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# THE IMPACT OF DEMOGRAPHIC RESILIENCE ON THE ECONOMIC DEVELOPMENT OF COUNTRIES (ON THE EXAMPLE OF THE VISEGRAD GROUP COUNTRIES)

## ABSTRACT

The population, its physical well-being and development is a defining feature of society, the basis of the state's strength. Taking into account demographic trends is important in shaping strategies for economic development. Understanding the impact of population changes on the labour market, consumer demand, investment climate, and population expenditures is crucial for creating a sustainable and competitive economy.

The demographic resilience of a country is determined by its ability to ensure quantitative and qualitative reproduction of demographic structures at various stages of historical development. Demographic resilience is a dynamic category that changes over time, and the level of a country's demographic resilience is defined by the parameters of its functioning.

The level of demographic resilience depends on trends in population reproduction and mortality, demographic dependency, migration processes, gender equality, and the development of the healthcare system. Under these conditions, the assessment of the demographic resilience of the Visegrad Group countries was carried out in the context of these specified directions, allowing for the calculation of an indicator of the level of demographic resilience for Poland, the Czech Republic, Slovakia, and Hungary.

The analysis of the level of demographic resilience in the Visegrad Group countries indicates an average value. However, the analysis of reproduction and mortality indicators suggests the presence of demographic crises in these countries. Population decline, falling birth rates, and an increase in mortality rates are key characteristics of the demographic crisis. Therefore, the Visegrad Group countries need to implement effective policy measures to ensure the development and efficient use of human capital, as well as social protection for migrants, refugees, and citizens, at a sufficient level through a politically and financially stable system.

**Keywords:** demographic resilience, shock influences, economic development, international migration, demographic policy, Visegrad group countries

**JEL Classification:** F15, F22, F66, H55, J11, J61

## INTRODUCTION

The greatest threat to any country is the destruction of its gene pool. The COVID-19 pandemic, international conflicts, and migration processes are altering the structure of society. In response to these challenges, significant changes are taking place in the functioning of many countries worldwide. In the contemporary world, amid the overall trend of population growth, which has already reached 8 billion people today, there are countries where the population is steadily decreasing, experiencing depopulation. The Visegrád Group countries belong to such nations.

Changes in population size and structure determine the scale of national production. Positive empirical experiences from developed and emerging economies demonstrate that a multitude of both natural factors (total population and density, the proportion of

economically active population in the overall structure, birth and mortality rates, average life expectancy, etc.) and mechanical factors (character and dynamics of migration, level of migrants' qualifications, gender equality level, etc.) influence changes in GDP.

Contemporary demographic reality needs to be systematically and thoroughly studied, well understood and acknowledged, and based on this, rational and effective ways to respond to current demographic processes should be sought. Demographic resilience reflects the ability and potential of a country (or regions) to ensure quantitative and qualitative reproduction of demographic structures under specific historical, socio-economic, legal, and natural conditions.

Mitigating negative trends and harnessing the positive consequences brought about by demographic changes are not possible without determining the real level of a country's demographic resilience. The low birth rate, long-term consequences of the COVID-19 pandemic, and the mass influx of Ukrainian refugees to the Visegrád Group countries in 2022 highlight the need to investigate their demographic resilience.

Determining the level of a country's demographic resilience is an important task due to its impact on all spheres of life, providing a multiplier effect for the economic development of the state. Currently, there is no unified scientifically substantiated approach and methodology for assessing the level of a country's demographic resilience, which is due to the uncertainty of criteria, the methodological basis for calculating indicators, and a lack of understanding regarding the stages of methodology formation. The need for the development of a scientific-applied toolkit suitable for justifying factors of demographic development emphasizes the problem of developing a methodology for calculating the level of demographic resilience.

## LITERATURE REVIEW

The concept of demographic resilience underscores the importance of population dynamics for social and economic development, individual well-being, as well as political stability and security. Demographic resilience involves the ability to analyze population dynamics, assess its multifaceted impact on socio-economic development, and formulate evidence-based, relevant, and effective policies and programs that fully consider current and projected demographic trends (UNFPA, 2022).

The convergence of demography and economics into a powerful interdisciplinary field took place in Western academic discourse at the turn of the 1970s-1980s. J.L. Simon and R. Gobin, studying the corresponding socio-demographic and economic interdependencies for developing countries, identified a lag effect of birth rate growth. This was because the outcomes of social production, obtained in the late 1970s, directly depended on the labour activity of individuals born significantly earlier (J. Simon, R. Gobin, 1980). R.D. Lee, based on international comparisons of economic growth rates and population growth, did not find a stable and statistically significant relationship between the indicators but suggested that in the long term, demographic dynamics would significantly impact the scale of social production (R. Lee, 1983). A.J. Coale noted that high per capita income growth rates are characteristic of societies with lower birth and death rates, i.e., countries with stable demographic structures (A. Coale, 1986).

