МРНТИ: 06.81.23; 06.81.25
JEL Classification: E42; E52; E58
DOI: https://doi.org/10.52821/2789-4401-2025-3-137-148

ASSESSMENT OF THE IMPACT OF THE CENTRAL BANK'S DIGITAL CURRENCY ON THE MACROECONOMIC STABILITY OF THE ECONOMY OF KAZAKHSTAN

A. A. Amankeldi[1], S. S. Arystanbayeva[2], G. E. Kassenova[1]
[1] Al-Farabi Kazakh National University, Almaty, Kazakhstan
[2] Narxoz University, Almaty, Republic of Kazakhstan

ABSTRACT

Research Objective: The aim of this study is to assess the macroeconomic consequences of introducing a central bank digital currency (CBDC) in the Republic of Kazakhstan.

Research Methodology: This research analyzes the effects of CBDC implementation in Kazakhstan from the standpoint of macroeconomic stability and household welfare. It employs a medium-scale Dynamic Stochastic General Equilibrium (DSGE) model adapted to account for the presence of digital currency and cash. The study also applies scenario analysis methods, encompassing five CBDC introduction scenarios based on calculations of standard deviations and correlation dependencies between scenarios.

Originality and Practical Value of the Study: The introduction of a central bank digital currency (CBDC) entails not only technological and economic aspects but also significant macroeconomic consequences. In the transition to digital forms of settlement, there is a need for a comprehensive analysis of the impact of CBDC on the stability of the national economy. Digital currency can serve as an alternative to cash, current accounts, and deposits in commercial banks. The degree of substitutability between different forms of money depends on the technical characteristics of the CBDC. Therefore, it is essential to determine the potential demand for digital currency and assess its impact on macroeconomic and financial stability.

Research Findings: Using a constant elasticity of substitution estimation, the CBDC was integrated into the medium-scale DSGE model, which made it possible to identify transmission mechanisms of economic shocks and assess the consequences of digital currency for macroeconomic stability and household welfare via the loss function.

Keywords: digital currency, central bank, DSGE model, macroeconomic stability, scenario analysis.

INTRODUCTION

In today's financial economy, digital currencies, which are electronic money used as an alternative or complementary currency, are playing an increasingly important role. The growth of the volume of unsecured money in circulation, provoked by their intensive issue and release into circulation over the past 15 years, especially during the pandemic coronavirus, replacing unsecured traditional financial assets. Under these conditions, central banks of different countries have become very active in creating central bank digital currencies (CBDCs) in order not to lose the initiative.

Unlike existing forms of digital money, such as cryptocurrencies or commercial bank e-money, CBDCs have a number of unique characteristics, including direct central bank obligations, potential universal accessibility, and the ability to be used offline. Introducing CBDC can have a significant impact on global finance, transforming the way payments are made, the structure of financial intermediation and the mechanisms of monetary policy implementation. With the rapid digitalization of the economy and the growth of cross-border capital flows, the study of the potential effects of CBDC implementation on macroeconomic stability is of particular relevance.

The existing literature on the topic of CBDCs covers a wide range of issues, including technical aspects of implementation, legal and regulatory frameworks, and macroeconomic effects. Boar and Wehrli (2021) provide an overview of the adoption of CBDCs around the world by analysing the strategies of central banks in different countries [1]. The study shows that the main motivations for the adoption of digital currencies are to improve the efficiency of payment systems, increase financial inclusion, and reduce reliance on cash. The report also notes that different countries are developing different models of CBDCs, including wholesale and retail digital currencies, each with different economic and regulatory implications.

One of the key arguments in favour of introducing CBDCs is to increase financial access for the public. Foster et al. (2021) and Andolfatto (2021) argue that CBDCs can accelerate the digitalisation of the economy by providing access to banking services for people without traditional bank accounts [2],[3]. These studies emphasise that digital currencies can reduce the cost of financial transactions and improve access to credit, which is particularly important for developing countries. Andolfatto (2021) also argues that the introduction of interest rates on CBDCs can attract deposits and stimulate savings, potentially increasing total funds in the banking system, offsetting possible deposit outflows from commercial banks [3].

How CBDCs may affect traditional commercial banks remains debatable. Chiu et al (2019) extended the study of Andolfatto (2021) by proposing a model in which commercial banks can use CBDCs as reserve assets [4],[3]**.** Their work showed that the yield on CBDCs can have a significant impact on commercial banks' policies, lending ability and risk level.

