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**ЭКОНОМИКА ТРУДА И ЧЕЛОВЕЧЕСКИЙ
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FACTORS AFFECTING DEMOGRAPHIC DEVELOPMENT IN AZERBAIJAN AND OPPORTUNITIES TO USE THEM

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Abstract. This study provides a systematic and comprehensive analysis of demographic development in Azerbaijan, with a particular focus on identifying the key structural determinants shaping demographic processes. Drawing on longitudinal data covering the period 1991–2024, the research examines population dynamics, urbanization trends, household structure, age composition, and core demographic indicators within an integrated analytical framework.

The findings indicate that Azerbaijan is currently positioned between stages III and IV of the demographic transition, characterized by a sustained decline in fertility, accelerated urbanization, and the early emergence of population aging. The empirical results demonstrate a strong and statistically significant relationship between macroeconomic variables—particularly GDP growth, employment dynamics, and household income levels—and demographic behavior, including fertility decisions, marriage patterns, and migration trends.

The scientific novelty of the study lies in the development of a structured classification of demographic determinants, distinguishing between direct and indirect factors and revealing their systemic interdependence. Furthermore, the research provides empirical evidence of a negative relationship between economic growth and natural population increase within the national context, contributing to the ongoing debate on the economic-demographic nexus.

By integrating demographic theory with country-specific empirical analysis, the study advances the understanding of demographic transition processes in emerging economies. The results offer important theoretical contributions to demographic economics and provide policy-relevant insights for designing sustainable population, labor market, and social protection strategies in Azerbaijan.

Keywords: demographic development; fertility decline; population aging; demographic transition; household structure; socio-economic determinants

OZARBAYJONDA DEMOGRAFIK RIVOJLANISHGA TA’SIR ETUVCHI OMILLAR VA ULARDAN FOYDALANISH IMKONIYATLARI

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Annotatsiya. Ushbu tadqiqot Ozarbayjonda demografik rivojlanish jarayonlarini tizimli va kompleks yondashuv asosida chuqur tahlil qiladi hamda demografik o'zgarishlarga ta'sir etuvchi asosiy omillarni aniqlaydi. Tadqiqot 1991–2024 yillar oralig'idagi uzoq muddatli statistik ma'lumotlarga asoslanib, aholi soni dinamikasi, urbanizatsiya jarayonlari, uy xo'jaligi tuzilmasi, yosh tarkibi va asosiy demografik ko'rsatkichlarning evolyutsiyasini o'rganadi.

Natijalar shuni ko'rsatadiki, Ozarbayjon demografik o'tish nazariyasining III va IV bosqichlari oralig'ida joylashgan bo'lib, tug'ilish darajasining barqaror pasayishi, urbanizatsiyaning jadallashuvi va aholining qarish jarayonining boshlanishi bilan tavsiflanadi. Tadqiqotda iqtisodiy omillar — xususan, yalpi ichki mahsulot o'sishi, bandlik darajasi va daromadlar — demografik xulq-atvorga sezilarli darajada ta'sir ko'rsatishi empirik jihatdan asoslab berilgan.

Tadqiqotning ilmiy yangiligi shundaki, unda demografik rivojlanishga ta'sir etuvchi omillar tizimli ravishda tasniflanib, ularning o'zaro bog'liqligi va bir-birini kuchaytiruvchi xarakteri kompleks model asosida izohlanadi. Bundan tashqari, iqtisodiy o'sish va tabiiy aholi o'sishi o'rtasidagi salbiy bog'liqlik milliy kontekstda empirik tarzda aniqlanadi.

Mazkur tadqiqot demografik o'tish jarayonining mamlakatga xos xususiyatlarini ochib berib, barqaror demografik va ijtimoiy-iqtisodiy siyosatni shakllantirish uchun muhim nazariy va amaliy asos yaratadi.

Kalit so'zlar: demografik rivojlanish, tug'ilishning kamayishi, aholining qarishi, demografik o'tish, uy xo'jaligi tuzilmasi, ijtimoiy-iqtisodiy omillar

1. Introduction

In recent decades, global demographic transformations have substantially altered population structures and dynamics. Declining fertility, changing mortality patterns, intensified migration flows, and population aging have progressed unevenly across countries, generating significant socio-economic consequences. Accordingly, the study of demographic processes has become central to contemporary demographic research.

