

ECONOMIC REVIEW
National Bank of the Republic of Kazakhstan

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PRUDENTIAL LIQUIDITY REQUIREMENTS AND A RISK-FOCSED APPROACH

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This paper analyzes Kazakhstan's practice of introducing prudential liquidity ratios (LCR and NSFR) recommended by the Basel Committee on Banking Supervision (BCBS). It reviews the compliance of Kazakhstan's ratios with the Basel standards, evaluates the effect of alternative interpretations, discusses the meaningfulness and effectiveness of the standards to reflect funding risks and improve market practices of liquidity management, their interaction with other standards and conditionality of the regulatory and competitive environment.

Key Words: liquidity and funding risks, Basel III, liquidity coverage ratio and net stable funding ratio (LCR, NSFR).

JEL classification: G01, G21, G28, G32.

1. Preamble

In this paper, we undertake the analysis of a new regime of bank liquidity regulation introduced in line with recommendations from the Basel Committee on Banking Supervision (BCBS) and its interaction with other financial stability frameworks such as the capital requirement and lending of last resort (LLRs).

Liquidity ratios are designed to improve the ability of supervised banks to perform their functions in the face of liquidity shocks caused by unforeseen withdrawals and other forms of fund outflows. Many banks, despite their capital adequacy, turned out to be unable to absorb liquidity shocks, with the risk of transferring the shock to bank customers and escalating a local shock into a systemic liquidity crisis with all that it entails. In these circumstances, central banks are forced to provide liquidity quickly and abundantly, without a risk of discriminating banks based on their level of capital adequacy.

The new Basel liquidity ratios are aimed at improving the quality of liquidity management in supervised banks and strengthening their ability to absorb liquidity shocks on their own. Liquidity ratios are positioned as ancillary requirements supplementing capital adequacy requirements. Unlike capital adequacy requirements, which are difficult to monitor due to information asymmetry in assessing the quality of the loan portfolio, liquidity requirements are relatively easy to monitor. In addition, in the presence of market discipline and in the absence of government support programs for banks, a bank's ability to maintain an adequate balance of liquid assets is a strong signal of the quality of a bank's loan portfolio and thus helps overcome information asymmetries.

One of the systemic risks historically inherent in the banking sector of Kazakhstan is the instability of funding sources, their short-term nature, concentration and dependence on the quasi-public sector, which, for their part, can trigger the realization of liquidity risk. Despite the systemic liquidity surplus, the idiosyncratic liquidity risk inherent in individual banks is significant due to the risks of outflow of customer resources because of a limited ability of banks to replace existing funding sources.

Based on these liquidity risks, we assessed how adequately the new LCR and NSFR liquidity standards assess the stability of funding taking into account the specifics of the domestic deposit market, as well as the risks of outflows given volatility of the funding base. In sections 2 and 3, we described the introduction of new liquidity standards in Kazakhstan, identified shortcomings in the current procedure for calculating liquidity ratios, and recalculated

liquidity ratios taking into account requirements that consider the specifics of Kazakhstan's banking sector. In Section 4, we examined volatility of funding for individual banks in the event of idiosyncratic risk associated with the depositor flight as well as the LLR facility, and in addition, we proposed measures to apply an alternative approach to the LCR calculation in the face of a shortage of stable funding. In Section 5, we analyzed the risks of wholesale funding and concentration risks, including the assessment of consequences of an outflow of funds from the bank's five largest depositors.

2. New Regime of Bank Liquidity Regulation

After the 2008 global financial crisis, in order to strengthen bank sustainability to liquidity risk in the short- and medium term, the Basel Committee on Banking Supervision designed two new liquidity standards:

- Liquidity Coverage Ratio (LCR), which shows whether high-quality liquid assets are adequate to cover short-term liabilities over a 30-day horizon;
- Net Stable Funding Ratio (NSFR), which reflects adequacy and stability of funds attracted by a bank over one-year horizon. The NSFR assesses the amount of stable sources of funding based on liquidity of available assets and the probability of searching for resources to meet contingent liabilities (BCBS, 2013).

The LCR ratio is based on the principle of liquidity management and control through the formation of a liquidity buffer sufficient to cover a 30-day outflow, premised on the behavioral data of clients during periods of stress. The NSFR also lies on the core of assessing the adequacy of available stable funding based on the behavioral principle.

As recommended by the BCBS, the implementation of LCR has been phased in from 2015, reaching a threshold of 1.0 by 2019. The start of NSFR implementation into the supervisory practice was planned for a later date without a phased adaptation of banks' balance sheets to this standard.

In Kazakhstan's practice, since mid-2016, the LCR has been calculated in a test mode with the introduction into mandatory supervision from September 2018 at 0.5 by increasing the threshold on a step-by-step basis to 1.0 by 2022.

The NSFR ratio was adapted and implemented in Kazakhstan later than the LCR. Starting from 2018, banks have furnished the regulator with the results of NSFR calculations in a test mode on a monthly basis with a view to assess liquidity risk. The NSFR equal to 1.0 was introduced into the perimeter of prudential regulation from 2019.

In Kazakhstan, the liquidity regulation was carried out before the implementation of LCR and NSFR as part of prudential requirements to liquidity ratios calculated as the ratio of average monthly highly liquid assets of a bank and its average monthly liabilities depending on their maturity and currency. However, the meaningfulness of these ratios was distorted because when they were calculated, the deposit maturities were included according to the contractual terms. The actual deposit holding terms were in practice much shorter compared to the contractual terms, as the maturities of term deposits offered by banks allowed withdrawals at any time without a penalty (the NBK's Financial Stability Report for 2015-2017, 2018-2H 2019). Considering that 80% or more of the banks' funding base consist of customer deposits, which gradually replaced the debt funding after the 2008 crisis, liquidity ratios calculated based on their contractual terms were uninformative in terms of liquidity risk management.

One of the distinguishing features of new prudential liquidity ratios should have been taking into consideration the terms of deposit maturities that discourage early withdrawal. In addition, new liquidity standards should have taken into account the historical volatility of the funding base and risks inherent in Kazakhstani banks.

In 2018, the NBK has initiated a set of measures aimed at developing and advancing the sustainable forms of funding including the introduction of differentiated cap interest rates of the KDIF (Deposit Insurance Fund) on retail deposits depending on the presence of terms and conditions discouraging early deposit withdrawals as well as the introduction of savings deposits where a loss of interest and mandatory 30-day pre-notification is provided for in case of early

withdrawal. However, the algorithm of LCR and NSFR calculation based on the most recent changes has not been revised (See Section 3).

3. Deposit Stability and Calculation of New Liquidity Ratios

The Basel standards recommend a minimum amount of assets to determine and maintain such liquidity level by banks that would not exclude liquidity risk but would reduce the likelihood of a systemic crisis. Thus, each supervisory authority should design its prudential requirements to liquidity based on specifics of the banking system whereby ensuring transparency of parameters and clarity of their definition (BCBS, 2013).

The effectiveness and meaningfulness of LCR and NSFR in relation to liquidity risk directly depends on the metrics established on the basis of judgments about the behavior of investors in a crisis, as well as the ability of the regulator and financial institutions to divide this behavior into stable or unstable (Blundell-Wignall and Atkinson, 2010).

The importance of correct and reasonable recording of customer deposits in assessing liquidity risks from the standpoint of soundness and stability of Kazakhstani banks is extremely high since over the past ten years customer deposits have become the main source of their funding, having increased from 57% at the beginning of 2010 to 81% in 2021.

The analysis of prudential requirements to LCR and NSFR implemented in Kazakhstan showed that one of the factors that reduce their meaningfulness is the overestimation of stability of retail deposits and the calculation of corresponding outflows on such deposits.

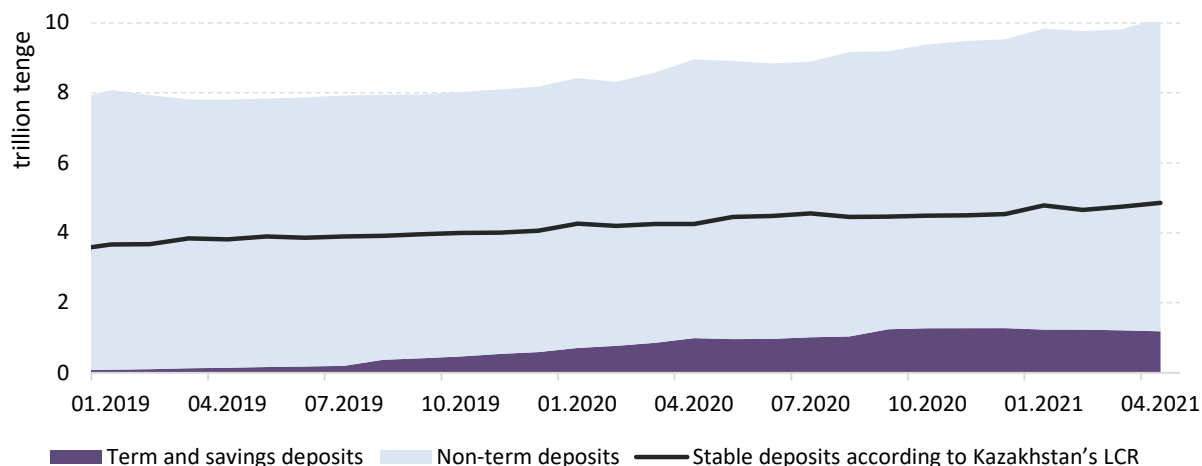
In particular, according to Kazakhstani requirements, when calculating LCR and NSFR, all retail deposits within the insured amount and regardless of the presence of early withdrawal provisions are classified as stable with a low outflow rate of 5%, and the rest are recognized as less stable with a 10% ratio.

At the same time, according to the BCBS recommendations, the presence of insurance is not a sufficient condition for classifying deposits as stable funding. Classification of deposits as stable funds requires consideration of other criteria, such as the existence of early withdrawal provisions (loss of interest, 30-days pre-notification), or the existence of established relationships that make withdrawals extremely unlikely (for example, transaction accounts to which wages and income are regularly credited and other transactions are conducted). At the same time, other easily withdrawable deposits, according to the BCBS recommendations, should be classified as less stable deposits with a higher outflow rate. In the practice of a number of countries (for example, the EU countries, Russia, etc.), in order to classify deposits as stable funds, in addition to the presence of insurance, similar conditions must be met. Besides, according to the regulatory requirements of these countries, the factor that increases the risk of deposit outflow is the possibility of remote access and management of the deposit via the Internet. Such deposits are not classified as stable deposits and have a higher run-off factor.

In Kazakhstan, before the 4th quarter of 2018, classification of deposits as term deposits and non-term deposits was quite nominal since the possibility of early withdrawal of term deposits without any limitations and penalties made them equal with demand deposits and current accounts. In this regard, at the end of 2018, the definition of deposit “term structure” was introduced within the framework of the KDIF’s cap rates. With the introduction of the new deposit classification mechanism, only 1% of retail deposits could actually be classified as stable according to the BCBS definition. In calculating the LCR, 48% of retail deposits are classified as stable deposits, which also include non-term deposits within the insured amount (Figure 1), while term deposits that meet the definition of “stable” according to the Basel and savings deposits that are completely excluded from outflows account for only 12%. As a result, LCR and NSFR do not fully reflect liquidity and funding risk.

Figure 1

“Stable” and “less stable” retail deposits according to Kazakhstan’s definition of the LCR and under the BCBS standard



Note: “Term deposits” by the KDIF’s definition mean deposits that have a penalty for early withdrawal not lower than the minimum set by the KDIF. Since the penalty for early withdrawal on savings deposits prescribed in the Civil Code exceeds the minimum amount, the savings deposits fall under the definition of term deposits. Deposits of Otbassy Bank as an integral part of the accumulation and saving contract including the bank’s obligation to provide a loan at a rate below the market as well as other deposits subsidized by the government are excluded from the statistics on retail deposits.

To take into account the term structure of deposits, we assessed the change in LCR and NSFR when rationalizing the prudential requirements for calculating these ratios. Thus, we have divided retail deposits into stable and less stable deposits according to the BCBS recommendations and based on specifics of the domestic deposit market.

In calculation of LCR and NSFR, the volumes of stable and less stable deposits included in the amount of cash outflow and available stable funding were adjusted. The adjustment was made on the basis of KDIF data on retail deposits based on their classification into deposits that comply with maturity requirements and deposits that do not comply with maturity requirements according to the KDIF’s Methodology¹.

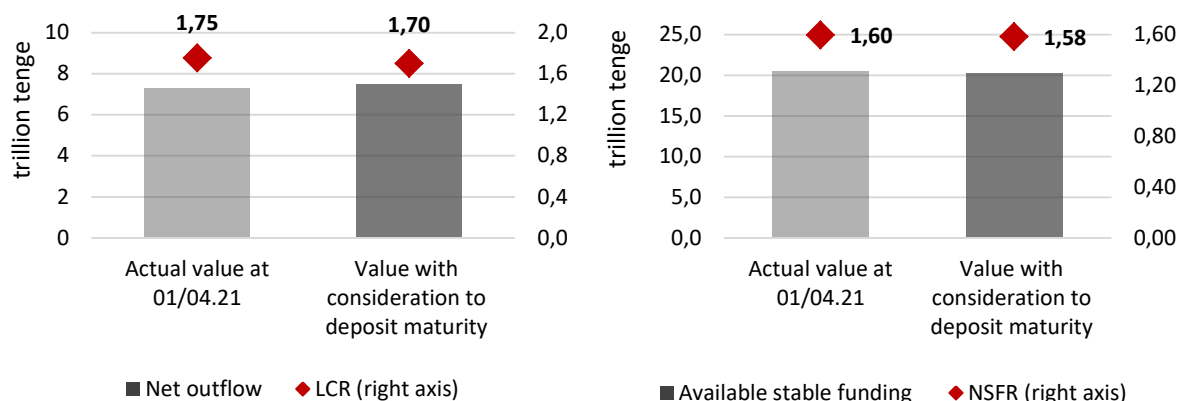
As a result, a net cash outflow across the system increased by 3% only from 7.3 trillion tenge to 7.5 trillion tenge, thus slightly reducing the LCR ratio – by 52 basis points (Figure 2). The volume of available stable funding in the system decreased by 1% from 20.4 trillion tenge to 20.3 trillion tenge while the NSFR went down by 12 basis points only.

It is worth mentioning that the 10% run-off factor on unstable deposits applied in the adjustment is the minimum ratio recommended by the BCBS. The BCBS allows supervisors to use ratios higher than those recommended, based on the historical volatility of deposits in a given jurisdiction. At the same time, in Kazakhstan’s practice, the outflow of retail and corporate deposits during realization of the idiosyncratic risk of individual banks reached up to one third of the deposit base (See Section 4).

¹ The Methodology for Determining and Setting a Maximum Interest Rate on New Deposits of Individuals approved by the Board Decision of the “Kazakhstan Deposit Insurance Fund” JSC of July 12, 2018 No.12

Figure 2

The available liquidity buffer enables banks to meet the LCR and NSFR ratios, even with consideration to adjustments of the volumes of stable and less stable deposits included in their calculation



Data Source: bank statements, the authors' estimate

Therefore, the existing liquidity surplus in banks allows all banks to comply with the existing LCR and NSFR ratios in accounting for deposit maturities under the international practices. Accounting for maturity of retail deposits, in addition to the existing accounting for the presence of guarantees, will require the introduction of a regulatory definition of maturity into the standard, similar to the definition used in the KDIF accession agreement.

The effect on the ratios and on the amount of required liquid assets is small compared to the losses that the banking system may incur because of the distorting effect of the ratio. In particular, tying the LCR only to the stipulation of deposit insurance without taking into account the economic characteristics of funding distorts motivation and pricing in the funding market, pushes banks towards less efficient ways of managing liquidity risk, and creates an unreasonably high premium between deposits.

Taking into account the term structure of deposits will bring the Kazakhstani LCR ratio closer to the Basel recommendations not only in form, but also in spirit and intentions of the implementators. The use of an explicit definition of the term structure in the Kazakhstani LCR ratio will allow the banking system to attract funding with more efficient combinations of risks and funding costs.

The most optimal period for such reform in liquidity ratios is the period of significant liquidity surplus that has been observed in the banking system of Kazakhstan for the fifth year already but which will inevitably decrease in the medium term. An undoubted advantage of such solution will be an increase in the meaningfulness and effectiveness of the implemented liquidity standards with minimal costs.

4. Liquidity Risks and the Lender of Last Resort Facility

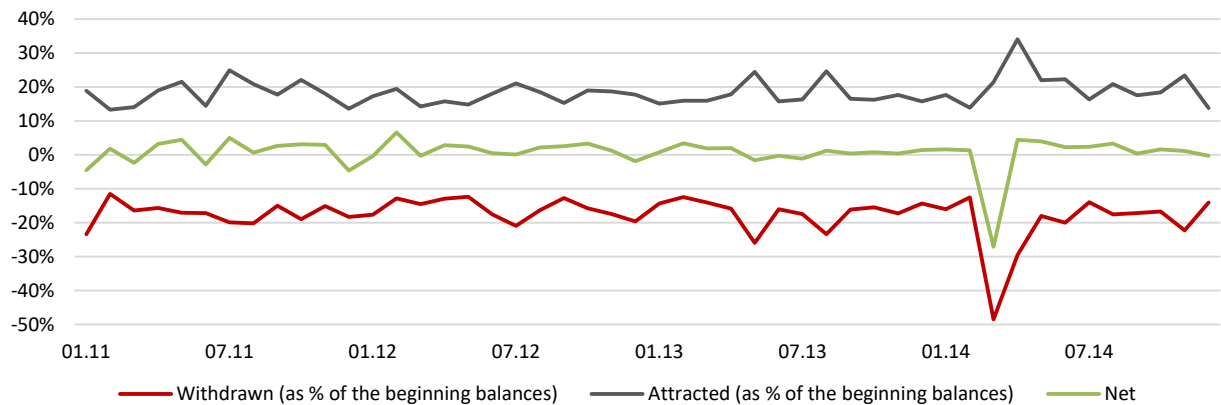
Liquidity performance indicators improve the ability of the banking sector to absorb economic and financial shocks that reduce confidence in the banking system. However, during a period of stress, it is quite normal for a bank to use high-quality liquid assets to meet obligations on realized outflows.

The liquidity coverage ratio is an essential part of the Basel III framework, which encourages the supervised banks to hold enough liquidity so as not to turn central banks into "lenders of first resort". The interplay between the liquidity coverage ratio and the central bank's emergency liquidity arrangements is critical to properly understand, assess, and effectively manage liquidity risk, since the central bank lending is the only reliable form of liquidity in times of stress. Thus, in the moments of idiosyncratic shock to a commercial bank, the important function of the central bank as a lender of last resort becomes relevant.

An example of exposure to a depositor flight in Kazakhstan's practice is a "bank run" case: massive deposit withdrawals of depositors of three banks in February 2014 in response to false messages in instant messengers about their financial insolvency. For banks, the consequence of SMS attacks was the withdrawal of term deposits of more than 400 billion tenge by individuals in the last ten days of February, which amounted to about 50% of all retail term deposits at these banks (Figure 3).

Figure 3

About 50% of retail term deposits had been withdrawn by depositors of the three banks that suffered from the SMS-attack

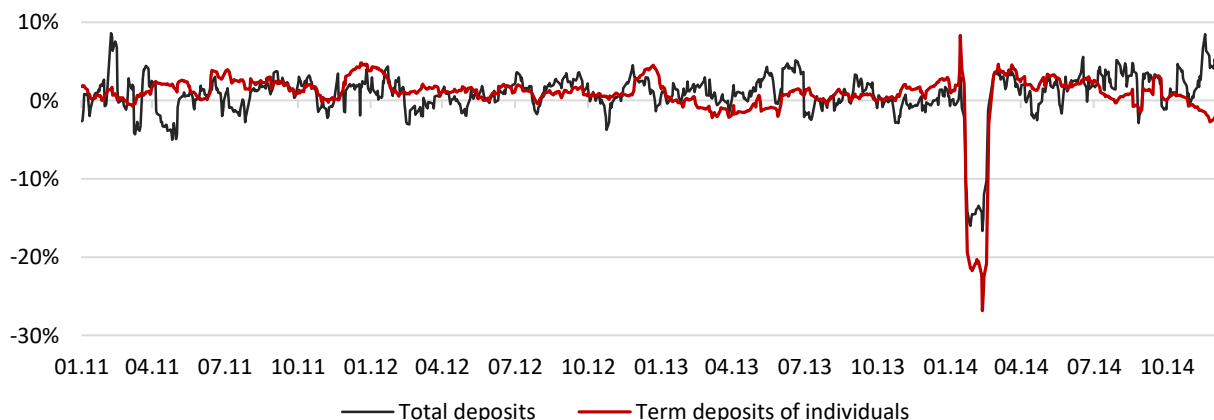


Data Source: bank statements, the authors' estimate

It should be noted that 30-day changes in the volume of term deposits of these banks during previous three years rarely exceeded 5% in either direction. The standard deviation for this sample was 1.8% (Figure 4), which is much less than the run-off factor (5%) recommended by the Basel for "stable" retail deposits and applied in Kazakhstan. However, these statistics are not informative as an indicator of liquidity risks because the distribution is fat-tailed. Thus, by end-February 2014, a net outflow of retail term deposits during 30 days accounted for 27% (Figures 3 and 4). This case also showed that being in compliance with the liquidity ratio is not sufficient to ensure that a bank can cope with bank runs on its own.

Figure 4

A 30-day change in deposits of three banks



Note: The logarithm of change in deposits (the total deposit base and term deposits of individuals in the tenge) compared to the same day of the preceding month. Calculated based on the daily data in cumulative balance sheet of the three banks suffered from the bank run in 2014.

Data Source: bank statements, the authors' estimate

Total deposits; Term deposits of individuals

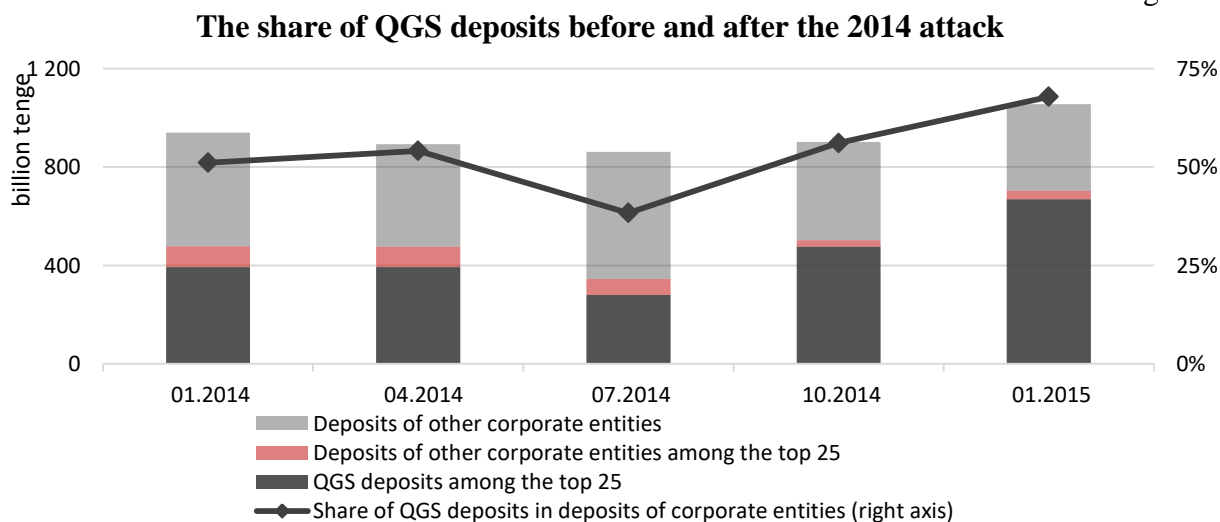
For the banking sector of Kazakhstan, one of the most important systemic risks on the funding side is a high concentration and dependence on the quasi-public sector. Deposits of large state-owned companies are comparable in scale to securities issues and other wholesale funding instruments but unlike wholesale funding, corporate investors in Kazakhstan have the right of early withdrawal enshrined in the Civil Code of the Republic of Kazakhstan.

In general, without regard to Kazakhstani circumstances, short-term wholesale funding is less stable in times of crisis compared to retail deposits. Yorulmazer (2008), in his analysis of Northern Rock, makes a point that banks which were more relying on wholesale financing suffered large losses as they adjusted to the financial shock. Shin (2008), reviewing the Northern Rock's annual report for 2007, noted a high refinancing risk caused by the high proportion of short-term unsecured securities, loans and term deposits. The outflow from the bank was caused by the refusal of large creditors to refinance the bank. The key sign of instability here is the short duration of funding, not its concentration.

Taking the case of the SMS attack against three Kazakhstani banks in 2014, once can see that, along with the outflow of retail term deposits, these banks faced the problem associated with an outflow of large wholesale funding. At the time of attack, the share of 25 largest bank creditors in three banks as a whole was 66% of corporate deposits. Notably, deposits of state-owned companies (the quasi-government sector, or QGS) accounted for 54% of all corporate deposits and 93% of the QGS's funds were placed on term deposits.

Despite the availability of early redemption rights in respect of corporate term deposits, the QGS deposits with these banks were decreasing gradually and with a delay (unlike retail deposits) and their share in the portfolio reduced to 38% by mid-2014 (Figure 5). This reduced the liquidity of banks and weakened their ability to carry out day-to-day operations. By that time, the outflow of QGS funds had reached such a scale that the problem acquired an additional dimension extending beyond the plane of economic policy and prudential regulation. Starting from the third quarter of 2014, the QGS began to increase the amount of funds at these banks. By end-2014, the share of QGS deposits in the corporate deposit portfolio of these banks not only restored but also went up to 68%!

Figure 5



Notes: Deposits of government authorities, QGS entities, and the UAPF are included into QGS deposits
Data Source: bank statements, the authors' estimate

It should also be noted that at the time of the panic, almost 100% of government securities in bank portfolios were encumbered with repo transactions, and the channels for obtaining liquidity were exhausted. Thus, banks did not have the opportunity to obtain LLRs from the National Bank secured by HQLA, and the mechanism for providing LLRs secured by non-marketable assets in the form of a loan portfolio during the specified period was not envisaged by law. The regulatory framework for such a mechanism was created in 2019 only.