In turn, Fernández-Villaverde et al (2021) analyse banking crisis scenarios and the risks of deposit outflows in CBDCs [5]**.** They show that if the central bank's digital currency offers high liquidity and reliability, it could lead to massive withdrawals from commercial banks**,** especially during economic shocks. However, the authors emphasise that flexible regulation and limited access to CBDCs can mitigate these effects. Studies by the Bank for International Settlements (BIS) and central banks in various countries (Auer et al., 2020; Auer, R., et al., 2021) discuss the design and characteristics of CBDCs, as well as potential implementation scenarios[6],[7]. Works by Andriyanov (2021) and Kochergin (2020) analyse the impact of CBDCs on monetary policy and financial stability[8]. At the same time, a number of authors (Engert & Fung, 2017; Ketterer & Andrade, 2016) point out the potential risks of CBDCs related to cyber threats and competition in the banking sector[9],[10].

Serikbayeva, Kasenova and Parmanova (2024) examine the potential impact on the financial system and prospects for integration with international payment systems from the introduction of national digital currencies in Kazakhstan[11].

Turmakhanbetova, Kasenova and Nurgalieva (2024) conducted a representative household survey to estimate the demand for CBDC in Kazakhstan under different design scenarios. Their findings revealed that nearly half of respondents (48.1%) would prefer a cash-like CBDC, while only 9.7% showed interest in a deposit-like model. These results underscore the importance of anonymity, usability, and institutional trust in shaping CBDC adoption, particularly in emerging markets [12].

This paper contributes to the existing literature by examining the benefits and challenges of CBDCs, as well as offering a comprehensive analysis of the impact of CBDCs on the macroeconomic stability of Kazakhstan's economy by analysing different scenarios of CBDC adoption. The introduction of central bank digital currencies (CBDCs) can bring both significant benefits and potential risks to the global financial system.

As noted by Marin (2024), CBDCs may significantly reshape global financial architecture by diminishing the role of intermediary institutions and enhancing the direct control of central banks over international capital movements. This could result in a long-term shift in the hierarchy of global finance and a reduced reliance on traditional reserve currencies [13].

One of the key benefits of CBDC is to increase the efficiency and reduce the cost of cross-border payments. Currently, cross-border payments often involve high fees, long processing times and complex procedures. CBDCs can enable faster, cheaper and more transparent cross-border transfers by utilising shared digital infrastructure and direct settlement between central banks. For example, the Inthanon-Lion Rock project of the Bank of Thailand and the Hong Kong Monetary Authority demonstrates the feasibility of real-time cross-border payments using CBDCs.

In addition, CBDCs can help strengthen financial inclusion and access to financial services. By providing households and communities with direct access to central bank digital money, CBDCs can reach people

without bank accounts and enable them to participate in the digital economy. This is particularly relevant for developing countries, where a large proportion of households remain outside the formal financial system. For example, the People's Bank of China's digital yuan pilot project focuses on increasing financial accessibility for low-income and rural residents. However, the implementation of CBDC also comes with a number of risks and challenges. One of the main concerns is the potential impact of CBDC on financial stability and competition in the banking sector. If CBDC is widely adopted, commercial banks may face deposit outflows and increased competition from the central bank. This could lead to a reduction in lending to the real economy and adversely affect financial intermediation. To mitigate these risks, central banks are considering different CBDC models, such as a two-tier system or limiting the amount of CBDC available to households. Another challenge associated with CBDC is ensuring the privacy and data protection of users. Unlike cash, digital transactions using CBDCs can be easily tracked and analysed, raising concerns about the potential for mass surveillance and privacy rights violations.

Results and Discussion. Currently, there are few empirical studies on consumer perceptions of CBDC due to the lack of data on CBDC. Before implementing CBDC, it is necessary to study the potential demand for CBDC and understand what attributes and characteristics of CBDC will influence demand. The central bank needs to understand consumer sentiment and preferences related to CBDC. Overall, the implementation of CBDC requires not only economic but also technical capabilities, which means that assessing the potential demand for it is very important when mining a central bank's digital currency.

This study empirically examines potential household demand for CBDC using household survey data collected in Kazakhstan.

This article uses statistical materials collected by CF ‘NAC Analytica’ for JSC ‘Centre for Development of Payment and Financial Technologies of the National Bank of the Republic of Kazakhstan’ through the web survey of households (2024) [15].