Demographic resilience is simultaneously a consequence of balanced national economic policies, the result of the prolonged evolutionary development of society, and an indication of the manageability and predictability of socio-demographic processes. To identify resilience factors, it is worthwhile to study the nature of the influence of demographic processes on basic macro indicators. It should be assumed that changes in GDP per capita somehow depend on a set of socio-demographic parameters. These indicators mostly include population growth rates, population density, the relative weight of the economically active population in the overall structure, birth and death rates, and morbidity levels (S. Kozlovskiy, H. Mazur, A. Npytaliuk, 2019).

The development of the economy of any country, the distribution of economic and political forces on a regional and global scale, largely depend on demographic and migration processes. Demographic growth can influence economic development even in spite of factors such as misguided political choices, corruption, or a lack of natural resources. It should be noted that population size is susceptible to significant economic factors and significantly influences them. In particular, the impact of demography on the economy occurs in several directions:

1. Economic growth: Per capita GDP growth slows down due to the reduction in the share of working-age citizens, leading to a decrease in overall productivity and investments;
2. Prosperity: Demographic factors play a significant role in shaping the share of labour incomes, revealing a connection between changes in the working-age population and per capita economic growth, and the level of poverty;

3. Labour market: Increased life expectancy and a higher retirement age increase employment among older individuals, requiring qualification enhancement programs for the elderly and the creation or adaptation of jobs considering their health (Pyschulina, 2023).

P. Capdevila et al. define demographic resilience as the population's ability to withstand changes in their demographic structure and recover from them, usually accompanied by changes in population size (P. Capdevila et al., 2020). Specifically, measurements of demographic resilience include physical health, psychological well-being, quality of life, and hygiene (M. Suleimany et al., 2022). The link between resilience, demographic characteristics of society, and the level of stress is investigated by S. Kimhi, et al. (S. Kimhi, 2020).

P. Capdevila (2020) in the measurement of demographic resilience uses two components: resistance and recovery. Further resistance consists of two different processes, demographic compensation and demographic resistance. Demographic compensation incorporates amplifications in population size after disturbance, which compensate for post-disturbance reductions in population size. Demographic resistance can be estimated using population attenuation bounds, where lower bounds indicate that the population or the species is less resistant. Demographic recovery quantifies the time required to reach population stability.

In the current conditions of globalization, the issue of demographic resilience for any country in the world is exceptionally relevant. Excessive population growth and its excessive decline negatively impact demographic resilience, posing a threat to socio-economic, financial, and political stability (I. Zaiukov, et al. 2021). The concept of demographic resilience should be fully integrated into the social and economic development strategy of a country with the aim of enhancing productive potential, proportional growth of human and physical capital, and qualitatively improving public well-being (S. Kozlovskiy, A. Nepyaliuk, 2019).

Europe currently finds itself caught in a demographic transition which will have ample consequences. Individuals have fewer children and live a longer and healthier life. Many choose to relocate in their search for better opportunities. As a result, Europe's population is rapidly ageing. Already today, one in four Europeans is aged 60 or older. By 2050, more than one-third of the continent's population will have entered this age group (C. Muresan, 2022).

Migration processes play a crucial role in the socio-economic, socio-political, and cultural life of the Visegrad Group countries. During the socialist period, population movements were limited in nature. Over time, particularly after the accession of the Visegrad Group countries to the European Union, there has been an intensification of their participation in European migration processes characterized by an increase in emigration, primarily for work purposes, to Western Europe, notably to Germany, France, Italy, and the United Kingdom (Y. Tsevukh, A. Krupytsia, 2021).

The perception of human resources in terms of regional development is one of the basic priorities in the Regional Development Strategy of V4 countries (Ministerstvo pro místní rozvoj ČR, 2013). The importance of individual factors for regional development stems from the nature of human resources, which are an active player in further development, and this makes them distinct from other factors of a passive nature. Human resources are able to transform other resources or are essential for their functioning (Národná stratégia regionálneho rozvoja Slovenskej republiky, 2010). Human resources and their potential for development are determined by social and demographic factors. Therefore, demographic trends are currently affected by a large number of qualified policy decisions in the areas of economics, social affairs, employment and education. The demographic profile of countries and regions is influenced by past population trends, yet it is also one determining the future development and further development potential of territorial units and societies (E. Koisova et. al. 2021).

