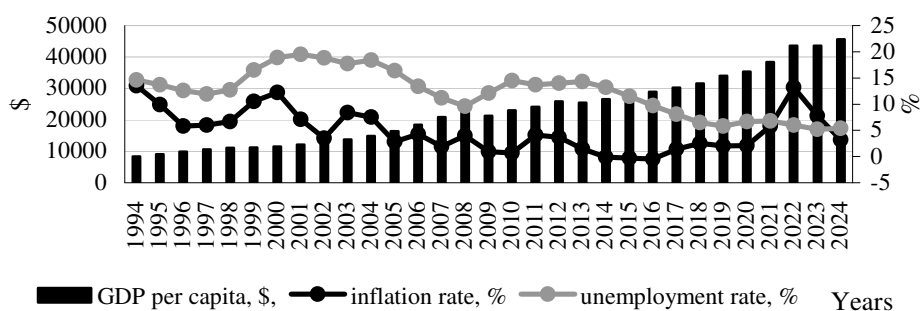
Applying these principles to the design of a mechanism for utilising human capital has increased labour market resilience and the adaptability of the workforce, while aligning economic growth with social development objectives (Ministry of the Environment of the Slovak Republic, 2001).

European integration has contributed to the harmonisation of labour legislation, the adoption of European employment standards, and the expansion of access to EU structural funds. This has paved the way for the implementation of human capital development programmes aimed at boosting labour productivity, encouraging labour mobility, and reducing structural unemployment.

Particular emphasis was placed on developing technical and digital skills, which was in line with the structure of the Slovak economy and its focus on industrial production and exports (International Monetary Fund, 2025) (Figure 4).

Figure 4

**Trends in GDP per capita, inflation, and unemployment in Slovakia for the period 1991–2024**



Source: based on World Bank (n.d.-a, n.d.-b, n.d.-c, n.d.-d), International Monetary Fund (2025).

The period from 2020 to 2023, marked by the COVID-19 pandemic and a sharp increase in inflation, revealed both the vulnerabilities and adaptability of Slovakia's human capital management system. The surge in inflation has affected people's real incomes, highlighting the need to adjust wage policies, strengthen social dialogue, and introduce flexible forms of employment.

An analysis of the correlation between macroeconomic indicators in the country under study will identify the most important factors for creating favourable conditions to develop human potential (Table 7).

Table 7

**The Pearson correlation coefficient and the Spearman rank correlation coefficient for Slovakia**

Indicators	Pearson coefficient (r)	Spearman rank correlation coefficient (ρ)
GDP per capita – unemployment rate	–0.826	–0.729
GDP per capita – inflation rate	–0.320	–0.460

Source: authors' calculations.

The results of the correlation analysis suggest a very strong inverse relationship between GDP per capita and unemployment rate in Slovakia. The values of the Pearson ( $r = -0.826$ ) and Spearman ( $\rho = -0.729$ ) coefficients indicate that economic growth is closely linked to a reduction in unemployment, which confirms the key role of the labour market in fostering economic stability.

The correlation between GDP per capita and inflation rate is weak to moderate inverse, indicating a limited but evident impact of inflationary trends on economic growth. The higher Spearman's coefficient compared with Pearson's suggests possible non-linearity in this relationship and the economy's sensitivity to specific macroeconomic shocks (Table 8).

To date, the integration of Ukrainian displaced persons into the Slovak labour market has helped to maintain employment levels in sectors facing labour shortages; however, it has also highlighted the need to strengthen language training, vocational adaptation, social support, and regional coordination of services. Consequently, the Slovak mechanism for developing human capital in this new context should be viewed as a combination of employment policy, social cohesion, border resilience, and adaptation to long-term security risks (OECD, 2024a; Directorate-General for Migration and Home Affairs, 2024; EMN & OECD, 2024).

Table 8

**Foundations, principles, and tools for the development of an economic mechanism for utilising human capital in Slovakia**