In order to analyse the implications of CBDC implementation in Kazakhstan for macroeconomic stability and household welfare, a medium-scale DSGE model with CBDC and cash was used. Currently, DSGE models are analytical tools that provide a fundamental basis for analysing the policy. This class of models is used to identify sources of destabilisation of the economic situation, structural changes, to forecast key macroeconomic indicators, and to assess the impact of policy changes. DSGE models also allow to establish the relationship between structural features of the economy and model parameters, which is not always possible when building complex macroeconomic models, the implementation of which is based on classical econometric approaches. The use of DSGE models has become widespread in government institutions, international organisations, central banks to analyse the cyclical dynamics of the economy, assess the effects of monetary policy and forecasting (2020).

The model consists of two types of households, the non-oil sector, the oil sector, the government and the central bank. As part of the construction of this model, we introduce financial market imperfections by distinguishing between unconstrained and liquidity constrained households. Unconstrained households, also known as Ricardian households, have unrestricted access to the financial market, which allows them to smooth consumption over time. Ricardian households can be assumed to benefit from the liquidity provided by cash and CBDCs, i.e. they hold both cash and CBDCs. Liquidity-constrained households (non-Ricardian households) have no access to financial markets and consume all their income. They have neither cash nor CBDCs at the end of each period. In addition, it is necessary to distinguish between the non-oil and oil sectors of the economy. The non-oil sector consists of domestic, export and import producers of goods and services. The non-oil sector consists of firms that inelastically supply oil at an exogenously given oil price. The government levies taxes in the form of income tax, VAT and tax on household capital income, and accumulates tax revenues from oil production in the National Fund.

We further categorise government spending into public consumption and investment and assume that the infrastructure created by public investment determines the utility function of households and affects the production decisions of firms. Infrastructure is generated by public investment subject to an inefficiency constraint. In addition, the government's new fiscal rules, i.e. the rules of limited growth in public expenditure and the rules of transfers from the National Fund at the oil cut-off price, need to be adapted (Abilov and Rahardja, 2022).

The central bank implements inflation targeting and sets the base rate according to the Taylor rule. Finally, we assume that the central bank issues CBDCs against government bonds, as in Barrdear and Kumhof (2021) [14].

We apply the scenario analysis methodology using 5 different scenarios. We start the analysis with a baseline scenario without CBDC. Then we introduce CBDC into the model, assuming that households derive utility from liquidity consisting of cash and CBDC according to the following constant elasticity of substitution function:

$$q_t^R = \left[\left(\frac{CB_t^R}{z_t P_t}\right)^{(\eta_q-1)/\eta_q} + \omega_t \left(\frac{DC_t^R}{z_t P_t}\right)^{(\eta_q-1)/\eta_q}\right]^{\eta_q/(\eta_q-1)} \quad (1)$$

where CB_t^R and DC_t^R denote cash and CBDC. ω_t is the time varying weight of CBDC in the Ricardian household liquidity function. η_q - the coefficient of the constant elasticity of substitution.

To make cash and CBDC stationary, we divide them by the trend in output, z_t, and by the trend in prices in the economy, P_t. In this section we use the estimated constant elasticity of substitution from the previous section, i.e.

$$\eta_q = \frac{1}{1-\phi} = 0.735. \quad (2)$$

Fixing the coefficient of constant elasticity of substitution in the model to the value estimated by the microeconometric model based on the survey data, we set four scenarios with CBDC.

In the first scenario, we assume that the CBDC interest rate is zero and households decide according to the optimality equations how much cash and CBDC to keep in equilibrium, i.e.

$$r^{dc} = 0. \quad (3)$$

In the second scenario, we assume that the volume of CBDC is determined in relation to GDP in the economy. That is, assume that the central bank fixes the CBDC volume at 10% of GDP, i.e.

$$\frac{DC_t}{4 \times P_t^y Y_t} = 10\% \quad (4)$$

where $4 \times P_t^y Y_t$ denotes the annual GDP of the economy. Since the central bank determines the volume of CBDC, households determine the equilibrium interest rate on CBDC through the optimality equation that determines their demand for CBDC in the model.