However, in order to prevent the risk of contagion and the episode turning into a systemic panic, the National Bank, regardless of credit risks, provided the required emergency liquidity in the form of special-purpose loans to those banks. This allowed banks to fulfill obligations to their customers, stop liquidity risk and avoid loss of solvency.

It is generally accepted that large banks are more protected in terms of a dramatic outflow of customer funds due to the wide base of customer current accounts, which, as a rule, reduces sensitivity to resource instability. However, the lack of diversity in the sources of the resource base (customer deposits accounted for 73% of liabilities of the three banks) and limited opportunities to raise liquidity in the money markets did not allow the three banks to take up and absorb the shock on their own without an external support. Banks managed to restore the volume of their retail deposit base to the pre-shock level only by the end of 2014.

Without emergency liquidity from the National Bank and the government support in the form of injecting the QGS funds, the drop in volumes of high-quality liquid assets of these banks would have been more dramatic (Figure 6).

Figure 6

The share of HQLA in assets of the three banks after the SMS-attack decreased to 6% and the banks would not have been able to meet their existing obligations without the government support



Notes: in order to calculate the path of HQLA excluding the special-purpose loan and other government support, the HQLA and bank assets were reduced by the amount of received special-purpose loan

Data Source: bank statements, the authors' estimate.

Thus, despite the stable situation with systemic liquidity, one of the systemic risks historically inherent in the banking sector of Kazakhstan is the lack of stable funding sources. According to the BCBS recommendations on the liquidity coverage ratio – LCR 31, “Alternative Liquidity Approaches” (BCBS, 2019), in jurisdictions with a shortage of stable funding sources, contractual committed liquidity facilities from the relevant central bank for a fee can act as an asset taken into account when calculating LCR. This approach is used by the Bank of Russia, which enables to use irrevocable credit facilities opened by the Bank of Russia as assets when calculating the LCR ratio.

It is worth mentioning that in order to reduce the credit risk of the National Bank and the risks of irresponsible behavior of banks in the event of providing emergency liquidity, the LLR mechanism was revised and streamlined based on the best international practices of central banks and the IMF's recommendations. In particular, since 2019, legislative provisions have been introduced envisaging that the National Bank will extend LLRs only to solvent banks experiencing temporary liquidity problems, on market conditions, for a short period (up to 3 months) and only against the pledge of assets. To expand the ability of banks to attract emergency liquidity under the LLR mechanism, real estate and loan portfolio of banks that meet certain criteria and have passed the preliminary collateral preposition procedure have been included into the list of eligible collateral.

Non-marketable assets that have passed the procedure of collateral preposition with the regulator are a full-fledged and independent source of liquidity, which can be included in high-quality liquid assets when calculating LCR. Moreover, this approach is set forth in the BCBS recommendations as an alternative approach for jurisdictions with a shortage of stable funding sources.

Despite the existing significant liquidity surplus associated both with limited capacities of liquidity placement and an unstable funding base, LCR requirements to maintain a high level of HQLA in a medium term perspective may put pressure on banks' balance sheets and earnings as the lending becomes more active. The emergency liquidity facility secured by the loan portfolio enables to provide a much larger amount of liquidity than is possible, or advisable to hold all the time by a second-tier bank. Despite the fact that the regulatory framework for this mechanism was developed in 2019, its full implementation requires that banks themselves should preposition the loan portfolio. For the regulator's part, this mechanism can be stimulated by introducing an alternative approach to the LCR calculation.

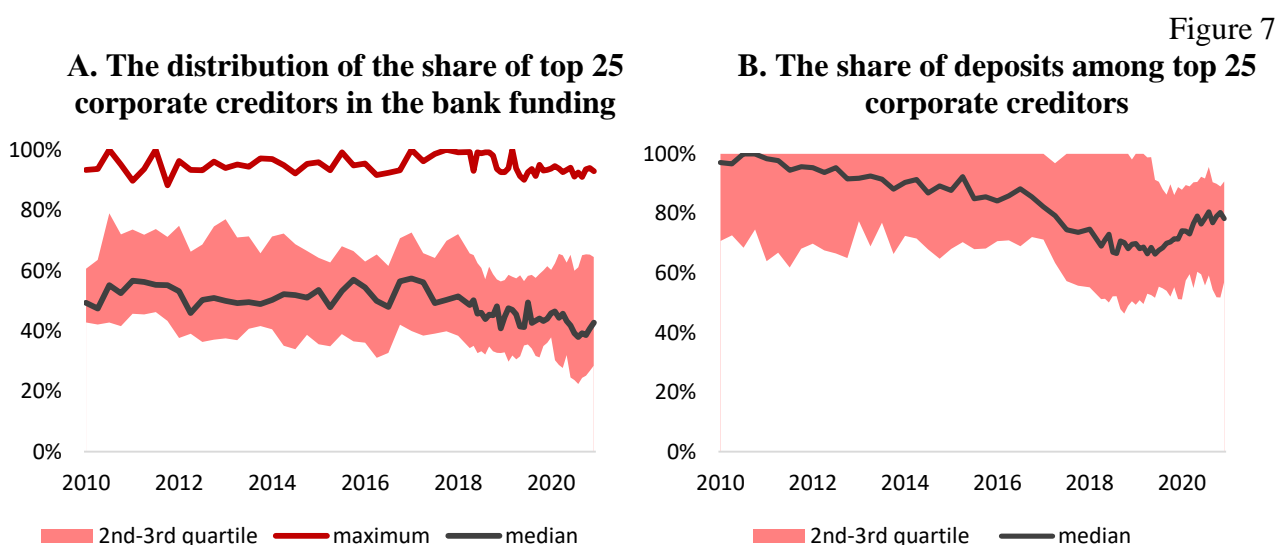
5. Risks from the Concentration of Funding

Under the new liquidity standards, the BCBS recommends higher outflow rates for wholesale funding compared to retail deposits. Thus, for unsecured wholesale financing attracted from non-financial corporations, government agencies, central banks, development institutions, the run-off factor is set at 40%. In the event if deposits attracted from such organizations are covered by a deposit insurance scheme or other government guarantee, then the outflow rate is set at 20%.

In Kazakhstan, taking into account high concentration risks, a differentiated approach has been established regarding the run-off factor for corporate wholesale funding depending on the amount of attracted funding: (1) 60% for large funds, which is higher than the values recommended by the BCBS; (2) and for other corporate funds, the run-off factor is 40%.

In Kazakhstan, the problem of reliance on large wholesale funding is quite pronounced and carries at the same time both the liquidity risk and funding risk.

Despite the fact that at the systemic level, the reliance of the banking sector on the largest corporate lenders has been gradually decreasing over the past 10 years (from 47% in 2010 to 30% in 2021), in half of Kazakhstani banks, the concentration of the largest creditors in liabilities is significant and exceeds 39% (Figure 7.A). Along with that, a large-scale wholesale funding is attracted mainly in the form of deposits (Figure 7.B).

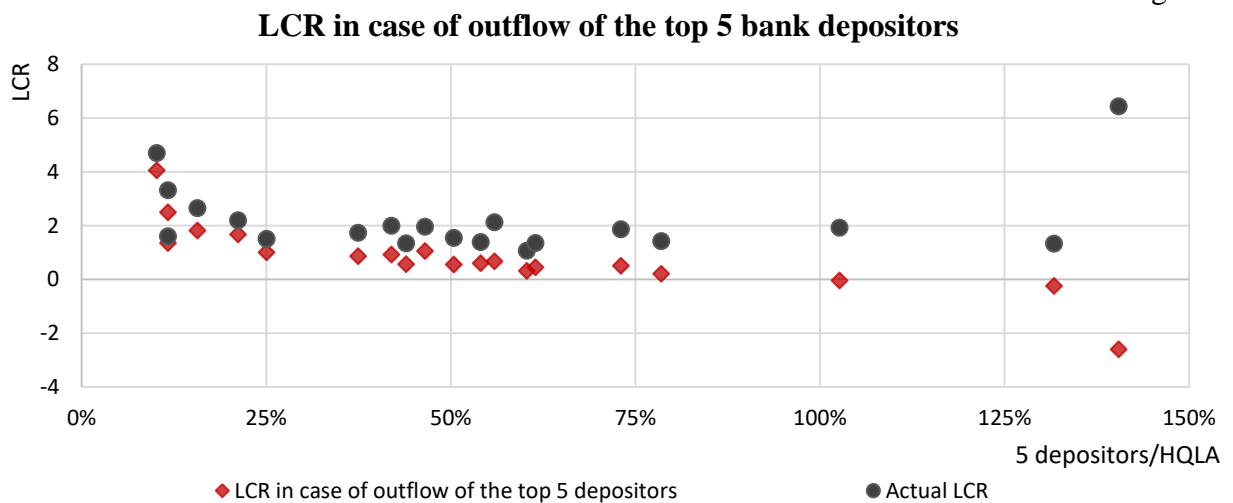


Notes: Figure A shows the dynamics in the ratio of liabilities of each bank to 25 largest corporate creditors and total liabilities of the bank distributed by quartiles. Figure B presents the dynamics in the share of deposits in liabilities of each bank to 25 largest corporate creditors distributed by quartiles. Source: banks' statements

A significant concentration of large deposits in the wholesale funding of banks considerably increases their liquidity risks. To assess the impact of withdrawals of funds by large depositors on liquidity ratios, an analysis of withdrawals of funds by the top five depositors of banks was performed, which showed a violation of the LCR ratio at 13 banks in the implementation of this scenario. At the same time, three banks do not have enough HQLA to cover such outflow (Figure 8)

A similar calculation was made in respect of NSFR. The outflow of the five largest depositors will have a significant impact on the level of available stable funding and, consequently, on the NSFR. In particular, eight banks will violate NSFR if five large depositors leave. It should be noted that historically in Kazakhstan, when a bank's condition deteriorates, the largest depositors are the first to leave (Figure 9).

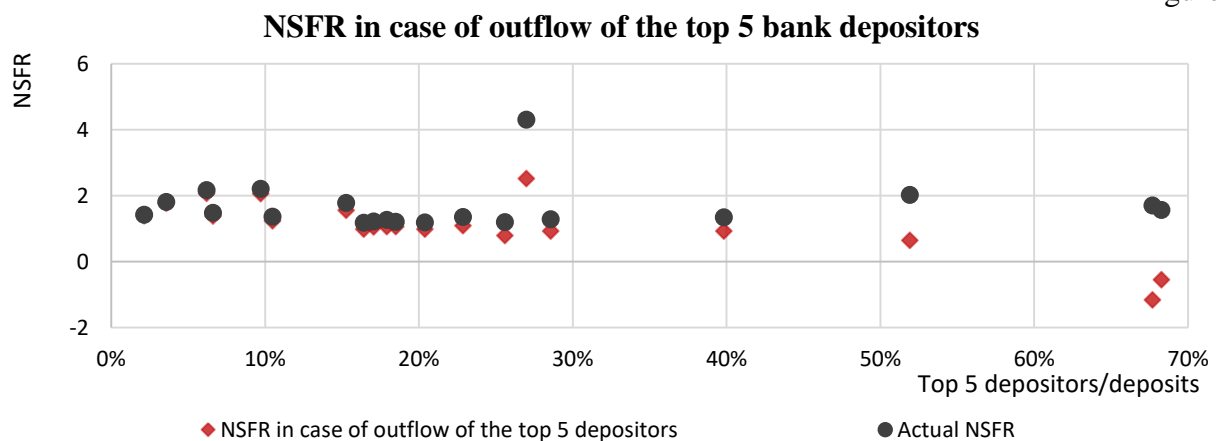
Figure 8



Note: LCR values (actual and in case of realization of the stress scenario) of individual banks are denoted with markers

Source: banks' statements, the authors' computations

Figure 9



Note: NSFR values (actual and in case of realization of the stress scenario) of individual banks are denoted with markers

Source: banks' statements, the authors' computations

The performed sensitivity test for deposit concentration risk shows that the HQLA reserve of individual banks will not be enough to cover losses from the exit of five largest depositors in the banking system. Alongside with that, the majority of banks have violation of liquidity ratios, which indicates high risks of concentration on the funding side.

This analysis also points to the necessity of implementing an alternative approach to the LCR calculation and accelerating the full implementation of the collateral preposition

mechanism, since, as practice shows, the largest depositors are among the first to withdraw funds from deposits.

6. Discussion

Regulatory requirements do not exist in a vacuum. Therefore, their effectiveness and usefulness cannot be assessed in isolation from other requirements and from the competitive and regulatory environment. In this regard, liquidity requirements are part of a system of regulatory requirements and financial stability frameworks such as deposit insurance, emergency liquidity provision and other forms of government support. The relationship and interaction between them are complex. As a result, deviation from the best practice in one aspect of regulation can significantly change the role and contribution of the liquidity ratio to the stability and functionality of the banking system.

For example, liquidity requirements are complementary to capital adequacy requirements. Hoerova et al (2018) argue that liquidity regulation would not be necessary if it were not for the problem of control over capital adequacy compliance and the regulator could reliably distinguish illiquid from insolvent banks. However, in practice, the regulator does not have complete information: its view of the actual capital of the supervised bank is distorted and is heavily relying on the quality of bank reporting, vigilance of supervision and the integrity and commitment of an independent auditor.

The emergency liquidity facility may lead to inadvertent bailouts of insolvent banks and create moral hazards. Under these conditions, liquidity requirements enable to ensure that banks have their own liquidity buffers and, to a certain extent, reduce dependence on the LLR as well as reduce certain distortions of government liquidity support. In addition, one of the advantages of new liquidity requirements, according to Hoerova et al (2018), is their lower verification cost compared to capital adequacy requirements.

In this regard, there is another illustrative example of conditionality of the beneficial effect of a regulatory standard. Thus, when the government support is provided to a bank, with systematic violations and deviations from the best practice of resolving unsound banks, with any other form of eroding market discipline that allows an unsound bank to maintain the required liquidity balance from external sources, the correlation between abundant liquidity and long-term stability weakens dramatically. In this case, the liquidity ratio loses its value as a signal of the bank's solvency.

These judgments also reflect in the BCBS standards. The BCBS and its Board² consistently emphasized that the interaction between the liquidity ratio and the emergency liquidity facilities from the central bank is critical for the correct understanding, assessment and effective management of liquidity risks, since in cases of stress, the only reliable form of liquidity is the central bank credit.

7. Conclusion

In this paper, we carry out a review of the new regime of bank liquidity regulation, including the assessment of compliance of ratios implemented in Kazakhstan with the Basel III standards and the international practice. The most essential difference between Kazakhstan's interpretation of LCR and that recommended by the BCBS is the absence of accounting for maturity and other significant characteristics of funding.

Accounting for maturity of retail deposits, in addition to the existing accounting for the presence of retail deposit insurance, will require the introduction of a regulatory definition of maturity in the standard, similar to the definition used by the KDIF capping mechanism.

The results of review showed that accounting for the term structure of deposits will increase the denominator and reduce the LCR. The effect on the ratio and on the amount of

² The Group of Central Bank Governors and Heads of Supervision, or GHOS). According to the Charter, the BCBS is accountable to GHOS; the GHOS signs off the main decisions made by the BCBS, approves the Charter and amendments thereto, and sets out the general area of focus, appoints the BCBS Chair from its ranks.

required liquid assets is relatively small compared to losses incurred by the banking system because of the distorting effect of the standard. Tying the LCR only to the stipulation of retail deposit insurance without taking into account the economic characteristics of funding distorts the motivation and pricing in the funding market, pushes banks towards less efficient ways of managing liquidity risk, and creates an unreasonably high premium between deposits. In particular, the LCR in Kazakhstan has become one of the factors in the appearance of a wide spread between the rates on savings and term deposits.

In addition, accounting for the term structure of deposits will bring the LCR ratio in Kazakhstan closer to the BCBS recommendations not only in form, but also to the stated intentions of the implementators. The use of an explicit definition of maturity in Kazakhstan's LCR liquidity ratio will allow the banking system to attract funding that finds more effective combinations of risks and the cost of funding.

The most optimal period for such reform in terms of liquidity ratios is the period of abundant liquidity, which the banking system of Kazakhstan has been experiencing for the fifth year already but which will inevitably end in the medium term.

In addition, the results of analysis of behavioral data of depositors during realization of the idiosyncratic risk associated with the flight of depositors showed a rapid liquidity depletion at banks. Liquidity ratios cannot completely eliminate the effects of shocks, and in such cases the emergency liquidity facility provides a much greater level of protection against the risk of outflows both from an individual bank and the system. The HQLA shortage in these scenarios showed the need for a full-fledged launch of the mechanism for preposition of non-marketable assets that can serve as collateral for provision of LLRs on market conditions, thus reducing the risks of bank abuse. To encourage the development of this mechanism, we proposed the use of an alternative approach to the LCR calculation.

A more effective and more appropriate way to reduce the risk of outflow is to further develop mechanisms for providing emergency liquidity based on the preposition of illiquid assets. The regulatory framework for this mechanism was developed in 2019, but its full implementation requires the preposition of the loan portfolio by banks themselves. This approach was also supported by the group of heads of central banks and bank supervisors, who recommended that the BCBS make further effort in analysing and accounting for the interaction of liquidity standards and frameworks for the provision of liquidity from the central bank. As a result, in 2019, the BCBS developed and adopted an alternative approach to the LCR calculation for countries with a shortage of stable funds.

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Benchmarking of the BCBS standard and Kazakhstan's practice of *LCR* implementation

Table 1

High Quality Liquid Assets			
Basel		Kazakhstan	
Level 1 HQLA			
Cash	100%	Cash on hand	100%
Reserves at the CB provided that the bank may withdraw them if the liquidity position deteriorates	100%	Депозиты в Национальном Банке	100%
Marketable securities issued (backed) by central banks, governments, Bank for International Settlements, IMF, ECB, European Commission, international development banks, subject to all of the following conditions: (i) securities have 0% risk ratio under the Standardized Approach of the Basel II framework; (ii) are traded in large and active repo markets or money markets that are characterized by a low concentration rate; (iii) are a reliable source of liquidity in the markets (repo or sale) even in a distressed market environment; (iv) issuers of securities are not banks or companies providing financial services.	100%	Claims on the Government of Kazakhstan, National Bank, including securities guaranteed by the Government of Kazakhstan, National Bank as well as securities of a corporate entity engaged in repurchase of retail mortgage loans where 100% of shares are owned by the National Bank; claims on foreign central governments and foreign central banks, on IFIs, including securities guaranteed by foreign governments and foreign central banks, securities of IFIs in public float on international stock exchanges specified in the List of trade organizers recognized by international stock exchanges and meeting the following requirements: (i) they are classified as the first group of assets with a 0% credit risk weighting; (ii) are not liabilities of financial organizations or their affiliated entities.	100%
Sovereign debt obligations or central bank obligations issued in the national currency of the countries where the liquidity risk was assumed or countries of bank origin (if a sovereign bank has a risk weighting different from 0%)	100%	Claims on foreign central governments and central banks in the form of securities denominated in the currency of issuing country, in the event if claims on foreign central governments and foreign central banks have a credit risk weighting above 0%	100%
Level 2 HQLA (maximum 40% of total HQLA)			
Level 2A HQLA			
Securities issued by governments, central banks, development banks subject to all of the following conditions: (i) risk ratio under the Standardized Approach of the Basel II framework is 20%; (ii) are traded in large and active	85%	Claims on the Ministry of Information and Social Development of Kazakhstan (MISD RK), including government securities issued by the MISD RK with a risk weighting of 20%; Claims on foreign central governments and foreign central banks, on foreign local authorities, IFIs, meeting the following	85%

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repo markets or money markets that are characterized by a low concentration rate; (iii) are a reliable source of liquidity in the markets (repo or sale) even in a distressed market environment: decline in the price of securities by not more than 10% or not more than 10 pp of the discount during a 30-day period; (iv) issuers of securities are not banks or companies providing financial services - Asset-backed bonds rated AA- and higher.		requirements: (i) having the credit risk weighting of 20%; (ii) over the recent ten years, there were no facts of impairment expressed in the reduction of market value by 10% or more during any 30 calendar days; (iii) are not liabilities of financial organizations or their affiliated entities.	
Corporate debt securities subject to all of the following conditions: (i) issuers of securities are not banks, their affiliated entities or companies providing financial services; (ii) rated AA- and higher; (iii) are traded in large and active repo markets or money markets that are characterized by a low concentration rate; and (iv) are a reliable source of liquidity in the markets (repo or sale) even in a distressed market environment: decline in the price of securities by not more than 10% or not more than 10 pp of the discount during a 30-day period	85%	Securities issued by non-financial organizations meeting each of the following requirements: (i) have a long-term rating of at least AA- assigned by Standard & Poor's or a similar rating of another rating agency; (ii) are in public float on international stock exchanges specified in the List of trade organizers recognized by international stock exchanges; (iii) over the recent ten years, there were no facts of impairment expressed in the reduction of market value by 10% or more during any 30 calendar days	85%
<i>Level 2B HQLA (maximum 15% of total HQLA)</i>			
Mortgage-backed securities subject to all of the following conditions: (i) securities and the underlying asset have not been created by the bank itself or its affiliated entities; (ii) rated AA- and higher; (iii) are traded in large and active repo markets or money markets that are characterized by a low concentration rate; (iv) are a reliable source of liquidity in the markets (repo or sale) even in a distressed market environment: decline in the price of securities by not more than	75%	Mortgage-backed securities other than financial derivatives and subordinated debt that are not liabilities of financial organizations or their affiliated entities, meeting each of the following requirements: (i) have a long-term rating of at least AA- assigned by Standard & Poor's or a similar rating of another rating agency; (ii) are in public float on international stock exchanges specified in the List of trade organizers recognized by international stock exchanges; (iii) over the recent ten years, there were no facts of impairment expressed in the reduction of market value by 10% or more during any 30 calendar days	85%

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20% or not more than 20 pp of the discount in a period of significant liquidity stress; (v) a pool of underlying assets is limited by a mortgage and cannot contain structured products; (vi) mortgage loans with full right of foreclosure and maximum LTV of 80% on average at disbursement serve as the underlying asset; (vii) in case of securitization, an issuer retain its share in securitized assets			
conditions: (i) rated from BBB- to A+ (ii) issuers of securities are not banks, their affiliated entities or companies providing financial services; (iii) a long-term credit rating from BBB- to A+; (iv) are traded in large and active repo markets or money markets that are characterized by a low concentration rate; (v) are a reliable source of liquidity in the markets (repo or sale) even in a distressed market environment: decline in the price of securities by not more than 20% or not more than 20 pp of the discount in a period of significant liquidity stress	50%		
Common stock subject to all of the following conditions: (i) issuers of securities are not banks, their affiliated entities or companies providing financial services; (ii) are traded on the stock exchange and have a centralized clearing; (iii) denominated in the national currency of the issuer's country or in the currency of the country where there is a risk to the bank's liquidity; (iv) are traded in large and active repo markets or money markets that are characterized by a low concentration rate; (v) are a reliable source of	50%		

liquidity in the markets (repo or sale) even in a distressed market environment: decline in the price of securities by not more than 40% or not more than 40 pp of the discount during 30 days in a period of significant liquidity stress			
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Table 2

Cash Outflow			
Basel		Kazakhstan	
Retail deposits ³			
Stable deposits	5%	Stable deposits	5%
deposits covered within the framework of deposit insurance system ⁴ , there is a long-standing relationship of depositors with a bank, thus making a deposit withdrawal highly unlikely;		insured retail deposits in the amount prescribed by the Law on mandatory deposit insurance	
Less stable deposits	10%	Less stable deposits	10%
– deposits not protected by a deposit insurance scheme – large deposits – deposits of wealthy depositors – easily withdrawable deposits – foreign currency deposits		retail deposits that are not subject to insurance or are insurable in the amount of excess over the level prescribed by the Law on mandatory deposit insurance	
		Other cash outflows on liabilities to individuals not included into lines 1 and 2 of this table	100%
Note: if, under the terms and conditions of a deposit, a depositor has no right to withdraw deposits during a 30-day LCR horizon or early deposit withdrawal will result in a penalty, then such deposit will not be included in the overall expected cash outflow. If, however, a depositor is allowed to withdraw such deposits without the application of respective penalty or despite the paragraph which says that the depositor has no legal right to withdraw such monies, the entire category of these monies must be		In case of a possibility of early withdrawal of term deposits of individuals, such liabilities are included in the LCR calculation in full irrespective of their maturity.	

³ The requirement was set whereby if early withdrawal of retail term deposits is possible, such liabilities are included in the calculation of the ratio in full irrespective of their maturity. However, in preparing the data for the LCR reporting and deposit reports submitted to the KDIF it appears that banks divide their existing retail deposit base proceeding from the criteria of insurance coverage of such deposits by the KDIF, while not taking into consideration the possibility of early withdrawal.

⁴ The existence of deposit insurance is not sufficient for a deposit to be classified as stable.