Researchers, relying on the criterion of "social protection of the population," identify key organizational and legal conditions for ensuring demographic resilience, including quality and accessible healthcare, gender equality, developed system of social programs and assistance, implementation of family-friendly policies, and effective management of migration and refugees. The development of organizational and legal conditions depends on effective state policies and a comprehensive approach to addressing this issue. Demographic resilience is one of the important conditions for ensuring sustained economic development based on a balance between the qualifications of workers, their quantity, readiness, and the ability not only to perform specific tasks but also to participate in their formulation and determine the ways to achieve the desired result (K. Nikolaiets et al., 2023). The practical exploration of demographic resilience issues is conducted by the United Nations Population Fund (UNFPA). For instance, on December 1-2, 2022, in Sofia, Bulgaria, a jointly organized conference by UNFPA, the Ministry of Foreign Affairs of Bulgaria, and "Population Europe" took place. The conference focused on discussing solutions related to demographic changes, ageing, low birth rates, and population migration in Eastern European and Central Asian countries. The topics covered included declining birth rates, ageing populations, urbanization, rural

development, gender and family policies, expanding rights and opportunities for youth, and financing social and demographic policies. The conference concluded with the establishment of the Sofia Alliance—a community of policymakers and practitioners to support countries in the region in strengthening their demographic resilience. Additionally, it announced the Decade of Demographic Resilience (2022-2032) to promote demographic resilience and the sustainable development agenda (UNFPA, 2022).

Therefore, aspects of demographic resilience are explored both theoretically and practically. However, the considered approaches do not fully address the toolkit and methodologies for calculating a country's level of demographic resilience.

## AIMS AND OBJECTIVES

The aim of this research is to establish a methodology for assessing the level of demographic resilience, using the Visegrad Group countries as an example, and to identify the relationships between demographic characteristics and the economic development of these countries.

## METHODS

In the course of the conducted research, a combination of methods was employed, including grouping and tabular methods – for compiling a list of indicators for calculating the level of demographic resilience; index, indicative, and statistical groupings – for standardizing indicators and calculating the composite index of demographic resilience for the Visegrad Group countries; systemic-structural and comparative analysis – for evaluating demographic resilience in the Visegrad Group countries across the following dimensions: population reproduction; population mortality; demographic dependency; migration processes; gender equality; development of the healthcare system; and the method of scientific abstraction – for justifying generalizations and conclusions drawn from the research.

## RESULTS

### *Methodological Guidelines for Calculating the Level of a Country Demographic Resilience*

The methodology has been developed to determine the level of a country's demographic resilience and defines a list of key indicators, their threshold values, as well as the algorithm for calculating the composite index of demographic resilience. The methodology serves an informational, advisory, and explanatory purpose. Executive authorities, research institutions, and other entities within their mandates may utilize this methodology to assess the level of a country's demographic resilience for decision-making. The compilation of the indicator list is based on the selection of metrics that most comprehensively characterize demographic resilience in a country across the following dimensions: population reproduction; population mortality; demographic dependency; migration processes; gender equality; and the development of the healthcare system.

Calculations are conducted based on official statistical data from the World Bank, United Nations Population Division, Eurostat, United Nations Statistical Division, UNICEF, Population Reference Bureau, Central Intelligence Agency, and the rating reports of international non-governmental organizations such as the Fund for Peace, the Johns Hopkins Center for Health Security, the Nuclear Threat Initiative (NTI), the Economist Intelligence Unit, Numbeo, Weworld GVC Onlus, European Institute for Gender Equality, and the World Economic Forum. The list of indicators and sources of input information for the components of a country's demographic resilience is provided in Table 1.