In the third scenario, we assume that the central bank fixes the CBDC interest rate and allows households to determine how much CBDC they would like to hold at a given interest rate in equilibrium. For simplicity, let us assume that the annual CBDC interest rate is fixed at 2%, i.e.

$$r^{dc} = 2\%. \quad (5)$$

In the fourth scenario, we make the assumption that the CBDC interest rate is determined through the Taylor rule and depends on output and the inflation rate, i.e. while the amount of CBDC held by households is determined by their optimality equation.

$$\hat{r}_t^{dc} = \rho_{dc}\hat{r}_{t-1}^{dc} + (r + 0.5(\hat{\pi}_t^c - \bar{\pi}) + 0.1\hat{y}_t), \quad (6)$$

We present theoretical aspects of the model under the above scenarios by calibrating the model parameters from Abilov (2021) and Agenor (2016) and calculate theoretical factors of key variables in the model. In particular, we compare the asymptotic variance and correlations of the model's endogenous variables in the baseline scenario and the other four scenarios with different CBDC rules. In contrast to Abilov and Rahardja (2022), who focus on simulated moments, we use asymptotic variance and correlations because they represent not only volatility and correlation in the present but also variance and correlation in the future [15].

Table 1 presents the asymptotic variance for the endogenous variables of the model under the above scenarios.

Table 1 – Theoretical standard deviations of variables under 5 scenarios

Variable	$r^{dc} = 0$	$\frac{DC_t}{Y_t} = 10\%$	$r^{dc} = 2\%$	Taylor's rule (r_t^{dc})
Inflation	6.35	6.39	6.46	6.44
Household consumption	1.56	1.60	1.58	1.60
Private investment	7.03	7.12	7.39	7.27
Exports	40.12	40.62	42.18	41.02
Imports	21.82	22.14	22.48	22.30
Real exchange rate	36.90	37.41	38.77	37.93
Interest rate	14.32	14.54	14.94	14.67
Volume of money	1.29	1.31	1.32	1.36
CEBS volume	20.63	29.14	23.22	31.29
Interest rate on CSE	-	54.39	6.46	69.61
Budget deficit	-	-	1.36	-
Public debt to GDP	62.43	150.29	173.37	247.67
Government consumption	64.79	55.56	38.47	55.32
Public investments	9.48	10.63	14.00	11.68
National Fund assets	17.87	17.87	17.87	17.87
Note – compiled by reports on the financial performance (CF Survey Centre «NAC Analytica)[16]				

Table 1 shows that the volatility of most variables changes insignificantly regardless of the scenario, implying that the effect of CBDC implementation does not significantly affect macroeconomic volatility. However, the volatility of cash and CBDC varies significantly across scenarios depending on the CBDC rules.

Table 1 shows that cash volatility increases due to CBDC with the highest volatility corresponding to the scenario where the central bank pays a fixed interest rate on CBDC. The main reason for this is the willingness of households to rebalance more in CBDC when the interest rate is fixed compared to the situation when CBDC is an interest-free instrument.

In Minesso et al.(2022), the authors come to a similar conclusion that exchange rate volatility increases because households and foreigners tend to rebalance more to the CBDC, which offers both liquidity services and interest income[17]. However, the volatility of the fiscal deficit increases after the implementation of the CBDC because of the volatility of capital tax revenues. That is, the central bank issues CBDCs in exchange for government bonds, and the volatility of CBDCs is converted into volatility of household capital income, which leads to higher volatility of capital tax revenue.

As a result, the volatility of the fiscal deficit increases substantially after CBDC issuance, even though the steady state government deficit to GDP falls from 3.0 per cent in the baseline scenario to 2.2 per cent in the CBDC interest-free scenario.

This finding needs to be interpreted with caution as it does not mean that the fiscal deficit relative to GDP falls in the long run due to the introduction of CBDCs. This result means that in the long run, the government has to reduce the fiscal deficit by 0.8 percentage points as capital tax revenues fall as households exchange government bonds for CBDCs. In turn, the ratio of government debt to GDP has the lowest volatility when CBDCs are issued at a ratio of 10 per cent of GDP. The introduction of CBDC into the model has almost no effect on the volatility of all other variables. The main reason for this is the closeness of the constant elasticity

of substitution between cash and CBDC to one (0.735), which means that CBDC and cash even being complementary instruments are close to perfect substitutability.

It should be noted that if CBDC and cash are perceived as perfect interchangeable instruments, CBDC will have no impact on the economy as cash is completely replaced by CBDC due to the cost of holding cash. However, as noted above, this is only possible with a certain design of CBDC, i.e. there must be CBDC completely similar to cash. In this model, the volume of CBDC to GDP in steady state with zero interest rate on CBDC is 5.7%, while households allocate their liquidity in steady state as follows: 40% cash and 60% CBDC.

In Table 2 we present contemporaneous correlations of endogenous variables with GDP.