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<i>regarded as demand deposits (i.e. irrespective of the remaining maturity, the deposit repayment rates specified in paragraphs 74-81 (stable and less stable deposits) will be applied to the deposits).</i>			
Funding received from SMEs: – a total amount received from one client that is a SME is less than one million euro; – without the right of early withdrawal	5-10%	Deposits placed by non-financial organizations that are SMEs where the total volume does not exceed the equivalent of one million US dollars	10%
<i>Unsecured wholesale funding</i>			
Operational deposits (clearing, custodial accounts)	25%	Deposits related to clearing, custody, and liquidity management activities	25%
Unsecured wholesale funding provided by non-financial corporations and government authorities, central banks, multilateral development banks <i>This category includes all deposits and other types of unsecured financing from non-financial corporate clients (which do not refer to the category of small business clients), government, central banks, and multilateral development banks. The run-off factor is set at 20%, if deposits of non-financial corporate clients, government authorities, central banks, and development banks are covered by a deposit insurance scheme or a government guarantee. Otherwise, the run-off factor is set at 40%.</i> Non-financial corporations are entities whose principal activities are the production of market goods and non-financial services. Non-financial corporations include the following legal entities: legally constituted corporations, branches of non-resident enterprises, quasi-corporations, notional resident units owning land, and resident	20% - 40%	Deposits of non-financial organizations, the Government of the Republic of Kazakhstan, National Bank, local executive authorities of the Republic of Kazakhstan, international financial institutions, foreign central banks, local executive authorities of foreign countries	40%

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non-profit institutions that are market producers of goods or non-financial services (https://www.bis.org/statistics/glossary.htm?&selection=279&scope=Statistics&c=a&base=term)			
		Deposits of non-financial organizations (a group of non-financial organizations when one legal entity is a large participant in another legal entity, and the amount of liabilities of each of the legal entities exceeds 0.5% of the bank's equity), <u>in the amount exceeding 5% of the bank's liabilities</u>	60%
Unsecured wholesale funding	100%	Liabilities to other corporate entities including liabilities on issued securities	100%
<i>Secured funding</i>			
Liabilities secured by level 1 HQLA or by central banks	0%	Liabilities secured by level 1 high quality liquid assets	0%
		Liabilities to the Government of the Republic of Kazakhstan and the National Bank	0%
Liabilities secured by level 2 HQLA	15%	Liabilities secured by level 2 HQLA	15%
Liabilities secured by national sovereigns, development banks that are not secured with level 1 or 2A HQLA, with risk ratio of 20% or less. Liabilities secured with mortgage-backed securities included with level 2B HQLA	25%	Liabilities to MISD RK, IFIs, with a risk weighting of not more than 20%, secured by assets that are not level one and level two high quality liquid assets	25%
Liabilities secured with other level 2B HQLA	50%		
Other secured liabilities	100%	Other secured liabilities	100%
<i>Additional requirements to cash outflows</i>			
Cash outflow on financial derivatives	100%		
Liquidity needs related to downgrade triggers embedded in financing transactions, derivatives and other contracts	100%	Increased liquidity needs on contingent liabilities, financial derivatives transactions and other operations in full amount in case if a bank is downgraded by 1, 2 or 3 notch downgrade versus the current bank rating	100%
Liquidity needs related to the potential for valuation changes on posted collateral (securing derivative and other transactions)	20%	Increased liquidity needs in revaluation of collateral (except level one high quality liquid assets) on financial derivatives and other operations	20%
Liquidity needs related to excess non-segregated collateral held by the bank that could contractually be recalled at any time by the	100%	The amount of excess collateral held by the bank in connection with maintaining the position on financial derivatives, which can be recalled at any time	100%

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counterparty because the collateral is in excess of the counterparty's current collateral requirements			
Liquidity needs related to contractually required collateral on transactions for which the counterparty has not yet demanded the collateral be posted	100%	Increased liquidity needs on operations that provide for collateral to be posted by the bank upon the counterparty's demand according to the contractual terms and conditions if such collateral has not been posted	100%
Liquidity needs related to contracts that allow collateral substitution to non-HQLA assets	100%	Increased liquidity needs related to the possibility of collateral to assets that are not high quality liquid assets	100%
Liquidity needs related to market valuation changes on derivatives or other transactions	The largest 30-day net outflow during the preceding 24 months	Increased liquidity needs in case of market valuation changes on financial derivatives or other transactions	The largest 30-day net outflow during the preceding 24 months
Expected outflow on asset-backed securities covered by bonds and other structured financing instruments	100%	Outflow on securities issued by the bank and secured by the receipt of monies on assets and maturing during the calendar month following the date of the liquidity coverage ratio calculation (including on mortgage-backed securities)	100%
		Outflow on securities secured by the receipt of monies on assets and issued by special purpose entities of the bank (including financial derivatives providing for the holder's right to require an early repurchase in full or in part), maturing during the calendar month following the date of the liquidity coverage ratio calculation	100%
Credit and liquidity facilities:			
<i>with repayment date of up to 30 days</i>	100%		
<i>an unused portion of credit facilities to retail clients and SMEs</i>	5%	<i>an unused portion of credit facilities and liquidity facilities provided to individuals and SMEs</i>	5%
<i>an unused portion of liquidity facilities to non-financial corporations, central banks, private enterprises and development banks</i>	10%	<i>an unused portion of credit facilities provided to non-financial organizations, to the Government of Kazakhstan, National Bank, MISD RK and IFIs</i>	10%
<i>an unused portion of liquidity facilities to non-</i>	30%	<i>an unused portion of liquidity facilities provided to non-</i>	30%

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<i>financial corporations, private enterprises</i>		<i>financial organizations, the Government of Kazakhstan, National Bank, MISD RK and IFIs</i>	
<i>an unused portion of guaranteed credit facilities and liquidity facilities provided to banks</i>	40%	<i>an unused portion of credit facilities and liquidity facilities provided to other banks</i>	40%
<i>an unused portion of credit facilities to other financial institutions including securities firms, insurance companies, and beneficiaries</i>	40%	<i>an unused portion of credit facilities provided to financial organizations that are not banks</i>	40%
<i>an unused portion of liquidity facilities to other financial institutions including securities firms, insurance companies, and beneficiaries</i>	100%	<i>an unused portion of liquidity facilities provided to other financial organizations that are not banks</i>	100%
<i>credit facilities and liquidity facilities to other entities</i>	100%	<i>an unused portion of credit facilities and liquidity facilities provided to other corporate entities (including special purpose entities of a bank)</i>	100%
Contractual obligations to provide funding within 30 days.	100%		
An expected outflow on contingent liabilities related to trade finance instruments	5% and less	Liabilities related to export and import financing of goods and services (on guarantees and sureties, letters of credit related to factoring and forfeiting)	5%
		Liabilities on guarantees and sureties, letters of credit not related to export and import financing of goods and services	10%
Other cash outflows provided for by contracts	100%	Other cash outflows on liabilities	100%

THE KEY TRENDS IN THE PAYMENT INDUSTRY

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Significant changes are taking place in the payments industry around the world. Active digitalization of all spheres and processes, including the financial and payment markets, the highly dynamic and comprehensive nature of the development of the digitalization sphere leads to the emergence, distribution and development of various innovative methods of making payments. The COVID-19 pandemic also influenced the development of many trends in the payment market and emphasized the importance of the development of remote financial services and services for making fast and convenient payments with the use of modern and innovative solutions and financial instruments.

Digital transformation and development of the financial market, including the payment market, is an integral component of ensuring the global competitiveness of the country's economy as a whole. A financial sector is one of the key industries where digital technologies and innovations are actively used. The very nature of financial services is inextricably linked with the possibility of using IT infrastructure and digital solutions.

Development of a competitive and strong financial sector and improvement of its efficiency require the use of new (advanced) tools and technologies introduced at the international level (implementation of the world's best solutions).

Among the main trends, the following ones can be distinguished at the present moment: large-scale penetration of services for the provision of remote payment services in online mode, the emergence and development of services for making payments and money transfers using mobile devices, payments with the use of QR codes, contactless payments, a new innovative environment, the use of biometric technologies and remote identification, fast (instant) payments, central bank digital currencies, etc.

The analysis presented in this study shows that global trends, the direction of the development of the payment industry, emerging business models for the provision of payment services, new types of payment instruments are relevant for the Kazakhstani market, where the development of a new innovative payment environment is in active process.

Keywords: payments, payment market, digitalization, trends, fintech, Instant payments, QR code, ecosystem, biometrics, central bank digital currency.

JEL-Classification: E42, G2, O3.

1. Preamble

Significant changes are taking place in the payment industry all over the world. New solutions allowing more efficient provision of services with maximum convenience for the consumer emerge. The financial industry is undergoing transformation under the influence of the development of financial technologies: relationships with customers are being revised, new business processes and interaction models appear, and geographical barriers are being erased. Financial institutions strive to provide a differentiated digital service and meet individual customer needs. Digital opportunities open up new ways of working internally and externally with clients (“front” and “back” office).

Historically, the use of innovative technologies in the banking sector has always been quite substantial. In the last 10-15 years, the world has seen even more progress in the development and expansion of new digital solutions in the financial industry. The trend of

“smartphones” use leads to a wide distribution of various mobile payment services, not only for making payments, but also for finance management. Digitalization contributes to modernization of financial and payment services, i.e. traditional solutions are combined with new fintech ones.

Banks, non-bank players, regulators create solutions to improve the efficiency of payment infrastructures, processes and services, to meet the needs of customers for automation, integration and fast provision of services. Banks invest their resources to the development of platforms and mobile banking, which expands the range of services provided.

The COVID-19 pandemic has created challenges for the global economy, including the economy of Kazakhstan, and for the financial sector. All sectors of the economy have undergone changes, including the payment market. Forced changes and restructuring of familiar processes have led to the development of payment services in accordance with the needs of customers and the emerging threats of the COVID-19 virus. The pandemic has accelerated many trends in the payments market, having re-emphasized the need for fast, efficient and ubiquitous payments. Due to social distancing the use of contactless payments has increased. Under the conditions of quarantine restrictions, due to timely made decisions and measures taken to develop new methods of providing financial services that would correspond to this period, the share of online payments has increased. According to a study by Visa, 78 percent of global consumers have adjusted the way they pay for goods due to the pandemic [1]. Overall, the pandemic has accelerated the transition to digital payments and a cashless society.

2. The Key Trends in the Payment Industry

The digital transformation of financial services is a process typical for the whole world and is a natural consequence of technological development and a change in behavioral habits of the consumer. Given the intensive development of digitalization around the world, including in the payment industry, experts predict a further increase in cashless payments.

According to the PwC report, it is predicted that the number of cashless payments in the world would increase by more than 80% by 2025 and would amount 1.9 trillion [2]. According to ReportLinker, the digital payments market is projected to grow at a CAGR of 13.7% between 2021 and 2026, driven by increased convenience of making payments, regulatory reforms and changing consumer behavior. Moreover, according to experts, by 2023 the volume of payments in the world made via mobile devices would exceed USD \$2 trillion [1].

The development of cashless payments in the new era of payments industry is influenced by new payment methods, services and market participants. The key recent trends include Fast (Instant) Payments, Open Banking, the transition of payment systems to ISO20022, the use of biometric technologies, remote identification and QR codes in payments, and research on the implementation of central bank digital currencies.

The use of electronic money and digital/mobile wallets is also actively growing. According to a study by Capgemini, by 2024 the number of digital wallet users would reach 4 billion people [3]. The total number of transactions with mobile wallets amounted to 102.7 billion in 2020 and, according to forecasts, would reach 2,582.8 billion by 2025 [4].

We also observe the emergence of ecosystems and platform business models that provide services to users within a single environment. Among the market participants that form such ecosystems, one can note the world's IT giants (BigTech), such as Meta, Amazon, Google, Tencent, Alibaba, that offer innovative high-tech products and services to consumers of payment services. Tech companies are putting pressure on the role of traditional banks in the financial sector with a sizable customer base and broad technological capabilities. According to Capgemini World Payments Report 2020, 30% of consumers worldwide use BigTech for payment services [5].

2.1. Fast (Instant) Payments

Fast (or Instant) Payments have become one of the main trends in recent years in the payment industry. Instant payment systems provide real/near real-time payments and 24/7 operational availability. The advantages of instant payments are also an increase in money

turnover, the development of new, additional services and improvement of financial inclusion. Instant payments are aimed at accelerating retail payments, thereby they represent an alternative to existing card and clearing systems and provide an additional channel to increase the share of cashless payments.

Instant payment systems have already been implemented in 60 countries (e.g. Faster Payments Service in Great Britain, FAST in Singapore, Swish in Sweden, New Payments Platform (NPP) in Australia, Fast Payment System in Russia, Instant Payment System in Belarus, TARGET Instant payment Settlement (TIPS)⁵ in the European Union).

The COVID-19 pandemic has also highlighted the growing relevance of instant payment systems. In countries that have implemented such a system, there has been a conspicuous increase in its use. According to ACI Worldwide research, more than 70.3 billion real-time payments were processed worldwide in 2020, which is 41% more than in 2019 [6].

Analysts predict further growth in the use of instant payments. According to Capgemini World Payments Report 2021, the share of instant payments and payments with the use of e-money by 2025 would constitute more than 25% of all cashless transactions in the world, compared to 14.5% in 2020 [7].

The National Bank of the Republic of Kazakhstan, under the Program for the Development of the National Payment System until 2025⁶ is also working on the development of the Instant Payments System (IPS). IPS is an interbank system designed to make fast real-time payments with the use of QR code, mobile phone number, etc. with instant money transfer to the recipient. The system was launched in pilot mode in November 2021.

2.2. Digital Ecosystems

Digitalization of the financial sector has led to an emergence of global financial ecosystems that cover various aspects of financial services' consumer's life.

Digital ecosystems allow users to receive a wide range of products and services in a single seamless integrated solution. Financial institutions' ecosystems cover a full range of services within an "all-in-one" platform, which, in turn, increases the interest in financial institutions' services.

The accumulation of a large amount of data allows ecosystems to form a "customer portrait" and ensure the seamlessness of services, as well as improve the accuracy of targeted offers of various products and their customization to the needs of a particular person (personalized services).

Ecosystems are formed in the global market by:

1) the expansion of services by financial institutions – "bank-centric" ecosystems (e.g. Sberbank and Tinkoff in the Russian Federation, Spanish bank BBVA, the Singaporean bank DBS, Kaspi Bank in Kazakhstan);







2) the expansion of services provided by "Bigtech" companies - technological multifunctional platforms (USA – Google, Meta, Amazon, China - Alibaba, Tencent, Japan - Docomo).

Global technology giants are increasingly expanding their presence in the financial sector and offer payment services, lending, crowdfunding and insurance services (Figure 1) Geographically, the expansion of technology companies into the financial market is more pronounced in developing countries than in advanced economies.

⁵ TIPS is a TARGET service for making instant payments on accounts opened with the central bank. The system uses the SEPA Instant Credit Transfer (SCT Inst) scheme.

⁶ Approved by the Resolution of the Board of the National Bank of the Republic of Kazakhstan dated November 30, 2020 No. 133

Figure 1

Expanding BigTech services						
	 Core business	 E-wallets	 Lending	 Payments	 Crowdfunding	 Insurance
Google	Internet search/advertising	✓		✓		
Apple	Technologies/electronics			✓		
Facebook	Social networks/advertising			✓		
Amazon	E-commerce/ online retail		✓	✓	✓	✓
Alibaba	E-commerce/ online retail	✓	✓	✓	✓	✓
Tencent	Technologies, games, messengers	✓	✓	✓	✓	✓
Baidu	Internet search/advertising	✓	✓	✓	✓	✓

Source: based on BIS report⁷

The success factors for the penetration of “Bigtech” companies are:

- a large amount of data and the ability to manage this data;
- a wide client base and resources, ready-made digital infrastructure for interaction with clients;
- multifunctionality of services.

According to McKinsey forecasts, by 2025 about 30% of corporate income in the world would be generated by digital business ecosystems [8].

Regulatory policy in relation to ecosystems is in process of active formation in many countries. The EU, UK, USA are considering the introduction of special regulation and the establishment of an independent special authority for overseeing digital platforms and ecosystems.

In addition, the authorities in the EU countries, China and Russia are developing regulatory tools for such issues as managing the flow of personal data and development of a common technological infrastructure for ecosystems' organization. Some countries also impose restrictions on the acquisition of non-core assets by ecosystems.

2.3. QR Code Payments

QR code payments have become popular in recent years, especially in Asian countries. Gradually, this payment method is spreading in Europe and North America.

QR code payments have gained great popularity in China. 95% of all mobile payments in the country are made with the use of QR codes [9]. The number of transactions made with the use of QR codes in China increased 15-fold between 2017 and 2020 [10].

The use of QR codes is gaining momentum in other countries as well. QR code solutions have been launched in Africa, India, Thailand, Malaysia, Singapore, Hong Kong and the US. Visa and Mastercard solutions are widely used.

To create a single and common interaction format for all payment services that use QR codes countries introduce QR code standards. Standardization is being implemented to provide flexibility and convenience for merchants and consumers, interoperability of various QR code services, fraud prevention and secure payment solutions. QR code standards have already been introduced in countries such as Hong Kong, Singapore, Indonesia, Saudi Arabia, Australia, Brazil, and Ghana.

⁷ «Big techs in finance: regulatory approaches and policy options», FSI Briefs №12 (2021)

2.4. Biometric Technologies and Digital Identification

Payments with the use of biometric technologies are gaining popularity around the world. Juniper Research study shows that the global volume of payments made with the use of biometric data in 2020 reached \$404 billion [11]. Biometric technologies are actively used due to increased level of security and convenience of payments.

In India, the Aadhaar number, which is a 12-digit identification number for residents and citizens of India, is used to identify a person in all payment systems in the country, as well as in the e-money system (Bharat Interface for Money, BHIM). The number links a resident to his/her demographic and biometric information (fingerprints and iris scan results) kept in a central database.

To expand digital services and increase financial inclusion many countries have introduced remote customer identification systems that use biometric parameters.

In the United Arab Emirates, some banks use the Government's facial recognition solution to provide financial services. Verification and authentication of the client is carried out with the use of government databases.

Biometric systems have also been introduced in EAEU. In 2018 the Unified Biometric System was launched in the Russian Federation for the purpose of unified identification of users during the provision of remote banking services. An identity in the system is identified through photo image and voice.

As part of the implementation of tasks to create conditions for digital transformation in the banking sector, the National Bank of the Republic of Belarus created the Interbank Customer Identification System. The system provides interbank identification and authentication of clients without their physical visit to banks based on information about primary identification in one of the banks of the Republic of Belarus.

In November 2021, the Austrian Financial Market Regulatory Authority (FMA) approved amendments to the regulation of online identification, allowing the use of automatic remote identification of new customers via biometrics. Currently, remote identification is carried out using videoconferencing. For the automatic biometric remote identification process to verify identity the client would need to read the NFC chip from the identity card.

Private companies also introduce identification of customers for payments with the use of biometric technologies. For example, Visa in the United States in a pilot project issued payment cards with an embedded biometric sensor for contactless confirmation of payments. In Poland PayEye has introduced a payment solution that uses an iris scan. In 2020, Amazon introduced palm payment technology – Amazon One in Amazon Go stores. Amazon One scanners analyze users' palm and unique vein configuration. In the Russian Federation, glance (face) payment solutions have been launched (e.g., Sber, Visa and X5 Retail Group service at self-service checkouts, VTB Bank and the Moscow Metro travel payment service).

2.5. Central Bank Digital Currency

With an active proliferation of cryptocurrencies and use of blockchain technology, many central banks around the world started to explore the possibility of issuing their own digital currencies (central bank digital currencies - CBDC). A CBDC is a digital representation of a sovereign currency issued by a central bank and is its liability. Mainly for the implementation of national digital currencies the application of DLT (distributed ledger technology) is being studied. This technology is used to resolve issues related to operational capacity, resilience, settlement finality and confidentiality.

Over the past four years, the share of central banks actively involved in CBDCs has grown by a third and as of January 2021 amounted to 86%. Countries are mostly testing digital currency for retail payments, as an additional form of money to cash and cashless forms. Several central banks are in advanced stages of research - experiments and pilot projects.

Regulatory authorities cite different reasons for the issuance of CBDC in their research: to increase the efficiency of the payment system, to strengthen financial integrity, to reduce cash-related costs, improve financial inclusion, address potential problems associated with private

payment systems such as monopoly, maintain the relevance of the central bank in monetary system and, as a result of the pandemic, ensure the issuance of stimulus payments and increase the resilience of payment systems to shocks.

Generally, digital currencies can provide high transparency of transactions, increase the share of cashless payments, stimulate innovation through the use of “smart contracts”.

As a choice for a possible distribution infrastructure, the most preferred one is a two-tier architecture that involves commercial banks. Such model would not cause competition with payment service providers and would not disrupt the existing financial infrastructure.

Currently, the People’s Bank of China is at the most advanced stage of introducing a digital currency. The reasons for issuing digital currency are improvement of financial inclusion and, in the future, development of cross-border payments. As of July 2021, as part of a pilot project, virtual wallets with digital currency were opened by more than 20.8 million individuals in 11 cities and regions of the People's Republic of China [12].

Sweden was one of the first countries to study the introduction of CBDC, due to the steady decline in cash payments in the country. In April 2021 the Central Bank of Sweden completed the first stage of a digital currency (e-krona) pilot project. At the next stage of the project, the bank plans to add real market participants to the network, test offline payments and integration with POS terminals.

The Central Bank of the Russian Federation is also exploring the issue of introducing a national digital currency - the digital ruble. In October 2020, the Bank of Russia released a report for public consultations, which presented possible options and ways to implement the digital ruble, as well as the necessary functional requirements. Based on the results of the public discussion, the Bank of Russia developed the concept of the digital ruble, which provides for the use of a two-tier retail architecture. In 2022, the regulator plans to test a prototype of the digital ruble platform.

A research on the introduction of a digital currency was also initiated by the European Central Bank in July 2021.

The issue of implementing a central bank digital currency is being studied also in Kazakhstan. In May 2021, the National Bank published a “Digital tenge” research report for public discussions. The report covered the issues of the nature of the digital tenge and the potential technology for its implementation, the possible benefits and risks from the introduction of the digital tenge. At present, the first stage of the pilot project has been completed, in which the basic scenarios for the life cycle of the digital tenge were implemented. In 2022 the functionality of the platform will be expanded, the research will also focus on economic, methodological and regulatory aspects of the digital tenge. The decision to introduce the digital tenge will be made based on the results of a comprehensive study.

3. Analysis of the Current State of the Payment Market in Kazakhstan and the Main Trends

The main trends in the payment market of Kazakhstan are currently:

1. digitization of financial and payment services, provision of services remotely via the Internet and mobile banking;
2. development of new innovative payment services (QR-code, biometrics, contactless payments, payments with the use of mobile number, etc.);
3. development of “bank-centric” digital ecosystems with functions of fintech companies (ecosystems, marketplaces).

3.1. Development of Remote/Online Services

The most significant trend in recent years in the financial industry has been the provision of online services through the Internet and mobile applications. Financial services’ provision is transitioning to remote channels (online/mobile banking). The use of financial technologies is changing the principles of customer service. By introducing innovative technologies banks are moving from physical customer service to remote.

Banks and Kazpost JSC conducted 4.9 billion transactions with the use of payment instruments (payment instructions, payment requests, checks, payment order, collection orders, payment notices, payment cards) in the amount of 467.7 trillion tenge during 9 months of 2021.

The most common payment instrument in Kazakhstan in terms of number of payments is payment cards (the share is 95%), in terms of volume of payments - payment instructions (the share is 84%) (Tables 1 and 2). The high share of payment cards in terms of quantity is associated with the use of this payment instrument mainly for payments and money transfers for small amounts, namely, it is used by the population for retail payments and money transfers.

At the same time, payment instructions prevail in terms of payment volumes, which is associated with the use of this instrument for payments and money transfers between bank accounts.

Checks, due to their specifics and the transition of the population to more convenient and innovative methods of making payments and money transfers, are the least used payment instrument in the market

Among all payment instruments payment cards show the largest growth in usage. The number and volume of payments with the use of payment cards over the past 3 years (for the period of 9 months of 2021 compared to the same period in 2019) increased by 4.3 times and 3.1 times, respectively.

Table 1

Payment instruments
The number of payments (in thousand transactions)

Payment instructions	2019	2020	9 months of 2021	Share	Growth (2019 - 9m.2021)
Payment requests	242 196,5	271 443,3	210 696,8	4%	-13%
Checks	1 598,0	1 109,5	1 113,0	0%	-30%
Payment order	1,7	1,3	1,0	0%	-39%
Collection orders	46 592,5	29 928,0	24 564,8	1%	-47%
Payment cards	960,8	1 475,6	1 445,3	0%	50%
Payment notice	1 571 455,1	3 174 351,3	4 594 807,3	95%	+192%
Payment instructions	36 441,3	32 510,3	19 498,2	0%	-46%

Source: National Bank of Kazakhstan.

Table 2

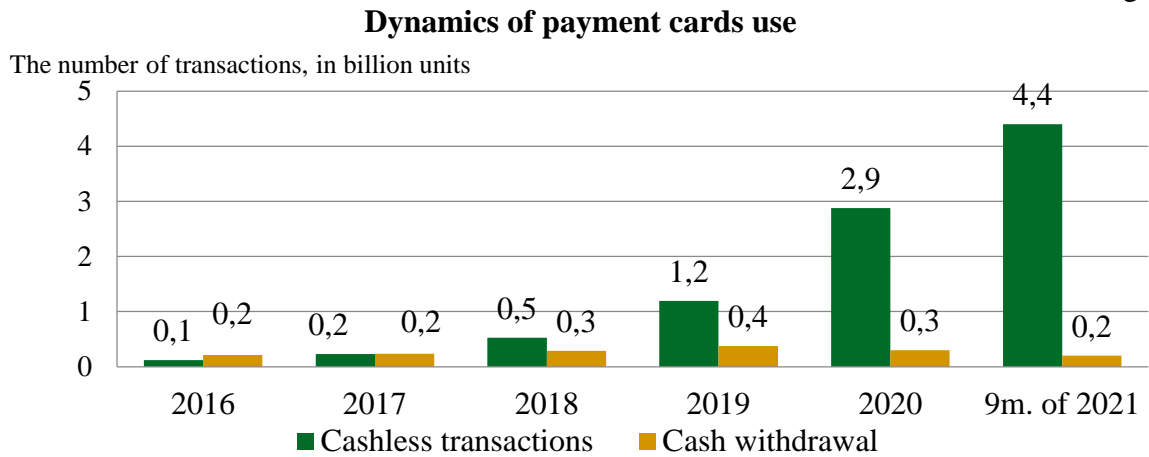
Payment instruments
Volume of payments (KZT billion)

Payment instruments	2019	2020	9m. 2021	Share	Growth (2019 - 9m.2021)
Payment instructions	419 807,7	408 597,9	394 708	84%	-6%
Payment requests	30,8	34	34,8	0%	13%
Checks	7,4	6,7	2,7	0%	-64%
Payment order	5 183,6	7 580,1	6 492,7	1%	25%
Collection orders	184,4	182,3	144,1	0%	-22%
Payment cards	30 375,4	51 915,3	65 144,1	14%	114%
Payment notice	1 477,7	1 455,7	1 199	0%	-19%

Source: National Bank of Kazakhstan.