**Table 1. Indicators for Assessing the Level of a Country Demographic Resilience.**

№	Indicator	Indicator Characteristics	The threshold value	Source of input data
<b>Population Reproduction Indicators</b>				
1.	Population Growth, %	The difference in the number of live births and the number of deaths	≥ 3	World Bank, <a href="https://data.worldbank.org/indicator/SP.POP.GROW">https://data.worldbank.org/indicator/SP.POP.GROW</a> Eurostat, <a href="https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Population_and_population_change_statistics">https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Population_and_population_change_statistics</a> United Nations Statistical Division, <a href="https://unstats.un.org/unsd/demographic/sconcerns/population/default.htm">https://unstats.un.org/unsd/demographic/sconcerns/population/default.htm</a>
2.	Birth rate, %	This entry gives the average annual number of births during a year per 1,000 persons in the population at midyear; also known as the crude birth rate	≥ 15	Central Intelligence Agency, <a href="https://www.cia.gov/the-world-factbook/field/birth-rate/">https://www.cia.gov/the-world-factbook/field/birth-rate/</a>
3.	Rate of natural increase, %	The birth rate minus the death rate, expressed as a percentage. This value represents the estimated rate of population growth without regard for migration	≥ 1,7	Population Reference Bureau, <a href="https://h7.prb.org/international/indicator/rate-natural-increase/snapshot">https://h7.prb.org/international/indicator/rate-natural-increase/snapshot</a>
4.	Gross reproduction rate, %	This entry presents the average number of daughters born alive that a group of women would have in their lifetime if the age-specific fertility rate were to apply to them in a given period, usually a calendar year	≥ 1,1	Central Intelligence Agency, <a href="https://www.cia.gov/the-world-factbook/field/gross-reproduction-rate/">https://www.cia.gov/the-world-factbook/field/gross-reproduction-rate/</a>
5.	Life expectancy at birth, years	Life expectancy at birth compares the average number of years to be lived by a group of people born in the same year if mortality at each age remains constant in the future	≥ 70	Central Intelligence Agency, <a href="https://www.cia.gov/the-world-factbook/field/life-expectancy-at-birth/country-comparison/">https://www.cia.gov/the-world-factbook/field/life-expectancy-at-birth/country-comparison/</a>
<b>Population Mortality Indicators</b>				
6.	Death rate, crude (per 1,000 people), %	The demographic indicator representing the number of deaths per year per 1,000 inhabitants divided by the average total population. It is used to characterize the intensity of mortality	≤ 8	World Bank, <a href="https://data.worldbank.org/indicator/SP.DYN.CDRT.IN">https://data.worldbank.org/indicator/SP.DYN.CDRT.IN</a>
7.	Mortality rate, infant (per 1,000 live births), %	The number of infant deaths under one year of age per 1000 live births	≤ 4	World Bank, <a href="https://data.worldbank.org/indicator/SP.DYN.IMRT.IN">https://data.worldbank.org/indicator/SP.DYN.IMRT.IN</a> UNICEF, <a href="https://data.unicef.org/topic/child-survival/neonatal-mortality/">https://data.unicef.org/topic/child-survival/neonatal-mortality/</a>
8.	Maternal mortality ratio (modeled estimate, per 100,000 live births)	The annual number of female deaths per 100,000 live births from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes)	≤ 100	World Bank, <a href="https://data.worldbank.org/indicator/SH.STA.MMRT">https://data.worldbank.org/indicator/SH.STA.MMRT</a> UNICEF, <a href="https://data.unicef.org/topic/maternal-health/maternal-mortality/">https://data.unicef.org/topic/maternal-health/maternal-mortality/</a>
9.	Population ageing rate, %	The proportion of population aged 65 and over	≤ 18	World Bank, <a href="https://data.worldbank.org/indicator/SP.POP.65UP.TO.ZS">https://data.worldbank.org/indicator/SP.POP.65UP.TO.ZS</a> United Nations Population Division, <a href="https://population.un.org/wpp/">https://population.un.org/wpp/</a>
<b>Demographic Dependency Indicators</b>				
10.	Age dependency ratio (% of working-age population)	The ratio of dependents--people younger than 15 or older than 64--to the working-age population--those ages 15-64. Data are shown as the proportion of dependents per 100 working-age population	≤ 60	World Bank, <a href="https://data.worldbank.org/indicator/SP.POP.DPND">https://data.worldbank.org/indicator/SP.POP.DPND</a>
11.	The Demographic Pressures Indicator	The indicator considers demographic characteristics, such as pressures from high population growth rates or skewed population distributions, such as a "youth or age bulge," or sharply divergent rates of population growth among competing communal groups, recognizing that such effects can have profound social, economic, and political effects	≤ 5	Fund for Peace, <a href="https://fragilestatesindex.org/indicators/s1/">https://fragilestatesindex.org/indicators/s1/</a>
<b>Migration Indicators</b>				
12.	Net migration rate, %	Net migration rate compares the difference between the number of persons entering and leaving a country during the year per 1,000 persons (based on midyear population)	≥ 1	Central Intelligence Agency, <a href="https://www.cia.gov/the-world-factbook/field/net-migration-rate/">https://www.cia.gov/the-world-factbook/field/net-migration-rate/</a>
13.	Refugees and Displaced Persons index	The Refugees and Internally Displaced Persons Indicator measures the pressure upon states caused by the forced displacement of large communities as a result of social, political, environmental or other causes, measuring displacement within countries, as well as refugee flows into others	≤ 5	Fund for Peace, <a href="https://fragilestatesindex.org/indicators/s2/">https://fragilestatesindex.org/indicators/s2/</a>
<b>Gender Equality Indicators</b>				
14.	The Global Gender Gap Index	The Index benchmarks the current state and evolution of gender parity across four key dimensions (Economic Participation and Opportunity, Educational Attainment, Health and Survival, and Political Empowerment)	≥ 0,6	World Economic Forum, <a href="https://www.weforum.org/publications/series/global-gender-gap-report/">https://www.weforum.org/publications/series/global-gender-gap-report/</a>
15.	The Gender Equality Index	The scores are based on the gaps between women and men in terms of the levels of achievement in six core domains: work, money, knowledge, time, power and health, and their sub-domains. The Index also has two additional domains: violence against women and intersecting inequalities	≥ 50	European Institute for Gender Equality, <a href="https://eige.europa.eu/gender-equality-index/2023">https://eige.europa.eu/gender-equality-index/2023</a>
16.	WeWorld Index	The Index is composed of 30 indicators grouped into 15 dimensions, which refer to 4 fundamental areas for the implementation of the rights of women, girls and children: health, education, economy and society, to which is added the environmental and cultural context, decisive in the quality of life of these two social categories	≥ 75	Weworld GVC Onlus, <a href="https://www.weworld.it/en/news-and-stories/news/weworld-index-2022">https://www.weworld.it/en/news-and-stories/news/weworld-index-2022</a>
<b>Indicators of Healthcare System Development</b>				
17.	Health Care Index	The index is based on the assessment of the quality, accessibility, and cost of medical services, the equipment level of hospitals, and the professional level of medical personnel	≥ 45	Numbeo, <a href="https://www.numbeo.com/health-care/rankings_by_country.jsp">https://www.numbeo.com/health-care/rankings_by_country.jsp</a>
18.	Global Health Security Index	The GHS Index benchmarks health security in the context of other factors critical to fighting outbreaks, such as political and security risks, the broader strength of the health system, and the country adherence to global norms	≥ 40	The Johns Hopkins Center for Health Security, the Nuclear Threat Initiative (NTI) and the Economist Intelligence Unit, <a href="https://www.ghsindex.org/">https://www.ghsindex.org/</a>