Foundations	Principles	Tools
<ul style="list-style-type: none"> <li>– <b>Historical transformation</b></li> <li>– <b>Macroeconomic stabilisation</b></li> <li>– <b>People-centred approach</b></li> <li>– <b>Sustainable development</b></li> <li>– <b>Harmonising labour legislation, employment policy, and education with EU standards</b></li> </ul>	<ul style="list-style-type: none"> <li>– Prioritising human resources and healthcare</li> <li>– Efficiency and rational use of resources</li> <li>– Prevention and predictability (minimising long-term risks)</li> <li>– Social, intergenerational, and territorial justice</li> <li>– Employment as key stabilising economic factor</li> <li>– Adaptability to macroeconomic shocks</li> <li>– Solidarity and social dialogue</li> <li>– Subsidiarity</li> <li>– Ethical and socially responsible management</li> <li>– Long-term orientation on economic and social value creation</li> </ul>	<ul style="list-style-type: none"> <li>– Labour market policy instruments</li> <li>– Educational and qualification tools</li> <li>– Institutional and regulatory tools</li> <li>– Financial and investment tools</li> <li>– Tools for social partnership and participation</li> <li>– Adaptive crisis management tools</li> <li>– Tools for promoting mobility and integration.</li> </ul>

Source: compiled by the authors.

Thus, the human capital development mechanism in Slovakia has evolved from reactive social protection mechanisms during the transition crisis to a strategic model integrated into national economic policy.

When examining the concept of developing competitive human capital in the Visegrad Group countries, it is worth considering the Human Development Index (HDI). Unlike purely economic indicators, the HDI combines characteristics of life expectancy, education, and income, thereby directly reflecting the key components of human capital (Table 9).

An analysis of HDI trends in Poland, Czech Republic, Slovakia, and Hungary for 2013–2023 reveals long-term trends in human capital development against the backdrop of post-socialist transformation, European integration, and the growing role of the knowledge economy. The gradual increase in the HDI values across all countries in the region suggests a consistent accumulation of human capital and an improvement in the effectiveness of state socio-economic policy.

Table 9

**Trends in the Human Development Index for the Visegrad Group countries  
 (Human Development Report)**

Years	Poland	Hungary	Czech Republic	Slovakia
2013	0.855	0.843	0.870	0.840
2024	0.863	0.851	0.878	0.845
2015	0.834	0.818	0.861	0.830
2016	0.843	0.826	0.870	0.844
2017	0.855	0.836	0.878	0.89
2018	0.865	0.843	0.888	0.896
2019	0.872	0.845	0.891	0.902
2020	0.880	0.854	0.9	0.860
2021	0.865	0.851	0.895	0.852
2022	0.865	0.867	0.895	0.855
2023	0.906	0.870	0.915	0.880

Source: compiled by the authors based on UNDP (n.d.).

Meanwhile, fluctuations in the index values in certain years reflect the vulnerability of human development to external shocks, particularly macroeconomic instability and the challenges posed by the pandemic, emphasising the importance of institutional resilience and investment in social infrastructure.

**The Role of the Human Resources Management Concept  
 in the Visegrad Group Countries**

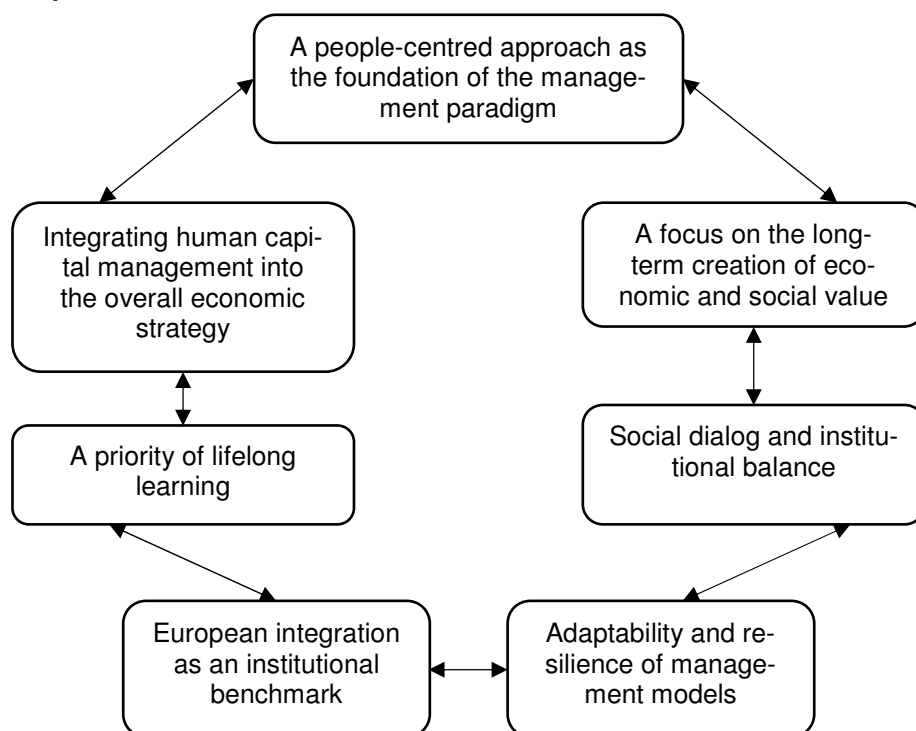
An analysis of the evolution of economic models, labour markets, and institutional changes in the Visegrad Group countries reveals several common basic principles that determine the current economic mechanism for developing and utilising human capital in these countries (Figure 5).