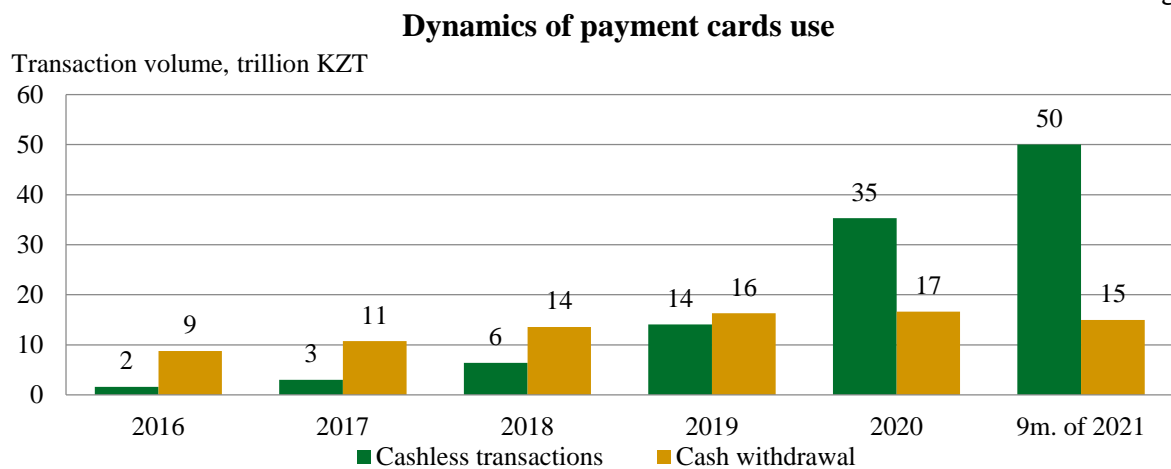
Tables 1 and 2 show the dynamics of the use of payment cards in Kazakhstan over the past 5 years. Over the past five years the volume of cashless payments with the use of payment cards in Kazakhstan has grown by 22 times, from 1.5 trillion KZT in 2016 - up to 35.3 trillion KZT in 2020 (Figure 3). At the same time, during 9 months of 2021, transactions for 50.2 trillion tenge carried out.

Figure 2



Source: National Bank of Kazakhstan.

Figure 3

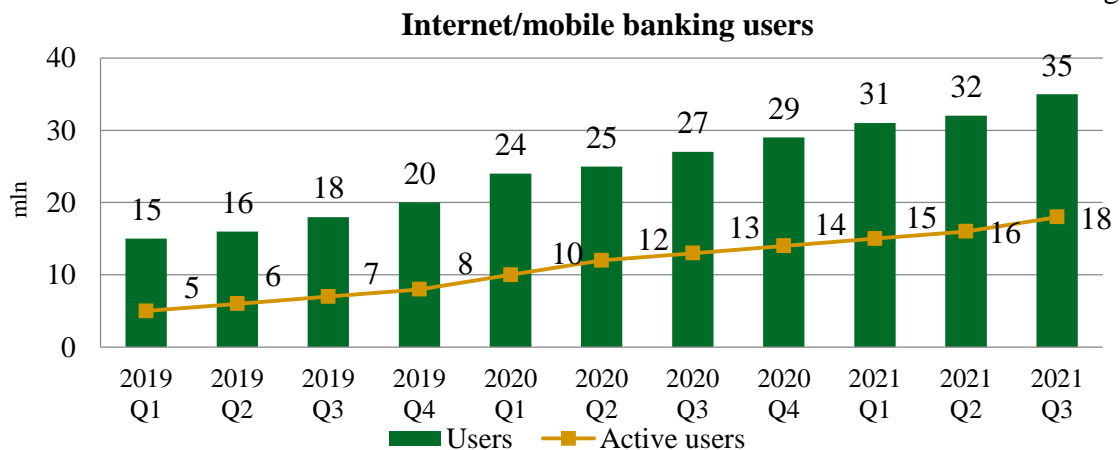


Source: National Bank of Kazakhstan.

The share of cashless payments in the total volume of retail trade in 2020 amounted to 57%, having increased by 40.1 percentage points since 2016. This is due to the development of the infrastructure of cashless payments and the high availability of payment services. The conditions of quarantine restrictions also affected the growth of cashless payments.

The segment of Internet and mobile operations shows stable growth from month to month, there has been recorded an increase of 46% in banks' online channels usage due to restrictions on physical contact over the period of 2020. Compared to 2018, the number of Internet/mobile banking users increased by 2.2 times, the number of active users rose by 2.8 times (Figure 4).

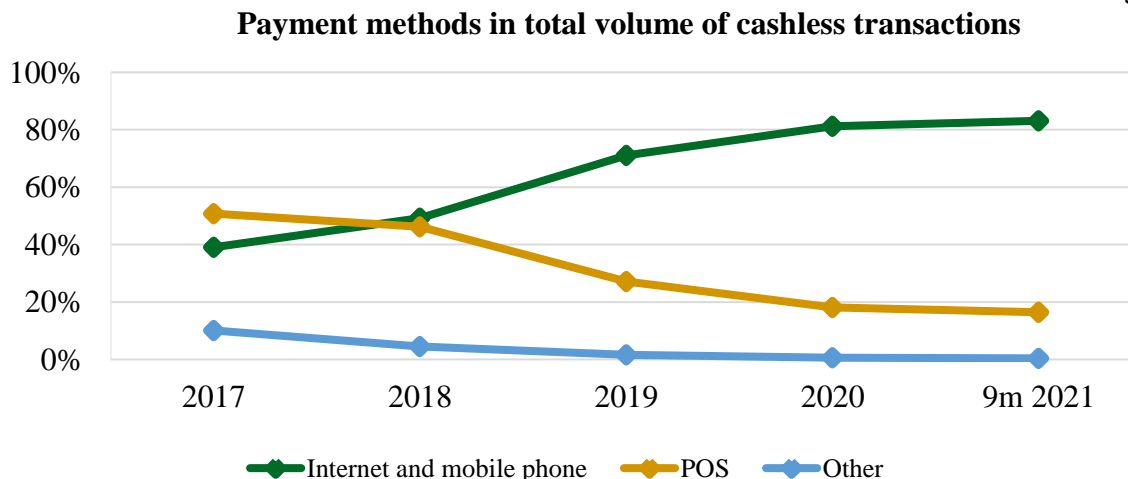
Figure 4



Source: National Bank of Kazakhstan.

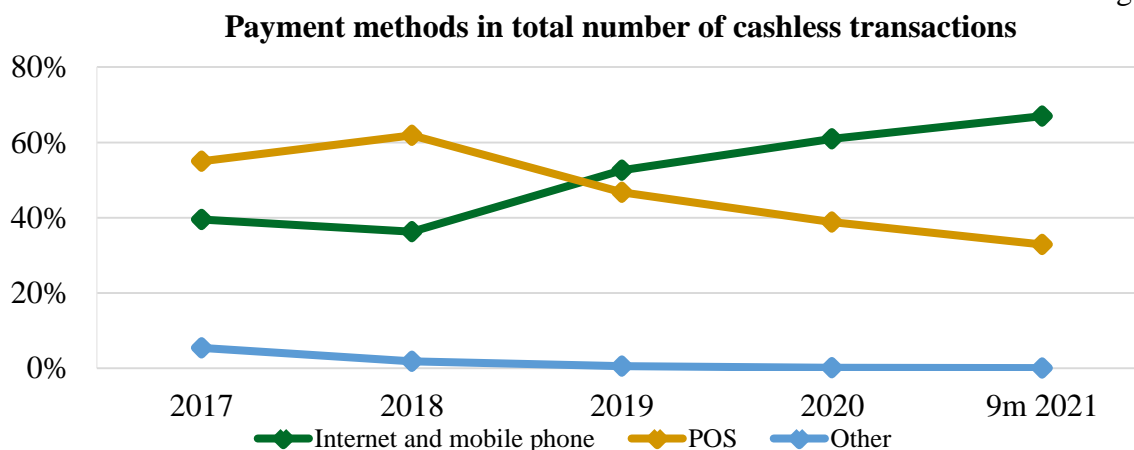
Over the past 5 years, the number of payments made via online channels has grown by 55 times (from 31.1 million transactions to 1.72 billion transactions). The development of the online payment method has led to the disappearance of payment methods such as payment through a bank kiosk and imprinter. With the development of payment through online channels, the overall share of payments through POS-terminals has decreased (Figures 5 and 6).

Figure 5



Source: National Bank of Kazakhstan.

Figure 6



Source: National Bank of Kazakhstan.

These results became possible, among other things, due to the rapid reorientation by banks of their business processes towards strengthening information technology capabilities, expanding the line of digital services through mobile applications. The digitalization of financial services has led to the development of electronic commerce, cashless payments and new payment services.

Payment services in the market of Kazakhstan are also provided by non-bank companies – payment organizations. The Law of the Republic of Kazakhstan “On Payments and Payment Systems” introduced regulation of payment organizations. Payment organizations carry out their activities after registration in the National Bank of the Republic of Kazakhstan.

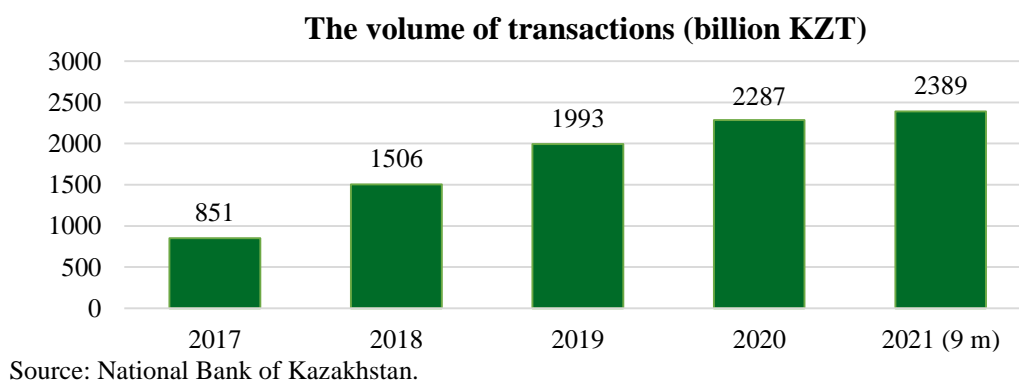
Payment organizations provide the following types of payment services:

- acceptance of cash payments without opening a bank account;
- e-money services: processing of e-money transactions;
- processing of transactions initiated electronically via the Internet and mobile application.

As of September 1, 2021, 81 payment organizations are registered in Kazakhstan.

There were transactions in the amount of 2.3 trillion tenge conducted via payment organizations in 2020, every third transaction was carried out online. The volume of transactions carried out through payment organizations in the first 9 months of 2021 exceeded the volume of transactions in 2020 and amounted to 2.4 trillion tenge (Figure 7).

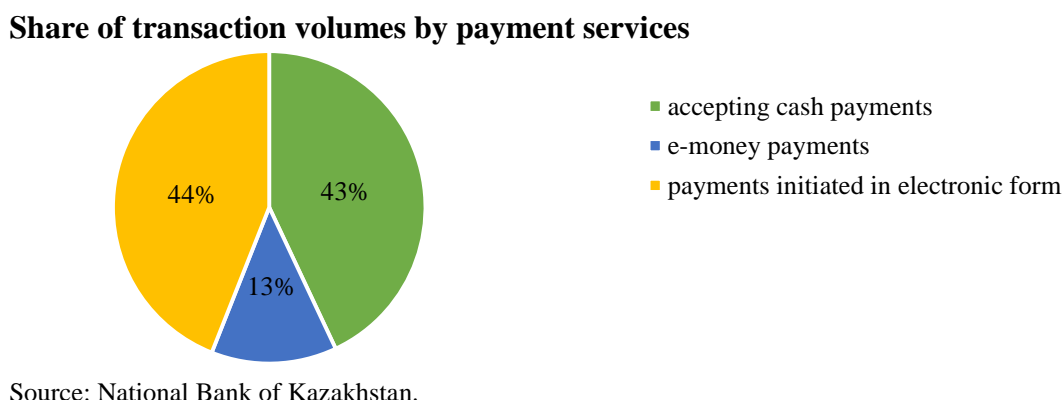
Figure 7



Over the past 5 years – from 2017 to 9 months of 2021 the volume of transactions conducted via payment organizations increased by 2.8 times.

The key trend in payment organizations' services is the growth in electronic payments. According to the results for the period of 9 months of 2021, payment organizations conducted the largest volume of transactions through the service of processing payments initiated in electronic form (Figure 8).

Figure 8



3.2. QR Code, Biometrics and Contactless Payments

Currently, all basic payment services, including opening a bank account, issuing a payment card, money transfers, are available remotely and online.

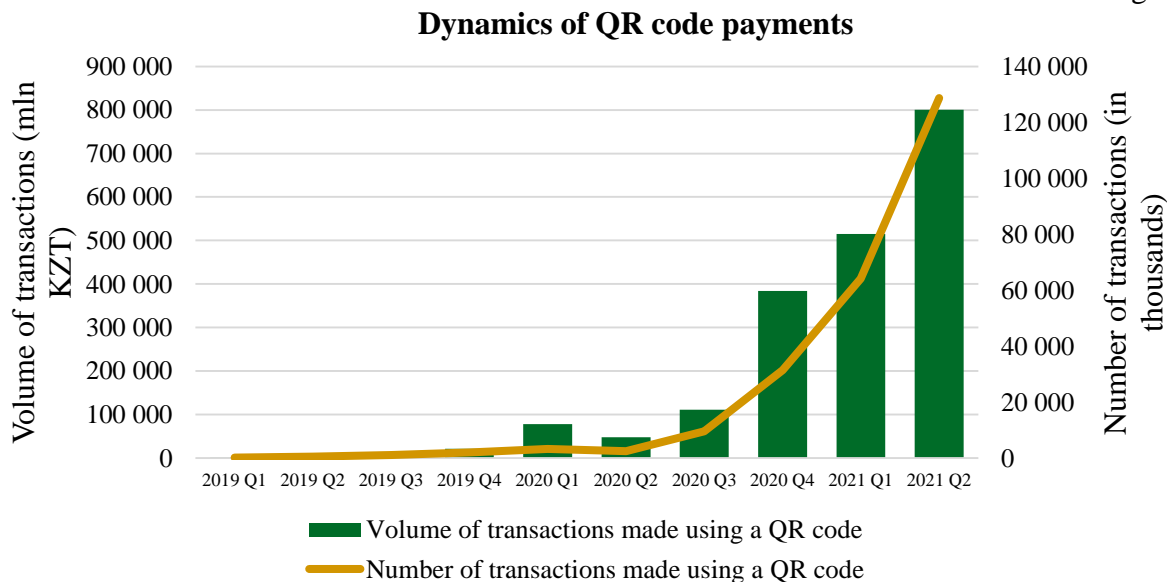
Availability of remote financial services was enhanced by the launch of a remote biometric customer identification system in a pilot mode by the National Bank on April 1, 2020.

The launch allowed banks to open accounts remotely for crediting social benefits during the pandemic. The service was launched fully in October 2020. The mechanism allows customers of banks and other financial/payment organizations to receive financial services remotely using available devices, regardless of geographic location. Client identification is carried out on the basis of his/her biometric parameters (face recognition). Since the start of the service more than 9.8 million requests for customer identification have been processed. In January-September 2021, 3.6 million financial transactions were carried out, 512 thousand transactions were carried out per month, on average.

Besides, citizens make payments by scanning QR codes, which contain information about the recipient of money.

In the first half of 2021, 192.8 million transactions with the use of QR code in the amount of 1.3 trillion tenge were carried out, which accounts for 26.4% of all cashless payments made online (Internet and mobile phone) with the use of payment cards (Figure 9). The number and volume of QR code payments increased by 33 times and 10 times, respectively, compared to the same period in 2020.

Figure 9



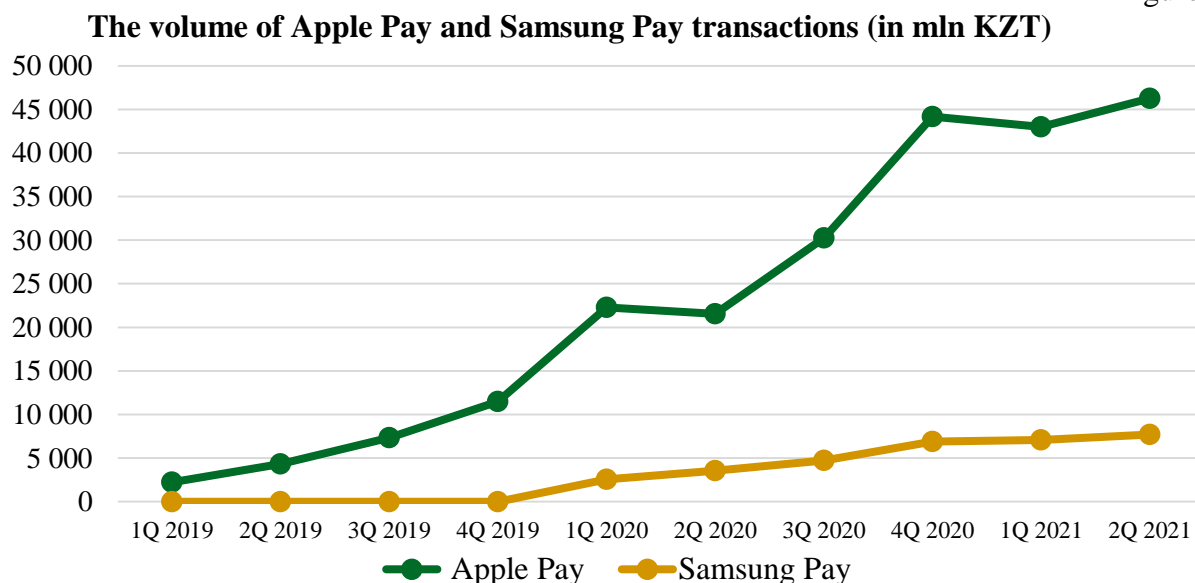
Source: based on commercial banks' data.

In order to unify the QR code formats used by various financial organizations on August 13, 2021, the authorized state body of the Republic of Kazakhstan approved QR code standard, which is for the use by business entities to receive payments ("CT PK" 3712-2021) ("order No.297-HK")

Consumers also actively make contactless payments with the use of a mobile phone or smart watch (Apple Pay and Samsung Pay services).

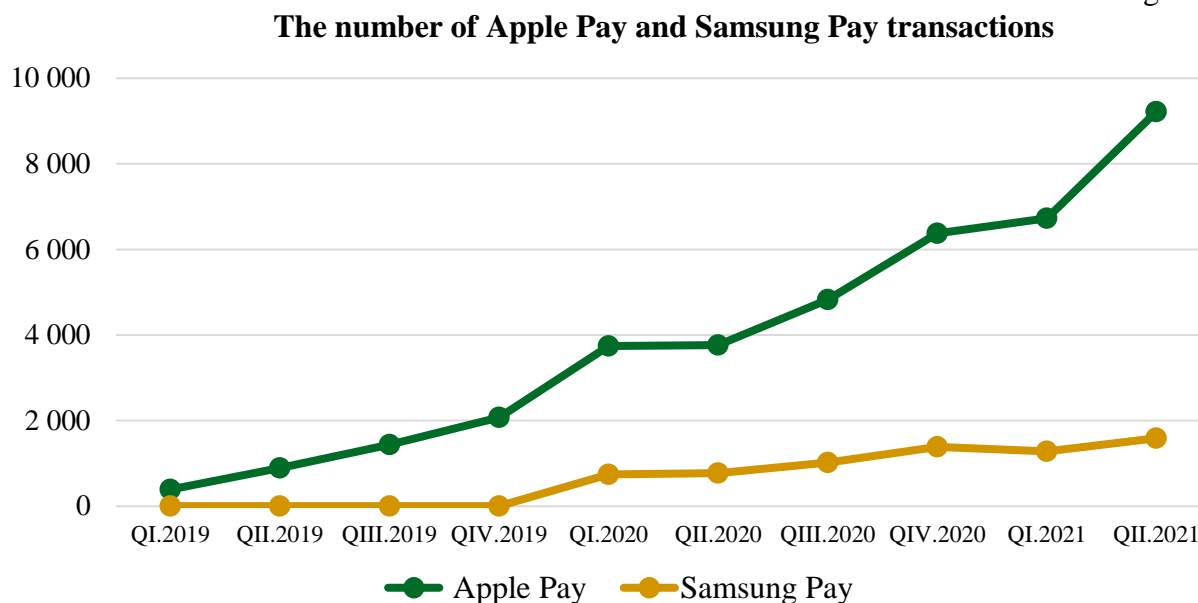
Figures 10 and 11 show the volume and number of transactions made via Apple Pay and Samsung Pay from January 2019 to June 2021.

Figure 10



Source: based on commercial banks' data.

Figure 11



Source: based on commercial banks' data.

In the first half of 2021 the population made 18.8 million transactions via Apple Pay and Samsung Pay in the amount of 104 billion tenge, of which 85.8% in number and 84.7% in volume were made via Apple Pay.

3.3. “Bank-Centric” Digital Ecosystems

In recent years, banks have been reengineering their financial and payment services towards more innovation. Banks prefer not to open new branches; instead they concentrate on digital methods of providing services (a new banking model) with the use of mobile applications and other modern technologies.

The leading players in the financial market are banks and non-bank financial organizations that are able to implement “fintech” solutions in their services by creating new and developing financial services provided (digital banks). Digital banks and platforms that provide a full range of financial services (financial ecosystems) through mobile and Internet applications are fully running in the market today.

Banks provide various types of services in ecosystems, including those not related to traditional banking activities, i.e. build their products to satisfy all the basic needs of a client.

Financial organizations in Kazakhstan implement non-traditional services through the development of their platforms and the creation of large closed ecosystems. To ensure the functioning of a full-fledged ecosystem, individual banks have carried out work to redirect their own business towards development as fintech companies. The main motive for switching to this business model is, first of all, their complementarity with the core business and, due to this, an improvement in the quality of customer experience, seamless service provision, an increase in the time spent by the client within the ecosystem, reduced need of the client to leave the ecosystem and an increase in business margins. Equally important is the acquisition of transactional data about the client – enrichment of client data for scoring targeted offers in ecosystem, which further strengthens the position of platforms.

For instance, there is Kaspi.kz platform. It provides a marketplace, payment infrastructure, consumer lending, services for buying/selling tickets, i.e. provides a wide range of financial and non-financial services.

Halyk Bank of Kazakhstan is also developing its own ecosystem: a marketplace, Buy Now Pay Later, auto insurance, investment solutions, etc. have been launched. Similar platforms are built also by other players (First Heartland Jusan Bank, ForteBank).

The emergence of such financial institutions with a closed ecosystem in the market has both advantages and disadvantages for the development of the financial system. This is due to the fact that banks develop and provide payment services within their closed ecosystems, mainly with the use of card technologies.

Understanding and recognizing all the undeniable advantages for the consumer provided by the services of such closed ecosystems, it should be noted that the unregulated development of ecosystems already today creates significant arbitrage with other business models, challenges the competitive environment, makes a merchant dependent on rules and tariffs of ecosystems, binds a consumer and often determines its consumption pattern.

4. Conclusion

The payment sector around the world is transforming towards active digitalization and the development of cashless payments. Innovative electronic and instant payments such as QR code payments, payments by mobile phone number are expanding on the global scene, the role of BigTech and FinTech companies and of global digital ecosystems is increasing.

A new generation of digital products (mobile and virtual wallets, contactless technologies, chat bots, online platforms and other digital applications) has emerged. Biometric technologies which provide access to financial services with the use of a client's biometric data (fingerprints, voice and face recognition) and so significantly increase the reliability and security of customer identification are in active use too. Besides, one of the most significant recent trends is the issue of implementing a CBDC.

Global trends in payment industry are also relevant for Kazakhstan. Kazakhstani banks also actively implement technological innovations and are switching to a digital form of customer relationship. The local payment market has achieved serious results and successes (e.g. in the development of Internet and mobile banking, QR code payments). Over the past 5 years, the number of payments made in online environment in Kazakhstan has grown by 55 times. At the end of 2020, the use of online banking channels increased by 46%. In the first half of 2021, compared to the same period in 2020, the number of QR code payments increased by 33 times. Digital ecosystems and banks' marketplaces which provide both financial and non-financial services are also actively developing in the country.

Remote biometric client identification system allows to increase the availability and reduce the time and cost of financial services for the population. Under thorough research is also the issue of implementing a digital tenge.

The Program for the Development of the National Payment System adopted by the National Bank in 2020 depicts the further development of the payment market, including the development of a modified instant payment system that ensures real-time payments and money transfers, and national switching and clearing system for card transactions.

Thus, the development of a new innovative ecosystem of payment market is actively underway. The current level of the local market's digital maturity demonstrates all the necessary prerequisites for the further successful and rapid development of the payment market.

It is assumed that over the next few years, financial technologies in the world will advance with the use of artificial intelligence, machine learning, and big data analytics. Certain banking services can be fully automated and provided without the participation of personnel based on the analysis and processing of data, consumer behavior of customers.

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ANALYSIS OF REFORMING THE NATIONAL PAYMENT SYSTEM OF KAZAKHSTAN

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Due to the growing market infrastructure, technological changes and the development of the global and national legal and regulatory environment, increase in the production volumes and, therefore, the number of transactions of economic entities, including individuals and enterprises in the material production sector, as well as the development of technologies in the financial services industry there is a need for constant development and adaptation of national payment systems to the challenges of the market and their transformation into more modern and convenient services that meet the challenges of the time.