Table 2 – Theoretical correlation of variables under 5 scenarios

Variable	$r^{dc}=0$	$\frac{DC_t}{Y_t}=10\%$	$r^{dc}=2\%$	Taylor's rule (r_t^{dc})
Inflation	-0.30	-0.33	-0.35	-0.32
Household consumption	0.44	0.47	0.48	0.46
Private investment	0.78	0.79	0.79	0.78
Exports	-0.27	-0.29	-0.30	-0.28
Imports	0.60	0.62	0.63	0.61
Real exchange rate	-0.46	-0.47	-0.49	-0.46
Interest rate	0.07	-0.00	-0.01	0.04
Volume of money	-0.08	0.00	0.02	-0.04
CEBS volume	-	0.01	1.00	-0.03
Interest rate on CSE	-	-	0.05	-
Budget deficit	-0.38	-0.16	-0.46	-0.09
Public debt to GDP	-0.21	-0.23	-0.30	-0.22
Government consumption	0.56	0.54	0.53	0.51
Public investments	-0.05	-0.05	-0.05	-0.05
National Fund assets	0.43	0.45	0.46	0.43
Note – compiled by reports on the financial performance (CF Survey Centre «NAC Analytica)[16]				

The correlations of real variables with GDP do not change across scenarios, except for the correlation of budget deficit with GDP. In the baseline scenario, the government's new fiscal rules ensure countercyclicality of fiscal policy with the correlation between the budget deficit and output at -0.38. After the introduction of CBDC, the correlation changes to -0.16 if CBDC is a non-interest bearing asset and to -0.46 if CBDC is issued as 10 per cent of GDP.

In other words, the degree of fiscal policy countercyclicality becomes weaker under a zero interest rate CBDC rule and stronger when the CBDC is fixed at 10 per cent of GDP. In all scenarios with a fixed CBDC interest rate and a Taylor rule for the CBDC interest rate, the degree of fiscal policy countercyclicality weakens. As a result, we conclude that the CBDC rule with a fixed ratio of CBDC to GDP is the closest to the baseline scenario in terms of volatility and correlation of the main macroeconomic variables.

Next, we analyse the impact of the CBDC scenarios on welfare and macroeconomic stability. Instead of using measurements based only on the utility function as an indicator of public welfare, we also take into account revealed preferences of public authorities by incorporating the volatility of different measures of macroeconomic volatility into a generalised social loss function, i.e.

$$\mathrm{L}=\left(\frac{\sigma_c^i}{\sigma_c^B}\right)^{\mu}\left(\left[\frac{\sigma_j^i}{\sigma_j^B}\right]^{0.5}\left[\frac{\sigma_k^i}{\sigma_k^B}\right]^{0.5}\right)^{1-\mu} \tag{7}$$

where the top index i refers to the CBDC scenarios; j and B are the bottom indices for the variables that determine macroeconomic volatility. B refers to the baseline scenario, which means that we define a gener-

alised loss function for the CBDC scenarios relative to the baseline scenario.

The volatility of private consumption represents the welfare loss of households, while the weighted average of the volatility of macroeconomic variables aims at defining a criterion of macroeconomic stability for the government.

In this paper, we focus on three criteria of macroeconomic stability: output and inflation, output and the real exchange rate, and output and the budget deficit.

Table 3 presents the values of the generalised loss function for different values of macroeconomic stability indicators. If the criterion of macroeconomic stability for government agencies is defined in terms of output and inflation rate, then the best CBDC rule would be the one with zero CBDC interest rate, regardless of the importance that government agencies attach to household welfare and macroeconomic stability.

Table 3 – Values of generalised loss function for macroeconomic stability indicators and values of μ.