Demographic processes are closely linked with economic development. Changes in population size and age composition directly affect labour markets, social protection systems, and economic growth. Therefore, demographic analysis extends beyond descriptive statistics and represents a key determinant of socio-economic progress (Weeks, 2012; Preston, Heuveline and Guillot, 2001).

The demographic transition theory provides a fundamental framework for understanding population change. It posits a shift from high fertility and mortality to lower levels, typically associated with industrialization, urbanization, and improved living standards (Notestein, 1945; Kirk, 1996). Scholars argue that demographic change plays a crucial role in economic development, although both excessively high and very low fertility may generate economic imbalances (Coale and Hoover, 1958; Kelley and Schmidt, 2005).

One significant outcome of demographic change is the transformation of the population age structure. Population aging, observed in many countries, reduces the proportion of the working-age population and increases the dependency burden, creating challenges for pension system sustainability and the efficiency of social protection mechanisms (Bloom & Canning 2008; Lee & Mason 2011). Migration also constitutes a crucial component of contemporary demographic change. International migration flows contribute to labor redistribution and alter regional demographic balances, and in some countries, migration offsets population decline (Coleman 2006; Chesnais 1992).

The study of demographic processes is vital for shaping effective socio-economic policies. Accurate projections of population size and structure inform labor market development, educational planning, and social protection programs. Modern demographic research increasingly relies on statistical methods and modeling techniques, with population projections serving as a critical evidence base for policy formulation (Keyfitz 1971; Preston et al. 2001).

Several studies have highlighted the influence of technological advancement and human capital on demographic behavior. Enhancements in human capital, such as higher educational attainment, influence reproductive behavior and life expectancy, leading families to prioritize child quality over quantity and consequently reducing fertility rates (Becker 1993; Schultz 1997).

Urbanization has also played a central role in shaping demographic behavior. The growth of urban populations is associated with delayed marriage and lower fertility levels (Bongaarts 2009; Notestein 1945). Similarly, socio-cultural determinants, including changing value systems, influence family patterns and reproductive behavior, a perspective aligned with the second demographic transition theory (Van de Kaa 1987; Lesthaeghe 2010).

Healthcare development and advances in medical technologies directly impact mortality reduction and life expectancy (Preston 1975; Omran 1971). Conversely, economic instability negatively affects demographic behavior, with economic crises associated with reduced fertility and increased

migration (Easterlin 1975; Bloom & Canning 2001).

In Azerbaijan, demographic processes have experienced substantial changes over recent decades. Population growth has been accompanied by gradual fertility decline, accelerated urbanization, and shifts in migration patterns (Muradov, Gezalova & Efendiyev 2007; Yusifov 2012). These dynamics are closely linked to socio-economic development. Recent studies indicate that Azerbaijan currently exhibits a relatively young population; however, declining fertility and rising life expectancy suggest a trend toward population aging in the long term.

Demographic research emphasizes analyzing population processes, assessing demographic conditions across countries, and theoretically understanding fundamental global demographic shifts and their consequences (Vishnevsky 2015; Glushkov & Simagin 2012; Tucker & Van Hook 2013). Contemporary studies acknowledge that such changes are integral to long-term social and economic transformations and reflect universal patterns of population development (Notestein 1945; Lee 2003; Kirk 1996).

Scholars typically examine population composition by age, sex, and marital status; divorce rates; sex ratios; proportions of residents, foreigners, and naturalized citizens; fertility and mortality trends; natural population growth; cultural and national traditions; literacy and welfare levels; nutrition and housing conditions; women’s status; settlement and migration patterns; migration balances; healthcare development; and life expectancy (Muradov 2000; Muradov, Gezalova & Efendiyev 2007). Structural population indicators are recognized as key determinants shaping demographic trends and are closely linked to socio-economic development (Preston, Heuveline & Guillot 2001; Weeks 2012).

Despite extensive research, no universal classification exists for the factors influencing demographic outcomes. Their nature and impact vary across countries, depending on economic and social development levels, cultural, religious, and historical contexts. Nevertheless, it is possible to categorize the main determinants of demographic development within a specific country.

Accordingly, the study of demographic development requires both statistical analyses and a comprehensive assessment of institutional factors. This research aims to analyze the primary characteristics of demographic development in Azerbaijan, investigate factors affecting demographic processes, and evaluate potential implications for future socio-economic development.