Presence of the payment system that meets the needs of the state, financial market, individuals and business entities in the safe and efficient transfer of funds is an important element of the national infrastructure of any developed country.

In order to meet the new requirements for the organization, regulation of payment systems and market demand, timely reforms in this area were required. Over the years, payment systems have undergone a number of significant changes as new payment methods, platforms and interfaces have emerged. This is due to the rapid development in the field of information and communication technologies, as well as the growing expectations and demand from clients – consumers of financial services.

Thus, the global processes of national payment systems formation and reform can be divided into the following main areas:

1) payment systems designed to make payments for large amounts are real-time gross settlement systems (RTGS) and clearing systems (DNS – deferred net settlement systems).

The central banks, which are the conductors of a public financial infrastructure for the financial market entities, played the main role in the emergence of the above mentioned systems.

In Kazakhstan, the creation of such payment systems fell on the period after the independence and was carried out in order to form the country's financial infrastructure that meets the requirements of the new market economy. As a result of the work done, RTGS and DNS systems were built – the Interbank Money Transfer System (2000) and the Interbank Clearing System (1999), which provide high-quality and timely execution of urgent and regular payments in the money and financial markets, thereby maintaining stable functioning of the country's financial ecosystem.

2) payment systems designed for retail payments, which include automated check clearing houses, national card and switching systems, and instant/fast payment systems.

Until recently, the creation and development of services that allow making payments in the retail segment was assigned to the banking community, whose activities include servicing retail customer transactions.

However, in recent years, due to the need to organize an interbank service for making fast, guaranteed and cheap payments, more and more central banks are working to introduce their own payment systems designed for interbank retail payments.

This direction is also relevant for Kazakhstan, where, within the framework of the Program of National payment system development in the Republic of Kazakhstan until 2025 approved by the Resolution of the Board of the National Bank dated November 30, 2020 No. 133, the work is actively carried out to implement initiatives aimed at implementing new components of the National Payment System – the Instant Payment System and the Interbank Payment Card System (the national “switching” payment system), which are designed to ensure

the continuity, efficiency, and ubiquity of the use of electronic online payments, regardless of the servicing bank and payment instrument.

Moreover, in some countries due to the emergence and integration of their fast payment systems, a new mechanism for cross-border payments has been implemented, which allows solving the problem of the speed and cost of cross-border payments.

In this study, a detailed analysis of the reform of the National Payment System of Kazakhstan, as well as international experience in the formation and development of payment systems is presented.

Keywords: payments, payment system, modernization, RTGS system, clearing system, payment services, digitalization, financial services, token, cross-border payments

JEL-classification: E42, G2, O3.

1. Preamble

The process of formation and development of the national payment system is continuous. In recent years, there has been a rapid acceleration in the direction of fundamental reforms in the national payment systems around the world.

There are several basic options for classifying payment systems. In this paper, wholesale or systems for payments in large amounts and retail payment systems (depending on the scale of activity and the size of the payment) are considered. Depending on the type of processing of payment orders and other characteristics, wholesale payment systems are of two types: real-time gross settlement systems (RTGS) and systems based on deferred net settlement (DNS) or clearing payment systems.

The group of wholesale payments includes large in amount and urgent in terms of execution transactions in the money and stock markets. Large payments usually include all types of interbank cash settlements, including payments for transactions in the money market, with securities and foreign currency. The category of retail payments includes day-to-day monetary transactions associated with the purchase of goods and services by consumers and businesses for relatively small amounts. Such operations are carried out both in the form of one-time transactions and in the mode of periodically recurring payments.

Currently most countries use real-time gross settlement systems, automated clearing systems/chambers (mass payment systems), retail (card) payment systems. The process of formation, development and reform of the national payment systems in connection with the constant development of the market and change in the business models of economic entities has been continuous all over the world since the appearance of the first payment systems.

The process of reforming national payment systems can be conditionally divided into several areas.

The process of reform in the national payment systems tentatively began in the 70s of the last century and ended in the first decade of 2000. At present, in many countries the creation of the first payment systems designed to conduct interbank payments for large amounts in real time (wholesale RTGS systems) and systems with calculation of the net positions of system participants at the end of the transaction day of the payment system (clearing payment systems).

In Kazakhstan, a similar stage of reforming the payment system began after the independence in 1991, as a result, two main payment systems of Kazakhstan were launched – the Interbank System of Money Transfer, which transfers funds between system's participants in the National Bank of the Republic of Kazakhstan, and the Interbank Clearing System, designed for making regular payments in small amounts. [6]

Thus, at the first stage of the modernization of the payment system, the emphasis was placed on payment systems serving enterprises and the interbank market for large payments.

The next area in the reform of national payment systems is the emergence of payment systems designed for retail payments – systems for making electronic payments in an instant

mode (systems of fast payments) and card systems (national “switching” systems for processing card transactions).

The defining characteristic of a fast payment system is the ability to make a guaranteed payment almost immediately and at any time. According to the Bank for International Settlements, the speed of implementation of fast payment systems around the world is about the same as it was with the wholesale RTGS systems [15]. Dozens of countries have already implemented fast payment systems, and several others are under development and planning.

In addition, in many countries, active work is underway to create their own national card payment systems. In the market of the financial services, the first local card systems began to appear in 1970-1980, they worked only in the national currency. Today, there is a rapid development of national card systems (UnionPay, RuPay, NSPK) and their entry (expansion) to the other markets. The payment environment of countries has changed significantly since its inception with the development of technology, emergence of new payment service providers, creation of new risk management standards and changes in the needs and expectations of the end users.

Considering these changes and the importance of the payment system for the financial system and the economy of the country, in Kazakhstan as in other developed countries the Program of the National Payment System Development was adopted in order to develop the infrastructure of the national payment system, the main components of which are Instant Payments System and Interbank payment card system (local system for processing card transactions), which are designed to provide retail electronic payments to the population.

Further, an analysis of the processes of reforming wholesale and retail payment systems is presented, reflecting the main trends.

2. First Stage. Creation and Development of Wholesale Payment Systems.

2.1. RTGS Systems

In developed countries, large-scale payment systems began to be massively introduced by the 1980s. In almost all countries since the 1990s, the modernization of wholesale payments has begun with the introduction of real-time gross settlement (RTGS). In 1990 there were less than 10 RTGS systems, and in 2017 there were already about 176 countries using RTGS systems or equivalent. The hours of operation of RTGS systems have also been extended over the past decade, with RTGS also operating several hours on weekends and holidays in some jurisdictions [13].

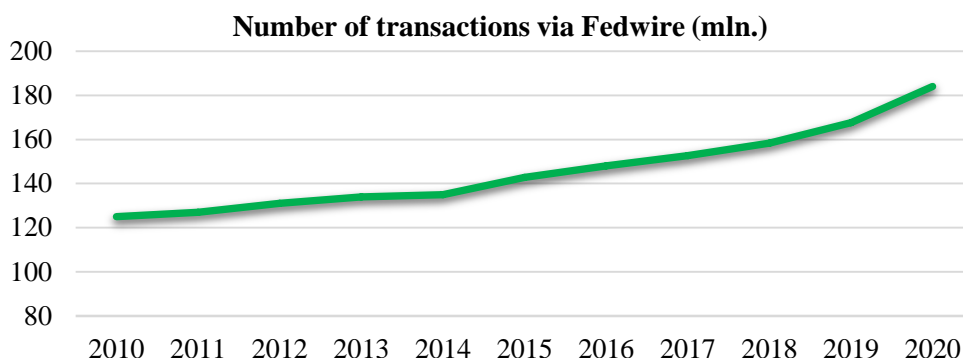
The presence of a full-fledged RTGS system in the country is an indicator of the development and reliability of the banking system functioning in the state. In such systems, the speed of transfer of payment information is high; all payment documents are received and processed electronically in a matter of seconds. Each payment is processed and calculated individually, its finality and irrevocability is guaranteed, and credit risk is minimized. All over the world, RTGS systems process huge flows of payment information in financial markets. Due to the great importance of these systems, the central banks of developed countries are currently updating their RTGS systems.

One of the largest gross settlement systems is the American Fedwire (Federal Reserve Wire Network). It carries out transfers related to interbank settlements in the money market, payments in favor of companies and individuals, settlements on transactions with securities. This system is owned and operated by the US Federal Reserve System (FRS). The Fedwire system runs on a fully automated platform, providing “real time” settlements [3].

The spread of the wholesale payment systems in the world was accompanied by an increase in the number of the transfers and average sums of the transactions. For example, in 1987-2000 the number of transfers via Fedwire grew by an average of 7.4% per year. Figures 1, 2 show the number and volume of transactions carried out through Fedwire in 2010-2020. At Fedwire, the peak was reached in 2020 when about 184 million transactions worth \$840.5 trillion

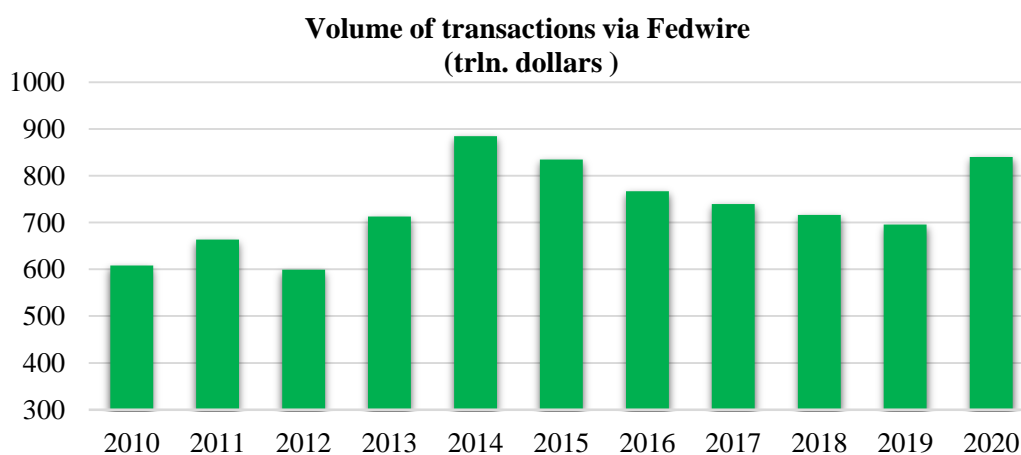
went through the system. However, the system processed the largest volume of payments in 2014 (\$884.6 trillion) [11].

Figure 1



Source: Based on the data from the Federal Reserve Bank

Figure 2



Source: Based on the data from the Federal Reserve Bank

In Europe, the process of reforming payment systems in the late 80s and early 90s took place in connection with the accelerated economic integration of the member countries of the union. In 1992, the Economic and Monetary Union (EMU) was created, in which the presence of RTGS in the country as a central element of the national payment system was a prerequisite for the participation.

Thus, in the European countries RTGS was given the role of the basic platform of the payment mechanism. Already in 1995, a political decision was made to create the TARGET (Trans-European Automated Real-Time Gross Settlement Express Transfer System) system, connecting the Central Banks of the EU member countries, as well as the European Central Bank for making money transfers in euros. The payment infrastructure in the euro area is characterized by the parallel existence of various European payment systems. The 16 national RTGS systems are interconnected by communication lines and together form a payment mechanism supported by the European Central Bank. The TARGET system used interfaces and networks that linked national systems and the main central network. This system was built on the infrastructure of the SWIFT system. One of the main tasks was to create common terms for all the participating countries, so all the credit institutions received right to make payments through TARGET [23].

In the course of further reformation of the European payment systems TARGET was modernized and on November 19, 2007 a new system TARGET2 was launched. Transactions are processed in euros using funds held in the Central bank's account. In the TARGET2 system, all the banks operating in the euro area, regardless of the country in which they are located, offer uniform services, as well as uniform tariffs. The system provides full technical consolidation on a single common platform provided by three central banks (Deutsche Bundesbank, Banque de

France and Banca d'Italia). The technical interface for the participants is harmonized based on SWIFT [23].

The Indian RTGS system was introduced by the Reserve Bank of India in March 2004. Afterwards, it was upgraded to the next generation RTGS (NG-RTGS) capable of operating on the basis of ISO 20022 standards and with enhanced functionality (liquidity management function, scalability, etc.). NG-RTGS is one of the first systems to migrate to the ISO 20022 standard [20].

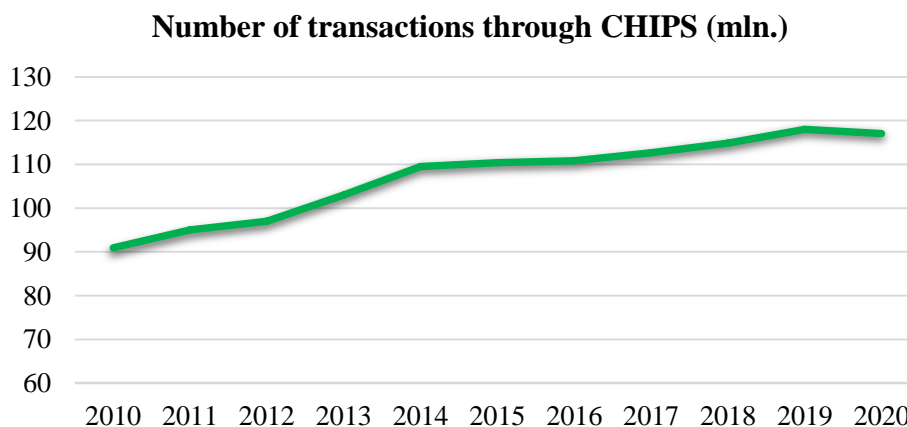
Transactions are settled in real time on a gross basis in the books of the Reserve Bank of India. RTGS also settles multilateral net settlement files originating from ancillary payment processors of Clearing Corporation and National Payments Corporation of India. RTGS accounts for most of the transactions carried out in Indian payment systems. The system was available for client transactions from 7 am to 6 pm and for interbank payments from 7 am to 7.45 pm. From December 14, 2020, RTGS is available 24 hours a day. The introduction of RTGS 24x7 contributes to the integration of Indian financial markets with international ones, development of international financial centers and provides Indian corporations and institutions with more flexible payments [20].

The decision to grant access to RTGS is made based on criteria established by the Reserve Bank of India. Organizations must meet the following requirements: (i) be a member of the Indian Financial Network / Structured Financial Messaging System / SWIFT network; (ii) maintain bank current and settlement accounts in the Reserve Bank of India; (iii) maintain a general ledger account in the Reserve Bank of India [22]. Membership in RTGS is open to all licensed banks and any other organizations on approval by the country's main bank. Members that do not meet the established requirements may receive restricted access. RTGS is available to customers through a web portal and private electronic network, and transactions can also be initiated at the location of the participants themselves. These features make the system reliable and easy to use. From July 1, 2019 the Reserve Bank of India has eliminated transaction processing fees and other fees imposed on banks for all outgoing transactions made using RTGS [20].

2.2. DNS Systems

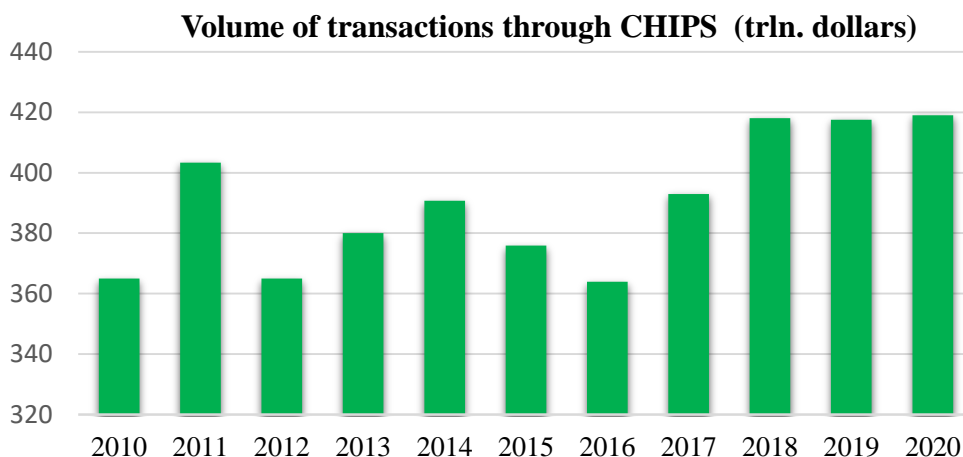
In the United States, the main part of large-scale money transfers is also carried out by the CHIPS system (Clearing House Interbank Payments System) pertaining to the net settlement system (DNS). CHIPS is a private settlement system for cross-border money transfers in US dollars. This high-value payment system has approximately 50 direct participants and is Fedwire's private sector partner. CHIPS accounts for about 96% of all the global dollar transactions: interbank settlements (short-term loans, support of correspondent accounts, etc.), various commercial client payments [3].

Figure 3



Source: Based on CHIPS data.

Figure 4



Source: Based on CHIPS data.

On the territory of Europe, the representative of the net settlement system is EURO1 launched at the end of 1998 by the European Banking Association. The EURO1 system, developed based on the experience of implementing the technological solutions of the SWIFT platform, is designed to transfer large payments (up to 500 million euros). The system is operated by the clearing company of the European Banking Association – EBA Clearing, founded by 52 largest European and international banks. Currently, 51 banks are direct participants in the EURO1 system. EURO1 was built to develop a pan-European payment area with euro settlements, as well as to provide European credit institutions with their own wholesale systems along with RTGS operated by the Eurosystem. EURO1 has been designed to settle on a net basis in order to provide greater liquidity than the RTGS system. The system processes an average of more than 180 thousand payments per day, totaling around 200 billion euros. Besides, at the system level 95% of the transactions are calculated in real time [8].

Banks generally prefer to use TARGET2 for more important payments due to the benefits of RTGS (robust operational risk management framework, efficiency and security provided by real-time central bank money settlement). In turn, EURO1 is a net settlement system used to make less urgent payments (domestic or transnational) in large amounts. Compared to TARGET2, the private system managed by EBA Clearing is characterized by liquidity efficiency due to the netting payments [8].

Large-value payment systems based on deferred net payment (DNS) continue to be used despite the development of RTGS systems, which are more secure. DNS systems have compensated for the lower level of security by building robust risk management structures that greatly reduce financial risk. The fact that EURO1 and CHIPS continue to function together with the RTGS system may be explained by the “dual” structure of the high value payments market, characterized by the coexistence of two systems operated by a public institution and the private sector.

2.3. Hybrid Systems

The next important step in the development of interbank settlement systems was the creation and implementation of hybrid (hybrid) payment systems that combine the properties of real-time gross settlement systems and “netting”. The system has improved operational characteristics – saving liquidity and instant completion of the transaction.

The Central Bank of Egypt successfully launched a hybrid RTGS system on March 15, 2009. It is based on the latest business concepts in the field of wholesale payment systems and most modern technologies. Settlements in the system are final and irrevocable. Since the system is hybrid, settlements are carried out both on one-time payment requests and on the results of netting by clearing houses. The Central Bank of Egypt provides banks with free daylight

overdraft. Treasury bills (through intraday repos with the Central Bank) and deposits of commercial banks, except for overnight deposits, are accepted as collateral in the system. RTGS supports a variety of liquidity optimization mechanisms to facilitate the timely execution of cash orders throughout the trading day. All the banks registered with the Central Bank of Egypt are direct members of RTGS. The operating mode of the system is from 8.30 am to 4.30 pm every working day [5].

The Egyptian system uses SWIFT's "Y Copy service", which is a safe and secure environment for transferring funds. Thus, all the messages sent through the system fully comply with the SWIFT messaging formats. More than 57 billion Egyptian pounds (more than 9 billion US dollars) of payments are processed daily in the system, indicating that RTGS is a systemically important element for the Egyptian economy. During the first 12 months of operation of the system, settlements were made in the amount of 13 trillions of Egyptian pounds (more than 2.5 trillion dollars). This means that the amount equal to the country's total GDP passes through the system in 20 working days.

Payment documents may be stored in the system for processing at a later time during the day or thereafter. All the transactions related to bank accounts at the Central Bank must go through the system. Hybrid RTGS operates in a highly secure environment with automated disaster recovery systems. The system fully complies with the key principles of the systemically important payment systems of the Bank for International Settlements, and proper supervision is carried out to ensure such compliance [5]. The Central Bank of Egypt, as the main catalyst for change in the Egyptian financial market, monitors market trends in the field of payment systems in order to maintain and further develop the country's payment infrastructure.

In Germany in 2001 during the reform of payment systems the latest electronic system RTGS^{plus} replaced EIL-ZV. Formed by the merger of two German clearing systems, Europe Link System (part of the platform for TARGET) and Europe Access Frankfurt, RTGS^{plus} is considered one of the largest, technologically advanced European systems designed for making large payments. The Germany's Central bank as well as German commercial banks took part in its creation. RTGS^{plus}, being a representative of hybrid systems, makes money transfers on a gross basis using "netting" to save liquidity [7].

Thus, important stages in the development of payment systems in the category of large payments are associated with the emergence of RTGS systems, their subsequent updating and upgrading to "hybrid" systems, a feature of which is the combination of real-time money transfer with a netting mechanism.

2.4. Payment Systems in Kazakhstan. Experience of Kazakhstan.

At the end of 1991, the payment mechanism of the former Soviet Union consisted of cash in the economy's retail sector and a system of deposit-based money transfers between enterprises based on the payment orders (credit instruments) and payment claims (debit instruments). Individuals could also pay for some government-provided services, such as housing and utilities, by transferring money from Savings Bank accounts.

The payment systems inherited from the former centrally planned system and supported by the State Bank of the former USSR were not suitable for a market economy. Under the socialist model, economic relations were regulated by the central planning bodies. The payment system and indeed the entire banking system essentially performed the functions of accountants keeping financial records of the centrally planned economic activities. This payment mechanism was unreliable, inefficient and unsuitable for the new market economy.

In 1994, the National Bank of the Republic of Kazakhstan was given the task of modernizing the payment system in order to speed up the passage of payments between banks and their customers, as well as to expand the list of payment documents used. In 1995 on the basis of the National Bank the first clearing house in the country, the Almaty Clearing House, was organized, which worked according to the method of multilateral netting. During the day, second-tier banks exchanged payment obligations. The banks made final settlements once at the

end of the trading day for the net position of each participant. Thanks to this, the banks had liquidity in their accounts during the day. The disadvantage of this system was that the participating banks at the end of the day had to exchange payment orders on paper.

Since 1996, the Almaty Clearing House has been reorganized into the Kazakhstan Interbank Settlement Center (KISC) – a state-owned enterprise on the right of economical jurisdiction, the founder and authorized body of which is the National Bank. Improvement of the regulatory legal framework, installation of modern equipment and software made it possible to work with electronic payment orders that do not require confirmation on paper [6].

A key moment contributing to the acceleration of the passage of interbank payments was the creation of the first prototype of the wholesale payments system – in August 1996 on the basis of KISC - that performs settlements on a gross basis and has the characteristics of an advanced real-time gross settlement system (RTGS). Before building this system, the practice of the countries of the European Union was studied, and the experience of Switzerland (SIC system) was taken as the basis for the Kazakhstani system of wholesale payments. The National Bank and all the commercial banks became users of the centralized system. In a short time, the system of large payments gained great popularity due to electronic document management that does not require paper confirmation, due to the speed and reliability of money transfers, as well as high level of security [6].

The next significant historical moments in the process of improving payment relations in Kazakhstan were:

- approval of the fundamental Law “On Payments and Money Transfers”, which regulates the issues of making payments and money transfers on the territory of the Republic of Kazakhstan and development of the appropriate regulatory legal framework;
- centralization of correspondent accounts of the second-tier banks in the National Bank in the period from October to November 1998. This transfer allowed the National Bank to quickly perform the functions of a settlement bank and increase efficiency of control functions over the banking and payment system, to transfer auxiliary accounting of correspondent accounts to work in real time.

As a result of almost a decade of work to improve the legislative framework in the area of payment systems, technical and technological modernization, bringing the payment systems of Kazakhstan closer to international standards, as well as in connection with the need to meet the growing needs of the banking and financial sectors in an efficient and secure payment system with final settlements on the same day, in February 2000 the Interbank System of Money Transfers (ISMT), which is a system of gross settlements in real time, began to operate on the basis of the Kazakhstani wholesale payments system [6].

At the same time, since 1995 the activities of regional clearing houses have also undergone significant changes. By 1999 these chambers at the regional branches of the National Bank were replaced by a system of multilateral netting of counter obligations (similar to the American automated clearing house), which operates without preliminary deposit of funds with the final calculation of users' net positions in ISMT. The system was called the Interbank Clearing System (ICSS) [6].

In 2009-2010, in order to improve operational reliability and production efficiency of the national payment systems, National Bank successfully upgraded the technical infrastructure of the payment systems and transferred them to a new software and hardware platform. New versions of the ISMT-2 and ICS-2 payment systems are characterized by a high level of security and a significant increase in throughput, cluster software allows the servers of the main and backup centers of payment systems to function as a single whole.

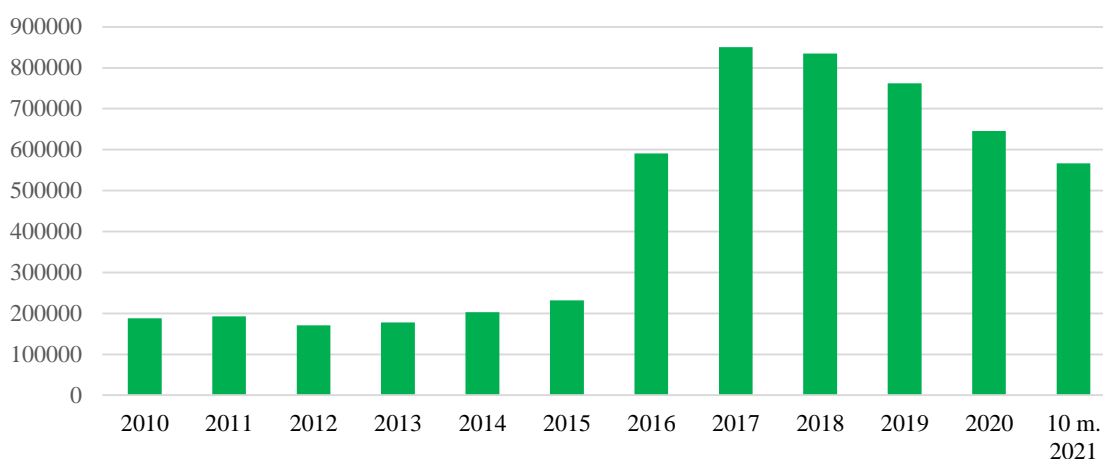
At the same time, on the new platform in mid-2010s international standards for the bank account number and bank identification code ISO 13616: IBAN and ISO 9362: BIC were introduced in payment systems, which made it possible to improve the system for identifying banks and their customers in the payment systems of Kazakhstan, to ensure automation and

acceleration of processing payments, and create prerequisites for possible future integration processes.