μ	$r^{dc} = 0$	$\frac{DC_t}{Y_t} = 10\%$	$r^{dc} = 2\%$	Taylor's rule (r_t^{dc})
GDP and inflation				
0.000	1.013	1.014	1.019	1.020
0.100	1.013	1.018	1.021	1.022
0.200	1.013	1.022	1.022	1.024
0.300	1.013	1.025	1.024	1.026
0.400	1.013	1.029	1.025	1.027
0.500	1.013	1.033	1.027	1.029
0.600	1.013	1.036	1.028	1.031
0.700	1.013	1.040	1.030	1.033
0.800	1.013	1.044	1.031	1.034
0.900	1.013	1.047	1.033	1.036
1.000	1.014	1.051	1.034	1.038
GDP and real exchange rate				
0.000	1.010	1.030	1.019	1.022
0.100	1.011	1.032	1.021	1.023
0.200	1.011	1.034	1.022	1.025
0.300	1.011	1.036	1.024	1.027
0.400	1.012	1.039	1.025	1.028
0.500	1.012	1.041	1.027	1.030
0.600	1.012	1.043	1.028	1.031
0.700	1.013	1.045	1.030	1.033
0.800	1.013	1.047	1.031	1.035
0.900	1.013	1.049	1.033	1.036
1.000	1.014	1.051	1.034	1.038
GDP and budget deficit				
0.000	1.556	1.681	2.005	1.973
0.100	1.490	1.604	1.877	1.850
0.200	1.428	1.530	1.757	1.735
0.300	1.368	1.460	1.644	1.627
0.400	1.311	1.393	1.539	1.526
0.500	1.256	1.329	1.440	1.431
0.600	1.203	1.268	1.348	1.342
0.700	1.153	1.210	1.262	1.259
0.800	1.104	1.154	1.181	1.180
0.900	1.058	1.101	1.105	1.107
1.000	1.014	1.051	1.034	1.038
Note – compiled by reports on the financial performance (CF Survey Centre «NAC Analytica)[16]				

However, the choice of the second best option depends on the importance that public authorities attach to household welfare. If government authorities pay more attention to macroeconomic stability than to household welfare, a rule with a fixed CBDC-to-GDP ratio works better than a rule with a fixed interest rate at 2% CBDC, while a Taylor rule for the CBDC interest rate leads to larger values of the loss function.

If government authorities attach more importance to household welfare, i.e. a high value of , then a CBDC rule with a fixed interest rate rule results in a lower value of the loss function, while a fixed CBDC-to-GDP ratio rule gives the highest value of the loss function.

Most emerging market economies that are highly dependent on commodity exports also determine macroeconomic stability in terms of real exchange rate volatility.

Thus, Table 3 reflects the values of the loss function when the government agency determines macroeconomic stability in terms of output and real exchange rate. In this case we come to a similar conclusion as in the previous cases, since the values of the loss function are the smallest according to the CBDC rule with zero interest rate.

The CBDC rule with a fixed interest rate is the next best option among the others. If government authorities also pay attention to the budget deficit as one of the main indicators of macroeconomic stability in the economy, the CBDC rule with zero interest rate again leads to the lowest values of the loss function. However, in contrast to the previous cases, the next best option for the economy is a rule with a fixed CBDC to GDP ratio.

CONCLUSION

The focus is on the importance of trust in the Central Bank and the banking system in which households are served in the adoption and use of central bank digital currencies (CBDCs). Logistic regression showed that trust in the Central Bank has a direct correlation with the probability of using CBDC, increasing it by 14.8 percentage points for individuals with high levels of trust. A similar trend is observed in the case of trust in banks, where the probability of adopting CBDC increases by 13.8 percentage points. This emphasises the importance of building trust in the financial system for the successful adoption of digital currencies.

In addition, the results of the analysis show that with a zero interest rate on CBDC, the long-term utilisation of CBDC could be between 5.7% and 6.2% of GDP. Households could thus potentially hold 40 per cent of their liquidity in cash and 60 per cent in CBDCs. This demonstrates the significant potential role of CBDC in the composition of households' financial assets, which in turn may have an impact on economic liquidity and financial flows.

Particular attention is paid to the CBDC's output strategy. The study emphasizes that fixing the output at 10% of GDP promotes the greatest financial stability. At the same time, the CBDC interest rate is 3.3 per cent. This rate is necessary to maintain the demand for digital currency among households, which confirms the importance of flexible interest rate policy in the management of digital currencies. Importantly, raising CBDC to 10 per cent of GDP requires the introduction of positive interest rates to encourage households to hold more funds in CBDC. This reflects the need to manage monetary policy in the digital asset environment to ensure optimal levels of demand and stability.

The findings of the study emphasise that the impact of CBDC on macroeconomic stability and financial stability is a multifaceted issue that requires a detailed and balanced approach. The introduction of CBDC can be accompanied by both potential benefits and significant risks, especially in the context of ensuring financial stability and preventing systemic risks. On the one hand, digital currencies can enhance the resilience of the financial system, facilitate transactions and reduce transaction costs. On the other hand, the widespread adoption of CBDCs may lead to changes in the structure of the money supply and put pressure on traditional banking institutions, which will require the development of new governance mechanisms.