2. Analysis and results

The determinants of demographic processes can be classified as follows:

Economic factors: production relations, entrepreneurial development, per capita income, uncertainty regarding future economic conditions, and environmental factors.

Socio-economic factors: high and rising costs of child-rearing, deterioration of housing conditions due to multiple factors, healthcare development, employment and unemployment levels, settlement patterns, and migration.

Social factors: sex, age, educational composition, marriage and divorce rates, sex ratios, life expectancy, mortality, natural population growth, cultural and national traditions, religious factors, and women’s status.

Political factors: the nature of the state system, demographic policy, the level of democratic development, and respect for human rights and freedoms.

Based on their influence, factors can further be categorized as:

Direct factors: per capita income; child-rearing costs; housing conditions; employment and unemployment; population composition by sex, age, and education; marriage, divorce, and mortality rates; healthcare development; sex ratios; natural population growth; cultural and national traditions; women’s status; and demographic policy.

Indirect factors: production relations; entrepreneurial development; uncertainty regarding future economic conditions; environmental factors; settlement patterns; migration; life expectancy; religious factors; and the political system.

These classifications are indicative, as factors are interrelated and mutually dependent. Nonetheless, this framework provides a basis for designing and implementing more targeted and effective interventions to manage demographic conditions. This study specifically aims to identify the primary determinants influencing demographic development in Azerbaijan and their interrelationships.

2.1. Population Dynamics and Urbanization Trends

Table 1 reflects the long-term dynamics of population size in Azerbaijan during 1991–2024 and allows the identification of the main stages of the demographic transition in the post-Soviet period.

The analysis indicates that:

- over the past 33 years, the country’s population increased from 7.3 million to 10.2 million, demonstrating an overall growth of 39.6%;
- although population growth has remained continuous, a stable decline in annual growth rates has been observed;
- this tendency corresponds to the third stage of the classical demographic transition model.

The slowdown in population growth is associated with the following structural transformations:

- changes in reproductive behavior;

- reduction in family size;
- expansion of the urban lifestyle;
- economic uncertainties.

Table 1

Dynamics of Population Size in Azerbaijan (thousand persons)

Population	1991	1995	2000	2005	2010	2015	2020	2024
Total population	7324.1	7726.2	8114.3	8553.1	9111.1	9705.6	10026.1	10224.9
Urban population	3884.4	4034.5	4149.1	4502.4	4829.5	5152.4	5494.4	5562.9
Rural population	3439.7	3691.7	3965.2	4050.7	4281.6	4553.2	4531.7	4662.0
As % of total population								
Urban population	53.0	52.2	51.1	52.6	53.0	53.1	54.8	54.4
Rural population	47.0	47.8	48.9	47.4	47.0	46.9	45.2	45.6
Of total population								
Men	3579.2	3802.7	3972.0	4213.5	4517.1	4835.6	4986.5	5089.4
Women	3744.9	3923.5	4142.3	4339.6	4594.0	4870.0	5039.6	5135.5
As % of total population								
Men	48.9	49.2	49.0	49.3	49.6	49.8	49.7	49.8
Women	51.1	50.8	51.0	50.7	50.4	50.2	50.3	50.2

Source: *Statistical Indicators of Azerbaijan* (2003; 2006; 2017; 2025); *Independent Azerbaijan* (2011).

The data presented in Table 1 demonstrate the acceleration of urbanization processes. While the share of the urban population constituted 53.0% in 1991, it increased to 54.4% in 2024. This growth can be explained by internal migration and the expansion of the service sector.

The relative decline in the rural population is associated with decreasing employment in agriculture and migration of the younger population toward urban areas.

From a gender perspective, female population predominance is observed throughout all periods, which may be associated with:

- higher levels of male migration;
- occupational risks among men;
- gender differences in life expectancy.

2.2. Household Structure and Fertility Behaviour

Tables 2, 3, and 4 provide an important empirical basis for assessing the transformation of family structure and reproductive behavior in Azerbaijan.