The calculation of the integral index of demographic resilience is based on the assessment of 18 indicators derived from statistical data. The formation of the list of indicators follows the principles of representativeness (including the most significant indicators influencing the level of demographic resilience), reliability, and information accessibility (official statistical data is used during calculations). When calculating the integral index for a specific period, if indicators are published only once a year or with a significant time delay, the latest available values for these indicators are used. The determination of the integral assessment of the country's demographic resilience is carried out in the following order:

1. Formation of the list of indicators;
2. Determination of threshold values for indicators;
3. Normalization of indicators;
4. Calculation of the integral index of demographic resilience.

Threshold values have been developed for each component of the country's demographic resilience level, as shown in Table 1. If an indicator corresponds to the threshold value, it is considered resilient; otherwise, it is considered non-resilient.

Normalization of indicators is carried out relative to the threshold values. If current values of indicators exceed (or are lower than) the threshold values, the normalized value of the indicator will be 0. If the current values of indicators match the threshold values, the normalized value of the indicator will be 1. The transition from absolute to normalized values allows measuring indicators on a scale from 0 to 1.

The integral index of the country's demographic resilience is calculated by the following formula (Source: A. Boiko, D. Shkuropadskis et.al., 2021):

$$I = \frac{\sum N_{x=1}}{\sum N_x} \times 100\% \tag{1}$$

where  $I$  – the integral index of the country's demographic resilience;  $N_{x=1}$  – the number of indicators with a normalized value of 1;  $N_x$  – the total number of indicators.

The level of demographic resilience of a country is the degree of adaptation and recovery of the population in the face of internal and external shocks. A country can be considered demographically resilient if it can ensure adequate population growth during a crisis while maintaining a balance between births, deaths, and migration. In other words, the country's population can adapt to changes in demographic structure and replenish its numbers. The system of quantitative and qualitative levels of demographic resilience of a country is presented in Table 2.

<b>№</b>	<b>Levels of Country Demographic Resilience</b>	<b>Measurement, %</b>
1.	High resilience level	91-100
2.	Sufficient resilience level	71-90
3.	Medium resilience level	51-70%
4.	Low resilience level	≤ 50

#### *Demographic Resilience Level of the Visegrad Group Countries*

The level of demographic resilience in the Visegrad Group countries is medium. Specifically, in Poland, Hungary, and Slovakia, it is at 61.11%, while in the Czech Republic, it is at 66.66% (Table 3). This result is largely influenced by natural demographic processes, including an increase in average life expectancy and a gradual "ageing" of the population - manifested by a growing proportion of elderly individuals.

**Table 3. Demographic Resilience Level of the Visegrad Group Countries in 2022.**

№	Indicators	Visegrad Group Countries							
		Poland		Hungary		The Czech Republic		Slovakia	
		Indicator value	Normalized value	Indicator value	Normalized value	Indicator value	Normalized value	Indicator value	Normalized value
1.	Population Growth, %	-0.5	0	-0.3	0	0,2	0	-0,3	0
2.	Birth rate, ‰	8.5	0	8.65	0	8,59	0	8,94	0
3.	Rate of natural increase, %	-0.4	0	-0.5	0	-0,2	0	-0,3	0
4.	Gross reproduction rate, %	0.69	0	0.72	0	0,73	0	0,71	0
5.	Life expectancy at birth, years	78.76	1	77.20	1	79,73	1	78,31	1
6.	Death rate, crude (per 1,000 people), %	14	0	16	0	13	0	14	0
7.	Mortality rate, infant (per 1,000 live births), %	4	1	3	1	2	1	5	0
8.	Maternal mortality ratio (modeled estimate, per 100,000 live births)	2	1	15	1	3	1	5	1
9.	Population ageing rate, %	19	0	20	0	21	0	17	1
10.	Age dependency ratio (% of working-age population)	51	1	53	1	58	1	49	1
11.	The Demographic Pressures Indicator	4.1	1	3.8	1	3.5	1	2.9	1
12.	Net migration rate, %	-0.34	0	1.21	1	2.32	1	0.2	0
13.	Refugees and Displaced Persons index	2.5	1	5.7	0	3.5	1	2.3	1
14.	The Global Gender Gap Index	0.709	1	0.699	1	0.710	1	0.717	1
15.	The Gender Equality Index	57.7	1	54.2	1	57.2	1	56.0	1
16.	WeWorld Index	86.1	1	81.6	1	83.2	1	82.0	1
17.	Health Care Index	57.8	1	53.4	1	75.3	1	60.3	1
18.	Global Health Security Index	55.7	1	54.4	1	52.8	1	54.4	1
<b>Integral Indicator of Demographic Resilience, %</b>		<b>61.11</b>		<b>61.11</b>		<b>66.66</b>		<b>61.11</b>	

