ISSN 2789-3308

ECONOMIC REVIEW

National Bank of the Republic of Kazakhstan

No. 1, 2025

NATIONAL BANK OF KAZAKHSTAN

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Published by: National Bank of the Republic Kazakhstan

ISSN 2789-3308

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CONTENTS

Analyzing the Pension System of Kazakhstan

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This paper provides a comprehensive analysis of Kazakhstan's pension system from its formation and development to an assessment of the current state and prospects for further reform. The paper includes a review of the historical evolution of the pension system, legislative changes and reforms that influenced its formation.

An important place is given to the analysis of the current state of retirement security, including both payouts from the state budget and the functioning of the accumulative pension system. Particular attention is paid to the mandatory and voluntary components of savings, as well as the role of pension annuities.

The author examines studies on the international assessment of the pension system of Kazakhstan, highlights its advantages and disadvantages. Based on the analysis, possible ways of reforming the system are proposed, taking into account the experience of foreign countries.

The work can be useful for specialists in the field of social policy, economists, as well as anyone interested in the aspects of Kazakhstan's pension system.

Key Words: pension system, pension reform, retirement age, solidary retirement benefit, basic retirement benefit, accumulative retirement benefit, retirement security, Kazakhstan.

JEL-Classification: H55, J26, J14, G23, I38.

1. Formation and Development of Kazakhstan's Pension System

The pension system of Kazakhstan was formed on the basis of the pension system that functioned in the Soviet Union, since the Kazakh SSR did not have its own pension system during its existence. However, over the years of independence, the country has carried out large-scale structural and institutional reforms in this area. To analyze and assess the current state of the pension system of the Republic of Kazakhstan, it is useful to consider its stages of development and formation in order (Table 1).

Table 1

Stages in the Formation and Evolution of Kazakhstan's Pension System

No.	Period	Summary
1	1991–1995	Transitional phase from the USSR pension system. Use of a solidary pension system.
2	1996–1998	Introduction of the pension system reform program, adoption of the Law of the Republic of Kazakhstan dated June 20, 1997 No. 136 "On Retirement Security in the Republic of Kazakhstan".
3	1998–2012	Implementation of the accumulative pension system. Establishment of the State Center for Pension Payouts (SCPP), government and non-government pension funds.
4	2013–2017	Adoption of the Law of the Republic of Kazakhstan dated June 21, 2013 No. 105-V "On Retirement Security in the Republic of Kazakhstan". Merger of state and non-state pension funds into JSC "Unified Accumulative Pension Fund" (UAPF).
5	2018–2023	Gradual increase in the retirement age, permission for early withdrawal of part of pension savings, temporary freezing of the increase in retirement age for women until 2028.
6	2023	Enforcement of the Social Code of the Republic of Kazakhstan.

In the first years after independence, Kazakhstan used a solidary pension system, which was adopted from the Soviet Union. This model operated on the principle of inter-generational solidarity, whereby pension contributions from able-bodied citizens were used to finance pension payouts to individuals who had already reached the appropriate age. It was assumed that retirement security for active workers in the future would be carried out at the expense of subsequent generations of workers. However, the transformation of the economy into a market format necessitated the modernization of the existing framework and the development of a new system adapted to modern economic realities.

Table 2

Economic situation in Kazakhstan before the pension system reform

No.	Factors	1990	1994	1995	1996	1997
1	Ratio of pensioners to the working-age population, in %	20.1	22.1	22.3	22.4	20.7
2	Number of people employed in the economy, thousand people.	7 560.0	6 581.8	6 551.5	65 18.9	6 472.3
3	Average life expectancy, years	68.7	65.1	63.7	64	64.4
4	Number of pensioners, thousand people	2 490	2 980	2 917	2 940	2 853
5	Average monthly pension amount at the end of the year, tenge	….	994.8	1 876	3 283	3 554
6	Revenue side of the state budget, as % of GDP	….	21.7	21.6	17.2	16.7

As shown in Table 2, the number of people employed in the economy decreased by 13.4% in 1995 compared to 1990, while the number of pensioners increased by 17.2%. The reduction in the number of workers stemmed from the economic downturn, rising unemployment and the crisis in the national economy, which caused difficulties in ensuring timely pension payouts to people.

At a certain stage, the solidary pension model could no longer cope with the new economic conditions, which required changes. Amid deteriorating economic situation, there was a need for reforms. On December 13, 1995, the President of the Republic of Kazakhstan approved the Program of Action of the Government of the Republic of Kazakhstan for 1996-1998, aimed at deepening reforms, including measures in the field of retirement security. First of all, it is worth pointing to such steps as increasing the retirement age, abolishing benefits for early retirement, as well as differentiating pension payouts in various sectors of the economy. In the context of implementing these measures, on May 12, 1997, the Concept of Reforming the Retirement Security System was approved by the Government Resolution No. 819. The implementation of this Concept was aimed at ensuring the adequacy of pension payouts for a decent standard of living at retirement age by diversifying sources of pension payouts and optimizing the distribution of responsibility for retirement security between the state, employer and employee.

The next important stage in the development of Kazakhstan's pension system was the adoption of the Law of the Republic of Kazakhstan "On retirement Security in the Republic of Kazakhstan", which ensured the transition from a solidary system to a system of individual pension savings. Kazakhstan became the first among the countries of the Commonwealth of Independent States (CIS) to implement a pension reform and switch to a mixed model based on a accumulative system. The reform used the experience of Chile, where the main principle was mandatory monthly pension contributions of employees to savings funds. The main goal of the reform was to create a fair system, where each individual is responsible for the size of their future pension, which can be described by the principle: "you will receive as much as you saved and earned." When switching to a system of individual pension savings, it was assumed that the retirement benefit based on personal savings would become the main source of income for pensioners. As part of the implementation of the pension system reform in Kazakhstan, in 1997 the State Center for Pension

Payouts (SCPP) was established on the basis of the Pension Fund of the Republic of Kazakhstan. Along with this, a state and several non-state pension funds were created. The State Pension Fund was responsible for providing services to pensioners, assigning pensions, paying social benefits, transferring pension savings, etc. The pension funds were tasked with accumulating funds received in the form of mandatory deductions (10% of earnings) and additional voluntary contributions from the system participants. At the same time, the regulatory role of the state was manifested in the creation of legal frameworks for protecting the pension savings of the population and establishing basic social guarantees when making pension payouts. Since January 1, 1998, citizens of Kazakhstan began to deduct 10% of their income in the form of mandatory pension contributions (MPC) with the opportunity to make additional voluntary contributions.

The first mandatory contribution was transferred to the State Accumulative Pension Fund (SAPF) on January 19, 1998; the SAPF became the first participant in the pension services market. Soon private pension funds appeared, and people had the opportunity to choose where to direct their savings. By default, funds went to the SAPF, and private funds actively worked to attract contributors. As mentioned above, the pension assets of the accumulative pension funds (APF) were formed from MPCs, which constituted a tenth of the salaries of the system participants. In the initial period of operation (until the end of 1999), the financial burden on these payments was borne exclusively by employers, which reduced the interest of the employees themselves in monitoring the timeliness of transfers. This situation created preconditions for delays in payments to the SAPF by enterprises and contributed to the growth of the shadow economy, since enterprises could understate official income in order to reduce the amount of contributions. To solve this problem, the Government of the Republic of Kazakhstan obliged employers to withhold MPCs from employees' earnings and transfer them to the APF simultaneously with the payment of wages. As a result of these measures, a significant increase in pension contributions to the APF was observed already in 2000.

The next stage of the pension system reform was associated with the basic retirement benefit to be paid from the state budget that was put in force in 2005; its the purpose was to support elderly people with low pension payouts. The basic retirement benefit is paid to all citizens of Kazakhstan who have reached the retirement age. Until 2018, it was provided in the same amount for all pensioners who reached the retirement age. However, from July 1, 2018, the calculation mechanism had changed: now it depends on the length of participation in the pension system. This enabled to take into account the labor input of each person and make payments fairer. The further development of Kazakhstan's pension system was characterized by increased competition among non-state pension funds, which led to positive changes: weak funds exited the market, while others merged and strengthened their positions. However, the investment strategy of private funds, along with the economic crisis, led to losses, whereby investors did not receive income from their savings. The largest funds accumulated significant financial resources that were to be used to finance long-term projects of the national economy. However, the practical implementation of this concept revealed a number of systemic shortcomings. As a result, by 2013, only nine of the largest private APFs continued to operate on the market: APF "Respublika", OAPF "Otan", APF "Capital", APF "Atameken", APF "Astana", APF "Neftegaz-Dem", APF "Grantum", APF "Ular-Umit", and APF of Halyk Bank Kazakhstan.

In order to improve the pension system's efficiency, further reforms were needed. One of the key tasks was to create a more efficient system for managing pension assets. As a result, from October 11, 2013 to June 26, 2014, pension assets and mandatory pension savings were transferred from private APFs to the UAPF.

The UAPF performs key functions to provide people with pension savings. Its main tasks were the accumulation of mandatory, voluntary and professional pension contributions, their safety and effective management of funds. The Fund also deals with the payout of pension savings, maintaining individual accounts of contributors and ensuring the transparency of information on the state of pension funds. Investment management of pension assets was transferred to the National Bank of the Republic of Kazakhstan.

The consolidation of pension assets in the UAPF brought a number of undeniable advantages:

1) reducing operating expenses and, consequently, increasing the investment income received;

2) making the protection of personal data of the pension system participants more effective;

3) rendering pension services in accordance with uniform standards, including in an electronic format;

5) improving the quality an transparency of pension asset management;

6) increasing real return on pension assets.

Creation of the UAPF and consolidation of pension assets changed the pension market, while preserving the key principles of the accumulative system, such as the right of ownership of savings, the possibility of their inheritance, the government guarantee of the safety of pension funds and the personalization of accounts.

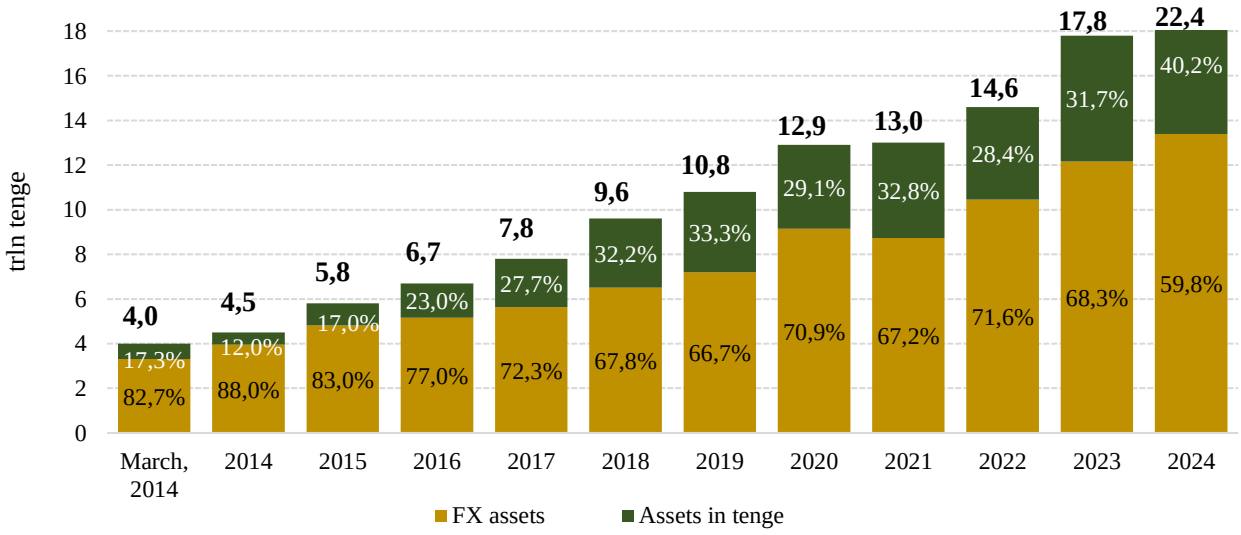
The founder and sole shareholder of the UAPF is the Government of the Republic of Kazakhstan, which is represented by the State Property and Privatization Committee of the Ministry of Finance of the Republic of Kazakhstan. The management of pension assets transferred to the UAPF is carried out by the National Bank. Since January 1, 2016, the authority to develop proposals for improving the management of pension assets has been transferred to the Council for the National Fund Management.

The current investment strategy for the UAPF pension assets under the trust management of the National Bank is balanced and provides for the possibility of investing in a wide range of financial instruments both in the local and foreign financial markets. The UAPF pension assets are invested exclusively in the interests of the UAPF contributors (beneficiaries) in accordance with market principles and the requirements of the UAPF Investment Declaration.