The Interbank System of Money Transfer and the Interbank Clearing System are of strategic importance for Kazakhstan's payment infrastructure. In 2020, 92% of cashless payments were made through ISMT and ICS. Over 10 years the volume of transactions carried out through these systems increased by 3.4 times from 187.7 trillion tenge in 2010 to 645.5 trillion tenge in 2020. During 10 months of 2021, 48.2 million transactions of 628.6 trillion tenge were carried out through ISMT and ICS.

Figure 5

**Volume of payments made through ISMT and ICS
(in billion tenge)**



Source: Based on the data from the National Bank of Kazakhstan.

Summing up the results of formation and development of the payment services market in Kazakhstan over the past twenty years, it should be noted that extensive work has been carried out to reform payment relations as part of the transition from a centralized economy to building a high-tech and reliable payment mechanism, which is an important link between all the subjects of the modern market economy. As a result of the consistent methodological work, study of the best world practices and application of the latest information technologies, the national payment systems functioning in the country today contribute to the effective implementation of the National Bank's monetary policy, contribute to ensuring financial stability and meet requirements of the international standards.

3. Second Stage. Creation and Development of the Retail Payment Systems

3.1. Card Systems

The use of cards as a payment method originated in the United States in the 1920s when individual firms, such as oil companies and hotel chains began issuing them to customers to make purchases at the sale outlets. The first universal credit card that could be used across institutions was introduced by Diners Club International in 1950. Another card of this type, known as the travel and entertainment card, was created by American Express in 1958. Under this system, the credit card company charged the cardholders an annual fee and billed them periodically. Collaborating merchants from all over the world paid their credit card issuer a service fee of 4-7% from the total amount.

Today bankcards are widely used for cashless payments through POS terminals and other online or offline channels, as well as for cash withdrawals and other transactions through ATMs. Interbank and cross-border transactions would not be possible without international card associations connecting banks and financial institutions. Card systems set standards, license

banks and other financial institutions to issue cards with their brand, resolve disputes, provide technical and operational support to their members, as well as commercial services, process transactions with clearing and settlement. The largest payment systems are Visa, MasterCard, American Express, Diners Club.

In practice, the level of development of the infrastructure for card payments or payments based on electronic money transfers varies from country to country. In some governments large international card systems dominate, in others local and regional payment systems win the competition. Local payment systems created by banks to service the cards they issue are not always convenient, since they do not accept other systems' cards. There is a need for a single card payment system working with the cards of the banks participating in the system. The first two decades of the 21st century were marked by the creation of national card payment systems.

In the early 2000s in China, different commercial banks independently engaged in the issuance and promotion of payment cards under different brands. The Bank of China issued the Great Wall card, the Industrial and Commercial Bank of China issued the Peony card, and the China Construction Bank issued the Dragon card. Until 2002 China did not have a unified card system or national bank cards, therefore, processing of the interbank transactions, organization of clearing and settlement were carried out by the commercial banks. In March 2002 UnionPay was founded by the State Council and the Central Bank of China to create a single platform for processing bankcards. As a key institution in China's bankcard industry, UnionPay has established and launched a nationwide clearing and settlement system for interbank transactions. In cooperation with partners, commercial banks and sales representatives, China UnionPay has set standards, created a single Chinese brand of bankcards, and has been promoting it in the market of non-cash payments [1].

In August 2003, UnionPay issued the first UnionPay card with a number beginning with "62", the UnionPay card issuer identification number established by the International Organization for Standardization (ISO). In January 2004 UnionPay POS terminals were installed for Hong Kong merchants, it was the first step towards overseas expansion. Since 2004, the number of cards issued by UnionPay has grown rapidly. With 2.3 billion UnionPay cards issued in 2010, China UnionPay became the largest player in the global bankcards market in terms of the number of cards in circulation [1].

Another example of a national payment card processing system is Troy system established in 2016 by the Interbank Card Center of Turkey (BKM). BKM was founded in 1990 as a result of the partnership of 13 public and private Turkish banks to develop and promote a unified infrastructure for card payments. Today, through BKM banks can collaborate on network technologies while still competing at the product level. BKM's work resulted in the common ATM platform, common POS terminal management system and the Troy card itself. The main activities of BKM are processing of the card transactions, development of the rules and standards for credit and debit cards in Turkey, formation of the internal rules and regulations, ensuring standardization in the field of payments, as well as establishing relations with international organizations and commissions [25].

Troy system was launched with the support of Turkish banks that are members of the Troy network or issue Troy cards. Troy represents a trusted local alternative to Visa and MasterCard targeting at over 90% of the Turkey's domestic transactions. Thanks to BKM, the Turkish banking market has remained relatively unfragmented facilitating rapid technological change. Working in the same payment system, participants compete in the implementation of innovations in the field of customer service.

Recently, there has been an increase in the use of payment cards in Turkey - from 30.6 million cards in 2016 to 89.6 million in 2020 with an average annual growth rate of 30.8%. This figure is expected to grow to 176.3 million by 2024. With the help of the Troy system, Turkey plans to become the largest cashless payment market by 2023. With that in mind, Turkish financial authorities are introducing other initiatives to stimulate electronic payments, including

a standardized national QR code (approved in August 2020) [25]. Such initiatives contribute to the rapid development of the country's payment market.

In Russia, the decision to build the National Payment Card System (NPCS) was made after the sanctions imposed by the United States, whereafter the international payment systems Visa and Mastercard stopped servicing the cards of the Russian banks' customers. After the launch of the NSPK in 2014, all domestic payments with the cards of the international payment systems began to be processed in Russia.

By 2015, the legal foundations required to ensure the smooth operation of a completely new financial institution were established. The requirements imposed by the Law on the National Payment System and regulations regarding payment service operators oblige the settlement, operational and payment clearing centers to be located within Russia. This makes it possible to ensure the independence of local payments from external political influences, and keep the entire information safe within the borders of the government. At the end of 2015, a new stage in the development of the national payment system began: it was during this period that the Mir national payment card was issued.

In Russia, promotion of the national payment instruments takes place in various directions. Firstly, issuance of the "co-badged" cards is being implemented, the service of which is carried out by two payment systems at once, i.e. it is connected to two processing centers. Currently the bilateral cards are issued under the brands of the Mir-Maestro, Mir-JCB, Mir-UnionPay, Mir-MasterCard, Mir-American Express. Russia is also actively working towards building and developing the payment space with the countries of the Eurasian Economic Union (EAEU). The NSPK, jointly with the national payment systems of the EAEU countries, not only develops technological services but also designs platforms that provide mutual, cross-system acceptance of the national payment cards in the infrastructures of the banks. For example, in July 2017, the integration of the national payment systems of Russia and Armenia was successfully carried out, and as a result it enabled to service Armenian Cards (ArCa) in Russia and Russian Mir cards in Armenia [12].

India is one of the examples where the national card systems have been successfully implemented. India's retail payments industry has been developed thanks to the local RuPay card payment system launched in 2012 by the National Payments Corporation of India (NPCI). The NPCI in its turn was established under the leadership and support of the Reserve Bank of India and the Indian Banks Association (IBA) as an umbrella organization to promote the retail payment system in the country. NPCI started with 10 major founding banks as shareholders. Up to date, the number of NPCI shareholders is 67, including 11 state-owned banks, 19 private banks, 5 foreign banks, 10 cooperative banks, 7 regional rural banks. NPCI, as a non-profit payment company, works for the benefit of member banks and their customers by building the infrastructure for the operation of the pan-Indian systems that handle the growing volume of retail electronic payments. Banks in India using the RuPay domestic card system do not pay high commissions to the multinational payment companies [19].

As a result of the 2016 demonetization and the launch of the RuPay debit and credit cards, the number of users has increased, especially in rural areas of India, where the card payment was a novelty five years ago. In 2017, RuPay cards accounted for only 15% of the total cards issued in India. However, today about 635 million RuPay cards have been issued by 1,200 banks, and every second person in India has a RuPay card. Thus, in 2021, the market share of the RuPay cards has increased to more than 60% of the total number of the issued cards [19].

Over the years, NPCI's retail payment systems including RuPay have been widely recognized throughout the country and attracted interest in other countries. In order to distribute NPCI payment products abroad, a subsidiary company – NPCI International Payments Limited (NIPL) was established in April 2020. The main task of NIPL is the internationalization of RuPay and UPI. Today, outside of India RuPay cards are issued in partnership with such payment systems as Union Pay (China), JCB (Japan), NETS (Singapore), BC Card (South Korea), Elo (Brazil) and DinaCard (Serbia), Discover and Diners Club International [19].

3.2. Fast (Instant) Payment Systems

The use of fast payment systems around the world can be called one of the most significant stages in the field of reforming payment systems in recent times. A report prepared by the World Bank Group showed that about 60 countries currently have fast payment systems [13]. The basic principle for all the countries remains the same and is providing money transfers 24/7 in real time. Central banks play a key operational role in the fast payment systems such as TARGET Instant Payment Settlement (TIPS) in the European Union, Faster Payment System (FPS) in Hong Kong, Cobro Digital (CoDi) in Mexico, PIX in Brazil. In addition, some countries have payment systems similar to the fast payments, but which are not classified as "fast payments" as defined by the Committee on Payments and Market Infrastructure: "fast payments are defined as payments in which the payment messages and final availability of the funds to the payee are carried out in real time or close to real time on an ongoing basis (24/7)" [13].

Various studies show that the use of fast payment systems varies significantly across jurisdictions. These differences will increase as new systems emerge, driven by different conditions, needs, private and public concerns.

FPS (Faster Payments Service) is a British interbank system for making small retail payments within a short period of time (an operating day is a few hours). The system was created as an alternative to the BACS⁸ system to maintain competition in the interbank settlements market. The infrastructure of these systems is similar in functionality and is maintained by VocaLinc.

Mutual settlements are carried out 3 times a day. In most cases, transaction process takes up to two hours, but this period is not guaranteed. The maximum transaction amount is £250,000 (financial institutions may set more stringent limits at their own discretion). The mobile phone number is used as the payment identifier. The transition in November 2011 to a 24/7 operating mode provided an increase in the volume of transactions from \$27 billion per month to \$60 billion in June 2012.

In 2020, the FPS hit the record in term of the largest number of payments processed in a year. In 2020, 2.9 billion payments in the amount of 2.8 trillion US dollars (2.6 trillion US dollars in 2019) were processed.

TARGET Instant Payment Settlement (TIPS) is a payment system launched by the ECB in November 2018. The system allows payment service providers to offer their customers the opportunity to make payments in real time around the clock, every day of the year. Thanks to TIPS, individuals and legal entities can transfer money within seconds regardless of the opening hours of their local bank. TIPS currently only makes payments in euro. However, from May 2022 TIPS plans to launch instant payments in Swedish Krona.

System's features:

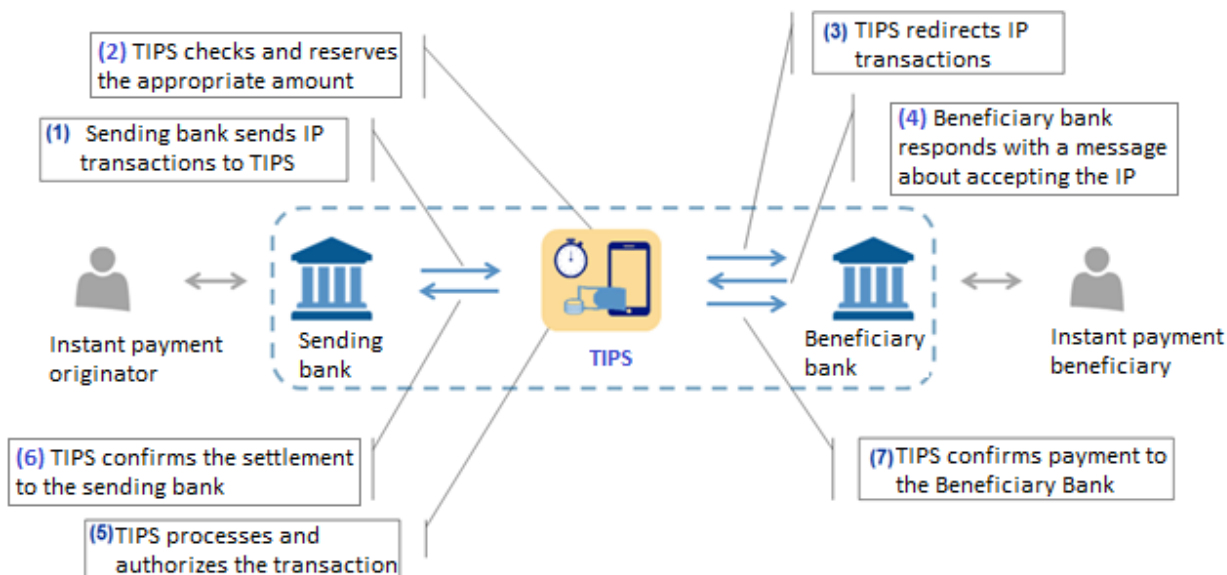
- the Single Euro Payments Area – SEPA: Integrated Market for Retail Euro Payments;
- is based on the SEPA Instant Credit Transfer (SCT Inst), a pan-European instant payment scheme;
- has been developed as an extension to TARGET2;
- the Payment Services Directive (PSD 2) opens the door for non-bank payment providers (payment initiation service providers – PIS and account information service providers – AIS);
- Instant payments.
- In order to attract the banks' interest to participate in this system, the following pricing tools were applied:
 - pricing works on a non-commercial basis on the principles of full cost recovery;
 - there is no fee for the account activation or its maintenance;

⁸The Bankers Automated Clearing Services - electronic offset of credit and debit entries according to the order of the system participants, with direct crediting of the amounts to accounts or debiting them from accounts without the use of checks or other paper-based media

- the price for an instant payment transaction is set at 0.20 euro cents (0.002 euros) until November 2020;
- the first 10 million payments made by each TIPS member before the end of 2019 are free.

Figure 7

The scheme for making a payment in TIPS



Participating banks can set aside part of their liquidity in a special account opened with their central bank from which instant payments can be made. Depositing funds to the TIPS account is possible only during the TARGET2 opening hours.

Because TIPS is settled in central bank money, participation in TIPS is contingent on having access to the central bank's money. For this reason, in order to open a TIPS account in euro, the bank must meet the same criteria as for the participation in TARGET2.

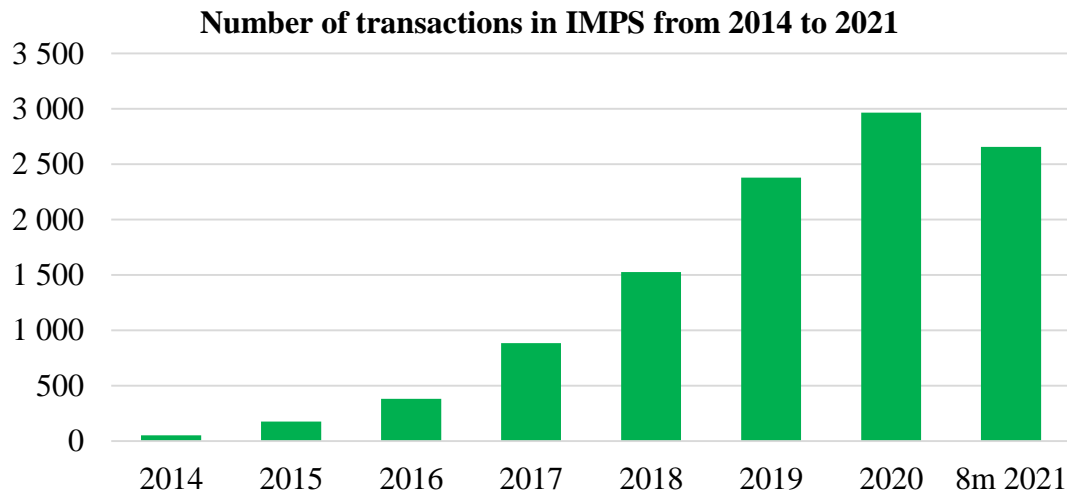
Payments are made only if there is enough money in the TIPS participant's account to complete the transaction, otherwise the transaction is rejected (funds guarantee for the settlement).

The Indian IMPS (Immediate Payment Service) is an interbank system of instant electronic transfers that allows you to transfer money 24/7 using a mobile phone, Internet and self-service terminals. Mutual settlements are carried out 3 times a day. The participants of the system are 641 banks. A feature of this system is its multi-channeling (you can initiate payments using payment terminals, mobile phone and the Internet) with the operation's confirmation by SMS [16].

The launch of the system in 2010 played an important role in the population's transition from cash to non-cash forms of payment (in 2010 for the first time in the history of India the volume of cash transactions yielded to the volume of non-cash transactions).

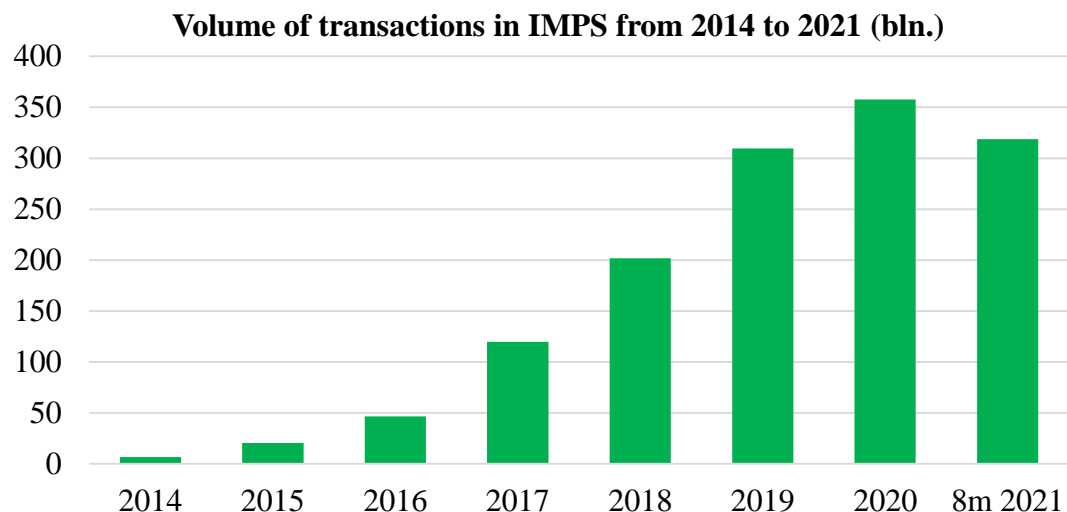
The system is currently showing a steady growth and is one of the most requested retail payment systems in India (Figures 8 and 9). Thus, over the past 7 years the volume of the transactions in IMPS has increased by more than 55 times (6 billion US dollars in 2014 and 357.8 billion in 2020). Through IMPS for 8 months of 2021 2.7 billion transactions were processed in the amount of 318.8 billion US dollars, which is 50% more than in the same period in 2020 (212.2 billion US dollars for 8 months of 2020) [16].

Figure 8



Source: Based on data from the Reserve Bank of India.

Figure 9



Source: Based on data from the Reserve Bank of India.

In addition, one of the components of the IMPS system is UPI (Unified Payment Interface) which is a fast payment system based on standard APIs to simplify online payments. UPI was launched by the National Payments Corporation of India with the support of the Reserve Bank of India with the aim of developing cashless payments.

Registration in the system is carried out using the Aadhaar number (the identification system of the citizens and residents of India with the help of which a unique personal citizen number is assigned), credit or debit card or a bank account number. The system uses a unique UPI identifier, which can be generated for each transaction if necessary, and payments are made using simplified details (using a unique UPI identifier), which is a part of the set of open APIs of various infrastructure systems in India, known as the Indian Stack [16].

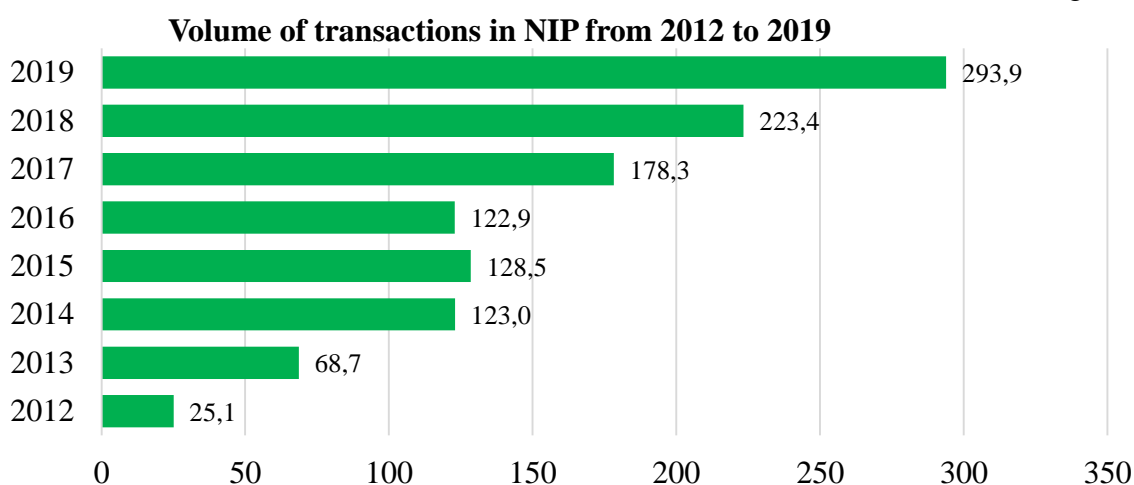
In Nigeria, since 2009, a comprehensive work has been underway to increase the share of cashless payments. The NIBSS Instant Payments System (NIP) was launched in Nigeria in 2011. In 2013 for the first time in the history of the country the volume of the non-cash transactions exceeded the volume of cash transactions (using payment terminals and checks) amounting to 11 trillion US dollars [18].

Since 2009 the financial regulator has been reforming payment systems. In 2009 the regulation of mobile money operators was introduced. A year later the national switching

platform was launched and in 2011 NIP was launched. In 2012 "cash-free" policy was adopted, placing restrictions on cash transactions and requiring banks to conduct public education campaigns and stop providing cash collection services. The following year, the powers of banking agents were expanded. 2014 was marked by the launch of the biometric identification platform together with the help of the banks, while 2015 was marked by the strengthening of the regulatory standards regarding mobile money operators, as well as the development of the "cashback" rewards' standards. Since 2017, it has become possible to process payments using QR code in NIP and a mobile phone number [18].

Figure 10 shows the volume of transactions in the NIP from 2012 to 2019. In 2019, transactions amounting to 294 billion USD were processed through the NIP, which is 2.4 times more than in 2018. The NIP accounted for 23.8% of total e-payments made in Nigeria in 2019 (total e-payments in 2019 was \$1.2 trillion).

Figure 10



Source: Based on data from the Central Bank of Nigeria.

Australia was virtually one of the latest to start developing and implementing a fast payment system, but this only served as an advantage allowing it to apply the experience of other countries and recommendations of the leading financial institutions.

Australia's New Payments Platform (NPP) owned and operated by NPP Australia Limited (NPPA) is essentially a clearing system for the fast payments. NPPA shareholders are direct participants in the system – nine banks, three aggregators (which provide connectivity for the smaller organizations) and the Reserve Bank [14].

The NPP infrastructure includes:

- a network that transmits messages about the payments' clearing and settlement between the participants, as well as between participants and the Fast Settlement Service (fast settlement system)
- payment gateways located in the ecosystem of each participant, which facilitate switching of the transactions through the network; and
- PayID payment service that allows customers to link their bank account with a simplified identifier such as a phone number, email address or business identification number.

The NPP service is supported by the Fast Settlement Service (FSS), created and operated by the Reserve Bank to settle payments with NPP in real time 24/7. When a payment is initiated through NPP, the payer's bank first receives confirmation from the beneficiary's bank that the payment can be received, and then transfers the money. Having received this confirmation, the payer's bank sends a settlement request to the FSS, and if there are enough funds on the account, the transaction is settled through the FSS, and the confirmation is sent to both the paying and beneficiary banks. All this happens in a matter of seconds [14].

In some respects, the Australian system is at the forefront of the fast payment systems. The later start of the development of the system made it possible to draw lessons from the foreign practices and include the functions that are relevant today.

In the two years since its launch, the NPP and FSS have enabled customers of 91 organizations to make fast payments 24/7. In January 2020, 4.1 million users with registered PayIDs averaged 1.1 million payments per day worth \$1 billion. NPP is expected to continue to provide new payment services and innovations given a number of the features currently under development.

3.3. Cross-Border Payments

Cross-border payments are both necessary for the state and business entities, and for individuals. While constant innovation makes domestic payments more efficient, cross-border payments still tend to be slower, more expensive and opaque.

Despite the widespread introduction and development of the fast payment systems, in many countries sending money abroad today is still time-consuming and costly. In order to solve this problem, few years ago, some countries of Southeast Asia initiated a joint effort of regulators, payment system operators, bankers' associations and banks. On April 29, 2021, the Bank of Thailand and the Monetary Authority of Singapore in their joint statement announced the launch of the world's first cross-border fast payment system called PromptPay-PayNow [24]. By linking Singapore's PayNow and Thailand's PromptPay customers of the participating banks in both countries can transfer up to SGD 1,000 or THB 25,000 (\$750-800) daily between the countries using only a mobile phone number.