*In the realm of population reproduction*, the Visegrad Group countries exhibit a positive outcome only in the "Life expectancy at birth, years" indicator. These countries are characterized by Type I population reproduction. The birth rate in these countries is low, a trend that originated during the economic transformation in the 1990s, and these tendencies persist to this day. Forecasts from Eurostat indicate a continued decline in birth rates and an increase in deaths, particularly due to the entry of the "baby boomer" generation of Visegrad countries into the oldest age group, resulting in a sustained negative birth rate (Eurostat, 2023).

In terms of mortality, the Visegrad Group countries show positive results in the "Mortality rate, infant" and "Maternal mortality ratio" indicators, reflecting advancements in medical care and services. However, the death rate and population ageing rate are high, posing challenges to demographic resilience. Recent research confirms a demographic crisis in these countries, especially in Poland, characterized by population ageing and a decrease in the number of youth and working-age individuals (P. Marczewski, 2023).

The challenging *situation in mortality* was further exacerbated by COVID-19, contributing to an increase in additional deaths. Poland, in particular, recorded over 79,000 additional deaths compared to the 2015–2019 average, ranking second in Europe for excess deaths (P. Basiukiewicz, 2021).

In the *realm of demographic dependency*, the Visegrad Group countries exhibit positive results in the "Age dependency ratio (% of working-age population)" and "Demographic Pressures Indicator" indicators. This suggests a favourable situation in terms of the balance between the workforce and economic development.

*Regarding migration*, Poland and Slovakia have net migration rates below the threshold, and Hungary has a Refugees and Displaced Persons Index below the threshold. In recent years, significant migration processes have been observed in the Visegrad Group countries (K. Nikolaiets, D. Shkuropadska, L. Lebedeva, 2023). Poland experienced a negative migration balance in 2022, indicating a decrease in population due to more people leaving than arriving. It's worth noting that the number of refugees from Ukraine in Poland in 2022 was 950.000, while the total number of Ukrainian citizens was approximately 2.3 million (Slovo i Dilo, 2022).

On June 26, 2023, in Bratislava, a summit was held with the prime ministers of the Visegrad Group countries. A crucial topic of discussion was migration, particularly the issue of war refugees. A shared conclusion was the necessity to strengthen the protection of the EU's external borders. Simultaneously, the Prime Minister of the Czech Republic emphasized the importance of developing a practical return policy as a priority in combating illegal immigration. Viktor Orban expressed the opinion that migrants wishing to live in the EU should submit an entry application to the European Union and enter only upon a positive decision. Former Slovak Minister of the Interior Roman Mikulec noted that many immigrants within the V4 countries did not intend to stay and were heading towards Western Europe (Institute of Central Europe, 2023).