As of January 1, 2025, pension assets amounted to 22.4 trillion tenge, having increased by 4.6 trillion tenge, or 26%, in 2024 (Figure 1). During the period from April 2014, when the consolidation of pension assets in the UAPF was completed, to December 2024, pension assets increased by more than 5 times. Since 2016, the foreign currency share of pension assets has been gradually increased from 17% to 40%. At the same time, in order to effectively manage foreign currency assets, an earmarked strategic allocation of the foreign currency portfolio by asset classes has been established and foreign management companies have been hired.

Figure 1

Dynamics of pension assets



As of January 1, 2025, the volume of the tenge portfolio amounted to 13.4 trillion tenge, or about 60% of the UAPF pension assets. In the structure of the tenge portfolio, the share of

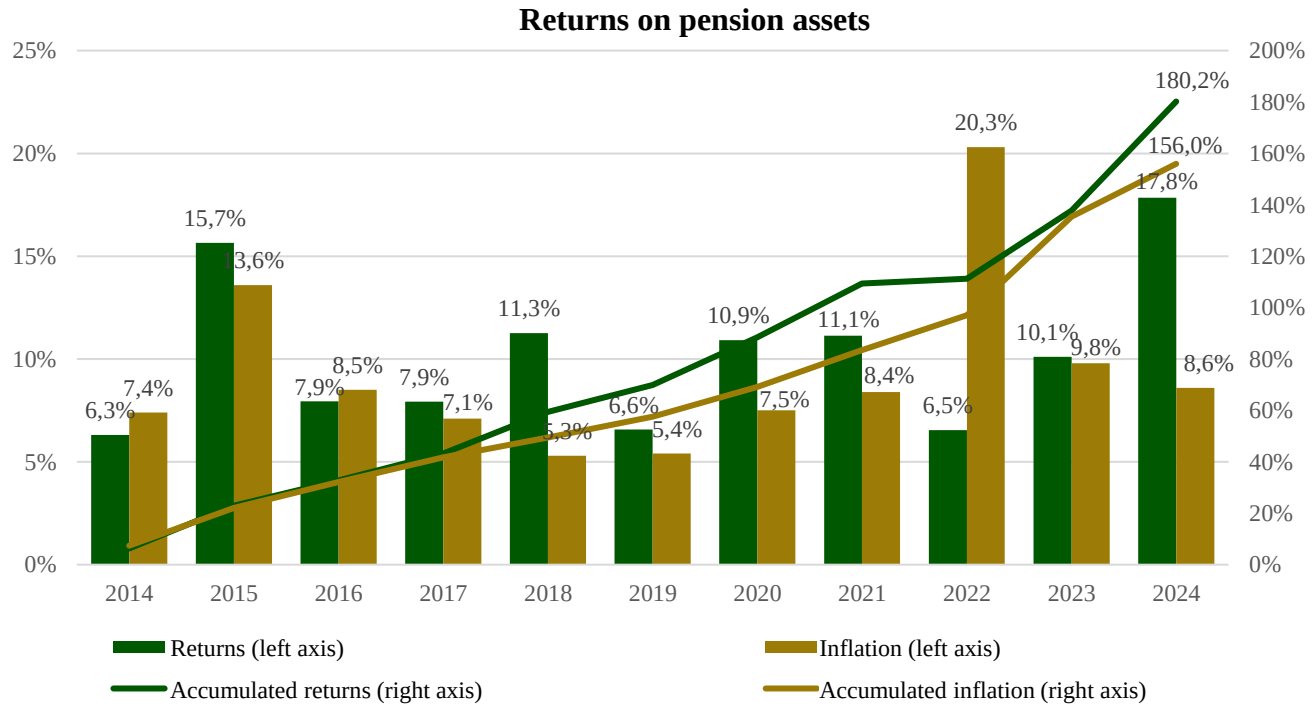
investments in government securities of the Republic of Kazakhstan accounts for about 70%, bonds of quasi-public sector entities – 15%, and second-tier banks – 7%. Government securities of the Republic of Kazakhstan are the most reliable and liquid financial instruments in the securities market of Kazakhstan. Investing the UAPF pension assets in the local market not only ensures stable investment income, but also contributes to the socio-economic development of the country.

It is important to mention that pension assets are invested exclusively at market rates, regardless of the issuers and their ultimate goals for using the funds.

As of January 1, 2025, the volume of the foreign currency portfolio amounted to USD 17.2 billion (KZT 9 trillion), or about 40% of pension assets. The presence of a foreign exchange position ensures diversification of the UAPF pension asset portfolio by expanding the geography of investments and the list of financial instruments, and also improves the quality and profitability of the investment portfolio in the long term. The foreign currency portion is invested in accordance with the strategic allocation, which provides for investments in key foreign asset classes, such as the US Treasury bonds, emerging markets government bonds, investment-grade corporate bonds and equities. It is important to note that assets in the foreign currency portfolio are managed on an index basis, where the index represents a wide range of securities in selected investment markets. For example, the stock index includes more than 1,000 issuers of companies such as Apple, Microsoft, Tesla and others.

Thus, the National Bank pursues a balanced investment policy aimed at ensuring the safety of pension assets and obtaining real returns in the long term. At the end of 2024, the return on the UAPF pension assets was 17.8% with inflation of 8.6%. The accumulated return from April 2014, when the consolidation of pension assets was completed, to 2024 was 180.8% with accumulated inflation of 156% (Figure 2). Thus, the return on pension assets managed by the National Bank is provided above the inflation rate.

Figure 2



Assessing the results of the development of the pension system of Kazakhstan, it is worth mentioning that the creation of UAPF as a centralized operator of the pension system was a timely and justified decision in the context of a difficult economic situation. In 2018, a gradual increase in the retirement age for women from 58 to 63 years began with a step-by-step increase of 6 months until 2027 (2018 – 58 years 6 months, 2019 – 59 years, 2020 – 59 years 6 months, 2021 – 60 years,

2022 – 60 years 6 months, 2023 – 61 years, 2024 – 61 years 6 months, 2025 – 62 years, 2026 – 62 years 6 months, 2027 – 63 years), which caused significant public controversy. Subsequent changes to the country's pension system became part of a new set of measures aimed at improving the pension system's efficiency. President Kassym-Jomart Tokayev, given the public outcry, in his Address to the People of Kazakhstan on September 1, 2022, announced a decision to temporarily fix the retirement age for women at 61 years until 2028.

In recent years, the issue of citizens' right to early withdrawal of a part of their pension savings to solve urgent problems, especially related to the acquisition of housing, has been actively discussed in Kazakhstan. The housing issue is a priority for both the government and the population. In this regard, in his 2019 address, the Head of State instructed the Government to elaborate the issue of targeted use of a part of their pension savings by working individuals by the end of the year, for example, to purchase housing or get an education. Thus, in 2021, in order to support the population, the UAPF contributors were granted the right to early use of their pension savings above the sufficiency threshold for the purchase of housing and medical treatment, as well as to transfer to private management companies. Since February 2021, the volume of early withdrawals of part of their pension savings by contributors amounted to about 4.4 trillion tenge. The main part (about 85%) was used to solve housing issues.

On April 20, 2023, the Social Code of the Republic of Kazakhstan was adopted, which covers all aspects of social support, including assistance to the elderly. It can be called the first unified social document adopted among the CIS countries. One of the key innovations in the field of retirement security was the gradual increase in pension payouts for existing pensioners. Over the next five years, it is planned to increase the size of the basic retirement benefit, as well as increase the maximum income used to calculate the labor pension, from 46 to 55 minimum calculation indices (MCIs) (which is 70% of the average salary). For future pensioners who have independently accumulated pension savings, additional pension contributions from employers were introduced from January 1, 2024. The Code provides for changes that expand the rights of contributors to manage their pension assets: contributors have the right to transfer up to 50% of their mandatory savings to the trust management of investment portfolio managers (however, the government guarantee of safety applies only to those funds that remain under the management of the National Bank); in addition, now people will be able to use savings that exceed the sufficiency threshold only for treatment or the purchase of housing.

2. Review of the Current State of Kazakhstan's Pension System

The pension system in Kazakhstan has become so deeply integrated into economic and social relations that it has become an important part of everyday life. However, its launch took place under significant challenges, including an underdeveloped legislative framework that has been amended several times.

The pension system in Kazakhstan has received international recognition and has been praised for its reform and transition to an accumulative model, which began in 1998. The World Bank and the IMF have praised Kazakhstan for its early transition to an accumulative pension system. They noted that Kazakhstan was one of the first countries in the post-Soviet region to move to a model based on mandatory savings. This step was seen as progressive in terms of ensuring the long-term sustainability of the pension system. The OECD also recognizes Kazakhstan's experience in implementing pension reforms and considers it as an example for other developing countries. In countries of Eastern Europe and Central Asia (e.g. Poland, Latvia, Estonia), Kazakhstan's experience has often been mentioned in the context of discussions on the transition to accumulative pension models. Kazakhstan was considered as an example of a country that had introduced a system of mandatory pension savings, which inspired many of these countries to reform their own systems. In the CIS countries, such as Russia, Ukraine, or Belarus, Kazakhstan was considered as one of the first examples of implementation of a mandatory accumulative pension system in the post-Soviet space. In these countries, the Kazakhstan model

was mentioned as a successful precedent for reforming retirement security in order to reduce the burden on the state budget.

In Kazakhstan, as in many countries, there is a multi-tier pension system, which is a flexible and comprehensive mechanism aimed at ensuring a decent standard of living for people during the retirement period. Each tier of the pension system performs a specific function – from providing minimum government guarantees to building up individual savings. The structure of the system includes the following three main tiers. The first level is the basic and solidarity pension paid by the state from the budget. The second tier is an accumulative system in which each working citizen transfers 10% of their salary to the UAPF every month, and for employees working in high-risk conditions, employers additionally transfer 5% of the salary – mandatory professional pension contributions (MPPCs). The accumulated funds are invested, and upon reaching retirement age, they are paid to the account holder. Since January 1, 2024, the accumulative pension system has been supplemented with a new element – mandatory employer pension contributions (MEPCs). The third tier is voluntary funded contributions, which give people an additional opportunity to increase their pension savings using their own funds.

2.1. Retirement Scheme Funded from the State Budget

Retirement Age Benefit. The solidary retirement benefit is an important element of Kazakhstan's pension system, especially for people who began working before the introduction of the accumulative system. Despite the transition to a new pension model, the solidary pension continues to play a key role in providing the older generation with financial guarantees.

A solidary pension is provided to those who have at least six months of work experience before 1998. The amount of pension payouts depends on the length of work experience and the amount of wages. The average monthly income for any three consecutive years starting from January 1, 1995 is used for the calculation, even if there were breaks in work activity. Since January 1, 1998, the calculation of the average income is based on the amounts from which MPCs were made in the UAPF. The maximum pension is no more than 75% of the average monthly income, limited to an amount equal to 55 MCIs (in 2025 this is 216,260 tenge).

The government ensures retirement security and provides the following guarantees. People who retired before January 1, 1998, retain the right to receive old-age pension payouts (solidary pension), and the amount of payouts established before April 1, 1999, remains unchanged. Persons who had the right to receive a pension for length of service and confirmed this right before January 1, 1998 in competent authorities, also continue to receive these payouts.

The old-age pension is gradually losing its relevance, since the number of people entitled to receive it is decreasing every year, its payments will continue until approximately 2043. The size of old-age pension for men and women is gradually curtailing, since the length of employment before January 1, 1998 is decreasing. In 1998, an accumulative pension system was introduced in Kazakhstan, which is now the main system for new generations of workers. Under this system, every person is required to contribute a portion of their salary to individual pension accounts (IPAs) in the UAPF.

The assignment of pension payouts at retirement age was carried out from July 1, 2001 to men upon reaching 63 years old and to women upon reaching 58 years old. At the same time, the retirement age for women in accordance with the Social Code is determined out according to the following schedule:

from January 1, 2018 upon reaching 58.5 years;
from January 1, 2019 upon reaching 59 years;
from January 1, 2020 upon reaching 59.5 years;
from January 1, 2021 upon reaching 60 years;
from January 1, 2022 upon reaching 60.5 years;
from January 1, 2023 upon reaching 61 years;
from January 1, 2028 upon reaching 61.5 years;
from January 1, 2029 upon reaching 62 years;

from January 1, 2030 upon reaching 62.5 years;

from January 1, 2031 upon reaching 63 years.

Old-age pension payouts are assigned in full to people upon reaching the prescribed retirement age for men with at least 25 years of work experience as of January 1, 1998, and for women with at least 20 years of work experience as of January 1, 1998. At the same time, people who are simultaneously entitled to old-age pension payouts and long-service bonus may choose one of these types of payments at their discretion (Annex 1). Thus, the solidary pension provides guaranteed payouts to those who contributed to the country's economy before the transition to the accumulative system, being an important tool of social protection for older people who did not have time to accumulate sufficient funds in their individual pension accounts. Despite the fact that in the future the solidary pension will cease to be part of Kazakhstan's pension system, its importance for the current generation of pensioners is undeniable. This framework remains an important tool for supporting people, especially those who have significant work experience before 1998.