Ultimately, to successfully implement CBDC, central banks need to carefully consider all factors affecting financial stability and macroeconomic equilibrium. It is necessary to adapt existing regulatory tools and develop new mechanisms for monitoring and risk management in the context of active digital development of the financial sector. It is also important to continuously analyse the consequences of CBDC implementation in order to timely adjust monetary policy and minimise potential threats. Thus, the key task for central banks is to find a balance between the potential benefits and risks of digital currencies, taking into account the specifics of each country and its financial system.

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ОРТАЛЫҚ БАНКТІҢ ЦИФРЛЫҚ ВАЛЮТАСЫНЫҢ ҚАЗАҚСТАН ЭКОНОМИКАСЫНЫҢ МАКРОЭКОНОМИКАЛЫҚ ТҰРАҚТЫҒЫНА ӘСЕРІН БАҒАЛАУ

А. Ә. Аманкелді[1], С. С. Арыстанбаева[2], Г. Е. Касенова[1*]

[1] Әл-Фараби атындағы Қазақ ұлттық университеті,
Алматы, Қазақстан Республикасы

[2]Нархоз университеті, Алматы, Қазақстан Республикасы

АҢДАТПА

Зерттеудің мақсаты – Қазақстан Республикасында орталық банк цифрлық валютасының (CBDC) енгізілуінің макроэкономикалық салдарын бағалау.

Зерттеу әдіснамасы. Бұл зерттеуде Қазақстанда CBDC енгізуінің макроэкономикалық тұрақтылық пен үй шаруашылықтарының әл-ауқаты тұрғысынан салдары талданады. Зерттеуде цифрлық ва-

лютаның және ақшалай қаражаттың болуын ескеретін орташа ауқымды динамикалық стохастикалық жалпы тепе-теңдік (DSGE) моделі қолданылады. Сондай-ақ, стандартты ауытқулар мен сценарийлер арасындағы корреляциялық тәуелділіктер негізінде құрылған бес сценарийді қамтитын сценарийлік талдау әдісі қолданылады.

Зерттеудің түпнұсқалығы мен практикалық маңыздылығы. Орталық банктің цифрлық валютасын (CBDC) енгізу тек технологиялық немесе экономикалық ғана емес, сонымен қатар елеулі макроэкономикалық салдарларға да ие. Есеп айырысудың цифрлық формаларына көшу жағдайында CBDC-нің ұлттық экономиканың тұрақтылығына әсерін кешенді түрде талдау қажеттілігі туындайды. Цифрлық валюта қолма-қол ақшаға, ағымдағы шоттарға және коммерциялық банктердегі депозиттерге балама бола алады. Бұл ретте түрлі ақша формаларының өзара алмастырылу дәрежесі CBDC техникалық сипаттамаларына байланысты. Сондықтан цифрлық валютаға деген әлеуетті сұранысты анықтап, оның макроэкономикалық және қаржылық тұрақтылыққа әсерін бағалау маңызды.

Зерттеу нәтижелері. Тұрақты алмастыру икемділігін бағалау әдісін қолдана отырып, CBDC орташа ауқымды DSGE моделіне интеграцияланды. Бұл экономикалық күйзелістердің берілу механизмдерін ашуға және цифрлық валютаның макроэкономикалық тұрақтылық пен үй шаруашылықтарының әл-ауқатына ықпалын шығын функциясы арқылы бағалауға мүмкіндік берді.

Түйінді сөздер: цифрлық валюта, орталық банк, DSGE-модель, макроэкономикалық тұрақтылық, сценарийлік талдау.

ОЦЕНКА ВЛИЯНИЯ ЦИФРОВОЙ ВАЛЮТЫ ЦЕНТРАЛЬНОГО БАНКА НА МАКРОЭКОНОМИЧЕСКУЮ УСТОЙЧИВОСТЬ ЭКОНОМИКИ КАЗАХСТАНА

А. Ә. Аманкелді[1], С. С. Арыстанбаева[2], Г. Е. Касенова[1*]

[1]Казахский национальный университет имени Аль-Фараби, Алматы, Республика Казахстан

[2] Университет Нархоз, Алматы, Республика Казахстан

АННОТАЦИЯ

Целью исследования является оценка макроэкономических последствий внедрения цифровой валюты центрального банка (CBDC) в Республике Казахстан.