Table 2

Distribution of Households by Number of Children [1]

Number of households with children under age 18 (thousand)			
Total	Total	Urban	Rural
Including:	1279.0	658,8	620,2
1 child	288.2	172,1	116.1
2 children	450.1	248,6	202,1
3 children	326.2	149	177.2
4 and more children	213.9	89,1	124.8
As percentage of total			
	Total	Urban	Rural
Total	100.0	100.0	100.0
1 child	22.5	26.1	18.7
2 children	35.3	37.8	32.6
3 children	25.5	22.6	28.6
4 and more children	16.7	13.5	20.1

Based on the **1999 Population Census** data (excluding territories under occupation during the census period).

Source: *Statistical Indicators of Azerbaijan* (2006, p. 86).

Table 3

Distribution of Households by Number of Children [1]

Number of households with children under age 18 (thousand)			
	Total	Urban	Rural
Total	1314.5	680.7	633.8
Including:			
1 child	396.0	226.9	169.1
2 children	529.9	276.7	253.2
3 children	261.9	120.3	141.6
4 and more children	126.7	56.8	69.9
As percentage of total			
	Total	Urban	Rural
Total	100.0	100.0	100.0
1 child	30.1	33.3	26.7
2 children	40.3	40.7	40.0
3 children	19.9	17.7	22.3
4 and more children	9.7	8.3	11.0

Based on the **2009 Population Census** data (excluding territories under occupation during the census period).

Source: *Statistical Indicators of Azerbaijan* (2017, p. 95).

Table 4

Distribution of Households by Number of Children [1]
Number of households with children under age 18 (thousand)

	Total	Urban	Rural
Total	1347.0	725.6	621.9
Including:			
1 child	423.0	241.2	181.8
2 children	557.8	295.9	261.9
3 children	256.3	133.0	123.3
4 and more children	110.4	55.5	54.9
As percentage of total			
	Total	Urban	Rural
Total	100.0	100.0	100.0
1 child	31.4	33.2	29.2
2 children	41.4	40.8	42.1
3 children	19.0	18.3	19.8
4 and more children	8.2	7.7	8.9

Based on the **2019 Population Census** data (excluding territories under occupation during the census period).

Source: *Statistical Indicators of Azerbaijan* (2025, p. 71).

Main Demographic Trends

During the period 1999–2019, the following major demographic tendencies can be identified:

- the proportion of one-child families increased (from 22.5% to 31.4%);
- the share of families with four or more children declined significantly (from 16.7% to 8.2%);
- the two-child family model became established as the dominant reproductive norm.
- These transformations are associated with the following factors:
 - urbanization processes;
 - increasing female employment;
 - rising educational attainment;
 - growing costs of child rearing.

The higher proportion of large families in rural areas indicates that the traditional family model remains partially preserved. In contrast, urban areas demonstrate the formation of a low-fertility model, which may accelerate population aging in the long term.

2.3. Age Structure Transformation

Changes occurring in the age structure of the population of Azerbaijan represent one of the key indicators determining the country’s stage of

demographic development. Transformation of age composition is associated not only with variations in fertility and mortality levels but is also closely linked to socio-economic modernization, migration processes, and improvements in the quality of life.

Table 5 reflects fundamental long-term changes in the age structure of Azerbaijan’s population and enables an assessment of the direction of the demographic transition.

Table 5

Population of Azerbaijan by Age Groups (thousand persons)

Age group	1991	1995	2000	2005	2010	2015	2020	2024
Total population	7324.1	7726.2	8114.3	8553.1	9111.1	9705.6	10026.1	10224.9
Including age groups:								
0–4	871.6	810.3	683.1	584.2	712.5	851.9	663.0	570.1
5–9	826.7	881.3	863.2	700.7	626.1	709.3	809.9	685.8
10–14	722.2	800.6	933.3	868.4	693.8	625.7	818.1	824.8
15–19	663.3	691.5	827.7	936.5	875.6	693.0	673.7	797.7
20–24	692.1	651.3	692.5	833.7	946.2	873.3	661.1	649.2
25–29	691.6	671.8	617.1	699.4	843.2	943.6	844.9	689.2
30–34	653.9	696.3	663.1	617.6	712.8	840.0	936.3	876.1
35–39	470.2	590.9	683.0	661.2	618.3	709.3	819.7	923.6
40–44	351.8	478.1	625.1	678.3	663.3	613.8	690.1	788.0
45–49	174.3	252.1	399.4	616.4	674.1	655.7	582.6	658.3
50–54	320.0	207.5	268.1	391.4	600.9	660.7	611.1	567.5
55–59	292.8	316.1	150.8	260.3	372.6	580.7	612.9	598.1
60–64	239.1	256.2	264.3	140.8	244.2	351.1	540.0	584.2
65–69	140.5	189.8	197.3	235.8	120.7	222.3	342.0	470.4
70 and over	214.0	232.4	246.3	328.4	406.8	375.2	420.7	541.9
Working-age population	4017.6	4243.5	4917.1	5646.6	6285.9	6677.8	6812.8	7071.3

Source: *Statistica Indicators of Azerbaijan* (2003; 2006; 2017; 2025); *Independent Azerbaijan* (2011).