The process does not require a user to fill in fields such as the full name of the recipient and account details, as it is required for a conventional transfer. Transfers will be completed within minutes, which is a marked improvement over 1-2 business days required for the most cross-border money transfer solutions. The fee will be 3-5% depending on the volume of the transfer, which is significantly lower than the average rates for transfer services (about 11%). In addition, senders of money can check applicable currency exchange fees before sending their funds and exchange rates will be comparable to the market ones.

Thus, the launched service effectively solves the long-standing problems in the field of the cross-border transfers, specifically long time for the completion of a transaction and high costs.

The integration of PayNow and PromptPay systems is just the start of a big effort of Thailand and Singapore's central banks in this direction, where the common goal is to involve other partners from the Association of Southeast Asian Nations (ASEAN) to expand this two-way communication to a network of the connected retail payment systems throughout the region. The team will work to attract members and increase the limits to facilitate business-to-business transactions. Today's integration of PayNow (operating on the basis of FAST) and PromptPay represents another key milestone towards improved digital payments. The integration of PayNow-PromptPay systems is also a key element of the cooperation under the ASEAN Payment Connectivity program, which was launched in 2019 and is closely aligned with the efforts of the G20, Financial Stability Board and other international bodies setting standards to ensure faster, cheaper and more transparent cross-border payments.

To promote the cross-border platform the Bank for International Settlements and the Monetary Authority of Singapore have published a plan called Project Nexus, describing how different countries can fully integrate their retail payment systems into a single cross-border network, allowing customers to instantly and securely make cross-border transfers using their mobile phones or other gadgets [4]. It is based on the experience of the successful connection of Singapore's PayNow and Thailand's PromptPay, and the experience of development and usage of the Unified Payments Interface (UPI) system of the National Payments Corporation of India (NPCI).

The Project Nexus plan provides for the creation of "Nexus gateways" that are designed to coordinate compliance, currency conversion, message translation, and payment ordering among all the participants. These gateways will be based on a common set of the technical standards, features and operational guidelines. The plan also includes the Nexus Scheme, which establishes a governance structure and set of rules for the participating retail payment processors, banks, and payment service providers to make cross-border payments across the network. The Project Nexus is trying to create the equivalent of Internet protocols for payment systems, i.e. a model by which any country can join by accepting certain technical and managerial requirements. According to the Nexus plan, participating countries will need to adopt the Nexus protocols only once in order to gain access to a wider network of the cross-border payments [17]. This eliminates the need for countries to negotiate payment links on a bilateral basis with each jurisdiction.

Europeans are also working towards integration of the payment systems of the Union countries and improving cross-border payments. Today, 19 member states use euro as their currency, and the Payment Services Directive (2007) established the Single Euro Payments Area, which allows consumers and businesses to make payments in euros on the same terms in 33 countries.

In July 2020, a group of 16 banks from Germany, France, Spain, Belgium and the Netherlands announced plans to launch the European Payments Initiative (EPI), originally named as PEPSI – Pan-European Payment System Initiative [9]. The purpose of the payment initiative is to create and implement a unified payment solution - including a payment card and a digital wallet - for the consumers and merchants throughout Europe. With these two products, all types of the retail transactions can be carried out: POS payment and e-commerce transactions, ATM cash withdrawals and card-to-card (P2P) transfers. The EPI payment initiative will be based on the European payment system TIPS (Target Instant Payment Settlement) launched at the end of 2018, with the help of which 24/7 real-time money transfers became available to the consumers of payment service providers [2].

Considering its important strategic goal the EPI initiative was supported by both the European Central Bank and the European Commission. The system being developed is designed to solve two important problems in the European payment area - issue of the fragmentation of European retail payment systems and of ensuring security and independence of the system. Some European countries have national payment systems that do not accept cards from other member countries of European Union. In addition, with digitalization innovative products such as mobile wallets, available only at the national level, appear in the payment services market. According to the EuroCommerce Association, four out of five transactions in Europe are processed by the American companies Mastercard and VISA. The dominance of US companies in the European payments area makes it easy to charge high fees to consumers and merchants. The EPI team expects that the developed system will change the landscape of the EU non-cash payment market, displacing the international payment systems visa and MasterCard from the first positions, as well as increasingly popular Chinese payment networks (UnionPay, WeChat Pay) [9].

The creators plan that the system will work in trial mode as long ago as 2022 with the gradual expansion of its functionality. Until the end of 2021, participants in the European market, banks or banking communities as well as other payment service providers can apply and join the EPI. Today 31 European banks and credit institutions from 7 European countries, as well as 2 leading third-party acquirers – the German company Nets and the French Worldline – are already involved in the EPI. The growing number of the project's participants contributes to an increase in the transaction volumes, and, consequently, to reduction in the transaction costs, thus ensuring investment of resources for innovations. Experts counted that several billion euros would be needed for the successful implementation of the system, and at present investments amounted only to 30 million euros [2].

3.4. Program of the National Payment System Development

Central banks are at the center of the development and transformation of the country's financial and payments ecosystem. The eventual result depends not only on technology, but also on the measures implemented and the structure of the market.

For the steady development of the Kazakhstani payments market, it remains very important to determine specific actions and effectively implement steps to develop the infrastructure of digital payments, introduce new products based on the best international practices.

Thus, at present, the National Bank of Kazakhstan is working on the implementation of the Program of the National Payment System Development as approved by the Resolution of the Board of the National Bank of the Republic of Kazakhstan dated November 30, 2020 No. 133. The program is a systemic document reflecting the comprehensive development of the country's payment market. The proposed initiatives affect changes in the activities of all subjects of payment relations: the regulator, banks, government agencies, non-banking organizations.

The program is aimed at taking measures and launching solutions to eliminate existing problematic issues in the payments market and provides for the development of the national payment system by introducing such components as Instant payments system and Interbank payment card system.

Instant payments system is an interbank system designed to make fast real-time payments using simplified details (QR code, mobile phone number, etc.) with instant transfer of money in favor of the recipient. The system operates in 24/7 mode 365 days a year.

The second component of the national payment infrastructure – the Interbank Payment Card System – will be aimed at processing card transactions within the country. Today, more than 90% of the transactions with cards of the international payment systems take place within Kazakhstan. As a result of the introduction of this system, continuity and reliability of domestic operations will be ensured.

The Program also provides for the measures aimed at standardizing and ensuring operational interaction of the market participants (unification of the QR code format, transition to the format of the international standard for financial messages ISO 20022, development of Open API and Open Banking).

4. Conclusion

Long-term experience shows that the growth path of the national payment systems in the past strongly depended on the historically established model of communication technologies and government policy in the banking sector.

Based on the historical data the global experience in reforming national systems can be divided into 2 main milestones.

Since the 1970s, an important role has been played by payment systems handling large and urgent payments and significantly increasing the speed of the process of making payments. In the process of building and developing the payment infrastructure, RTGS systems have taken the role of a basic element in most of the national payment systems of the world due to the significant advantages they provide for settlements. With the development of technology, the architecture of the RTGS system like other payment systems has been transforming as new requirements for the system arise. Kazakhstan is no exception in this direction. There was the start of the work on reforming the payments market by the National Bank of Kazakhstan and building Kazakhstani payment systems after the declaration of the country's sovereignty as part of the transition to the market relations and building a new financial system.

As a result of the focused efforts made, the effective payments infrastructure was formed that meets the needs of the population, business and government in conducting monetary transactions. Thus, at the present moment payment systems of the National Bank of Kazakhstan

(Interbank money transfer system and Interbank clearing system) operate on the territory of the Republic of Kazakhstan, ensuring the functioning of the country's financial system.

At the same time, as international experience shows at all times, the global payment industry has been experiencing a paradigm shift due to the changes in the economy, demographics and customer needs for faster, cheaper and more accurate payment tools.

Thus, a new stage in the reform of the national payment systems around the world is the creation and implementation of interbank systems that ensure retail payments and money transfers. So recently on a global stage, fast payment systems and national card systems have been creating to process local card transactions.

Many countries followed each other to launch modernization programs on the payments infrastructures, to begin joint projects on the innovations study and their introduction. As providers of public infrastructures, central banks are introducing new technologies to improve and strengthen the position of their payment systems.

For example, in the US, they are working on the FedNow fast payment system, which will provide real-time retail interbank services around the clock. The Bank of England is updating its bulk payment system to enable digital interaction, such as through "tokens".

For example, in the US there is the work going on the fast payment system FedNow, which will provide real-time retail interbank services around the clock. The Bank of England is updating its bulk payment system to enable digital interaction, for example by using "tokens".

In 2020, Kazakhstan had also adopted the Program of National Payment System Development. Within the framework of this program the National Bank of Kazakhstan is working to reform the national payment system, the main components of which are the Instant Payment System and the Interbank Payment Card System (local system for processing card transactions), as well as the other activities related to the implementation of ISO 20022 standard in payment systems, unification of the QR code format and introduction of Open API and Open Banking in the financial market.

Thus, the general direction of the new stage of reforming the Kazakhstani national payment system is in line with the best international trends and meets the needs of the market. The planned implementation of the Program of National payment system development until 2025 will speed up payments within the country, increase share of the non-cash payments, increase transparency of the cash flows and ensure security of the payments market in Kazakhstan.

At the same time, it should be also noted that the work on the development of fast, convenient and cheap cross-border payments becomes more and more common internationally as a new growth area. The difficulty in organizing convenient, fast and cheap service for cross-border payments lies in the difference of the formats, standards used by the different national payment systems and exchange rates used when making a transaction in foreign currency. The Central Bank of Singapore is working towards the development of cross-border payments and in April 2021, together with the Bank of Thailand, it launched the world's first cross-border fast payment system. European Union has also taken a course towards harmonization of the payment processes and reduction of barriers to the cross-border payments within the region. The most recent EU initiative is the EPI designed to address fragmentation of the European retail payment systems.

Thus, taking into account globalization and growth of the national economies, we believe that the next stage in the development of the national payment system is to build a service for making cross-border payments.

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MEASURES FOR REGULATING CASH CIRCULATION AS AN INSTRUMENT TO COMBAT THE SHADOW ECONOMY

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Key Words: shadow economy, cash, cash withdrawal limits, payment instruments, cashless operations.

JEL-Classification: E41, E58, O17.

1. Preamble

The shadow side of the economy is considered a serious and complex problem that has not only economic but also political and social causes. World experience and numerous studies show that measures aimed at reducing the extent of the shadow economy should be implemented concurrently in several areas. Any bias or concentration of measures in only one area can be not only ineffective but also lead to opposite results (A. Suslina, 2016). Considering that the fight against the shadow economy is an object of increased attention of all branches of the government, these circumstances necessitate the adoption of effective measures in every area of the economy that has signs of a shadow economy.

One of the key factors in building the new mechanisms to counter (contain and reduce) the shadow economy is cash circulation; its regulatory and institutional improvement is the basis for an effective organization of managing the entire economy and limiting its negative component – the shadow sector (A. Vladimirovich, 2008).

In modern conditions, due to the development of technological processes in the field of money circulation in Kazakhstan, a number of issues including those related to the shadow economy need to be addressed. According to various estimates, the share of the non-observed economy in the country's GDP ranges from 20% to 35%, while in international practice, 5-10% is considered an "acceptable" value.

Various aspects in the functioning of the shadow sector in a market economy environment and its relationship with cash have been studied by many foreign scientists. In particular, C. Jobst and H. Stix in a joint paper regarding the role of cash in the economy noted that in the last decade, and especially after the financial and economic crisis of 2008-2009, the amount of cash in circulation has increased dramatically almost all over the world outperforming the GDP growth rates (Jobst & Stix, 2017).

One of the criticisms regarding cash that was expressed at various times is that it is used for illegal activities in the shadow economy and, in particular, for tax evasion and money laundering. Such discussions often suggest that anonymous transactions are almost always illegal and are carried out using cash (Buiter, 2009; Sands, 2016). However, there is no empirical evidence to support this hypothesis. The head of the European Central Bank's Currency Management Department said there is no statistically proven link between a criminal activity and the use of cash, or, in fact, between the size of the shadow economy and cash (FAZ, 2016). As regards the anonymity, Drehmann et al (2002) wrote: "There are many reasons why people may prefer anonymity – many of which are connected with "bad" behavior." However, "bad" does not always mean "illegal". It can also include the small human weaknesses we are prone to".

Moreover, large-scale crimes involving huge sums of money are often realized using clearing transactions (Mai, 2016). By using complex and confusing cross-border transaction chains, criminals try to hide the origin of their funds.

One way or another, the movement of cash, due to its specificity, is a practically unobservable process, since this money can be transferred from person to person without formalizing and recording these transactions. In recent years, attempts and proposals have been made in a number of countries to reduce the amount of cash in circulation, withdraw certain denominations from circulation or limit their use (Rogoff, 2016).

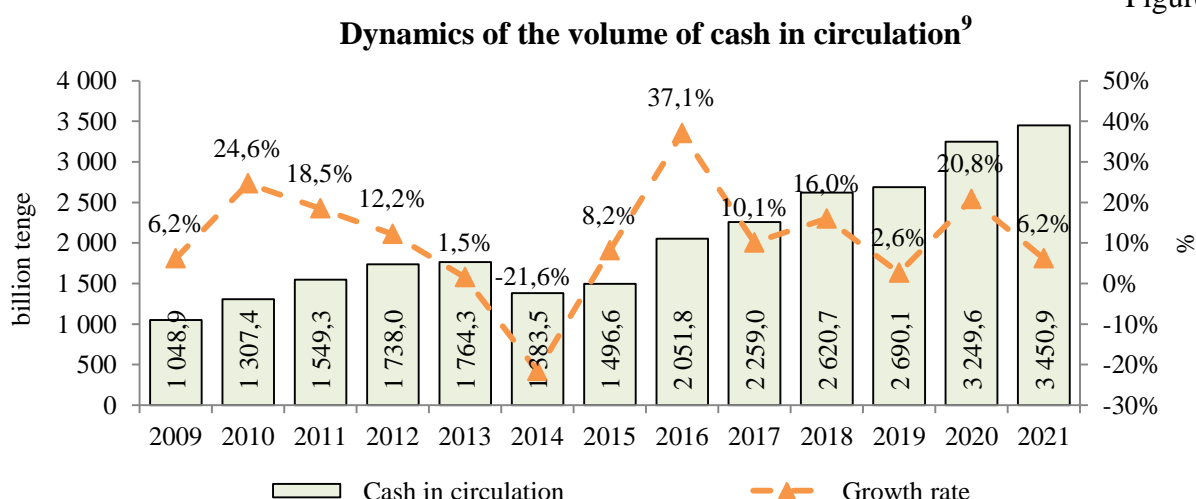
The purpose of this work is to analyze the current state of cash circulation in the Republic of Kazakhstan, taking into account the measures taken by the National Bank of the Republic of Kazakhstan to increase the volume of cashless payments, increase the transparency of operations carried out by business entities, as well as reduce the extent of the shadow economy. The study consists of several sections. The first section presents a general analytical review of cash circulation. The second section analyzes the mechanism for regulating the maximum amounts of cash withdrawals from the bank accounts of business entities and how it affects the growth in the volume of cashless payments. The final section describes the international experience in the regulation of cash circulation by setting limits on cash settlements.

2. Analytical Review of Cash Circulation

2.1. The Existing Situation in Cash Circulation

The National Bank of Kazakhstan, in accordance with Article 8 of the Law “On the National Bank of the Republic of Kazakhstan”, being the sole issuer of banknotes and coins of the national currency of the Republic of Kazakhstan, organizes cash circulation within the territory of the Republic of Kazakhstan for an uninterrupted supply of economic entities with the domestic cash.

In connection with the emergence and spread of new payment instruments, cash is used as a means of payment for goods and services less often. At the same time, the amount of cash in circulation does not decrease. The reasons for this phenomenon are many and varied. Thus, the dynamics of the last 12 years (with the exception of reduction in the volume of cash in circulation in 2014 caused by devaluation expectations among the population) shows a stable increase in the amount of cash in circulation.



⁹ Cash outside the National Bank of Kazakhstan

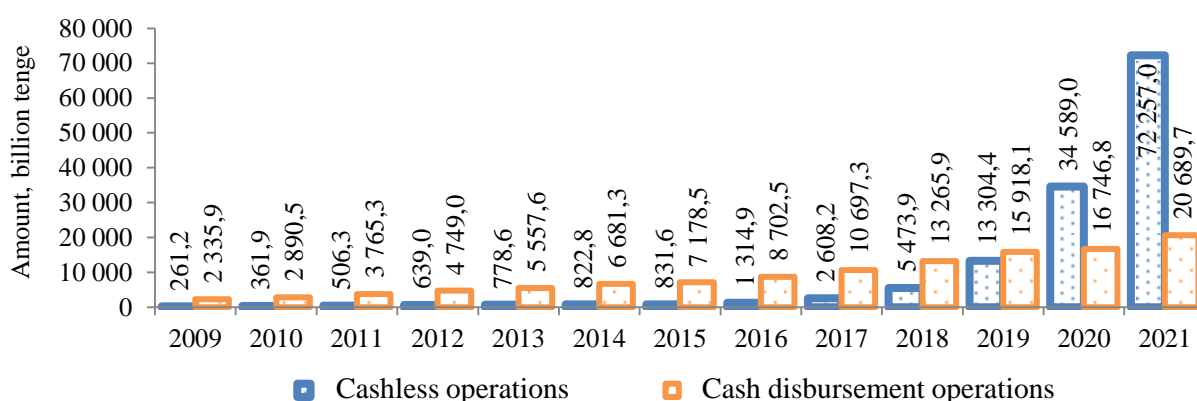
At the end of 2021, with a total amount of 6.9 trillion tenge of cash disbursed by the second-tier banks, the amount of acceptance was 6.7 trillion tenge or 97.1% of the cash disbursed; in 2020 this ratio made up 91.5%.

In 2021, the overall cash turnover via the cash departments of the second-tier banks in transactions with economic entities equaled 84.0 trillion tenge, which is by 70.4 trillion tenge or 6.2 times larger than the overall cash turnover via the cash departments of the National Bank's regional branches (13.6 trillion tenge).

The dynamic development of the payment systems market, namely electronic payment instruments, allows considering them as a possible alternative to cash, but, despite the trend towards an increase in the number of transactions carried out using cashless payments, there is no complete shift in consumer payment preferences.

Figure 2

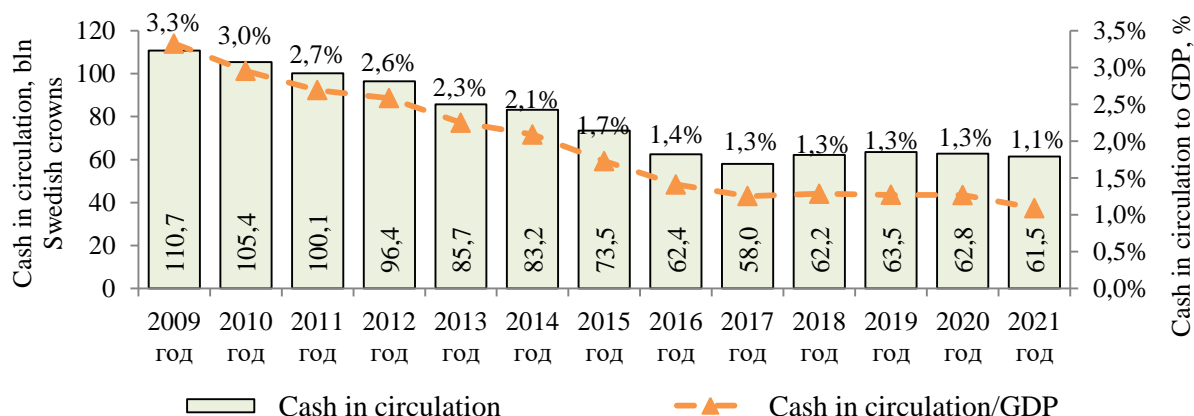
Dynamics of operations with the use of payment cards issued by Kazakhstani and foreign issuers within the territory of the Republic of Kazakhstan



For example, the experience of Sweden, a country with one of the highest rates of cashless payments, shows that because of the risks of power outages as well as potential threats of cyber-attack¹⁰, the cash-related policy of the Swedish central bank is undergoing changes to maintain the cash circulation infrastructure. According to the Bank for International Settlements, at the end of 2021, the ratio of cash to GDP in Sweden was 1.1%, and the number of banknotes per capita – 25.

Figure 3

Cash in circulation to GDP in Sweden

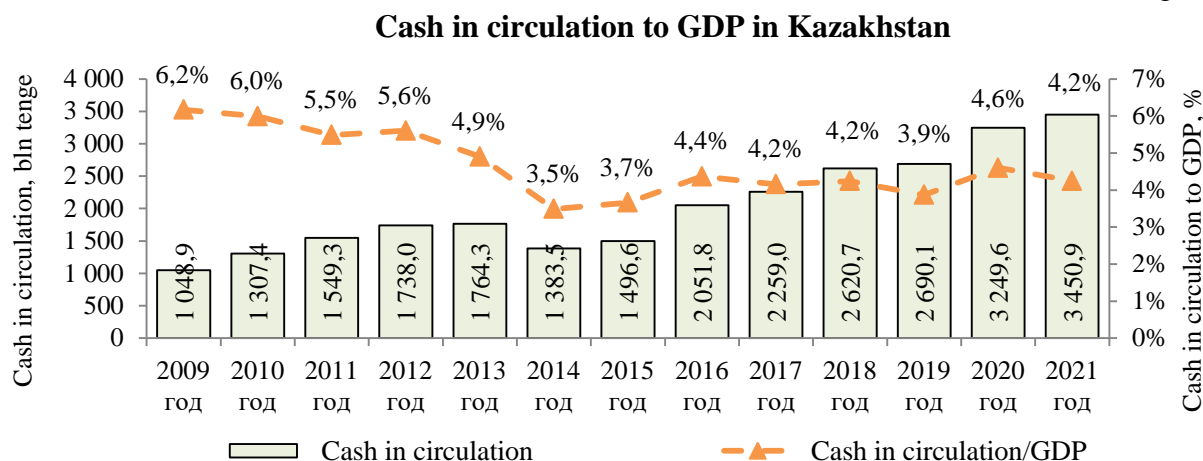


¹⁰ If crisis or war comes, Important information for the population of Sweden, 2018

In Kazakhstan, cash in circulation to GDP made up 4.2% at end-2021, and the number of banknotes per capita – 27.

At the same time, the ratio of cash to GDP in Kazakhstan over the past 10 years, just like in Sweden, has had a downward trend, which is an evidence of GDP growth rates outpacing the growth rates of cash in circulation.

Figure 4



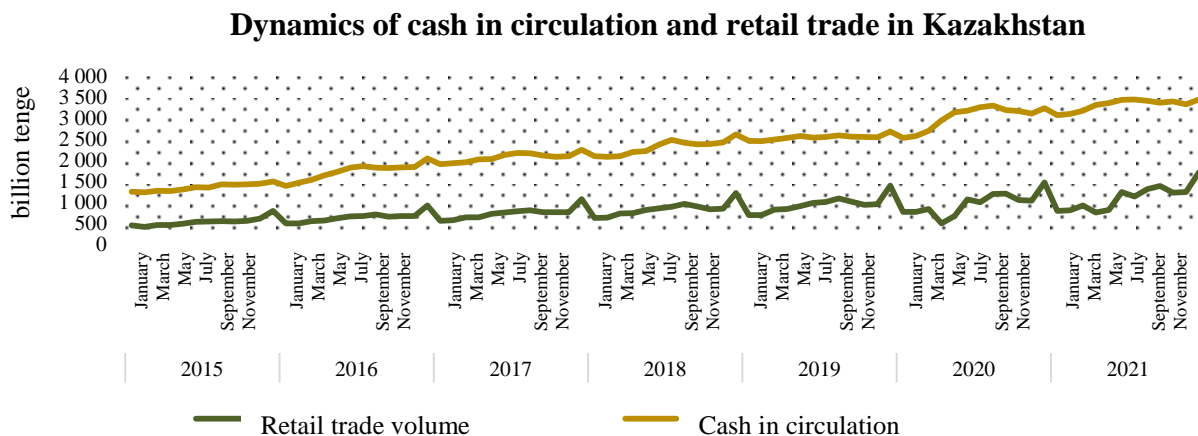
More than a two-fold annual growth in the volume of cashless transactions in Kazakhstan is a proof of the development of cashless payments. At the same time, it should be noted that the most likely development scenario for money is an increase in the use of all forms of digital payments (central bank digital currency, digital assets) while retaining the use of cash and related infrastructure¹¹.

2.2. Factors Mostly Affecting the Growth Rate of Cash in Circulation

Some of the factors shaping the demand for cash are the GDP volume, inflation, turnover of retail trade and the service sector, money income of the population, the volume of provided loans and the purchase of foreign cash by the population. At the same time, it should be noted that retail trade in food and non-food products is one of the main indicators that directly affect the growth rate of cash in circulation. Their correlation coefficient for the last 7 years was 79.2%. The 1% growth of this indicator leads to an increase in the growth rate of cash by 0.14%.

This explains the following pattern: the greater the turnover in the country, the more cash is needed to service it.

Figure 5



¹¹ Future of money, SIX White paper, 2019

Political factors, such as restricting the activities of business entities, providing the possibility of deferring the repayment of loans for legal entities and individuals, as well as social benefit payments to citizens of Kazakhstan due to the loss of income during the pandemic, can also indirectly affect the amount of cash in circulation. In particular, in 2020, during the imposition of the state of emergency in the country and putting restrictions to operation of economic entities, the amount of cash in circulation increased significantly and in August of the same year reached its historical maximum at that time, amounting to 3.31 trillion tenge. One of the reasons for the growth in the volume of cash in circulation was reduction in the volume of cash withdrawal from circulation, which in April 2020 reached its minimum level over the past 11 years – 54.7%.