Basic Retirement Benefit Payment. One of the key elements of Kazakhstan's pension system is the basic retirement benefit, which plays an important role in providing social guarantees for elderly people. The basic retirement benefit is intended for all people who have reached the retirement age. Its main goal is to guarantee a minimum level of income for elderly people, catering to their basic needs after the end of their working life. It was introduced in 2005 as a measure to prevent poverty, which contributed to an increase in the income of pensioners. The basic retirement benefit is provided to all citizens of Kazakhstan, regardless of their work experience and participation in the mandatory pension savings system. The main condition for receiving a basic pension is reaching the established retirement age. As of 2025, the retirement age in Kazakhstan is 63 years for men and 61 years for women.

From January 1, 2023, if the length of service in the pension system was less than 10 years or there was no length of service, the basic retirement benefit was 60% of the subsistence minimum (SM). For each full year of service over 10 years, the pension amount was increased by 2%, but could not exceed 100% of the SM. In accordance with the President's instruction, from 2023 to 2027, a gradual increase in the minimum basic retirement benefit was introduced from 60% to 70% of the SM, and the maximum - from 100% to 120% of the SM; this is aimed at increasing the efficiency of the pension system and providing people with decent pensions. From January 1 2025, the minimum basic retirement benefit was increased from 65% to 70% of the SM (in 2025 - 32,360 tenge), the maximum amount from 105% to 110% of the SM (in 2025 - 50,851 tenge).

The amount of the basic retirement benefit is adjusted annually based on the inflation rate, since its amount is linked to the amount of the subsistence minimum. The basic retirement benefit from the government is provided to persons:

1) for whom old-age pension payments were assigned before July 1, 2018;

2) who have reached retirement age in accordance with paragraph 1 of Article 207 of the Social Code, with the exception of judges of the Constitutional Court of the Republic of Kazakhstan whose powers have been terminated due to the expiration of the term of office established by the Constitution, who receive a monthly lifetime allowance, retired judges who receive a monthly lifetime allowance, military personnel, employees of special government and law enforcement agencies, the state courier service, as well as persons whose rights to have special ranks, class ranks and wear uniforms were abolished from January 1, 2012, and persons whose medical positions were reduced in the internal affairs bodies of the Republic of Kazakhstan from July 1, 2022 and January 1, 2023, who at the time of the reduction of the position had at least twelve years of service and six months of continuous military service, service in special government and law enforcement agencies, the state courier service, provided that they continue to work in medical organizations located in pre-trial detention centers and institutions penal system, receiving pension payouts for years of service.

Thus, the basic retirement benefit is an important tool for combating poverty among the elderly, especially those who have not been able to accumulate sufficient funds during their

working life. Thanks to this framework, the government maintains the standard of living of pensioners, guaranteeing a minimum income necessary to cater to basic needs. The basic retirement benefit plays a key role in social support for elderly people in Kazakhstan and not only ensures financial stability of those who have retired, but also guarantees social justice by supporting those who have not been able to provide for themselves through other sources of income. In 2024, pensions in the amount of more than 3.7 trillion tenge were paid from the national budget to 2.4 million people, of which 1.2 trillion tenge were allocated for the payment of the basic retierment benefit, and 2.5 trillion tenge for the solidary retirement benefit.

2.2. Accumulative Pension System

Mandatory Accumulative System. The second tier of the pension system includes the MPCs (10%) of workers, as well as the MPCs in the amount of 5% of the income of workers employed in high-risk conditions. Kazakhstan became the first country among the CIS countries to implement a pension system reform, which was based on a model developed by analogy with the pension system of Chile. After the collapse of the Soviet Union, the unified pension system was destroyed, and on June 20, 1997, the Law "On Retirement Security in the Republic of Kazakhstan" was passed. In 1998, the country began a pension reform. From January 1, 1998, all working individuals were required to deduct 10% of their income to the APF on the IPS. The main developers of the pension reform were Daulet Sembayev and Grigory Marchenko[1].

Pension payouts from the MPCs are provided to the following persons who have pension savings in the UAPF:

1) persons who have reached the generally established retirement age;

2) individuals with disabilities of the first or second group, if the disability is established indefinitely;

3) foreigners and stateless persons who have left for permanent residence outside the Republic of Kazakhstan;

4) citizens who have reached the age of forty-five years and have sufficient pension savings to ensure an insurance payment of at least 70% of the minimum subsistence level (in 2025 - 32,360 tenge) to enter into a pension annuity agreement with an insurance organization.

It is also worth mentioning that Kazakhstan has a unique government guarantee for the safety of MPCs. It provides for the return of amounts actually contributed to the individual pension account, taking into account inflation at the time the right to pension payments arises (reaching the generally established retirement age, registering a move to a permanent place of residence abroad, or establishing permanent disability of groups I or II).

From January 1, 2003, employers began making voluntary professional pension contributions in favor of employees engaged in hazardous industries. From January 1, 2014, these contributions became mandatory: a new type of pension contribution was introduced within the framework of the accumulative pension system – MPPC. The purpose of this payment was to create and strengthen a mandatory professional pension scheme based on the principle of equal responsibility of the government, employer and employee engaged in hazardous working conditions. The first payments from MPPCs began to be made from January 1, 2019. The MPPCs are the funds contributed by employers to the UAPF for the benefit of employees working in conditions included in the approved list of industries and professions. Pension payouts from the MPPCs are provided to the following persons who have accumulated pension funds in the UAPF: 1) persons who have reached the generally established retirement age; 2) individuals with disabilities of the first or second group, if the disability is established indefinitely; 3) citizens of the Republic of Kazakhstan, foreigners and stateless persons permanently residing in the territory of the Republic of Kazakhstan, not employed in jobs with harmful working conditions, upon

[1] Daulet Sembayev – Governor of the National Bank of Kazakhstan from December 20, 1993 to January 10, 1996. Grigory Marchenko – Governor of the National Bank of Kazakhstan from October 12, 1999 to January 6, 2004 and from January 22, 2009 to October 1, 2013.

reaching the age of 55 and when the MPPCs for such individuals have been paid in total for at least 84 months; 4) foreigners and stateless persons who have left for permanent residence outside the Republic of Kazakhstan; 5) persons who have reached 40 years of age, for whom the pension annuity has been paid for at least 60 months, subject to the entering into a pension annuity with an insurance organization, which will ensure insurance benefit payments of at least 70% of the minimum wage.

Employers act as contributors to the MPPCs, transferring monies from their own funds in favor of employees. The right to pension payouts under the MPPC is granted to individuals employed in professions included in the list approved by the Government of the Republic of Kazakhstan, which is compiled on the basis of research conducted by the Republican Research Institute for Labor Protection, subject to the following criteria:

- existence of harmful production factors;
- employment of at least 80% of the time in jobs with harmful working conditions;
- presence of harmful working conditions (not lower than class 3) related to the specifics of production.

In addition, from January 1, 2024, a new conditional funded component was introduced – the MEPCs as part of the accumultive pension system, contributions to which are transferred from the employer's funds for employees born after January 1, 1975. The size of the MEPCs from the employee's income will gradually increase and will amount to:

from January 1, 2024 – 1.5%,
from January 1, 2025 – 2.5%,
from January 1, 2026 – 3.5%,
from January 1, 2027 – 4.5%,
from January 1, 2028 – 5%.

In this case, the income taken into account for calculating the MEPCs must not be lower than the minimum wage (MW) and not exceed 50 times the MW. The maximum amount of pension payouts at the expense of the MPCR cannot be more than twice the PM.

In future, savings formed from the above-mentioned contributions of employers will allow providing employees (who do not have work experience in the solidarity system, i.e. before 1998) with a higher level of retirement benefit on a lifelong basis.

Voluntary accumulative system. Voluntary pension contributions play an important role in the buildup of additional pension savings for people. This framework enables people to independently manage their pension income, provides more flexibility and opportunities to ensure a dignified old age.

People are given an additional opportunity to increase their savings through voluntary pension contributions (VPCs), which will become an additional source of income for pensioners in future.

Voluntary pension savings (VPSs) supplement mandatory contributions and ensure a higher standard of living after retirement. They can be useful for people whose official income was not high enough to accumulate significant pension savings, as well as for those who want to ensure a higher standard of living in retirement. However, their popularity remains low.

Pension payouts from VPCs can be received by the following persons who have savings in the UAPF:

1) persons who have reached the age of 50;
2) persons with disability;
3) foreigners and stateless persons who have left for permanent residence outside the Republic of Kazakhstan.

The VPCs are credited to the opened IPAs of individuals on whose behalf the VPCs are transferred. If an individual does not have an open IPA in the UAPF to keep record of the VPCs, it is opened on the basis of a list of persons submitted by employers to the fund when transferring the first contributions. The VPCs can also be contributed by an individual in his or her own favor or in favor of another person.

However, in relation to pension savings at the expense of the VPCs, there is no government guarantee for safety taking into account the inflation rate, as is the case with the MPCs, MPPCs in the UAPF.

One of the key advantages of voluntary contributions is the ability of people to independently influence the size of their future pension. In conditions where the MPCs may not provide a sufficient level of income for retirement, voluntary contributions can compensate for this shortcoming. Contributing additional monies to your pension account helps to form a more stable financial base for the retirement period.

In addition, VPCs have tax benefits. According to the existing tax legislation of Kazakhstan, amounts contributed in the form of voluntary pension contributions can be deducted from the taxable base. This creates an additional incentive for individuals and employers to participate in the program.

Pension Annuity. A pension annuity is an insurance product that allows the UAPF contributors to begin receiving pension payouts before reaching the required retirement age, provided that they have sufficient savings.

The pension annuity contract provides lifetime payments to the contributor, starting from a certain age. After purchasing the annuity, the surplus funds remaining in the UAPF can be used to improve housing conditions or pay for medical treatment. In 2025, to enter into a pension annuity, a man aged 55 years will need to accumulate 8.6 million tenge, and a woman aged 53 years – 11.2 million tenge.

At the same time, there is a deferred pension annuity that can be purchased from 45 years, and payouts will begin from 55 years. To do this, a man aged 45 years needs to accumulate 7.2 million tenge, and a woman – 9.1 million tenge.

Payouts from the UAPF continue until the contributor’s pension savings are fully used up. Payments from the insurance organization for the pension annuity are made for life, even if the savings are exhausted. This means that payments do not depend on the amount of funds transferred.

To improve the parameters of the pension annuity, a joint annuity model was introduced, which enables not just one person to participate in the contract, but a married couple or close relatives. A joint annuity allows for the pooling of savings and the redistribution of income, which makes it possible for both parties to receive lifelong payments, even if one of the spouses does not have enough savings to purchase an annuity.

2.3. Results

The pension system of Kazakhstan is multi-tier and is aimed at providing people with various types of pension payouts based on their length of service, working conditions and pension savings. It combines elements of distribution and accumulation of pensions, which allows the system to be adapted to changes in the economy and the social status of individuals.

Summing up, it should be noted that the main objective of the pension system is to provide all people with a stable income in old age.

Despite the existing difficulties in the pension system, it can be emphasized that the new accumulative pension system in Kazakhstan has demonstrated its sustainability not only during the periods of economic growth, but also in the context of serious crises, which consequences are still felt. At the moment, an important task is to overcome them, as well as to create favorable conditions for the effective operation of pension funds and the further development of the accumulative system in future.

3. Assessing the Pension System of Kazakhstan

In 2023, for the first time Kazakhstan's pension system became a part of the international rating – the Mercer CFA Institute Global Pension Index, developed jointly with the consulting company Mercer Consulting (Australia). The rating includes 47 countries, which are home to 64% of the world's population. The Global Pension Index evaluates pension systems on a variety of parameters grouped into three categories: adequacy, sustainability and integrity – covering 50 different criteria. According to results of the analysis and comprehensive assessment, in 2023, the pension system of Kazakhstan ranked 20th in the rating, receiving 64.9 points out of 100 possible and a rating of "C+", which is higher than Hong Kong, the USA, the UAE, Colombia, France and Spain. The report says that the pension systems of these countries have both strengths and aspects requiring improvement to increase their effectiveness and sustainability over time.