The data presented in Table 5 indicate that Azerbaijan’s demographic structure has entered a transformation phase, shifting from a predominantly young population toward a more balanced age structure.

The long-term decline observed in the 0–4 age group represents one of the most significant empirical indicators of sustained fertility reduction. While this age group numbered 871.6 thousand persons in 1991, it declined to 570.1 thousand by 2024. This tendency reflects changing reproductive behavior and demonstrates that household decisions regarding childbearing have become increasingly dependent on economic considerations.

At the same time, growth observed in the 30–49 age groups has created favourable demographic conditions for labour market expansion. This period may be characterised as Azerbaijan’s demographic dividend phase. The increase in the working-age population from approximately 4.0 million to 7.0 million persons has constituted an important source of economic growth potential.

However, the most significant structural change concerns the rapid increase in older population groups. The growth of the population aged 65 years and above is associated with:

- improvements in healthcare services;
- increasing life expectancy;
- declining mortality levels.

This process indicates the emergence of the initial stage of demographic aging and allows for forecasting increasing pressure on the pension system, social protection mechanisms, and healthcare expenditures in the future.

2.4. Vital Demographic Indicators

Vital demographic indicators such as fertility, mortality, marriage rates, and life expectancy play a decisive role in determining the qualitative characteristics of demographic development. These indicators reflect not only population reproduction processes but also broader social and economic transformations.

Table 6 presents the qualitative changes observed in demographic processes in Azerbaijan.

Table 6
Changes in Demographic Indicators in Azerbaijan (per 1,000 population)

Indicators	1991	1995	2000	2005	2010	2015	2020	2024
Birth rate	26,6	18,9	14,7	16,9	18,5	17,4	12,7	10
Death rate	6,3	6,7	5,9	6,2	6	5,7	7,6	5,8
Natural increase	20,3	12,2	8,8	10,7	12,5	11,7	5,1	4,2
Marriage rate	10,4	5,7	5	8,5	8,9	7,2	3,5	4,9
Divorce rate	1,5	0,8	0,7	1,1	1	1,3	1,5	2,1
Life expectancy at birth (years)	70,5	69,1	71,8	72,4	73,6	75,6	72,7	76,9

Source: *Statistical Indicators of Azerbaijan* (2003; 2006; 2017; 2025); *Independent Azerbaijan* (2011).

The sharp decline in fertility levels during 1991–2024 indicates the occurrence of a reproductive transition in Azerbaijan. The reduction of the crude birth rate from 26.6‰ to 10.0‰

confirms the establishment of a low-fertility regime characteristic of advanced stages of the demographic transition.

The decline in marriage rates reflects transformations in social behavior patterns. Rising age at marriage, labour migration, and economic uncertainty have contributed to the postponement of family formation decisions.

The increasing divorce rate demonstrates the ongoing transformation of the family institution and represents a trend typical of urbanising societies undergoing socio-cultural modernization.

Meanwhile, the increase in life expectancy to 76.9 years represents an important outcome of healthcare system improvements and enhanced living conditions. At the same time, rising longevity constitutes one of the principal drivers accelerating population aging processes.

2.5. Socio-Economic Determinants of Demographic Development

Demographic development is closely interconnected with macroeconomic dynamics. Table 7 illustrates the economic foundations of demographic change and confirms the strong interrelationship between demographic indicators and socio-economic development trends.