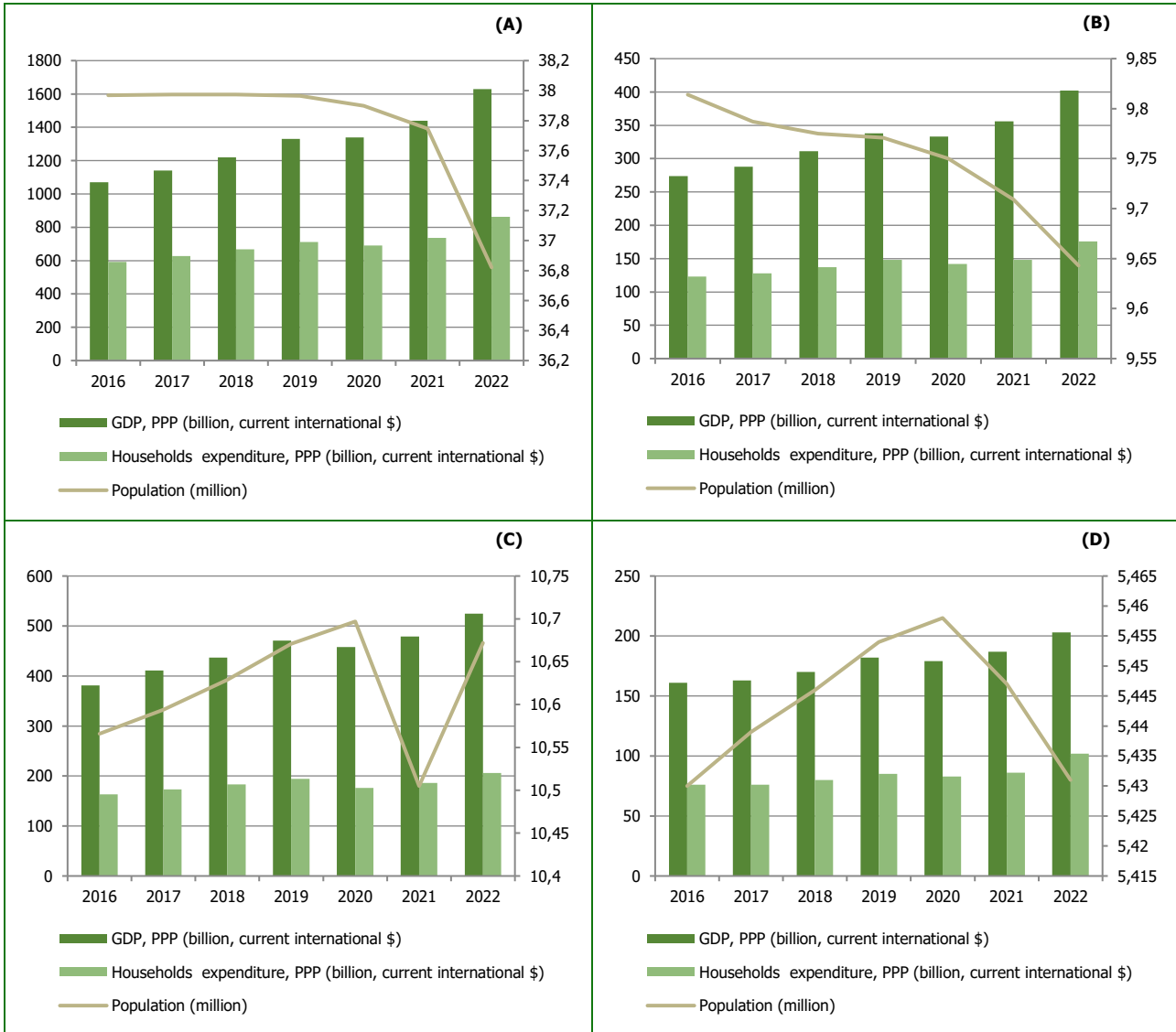
In the *realm of gender equality*, all Visegrad Group countries surpass threshold values, indicating robust parameters. Each country has initiatives and programs aimed at promoting gender equality. However, challenges persist, such as unequal pay based on gender, insufficient representation of women in higher positions, and issues related to family policies and combating violence.

Concerning the *development of healthcare systems*, all Visegrad Group countries exceed threshold values, showcasing resilient parameters. While healthcare systems in these countries are relatively well-developed, the COVID-19 pandemic highlighted new challenges and emphasized the need for improvement and adaptation in the medical field. The pandemic underscored the significance of telemedicine and innovative technologies in providing medical services and facilitating communication between patients and healthcare professionals.

To address the impact of the pandemic, the Visegrad Group (V4) initiated joint projects with Ukraine under the "V4 East Solidarity Programme for the Eastern Partnership Countries." These projects aim to enhance the capacity of health facilities to cope with the effects of the pandemic, managed by the International Visegrad Fund (A. Boiko et al., 2022).

Demography does not determine the fate of economic growth, but it is one of the key factors influencing the potential for economic expansion. When identifying sources of economic growth, there is a direct correlation: the rate of Gross Domestic Product (GDP) growth is directly dependent on both population growth and GDP per capita growth. Since changes in production volumes are directly related not only to changes in physical capital or technological development but also to changes in human capital, it is evident that any model of economic growth should consider demography as a crucial indicator (CERP, 2014).

Demand is the most active macroeconomic variable. It significantly influences both the country's GDP growth and the pace of economic transformation within it. Supporting demand is particularly important during periods of crisis when the economy begins to contract. The dynamics of GDP, consumer demand, and population quantity in Poland, Hungary, the Czech Republic, and Slovakia from 2016 to 2022 are presented in Figures 1-4.