Based on the assessment, Kazakhstan's pension system was assigned the following scores in the three main sub-indices. In the adequacy category, which assesses the level of income provided by the pension system, Kazakhstan scored 46.9 (out of 100), ahead of countries such as Malaysia and Turkey, but there is room for improvement in the minimum pension and its indexation, the level of pension savings of the population, and the ability to invest savings. In the sustainability category, Kazakhstan outperformed Singapore, Germany, and the United States, scoring 74.8. This indicator reflects the ability of the system to remain sustainable in the long term. In the integrity category, which assesses the regulation and management of pension funds, Kazakhstan scored 80, ranking 14th, ahead of Sweden, Switzerland, and China, as Kazakhstan's strengths include good regulation and a high level of protection for pension system participants. Although Kazakhstan performed well in the sustainability and integrity indicators, its pension system performed poorly in adequacy, ranking 38th out of 47 countries.

Based on the assessment results, general recommendations were formulated by Mercer experts for the further development of the pension system in Kazakhstan:

– increasing the minimum level of support for the poorest pensioners;

– stimulating households to increase the level of pension savings;

– reducing the outflow of savings in the pre-retirement period by restricting access to pension savings;

– increasing the level of participation in the economy of older people as life expectancy increases;

– enforcing a requirement to reflect projected pension payouts in annual statements of pension system participants.

The recommendations of the Mercer CFA Institute for Kazakhstan's pension system development are aimed at ensuring its sustainability and fairness in the long term and will be used in implementing the aspects of further improvement of the country's pension system.

4. Experience of Foreign Countries

The pension systems of most developed countries are structured as a three-tier model. The first tier is protection against poverty, which guarantees a minimum level of income to meet basic needs. Here, payments are made by the government on a distributive principle. The second tier is focused on the working population and is aimed at stimulation or mandatory accumulation of funds during the period of work for their use at retirement age. Both the distributive and accumulative principles can be applied here. The third tier is voluntary retirement security. It is a personal initiative and is implemented via insurance companies, banks or private pension funds. The government does not participate in this tier.

Pension systems of developed countries can be conditionally divided into two categories: with a predominance of privately funded retirement security (for example, Australia, Denmark, Finland) and with a dominant role of payouts by the government (for example, Italy, USA, Belgium, Germany). In the countries of the first category, private pension plans are mandatory – they are regulated either at the legislative level or through collective agreements, which makes them an important part of national pension systems. In countries where public pension systems

prevail, participation in private pension plans is most often voluntary. As a result, only a small proportion of workers receive private pension payouts, relying mainly on public retirement security. This difference in approaches is reflected in the level of social protection of the population and the financial sustainability of pension systems.

According to a study by Mercer consulting company, which covered 47 countries, Denmark received the highest rating of category A (over 80 points), while Australia and Finland received a B rating (from 75 to 80 points). To better understand successful pension system models, it is useful to analyze the key features of systems functioning in these countries, since they demonstrate effective retirement security methods and apply a three-pillar model, which has become the basis for retirement security in most other countries. The Danish pension system is one of the most sustainable and balanced in the world, which stands out in such indicators as adequacy, sustainability and transparency. Its multi-pillar structure, including payouts by the government, labor savings and voluntary pension programs, provides people with a stable financial situation in old age. The Danish pension system model includes three main components:

1. Guaranteed social pensions. These payouts are intended to provide pensioners with a minimum subsistence level.

2. Accumulative labour pensions. This component is aimed at minimizing the gap between income during active working life and at retirement, as well as improving the standard of living of pensioners. Contributions are made by both employers and employees, and savings are invested. These programs supplement the government pension and form a significant part of pension payouts. Payments of accumulated funds can be made either as a lump sum, or annually or monthly for 10–25 years.

3. Private pension savings and investments. The third pillar of the pension system includes voluntary savings and investments of individuals. They can independently choose insurance companies, determine the amount of contributions, the frequency of deductions and types of insurance.

The Danish pension system is considered one of the most sustainable in the world due to its high level of population coverage, automatic inclusion of workers in savings schemes and effective regulation. The Australian pension system focuses on a gradual increase in the retirement age for men and women, which by 2025 reached 67 years. This strategy reflects global trends associated with an increase in the number of pensioners and reduction in the working population in developed countries. In the context of demographic changes and migration, the Australian system provides for working citizens to independently deduct part of their income into a state fund, from which the insurance portion of the pension is then formed. The Australian pension system includes the following elements:

1. A government pension, which main purpose is to ensure a minimum standard of living for pensioners. Funding is provided by state tax revenues. The amount of benefits depends on the level of income and property: the higher the income and property status, the lower the benefit.

2. Labor pensions. Contributions total 18% of the employee’s income: 9% each is contributed by employers and employees. These funds are transferred to private pension funds or insurance companies in accordance with pension plans.

3. Personal pension. Personal pension accounts are opened on a voluntary basis and allow making small contributions. Like labor pensions, such accounts are subject to taxation.

Since the introduction of the Compulsory Superannuation Guarantee in 1992, employers have been required to make superannuation contributions for employees as part of an agreement between the government, employers and trade unions. There are a number of superannuation funds in Australia (Table 3) that provide financial services to individuals, including benefits and pensions.Pension assets are invested in various financial instruments and real estate. Individuals are offered a choice of several investment strategies that vary in the level of risk and profitability. The government exercises control over operations of all pension funds: they are required to submit

annual reports to the Australian Taxation Office[2] with an auditor's report reviewing their investment operations.

Table 3

Types of pension funds in Australia

Pension funds			
Corporate funds	**Industry funds**	**Public-sector funds**	**Retail funds**
- are established by employers; - are intended for the staff of a specific enterprise	are intended for the staff of a specific industry	Operate in accordance with the laws of the Commonwealth, state or a territory	Deal with individuals and employers as a financial service provider

The Australian pension system is therefore considered one of the most sustainable in the world due to its high population coverage, strict regulation and high capitalization of pension funds.

The key features of the Finnish pension system are its transparency and good organization. Many sources emphasize that the combination of a government pension and several pension schemes makes the Finnish system sustainable.

The Finnish pension system consists of two pillars: the government pension and voluntary corporate and individual pension plans.

The government pension includes:

– national pension (paid from the state budget and provides an additional payment up to the subsistence minimum for those citizens whose income does not allow them to reach this level);

– a guarantee pension for people with no other sources of retirement income;

– labor pension. Employees and employers (or entrepreneurs) make regular contributions to a pension fund throughout their working life. These funds accumulate and form the basis for future payments.

Voluntary plans are implemented through corporate and individual schemes financed by individuals and companies through insurance premiums.

That is, an income-related pension is designed to provide pensioners with a sufficient level of income to maintain consumption at a level comparable to their income during their working life. The national pension guarantees a minimum income in cases where the income-related pension is insufficient.

Voluntary pension programs, including corporate and sectoral pension schemes, are becoming increasingly popular, although their role in the overall pension structure remains insignificant.

In summary, pension systems in countries such as Denmark, Finland and Australia are largely based on private sources of funding, as enshrined in the laws. These goals are also relevant for many European countries that are facing the problem of an ageing population and are actively improving their pension systems.

Studying international experience in reforming pension systems allows identifying various approaches and their key characteristics that contribute to increasing the sustainability of systems. Despite differences in structure, legislation and other features in different countries, most pension systems have similar multi-tier models.

Using best international practices can significantly increase the sustainability and efficiency of the pension system in Kazakhstan. At the same time, it is important to adapt these practices to local realities, ensuring a balance between protection of social interests of people and the financial sustainability of the system.

[2] The Australian Taxation Office is an Australian government statutory body and the main body responsible for collecting revenue for the Australian Government. The Office is responsible for monitoring the Australian federal tax system and superannuation legislation.

Findings

The pension system of Kazakhstan has undergone significant changes since its formation in 1998, when the country switched to an accumulative model. Creation of the UAPF was an important step towards a sustainable and reliable system aimed at providing people with a decent standard of living after retirement. Despite a number of challenges, the system continues to develop and demonstrate positive results.

To summarize, we will highlight the main aspects of the pension system of Kazakhstan.

1. Accumulative system as a guarantee of the future. One of the most significant achievements is the introduction of the accumulative pension system, which allowed every citizen of Kazakhstan to directly participate in the formation of their pension. This model provides a personalized approach to savings: the longer a person works and the more funds he/she contributes, the greater their future pension payments. Unlike distribution systems, which in many countries are under pressure from demographic changes, the accumulative system is more flexible and able to adapt to economic and social challenges. The transition to the accumulative model contributes to an increase in personal responsibility for future well-being, encouraging people to plan their financial stability in retirement. Thus, a new culture of managing one's monies is being formed and awareness of the importance of pension savings is increasing.

2. The UAPF as a central instrument of stability. The creation of UAPF was an important step in increasing the reliability and transparency of the pension system. The UAPF accumulates people's pension assets and ensures their safe investment. An important advantage of the fund is its government support, which guarantees the safety of savings and ensures the stability of the system in the long term.

The UAPF prepares regular reports on its operations and provides people with access to information on the status of their pension accounts through online platforms, which contributes to the growth of trust in the system. The transparency of the fund's work, as well as strict control measures over its activities, allow people to be confident that their pension savings are reliably protected.

3. Growth in the number of participants and assets. In recent years, there has been a significant increase in the number of participants in the pension system, as well as in the volume of accumulated assets. According to the UAPF, the number of contributors is constantly increasing, which indicates the growing confidence of people in the accumulative model. The total amount of savings is also growing, which is an important indicator of financial stability of the fund and its ability to provide payouts to future pensioners. This suggests that citizens of Kazakhstan are increasingly using the opportunities of the pension system to build their well-being in retirement. The increase in savings indicates that the system has a stable financial foundation and can provide stable payments in future.

4. Social protection and support of the population. In addition to the accumulative part, Kazakhstan also continues to support the solidary part of the pension system, which guarantees basic retirement benefit payments for all citizens. This is especially important for those who have insufficient savings or have faced economic difficulties during their working life. The government regularly carries out indexation of basic retirement benefits, which helps protect pensioners from inflation and ensures a minimum level of income for those who need it. Thus, the combination of the accumulative and solidary systems creates a flexible and adaptive pension model that provides support to wide segments of the population, regardless of their income level and work experience.

5. Mercer CFA Institute Global Pension Index. Kazakhstan's appearance in the Mercer CFA Institute Global Pension Index in 2023 at the 20th place out of 47 countries is a significant achievement that demonstrates progress in the development of the national pension system. High scores in the sustainability and integrity sub-indices confirm the system's ability to remain stable over time and ensure high-quality management of pension resources. However, a low score on the adequacy index is an evidence of the need to raise the level of pensioners' income, requires an increase in the minimum retirement benefit and incentives for savings.

Implementing expert recommendations, such as supporting the most vulnerable pensioners, encouraging savings and limiting early withdrawals, could be important steps to further strengthen the system. Introducing pension payment forecasts in annual reports would help improve transparency and awareness among participants. Thus, further improvement of the pension system in Kazakhstan will not only increase its social justice, but also strengthen its competitiveness at the international level, ensuring a decent standard of living for future generations of pensioners.

6. Focus on long-term development. The Government of Kazakhstan and the National Bank are actively working to improve the pension system. It is planned to further develop pension programs, expand the range of investment opportunities, and strengthen measures to protect pension savings. Particular attention is paid to improving the financial literacy of people, thus contributing to the awareness of importance of regular contributions and proper management of their savings.

All this testifies to a long-term strategy for the development of the pension system, aimed at ensuring its sustainability and competitiveness in the context of global economic changes. Such focus on the future is an important factor in the system's stability and reliability.

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Annex

Retirement security for military personnel

No.	Parameter	Description
1	Option	Individuals who are entitled to a retirement benefit based on age and length of service choose one of the types of payments
2	Condition for pension for length of service years	Refund of 50% of MPCs contributed at the expense of the government before January 1, 2016.
3	Categories of beneficiaries	- military personnel (except for compulsoty military servicemen) - employees of special government agencies and law enforcement agencies - employees of the military courier service - persons with abolished ranks/titles (since 2012) - medical workers whose positions have been reduced in the Ministry of Internal Affairs (since 2022/2023)
4	Requirements to work experience	At least 12 years and 6 months of service in the above mentioned agencies and work in medical institutions of the pre-trial detention center/penal system.
5	Categories under the 1998 reform	1. Service > 10 years as of 01.01.1998 – solidary pension, without MPCs. 2. Service < 10 years – mixed pension: 2% for service + 1% for service before 1998 + 20% savings. 3. Received after 01.01.1998 – only savings system.
6	Differentiation of pensions (2006)	Pension amounts have been unified for the same positions and length of service, regardless of the year of dismissal.
7	Changes from 2016	All employees have been transferred to full government retirement security (without the accumulative portion).
8	Consequences of the 2016 reform	Recalculation of pensions for the second category based on indexation. The third category can receive a full government pension with: length of service > 25 years, service > 12 years 6 months, dismissal due to age/staffing/health.
9	Innovations in the Social Code	Possibility of using the MPCs for: - improving housing conditions; - paying for medical services (for oneself, spouse or relatives). MPPC can be used upon reaching the retirement age.