2.3. Results of the Opinion Survey

In order to identify factors that shape the demand for cash and to study the targeted use of cash by households and business entities in Kazakhstan, in 2021 the National Bank of the Republic of Kazakhstan conducted the first stage of an opinion survey on the topic “Medium-term prospects for the use of cash”.

Similar to other central banks, the survey is based on a focus group research that includes an overview of the methods of payment by respondents (cash, payment cards, electronic money, etc.) and the amount of payments for everyday purchases as well as the use of certain denominations for accumulation and savings.

According to the results of the study, about 60% of the population uses cash along with other payment instruments in their daily transactions. In addition, the share of cash in the turnover of business entities is 30-40% on average. In the regions, more than 80% of the surveyed population uses a bankcard to withdraw cash from ATMs. Cash is mostly used in Turkestan and Zhambyl regions (79.0%), and least of all – in Almaty (34%). Now, the most common payment instrument among citizens is a transfer to a phone number (71.3%). The capital and cities of national significance account for the main share of cashless transactions using payment cards – more than 60.0%. In turn, almost 60.0% of the volume of cash withdrawals via payment cards falls on the regions.

The above shows that cash continues to be an important payment instrument among the economic entities. At the same time, the financial and digital infrastructures in some regions of the country are at the stage of development, where even the payment of wages and social benefits to the population requires cash.

3. Regulation and Control of Cash in Circulation

In accordance with the Strategy Map 2025 of the National Development Plan of the Republic of Kazakhstan until 2025, the extent of shadow turnover in the economy in % of GDP in 2025 should be no more than 18.2%.

Table 1

The share of non-observed economy in Kazakhstan by main types of economic activities as % of GDP¹²

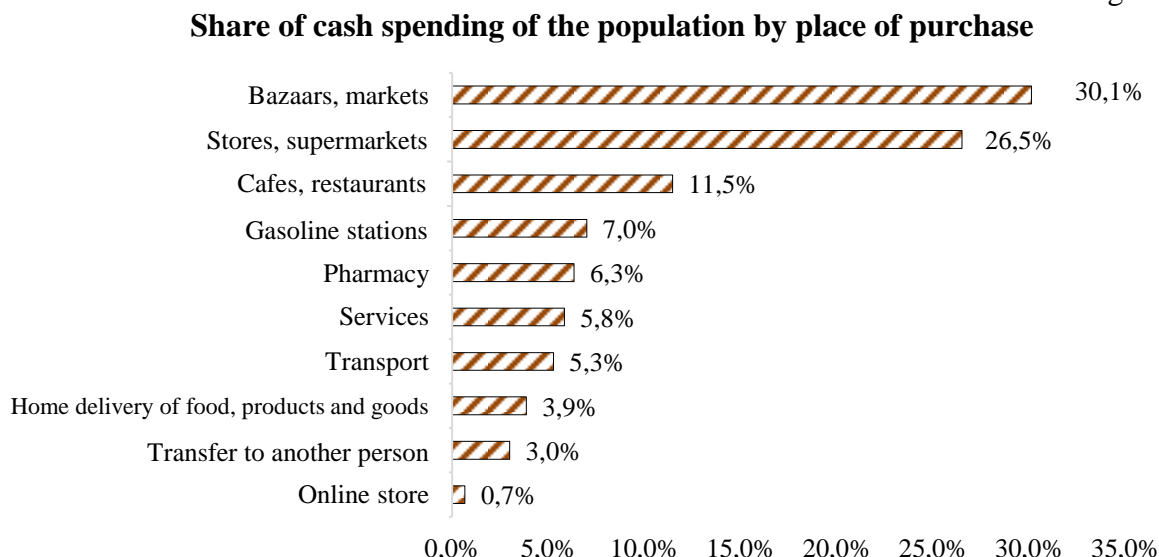
Activities	Actual					
	2018		2019		2020	
	non-observable economy	incl. illegal economy	non-observable economy	incl. illegal economy	non-observable economy	incl. illegal economy
Production of goods	6,90	0,80	5,65	0,84	5,19	0,95
Agriculture	2,37	0,19	2,21	0,22	2,59	0,20
Industry	1,95	0,61	1,63	0,62	1,39	0,75
Electricity supply	0,17	0,00	0,12	0,00	0,07	0,00
Water supply	0,04	0,00	0,02	0,00	0,01	0,00
Construction	2,37	0,00	1,67	0,00	1,13	0,00
Production of services	20,12	1,03	18,04	1,03	15,04	0,76
Wholesale and retail trade	8,62	0,21	7,98	0,18	5,57	0,28
Transport	4,00	0,00	3,78	0,00	2,87	0,00
Accommodation and catering services	0,24	0,00	0,16	0,00	0,13	0,00
Information and communication	0,36	0,00	0,32	0,00	0,39	0,00
Financial and insurance activities	0,45	0,00	0,31	0,00	0,15	0,00
Real estate operations	0,86	0,00	0,81	0,00	0,57	0,00
Professional, scientific and technical activities	1,17	0,00	0,87	0,00	0,75	0,00
Education	1,04	0,00	0,98	0,00	1,09	0,00
Healthcare	0,84	0,00	0,64	0,00	1,64	0,00
Arts, entertainment and recreation	0,13	0,00	0,12	0,00	0,27	0,00
Other types of services	1,76	0,82	1,60	0,85	1,06	0,48
Total for sectors	27,02	1,83	23,69	1,87	20,23	1,71

The given data shows that there are potential threats affecting the growth of the economy, and significant volumes of economic and industrial activity being shifted to the shadows. According to the presented data, wholesale and retail trade accounts for a major share of the shadow economy in GDP. At the same time, with the development of cashless payments and as a result of measures to reduce the shadow economy, a gradual decline in its dynamics is observed. The shadow economy in trade is represented mainly by hidden production and unofficial transactions on the purchase and sale of goods or services with an aim to underestimate the taxable base. According to the official statistics, as of January 1, 2022, there are 738 sales outlets in Kazakhstan with 180.3 thousand trading places. However, the actual number of informal retail outlets in the country is unknown and may well exceed official figures. In this regard, in order to make the fight against the shadow economy in this industry more effective, it would be more appropriate to monitor operations of markets and the entire infrastructure accompanying them, from the moment a commodity crosses the customs border and ending with its sale.

The survey also established that average cash expenses of the population in 2021 amounted to 34.2% (65.8% – cashless expenses). Bazaars and markets accounted for the largest share of cash expenses (30.1%).

¹²In accordance with the Methodology for Assessing the Non-Observable Economy as approved by the Order of the Chairperson of the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan dated 07.08.2019 No.4 and registered with the Ministry of Justice of the Republic of Kazakhstan of 08.08.2019 No.19215.

Figure 6



At the same time, at present the National Bank makes a consistent effort to expand the use of cashless payments.

Thus, as part of implementation of the Presidential Decree of the Republic of Kazakhstan¹³, the Comprehensive Plan for the Economic Growth Recovery¹⁴, as well as in compliance with the laws of the Republic of Kazakhstan¹⁵, with an aim to increase the volumes of cashless payments, make transactions conducted by business entities more transparent and to reduce the extent of the shadow economy, the National Bank, jointly with the Agency for Regulation and Development of the Financial Market and Kazakhstan's Ministry of Finance have taken measures¹⁶ to regulate the maximum amounts of cash withdrawal from bank accounts of business entities. According to the measures taken, the maximum amounts of cash withdrawal from bank accounts of business entities within one month were established.

¹³ Presidential Decree of the Republic of Kazakhstan dated April 21, 2020 No. 308 "Regarding Some Measures for Stabilization of the Economy".

¹⁴ paragraph 89 of the Comprehensive Plan for the Economic Growth Recovery until the end of 2020, as approved by the Decree of the Government of the Republic of Kazakhstan dated May 20, 2020 No. 307.

¹⁵ The Law of the Republic of Kazakhstan dated July 3, 2020 "On Amendments to Some Legislative Acts on Mortgage Loans in Foreign Currency, Improving the Regulation of the Payment Services Market Entities, Universal Declaration and the Economic Growth Recovery".

¹⁶ 1. Joint Resolution of the Board of the National Bank of the Republic of Kazakhstan dated December 21, 2020 No. 151, the Board of the Agency of the Republic of Kazakhstan for Regulation and Development of the Financial Market dated December 22, 2020 No. 125 and the Order of the Minister of Finance of the Republic of Kazakhstan dated December 22, 2020 No. 1223 "On Approval of the Rules for the Withdrawal of Cash from Bank Accounts by Business Entities".

2. Joint Resolution of the Board of the National Bank of the Republic of Kazakhstan dated December 21, 2020 No. 150 and the Order of the Ministry of National Economy of the Republic of Kazakhstan dated December 23, 2020 No. 95 "On approval of the Maximum Amounts of Cash Withdrawal from Bank Accounts by Business Entities, as well as Business Entities that are not Subject to the Requirement of Cash Withdrawal from Bank Accounts".

Table 2

Maximum amounts of cash withdrawal from bank accounts of business entities were established

Type of entity	Date of establishment	Category of business entity		
		Small business	Medium-sized business	Large business
Legal entities	From June 1, 2020	20 million tenge	120 million tenge	150 million tenge
Individual entrepreneurs	From January 1, 2021			
Maximum amounts of withdrawal shall not be applicable to: <ul style="list-style-type: none">– individuals;– micro-business entities;– business entities engaged in procurement of agricultural products, aquaculture products (fishery);– business entities engaged in trading of food, beverages, pharmaceutical, medical and orthopedic products;– second-tier banks, National postal operator and exchange offices.				

However, it is possible to withdraw cash from the bank account of a business entity in excess of the prescribed limit, if such an operation is substantiated. In such cases, such operation is agreed upon with the State Revenue Committee of the Ministry of Finance of the Republic of Kazakhstan, which, in accordance with the risk assessment system, permits a cash disbursement or rejects an application for cash withdrawal in excess of the established limit.

It is worth mentioning that the introduced measures had been discussed with the Financial Institutions' Association of Kazakhstan and had been also approved by the Financial Stability Council of Kazakhstan.

In 2021, a total of 2.8 trillion tenge in cash was withdrawn from the bank accounts of business entities (legal entities and individual entrepreneurs), where cash withdrawals in excess of the established limits amounted to 225.4 billion tenge, or 8.0% of the total sum.

These measures showed the first results of efficiency in increasing the volume of cashless payments. Thus, the total volume of cashless transactions in 2021 amounted to 72.3 trillion tenge, which is 2.1 times more than in 2020 (34.6 trillion tenge). Moreover, at the end of 2021, the volume of cashless transactions using payment cards exceeded the volume of cash withdrawals by 3.5 times.

At the same time, there are cases when some business entities, in order to avoid sending information to the State Revenue Committee of the Ministry of Finance of the Republic of Kazakhstan, withdraw cash within the limit in different financial institutions, while exceeding the amount of the limit in total. Nevertheless, the National Bank of the Republic of Kazakhstan, on a monthly basis, sends information about such transactions of business entities to the State Revenue Committee of the Ministry of Finance of the Republic of Kazakhstan for verification through the risk management system as suspicious transactions.

In accordance with paragraph 25 of the Comprehensive Plan of Arrangements to Counteract the Shadow Economy for 2021–2023¹⁷, a possible updating of limits is scheduled for the first quarter of 2023.

Along with the regulation of the cash withdrawal procedure, the current Law of the Republic of Kazakhstan “On Payments and Payment Systems” provides for a limit on cash transactions between legal entities, including individual entrepreneurs, registered as a payer of

¹⁷Government Decree of the Republic of Kazakhstan dated September 21, 2021 No. 644 “On Approval of the Comprehensive Plan of Arrangements to Counteract the Shadow Economy for 2021–2023”.

value added tax. In accordance with this Law, payments of transactions that exceed a thousand-fold amount of the monthly calculation index (3,063,000 tenge), are made only in a cashless manner.

The currency exchange legislation of the Republic of Kazakhstan¹⁸ has not prescribed any quantitative limitations as to the exchange operations. At the same time, since under the Law on Anti-Money Laundering and Terrorist Financing¹⁹, exchange transactions with foreign cash are classified as transactions with a high level of risk, authorized banks and authorized organizations carry out financial monitoring of such transactions. In particular, the subjects of financial monitoring are obliged to send information to the FMA RK regarding purchase and sale transactions with foreign cash that exceed the equivalent of 10 million tenge. The AML Law also provides for the obligatory conduct of due diligence of clients by the subjects of financial monitoring regarding the transactions over 500 thousand tenge. At the same time, if there are signs of suspicion, the information is sent to the FMA RK, regardless of the amount of exchange transactions. In addition to the above, from February 1, 2020, there is a mandatory requirement for authorized banks and authorized organizations to record the customer data on any exchange transaction with foreign cash. This amendment was introduced as part of expansion of regulatory requirements to exchange transactions with foreign cash and implies better transparency of the activities of the entities subject to financial monitoring. In addition, recording the customer data on any exchange transaction will enable to assess how the entities subject to financial monitoring comply with the requirements of the AML Law.

Thus, the National Bank of Kazakhstan is taking measures aimed at stimulating cashless settlements and limiting the use of cash by economic entities. The results of the measures taken are proving their effectiveness, as evidenced by the steadily growing volume of cashless transactions. This, in turn, helps to increase transparency of the activities of economic entities and reduce the shadow economy volumes in the Republic of Kazakhstan.

4. International Experience in the Regulation of Cash

According to foreign experts of financial institutions, the scale of the shadow economy in different countries is directly proportional to the volume of cash in circulation.

Imposition of limitations on cash settlements and stimulation of cashless payments usually implies that the share of the shadow economy is decreasing and the transparency of operations of economic entities is increasing. In this regard, the question of optimal structure of the overall money supply in the economy, the ratio of its cash and non-cash forms becomes more relevant (S.Panova, 2014).

At present, in other countries there is a practice of setting limits for cash settlements, including natural persons, in excess of which a fine or the obligation to send an appropriate transaction report. For example, in the European Union member countries, limitations on transactions and purchases paid for in cash range from 1,000 to 15,000 euros depending on the country, in the USA – 10,000 US dollars, in Canada – 10,000 Canadian dollars, in Australia – 10,000 Australian dollars. At the same time, limitations in these countries apply mainly to transactions between business entities and consumers of goods and services, whereas in the Republic of Kazakhstan the limits are set for operations on cash withdrawals from bank accounts of business entities.

¹⁸ Law of the Republic of Kazakhstan dated July 2, 2018 No. 167-VI “On Currency Exchange Regulation and Currency Control”.

¹⁹ Law of the Republic of Kazakhstan dated August 28, 2009 No.191-IV “On Counter-Acting Money Laundering and Terrorist Financing”.

Table 3

The extent of the shadow economy in the European Union member countries²⁰
(a share of GDP, %)

Country	2014	2015	2016	2017	2018	2019
Albania	27.1	27.5	27.6	27.1	27.4	27.7
Austria	9.3	9.4	9.6	9.4	9.3	9.4
Belgium	21.4	21.4	22.4	22.1	21.7	21.5
Bosnia and Herzegovina	36.6	36.4	37.1	36.8	36.5	35.4
Bulgaria	36.9	36.8	37.2	36.8	36.8	37.1
Croatia	35.5	34.5	33.9	33.5	33.7	34.2
Cyprus	30.2	29.9	29.6	29.2	29.2	29.8
Czech Republic	18.2	18.4	19.5	19.4	19.0	19.2
Denmark	17.4	18.0	18.8	18.1	17.9	18.0
Estonia	31.7	32.2	33.7	33.7	33.6	33.2
Finland	19.4	19.9	20.6	20.2	19.0	19.3
France	14.4	14.2	15.2	14.8	14.4	14.8
Germany	15.2	16.0	16.7	16.0	15.7	16.0
Greece	28.7	28.7	29.0	28.3	27.8	29.4
Hungary	25.3	25.2	26.1	26.2	25.9	26.2
Iceland	15.8	15.8	15.4	16.1	16.1	15.9
Ireland	15.1	15.4	15.2	15.1	15.3	15.3
Italy	26.4	26.0	27.7	27.1	26.0	26.6
Kosovo	37.8	38.5	38.2	38.3	38.8	38.3
Latvia	28.1	27.5	27.9	27.2	27.8	28.7
Lithuania	34.5	34.4	34.7	34.0	34.2	34.4
Luxembourg	9.3	9.4	9.8	9.6	9.5	9.6
Macedonia, FYR	37.0	37.0	37.3	37.9	37.9	37.6
Montenegro	37.4	37.6	38.0	38.2	38.0	37.5
Netherlands, The	12.9	12.6	13.0	12.4	12.9	13.0
Norway	20.9	20.7	19.8	19.9	19.6	20.2
Poland	27.2	28.0	28.2	26.9	27.5	27.5
Portugal	23.3	23.1	24.0	23.5	23.2	24.0
Romania	33.7	33.1	34.3	34.6	33.8	34.2
Serbia	33.4	33.0	33.0	33.0	32.8	33.5
Slovak Republic	16.8	17.2	17.2	17.4	17.5	18.3
Slovenia	27.7	27.4	28.4	28.3	26.8	27.7
Spain	19.7	19.4	20.0	19.7	19.1	19.9
Sweden	18.7	18.6	19.4	19.1	18.3	18.5
Switzerland	9.5	9.7	9.9	9.8	9.8	9.6
Turkey	28.7	28.6	30.1	29.2	28.5	29.1
United Kingdom	12.7	12.9	12.7	12.3	12.5	12.7

Table 4

Limitations of cash payments in foreign countries²¹

#	Country	Imposed limitations
1	United Kingdom	<p>Consumers may make payments in cash without any limitations. However, traders are required to register with tax authorities as “high value dealers”, if they take cash payments in the amount exceeding €15 000.</p> <p>Banknotes of £5, £10, £20 and £50 are a legal tender for payment of any amount in England and Wales but not in Scotland and the Northern Ireland. £1, £2, £5 coins are accepted without limitations while the acceptance of coins with denominations of 20, 25 and 50 pence is limited by the amount of £10, and 5 and 10 pence coins – £5.</p>
2	Belgium	<p>From January 2014, the limit is €3,000, and applies not only to the purchase of goods but also to services such as the services of a real estate agent, an information and communication technology consultant, etc. Since January 2014, all cash payments in property purchases have been prohibited. A notary or real estate agent, as well as some other categories of sellers, are required to inform the authorities in case of non-compliance with the law. The authorities can impose a fine on violators ranging from €250 to €225,000.</p>
3	Germany	<p>There are no limitations as to payments in cash for purchases of</p>

²⁰ Source: IMF staff calculations.

²¹ <https://www.europe-consommateurs.eu/en/shopping-internet/cash-payment-limitations.html>

		goods. Consumers who wish to pay an amount in excess of €10,000 in cash must present their ID; the trader must document their last name, first name, place of birth, date of birth, home address and nationality.
4	Norway	<p>There are no limitations as to payments in cash for purchases of goods.</p> <p>However, in cases where the purchase of services from self-employed persons is paid in cash for an amount exceeding NOK 10,000 – approximately €1,078, the consumer will be jointly and severally liable with the seller if the seller fails to pay taxes and VAT on the purchase price.</p>
5	France	<p>French residents are allowed to make purchases at retailers against cash up to €1,000. For non-residents, the limit is €15,000. As long as the amounts payable do not exceed these limits, the trader must accept cash. If these limits are exceeded, the consumer must use another means of payment, such as checks or bank cards.</p> <p>There are no limitations on cash payments between consumers (e.g. for cars), but if they exceed €1,500, an invoice is required to prove that the payment has been made.</p> <p>Cash payments at local government financial institutions are limited to €300. These include payments of VAT, income tax, local taxes, fees (such as audiovisual license fees), fines, and hospital bills or rent paid to government agencies. In addition, payment must be made in a dematerialized way, namely by direct online payment, monthly direct debit or direct debit at expiration.</p>
6	Czech Republic	<p>A limitation for cash payments is 350 000 CZK (about €14 000) a day.</p> <p>In terms of coins, the limit is 50 pieces. Banknotes should be accepted without limitations, except for banknotes damaged in a non-standard way.</p>
7	Hungary	<p>There are no limitations for consumers. The HUF 1.5 million limit (about €5,000 per month) only applies to legal entities, unincorporated business associations and registered VAT payers who are required to open a bank account.</p>
8	Slovakia	<p>Cash settlements have been regulated since January 1, 2013. Limitations for cash payments are as follows:</p> <p>business-to-business, consumer-to-business and business-to-consumer payments – up to €5 000;</p> <p>a natural person acting for purposes that go beyond his/her profession, business – up to €15 000.</p> <p>Payments in excess of the above limits may be made only in a cashless form.</p>
9	Estonia	<p>The central bank and all credit institutions operating in the country are obliged to accept coins and banknotes without limitations.</p> <p>All other entities are required to accept up to 50 coins regardless of their value and banknotes without limitations.</p>
10	Portugal	<p>Cash payments for goods and services between consumers and merchants are limited by law: payment of invoices or similar documents in excess of €1,000 is made to the merchant's bank account in a manner that allows the recipient to be identified (bank transfer, bank debit or personal check).</p>
11	Spain	<p>From November 19, 2012, the limit is €2,500 for residents and €15,000 for non-residents. If the amount exceeds the specified limits, the</p>

		payment must be made via a bank transfer. The penalty for non-compliance with this instruction can be about 25% of the total amount of the transfer. The law applies to payments between consumers and merchants, but payments between consumers are not covered by the law.
12	Italy	From January 1, 2016, cash payments are only allowed up to €2,999.99. For larger amounts, debit cards, credit cards, non-transferable checks, or bank transfers must be used. Penalties range from €3,000 to 40% of the payment amount, in case of payment exceeding €50,000, the fine is at least €15,000.
13	Netherlands	No limitations. Nonetheless, some institutions are obliged to inform of any unusual transactions (including the identity and other personal data of the person involved).
14	Poland	From March 2015, the limitation for cash payments is €15 000.
15	Bulgaria	The limit is set at 9,999 leva (approximately €5,110). If the transaction exceeds this limit, then the consumer must pay for it via the bank. The same applies to any case where the purchase price is equal to or exceeds BGN 10,000, even if the consumer pays not the whole amount, but part of it – all parts of the price must go via a bank payment. If the payment is effected in another currency, then the 9 999 leva limit is calculated at the exchange rate of the Bulgarian National Bank at the date of payment.
16	Greece	Cash payments (including VAT) for the purchase of goods and services are allowed up to €1,500. Payments beyond this limit must be made through bank accounts, checks or credit/debit cards.
17	Denmark	There are no limitations on cash payments when purchasing goods. At the same time, a legislative proposal not yet adopted may allow the merchant not to accept cash payments any more. However, in cases where services are purchased against cash for an amount exceeding DKK 10,000 (approximately €1,340), the consumer will be liable together with the seller if the seller fails to pay taxes and VAT on the purchase price. If the consumer is unable to pay digitally, he/she may be released from liability if he/she reports the purchase amount to the tax office.
18	Romania	From May 9, 2022, cash payments from individuals to commercial enterprises are limited to 10,000 lei per person a day (€2 260).
19	Sweden	When conducting transactions, payment instruments may be limited on a contractual basis. The seller may not accept cash as payment if it notified the buyer about this in advance.
20	Finland	There is no provision in the legislation that obliges anyone to always accept cash as payment. The Company is not required to receive a large amount of coins (more than 50 metal coins for the same payment) or an exceptionally large banknote. If a company accepts cash but places limits on acceptable payment instruments, the limits must be clearly explained before the sale is made.

5. Conclusion

This study addresses the current state of cash circulation and analyzes the measures aimed at reducing the level of the shadow economy by regulating cash and encouraging cashless payments, as well as the experience of foreign countries in limiting the use of cash.

An analytical review of cash circulation showed that, despite the development of cashless payments, there is a parallel trend towards an increase in the amount of cash in circulation. This

is explained by the insufficiently high level of confidence of economic entities in banking and payment systems due to the potential risks of cyber fraud and fears associated with the likelihood of failure of the digital payment infrastructure. In addition, cash has advantages over alternative payment instruments in terms of such important indicator as liquidity, and has advantages in money circulation associated with low social costs per transaction and ensuring high speed of settlements.

A similar situation was observed not only in Kazakhstan but also in many other countries, where, in the face of increased uncertainty and restrictive measures provoked by the pandemic, economic entities began to show higher demand for cash. Even in Sweden, where an attempt was made to reduce the volume of money supply in cash, its growth resumed in 2017-2019.

The most significant indicator that has a direct impact on the amount of money needed for circulation is the volume of retail trade. It is the volume of goods and services produced that primarily determines the amount of cash in circulation necessary to ensure the uninterrupted process of exchange and consumption of goods and services.

The regulation of cash by setting limits on withdrawal amounts showed the first results of effectiveness in reducing the risks of participation of legal entities in tax evasion schemes and increasing the transparency of operations of business entities, and also contributed to the expansion in the use of cashless payments, stimulating the reduction of the shadow economy and corruption in the country. At the same time, when performing the analysis regarding the updating of maximum withdrawal amounts, in accordance with paragraph 25 of the Comprehensive Action Plan to Counteract the Shadow Economy for 2021–2023, similar to foreign countries, it is proposed to consider the possibility of putting limitations on transactions between business entities and consumers of goods and services.

In general, there are multidirectional trends in the world related to the nature of the use of cash in the economy: on the one hand, cash is being squeezed out of circulation, and this trend is preferable for the global money turnover; but, on the other hand, cash continues to be an important component of the money supply, whose reliability and liquidity is guaranteed by the government, thereby maintaining a fairly high level of its use.

An important role in the use of cash is played by the possibility of using it without the presence of technical equipment in the form of modern gadgets and Internet connections, which is especially relevant for residents of remote settlements of the country and the people of elder generation.

The shadow economy is a complex socio-economic phenomenon, covering the entire system of social economic structures and economic relations of the society. Only balanced comprehensive economic measures will prevent the transfer of resources into the shadow circulation, which will not only increase the volume of tax revenues to the budget but will also give impetus to the sustainable development of the country's economy. At the same time, the limitation of cash circulation is not a panacea in achieving this objective. The main efforts should be directed to identifying and combating the sources of shadow turnover (criminal organizations, corruption, informal employment, etc.).

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