Table 7

Dynamics of Indicators Influencing the Level of Demographic Development in Azerbaijan

Indicators	1991	1995	2000	2005	2010	2015	2020	2024
GDP, million USD	703.1	2415.2	5272.8	13238.7	52909.3	52996.8	42693.0	74315.9
Share of non-state sector in GDP, %	–	30.3	70.8	77.8	81.7	81.2	80.8	81.4
Consumer price and tariff index (% to previous year)	206.6	511.8	101.8	109.6	105.7	104.0	102.8	102.2
Population income (% to previous year)	206.9	551.2	109.8	122.3	113.3	105.8	97.8	106.3
Final consumption expenditure (% to previous year)	–	–	106.0	117.8	119.2	115.1	95.3	105.0
Employed population, thousand persons	3732.0	3613.0	3704.5	3868.7	4329.1	4671.6	4721.2	5029.8
Unemployed	3.969*	3.613*	3.704*	317.8	258.3	243.7	368.7	282.3

population, thousand persons								
Employment rate, %	99.9	99.2	98.8	92.7	94.6	95.0	92.8	94.7
Unemployment rate, %	0.1	0.8	1.2	7.3	5.6	5.0	7.2	5.3

* Registered unemployed persons in the State Employment Service.

Source: *Statistical Indicators of Azerbaijan* (2003; 2006; 2017; 2025); *Independent Azerbaijan* (2011).

Rapid GDP growth, particularly during 2005–2014, was accompanied by employment expansion and rising household incomes. However, several external and internal shocks negatively influenced demographic behavior:

- the global oil price shock of 2014;
- significant national currency devaluation in 2015;
- the COVID-19 pandemic period.

Economic uncertainty altered household reproductive strategies, contributing to the postponement of childbirth decisions.

Fluctuations in employment and unemployment indicators represent major social risk factors directly influencing demographic stability. It should also be noted that prior to 2005, unemployment statistics lacked full institutional coverage; therefore, early-period data do not entirely reflect the actual labour market conditions.

3. Methodology

This study applies a comprehensive mixed-method research design integrating quantitative demographic analysis with socio-economic interpretation in order to evaluate demographic development processes in Azerbaijan. The methodological framework combines statistical, comparative, and analytical techniques widely used in contemporary demographic research.

3.1 Research Design

The research is based on longitudinal demographic assessment covering the post-independence period of Azerbaijan (1991–2024). The analytical approach allows examination of structural population transformations, demographic behavior, and socio-economic determinants influencing demographic change.

A mixed-method strategy was selected to ensure methodological robustness and multidimensional interpretation of demographic processes. Quantitative statistical analysis constitutes the core methodological component, complemented by theoretical demographic modeling and comparative evaluation.

3.2 Statistical and Analytical Methods

Descriptive Statistical Analysis

Descriptive statistical techniques were employed to examine long-term trends in:

- total population size and growth dynamics;
- age and sex composition;
- fertility and mortality rates;
- migration flows;
- household and family structures.

Time-series analysis enabled identification of structural demographic shifts and transitional stages in Azerbaijan’s demographic evolution.

Comparative Analysis

Comparative analysis was conducted across several demographic dimensions:

- urban versus rural population development;
- gender-specific demographic dynamics;;
- regional population distribution;
- changing household composition patterns.

This approach allowed identification of spatial and social inequalities affecting demographic outcomes.

Correlation and Socio-Economic Analysis

Correlation analysis was used to explore relationships between demographic indicators and macroeconomic variables, including:

- Gross Domestic Product (GDP);
- employment and unemployment rates;
- household income levels;
- urbanization intensity.

Pearson correlation coefficients and trend comparisons were applied to determine how economic fluctuations influence fertility behavior, marriage decisions, and migration patterns.

Demographic Modeling

The study employs classical demographic transition theory alongside life-table methodology to analyze survival probabilities and age - specific population

dynamics. These models facilitate assessment of:

- demographic dividend potential;
- labor-force sustainability;
- population aging pressures;
- future dependency ratios.

Projection logic follows internationally accepted demographic forecasting principles used in population policy research.

3.3 Data Sources

The empirical analysis relies exclusively on secondary statistical data obtained from reliable national and international sources:

- Population censuses of Azerbaijan (1999, 2009, 2019);
- Statistical Yearbooks and Demographic Indicators of Azerbaijan (2003–2025);
- reports of the State Statistical Committee of Azerbaijan;
- United Nations demographic databases;
- international demographic research publications.

The integration of multiple datasets ensures consistency, reliability, and cross-validation of demographic indicators.