The Effect of Oil Shocks on Macroeconomic Indicators of Kazakhstan

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Oil prices represent a volatility factor for the Kazakh economy due to its high dependence on revenues from this sector. The purpose of this study is to examine the impact of oil shocks on macroeconomic indicators of Kazakhstan. What is the impact of oil fluctuations on the economy? What is the dynamics of macroeconomic indicators when oil shocks occur? To obtain qualitative and quantitative answers to the questions of interest, an analysis was conducted using the vector autoregression (VAR) model. The results showed that a positive oil shock has the greatest and statistically significant impact on the exchange rate, and also has a positive effect on economic activity.

Key Words: vector autoregression models, oil shock, exchange rate, pass-through effect.
JEL-Classification: C32, C52, E17, E31, E32.

I. Introduction

Oil price fluctuations play a key role in the global economy, significantly affecting the macroeconomic stability of both oil-exporting and oil-importing countries. Kazakhstan, as one of the major players in the global oil market, is heavily dependent on oil sector revenues. Black gold exports account for more than half of total exports (56%), oil production amount to about 16% of GDP, and oil revenues account for more than a third of state budget revenues. The economy's dependence on the resource sector underlines the importance of studying the impact of oil shocks on economic indicators.

This study examines the impact of oil shocks on key macroeconomic indicators of Kazakhstan: the short-term economic indicator (KEI) (a proxy for economic activity), the exchange rate of the tenge to the US dollar, and inflation.

Since August 2015, the National Bank of Kazakhstan has been pursuing an inflation targeting policy and implementing a free-floating regime of the tenge, which makes the exchange rate more sensitive to market conditions. The study covers the period from January 2017 to November 2024, excluding the period of high volatility from August 2015 to December 2016. The study uses a vector autoregression (VAR) model to analyze the relationship of macro indicators, contributing to the study of the impact of external shocks on the economy of oil-exporting countries.

II. Literature Review

The impact of oil shocks on macroeconomic indicators has been widely studied, especially in countries dependent on oil revenues. Thus, the results of the study by Amany El-Anshasy (2009), Amir Sadeghi (2017) showed a positive relationship between the growth of oil prices and economic activity in oil-exporting countries. Calculations by Amany El-Anshasy (2009) show that an increase in oil prices has a moderate positive effect on long-term growth: a 1% increase in oil prices leads to the GDP growth of 0.03 percentage points. Most studies emphasize that fiscal policy plays a key role in the pass-through of changes in oil prices onto the economy. The study by Gurvich et al. (2009) shows that oil prices have a significant impact on the economies of Norway, Russia, Iran and Venezuela. However, for Kazakhstan, no significant impact of oil prices on GDP or fiscal indicators was found.

The relationship between oil shocks and industrial production is also a subject of research. Zeynalov & Tiron (2022) demonstrate that industrial production in resource-dependent economies is strongly pro-cyclical to changes in oil prices, which is due to fiscal and monetary channels.

El Anshasy et al. (2016), Chaoqun Ma et al. (2022) confirm that rising oil prices have a positive effect on the exchange rate in oil-exporting countries. Golub (1983), Krugman (1983) explain this effect through the wealth channel: rising oil prices lead to a flow of resources from importing countries to exporting countries, which depreciates the currencies of oil importers. Amano and van Norden (1998a, b), in turn, adhere to the assumption of a connection between oil prices and the exchange rate through the terms of trade channel: a growth in oil prices leads to a rise in prices for non-tradable goods (services, construction, transport, etc.), which results in a general increase in inflation and appreciation of the real effective exchange rate in the long term. At the same time, expectations about such appreciation may cause changes in the nominal exchange rate even before the actual realization of these processes.

Oil price fluctuations can also have a significant impact on inflation. The literature describes two pass-through channels for this effect: the direct channel – changes in domestic prices to adjust to an external oil shock, and the indirect channel – the pass-through effect through changes in the exchange rate (Kartaev&Medvedev (2019)). Czech&Niftiyev (2021) highlight the key role of the tenge/US dollar exchange rate in passing through the effects of oil shocks in Kazakhstan. Their results show that currency appreciation caused by rising oil prices can stabilize inflation. In addition, they note that these relationships become more pronounced during the periods of economic crises, such as the COVID-19 pandemic, when external shocks increase domestic vulnerabilities.

In the context of oil-exporting countries, studies highlight the dual nature of oil shocks. On the one hand, high oil prices increase budget revenues, which allows for an increase in government spending and stimulates the economic growth (Yoshino & Alekhina (2016)). On the other hand, prolonged periods of high oil prices can lead to the "Dutch disease", characterized by currency appreciation and the reduced competitiveness of non-resource sectors (Corden & Neary (1982), Egert & Leonard (2007)).

The VAR model in these works has become a popular tool for analyzing the dynamic impact of oil shocks on macroeconomic variables. These methodologies allow estimating impulse response functions and variance decomposition of forecast errors, providing valuable insights into the pass-through mechanisms of oil shocks.

III. Data

The empirical analysis in this study is based on monthly data for the period from January 2017 to November 2024. This period covers several oil shocks: the Covid shock, the conflicts between Russia and Ukraine, and in the Middle East.

The endogenous variables used in the study are defined as follows:

$$Y_t = [C01, KEI, ER, CPI\ ],$$

where:

C01 – oil price at period-end,

KEI – short-term economic indicator, Dec.2016=100,

ER – USD/KZT exhange rate at period-end,

CPI – consumer price index, Dec.2016=100.

The data was downloaded from Bloomberg Terminal and the Bureau of National Statistics website. All variables were tested for stationarity using the following methods: autocorrelation functions (ACF), partial autocorrelation functions (PACF), and Dickey-Fuller test (ADF). To ensure data stationarity, a diff-log transformation was applied to all variables. (DLOG).

Following the Cholesky decomposition, impulse responses were calculated according to the following order of variables reflecting the economic relationships studied in previous works (Yildirim & Arifli, 2021; Syzdykova, 2018): C01 -> KEI -> ER-> CPI. This order of variables corresponds to economic transmission mechanisms, where external factors influence economic

activity through the fiscal channel, which is also reflected in the dynamics of the exchange rate and, due to the pass-through effect, affects inflation.

The specification and tests for validating the VAR model are presented in the Appendix.

IV. Methodology

The study employs the vector autoregression (VAR) model, which is widely used in empirical macroeconomic analysis due to its flexibility in treating variables. This method was developed by Sims (1980) and is based on the Granger causality test (Granger (1969)). The difference between the VAR model and other autoregression models is that it predicts bidirectional effects between time series. Previous studies (Adler et al. (2019), Syzdykova (2018), Yildirim & Arifli (2021)) have demonstrated the effectiveness of VAR models in studying exchange rate movements in oil-producing and developing economies like Kazakhstan. The general VAR(p) model is presented as follows:

$$Y_t = \alpha_0 + \sum_{j=1}^{p} A_j Y_{t-j} + \varepsilon_t,$$

where:

Y_t denotes $M \times 1$ vector containing M time series,

α_0 is $M \times 1$ vector consisting of a constant,

A_j is a matrix of $M \times M$ coefficients,

$\varepsilon_t M \times 1 \; - \;$ vector of errors.

The VAR model has advantages because macroeconomic variables are linear functions of their past values, and each time series is a linear function of the past values of other macroeconomic variables. However, VAR models with high parameter density can lead to out-of-sample forecast instability and difficulties in structural analysis.

V. Results of the Model

To assess the relationship between oil shocks and macroeconomic indicators, a VAR model and impulse responses to shocks were estimated. Impulse response functions demonstrate the reaction of endogenous variables to a shock of one standard deviation on other endogenous variables in the VAR system. Impulse response analysis allows estimating the duration of the impact of a shock to one variable on other variables, as well as to determine which of them demonstrates the greatest response to this shock. Given that the variables in the model were used in the first difference of logarithms, for normalization purposes, the impact on variable A in response to a 1% change (shock) in variable B in the n^{th} month was calculated according to the formula presented in the study by Sansone and Justel (2016), based on the cumulative impulse responses of the VAR model:

$$\frac{\text{cumulative response of variable A to shock of variable B in the } n-th\ month}{\text{cumulative response of variable B to shock of variable B in the } n-th\ month}$$

Thus, this indicator reflects the change in variable A in percentage terms in response to a corresponding 1% shock to another variable B. The graphs in Figures 1 and 2 were obtained by calculating impulse responses according to this formula and demonstrate the main results of the model.

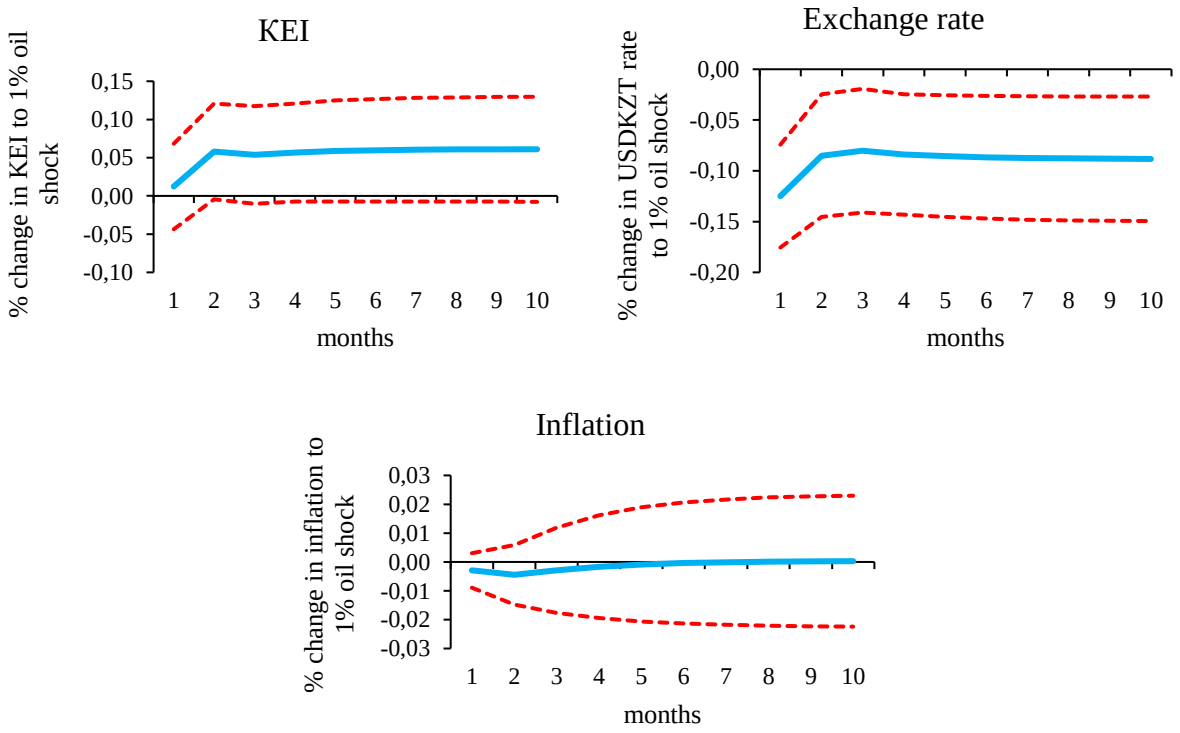
Figure 1 shows that the oil price shock has the greatest and statistically significant impact only on the exchange rate. Thus, the positive effect of a 1% increase in oil prices in month 1 is reflected in the strengthening of the tenge by 0.12% in the same month, and the effect stabilizes in month 3, where the national currency exchange rate as a whole strengthens by 0.09%. The effect of the oil shock on the exchange rate is statistically significant.

According to the impulse response of the KEI, there is an increase in the index against a positive shock to oil, the greatest effect is observed in the 2nd month and then it stabilizes.

The impact of oil shocks on inflation demonstrates a weak negative relationship, fading and stabilizing by the 4-5th month. The effect of pass-through of the oil shock onto inflation can be noisy due to the government regulation of prices for oil products, which does not allow for a direct and immediate impact on the prices of production costs.

Figure 1

Cumulative impulse responses of variables to a 1% shock of oil prices
Coefficients and confidence intervals (±2 stand.errors)

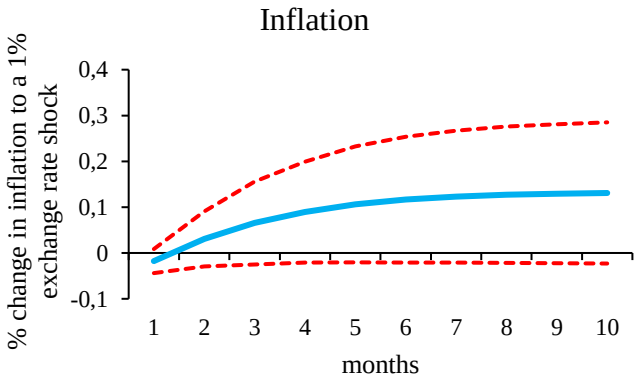


Source: compiled by the authors.