**Figure 4. The dynamics of GDP, consumer demand, and population dynamics in (A) – Poland; (B) – Hungary; (C) – Czech Republic; (D) – Slovakia from 2016 to 2022. (Source: The World Bank)**

Demographic characteristics of the population, such as age, gender, family size, and income level, have a significant impact on consumer demand. This can determine which goods and services meet the demand, how the market is shaped, and how the economy develops. A reduction in consumer demand inevitably leads to a contraction of the domestic market because a decrease in demand results in a reduction in the production of consumer goods and services. As seen from the tables, demand reacts very quickly to economic changes, on the one hand, and on the other hand, stimulating demand allows achieving rapid economic effects.

The expected slowdown in population growth rates and economic activity will have consequences for both long-term economic growth and the growth structure. Key factors determining long-term economic growth rates include the growth of the workforce and productivity. The effectiveness with which the economy combines its labour and capital expenditures to expand creates the capabilities for future development.

## CONCLUSIONS

The methodological approach employed to calculate the level of demographic resilience allowed to evaluate the demographic situation in the Visegrad Group countries in 2022. The findings reveal a medium level of demographic resilience for Poland, the Czech Republic, Slovakia, and Hungary. Presently, these countries are grappling with demographic crises characterized by intensified destructive demographic processes, notably a significant decline in birth rates, unstable migration patterns, and an accelerated ageing population.

Given the unlikelihood of a substantial increase in birth rates under any scenario, there is a need for policy interventions to ensure the development and effective employment of human capital in Visegrad Group countries. Additionally, social protection mechanisms must be in place through politically and financially stable systems. To achieve this, policies should be grounded in modern, accurate, reliable, and detailed population data to facilitate proper budgeting for the development of quality and accessible healthcare, gender equality, social programs, family-friendly policies, and an efficient migration and refugee management system. Regular population censuses are crucial for obtaining such data.

A political approach based on human rights, gender sensitivity, and non-discrimination is essential. Such an approach can positively impact family composition and size, fully harness the developmental potential of migration, and enable all individuals, especially vulnerable and marginalized populations, to actively participate in the development of society. Governments in the Visegrad Group countries should implement a comprehensive migration management system to fully exploit the potential of external migration for national development and strategically plan the enrichment of national human capital by integrating foreign migrants.

The size and structure of the population manifest themselves in consumer demand, shape the state's strategy in the labour market, and influence investment and social policies. The specificity of demographic trends lies in their stability and long-term nature, essentially irreversible over quite extended periods. Consequently, based on them, it is possible to qualitatively and reliably forecast the situation in various social and economic spheres.

It is crucial to recognize that each of the Visegrad Group countries has unique demographic and cultural characteristics, requiring tailored instruments and policies adapted to the specific conditions of each country. Regular monitoring and evaluation of the effectiveness of measures are essential for achieving and sustaining demographic resilience.

Prospects for further research involve studying the impact of globalization on the demographic resilience of countries.

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## ADDITIONAL INFORMATION

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*The Authors declare that there is no conflict of interest.*

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## ВПЛИВ ДЕМОГРАФІЧНОЇ СТІЙКОСТІ НА ЕКОНОМІЧНИЙ РОЗВИТОК КРАЇН (НА ПРИКЛАДІ КРАЇН ВИШЕГРАДСЬКОЇ ГРУПИ)

Населення, його фізичне благополуччя й розвиток є визначальною рисою суспільства, основою сили держави. Ураховання демографічних тенденцій має важливе значення при формуванні стратегій економічного розвитку. Розуміння впливу змін населення на ринок праці, споживчий попит, інвестиційний клімат і витрати населення має вирішальне значення для створення стійкої та конкурентоспроможної економіки.

Демографічна стійкість країни визначається її здатністю забезпечувати кількісне та якісне відтворення демографічних структур на різних етапах історичного розвитку. Демографічна стійкість – це динамічна категорія, яка змінюється з часом, а рівень демографічної стійкості країни визначається параметрами її функціонування.

Рівень демографічної стійкості залежить від тенденцій відтворення населення та смертності, демографічної залежності, міграційних процесів, гендерної рівності, розвитку системи охорони здоров'я. У цих умовах проведено оцінку демографічної стійкості країн Вишеградської групи в розрізі зазначених напрямів, що дозволило розрахувати показник рівня демографічної стійкості для Польщі, Чехії, Словаччини та Угорщини.

Аналіз рівня демографічної стійкості країн Вишеградської групи вказує на середнє значення. Однак аналіз показників відтворення й смертності свідчить про наявність демографічних криз у цих країнах. Скорочення населення, зниження народжуваності, зростання смертності є ключовими характеристиками демографічної кризи. Тому країнам Вишеградської четвірки необхідно вживати ефективних політичних заходів для забезпечення розвитку та ефективного використання людського капіталу, а також соціального захисту мігрантів, біженців і громадян на достатньому рівні через політично та фінансово стабільну систему.

**Ключові слова:** демографічна стійкість, шоківі впливи, економічний розвиток, міжнародна міграція, демографічна політика, країни Вишеградської групи

**JEL Класифікація:** F15, F22, F66, H55, J11, J61