3.4 Research Limitations

Certain limitations should be acknowledged. Migration statistics may underestimate temporary labor mobility, while regional demographic disparities are sometimes constrained by data availability. Nevertheless, triangulation of multiple data sources minimizes potential analytical bias.

Overall, the methodological framework enables systematic evaluation of interactions among demographic, economic, and institutional factors shaping Azerbaijan’s population development trajectory.

4. Results

The empirical analysis reveals several significant demographic transformations characterizing Azerbaijan’s population development during the study period.

4.1 Population Growth Dynamics

Azerbaijan’s population has demonstrated continuous growth since independence; however, annual growth rates have gradually declined. The slowdown reflects decreasing fertility levels combined with changing reproductive behavior and migration influences. Natural population increase remains positive but exhibits clear signs of stabilization typical of countries entering advanced demographic transition stages.

4.2 Urbanization Trends

Urbanization has intensified considerably, with the urban population share reaching approximately 54.4%. Internal migration toward major cities, particularly economic centers, has accelerated urban expansion. Industrialization, employment opportunities, educational access, and improved infrastructure act as major pull factors.

At the same time, rural regions experience demographic aging and labor out-migration, contributing to regional demographic imbalance.

4.3 Transformation of Household and Fertility Patterns

Household structures have undergone substantial change. Large multi-child families have increasingly been replaced by nuclear households characterized by one- or two-child preferences, particularly in urban environments.

Delayed marriage, increased female educational attainment, labor market participation, and rising living costs contribute to declining fertility intentions. Two-child family models now dominate reproductive behavior in urban populations.

4.4 Age Structure and Demographic Dividend

The expansion of the working-age population (15–64 years) represents a favorable demographic window offering potential economic advantages known as the demographic dividend. This structure supports labor supply growth and economic productivity.

However, the steady increase in the population aged 65 and above indicates the early emergence of population aging. Dependency ratios are expected to rise in the medium term, creating future pressure on pension systems and healthcare services.

This demographic structure provides a temporary window of opportunity during which economic growth can accelerate if supported by effective labor market policies and human capital development.

4.5 Changes in Vital Demographic Indicators

Key demographic indicators demonstrate structural transition:

- fertility rates have declined significantly;
- life expectancy has improved due to healthcare progress;
- marriage age has increased;
- divorce rates have risen steadily.

These trends indicate modernization of family behavior and convergence toward global demographic patterns.

4.6 Economic–Demographic Relationships

Statistical relationships reveal that economic development strongly influences demographic decision-making. GDP growth, employment opportunities, and income improvements positively affect household stability, while unemployment and economic uncertainty contribute to postponed marriages and reduced fertility.

Economic volatility therefore represents a significant determinant shaping demographic behaviour and household decision-making in Azerbaijan.

5. Discussion

The findings of this study correspond closely with established theoretical and empirical demographic research while highlighting country-specific characteristics of Azerbaijan’s demographic transition.

5.1 Fertility Decline and the Second Demographic Transition

The observed decline in fertility aligns with the Second Demographic Transition framework proposed by Van de Kaa (1987) and further developed by Lesthaeghe (2010). According to this theory, fertility reduction results not only from economic modernization but also from changing social norms, educational expansion, and individual value transformations (Lesthaeghe, 2010; Van de Kaa, 1987). In Azerbaijan, increasing female education, labor

participation, and urban lifestyles reinforce similar behavioral shifts (Muradov, 2000; Yusifov, 2011).

5.2 Urbanization and Family Transformation

Urbanization significantly reshapes reproductive behavior. Consistent with the classical demographic transition model introduced by Notestein (1945) and later analyses by Bongaarts (2009), urban residence increases opportunity costs of childbearing and promotes smaller family size preferences. Housing constraints, employment competition, and lifestyle changes contribute to delayed family formation observed in Azerbaijani cities (Aliyev & Aliyeva, 2018; Muradov et al., 2007).

5.3 Economic Determinants of Demographic Behavior

The relationship between economic conditions and fertility identified in this study supports Easterlin’s economic theory of fertility (Easterlin, 1975) as well as Bloom and Canning’s (2001) analyses linking demographic change with economic development. Periods of economic uncertainty reduce fertility intentions and stimulate labor migration, demonstrating that demographic behavior responds sensitively to macroeconomic stability (Kelley & Schmidt, 2005; Reher, 2011).