Also, due to high import dependence, the exchange rate has an impact on inflation in accordance with the pass-through effect (Figure 2). In response to a 1% exchange rate shock, inflation increases by 0.12 percentage points, the total effect reaches its peak in the 5-6th month and then stabilizes (comes to naught).

Figure 2

Cumulative impulse responses of variables to a 1% exchange rate shock of the tenge



VI. Findings

In this study, an assessment of the impact of oil shocks on macroeconomic indicators was conducted: economic activity, exchange rate and inflation.

The results of the model showed a significant impact of oil on the tenge exchange rate: a 1% increase in oil prices is reflected in the strengthening of the exchange rate by 0.09-0.12%. The positive effect of oil price growth on economic activity in the country and a weakly negative relationship between oil and inflation are also confirmed.

At the same time, high dependence of the economy on imports determines the impact of exchange rate changes on inflation: a 1% change in the exchange rate is accompanied by an increase in inflation by 0.12 percentage points.

According to a number of studies, the introduction of an inflation targeting regime helps to reduce the impact of external shocks on domestic inflation. Effective implementation of monetary policy strengthens the trust of economic agents and increases their confidence in achieving the target, which contributes to a more stable consolidation of inflation expectations. As a result, external shocks have a less significant effect on inflation expectations.

The introduction of inflation targeting, effective implementation of monetary policy, together with measures aimed at diversifying the economy, import substitution and compliance with budget rules, make it possible to reduce the vulnerability of macroeconomic indicators to external shocks.

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Annex

VAR model specification

Vector Autoregression Estimates
Date: 30/12/24 Time: 13:19
Sample (adjusted): 2017M02 2024M11
Included observations: 94 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	DLOIL	DLKEI	DLUSDKZT	DLCPI
DLOIL(-1)	0.212363	0.061763	-0.003029	0.006850
	(0.11767)	(0.03195)	(0.03075)	(0.00343)
	[1.80468]	[1.93335]	[-0.09848]	[1.99511]
DLKEI(-1)	-0.680094	-0.199148	0.112499	0.013244
	(0.37110)	(0.10075)	(0.09698)	(0.01083)
	[-1.83264]	[-1.97670]	[1.16000]	[1.22322]
DLUSDKZT(-1)	0.342679	-0.004903	-0.177547	0.056811
	(0.45823)	(0.12440)	(0.11975)	(0.01337)
	[0.74784]	[-0.03941]	[-1.48264]	[4.24940]
DLCPI(-1)	1.337778	1.691478	-2.018142	0.716833
	(2.72517)	(0.73984)	(0.71219)	(0.07951)
	[0.49090]	[2.28628]	[-2.83372]	[9.01576]
C	-0.004594	-0.004896	0.019395	0.001716
	(0.02386)	(0.00648)	(0.00624)	(0.00070)
	[-0.19250]	[-0.75575]	[3.11000]	[2.46484]
R-squared	0.067079	0.125209	0.108943	0.490654
Adj. R-squared	0.025150	0.085893	0.068895	0.467762
Sum sq. resids	1.290356	0.095103	0.088127	0.001098
S.E. equation	0.120409	0.032689	0.031467	0.003513
F-statistic	1.599830	3.184651	2.720341	21.43346
Log likelihood	68.17349	190.7359	194.3165	400.4090
Akaike AIC	-1.344117	-3.951828	-4.028010	-8.412956
Schwarz SC	-1.208835	-3.816546	-3.892728	-8.277675
Mean dependent	0.002869	0.006200	0.004844	0.007196
S.D. dependent	0.121953	0.034190	0.032611	0.004815

Determinant resid covariance (dof adj.)	1.38E-13
Determinant resid covariance	1.11E-13
Log likelihood	868.4307
Akaike information criterion	-18.05172
Schwarz criterion	-17.51059
Number of coefficients	20

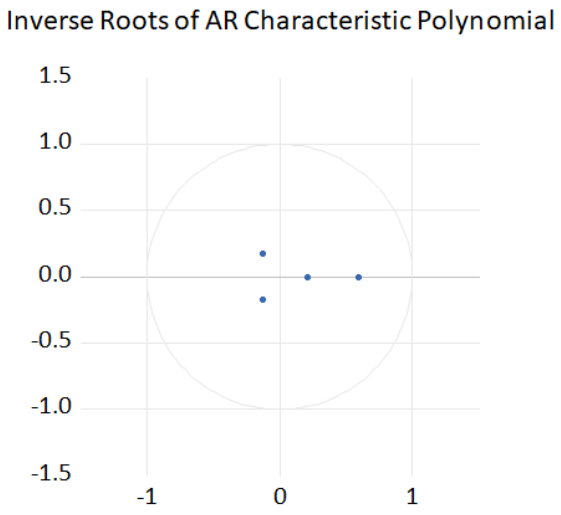
Below is a Table for determining the optimal number of lags for the model. Based on the Schwartz and Hanna-Queen information criteria, the optimal lag is chosen at the level 1.

VAR Lag Order Selection Criteria
Endogenous variables: DLOIL DLKEI DLUSDKZT DLCPI
Exogenous variables: C
Date: 30/12/24 Time: 13:20
Sample: 2017M01 2024M12
Included observations: 87

Lag	LogL	LR	FPE	AIC	SC	HQ
0	755.5163	NA	3.69e-13	-17.27624	-17.16286	-17.23059
1	796.7836	77.79115	2.07e-13	-17.85709	-17.29022*	-17.62883*
2	807.2534	18.77345	2.35e-13	-17.72996	-16.70959	-17.31909
3	823.0536	26.87850	2.38e-13	-17.72537	-16.25149	-17.13189
4	848.1594	40.40019*	1.95e-13*	-17.93470*	-16.00732	-17.15860
5	856.1960	12.19345	2.39e-13	-17.75163	-15.37076	-16.79293
6	872.7665	23.61765	2.42e-13	-17.76475	-14.93037	-16.62343
7	887.1237	19.14290	2.61e-13	-17.72698	-14.43910	-16.40305
8	896.2522	11.33197	3.23e-13	-17.56902	-13.82764	-16.06248

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

The VAR model is stationary because all inverse roots are less than one in absolute value and lie within the unit circle.



The null hypothesis of no autocorrelation of errors cannot be rejected, probabilities are higher than 0.05.

The Trend of Using Cash in Kazakhstan and Worldwide in the Era of Digitalization

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This research paper examines the dynamics of cash use in the global economy, as well as the specifics of its circulation in Kazakhstan in the face of digitalization. The practices of various countries, including the United States, the Eurozone, the United Kingdom and Sweden, are considered, with an emphasis on the statistics of cash rise and decline. The analysis shows that, despite technological changes and the growth of cashless payments, cash continues to retain its importance, especially in the environment of economic instability, when the population prefers it as a safer means of payment. The paper also examines the risks associated with a decline in cash, and raises the issue of introducing central bank digital currencies, which can become an important tool in adapting financial systems to new realities. The results of the study allow developing recommendations on strategic directions for the effective management of cash circulation in Kazakhstan and other countries.

Key Words: cash, cash statistics, quantity of banknotes, cash adequacy level, cash circulation, cashless payments, central bank digital currencies.

JEL-Classification: A10, A13, C10, C40, C43.

1. Cash Circulation Worldwide

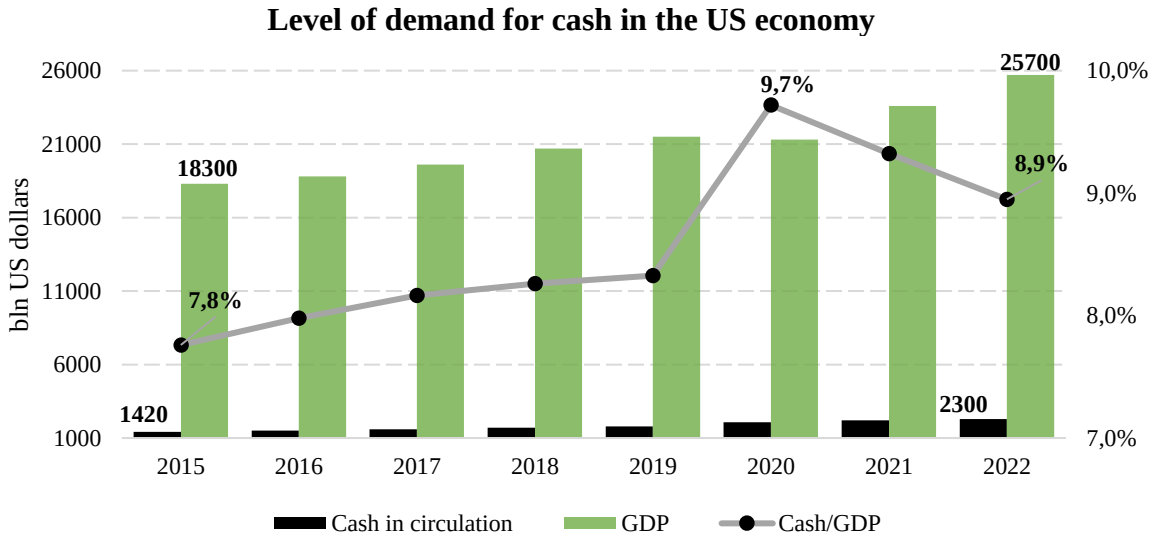
A study of the economies of more than 20 developed and developing countries was conducted by the Bank for International Settlements, which covered the dynamics and volume of cashless payments, as well as cash usage statistics (Glowka, Kosse & Szemere, 2023). According to this study, despite the decline in cash usage statistics in 2021 following the pandemic, the volume of cash in circulation relative to GDP still exceeds pre-pandemic levels in both advanced and emerging economies. At the same time, in Japan and Hong Kong, the volume of cash usage exceeded a fifth part of the country's GDP, and in Sweden this figure was about 1%. The 2023 analysis by the Federal Reserve Bank of San Francisco (Cubides & O'brien, 2023) examines changes in consumer payment preferences in the United States, especially in the context of the shift to cashless payments during the pandemic. In 2016, cash made up 31% of all purchases in the US, but in 2022, it accounted for 18% only. This decline is not stemming from the decreasing popularity of cash, but is due to the increase in cashless transactions. A diary study of US residents found that access to banking services has a strong impact on cash use: among those with access, the share of cash transactions decreased from 25% in 2019 to 17% in 2022, while among those without access, it increased from 55% to 66%, highlighting the importance of cash for vulnerable populations. Additionally, the average amount of cash in a wallet increased by $5 to $73 in 2022. Despite the steady trend towards credit cards, demand for cash remains high: most consumers do not plan to choose not using cash anytime soon, with one in five preferring it.

In 2017, the Federal Reserve Bank of San Francisco conducted a cash analysis (Nguilfoyle, 2017) covering 42 countries, which together account for 75% of global GDP. The analysis was conducted in response to the rise of technologies such as Apple Pay, Bitcoin, and Square and the perception that they will displace the use of cash. The analysis involved comparing two indicators – GDP growth and the growth of cash in circulation. The comparison showed that in all but two countries, cash in circulation is growing faster than GDP. The two countries that are showing the opposite trend – Sweden and Norway – have deliberately pursued policies to reduce cash in circulation through government initiatives, coordination of financial institutions, and the development of electronic infrastructure.

In 2019, the Asian Development Bank Institute (Think Tank) published a working paper entitled "What Explains the Growing Global Demand for Cash?" (Shirai & Sugandi, 2019), which analyzes the growth of cash in circulation despite the increase of cashless payments and innovations in payments and transfers. Statistics were collected from 11 developed (Australia, Canada, Denmark, Eurozone, Japan, South Korea, Norway, USA, Singapore, Sweden, UK) and 11 developing countries (Brazil, China, India, Indonesia, Malaysia, Mexico, Philippines, Poland, Russian Federation, Thailand, Turkey). Based on the analytical work, among other results, it was mentioned that almost all developed countries selected, except Sweden and Norway, have seen a steady trend towards an increase in the amount of cash in circulation. In 11 developing countries, the growth trend is stronger than in developed countries, but no countries were identified where the amount of cash in circulation was decreasing.