Following Russia's full-scale invasion of Ukraine in 2022, the concept of human capital management in the Visegrad Group countries has taken on a new security dimension. While the key priorities prior to 2022 included European convergence, labour productivity, labour mobility, digitalisation, and skills development, the war on the EU's eastern border has added labour market resilience, the capacity to integrate forced migrants, the adaptation of education and vocational training systems to crisis conditions, psychological support for employees, the energy and cyber resilience of organisations, and the readiness of human capital to operate in conditions of prolonged geopolitical uncertainty (European External Action Service, 2022; NATO, 2022).

Across the Visegrad Group countries, Russia's full-scale war against Ukraine has led to an expansion of the core principles of the human capital management concept. The traditional principles, such as strategic focus, a people-centred approach, an emphasis on investment, flexibility, social partnership, and European integration, should now be supplemented by security resilience, crisis adaptability, the integration of forcibly displaced human capital, psychological and social support for employees, the development of defence-technology and digital competencies, as well as the ability of state and corporate human resource management systems to respond to prolonged external shocks. These are the principles that shape the updated logic of the economic mechanism for developing and utilising human capital within the V4, in the context of the new European security landscape.

Figure 5

**Key principles of the human capital management concept in the Visegrad Group countries**



Source: developed by the authors.

## Conclusions

The Visegrad Group countries are characterised by a combination of relatively similar initial conditions in the early 1990s and different national reform models. All four countries experienced high inflation, rising unemployment, deindustrialisation, and migration outflows. The response to these challenges was the gradual development of strategic approaches to the mechanisms for building and utilising human capital, which included reforming the education system, implementing active employment policies, developing vocational training, and integrating human potential into the overall economic development strategy.

The experience of the Visegrad Group countries in overcoming crises is particularly revealing in the context of recurring external shocks, such as the global financial crisis of 2008–2009, the COVID-19 pandemic, and the energy and inflation crises of the 2020s. In these circumstances, it was precisely the effective economic mechanism for utilising human capital that became one of the key factors in economic resilience: labour markets demonstrated relative adaptability, while investment in education and skills enabled economies to remain competitive even under adverse macroeconomic conditions.

At the same time, the current stage of development in the Visegrad Group countries differs from previous crises because economic and social adjustment is taking place against the backdrop of a long-standing military threat on the EU's eastern border. The Russian Federation's aggressive foreign policy and the consequences of its large-scale military aggression against Ukraine are creating a new set of challenges for the V4 in terms of labour market security, population mobility, refugee integration, skills retention, psychosocial support, and the need to align human capital policy with defence, energy, and infrastructure resilience policies (NATO, 2022; European External Action Service, 2022; OECD, 2023d). Therefore, the security dimension should be regarded as an integral part of the modern economic mechanism for developing and utilising human capital in the Visegrad Group countries.

For Ukraine, the experience of the Visegrad Group countries is extremely valuable for several reasons. Firstly, like the V4 countries in the 1990s, Ukraine is undergoing profound structural transformation and post-crisis recovery. Secondly, the Visegrad Group countries have demonstrated that human capital can serve as both a social and an economic resource for recovery, provided it is managed strategically. Thirdly, their experience is relevant given their shared post-socialist heritage, geographical proximity, and integration into the European legal and institutional framework.

Future research should focus on a more in-depth assessment of the impact of the security situation on human capital development mechanisms in each of the countries under study. In particular, there is potential for developing a comparative index of human capital security resilience for the Visegrad Group countries. It could cover indicators such as the integration of Ukrainian refugees into



the labour market and education, the adaptation of vocational training systems to the needs of defence and critical infrastructure, the impact of energy and logistical risks on employment, as well as the capacity of state institutions to provide psychosocial support and ensure the retention of skills. Another area for future research should focus on scenario-based modelling of migration, remigration, and circular mobility between Ukraine and the V4 countries during the post-war recovery. This would provide a more accurate picture of the long-term consequences of the war for the region's human capital (European External Action Service, 2022; EMN & OECD, 2024; UNHCR, 2025).

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