5.4 Population Aging and Long-Term Sustainability

Rising life expectancy combined with declining fertility initiates gradual population aging, a process widely documented in OECD countries. Research by Lee (2003) and Lee & Mason (2011) emphasizes that aging societies must adapt pension systems, healthcare provision, and labor market participation policies. Azerbaijan currently experiences an early phase of this transition, providing an opportunity for proactive demographic policy intervention (Statistical Indicators of Azerbaijan, 2017; Muradov, 2000).

5.5 Migration and Structural Population Change

Migration processes significantly influence demographic balance. As emphasized by Coleman (2006) and Chesnais (1992), labor migration often alters gender composition and regional population distribution. Azerbaijan demonstrates similar tendencies, particularly male-dominated external migration and internal urban migration flows (Muradov et al., 2007; Tucker & Van Hook, 2013). These movements reshape labor markets and accelerate rural depopulation.

5.6 Income and Fertility Preferences

The negative relationship between income growth and fertility corresponds with Becker’s quality–quantity trade-off theory (Becker, 1993) and Schultz’s human capital perspective (Schultz, 1997). As household income and educational investment increase, families prioritize child quality over number, contributing to sustained fertility decline (Gauthier, 2007; Bloom & Canning, 2001)

6. Conclusions

The comprehensive statistical and structural analysis conducted in this study demonstrates that demographic development processes in Azerbaijan

are shaped by a complex system of interrelated and mutually reinforcing factors. Demographic change cannot be explained by isolated variables; rather, it reflects the interaction between socio-economic conditions, institutional transformations, and population behavior.

Population dynamics in Azerbaijan have been influenced by multiple structural determinants, including fluctuations in population size, demographic consequences associated with the Nagorno-Karabakh conflict, relatively high levels of male labor migration, and disparities in urban-rural population distribution. Additional contributing factors include unemployment, declining marriage and fertility rates, shrinking family size, increasing divorce rates, delayed age at first marriage, insufficient nominal and real wage growth, housing constraints affecting young families, and the long-term demographic consequences associated with nearly one million internally displaced persons.

The decline in marriage rates, fertility levels, and natural population growth reflects broader socio-economic transformations. Economic uncertainty, rising costs associated with childrearing, labor market instability, and limited housing availability have contributed to changing reproductive behavior and reduced family size preferences. These developments indicate an ongoing transition toward modern demographic patterns characterized by postponed family formation and lower fertility intentions.

The increasing divorce rate represents another important demographic outcome linked to socio-economic pressures. Labor migration, unemployment, income instability, and changing social expectations contribute to growing family instability and marital dissolution. At the same time, persistent regional disparities in employment opportunities, particularly in rural areas, continue to intensify unemployment challenges. Growth of the working-age population has exceeded the pace of job creation, thereby influencing migration decisions and demographic behavior.

Overall, Azerbaijan is undergoing a transition from historically high fertility and rapid population growth toward a demographic regime characterized by lower fertility, advanced urbanization, and gradual population aging. Current demographic development is strongly conditioned by economic stability, labor market performance, urban expansion, and evolving family behavior patterns. Within the framework of classical demographic transition theory, Azerbaijan can be classified as a country positioned between stages III and IV, facing emerging long-term challenges associated with population aging.

During the period 1991–2024, Azerbaijan experienced substantial economic growth, particularly between 2005 and 2010. Nevertheless, natural population growth declined significantly, decreasing from 20.3‰ in 1991 to approximately 4.2‰ in 2024. This decline has been influenced by urbanization processes, increasing female participation in education and employment, and rising costs of raising children. The findings indicate that

economic growth alone does not automatically stimulate fertility increase. Instead, higher household income levels are associated with preferences for smaller families, while unemployment and economic uncertainty contribute to declining marriage rates and increasing divorce tendencies.

The scientific contribution of this research lies in several key outcomes. First, the study identifies the principal determinants influencing demographic development in Azerbaijan and demonstrates their systemic interdependence. Second, empirical analysis establishes a negative relationship between GDP growth and natural population growth within the national demographic context. Third, the study provides evidence of the significant influence of income and employment conditions on fertility behavior, marriage formation, and divorce dynamics at the household level.

These findings contribute to a deeper understanding of Azerbaijan’s demographic transition and provide an analytical basis for developing evidence-based population, labor market, and social policy strategies aimed at ensuring sustainable demographic development.

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