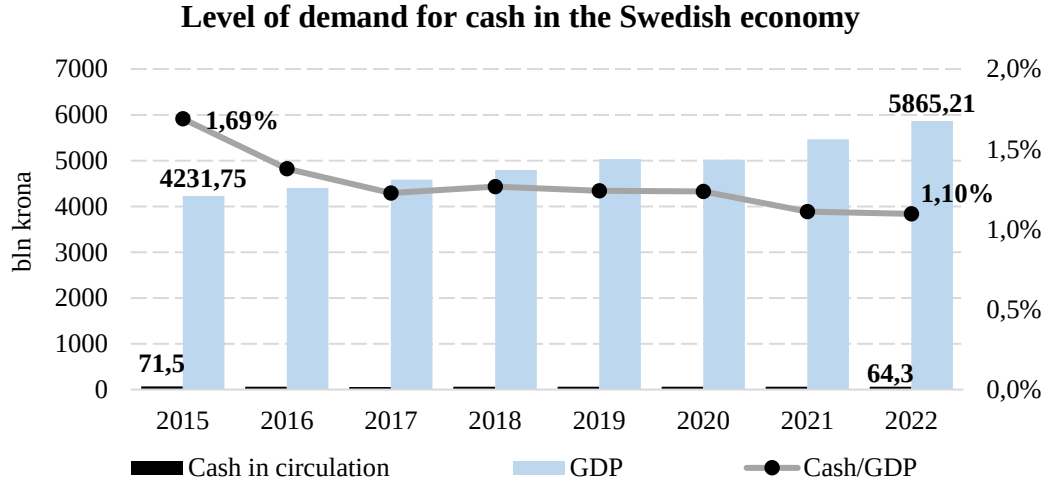
When analyzing the cash to GDP ratio, which serves as an indicator of the demand for cash in the economy, it was found that in the United States this indicator fluctuates between 7.8% and 8.9% (Figure 1). This is an evidence of stability and importance of cash in the economy of this country. In Sweden, the cash to GDP ratio decreased from 1.69% in 2015 to 1.1% in 2022 (Figure 2), indicating a decrease in its importance in the country's economy. However, due to changes in Sweden's domestic policy, no further decrease in the indicator was observed.

Figure 1



Source: Trading Economics, 2023.

Figure 2

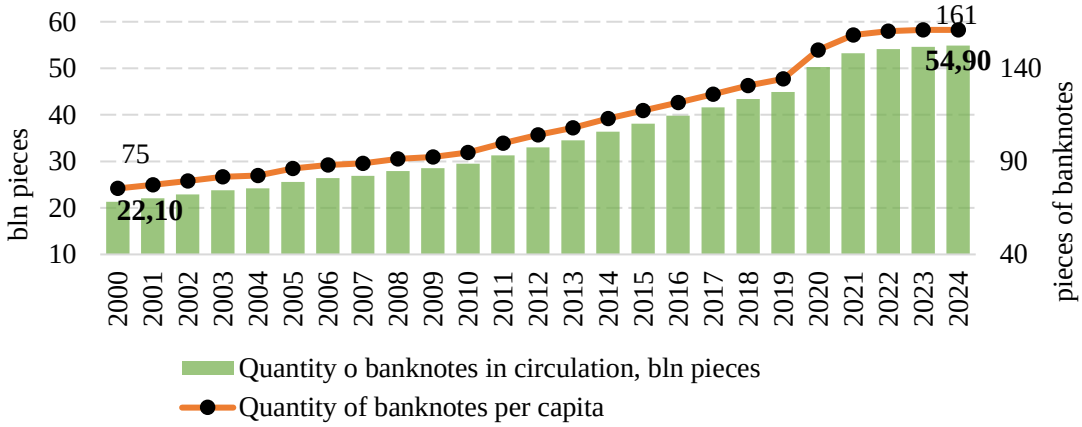


Source: Statistikdatabasen, 2024.

To update the information from the above studies, detailed statistics on banknotes in circulation in various countries have been collected. In the United States, there has been an increase in the amount of cash dollars in circulation since 2000, with an average annual growth rate of 7% (Board of Governors of the Federal Reserve System, n.d.). In 2020, cash demonstrated a sharp growth of 12%, which may be due to a ramp-up in liquidity and the population's increased need for safety during the COVID-19 pandemic. Over the past two years, there has been an acceleration in the growth rate of the quantity of banknotes in circulation to 9%. In 2024, the number of dollars in circulation reached 54.9 billion banknotes. The quantity of banknotes per capita also went up. Over the past 20 years, this figure has shown more than a two-fold increase and amounted to 161 banknotes per person (Figure 3). Cash in the United States continues to be one of the main means of payment. For example, in 2021, 29% of all payments in the US were made with cash, 30% with debit cards, and 32% with credit cards, with the rest being prepaid and mobile app payments (Board of Governors of the Federal Reserve System, n.d.).

Figure 3

Quantity of US dollar banknotes in circulation and quantity of banknotes per capita

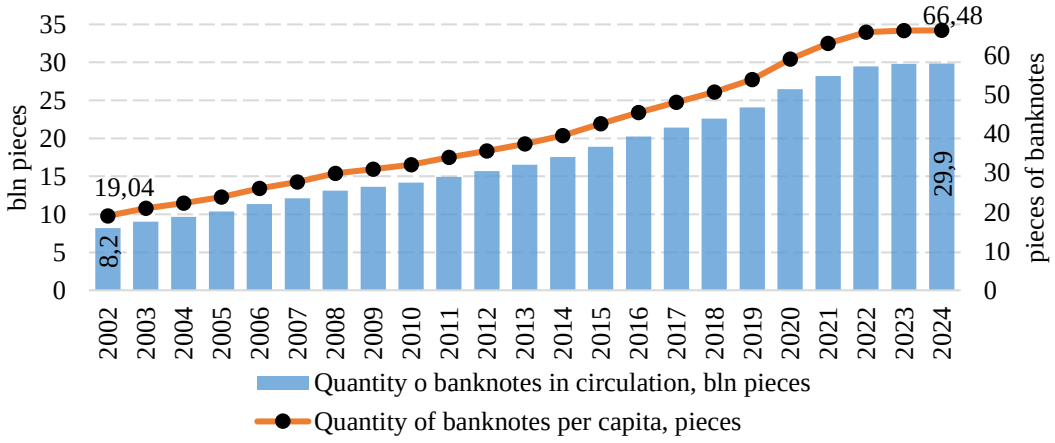


Source: Board of Governors of the Federal Reserve System, n.d.

The Eurozone, like the United States, has seen a steady increase in the quantity of banknotes in circulation, with an average increase of about 13%. The largest increases have been in high-denomination banknotes, with the exception of the €500 banknote (European Central Bank, 2021). Production of the €500 banknote ceased in 2014. The per capita banknote supply for 2024 is estimated at 66 banknotes per every inhabitant of the European Union (Figure 4). This figure has more than tripled over the past 20 years, demonstrating confidence in and preference for the euro.

Figure 4

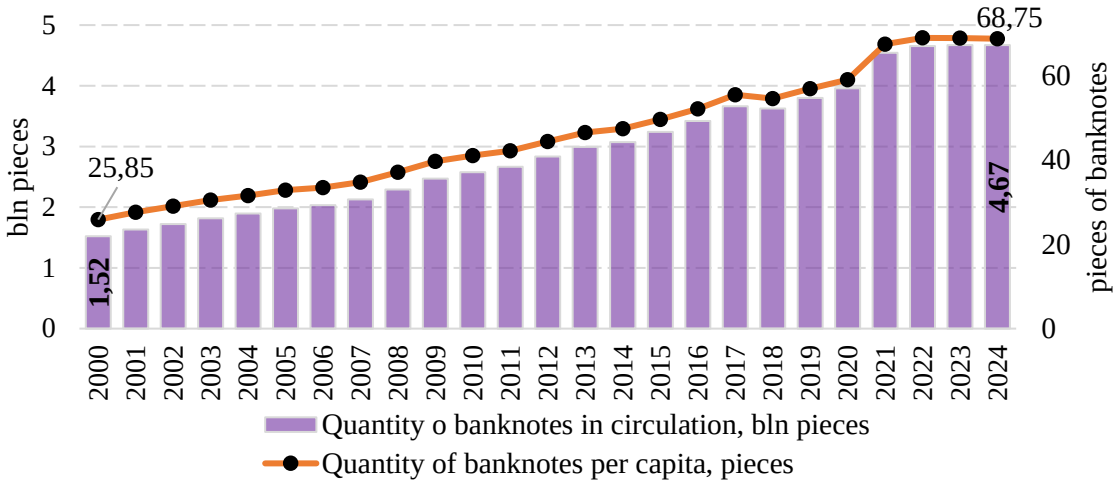
Quantity of euro banknotes in circulation and quantity of banknotes per capita



The UK has significantly fewer banknotes in circulation than the US and EU, at £4.7 billion in 2024. However, the per capita banknote figure of 69 (Figure 5) is identical to that of the European Union, indicating significant use of cash by the population. The average annual growth rate of banknotes in circulation in the UK over the past 20 years has been 8.5%. In 2021, there was a record increase in cash in circulation of 14.7% (Bankofengland.co.uk, 2017). Due to high inflation, the UK saw a growth in cash withdrawals in 2022: by 20% in England, 39% in Northern Ireland, 17% in Wales and 13% in Scotland. This trend is expected given the surge in demand for cash as a safe form of payment during the times of uncertainty.

Figure 5

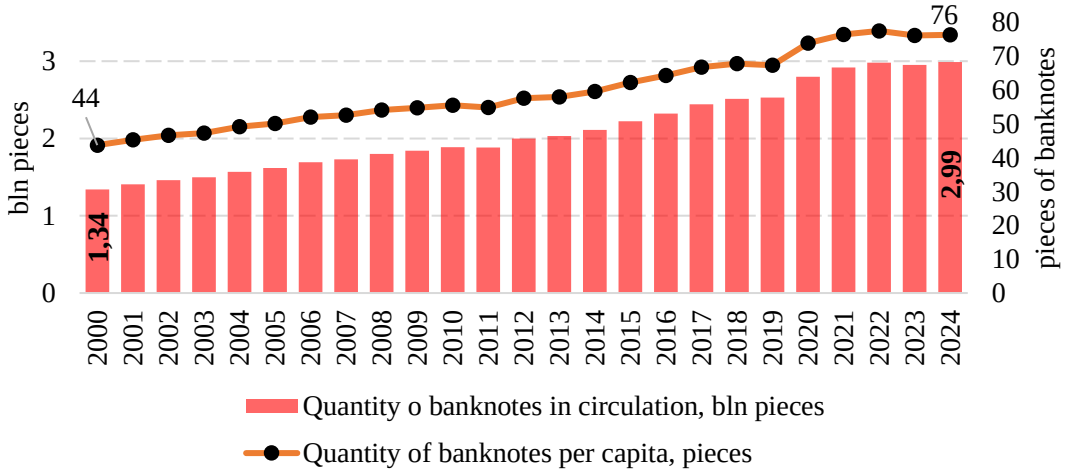
Quantity of pound sterling banknotes in circulation and quantity of banknotes per capita



There are 76 banknotes per capita in Canada (Figure 6). The average annual growth rate of banknotes in circulation, which has been around 6% over the past 20 years, indicates stable dynamics of money circulation in Canada. In some years, such as 2013 and 2020, the quantity of banknotes increased significantly – by more than 10%, which can be associated with various economic factors and public needs (www.bankofcanada.ca, n.d.).

Figure 6

Quantity of Canadian dollar banknotes in circulation and quantity of banknotes per capita



According to the European Payments Council, Sweden has been leading the race to become the world's first cashless society: cash usage has been declining for years, while instant mobile payments and other new technologies have gained prominence. The decline in cash usage peaked in 2020, when less than 9% of all transactions were made with cash (Payments in Sweden 2020 1, n.d.). However, the Riksbank faces the challenge of using new technologies among older people,

people with disabilities, and in remote areas. In 2019–2021, Sweden experienced a large number of cyber-attacks, targeting retailers and other institutions. More than 200 large organizations were attacked, making payments and transfers impossible. Moreover, the degradation of the cash infrastructure (low volume of cash in circulation, reduced staff, closed branches of the Riksbank and commercial banks, lack of ATMs) has complicated making cash payments.