Методология исследования. В рамках исследования проводится анализ последствий внедрения CBDC в Казахстане с позиций макроэкономической устойчивости и благосостояния домохозяйств. Используется среднемасштабная модель динамического стохастического общего равновесия (DSGE), адаптированная для учета наличия цифровой валюты и денежных средств. Также применяется метод сценарного анализа, охватывающий пять сценариев внедрения CBDC, основанных на расчетах стандартных отклонений и корреляционных зависимостей между сценариями.

Оригинальность и практическая ценность исследования. Введение цифровой валюты центрального банка (CBDC) имеет не только технологические и экономические, но и значимые макроэкономические последствия. В условиях перехода к цифровым формам расчетов возникает необходимость комплексного анализа воздействия CBDC на устойчивость национальной экономики. Цифровая валюта может выступать альтернативой наличным деньгам, текущим счетам и депозитам в коммерческих банках. При этом степень взаимозаменяемости различных денежных форм зависит от технических характеристик CBDC. Поэтому важно определить потенциальный спрос на цифровую валюту и оценить ее влияние на макроэкономическую и финансовую стабильность.

Результаты исследования. Используя оценку постоянной эластичности замещения, CBDC была интегрирована в среднемасштабную DSGE-модель, что позволило выявить механизмы передачи экономических шоков и оценить последствия цифровой валюты для макроэкономической стабильности и благосостояния домохозяйств через функцию потерь.

Ключевые слова: цифровая валюта, центральный банк, DSGE-модель, макроэкономическая стабильность, сценарный анализ.

ABOUT THE AUTHORS

Amankeldi Aigul Ashirbekkyzy – Executive Master of Business Administration, Master of Economic Sciences, Professional accountant, Tax consultant-1st category. PhD student and Senior Lecturer, Department of Finance and Accounting, Al-Farabi Kazakh National University, Almaty, Kazakhstan, email: aigul.amankeldy@mail.ru, ORCID ID 0000-0002-5752-1646

Arystanbayeva Saule Sabyrovna – Doctor of Economic Sciences, Professor, Narkhoz University, Almaty, Republic of Kazakhstan, email: saule.arystanbaeva@narxoz.kz , ORCID 0009-0004-9040-390X

Kassenova Gulmira Yesengeldievna – Candidate of Economics Science, Senior Lecturer, Department of Finance and Accounting, Al-Farabi Kazakh National University, Almaty, Kazakhstan, email: g.kassenova.1971@gmail.com, ORCID 0000-0002-0865-2869*

МРНТИ: 06.58.55
JEL Classification: E21, H75, I18, I31, J14
DOI:https://doi.org/10.52821/2789-4401-2025-3-148-161

ПЕНСИОННАЯ СИСТЕМА КАЗАХСТАНА: СОВРЕМЕННОЕ СОСТОЯНИЕ И НАПРАВЛЕНИЯ РЕФОРМИРОВАНИЯ

В. Л. Назарова[1], Б. В. Тутенов[1*], Д. А. Ксенофонтов[2]

[1]Алматинский гуманитарно-экономический университет, Алматы, Казахстан
[2] Международный университет инновационных технологий, Бишкек, Кыргызстан

АННОТАЦИЯ

Одной из ключевых составляющих государственной социальной политики является качество пенсионного обеспечения, отражающее уровень ответственности и способности действующей власти обеспечивать защиту граждан, утративших трудоспособность по возрасту или состоянию здоровья.

Цель исследования — проанализировать основные аспекты пенсионного обеспечения в Республике Казахстан, выявить существующие проблемы, оценить их влияние на устойчивость и адекватность пенсионной системы, а также обосновать необходимость её реформирования.

Методология исследования. В статье использованы общенаучные методы познания, включая логический и исторический подходы, сравнительный анализ, метод аналогий, а также метод научной абстракции.

Результаты исследования. В ходе анализа действующей пенсионной системы Казахстана были выявлены ключевые риски и проблемы, касающиеся адекватности назначения и выплаты пенсий, а также эффективности управления обязательными пенсионными взносами. Установлено институциональное несовершенство действующей модели пенсионного обеспечения, что обусловлено изменениями в реализации концептуальных основ пенсионной реформы.

Оригинальность и практическая значимость исследования. На основании проведённого анализа выявлены ранее не рассмотренные причинно-следственные связи существующих проблем пенсионного обеспечения. Авторами предложены рекомендации по ряду организационных и системных вопросов, реализация которых может способствовать повышению устойчивости и адекватности казахстанской пенсионной модели.