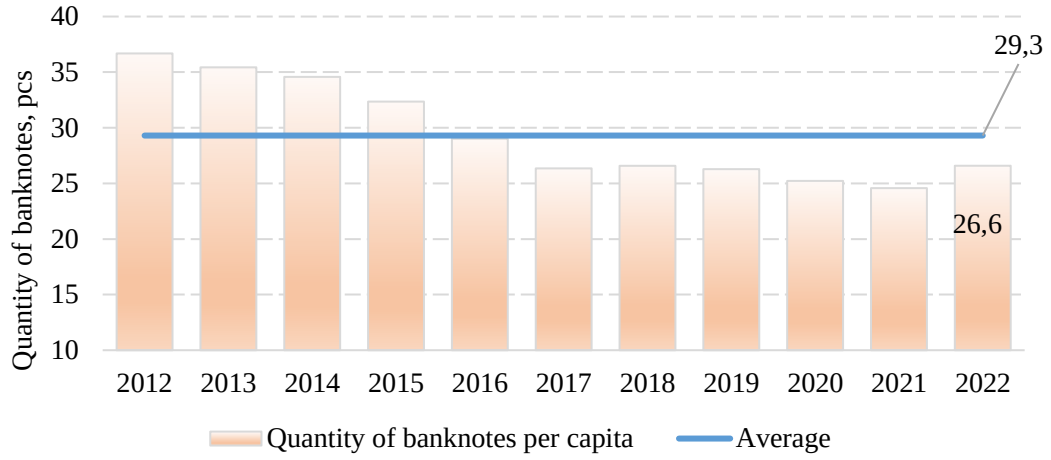
It is worth mentioning that the Swedish Civil Contingencies Agency in 2020 issued information on the need for war preparedness, where among other measures, it recommended to have cash and made an emphasis on the possibility of a power outage, internet and other communications.

In January 2021, an amendment to the Payment Services Act came into force in Sweden, obliging banks to provide a full range of cash services (which increased the availability of ATMs for the population, ensured the presence of cash branches, etc.). Also in 2021, the Riksbank announced plans to strengthen its role in cash circulation, which included opening additional branches and opening 5 money vaults in various locations in Sweden (Riksbanken, 2021).

Currently, Sweden is seeing an increase in the amount of cash in circulation, as well as a growth in the quantity of banknotes per capita (Riksbanken, 2018) (Figure 7).

Figure 7

Quantity of Swedish krona banknotes per capita

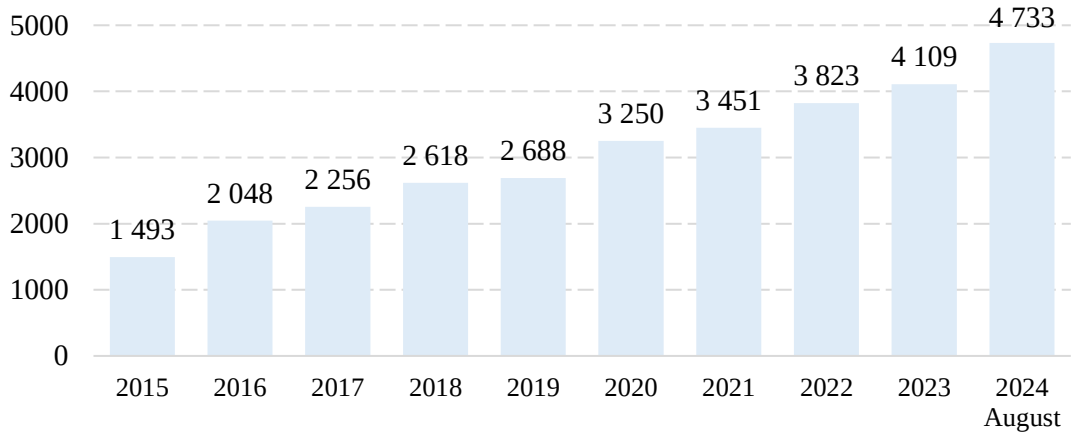


2. Cash Circulation in Kazakhstan

The amount of cash in circulation in Kazakhstan at the end of August 2024 was 4.5 trillion tenge (Figure 8), having increased since the beginning of the year by 458 billion tenge, or 11.3%. The average annual growth rate of cash in circulation from 2014 to 2024 is 13%. Over the past 10 years, the growth of the amount of cash in circulation amounted to 3.1 trillion tenge, or 226%.

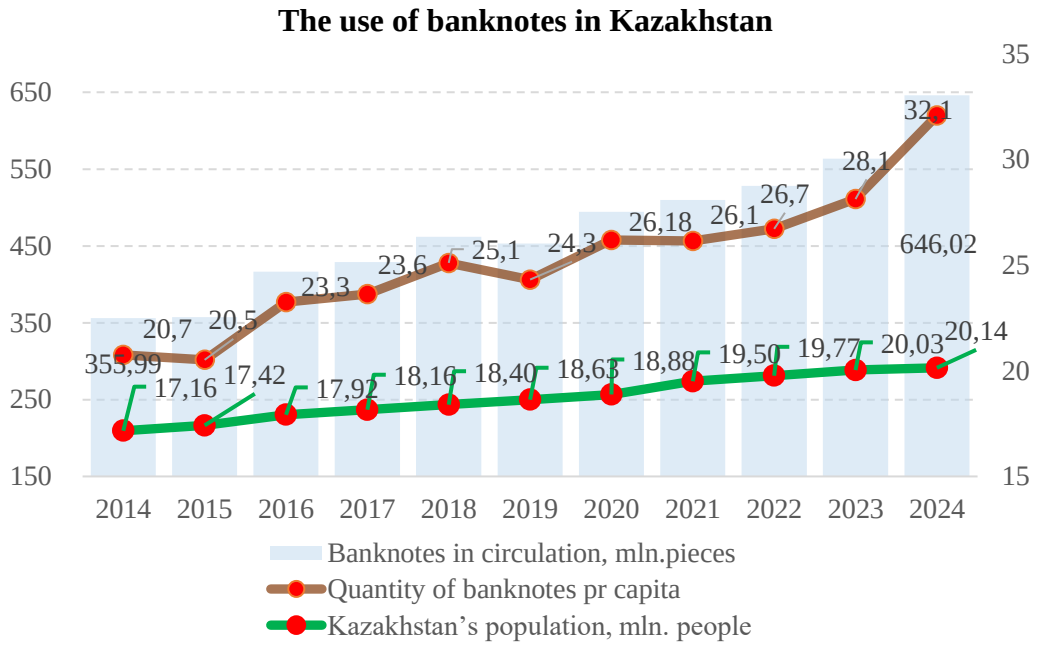
Figure 8

Amount of cash in circulation in Kazakhstan



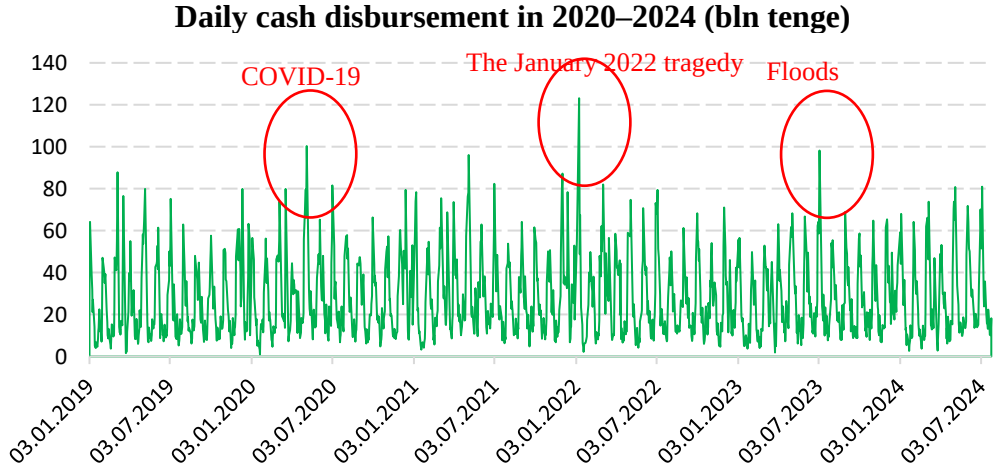
Kazakhstan has seen a steady increase in the amount of cash in circulation. The annual growth rate of the quantity of banknotes since 2014 has been 6%. There are currently 626.6 million banknotes in circulation. The quantity of banknotes per capita also is demonstrating a steady growth, which at the end of August 2024 amounted to 31.1 banknotes per person (Figure 9). Since 2018, the volumes of cash issued and received by second-tier banks have been increasing. Thus, since 2018, the volume of cash issued has expanded from 5.29 trillion tenge (1.11 billion banknotes) to 6.50 trillion tenge (1.18 billion banknotes) in 2022, or by 23.2%, and acceptance increased from 4.92 trillion tenge (1.07 billion banknotes) to 6.19 trillion tenge (1.15 billion banknotes), or by 26.1% in 2022.

Figure 9



The average daily cash issuance is 26 billion tenge. During the periods of instability, there is a sharp surge in the demand for cash. For example, when the announcement of the coronavirus pandemic in Kazakhstan had been made, the daily issuance was 100 billion tenge (4 times more than the average daily issuance), and during the January 2022 tragedy in Kazakhstan, the issuance was 123 billion tenge (5 times more than the average daily issuance) (Figure 10).

Figure 10



According to a study by the Analytical Center of the Association of Financiers of Kazakhstan, the growth rate of cashless transactions in Kazakhstan is slowing down, which may

indicate that the market is approaching the saturation point (AFK, 2024). Thus, the growth of cashless transactions in the first quarter of 2022 amounted to 52% (year-on-year), while in the same period of 2021 this figure reached 124%. In absolute terms, the volume of cashless transactions in the first quarter of 2022 increased to 19.1 trillion tenge compared to 12.5 trillion tenge a year earlier. In the first half of 2024, the rate of cash withdrawals from ATMs, on the contrary, increased from 3.4% to 11.1%: in the first half of 2024, Kazakhstanis received 11.9 trillion tenge from ATMs against 10.7 trillion tenge in the same period of the previous year.

The impact of mobile transfers on cash payments in Kazakhstan is also worth mentioning. In the analytical report "Medium-term Prospects for the Use of Cash", prepared by the Sange Research Center (2024), a hypothesis was put forward that due to the screening of mobile transfers to detect signs of hidden business activity, the demand for cash may increase due to the need for anonymity and avoidance of financial transaction tracking. Although in practice this hypothesis turned out to be true only for micro businesses, given that the share of mobile transfer users is 72%, with increased monitoring of mobile transfers, it is possible that payments made through mobile transfers will also be made in cash, contributing to an increase in the use of cash.

3. Central Bank Digital Currencies

A study by the Bank for International Settlements (Glowka, Kosse and Szemere, 2023) points out that despite the development of digital and contactless payments, the demand for cash is still there. This raises a reasonable question about how to satisfy public demand for cash in a world that is becoming increasingly digital every year. In this context, central banks in many countries are exploring the possibility of issuing digital currencies, and some have already implemented or are developing various pilot projects for central bank digital currencies (CBDCs).

CBDCs are digital forms of national currencies issued and regulated by state-owned central banks. In recent years, attention to CBDCs has increased significantly due to global trends in the digitalization of financial systems and changing consumer preferences.

Many countries, including China (with the digital yuan project) and Sweden (with the e-krona project), are actively researching and testing digital currencies. This confirms the growing interest in digital currencies as a tool for modernizing the financial system. More than 80% of the world's central banks are exploring the possibility of introducing digital currencies (Atlantic Council, 2024). Due to the fact that digital currencies represent a payment system closer to cash in terms of their functionality, they can be one of the factors in the transition to a cashless society, offering an alternative to cash. However, digital currencies require high security standards to protect against cyber-attacks and fraud. There are also concerns about the safety of user personal data and control over transactions. Kazakhstan is also pursuing a Digital Tenge project, which will become a third form of national currency in Kazakhstan along with cash and cashless money, providing an additional payment instrument for market participants, supported by the commitments of the National Bank of Kazakhstan.

Central bank digital currencies represent an important step in the evolution of financial systems. They can improve the availability and security of financial services, but require careful consideration of security and privacy. As the economy becomes increasingly digital, central bank digital currencies could become an integral part of future financial ecosystems.

4. Findings

The study shows that despite active development of cashless technologies, cash continues to play an important role in the financial systems of most countries, including the United States and the Eurozone. Cash continues to retain its importance, which is especially relevant during the periods of instability, such as the COVID-19 pandemic or economic crises, when there is a sharp surge in demand for cash. The population prefers cash as a safer means of payment.

At the same time, attention is growing to CBDCs, as they can be an alternative to cash, allowing for improved accessibility of financial services, but at the same time CBDCs require consideration of cyber-security risks and personal data protection.

In Kazakhstan, the use of cash is growing steadily, which is confirmed by an increase in both the amount of cash in the economy and the quantity of banknotes per capita, and indicates a high degree of public trust in cash.

Given the trend of using cash in Kazakhstan, as well as the economy approaching the saturation point of cashless payments, it is advisable to conduct a further study of the dynamics of cash in Kazakhstan with an emphasis on the correlation with various cashless payment instruments. Among other things, it is practicable considering the optimization of nominal series of banknotes of the national currency – tenge. It is also advisable to study the potential consequences of the introduction of the CBDCs in Kazakhstan, including their impact on traditional forms of cash payments and financial stability.

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